

# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World      Feb. 1981

Welcome to Superletter! It's my pleasure to introduce you to the first international newsletter conceived and published exclusively for owners and operators of the Intertec SuperBrain computer.

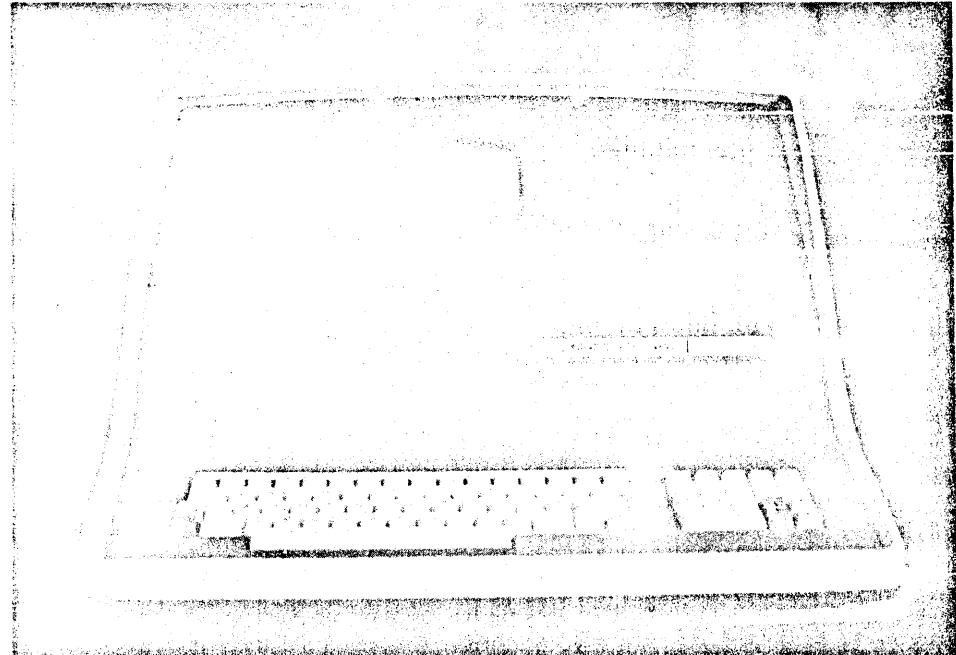
We are going to endeavor to provide you with an exciting monthly forum in which to share valuable information, like programming tips and technical problems, with thousands of other SuperBrain users around the world.

Your letters, your feedback and your creative ideas will eventually determine the success of this venture. We promise to search out the most timely facts and news regarding the use of the SuperBrain and present them to you quickly in a convenient and readable form.

We know from your letters and phone calls that many of you have experienced frustration and problems in dealing with Intertec Data Systems in the past. This failure of the factory to communicate properly with its customers is probably the reason for the overwhelming response we've received since we announced our intent to publish.

However, it is our belief that now a positive and constructive relationship can be formed between you, our readers, and the people at Intertec. This welcome dialog can be, and should be, a creative two-way street.

If you'll take the time to communicate with us, we'll provide you news of the latest in SuperBrain compatible CP/M software,



technical accessories, hardware modifications and repair suggestions. Let us know how you use your computer. What adaptions have you made? What software have you written? What suggestions for improvements would you like the factory to consider?

When you write us remember that many of our readers do not speak or understand technical jargon. If you'll keep your articles and letters simply written and easy to read, you'll reach a more appreciative audience and make a bigger impact.

However, what you can communicate in easy-to-follow programming terms, for example, is fine. The same goes for step-by-step maintenance or modification procedures. The choice of subjects is yours.

The pleasure in sharing them with others is ours.

And one more thing:

Our advertisers will welcome your patronage. By mentioning that "you saw it in Superletter", you'll provide them important customer feedback and encourage their continued support. Ads provide us all with excellent information as well as vital buying opportunities for the software we need.

So, read on and enjoy this charter issue of what we hope will become for you an integral part of your computer world . . . Superletter!

Albert Abrams  
Aberdeen Proving Ground, MD 21010  
EDITOR

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## Guest Interview

(Superletter this month talks with Dr. Jacques Vidal, a SuperBrain owner and Professor of Computer Science at U.C.L.A.)

Q: How long have you been using a SuperBrain?

A: For about a year now. It's a Model 2, using the CP/M 2.0 system.

Q: Do you plan to update it?

A: Yes, basically because I would like to be able to exchange some non-proprietary software with other users who are mostly working with the Model 3 with CP/M 2.2.

Also, I'm considering using Pascal and some of the text-editors like Magic Wand, Word Star and some business software packages that are available.

Q: How are you currently using your SuperBrain?

A: My main computing at UCLA is done on a PDP-Vax 11 and a PDP-1145, both of which operate on the UNIX System.

Dr. Vidal,

I wanted a compact computer that would act as an intelligent terminal and stand alone for separate text-editing with the diskettes used for off-line storage of UNIX files.

Q: Have you been successful?

A: There have been some difficulties. Not necessarily with the SuperBrain, but with the way UNIX takes interactive I/O. I've had to do some tricks, a lot of programming gymnastics. We had to use the PIP program, but we did succeed in transferring some files from the UNIX system to the SuperBrain.

Q: What would you say are the good points of the SuperBrain?

A: The packaging. The price. It's an entire computer with two drives I can put it in the trunk of my car. It's open-ended with the S-100 bus adaptor. I see it as a system I can grow with, adapt to future use, even possibly as a process controller if I want.

Q: And its faults?

A: I'm concerned about the back-up from the factory. It seems every owner I've talked to has some horror story or another about the service or the lack of it.

The documentation you get with the computer is skimpy. One problem we've had despite the fact that we bought the modification package to actuate the auxiliary port is that it still hasn't worked.

Then there is the way that the mother board is attached to the frame. It's poorly supported. Some bad design there. And I've found that the system definitely does not meet certain FCC standards for emitted radiation. The TV interference the computer creates is quite obvious.

But, to overcome that problem you can buy a plug-on filter which seems to do the trick.

I also would have preferred a removable power cord. It would have cost them nothing to make it that way.

The S-100 bus connector is a good idea except that they should have made a better way to make external connections. As it stands, you have to make a change in the cabinet itself. You can see the difficulty if you wanted an extra parallel connection.

Q: Do you think the factory has a problem in dealing with its customers?

A: It's surprising that Intertec doesn't take advantage of the fact that they've got thousands of customers out there. I filled out the warranty card and even purchased their schematics and I've never heard from them once.

You would think the factory would bombard you with helpful information about new software offerings and technical changes. But they don't.

That's why your monthly newsletter is such a good idea.

Q: What kind of enhancements would you like to see?

A: There could be software in

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### **PRINTERS:**

Base 2 (Model ST)	\$535.90
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Centronics 730 (w/cable!)	678.50
Centronics 737 (w/cable!)	811.90
Centronics 779 (w/tractors)	851.00
Diablo 1640 (RO)	2,799.95
Diablo 1640 (KSR)	2,995.00
Diablo 1650 (RO)	2,950.00
Diablo 1650 (KSR)	3,199.95
QUME 5/45 (RO)	2,495.00
QUME 5/45 (KSR)	2,850.00
QUME 5/55 (RO)	2,595.00
QUME 5/55 (KSR)	2,999.95
TI-810 Basic	1,595.00

### **TERMINALS:**

Soroc IQ 120	695.00
Televideo 912-C	725.00
Televideo 920-C	795.00
Lear 3-A	789.00

### **WARRANTY:**

All products come with complete factory warranties.

### **TO ORDER:**

Use VISA or Master Charge, Money order, or check. (Personal or company checks need 2 weeks to clear.)

### **SHIPPING:**

We ship FREIGHT COLLECT via UPS or Motor Freight, or we can advise you of the cost and you may include it with your payment.

### **WORLD-WIDE**

### **COMPUTER SALES**

P.O. Box 67735  
Los Angeles, CA 90067  
(213) 551-2990

order to use the computer with some kind of "escape" to a local facility. It's clear that this machine looks like a terminal. We should be able to use it like a terminal.

We should be able to establish a connection between the keyboard and a host but be able to decide on an escape character, presumably one that the host wouldn't recognize, so you wouldn't affect the host connection, but an escape sequence that would let you reload other programs into CP/M.

Maybe that program shouldn't run at location 100, but somewhere down in the memory, so that you would be able to run programs and jump back when you finish.

For example, suppose that I wanted to transfer a file from one disk to another. I would like to be able to use the PIP program but maintain my host connection at the same time. This software should be a simple thing to create and make available.

The terminal features in the SuperBrain are very primitive. There are not many terminal features available, although they worked it out for the Intertube. There is no reason why there can't be an emulator program running on the SuperBrain which would let you have a decent terminal.

There's only a few basic terminal features that are built into the screen interface and that's all you get. So that's something I think Intertec should be providing.

**Q: Do you have any use in the future for the S-100 bus card slot?**

**A: Yes.** I would like to be able to use an exterior unit with an 8-inch diskette and make it a 4 disk CP/M. Eventually I was contemplating using the SuperBrain as a computer monitor at the house, but I think it would be better to use some other dedicated system for that. But I would like to expand it and put it on the S-100 bus. However, I don't want to use the adaptor that Intertec offers because that's only one card that you can put inside.

**Q: Do you have anything to say in summary?**

**A: Intertec's SuperBrain** is a standard CP/M system that works. It does what it's suppose to do in terms of being a basic 64K CP/M system.

But I'd like to stress again that although Intertec, as a company, is obviously interested in selling terminals, if they can offer the Intertube with multiple emulation version, why can't they make a version of that for the SuperBrain?

It would be immensely useful, but they haven't done that. There's no reason why you couldn't have reverse video and various features like "Form" on the SuperBrain, if you had the proper software.

## **Calendar**

### **THINGS TO COME!**

Here are two shows and a conference that readers of the Superletter might want to take note of:

Feb. 18-20, Houston, TX. BUSINESS AND PERSONAL COMPUTER SALES AND EXPOSITION AND HOUSTON BUSINESS SHOW. Houston Civic Center, Capitol Avenue and Bagby St.

Feb. 23-26, St. Louis, MO. ACM (Association for Computing Machinery) COMPUTER SCIENCE CONFERENCE. Stouffer's Riverfront Towers Hotel. For more information, contact: Mr. Orrin Taulbee, (412) 624-6475.

March 11-13. New York, NY. BUSINESS AND PERSONAL COMPUTER SALES AND EXPOSITION AND NEW YORK BUSINESS SHOW. Madison Square Garden. (For more info on both the New York and Houston shows contact: Produx 2000 Inc., (215) 457-2300. P.O. Box 2000, Bala Cynwyd, PA 19004.)

Do you have any news on upcoming computer shows, seminars, or conferences that will be of interest to Superletter readers? Let us know and we'll spread the word!



## Letters to the Editor

### SUPERLETTER FORUM

We are considering setting up a SuperBrain with a hard disk but the information is limited. Are there any Superletter readers that can help us?

DARRELL BUSHNELL  
Passaic, NJ

We have recently purchased an Intertec SuperBrain. Among the projects we plan to "bring up" on the computer are the Museum's membership, the Museum Shop's inventory, as well as developmental office files.

One of our long range goals is to have the artifact collection inventory on the SuperBrain and be able to answer a number of research questions based on our holdings.

LINDA FOTH  
Museum of the  
American Indian  
New York, NY

### NOW THAT'S A REAL SUPERBRAIN!

"One might even conceive of biological components in computers. It is quite obvious that computers so far are just bad imitations of our brains. Once we learn more about how the brain acts, I would be surprised if we could not construct a sort of biological computer. Such a computer might have electronic components modeled after biological components in the real brain."

Alvin Toffler  
"Future Shock"

(But will there be a decent warranty? Ed.)

### NAME SOUND FAMILIAR?

This quote caught our eye from a recent Wall Street Journal article detailing the upcoming invasion of new Japanese microcomputers.

"As a matter of course," predicts Mr. Toyohito Akutsu, "within less than one year, the American market will be flooded with Japanese products because Japan is No. 1 and superior in terms of production management and quality control."

"That may sound a bit hyperbolic, but Mr. Akutsu speaks from personal experience. He manages a personal computer store in Tokyo called Super Brain. Until last year, he says, 'almost 100% of our sales were American products'. Since Nippon Electric Co., one of Japan's largest computer makers began marketing personal computers in Japan, today almost 100% of Super Brain's sales are Japanese products."

## SUPERClassifieds

At last! A poster-size buyer's chart that compares in detail every feature of every printer and terminal on the market today. It's the only chart of its kind and it can save you hundreds of dollars and hours of time. The price? Only \$7.50! Just send a check or money order to: "Buyers' Comparison Chart", P.O. Box 67735, Los Angeles, CA. 90067.

Wow! A ten-megabyte hard disc system that attaches to your SuperBrain with only a five minute easy installation. These are factory-fresh Intertec units. Only \$3,890! A great savings on a great hard disc unit. Call direct: 1-800-426-2963. Ask for Jerry Jones.

SuperClassified rates are:

\$4.00 per line

1/4 line minimum — 5 words per line.

Please note: Publication of all SuperClassifieds are dependent on dates of receipt of copy and payment and space availability.)

Mail to: SuperClassifieds  
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## SUPERLETTER

### Factory News

#### OWN A SUPERTERM?

Don't fret. There's still hope. Intertec can supply owners of the Superterm with ribbons and spare parts even though the printer is no longer in production.

The part number for the ribbon is 1190100 and they come in six-packs for \$30.

Either the order-processing or the customer-service department at Intertec can take care of a customer's Superterm needs.

One reminder: Intertec requires a minimum \$50 order for parts.

#### A POSSIBLE CURE FOR GROWING PAINS

If you're considering moving up to a multi-user, shared disk microcomputer system, you might want to take a look at Intertec's CompuStar.

It's a network of video-display terminals each with its own individual microprocessors and dynamic RAM, tied together by a single Winchester, or similar hard disk device. In this way, CompuStar allows the system to share disk drives while allowing individual users to maintain restricted data bases.

The network architecture is based around one of three disk storage systems: a 10-megabyte Shugart-type Winchester 8-inch drive, or a 32- or 96-megabyte cartridge module drive. The multi-user system can accept up to 225 video terminals in a single network.

Each system consists of the hard disk device, complete with power supply, and a disk controller and multiplexor circuitry to tie the user stations into a common disk system.

For more information and prices contact Intertec directly or your dealer.

### Book Review

#### A VERY STICKY SUBJECT!

Read a good book lately? If not, consider this one: "THE PEANUT BUTTER AND JELLY GUIDE TO COMPUTERS", by Jerry Willis.

This 215 page book, like the sandwich evoked in the title, is a simple and easy-to-digest guide to selecting, owning and operating a microcomputer.

Written on the author's home word processor, the book surveys equipment, systems, and languages; provides consumer tips on buying hardware; and deals with recreational, educational, home and business applications.

Willis supplies technical material only when it is helpful and understandable, and leads the reader gently.



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April/May 1981  
Vol. 1 No. 2

**T**here's an explosion going on! New software products and hardware enhancements for the SuperBrain computer are now rapidly making their way into the marketplace. And we're going to find and introduce them to you with important details and facts that can help you with your critical buying decisions.

Beginning with this issue of Superletter, we'll be publishing an ongoing listing of all of these new products. Obviously, we can't guarantee their effectiveness or value unless manufacturers provide us with their products for a careful and objective user-oriented analysis. But, we can put all the information together in one place for you, and that's a first for SuperBrain users!

Yes, you'll see some big changes in our price and publishing schedules. Many of you responded with some very valuable feedback after reading our charter issue in February. Your comments and suggestions were warmly received and listened to.

Therefore, we are now going to publish bi-monthly and cut our sub-

scription rates in half. It seems that both readers and advertisers alike prefer that formula, so we have adapted our operations accordingly.

As you'll see in one of our articles, the price of the 64K SuperBrain has gone up. So has the drop-ship price to retailers. Although it means that infla-

tomers so that we can send them a sample issue of Superletter. Any new venture can only succeed when it gets that kind of encouragement and support.

We are here to listen and help when we can. We appreciate the news and articles that many of you have provided us. By way of

Superletter this beneficial information can now be exchanged easily to thousands of other SuperBrain users.

If you haven't subscribed, don't wait any longer. Our next issue will be featuring articles about using APL; how CP/M works in the SuperBrain; new detailed service and repair information, as well as the continued listing of available new products.

And for those of you who will be in Chicago, have a great NCC!



EDITOR

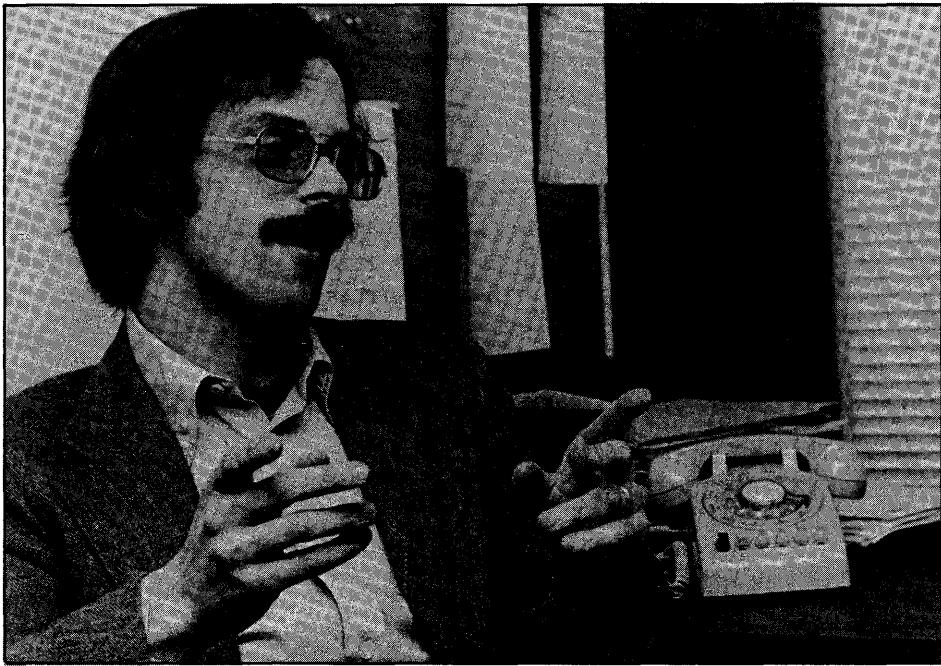
tion has caught up with the price of Intertec products, (when some other computer prices are falling), one way to look at it is that the re-sell price will probably rise as well.

We appreciate the generosity of the many fine Intertec dealers, OEM's, and product manufacturers who have supplied us with the names and addresses of their SuperBrain cus-



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Peter Hendrick

## Guest Interview

(*Superletter this month talks with PETER HENDRICK of IE Systems, Inc. 98 Main Street, P.O. Box 305, New Market, New Hampshire 03857 (603) 659-5891*)

**Q:** We understand that you make and market an enhanced PROM for the SuperBrain computer. How did that come about?

**A:** We're primarily an engineering and software house and we have been working with the SuperBrain since its inception. We had sold Intertubes and had suggested changes to Intertec on their design to include disk drives. Sure enough, Intertec did just that and thus was born the SuperBrain.

We have designed and implemented computer boards and an IO board for S-100 systems. We are local dealers for an S-100 computer plus the SuperBrain. We started working with the SuperBrain shipping Wordstar and other MicroPro products on it and running into some real

problems in the early models.

That led to the development of a new PROM and an enhanced BIOS that replaces the BIOS developed by Intertec that's shipped with their CP/M license set. Digital Research has referred a lot of their problem users to us because we've developed so much in-house experience with the SuperBrain.

We're about to release Version 4 of what we call SB/E, the enhanced SuperBrain EPROM and BIOS. It comes with a manual of instructions on interfacing the SuperBrain with nine various printers, on how to maintain the computer, and some operating hints.

**Q:** What are the features of the new EPROM?

**A:** Some of the things that will be available in Version 4 are greater disk capacity (up to 192 K bytes per side per drive). We can increase the "step rate" (faster disk access time) down to 6 milliseconds, except where there is a limitation on the

Shugart drives. We have keyboard "type-ahead" and "auto-repeat" on all keys. There is a programmable "key-click" function, if you want it, to give you a typewriter-like sound when you type. There are 35 programmable keys that can be programmed directly from a menu. And with that you get specially labelled key-caps for easier Magic Wand and Wordstar use.

**Q:** What about an increased I.O. port buffer?

**A:** We've added an increased 256 byte buffer that can be pointed to either port. And, we've implemented the I.O. byte capability of CP/M and programmable handshaking at either the Main or Aux ports with a menu program called "ACTIVATE".

**Q:** Anything else?

**A:** There is a real-time clock. Enhanced screen controls. We've also included an option that permits you to use the ADM-31 screen control that emulates that popular terminal.

We have a feature that lets you check out the speed of the disk spindle motors. It permits you to find out whether the motors are out of sync.

You can implement an automatic shut-off of the spindle motors that will happen when the disk drives are not being accessed after ten seconds. When you consider that the disk drives are only expected to have a normal 2,000 hour life, this feature's benefits become very apparent.

We also sell an optional diagnostic package that includes a screen exerciser, an I.O. port exerciser, a complete memory test and a screen tachometer for the spindle motors.

**Q:** What are the prices for these products?

Continued on next page



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TI-810 Basic	1,595.00

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Televideo 920-C	795.00
Lear 3-A	789.00

All products come with complete factory warranties.

### **TO ORDER:**

Use VISA or Master Charge, money order, or check. (Personal or company checks need 2 weeks to clear.)

### **SHIPPING:**

We ship FREIGHT COLLECT via UPS or Motor Freight, or we can advise you of the cost and you may include it with your payment.

### **WORLD-WIDE COMPUTER SALES**

P.O. Box 67735  
Los Angeles, CA 90067  
(213) 551-2990

**A: The new IE PROM sells for \$195.**

**Q: Is it easy to install?**

**A: You just have to undo the hood and remove the PROM. If you're used to handling PROMS it's no problem. If you're not, you must use an PROM removal tool. That's the trickiest part: the handling of the PROM because of the danger of static electricity from the finger tips.**

**But the instructions are clear and should be followed carefully.**

**The diagnostic package of five tests sells for \$100.**

You should also know that we market a mainframe auto-dial, auto-answer modem for the SuperBrain. It costs \$300.

**Q: And your documentation?**

**A: We send along with our products a 40 page manual. We use a very straight-forward, easy-to-read style that explains each product and its installation and use. It takes the reader through each procedure step-by-step.**

**Q: Are you working on any other products for the SuperBrain?**

**A: We're working on a noise suppressor, a surge suppressor and other things that will take care of some of the power-related problems, like the RF emissions.**

**Q: What other tidbits of information could you pass on to SuperBrain owners?**

**A: Well, for example, we're working with the Diablo printer which is somewhat difficult to interface. Its wiring is tricky and it seems to vary from model to model. We'll have a standard interface for the Diablo printer series soon. We've had success with it, but it does have some problems now.**

**Q: How would you compare the advantages of the SuperBrain versus its weaknesses?**

**A: We think it's a very good desktop computer. From the applications standpoint we think some people have tried to make it do things it wasn't designed to do with its size and without its mass storage capability.**

From a technical viewpoint, there's been a learning curve and things have been found and corrected. But on the whole we think the SuperBrain is going to grab a major share of the desk-top computer market, not only here in the States, but world-wide as well.

## **Calendar**

### **THINGS TO COME:**

**April 3-5, San Francisco, CA. THE SIXTH WEST COAST COMPUTER FAIRE, Civic Auditorium, San Francisco, CA. The Faire is a major personal-computing event. A full program of talks plus a large display of hardware and software are featured. For more information, contact Computer Faire, 333 Swett Rd., Woodside, CA 94062, (415) 851-7075.**

**April 13-16, Mexico City, Mexico. THE FIFTEENTH ANNUAL SYMPOSIUM ON MINICOMPUTERS AND MICROCOMPUTERS, MIMI '81, Sheraton Hotel, Mexico City, Mexico. This symposium covers hardware, software, distributed processor architecture, computer networks, telecommunications, real-time applications, education, and more. Contact Ing. Jorge Gil, Academic Secretary, MIMI Symposium, IIMASUNAM, Apartado Postal 20-726, Mexico 20 D F, Mexico.**

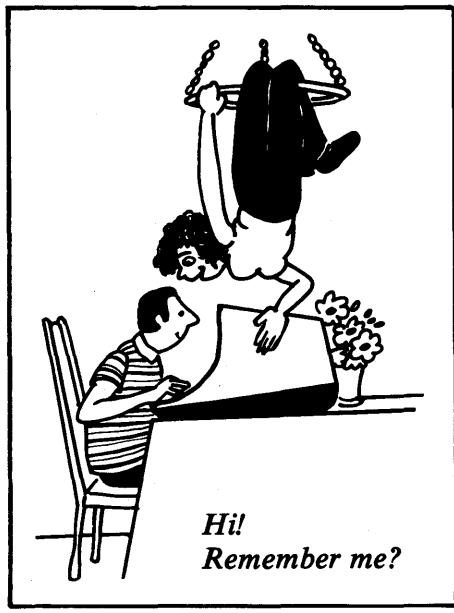
**MAY 4-7, Chicago, IL. NATIONAL COMPUTER CONFERENCE, McCormick Pl., Chicago, IL. Approximately 90,000**

*Continued next page*

people are expected to attend the National Computer Conference (NCC) this year. The use of robots and artificial intelligence will be among the program sessions at the Personal-Computing Festival during the NCC. For the first time, personal-computing exhibits will join the rest of the conference in the main exhibit area. Over thirty technical sessions will be held. All major companies will be represented. Contact the American Federation of Information Processing Societies Inc., POB 9658, 1815 N. Lynn St., Arlington, VA 22209 (703) 558-3617.

May 11-13, Atlanta, GA.

**THE THIRTY-FIRST ELECTRONIC COMPONENTS CONFERENCE**, Colony Square Hotel, Atlanta, GA. Papers on semiconductor-processing technology, optoelectronic devices, manufacturing technology, materials, hybrid microcircuits, discrete components, interconnections, reliability, and connectors will be read. Contact T.G. Grau, Bell Laboratories, Whippny Rd., Rm. 3B-312, Whippny, NJ 07981; or Electronics Industries Association, 2001 Eye St. NW, Washington, DC 20006.



## Add-on SuperBrain® Drives

AVAILABLE ONLY FROM VR DATA!

Increase the storage capacity of your SuperBrain™ to 700K with two extra 40 track drives, or over 1 Meg with QD drives.

- Fully compatible with SuperBrain operating system
  - Fully compatible with all SuperBrain drives
  - Easy plug-in installation
  - Includes patch program
  - 90 day warranty, 100% parts and labor
  - Extended warranty available
- Complete two drive kit  
(incls. cable and patch) 789.  
QD drives 1339.

**6.3 MEG WINCHESTER**

\$2995.00

If two extra drives aren't enough try our 6.3 Meg Winchester Assembly (complete with software patch)

## SuperBrain Parallel Printer Port

Available only from VR Data!

Now, you can add a parallel printer port to your SuperBrain and use Centronics - compatible parallel printers.

- designed exclusively for the SuperBrain by VR Data
- easy, plug-in installation
- 90 day warranty, 100% parts & labor
- complete \$99.95

## SERVICE CENTER

Fast, Expert service on SB's, QD's, etc.

- 48 hr. turnaround on most repairs
- Carry or ship-in
- Call for estimate

## COMPATIBLE PRODUCTS

Magic Wand	300.
Anadex 9500/01	1395.
Epson MX80	550.
Okidata 80	495.
Okidata 83	1095.
TI 810 Basic	1590.
NEC 5510 w/trac	2995.
Diablo 630 w/trac	2495.
Starwriter 25	1595.
Call for quotes on other products.	

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VR Data, a manufacturer of innovative computer products, is known world-wide for quality, dependability and prompt, personal service since 1972.

To order call toll free (800) 345-8102, or (215) 461-5300 in PA.



## New Products

### SUPERBRAIN SOFTWARE AND HARDWARE LISTING:

#### I.T.I.

#### INFORMATION TECHNOLOGY, INC.

56 Kearney Road  
Needham, MA 02194  
(617) 444-5702

Contact: Leonard F. D'Innocenzo  
Andrea Frulla

**HARDWARE:** I.T.I. is a dealer for the Model 4 SB/E PROM and enhanced BIOS disk. Also, compatible printers, SuperBrains, Intertubes, the Emulator and CompuStar Systems.

**SOFTWARE:** Fully interactive and SuperBrain compatible American Business Systems' General Ledger, Order Entry/ Inventory Control, Accounts Receivable/Payable and Payroll software.

Also Real Estate, Client Accounting, Financial Modeling and Correspondence Management Systems.

I.T.I. also provides the latest versions of Magic Wand and Wordstar for the SuperBrain with snap-on keycaps.

#### DIVERSIFIED DATA SYSTEMS

8043 W. 82nd Street  
Indianapolis, IN 46278  
(317) 299-0115

Contact: Steve Maschmeyer

**HARDWARE:** I.E. - type PROM with a special hardware option that permits connection to their own 10-Megabyte, 8" HARD-DISK Winchester system for the SuperBrain.

Also available is a special 300 Baud MODEM incorporated inside the SuperBrain with auto-dial, auto-answer, and a phone jack that comes out of the computer. It's FCC approved for direct-connect.

A COMPOSITE VIDEO KIT allows you to run the Brain to a separate TV monitor. Especially good for large educational uses. The kit is assembled, easy to install and uses the 40-pin cable connector that sits inside the computer.

D.D.S. claims to have the only true S-100 BUS ADAPTOR coming soon for the SuperBrain computer. Though not standard by IEEE, it uses a "piggy-back" board on the existing Z-80 chip with an additional power supply. With it you'll be able to add an additional disk controller, serial or parallel ports or any other S-100 attachment. Technical expertise and some CP/M knowledge will be required to use it.

They also sell the entire Intertec line and their own hard-disk systems. SOFTWARE: Almost all commercial software packages for the SuperBrain and their Pharmacy System written in COBOL. They are COBOL specialists.

#### VR DATA

777 Henderson Boulevard N-6  
Folcroft Industrial Park  
Folcroft, PA 19032  
(215) 461-5300

Contact: Warren Rosenkrantz

HARDWARE: All Intertec products and a local technical service center equipped with Intertec parts.

VRData sells a working PARALLEL PRINTER PORT for the SuperBrain and the QD allowing full use of all Centronics printers. It snaps on in minutes and comes with a full warranty for parts and service.

They also offer the only DRIVE 3 and DRIVE 4 ADD-ONS for the SuperBrain which can increase disk storage to 700K and up to 1 Meg in the QD's. Kit includes two 40 track drive assemblies with cable and

patch programs and instruction for plug-in installation.

**MICROAGE CONSULTANTS**  
53, Acton Road, Long Eaton  
Nottingham NG10 1FR  
England  
(06076) 64264

Contact: Andrew Billson

**HARDWARE:** SUPERBIOS is a strong product from these English SuperBrain experts. It contains a real-time clock, XON/XOFF or ETX/ACK protocols, repeat and type-ahead keyboard functions, compatible with their own designed 8" hard-disk system with the Decitek 8000/S. Also, the product makes Wordstar workable.

SUPERVID is a product of their MicroMod division. It permits dim video, reverse video, blinking and underline, line drawing and graphics, lower-case descended, attributes mixed on the screen and three alternative character ROM sockets so that you can use chess symbols, APL, etc. Distribution of their pro-

ducts will be handled by special dealers on both American coasts.

They'll be introducing a new INTERFACE CARD for Seagate Technology's ST-506 5" Winchester Disk providing 5 Meg storage inside the cabinet.

#### MEASUREMENT MASTERS

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Santa Ana, CA 92704

(714) 754-0528

Contact: Don Baer

**HARDWARE:** The entire Intertec line with special regional service facilities and parts. Also compatible printers including a large-buffer, bi-directional NEC Spinwriter and Tiger Printers.

Continued on page 7

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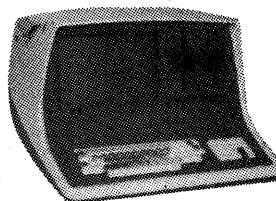
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## Technical Corner

For 64 (Q) CP/M5/5 et al.

Submitted by Dr. Andrew Billson,  
London, England.

These programs are actually copies of the operating system (to be found at 0980 up when the files are inserted under DDT) with SYSGEN22 located in the area between 0100 and 097F.

The following changes make them work without inviting "SOURCE DRIVE NAME":

Set 0383 to 24

Set 04D3 to 11

Set 04D6 to 0E } Put 09 in C

04D7 to 09 }

04D8 to CD)

04D9 to 05 } Call BDOS

04DA to 00 }

Fill 04DB, 04E0, with 00 NOP's

Set 04E2 to 1B

04E3 to 03

Before SAVEing this modification { SAVE 48 CPMOD5/5.COM }, careful readers may wish to change the CONFIGUR bytes --

Set 3086 to 01 to enable DSR handshaking on AUX port.

Set 3087 to FF to require Read After Write Verification.

To cause some command line to be executed automatically on cold start you can also put this command at 0988ff:

Eg. to "DIR":

Set 0987 to 03 no. of characters in command

Set 0988 to 44 D

Set 0989 to 49 I

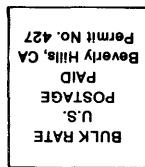
Set 098A to 52 R

Set 098B to 00 End Flag



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## **Factory News**

### **INTERTEC ANNOUNCES PRICE HIKE AS 64K BECOMES NEW STANDARD FOR SUPERBRAIN.**

The 32K SuperBrain, factory priced at \$2,995, will soon be a thing of the past as Intertec now has begun shipping only their 64K Model at a new factory price of \$3,495.

The additional 32K will be installed as a part of the manufacturing process and the units will be "fully tested and burned-in before leaving the plant," according to a recent Intertec press release.

Dealer and OEM pricing will be increased proportionally, although it is expected that reseller discount margins will remain about the same.

Intertec sales have soared from \$6 million in 1979 to nearly \$20 million

in 1980. Sales projections for 1981 are expected to be somewhere between \$35 and \$40 million.

The price change is the first in nearly two years.

### **NEW "OFFICE PRODUCTS DIVISION" TO DEBUT IN MID-81.**

Intertec is exploring the lucrative business word-processing market with a new multi-user system that will retail for less than \$9,000 and feature up to 7 megabytes of dual disk storage.

The proposed new business system will be expandable up to 255 work-stations with each targeted at about \$2,000 each.

Although plans are now only in the research and development stage, most of the software and design

aspects are said to have been started.

Marketing plans for the new "Office Products Division" may mark the premier of Intertec's first TV and radio commercials on a national and regional scale. Also on tap are point-of-purchase displays, factory training, and even a special Intertec van for mobile demonstrations.

Sales and distribution of the new product, when the green light is officially given, will be handled by separate sales, service and marketing departments apart from the existing operations in Intertec's Data Systems division.

The new product will be distributed by a select group of independent sales organizations already serving the retail office products industry. Strict requirements will be applied during the selection of dealers.

# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

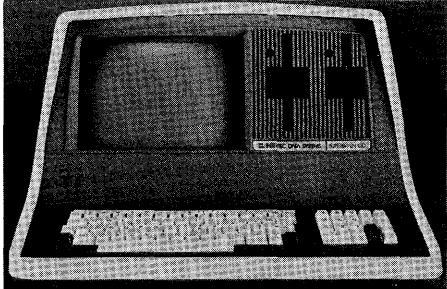
June/July 1981  
Vol. 1 No. 3

## S ervice and repair.

Those two words have been brought up continuously over the last several months when readers and SuperBrain users have complained to us about problems they've experienced with Intertec in the past.

And it's no secret that customer support has plagued Intertec Data Systems since its inception. Dealers around the country have quoted figures to us as high as 50% when referring to the number of "D.O.A.'s" that arrive in shipments from the factory in Columbia or from distributors.

When you look at what Intertec has offered in the way of warranty plans, the problem becomes even more exasperating. The end-user has to send the entire unit back to Columbia at his expense (in both directions!) for a warranty repair or alignment. For most parts of the



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country that usually amounts to over a hundred dollars.

And, it's easy to see why few users have bought Intertec's Carterphone deal. The price is ridiculously high for a reasonable service any factory should be offering on its products.

And the "module swap" program is only good if you feel comfortable using tools on your computer. For most people, that's like asking them to operate on themselves.

The only light at the end of the tunnel may be the CARE Program which is small now but promises to resemble a regional service idea in the future.

In the CARE Program, certain dealers and technical reps trained at the factory can offer service to local end-users in their area. The only drawback is that the dealers don't have to service your machine if they don't want to. If you didn't buy it from them, they can close the door in your face. It's a form of corporate discrimination that makes absolutely no sense.

Our suggestion? As Intertec opens its classrooms for service training it should also insure that any SuperBrain owner in the nation or in Europe

has the right to get service from a nearby CARE dealer and be charged reasonable prices for the repairs needed -- especially warranty repairs.

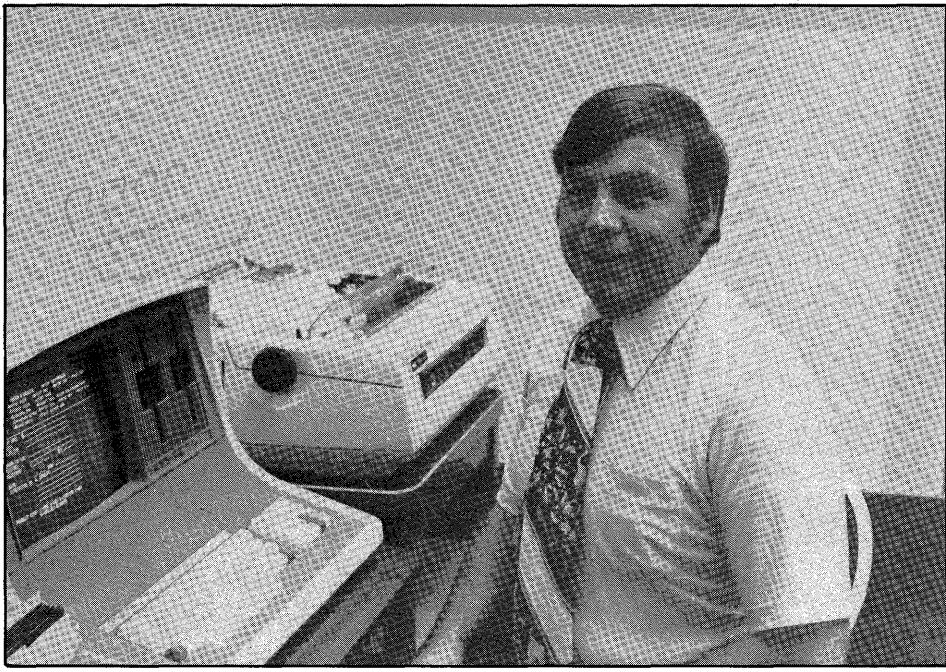
We feel this is an important matter, so we'll be watching events closely. And, we've listed the names and addresses of regional Intertec reps across the United States so you can let them know how you feel about Intertec service and repair policies -- what you've experienced in the past, and more importantly, what you'd like to see done in the future.

If you're a subscriber, send us a self-addressed stamped envelope and we'll send you free programs created for SuperBrain owners by Dr. Paul Kelley in Boston. They're fascinating and helpful in understanding how your SuperBrain really works.

As before, we thank you for all of your comments and letters. We'll continue to stay on top of things for you so that you can get more out of your SuperBrain in the months and years to come.

*Albert Abrams*

EDITOR



Don Baer

## Guest Interview

(*Don Baer is President of MEASUREMENT MASTERS in Orange County, California, a SuperBrain OEM retailer.*)

**Q:** How long have you been using the SuperBrain?

**A:** We've been involved with Intertec for over a year. We were involved with another computer company, but we found what they had was inadequate and so we began a search for a new type of computer that we could use. We looked at everything in its price range and settled on the SuperBrain.

**Q:** What are the ways you're using it now?

**A:** Presently, our primary purpose is to sell the SuperBrain in the machine tool market for computer assisted programming for NC (numerical control) machines. We've written our software around lathes and mills to enable the small shop owner to have a computer that could program his automatic machines so he would not have a full-time NC programmer.

**Q:** How easy to use is your software?

**A:** Our software is menu-driven and configured in such a manner that the client just answers a series of questions and the software will program the machines for him without him having to learn complex computer languages like COMPACT and others which are common to the machine-tool industry.

**Q:** Are you happy with the SuperBrain?

**A:** Yes. We've been very successful using it. For several reasons.

One is that the machines we're programming all follow a standard program-

ming configuration, but the communications protocol requires different Baud rates, different start and stop bits, that sort of thing.

The SuperBrain is ideal in that we can program, into what we call a "closed processor", the protocol we want, depending if it's a Fanuc, a common machine-tool with a dedicated microprocessor, or other special machines. But none of them necessarily has the same communication protocol. But with the SuperBrain we're able to configure a closed processor for any given machine.

So when a customer plugs in his program disk, it is configured for the machine that he is using at that particular time.

**Q:** How did you decide to become an Intertec dealer?

**A:** Well it happened out of necessity. We were selling them with our programming to clients and providing service. Our units are completely burned in and tested and we provide continuing technical service. And of course we configure the machines with the business software that's necessary. So even if a person doesn't own a machine shop, he can use it for word-processing or for business finances.

**Q:** You consider yourself a certified service-center?

**A:** Yes, we, like other large-volume OEM's participate in the Intertec "CARE" Program. We pay a royalty for a priority service to Intertec. In turn they make us an authorized service center and provide us with factory parts.

**Q:** So, do people have to have a maintenance agreement with you or can they just go to you for parts?

**A:** If the machine is out of warranty, we'll just sell them the parts and get them up and running. They can just buy parts or if they want they can let us take a look at it and service it for them.

**Q:** Are most of your customers in California?

**A:** As a matter of fact our customer list is growing to the point where we are getting customers from as far away as Chicago.

**Q:** So any person anywhere who needs a part can call you and you can supply them with the parts they need?

**A:** Sure. We have the parts on the shelf because Intertec furnishes them to us as an authorized service center. There are numerous distributors who, through the volume of units they're selling can become members of this "CARE" Program. It means they have factory parts on the shelf and they go through a factory warranty situation with Intertec.

**Q:** What about the Carterphone situation?

**A:** Carterphone is a national organization to which you pay a fee by the month and they provide on-site service as long as you're within a certain number of miles of one of their offices. They're in all the major cities. L.A., San Diego, San Francisco, New York, Atlanta, Dallas, Houston. The last time I opened the latest manual they supplied a map showing where the Carterphone people were.

**Q:** But for customers who own the older manuals, they wouldn't know, would they?

**A:** Intertec will tell you if you call them where your nearest authorized service center is located. There are dealers throughout the country like ourselves who are buying in volume and participating in the "CARE" Program. We bring the units in in quantity, plug them in and test them thoroughly. We don't see how we could supply our customers with a product that isn't tested and running and expect them to have to fight the factory.

**Q:** What do you think the status is with the S-100 bus connection?

**A:** To my knowledge I haven't known anyone to use it yet.

**Q:** So the feature that Intertec plays up in its advertising is basically still unused.

**A:** Yes.

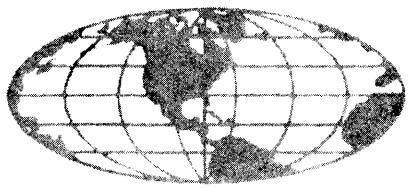
**Q:** What do you think people could eventually use it for?

**A:** You could use it to tie in a hard disk, a Winchester type hard disk, get an adaptor and tie it into the SuperBrain. You could use it for communication to a printer. You could use it for driving special cards with input-output. There are several things you can do with it.

**Q:** And the reason it's not being used now?

**A:** Well, Intertec is supplying its own 10 Megabyte hard-disk system which you can

*Continued on next page*



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plug into the SuperBrain. You have to remember one thing. Intertec is interested in pushing their Model A. Don't get me wrong, it's an especially well-designed product. It's very well thought-out. It uses quite a bit of the latest hardware and it's a universal machine but they're not interested in supplying a machine which can do ninety million different things. They want a universal machine. They're not interested in specials.

Q: Do you sell a number of software packages configured for the SuperBrain?

A: Yes. We sell WordStar among others. We also sell a combined SuperBrain WordStar and updated NEC Spinwriter package that can use the printer at up to 9600 Baud. I use it myself. And it's bi-directional. Most people don't know that the NEC is designed for bi-directional printing. As a matter of fact we also use it for plotting. And it's a very accurate plotter because you can plot about 1500 characters per square inch. And that's without any modification to the machine. It just depends on the software you're using, how you program it. And that's what we do. We can also increase the buffer in the NEC to about 16K to our customers. And, to my knowledge, we offer the only high-resolution graphics package.

Q: What is "Datalex"?

A: Datalex is a Pascal batch-processing system designed to run on the SuperBrain. We sell that too. We found we had some OEM accounts that wanted to do some communication with IBM mainframe computers. They wanted a system that was screen oriented so that they could bill for screen time. We saw that Datalex was in Pascal and that it was fast and easy to configure.

Q: What improvements would you recommend for the SuperBrain?

A: There's probably room for improvement in the way that Intertec deals with the flood of technical questions they must get each month from owners who have technical difficulties.

You might say they have a communications problem. Some customers are known to have waited for up to eight or nine weeks for repairs to their machines. They don't seem geared to handle that kind of volume of service. They're just so busy producing the machines. But that's where we make our money. We prevent that from happening to our customers. They may pay a bit more for our prices compared to buying from mail-order houses, but they're getting insured back-up from us. And we think that's very important.

Q: Any final comments?

A: Well, we've found the SuperBrain to be a very powerful machine. And once they're up and running, we find that most people have very little problems with them. It's important that people do not get discouraged if they buy one and have problems. Once they're fixed and secure, we think they're very reliable.

## Rampant Featuritis Strikes 'Brain

An outbreak of SB/E has hit Intertec SuperBrains\*. SB/E (for Super Bios and EPROM) is a feature-filled software/firmware package that has been found on SuperBrains at government agencies, leading universities, and Fortune 500 companies.

Because it is standard CP/M®, not one of those "compatible" derivatives, SB/E can be tricky to spot. Experts recommend holding down any key to check for auto repeat or audible key click; looking for greater disk capacity and much faster disk access times; or testing for programmable function keys and a real time clock.

### Reliability Affected

It is the automatic spindle motor shut off and the disk speed check, however, that have made identification difficult. These features directly lead to more reliable operation and longer MTBF. This means that SB/E equipped machines are less likely to turn up at repair centers, the usual place to monitor computer performance.

### Source Located

Hundreds of SB/E installations have been reported, in America, Canada, Europe, Africa, and Australia. Investigators have traced the source of the outbreak to IE Systems, a group of high tech junkies operating out of a New England mill town.

IE Systems has been forced to publish a free booklet explaining what they've done. And to ease the anguish of people waiting for SB/E to hit their 'Brain, IE has installed more phone lines. They have also agreed to sell directly to end users at \$195, as well as to dealers.

People who need immediate positive confirmation that SB/E is running on their machine should call the junkies and get their fix.

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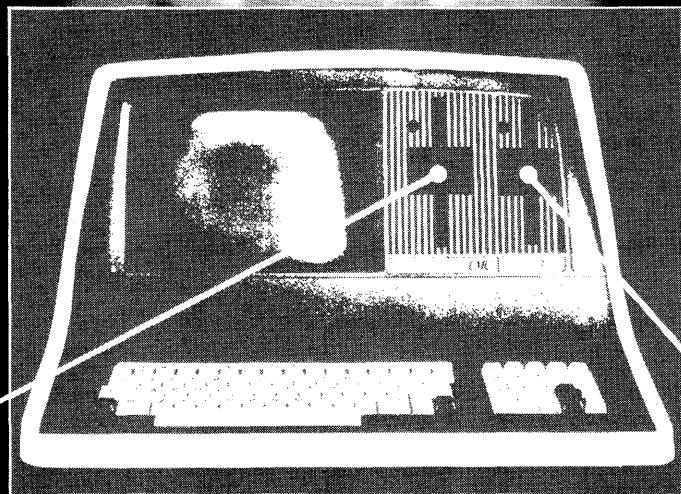
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## Calendar

### THINGS TO COME:

June 6-9 Atlanta, GA. ATLANTA SMALL COMPUTER SHOW, Atlanta Hilton, Atlanta, GA. Producers of small computers, peripherals, supplies, and services will be exhibiting at this show. For information contact the Atlanta Small Computer Show, 4060 Janice Drive, Suite C-1, East Point, GA 30344, (404) 767-9798.

June 17-19 Denton, TX. NATIONAL COMPUTING CONFERENCE, North Texas State University, Denton, TX. Computer literacy, computer education for teachers, and computers in education are some of the topics to be covered. Contact Dr. Jim Poirot, NECC-81 General Chairman, Computer Sciences Dept., North Texas State University, Denton, TX 76203.

June 23-25 New York, NY. COMDEX/SPRING, Madison Square Garden and the New York Statler Hotel, New York, NY. Computer and computer - related manufacturers, systems houses, computer retailers, dealers, distributors, manufacturers' representatives, commercial OEMs, and other related businesses will be exhibiting. Contact The Interface Group, 160 Speen Street, Framingham, MA 01701, (800) 225-4620; in Mass. (617) 879-4502.

July 29-31 London, England. THE 1981 MICROCOMPUTER SHOW, Wembley Conference Centre, London, England. Seminars on microcomputer applications in business, production, and education will be presented. Topics will include hardware availability, software packages and development, automatic test equipment, robotics, and process control. Exhibits from major European and American manufacturers will be featured. Contact TMAC, 680 Beach St., Suite 428, San Francisco, CA 94109, (800) 227-3477; in California (415) 474-3000.

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(205) 595-7233/(205) 933-2798  
Contact: Jeff Lyons

HARDWARE: CompuStar system distributor. Stocks all parts and modules and checks out equipment prior to shipping. Also sells a driver for Cameo Electronics to interface a CDC 10 Meg drive with the SuperBrain (5 Meg fixed and 5 Meg removable cartridge).

SOFTWARE: Sells TARGET, the Visicalc-like CP/M financial planner; SELECTOR IV; S-Basic; MicroDaSys Accounting Package; and their own Point-of-Sale software for inventory and A/R maintenance. Also can download any software on an 8" soft-sectored disk (such as the TRS-80 Model II) to the SuperBrain format.

CMC INTERNATIONAL  
11058 Main Street, Suite 125  
Bellevue, WA 98004  
(206) 453-9777  
Contact: Jerry Jones

HARDWARE: Introducing the first combination of a five Meg hard-disk inside the SuperBrain QD using the Seagate ST-506. Called the SuperFive System, it retails for about \$6,995. Upgrade kits for existing QD systems are also available. Plans are underway for an internal 10 Meg disk as well.

DIGITAL DELI COMPUTER STORE  
80 W. El Camino Real  
Mt. View, CA 94040  
Contact: Mr. Mel Cruts

SOFTWARE: Sells an enhanced "Super DOS" for the SuperBrain with 3 versions.

The earliest SuperBrain model is supplied with a new PROM and a diskette. The two later Intertec models need a diskette only. The item provides keyboard type-ahead, programmable numeric keyboard function, faster disk access, expanded serial port buffer, "click" response on the keyboard and expanded disk capacity. \$99.95

TRANSDATA CORPORATION  
1717 Old Country Road  
Belmont, CA 94002  
(415) 591-5705  
Contact: Alan Glickman, Sales Engineer

HARDWARE: Master re-conditioners of 5 1/4" floppy disc drives. Can take defective or misaligned drives and restore to the original manufacturer's specs within 30 days of delivery to them. Work is guaranteed. Single-sided, \$95.00. Double-sided, \$140.00.

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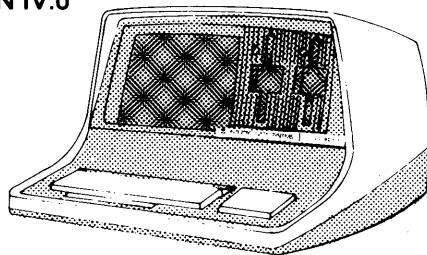
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With UCSD Pascal\*, FORTRAN, and BASIC

VERSION IV.0

UCSD p-System includes: operating system, editor, filer, library, Z80 assembler, and documentation.

with Pascal	\$ 600
with FORTRAN	600
with BASIC	500



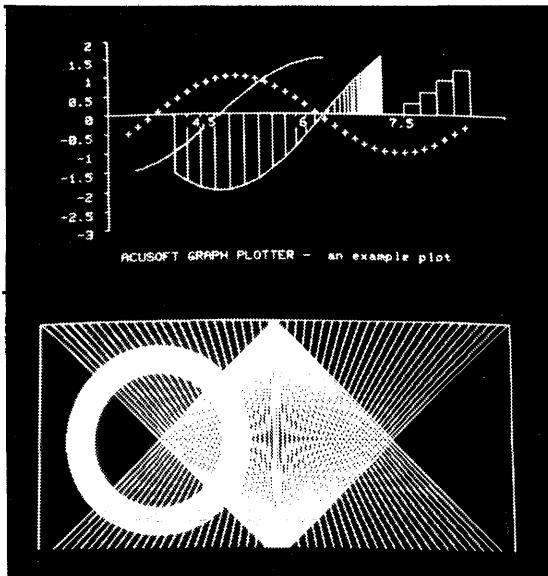
**THE DATALEX COMPANY**

1431 Twelfth Avenue, San Francisco, CA 94122  
Telephone: (415) 665-4467

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<sup>TM</sup>Trademark of Intertec Data Systems

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## Technical Corner

**UCSD Pascal on the SuperBrain**  
By John Tibbets, President, The DATALEX Company, 1431 Twelfth Avenue, San Francisco, CA 94122. (415) 665-4467.

The words "Pascal" and "portability" have all but become synonyms over the past decade. Even before Pascal was implemented on microcomputers in the last half of the '70s at UCSD (University of California at San Diego) it had already been implemented on over 100 mainframe and minicomputers. Pascal has now found its way to perhaps the most compact hardware package yet: the Intertec SuperBrain. As one sits down to a desk-top computer outfitted with a superset of the Pascal language, full-screen editor, big-machine "segmented" architecture, multitasking, and a whole host of vendor-supplied software, including multi-key indexed files and a formatted CRT language, the very first reaction is to check the back of the unit to see what else it's cabled into!

The first thing to realize about UCSD Pascal is that it is not a language that runs under CP/M; it is an operating system that replaces CP/M. In fact, it is now called the UCSD p-System ("p" for portable), since it supports more than just Pascal. Fortran '77, a full-function Basic, and, soon, Cobol are also p-System languages. All of these languages generate portable code which can be moved to a wide variety of machines. Furthermore, they are all interlinkable--program pieces written in one language can invoke program pieces written in any other.

The programs are developed in a powerful, full-screen editor that is dramatically simpler to use than its CP/M counterpart. A linker is used to stitch together separately compiled program segments written in any of the languages or in assembly language (in the rare event that compromises to portability need to be made for speed or machine-specific coding).

Our SuperBrain implementation of the p-System comes on four diskette images packed onto two "floppy" diskettes. These diskettes boot directly to the p-System. In addition to the standard p-System files, we include utilities for replacing the CP/M CONFIGUR and FORMAT programs (thus providing full independence from CP/M), a terminal emulator program, and

several other useful programs. The BIOS has been totally rewritten to make use of the considerably wider device control of the p-System (e.g. testing the status of either serial port, reading from the printer, accessing the system clock, etc.). "Hold down" repeat keys have been implemented, with the repeat key time constants (slow or fast repeats) settable by the Configure program. A system clock has been implemented and is available to Pascal. Both the keyboard and the main (modem) port have 64 character "type-ahead" queues. With all of the changes, the BIOS is still several hundred bytes smaller than the CP/M BIOS. In general, the system has a very smooth, fast, and user-friendly feel to it.

Although, from a features standpoint, the p-System stands as a very capable operating system, there is little question that its ultimate benefit is its first: portability. While the SuperBrain will be the answer to many application needs, it can't be the answer to them all. Software developers need to be able to move their software, developed at great cost, to the widest market available. CP/M addresses portability only within the 8080/Z80 market. The UCSD p-System has been adapted to every major microprocessor available, including the very newest (Z8000, 8086, and 68000). I've personally built and compiled large software packages on the SuperBrain, and then moved them directly to an Apple, TI, and DEC micro without so much as a recompilation. It is this ability for the software designer to freely choose the hardware vehicle that makes the p-System a superior programming tool.

## Letters to the Editor

I have interfaced my SuperBrain with a Diablo 1641 but did it almost by trial and error. I get stray ASCII outputs from time to time and cannot make full use of some of the specialty features of the printer from my Magic Wand.

Can someone supply me with the proper pin configuration?

Thanks,

Steve R. Riskin, Ph.D. J.D.  
1327 Palms Blvd.  
Venice, CA 90291

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## Factory News

### INTERTEC GOES PUBLIC

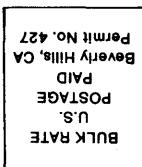
On April 24th, Intertec sold 1,650,000 shares of its stock in a public offering for a total figure of over \$37 million, half of which went to the principal stockholders, the other half to the company itself.

The main beneficiary of the offering was Intertec's President William M. Wells, 32, who netted over \$11 million based on sold shares, according to the SEC prospectus and the principal underwriters for the deal.

Listed on the Over-the-Counter market with the initials, "IDSE", the company's stock was selling around \$28 in late May. According to Intertec, proceeds of the offering are going to be used to increase inventory, expand marketing and R&D, and further automate and improve the existing Columbia plant.

The prospectus reveals that 6,300 SuperBrains have been shipped from the company through February 20, 1981, and that another 6,000 were on order. Other areas covered in the document include in-depth plans for improvement of service, marketing budgets, and who is who and who owns what in the company.

*Continued on page 8*



Beverly Hills, CA 90212  
P.O. Box 3121  
**SUPERLETTER**

*Continued from page 7*

Those interested in reviewing the details of the public prospectus may do so by requesting one from Bear, Stearns & Co., 55 Water Street, NY, NY 10041 (212) 952-6683. Contact: Mr. Barry Ridings. The company is required to fulfill requests for the printed prospectus only until July 15, 1981.

## Book Review

The CP/M Handbook with MP/M  
By Rodney Zaks  
SYBEX, 2344 Sixth Street  
Berkeley, CA 94710

Intertec should include a copy of this book with every new SuperBrain sold. Why? Because now, both new computer users and pros have a reliable, thorough handbook that covers almost every detail of CP/M, the most popular operating system for microprocessor-based computers.

It's not easy to take a complex subject like CP/M and make it simple to understand and use -- all in a single volume. But instead of the undecipherable gobbledegook that Digital Research has put into their "manual", Mr. Zaks's book has been designed and written in clear, concise language.

For first-timers, the beginning chapters offer an easy-to-use self-teaching process that gets you up and running with every major CP/M function. And to help you understand it better, Mr. Zaks takes you on a journey through the inner workings of CP/M with descriptions of the way it all works.

PIP, ED, ERA, SAVE, MOV, and all the other important CP/M functions are described with working examples to drive the lessons home. The reference chapters in the back are an excellent tool even for polished professionals to quickly find function descriptions, trouble-shooting hints, error messages and conversion tables.

## EDITOR'S NOTE:

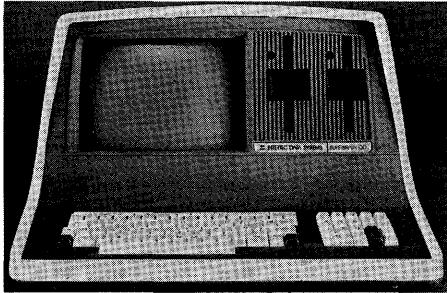
In our April/May interview with Peter Hendrick of IE Systems, Inc., there were several points made that we feel deserve clarification.

- 1) IE Systems was just one of many companies that recommended to Intertec that they put disc drives on the InterTube.
- 2) The specially labelled keycaps for Magic Wand and WordStar are an optional extra to the SB/E PROM.
- 3) The spindle motors, not the SuperBrain disc drives, have a life expectancy of 2,000 hours.
- 4) The SB/E PROM can be inserted easily without special tools.
- 5) MDR, the diagnostic package IE sells, is priced at \$145, not \$100, as mentioned. For four months, if ordered after May 1st with the SB/E, there's a \$45 discount.
- 6) The SB/E manual has interface diagrams for NEC, Okidata, Epson and Centronics printers. They can help customers interface with others.

# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

Aug/Sept 1981  
Vol. No.4



**M**any thanks.

Not just to our expert consultants and contributors like Paul Kelley, Ph.D., and Andrew Billson, Ph.D., for their superb articles and technical advice, but also to you, our readers, and Intertec Data Systems, for the great support shown for our recent strong position regarding SuperBrain service and repair.

We began with a commitment to consumer advocacy for SuperBrain owners and users, and the backing we've received re-confirms this commitment.

Information overload. It affects everybody these days. Including Superletter. We had to push back our scheduled guest interview just to make room for this issue's news and articles.

If you are a subscriber, and if you haven't already done so, send us a large S.A.S.E. and we'll mail you two of Dr. Kelley's programs revealing exciting features that are possible with your SuperBrain.

We felt that Intertec's press releases were important enough to share in total with you, so my space had to be sacrificed as well. We're already beginning to feel a crunch in editorial space, but don't let that stop you from sending in articles and letters you'd like to share with other SuperBrain users. We'll find the room.

*Albert Abrams*

EDITOR

## GUEST ARTICLE

### HARDWARE INFORMATION ON THE SUPERBRAIN

by Dr. P. L. Kelley

236 Varick Road, Waban, MA 02168

Information will first be given on the ports addressed by the CPU. Understanding the ports is important; they allow the CPU to control and interact with the display, the keyboard, the disk control system, and the communications ports. Further information on ICs which are not addressed as ports will be given later. It may be useful to get the data sheets on the ICs from the manufacturer of the IC or from other sources, such as, IC Master.

#### RS232C PORTS:

Auxiliary Data	40H
Auxiliary Status	41H
Main Data	58H
Main Status	59H
Main Ring (PPI Port B)	69H

The Data and Status Ports address USARTs (Intel 8251 or equivalent). The Auxiliary RS232C Port is intended to be used with a serial printer. The Main RS232C Port is for communications via modem or direct connection with a serial port on another computer. The main ring is input to the SuperBrain via PPI Port B, which is discussed in more detail below; bit 6 is reset when the ring indicator is on. The functions of the USART are:

Data Port	Output and Input of Data
Status Port	Output of Command and Mode instructions. Input of status information.

The output to the Status Port of mode and command instructions is detailed in the 8251 data sheets. A typical set for the SuperBrain is:

OUTPUT (STATUS), 42H ;reset USART, keep data ;terminal ready (DTR) on  
OUTPUT (STATUS), 4EH ;8 data bits, 1 stop bit, ;no parity, 16X baud rate  
OUTPUT (STATUS), 17H ;receive and transmitable, ;DTR on, reset error flag

These should probably be done with 5 or 6 intervening NOPs to give the USART time

to swallow the previous input. Input from the Status Port is, as follows:

BIT	INFORMATION
0	Set for transmit ready
1	Set for receive ready
2	Set for parity error
3	Set for transmitter empty
4	Set for overrun error
5	Set for framing error
6	Not important in asynchronous mode
7	Set for data set ready (DSR)

In the case of the Main Port, the data set ready information may be used with certain modems as the carrier detect. The auxiliary port has uses DSR for handshaking with the printer.

BAUD RATE PORT: 60H

The baud rate generator (Western Digital BR1941L) outputs frequency 16 times the baud rate. The upper four bits outputs a frequency 16 times the baud rate. The upper four bits output to the baud rate generator determine the main port baud rate while the lower four determine the auxiliary port rate. The values are:

UPPER OR LOWER FOUR BITS	BAUD RATE
0H	50
1H	75
2H	110
3H	134.5
4H	150
5H	300
6H	600
7H	1200
8H	1800
9H	2000
AH	2400
BH	3600
CH	4800
DH	7200
EH	9600

CHARACTER INTERRUPT PORT: 48H

Anything output to this port resets the interrupt generated to output characters to the display memory during vertical blanking.

#### KEYBOARD PORTS:

Character Port	50H
Test Port (PPI Port B)	69H
Set/Reset Port (PPI Port C)	6AH

The Test Port is used as follows:

*Continued on page 2*

BIT	INFORMATION
0	Set for new character
1	Set for any key down
4	Reset for caps lock

When bit 7 is set on PPI Port C keyboard new character tests may be done at PPI Port B bit 0. Resetting bit 7 on PPI Port C resets bit 0 on PPI Port B; this prevents multiple inputs of a character. The character is input from the keyboard encoder at Port 50H (Standard Microsystems KR3600-PRO).

#### PROGRAMMABLE PERIPHERAL INTERFACE PORTS:

PPI Port A	68H
PPI Port B	69H
PPI Port C	6AH
PPI Control Port	6BH

The Programmable Peripheral Interface is an Intel 8255 or equivalent. Ports A, B, and C control the operation of the disk control system, the display controllers, the keyboard input, the bell and the main port ring indicator. Port A is a bidirectional port. Port B is for input only. Port C is used for output only. Port C bits can be set or reset by writing a command to the Control Port.

Display function include:

FUNCTION	OPERATION
CRT VDAC Mode Select 0	Set or reset bit 0, Port A
CRT VDAC Mode Select 1	Set or reset bit 1, Port A
CRT VDAC UNDLN	Set bit 2, Port A underline mode
CRT VDAC STKRU	Set bit 5, Port A strike thru mode
Frequency to CRTC	Set bit 6, Port A for 60 Hz; Reset for 50 Hz
Reverse Video	Set Bit 7, Port A Reset for normal video
Enable CRTC	Set Bit 0, Port C Use bit set/reset feature via the PPI Command Port
CRTC Vertical Blanking	Test Bit 2, Port B Set if vertical blanking

The CRT VDAC is a video display controller/character generator (Standard Microsystems CRT 8002). The CRTC is a CRT controller (National Semiconductor DP8350). The CRT VDAC modes are:

MODE	BIT 0	BIT 1
Wide Graphics Mode	Reset	Reset
External Character Mode	Set	Reset
Thin Graphics Mode	Reset	Set
Internal Character Mode	Set	Set

Internal character mode is the normal operating mode. Care must be taken with the CRTC not to enable it from a routine in the first 16 K of memory as the CPU can no longer read this RAM. The CRTC addresses video memory at approximately F850H to FFFFH in RAM. Its functions are:

FUNCTION	DATA SENT TO CRTC
No Select	00H
Row Start	01H
Top Of Page	02H
Cursor	03H

The functions of the PPI ports for the keyboard are repeated here for completeness:

FUNCTION	OPERATION
New Character	Bit 0, Port B is set
Any Key Down	Bit 1, Port B is set
Caps Lock	Bit 4, Port B is reset
Set or Reset keyboard	Set or reset bit 7, Port C Use bit set/reset feature via the PPI Command Port

The first three operations are inputs, the fourth is an output.

The bell may be rung by setting and resetting Bit 6, Port C. Again, use the Port C bit set/reset feature by output to the PPI Command Port.

Bit 6, Port B is reset when the telephone is ringing, assuming the modem outputs ring indicator.

The remaining functions of the PPI ports concern the operation of the floppy disk control system. Further information will be provided in a subsequent article.



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Trademarks: <sup>1</sup>Digital Research, <sup>2</sup>Cromemco

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*Editor's Note: A detailed story explaining the differences between Intertec's DOS 3.1 and SUPERBIOS packages offered by Information Engineering and others will be featured in our October issue.*

*Continued from page 2*

#### TEN MEGABYTES OF STORAGE FOR SUPERBRAIN USERS

A special adaptor cable is now available from Intertec which will allow SuperBrain owners to use the CompuStar Ten Megabyte Disk Storage System.

This adaptor interconnects directly to the processor board of the SuperBrain micro-computer and the rear data port on the DSS. Once installed, extremely fast Winchester technology disk storage is provided to any SuperBrain or SuperBrain QD, (revision 1.0 or higher).

A diskette is supplied with the adaptor cable. This diskette will enable the user to reconfigure the storage allocations on the disk storage system if desired. The diskette also contains programs which generate new operating systems to permit the SuperBrain

and the SuperBrain QD to communicate with the Disk Storage System.

The adaptor cable is priced at \$45.00, quantity one, end user, and delivery is from stock. Simple installation instructions are included with the adaptor which is available from any authorized Intertec dealer or the Customer Service Department.

#### INTERTEC APPOINTS EXECUTIVE VICE PRESIDENT

Ron L. Wells has been promoted to Executive Vice President of Intertec Data Systems. Formerly Director of Marketing, Wells has been with Intertec for six years, almost since the company's inception.

In his new position, he will become primarily responsible for corporate planning and administration. Additionally, he assumes responsibility for the company's Corporate

Communications Department and will coordinate an intensified investor and public relations program in light of the company's recent public stock offering.

#### INTERTEC TRAINING PROGRAM OFF AND RUNNING

As reported in Superletter's June issue, Intertec has established a new Training Department, under Intertec's Training Manager, Shirley Peeler.

The program, primarily technically oriented, has been developed to allow field service technicians to become more familiar with the complete Intertec product line, and to aid in the servicing of Intertec equipment in the field.

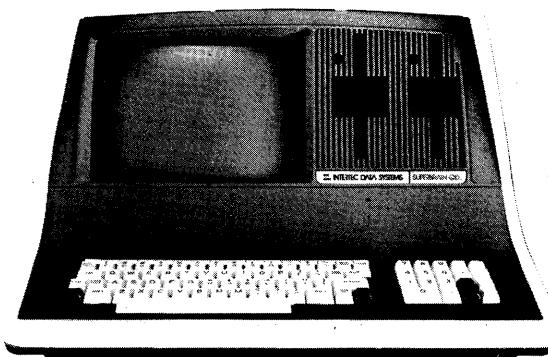
Participants will be shown how to determine unit malfunctions, swap out modules, align CRTs and disk drives, and will receive

*Continued on page 7*

# SUPERBRAIN QD™

SuperBrain users get exceptional performance for just a fraction of what they'd expect to pay. Standard SuperBrain features include: two double density mini-floppies with 700K bytes of disk storage, 64K RAM to handle even the most sophisticated programs, a CP/M® Disk Operating System with a high powered text editor, assembler, debugger and a disk formatter. Truly incredible performance. All in a single, smart looking, self contained desktop unit.

**\$2995.**



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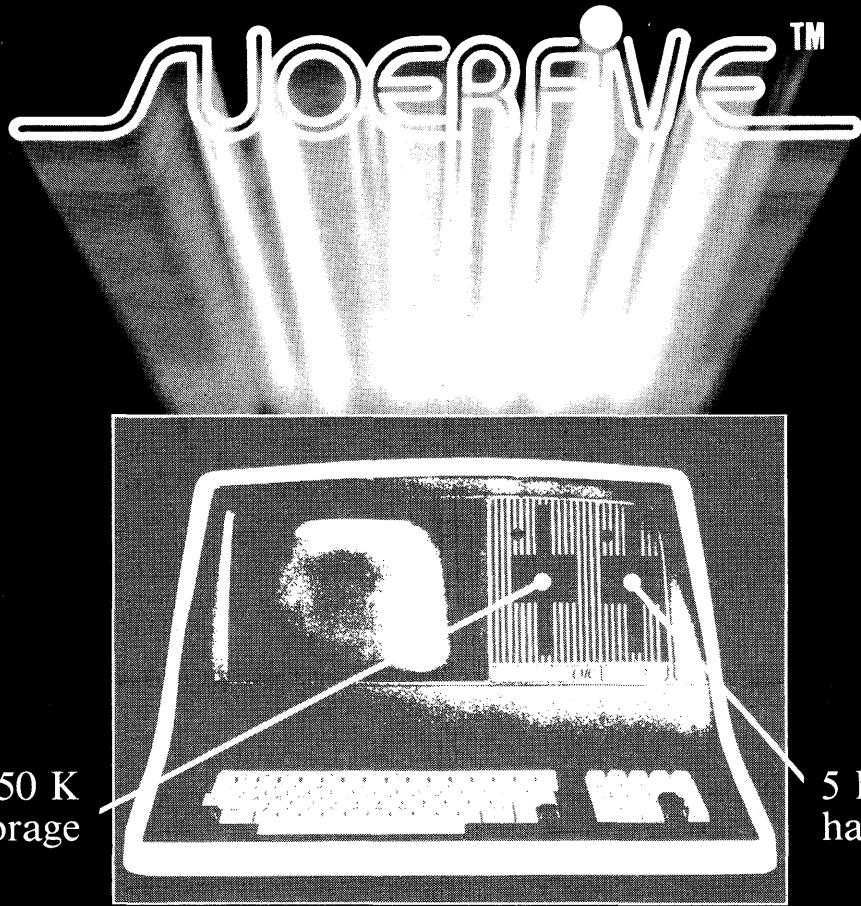
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## New Products

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62 Guided Ct., Rexdale, Ontario M9V4K6  
(416) 745-2115  
Contact: Jim Estill, President

### HARDWARE: SUPERBRAIN CHARACTER GENERATOR

Five minute installation. Allows one of the following: Graphics characters, APL, true descenders or define your own — \$2/character (\$10 minimum). All of the normal characters are still accessible plus 128 others.

FAST PROM: This prom allows 40 tracks/drive (400K or 800K). It is 25-35% faster on disk operations.

NEW OPERATING SYSTEM FEATURES: Definable numeric pad, automatic repeat, real clock, type ahead, APL support, 3K more user space, allows personalized sign-on messages.

LIFEBOAT ASSOCIATES  
1651 Third avenue  
New York, NY 10028  
(212) 860-0300

SOFTWARE: Combining word and numerical data processing in a single disk, T/MAKER II™, from Lifeboat Associates, is the new CP/M, SuperBrain compatible software for financial reporting.

T/MAKER II™ was designed especially for use in professional offices and small businesses. Unlike older programs, such as Visi-Calc™, T/MAKER II™ combines advanced numerical data processing features with word processing controls. In addition, T/MAKER II™ contains automatic functions, such as transcendentals and logarithms, for scientific applications.

The complete T/MAKER II™ software package includes the disk, an instructional manual (with tutorial) and a quick reference card for \$275.00.

## Letters to the Editor

I would like to make a suggestion. Most of the letters to the Editor, asking for help, deal with problems faced by most of SuperBrain users. Why don't you print the answer that you feel is the best? For example, the April issue of Superletter had a letter from someone interested in generating some special characters, since I have a similar problem with Spanish characters which are not shared by the English alphabet I was hoping to find the answer in this issue of Superletter, but no luck!

Carlos A. Duque, P.E.  
39 Biscayne Place  
Sterling, VA 22170

*Editor's Note: See our New Products section in this issue.*

I would like to know if any of your readers know which ports on the CPU control which devices. This would help me a great deal in setting up some specialized applications.

Sincerely,  
Richard Ross  
5741 Agnes Avenue  
N. Hollywood, CA 91607

*Editor's Note: You'll probably find the info you're looking for in Dr. Kelley's article in this issue.*

SUPERLETTER is a publication which fills a definite void in the information exchange process between SuperBrain owners.

I have a potential customer who operates a bookkeeping service for small businesses. In order to meet his needs, I have to locate software compatible with the SuperBrain 64K QD machine which is designed for multiple client use in the general ledger and accounts receivable areas. Would you please put my request in your "Letters to the Editor" section?

Thanks for your cooperation and keep up the good work.

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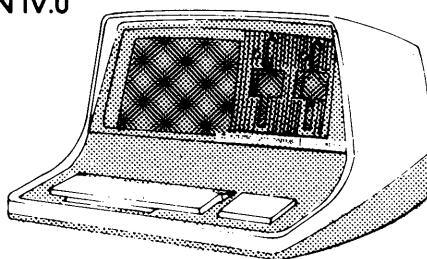
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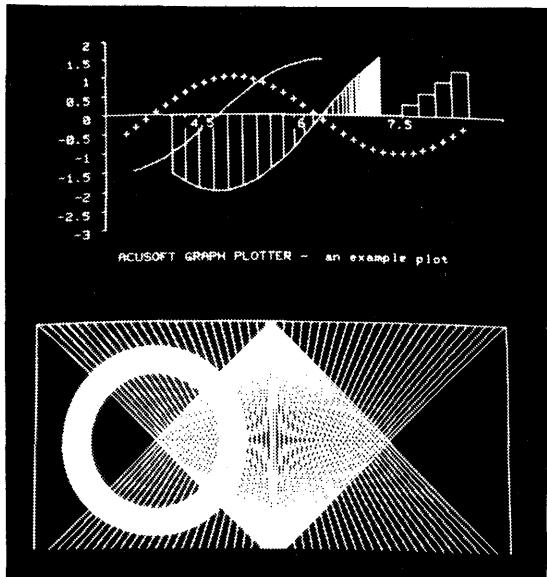
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Factory News continued from page 3

general troubleshooting instruction. The major emphasis of the program will be centered around Intertec's CompuStar multi-user microcomputer system.

#### DIAGNOSTIC DISKETTE WILL ASSIST DEALERS IN SERVICING INTERTEC EQUIPMENT

Intertec announced recently that a diagnostic diskette is now available to aid in servicing of their complete line of products.

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## Calendar

### THINGS TO COME:

August 26-29 New York, NY. THE FIFTH ANNUAL NATIONAL SMALL COMPUTER SHOW, New York Coliseum, New York, NY. Daily lectures and a five-hour executive-only seminar will be featured. The executive seminar is designed for upper-level managers who need an introduction to the understanding, acquisition, and use of computers in business. Contact the National Small Computer Show, 110 Charlotte Pl., Englewood Cliffs, NJ 07632 (201) 569-8542.

September 1-3 COMPUTERIZED OFFICE EQUIPMENT EXPO (COEE), Civic Center, Atlanta GA. COEE provides a forum where the owners and executives of small and large businesses can learn about office automation. Contact Cahners Exposition Group, 222 W Adams St., Chicago IL 60606 (312) 263-4866.

*Continued on page 8*

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*Continued from page 7*

September 10-13 MID-WEST COMPUTER SHOW, McCormick Place, Chicago IL. This show features office systems, data-and word-processing equipment, telecommunications equipment, microcomputers, computer graphics, peripherals, and other related supplies. For information, contact the National Computer Shows, 824 Boylston St., Chestnut Hill MA 02167 (617) 739-2000.

September 15-17 WESCON/81, Brooks Hall, Municipal Auditorium, and Hilton Hotel, San Francisco CA. Sessions on communications, components and devices, computer and microprocessor hardware and software, office automation, and memory systems will be presented. Contact Electronic Conventions Inc., Suite 410, 999 N. Sepulveda Blvd., El Segundo, CA 90245 (213) 772-2965.

September 24-25 MICROPROCESSORS: HARDWARE, SOFTWARE, AND APPLICATIONS, Worcester Polytechnic Institute, Worcester, MA. For more information, contact Ginny Bazarian, c/o Office of Continuing Education, Worcester Polytechnic Institute, Worcester, MA 01609 (617) 753-1411, Ext. 517.

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# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

Oct./Nov. 1981  
Vol. 1 No. 5

We've made some changes.

The most obvious one is with our type face. It's a bit smaller, but now we have greater control of our articles: more information per page within the space we have allotted for copy. And, we can print any important articles or stories that may come in at the last minute.

The other change is in the switching of "Guest Interview" to "Guest Article", a move which has generated much positive response. We're aware that our readers are requesting more and more facts and technical information on the SuperBrain. We feel that's a legitimate demand and we're happy to oblige the best way we can.

However, as you know, there is no plethora of information on the SuperBrain or CompuStar in any of the usual computer magazines. We have to go out and find it. And we have to depend on you to report back to us in writing on what you've discovered and are learning about the machines.

We are still awaiting a thorough comparison of the new Intertec DOS 3.1 with the other commercial enhanced PROMS and BIOS's. That article is unfortunately delayed.

But I hope you enjoy the two articles in this issue concerning CP/M's internal configuration and the affect of the new tax laws on your future computer purchases and sales.

Speaking about sales, we have learned that Computer Sciences Corporation has completed purchase of over a thousand SuperBrains in what was the single largest sale of any microcomputer to a major corporation. Do you think CSC will have to send them, at their own expense, back to the factory for service? I wonder.



EDITOR

## Guest Article

### HOW NEW TAX LAW AFFECTS SUPERBRAIN OWNERS

By Vernon K. Jacobs, CPA

Should you buy a computer this year or next? Should you lease or buy? Are there any other areas of the new tax law that might affect those who own or are thinking of owning a computer. There are at least 109 specific provisions in the "Economic Recovery Act of 1981", and it will be months (perhaps years) before the impact of all the provisions is evaluated.

It's almost certain that we will have another tax bill early next year to correct the inevitable technical errors and flaws in this hastily drafted and complex set of tax law changes. Nonetheless, here is a brief summary of some of the provisions of the new tax law that should be of specific concern to SuperBrain owners, lessees, and dealers.

**Full Write Off For Small Computers:** One of the provisions of the new tax law will permit businesses to deduct the first \$5,000 of business equipment acquired in 1982 and 1983, the first \$7,500 of purchases in 1984 and 1985 and the first \$10,000 of purchases after 1985.

This means that many small desktop computers could be fully expensed in the year acquired. No investment credit would be allowed on such purchases but the immediate write off would usually be better. If the cost of the computer exceeds the deductible amount, the excess would be eligible for the new depreciation method. This full write off provision is not available for investors. It's only available if the equipment is to be used in a trade or business.

**New Depreciation Rules:** If you purchased a computer in 1981, the 100% write off won't be available, but the new method of depreciation (called the "Asset Cost Recovery System") does apply to 1981 equipment purchased. Under the new method, computers will be depreciated over a five year period using specified rates for each of the

five years. (If computers can be classed as research and development equipment they can be depreciated over a three year period.)

For five year class equipment purchased in 1981 through 1984, the first year's depreciation will be 15% of the cost. The second year's depreciation will be 22% of the cost and the rate will be 21% in each of the next three years. The entire cost will be deducted over the five year period.

By contrast, the prior law permitted a computer owner to write off up to 40% of the cost in the first year if the equipment was placed in service before July first. An additional 24% of the cost would be written off in the second year, 14.4% in the third year and 10.8% in the fourth and fifth years. This assumes a five year life, which has been typical for computer owners.

Consequently, owners of larger and more expensive computers won't fare as well under the new law as under the old, but owners of desktop computers, such as the SuperBrain and the CompuStar, will be better off - assuming no other equipment purchases in the year. A good selling tip for retailers to remember.

If the tax deductions won't be available because of other tax deductions or business losses, computer owners will be able to elect to write the equipment off over a 12 year or a 25 year period using a straight line method of depreciation. However, the election to use the slower method is mandatory for each year's purchases - meaning you can't change your mind after a year or two.

The main reason to use a slow method of depreciation is to avoid the possible loss of deductions during a prolonged start up period due to the existing time limit on offsetting losses of one year against profits of future years.

The new law provides some substantial relief in this area - which may make the slower depreciation method unnecessary. Previously, business losses could be carried forward for seven years, but the new law extends this to 15 years - retroactive to 1976.

*Continued on page 2*

Continued from Front Page

**Changes In Rules For Investment Tax Credits:** Computer buyers will realize a small increase in the amount of available investment tax credit for purchasing a computer. Under current law, equipment with a five year useful life is eligible for 2/3 of the full 10% tax credit. Equipment with a five year life will now be qualified to claim the full 10% tax credit for equipment that is depreciated over a period of five or more years.

If the equipment will have a three year useful life (autos, trucks, and certain R & D equipment), the tax credit will be 6% of the cost of the property rather than 10%. These new tax credit rules take effect in 1981 - including property that was acquired before the law was passed. (It was signed on 8/13/81.)

There was no specific change relative to claiming the tax credit on the full cost of a system that included both hardware and software. However, if the tax credit is claimed on the software because the price is combined with the hardware, then the buyer must depreciate the software with the hardware. If the software is purchased separately, and is licensed rather than purchased, then the full software cost can be deducted in the year of acquisition.

**New Rules For Defining Leases:** Taxpayers and the IRS have been arguing for years about whether a lease is really a lease or just a method of financing an equipment purchase. The new tax law attempts to simplify some of the complex rules that have cropped up in this area of controversy.

Basically, the parties must clearly agree that the transaction is a lease and the lessee must not acquire ownership of the property at any time during the lease. The lessor must be a corporation and must have an investment of at least 10% that is "at risk" in the investment. Generally, the property must be new property.

(EDITOR'S NOTE: Vernon K. Jacobs practices as a tax consultant in the Kansas City area. He edits *Tax Angles* and publishes *Financial Systems Report*, a monthly six page report about computer systems for financial specialists. You may contact him at: Research Press, Inc., P.O. Box 8137-P, Prairie Village, KS 66208, (913) 362-9667.)



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OEM and dealer discounts are available on both SBCAL SuperBrain kits.

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**PUBLICATION:** New report entitled, "How To Copyright Computer Software." List price \$25.00, but can be purchased for \$20.00 direct from publisher.

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## Factory News

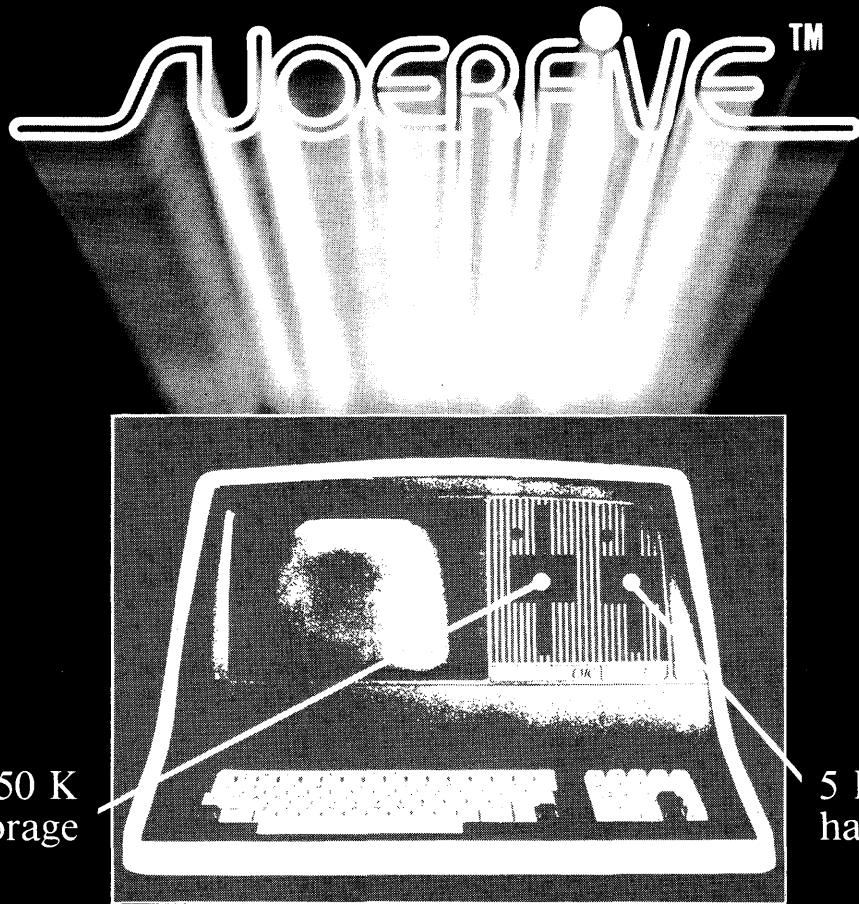
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Jim Rutledge has been named new Director of Marketing for Intertec Data Systems.

Formerly the Marketing Manager of the Small Business Systems Division of Texas Instruments, Mr. Rutledge also worked previously with Xerox and the University Computing Company.

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# Technical Corner

**CP/M UNVEILED**  
By Andrew Billson, Ph.D.

Courtesy of "Computer Age", Issue #17

**Introduction:** CP/M is a suite of software routines written by Digital Research, Inc., which significantly enhances the utility of microcomputer systems using the Intel 8080 microprocessor. Since the Zilog Z-80 CPU will run 8080 code as a proper subset of its own instruction set, this software will also run on Z-80 based machines.

All the popular branded micros now incorporate either the slower and less powerful MLS Technology 6502 or the Z-80, and a very large number of home-brew machines were based on the 8080. Adoption of CP/M on the latter was the basis of CP/M's market success, leading to a large number of machine manufacturers choosing to integrate it with their own hardware products.

The system is satisfactory rather than good, but it is relatively bug-free and is reasonably compact; i.e. it works! The documentation, unfortunately falls way below the generally abysmal industry standards.

The main strength of CP/M is a sensible high-level structure which defines an interface with the hardware and thus allows machine-dependent routines not to affect the outward appearance of its operations. This interface is called the BIOS and is the major concern of this article. First, however, let's recall the system structure, revealed in a Computer Age article by Martin Healey in April, 1980.

**Overview of CP/M:** In his article, Professor Healey gave a memory map for a typical 48K system. To illustrate some of the possible variation from this schema, I have shown in Figure 1 the memory map for an Intertec SuperBrain with 64k bytes of RAM. The SuperBrain system is in fact larger by 1 kbyte because it is built around CP/M 2.2, and is enlarged still more by code provided by Intertec Data Systems.

Let us first of all compare the two versions of CP/M:

Both use page 0 for I/O and disk buffering, and to hold certain system parameters. In particular, the size of memory available to transient programs (the TPA) is easily found by examining the jump-to address at 0006 and 0007, since a jump to fbase resides at 0005. This area is located at 0100 upwards in standard CP/M systems. Located above the TPA is the CP/M system code consisting of three major areas.

First there is the Console Command Processor which interprets the user's requirements. Version 2.2 has the same built-in functions as 1.4 (DIR, REN, ERA, TYPE, SAVE) and the same facility to look for a ".COM" file of any other name. Some changes have been introduced to support a USER distinction between files, and there are some minor improvements in terminal handling.

FFFF	Screen Memory	top of MEMORY
F800	Uninitialized RAM space	
EF00	Extended BIOS (Basic I/O System)	
DE00	Jump Vector	iBase
	Basic Disk Operating System	
D000	Function call Analyser	fBase
	Console Command Processor	
C800	Transient Program Area	cBase
100	128 byte Disk Buffer	tBase
7	Autoload Command String	
5	Jump to fbase (system call)	
4	Current logged-in Default Drive	
3	I/O BYTE	
0	Jump to iBase+3 (warm start)	

Figure 1. Intertec Superbrain Memory Map.

The CCP occupies the same space in both versions and is placed at the same position on the system tracks of a disk.

Next comes the BDOS which is considerably enhanced in Version 2.2, there being 11 new function calls and changes to 8 others. The significant improvements relate to better file handling and directory manipulation, including file level attributes (USER, R/W status, SYSTEM file-types) accessed via the STAT utility, and system support for random access files.

Unfortunately, the file-store has not been made hierarchical so it is not possible, for example, to put SYSTEM utilities in USER 0 and automatically load them from any other user number. The BDOS code is one page (1/4k) larger in Version 2.2 than in Version 1.4.

Above BDOS, there is the BIOS code provided by the tailoring expert to match the particular hardware; this is typically followed by an area of uninitialized memory reserved for use by the BIOS, and further memory for hardware use.

In the case of the SuperBrain, 4k is reserved at F000; the first half of this space is used by various stacks, and the top half is used to hold the screen display characters.

**A look at the BIOS:** By way of simplification, it is sometimes said that CP/M 2.2 requires 7k of RAM. This is only true so far that two tracks of an 8" single-density IBM-format floppy disk are assumed to be loaded by the bootstrap process. In fact the CCP occupies 2k of memory, the BDOS code occupies the next 3.75k, and a further 1k is allowed for BIOS code.

In the SuperBrain, however, the BIOS is 4.75k, much larger than the skeletal BIOS in a 'standard' CP/M. The system only reserves two disk tracks for itself, but they are 5 double-density tracks holding 40 sectors each — enough for 10k of code. Thus Intertec's CP/M matches all the parameters of a system tailored to a 57k machine. The free memory space is, therefore, 50k.

BIOS code in a CP/M system starts with a jump vector which is expected, by the rest of the system, to obey certain conventions. The obvious example is that the second three bytes of the BIOS should be a jump to the 'Warm Start' routine (the first three lead to a 'Cold Start').

This is because a warm start, or reboot, is promised as the result of jumping to 0000, and a jump to ibase+3 is specified at that location; thus to complete the sequence a jump to the actual code to be executed must appear at ibase+3 — occupying the second three bytes of the BIOS. A total of 17 jump instructions are similarly defined by the interface assumed between the BIOS and the rest of CP/M.

The purpose of this jump vector is to permit arbitrary long code routines to be written to perform the required functions and to permit these to be changed or enhanced later.

The location of one of these routines, and hence the jump address, can be determined at assembly or re-assembly of the BIOS; provided that the jump locations are preserved, there will be no need to alter any code which uses or calls BIOS routines as long as they are accessed by way of the jump vector.

While those routines which must be provided by the BIOS are essentially the same for all machines, there may be some which are optional (e.g., a real-time clock) and all will vary according to the selection of particular chips comprising the real machine.

For example, the choice of CRT controller will determine the values to be tested for in its status port and the form in which it will expect data for display, 'Driver' code for the serial port controller (an 8251 USART in the SuperBrain) and for collecting and interpreting keyboard characters are other examples.

**Internal BIOS Enhancements:** The most significant addition to the BIOS in CP/M Version 2.2 is provision for the ability to mix drives with different characteristics on a single system; in particular, a hard disk can easily be defined as several logical drives. This is accomplished by associating a disk header block with each drive. This contains 3 words for system use and 5 addresses.

The addresses point to a logical-to-physical sector translate table, the shared directory buffer, a disk parameter block shared by drives with similar characteristics, and two scratch-pad areas unique to each drive.

In its turn, a disk parameter block contains values which determine the number of tracks, the number of directory entries and the block allocation size for diskfiles on the drive in question. One minor problem in changing these values is that several inter-dependent changes are typically required.

The fixed data of the disk header and disk parameter blocks are just some examples of constant values built in to any particular system. Other examples in the SuperBrain are the values found at EF00 et seq.; these are used to define serial port characteristics; line frequency, and whether read-after-write verification is to be carried out.

Use of such data by an application program, even mere inspection, is a violation of the system interface leading to potential incompatibility of software on different versions/releases of a system.

A very common violation on SuperBrain seems to be direct use of the memory locations which store the top-of-screen address and the cursor address. Violation of this nature introduces a compatibility problem when enhancing the BIOS as described in the next section; this problem can only be resolved by preserving those locations which are frequently accessed.

**External BIOS Enhancements:** The public nature of BIOS code lends itself to the construction of improved systems by providing an enhanced BIOS to be integrated with the standard CCP and BDOS parts of the original.

One obvious example is the actual provision of mixed drive systems: 8" single-density drives can now be added to the SuperBrain (requiring a hardware interface as well as BIOS support), double-tracking 5" drive systems have been available for some time, and 5 Mbytes of Winchester disk storage are now available inside a standard SuperBrain cabinet.

A repeating, type-ahead keyboard buffer has been integrated with the SuperBrain, fully compatible with the standard system. This facility improves the throughput of an experienced user and allows autoloading to be implemented as a quite trivial operation. At the same time a keyboard translate table may

also be defined to generate frequently used character sequences, such as BASIC reserved words.

As a final example, consider the provision of a real-time clock. It is quite easy to provide a software clock by reserving a few bytes of memory, whose values are regularly incremented by an internal interrupt.

CP/M, however, does not define such a function and so there are no system calls to set or read the clock. Thus, although the clock can be provided, access to it is only possible by way of technical violations of the system interface.

**Summary:** CP/M consists of three major parts, one of which, the BIOS, is public and defines the interface with the hardware of the real machine. This code is skeletal in the issued system, but has been extended by individual manufacturers for sale with their products.

Further enhancements may be possible by independent software writers, although compatibility issues raise problems which are important to resolve. Some facilities available with an enhanced BIOS may require a technical violation of the system interface in order to access them.

(Editor's note: Dr. Billson is the creator of the "SuperVid" and "SuperBios" modification packages for the SuperBrain. He may be reached c/o MicroMods, Ltd., 53 Acton Road, Long Eaton, Nottingham, NG10 1FR, England.)



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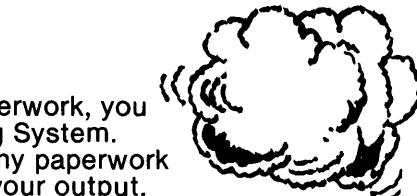
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## Letters to the Editor

Our company bought several 10 MB disk drives from Intertec for use with the CompuStar 30. We've encountered what seems to be a "thermal shut-off" problem in each one of the drives.

We'd appreciate hearing from users and dealers if they have encountered the same thing and what solutions they've found. Taking the cover off the disks helps, but it's not the answer.

W. Fred Rump  
President  
CompuData, Inc.  
(215) 667-6843

(Editor's Note: One dealer has attached special small fans onto the side of their disk drives to provide better cooling during the operation.)

I would like to see reports on CP/M networking and high-speed modems (600 to 1200 baud) for the SuperBrain. By the way, Superletter is great, but not frequent enough to feed the hungry.

James G. Worth  
Miami Springs, FL

First of all, thank you for the super job you're doing. Superletter is packed with information.

If possible, I would like to see a rundown of modems in the near future. I don't know which is the best to buy. I also would like to see a survey of information sources, like CompuServe and the Source. I'm sure a lot of readers would enjoy it.

Margaret Bailey  
24301 Partridge Circle  
El Toro, CA 92630

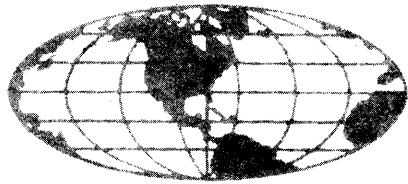
(Editor's Note: It appears as if the subject of modems and information transfer via the SuperBrain is worthy of attention. We're open to any report and/or article from our readers on the subject.)

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# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

Dec/Jan 1981-82  
Vol. 1 No. 6

## It's been a good year.

New software packages, BIOS enhancement products, hardware add-ons, technical improvements, and more information than ever before has been made available to users and owners of SuperBrain and CompuStar computers.

We're happy to have played a small part in getting much of that information and many of the new products introduced to you. And we hope to be able to continue doing so in the months ahead.

Looking back, some specific things come to mind that I feel deserve special mention. First, quality control at Intertec has improved greatly over the last six months. I'm not sure, but I believe there have been definite improvements made in shipping container protection, and with better pre-shipping testing and burn-in monitoring of the products.

Second, some software products have demonstrated themselves to be of a superior nature when considering price, features and ease of use.

Spellbinder, I believe, is one of the best office management/word processing values on the market today. Our guest article this month will relay the facts behind this opinion, but our dealings with the creators of the software have always been excellent. They have gone out of their way to conform their products to the specific needs of SuperBrain users. And they truly provide more in a single package than is currently available anywhere.

Another recent find is ZED. This unique word processing software package was designed specifically for the SuperBrain and all of its internal features. It is the "friendliest" package we've ever used. Very simple to run and operate. And again the personal back-up and technical consultation available to users is superior. Its

special Video Calculator which can be used during word processing is not available anywhere else. To top it all off, you edit, if you like, on a white screen with black letters and actual paper margins.

But the key product for 1981 has been the SB/E Prom from Information Engineering. It makes the SuperBrain a superior machine in its features and operations. You know that's true when you see software packages being advertised as compatible with the IE Prom. And again, personal service and technical advice from the company is always there to back up the product.

The last package we think is special enough to mention is SuperCalc. It works and does everything it advertises itself to be. And it's easy to use. Quite a remarkable piece of software. However, at this point in time, it does not conform to the BIOS of the IE Prom.

Next year is going to bring low-cost graphics packages, new advanced BIOS's, small and compact hard-disk devices, and even more, easy-to-use software designed with you, the SuperBrain user, in mind.

This issue begins a special 4-part serialization of the first wire-by-wire, chip-by-chip internal breakdown of the Intertec SuperBrain computer. This outstanding document was brought to our attention by Dr. Jacques Vidal of UCLA.

Jonathan Platt, the author, has granted us permission to publish it and it is presented to you in our continuous goal of helping you better understand and use your SuperBrain computer.

As always, our door is open to your comments, suggestions and articles. Let us hear from you, and we hope you have a successful, prosperous 1982!

*Albert Abrams*  
EDITOR

## Technical Corner

### HARDWARE INFORMATION ON THE SUPERBRAIN

by Jonathan W. Platt

Special thanks to  
Paul L. Kelley, Ph.D.

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This is a technical report describing each subsystem of the SuperBrain and how it functions. Specific descriptions of the IC's are not generally given. Programmable chips, however, are described in more detail. Obtaining data sheets on all IC's of the SuperBrain is advised. A TTL Data Book, a Microprocessor Component Data Catalog and the Osbourne three volume set will cover most or all of them.

The Input/Output ports are essential to the operation of the SuperBrain. And the knowledge of them and their functions are equally important to the comprehension of the system as a whole. They allow the CPU to control and interact with the display, keyboard, disk control system and the communications ports. The port descriptions will, therefore, be given first. When referring to one of the two CPU's within the SuperBrain, CPU-1 is the main Z80 CPU attached to the 64K RAM and CPU-2 is the disk system processor. The ports attached to CPU-1 are listed first, then those of CPU-2.

### CPU-1 PORTS

All ports of CPU-1 are between 40H and 7FH. They are selected through the 1-of-8 Decoder (74LS138). The external bus (S-100) should only be utilized for I/O devices using addresses 80H to FFH. There are two exceptions, however. If the special ROM which is used for parallel external communication is not on the processor board, the chip select for that ROM

*Continued on Page 3*

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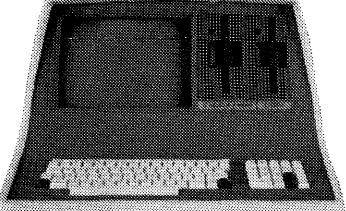
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## — Guest Article —

### SPELLBINDER WORD PROCESSING on the SUPERBRAIN

by Ralph Manildi  
 The Nicolet-Zeta Corp.

The combined capabilities of Spellbinder and the SuperBrain are greater than any other Word Processing System (WPS) that we have compared. Over a dozen WPS's were originally considered at the start of 1981, and several more recently introduced WPS's have been compared.

The Spellbinder software package is comprised of three parts; the EDIT functions, the COMMAND functions, and the MACRO functions. The MACRO functions are pre-programmed command sequences which are executed automatically. This article does not touch on all of Spellbinder's capabilities. The Spellbinder user manual, which contains almost 115,000 words, covers the capabilities in reasonable depth. Included in the manual is an excellent tutorial, which can be used to self-teach Spellbinder quickly and easily. The EDIT and COMMAND functions will be discussed first, then the MACRO capabilities will be briefly described.

As SuperBrain owners know, the SuperBrain QD includes two floppy disk drives and the operating system is the industry standard CP/M. We have added an enhanced version of the operating system called SBE/DOS. The SBE/DOS description would be an article by itself, but few of the word processing related benefits include the following:

- a. User programmable keys. Both the function keypad and the top row of the main keyboard are easily programmable. Different programs can be stored for different applications.
- b. The drive spindle motors are turned off after being inactive for 10 seconds. This prolongs the motor life and makes for mostly silent operation. This can be particularly appreciated when using the word processor.
- c. A type-ahead buffer is provided which can speed up a number of operations.

And much more. SBE/DOS was designed and is marketed by I.E. Systems, Inc., Newmarket, NH, and is available from them and many local SuperBrain dealers.

To bring Spellbinder into operation, type in the name of the Spellbinder version desired. The versions I use are named RMxxx, where xxx describes the print

wheel that the version is configured to print in the proportional mode. Any version can be used to create or edit text.

Note that keys will repeat if held down for more than about one-half second. This is adjustable as is the rate of repeating (thanks to SBE/DOS).

To enter Spellbinder type in RMDUAL (for letter gothic print wheel). SuperBrain will load Spellbinder and ask "OLD FILE (Y/N)?". Type N for no and you will be in the EDIT mode, ready to type.

Before jumping into the Spellbinder EDIT mode, let's describe some frequently used WPS terms.

**Word wrap or wraparound** - The user can enter text at full speed without attending to carriage returns or an approaching end of line. A word which does not fit at the end of a line will automatically be moved to the following line.

**Enhancement** - Used when printing to emphasize certain characters or words. There are several types of enhancement available with Spellbinder, including the following: underlining, shadow print, boldface, slash overstrike and dash overstrike. The different types may be mixed as desired.

**Proportional spacing** - This is when the space allotted to each character is proportional to that character's width. For example, the letter "i" does not take as much space as the letter "m".

*Continued on page 4*

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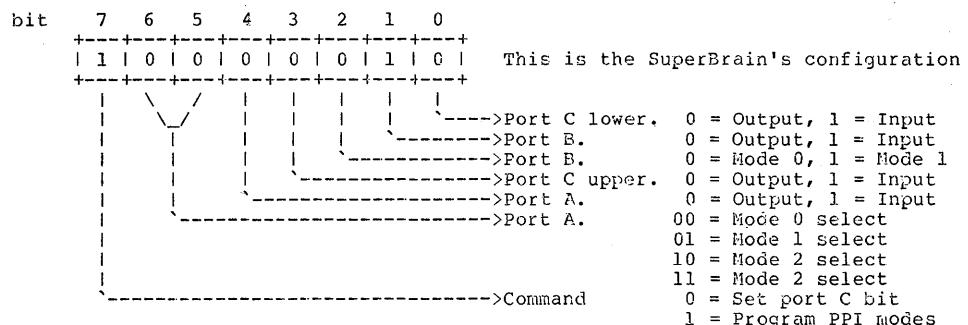
### Technical Corner, Continued from Page 1

(port 78H) may be used as the select line to an external device which could be using the data lines off the S-100 edge connector or the data lines of the ROM socket. Port 78H is connected to the third pin up on the right side of the ROM socket. Port 70H is not attached to anything on the processor board. It could be used by soldering a jumper to it, if desired.

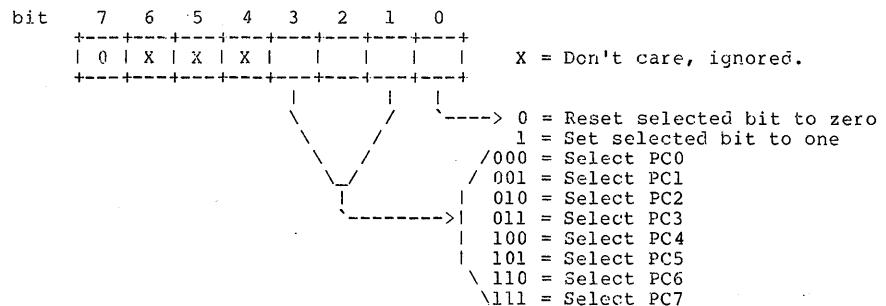
There is one port which needs to be singled out because it is not clearly marked on the schematics (if at all). It was found through disassembling Intertec's FORMAT 1.3 program. It seems that bit three of port 44, if set, will select side one of the selected disk drive. Conversely, if reset, it will select side two of the selected drive. This is not definite, however; it may be a leftover from a pre-revision 1 board. FORMAT 3.1 does not use port 44.

Chip	Hex Location
8251 Aux port USART	
Data port	40
Status port	41
*Exact definition*	
unknown	44
8251 Main port USART	
Data port	58
Status port	59
RS Flip-Flop	
Interrupt Latch	48
KR3600-PRD	
KB Encoder	50
BR1941L Baud rate generator	60
8255 Programmable Peripheral Interface (PPI)	
Port A (PPIA)	68
Port B (PPIB)	69
Port C (PPIC)	6A
Control Word port (PPICW)	6B

The 8255 PPI has three data ports and one bidirectional data bus (PPICW). Port A is capable of being bidirectional but the SuperBrain does not use it in this mode. The PPI is programmed by sending the following configuration to the PPICW. Bit set/reset commands for port C are also sent to the PPICW. For more information on the different modes, look up this chip's data sheet.



If you write a control word to the PPI to set or reset individual bits of port C, the command has the following format:



The PPI is responsible for controlling and monitoring everything that is happening with the SuperBrain with the exception of the Floppy Disk Controller which is handled by CPU-2. Ports A, B and C control operation of the disk control system, the display controllers, the keyboard input and status, the bell and the main port ring indicator. Ports A and C are output ports which control. Port B is a monitor port, getting status from the various subsystems.

*Editor's note: The "Hardware Information on the SuperBrain" may be purchased in its entirety from Jonathan Platt for \$50. He also has "SOS," a new BIOS for the SuperBrain. Write to:*

Jonathan Platt, Pine Villa Apt. 114, 200 East University Blvd.,  
Melbourne, FL 32901 (305) 724-6148

## *Spellbinder, Continued from page 2*

Right justify - Right justification means that all lines of the printed text are equal in length (assuming a normal aligned left margin). The space is spacing may be set by the user in increments of 1/120th of an inch. This text is right justified and the minimum spacing is 5/120th, maximum is 25/120th of an inch.

### **EDIT MODE**

The function keyboard, located to the right of the main keyboard, provides the primary editing functions. We use labeled function keys for Spellbinder which are available from Digital Marketing, Walnut Creek, CA. These function keys include the cursor movement keys (white), the cursor mode movement keys (blue), and others.

The white cursor movement keys move the cursor in the direction indicated by the arrow, one character for each keystroke. Note that if a key is held in the down position, the key will repeat until released.

The blue cursor mode movement keys move the cursor backward, forward, or will delete characters, one mode unit for each keystroke. The cursor mode unit may be changed using the blue CURSOR MODE key, from word to sentence to paragraph to character and back to word. These keys are useful for moving the cursor in units larger than one character, and for deleting in larger units. The mode using is set to word when Spellbinder is entered.

Additional means of cursor movement is provided by certain red keys; the CURSOR SCAN key will scan the cursor to the end of the line on the first keystroke, then to the beginning of the line on the second stroke. Subsequent keystrokes will alternately move the cursor to the end and beginning of the line.

The REWRITE key moves the text and cursor to the top of the screen.

The MODE ENHANCE key will enhance the word, sentence, paragraph or character mode unit, depending on the setting of the CURSOR MODE. If a word (or sentence, etc.) is already enhanced, then this key will turn off the enhancement of the word or mode unit.

The ENTER ENHANCE key is a switch which is used to turn on or off the enhancement feature while entering text. For example, I depress the key once and everything being entered is enhanced until I stroke the key a second time.

The INDENT key provides an indent to the right of the left margin. Although the indented line may look the same as a line which is created with a TAB, there are differences. A tab fills a line with spaces, while the indent actually moves the left

margin. If a paragraph is indented using the TAB key and then edited in the first line, there will be blocks of spaces scattered through the text. Text, of course, will be scattered into the margin.

The MARK key provides a non-printing mark. The mark appears on the screen as a character. Marks can be used with the COMMAND mode functions which affect a specified number of lines.

The SOFT HYPHEN key provides one of the three types of hyphens that may be used with Spellbinder (soft, firm and hard).

The INSERT key is used when you wish to insert new characters in the middle of text without typing over the old text. When the INSERT key is first struck, the existing text is moved out of the way so that new characters may be added. The INSERT mode is indicated by the word "INSERT" at the top of the screen. The second keystroke of the INSERT key will close the old text back adjacent to the new.

The ALT MODE key is user programmable and will be discussed later (This key we borrowed from an old keyboard).

The EDIT/COMMAND key allows the user to switch back and forth between the two modes of operation. The current mode is always indicated in the upper left corner of the screen.

### **MAIN KEYBOARD SPECIAL FUNCTION KEYS**

There are several keys on the main keyboard which have particular functions in the EDIT mode. They are described below.

The DELETE key will delete the character on which the cursor is positioned each time it is struck. The deleted character will be replaced with a block which is called a rubout character. As with the other keys, if it is held down, the DELETE key will continue to operate (delete characters in this case) until released.

The BREAK key is used after the DELETE key to clear the rubout characters from the text. Note that the text from lines below will align automatically.

The BACKSPACE key operates exactly as the cursor left (arrow) key.

The HERE IS key operates exactly as the INSERT key.

The LINE FEED key operates exactly as the cursor down (arrow) key.

### **USING THE EDIT MODE**

The EDIT mode functions always operate at the location of the cursor. The screen will always display EDIT in the upper left corner when in the EDIT mode. To create text, type on the keyboard as though you were using a typewriter. Words that you type will appear on the screen. The cursor

always indicates the position on the screen where any text you type will appear. The numbers on the message line display the current position of the cursor by line and space number, respectively. There are 80 spaces across the screen, and the working space may be expanded up to 160 spaces as desired. The number of lines is limited only by the working size of the computer's memory (typically over a thousand, depending on line width).

Text may be modified by typing over, deleting or inserting, or by a combination of these means. The cursor is moved to the character to be modified and the appropriate action taken.

The screen will be rewritten in steps of one-half screen. This will occur as the cursor reaches the bottom line, or if the cursor is moved up from the top line. Note that the white cursor movement keys may be held down to provide scrolling in 10 line increments.

### **COMMAND MODE**

These commands are used to make major changes in text, for disk operations, and for printing. They are performed using the main keyboard characters. The command letter is typed in either upper or lower case letters followed by a carriage return.

Some of these commands necessitate that the user specify a number of lines (usually) on which the command is to act. This will be denoted by the letter "n" signifying that the user should insert the number desired in place of n.

### **DYNAMIC PRINT COMMANDS**

In addition to the commands used in the command mode, there are two types of DYNAMIC PRINT COMMANDS. Both types are embedded in the text, and thus will be activated during printing. For this reason they are termed DYNAMIC PRINT COMMANDS. They are DOT commands and IN-LINE commands. Dot commands are always placed at the beginning of a line and start with a period. In-line commands may be placed anywhere in the text.

### **USER PROGRAMMABLE KEYS (Thanks to SBE/DOS)**

The top row of keys on the main keyboard are user programmable with up to five commands or characters each. To use one of these keys in this alternate mode, the user designated ALT MODE key on the function keypad must be typed first. Different programming may be used, and saved, with different applications. One use of these keys with Spellbinder that may be popular is a two-key sequence for writing a file from memory to disk. The sequence of operations is as follows:

*Continued on Page 6*

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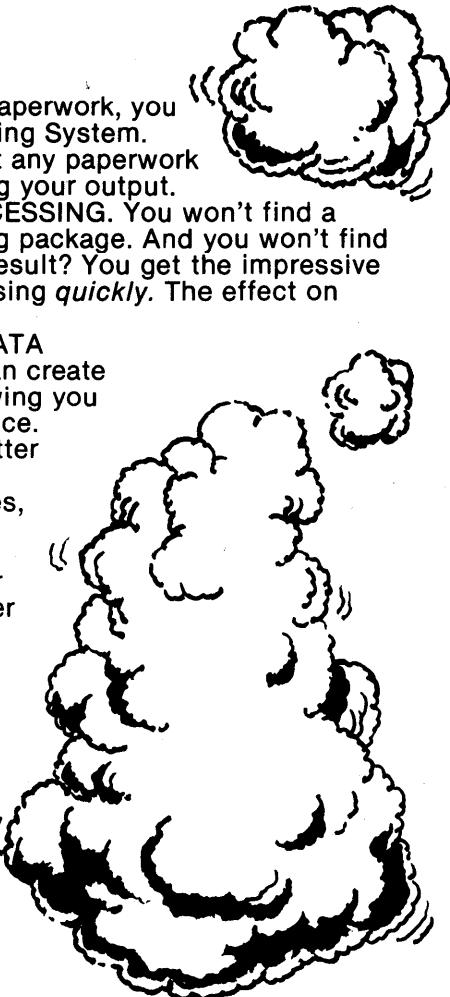
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## **Spellbinder, Continued from page 4**

- |                            |                          |
|----------------------------|--------------------------|
| a. T (move to top of text) | d. RETURN (or /)         |
| b. RETURN (or /)           | e. WD (close write file) |
| c. W (write)               | f. RETURN                |

Note that a total of seven keystrokes must be entered. Also note that the user must remember to move the cursor to the top of the text (I have been known to forget).

The sequence shown above is programmed into two of the programmable keys (1 and 2). This provides the following advantages:

- a. The number of keystrokes is reduced to four.
- b. The saving procedure is easier to remember (as simple as 1, 2).
- c. The user is not likely to forget to move the cursor to the top of the text.

The procedure for programming the keys is contained within the SBE/DOS manual. It is fairly simple and there are many potential uses outside of Spellbinder.

### **MACRO PROGRAMS**

#### **A FANTASTIC SPELBINDER PLUS**

A macro program is a series of commands which are performed sequentially and automatically. Individually, these commands are essentially the same simple commands used in Spellbinder. When many such commands are performed in sequence automatically, they can perform complex jobs such as merging a mailing list into a form letter, thus producing many individual letters.

The list of commands contained in a specific macro program is put into a macro buffer and then the commands are executed automatically by Spellbinder. A **Load and Go** macro is a macro which is loaded from disk directly into the macro buffer and then executed with one command.

Spellbinder provides nine load and go macros. They may be loaded into the macro buffer with the command AD. The macro file name will then be requested and loaded after the user responds. The load and go macros are briefly described below:

#### **SPELBINDER LOAD AND GO MACROS**

<b>File Name</b>	<b>Description</b>
ALPHA	Creates a list in which sorting may be done alphabetically or numerically.
BATCH	Automatically prints a list of the files unattended.
BOILER	Provides cut and paste boiler plating capability. This allows the user to pull words, clauses (so called boilerplate), from a master boiler plate file and locate them at specified points in a current document.
CUESORT	Sorts a customer list or other file on the basis of categories which the user assigns.
FORMS	Provides forms generating and fill-in capability.
LINENB	Numbers each line of a file to correspond with the lines displayed on the screen.
MMERGE	Prints a personalized form letter to everyone on a mailing list.
ZIPSORT	Sorts a mailing list into ascending order of ZIP codes.
2CPRNT	Prints text in two columns. The Spellbinder manual was printed using this macro.

Similar macro programs can be designed by someone with very limited programming experience, using the programs listed above as a guide. There is additional information in the Spellbinder manual.



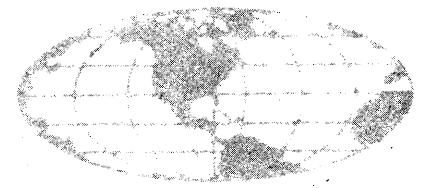
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<b>Diablo 1650 (RO)</b>	<b>2,950.00</b>
<b>Diablo 1650 (KSR)</b>	<b>3,199.95</b>
<b>QUME 5/45 (RO)</b>	<b>2,495.00</b>
<b>QUME 5/45 (KSR)</b>	<b>2,850.00</b>
<b>QUME 5/55 (RO)</b>	<b>2,595.00</b>
<b>QUME 5/55 (KSR)</b>	<b>2,999.95</b>
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So, if you're ready to get down to serious business with micro-to-mainframe communications, get the facts about IE/Modem. Call the people who asked the question—and answered it—before anybody else.

Call the people at IE Systems.



\*Registered trademark of Digital Research

\*Registered trademarks of Digital Equipment Corporation

## —Factory News—

### INTERTEC OPENS NEW OFFICE IN LOS ANGELES

Rod Hart, formerly the District Sales Manager for Intertec in Southern California, has been tapped to head the company's new Western Regional Sales office which will manage sales and distribution networks for the company's eleven state western region.

The new office is part of Intertec's ongoing expansion program that came about following its public offering in April of this year.



### INTERTEC UNVEILS 5 1/4" IRWIN WINCHESTER DRIVE

In what is being called a "technological first" for the microcomputer industry, Intertec announced the signing of a \$4 million manufacturing agreement with Irwin International Corporation to produce a small, compact 12½ MB drive that will fit directly into the floppy disk drive slot. It will have a back-up capability insured by an ordinary audio cassette that is built into the drive itself.

The size, cost and back-up characteristic of the drive makes it one of the most unique computer enhancements to be marketed by Intertec. The exact specifications, pricing, and distribution of the new drive will be announced in mid-1982. The new product will be included in the 1983 product line.



## —New Products—

### STOK COMPUTER INTERFACE

P. O. Box 501  
Woodside, NY 11377  
(212) 426-7022  
Contact: Glenn Stok

**SOFTWARE:** Stok Pilot is a new powerful language tool that allows the creation of a fully menu driven environment for any CP/M application. Its dual purpose allows it to be used to write system control programs as well as CAI courses, or any combination of the two. It also allows you to do things at the CP/M level without having to know CP/M commands.

Available in SuperBrain format: \$109.00 with dealer discounts available.

DO.COM is another product that allows you to type a string of CP/M commands that will execute one at a time. Price: \$29.00.

### WARREN INSTROTECH, Ltd.

P. O. Box Station "F"  
Ottawa, Ont. K2C 3M1

**HARDWARE:** Produces the W-DLT (Date Line Tester) that identifies the seven most commonly used RS-232 data lines and shows the most likely cause of a connecting problem to a modem or printer. It permits any standard device to communicate with other devices without having to know which cables work where. Price: \$59.95 with dealer discounts available.

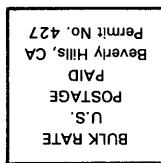
### COMPUDIAL, INC.

2 Keystone Avenue  
Cherry Hill, NJ 08003  
(609) 424-4700 or  
(215) 629-1289  
Contact: Dan Brown

**HARDWARE:** All Intertec products. SuperBrain and CompuStar specialists with communication and technical experts on staff to assist dealers and customers. Carries full line of printers and modems compatible with the SuperBrain. An East Coast service center.

**SOFTWARE:** Has a "Lease Tracking" software package that helps keep track of lease values, additions, subtractions, replacements and repairs.

*Continued on Page 8*



Beverly Hills, CA 90212  
P.O. Box 3121  
**SUPERLETTER**

**New Products, Continued from Page 7**

**TELECOMPUTE INTEGRATED SYSTEMS, INC.**

251 Spadina Avenue  
Toronto, Ont. Canada MST 2E2  
(416) 363-9295

Contact: Suren Mehta, Director of Marketing

**SOFTWARE:** Markets TIS-APL for the SuperBrain. Three versions in kit form include APL interpreter on disk, APL keycaps and APL character generator. Also comes with installation procedures, tutorial and reference manual.

TIS-APL now provides SuperBrain users with all the power of APL. Version 1 is the Educational Version: \$295. Version 2, the Software Development Version: \$495. Version 3, the Full Support Software Development Version: \$1,195.

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Contact: Dominic G. Hibbs

**HARDWARE:** Offers a low-resolution graphics package providing reverse video, underline and blinking for the Super-Brain.

The package comes with a video-board that plugs in less than five minutes. All the functions are under program control, easily implemented in MBASIC. Package also includes sample routines, sample graphics and X-Y plot graph for mathematical equation. Price: \$150 - \$175 with dealer discounts available.

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## Book Review

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**DON'T**

**(Or, How To Care For Your Computer)**  
by Rodney Zaks, \$11.95  
SYBEX, 2344 Sixth Street  
Berkeley, CA 94710  
(800) 227-2346

It's amazing that people will spend thousands of dollars on expensive computer and peripheral equipment and then smoke cigarettes or spill hot liquids on them, often causing severe damage to both machine and stored data.

In DON'T, Rodney Zaks, the king of consumer computer books, details the most common human mistakes that can lead to costly computer breakdowns, and the best ways to maintain a proper computer room environment; shows how smoke affects hard disk devices and floppy diskette surfaces; and reveals how to create the optimum conditions for using computers and their accessory devices.

The book also provides an important hand-holding service when things suddenly go wrong. The reader acquires a clear, easy-to-follow checklist that will help identify mysterious problems and suggest solutions to get you up and running again.

# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

Feb/March 1982  
Vol. 2 No. 1

**L**ooking forward, I see a year that can be filled with important information to help you use your SuperBrain or CompuStar computer more efficiently. Here are some topics that we feel need investigation and your input.

**SPECIAL INTERFACING** the SuperBrain with various types of hardware and hard-disk systems, other than the Intertec products. For example, do you know of a SuperBrain working with a Corvus, Morrow Design or other hard disk system? What about interfaces with teletype machines, TV monitors, security devices, home appliances, or even speech synthesizers.

(The article in this issue by David Storti on the SuperBrain marriage with the ESCON typewriter system is a good example of an interface that you, our readers, have expressed an interest in.)

**MODEMS.** What brands do you use? What are the costs? The problems? The advantages? What modifications have you made?

**APPLICATIONS.** Do you know of any interesting uses of the SuperBrain in educational environments, farm forecasting, monetary forecasting, games and scientific or other experimental areas?

**SERVICE.** Send us the information you know about or may have regarding regional and national service centers in the United States, Europe or other parts of the world. We'll collect it, organize it and list all of it in one special issue. We'll need the facts on the numbers of technical personnel available, the size of the facilities, hourly service bench rates, shipping instructions, and special services that are offered. This international service listing could turn out to be one of the most important issues of the year.

Many of you have asked about games that can be played on the SuperBrain. We have found NEMESIS by SuperSoft Associates.

It is a Dungeons and Dragons game that will consume your imagination and free time. DUNGEON MASTER is an optional accessory that permits you to completely create new obstacles and mazes within NEMESIS. We are now offering both in SuperBrain formats at \$40.00 and \$35.00 respectively.

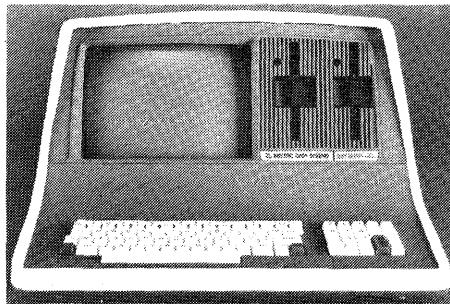
Regarding the differences between IE's S/BE-4 DOS and the new 3.1 DOS by Intertec, here are some important differences: IE's is much faster; you can program many keystrokes with theirs and only one within the Intertec DOS. The IE DOS supports the Corvus hard-disk, while Intertec's doesn't. Auto-repeat is not programmable with Intertec's and they don't have a communications buffer or a spindle-motor speed-check. The Intertec DOS does have a built-in on-screen clock, however, with their auto-repeat and other features.

Remember, some back-issues are still available for those of you who want to have them for your library. The cost including shipping is \$3.50 an issue.

Stay in touch with us and let us know what you're up to with your SuperBrains and CompuStars. It's your input that always makes the best news for this publication. And that's the way it should be.

*Albert Abrams*

EDITOR



## Technical Corner

### HARDWARE INFORMATION ON THE SUPERBRAIN

*Second in a Series*

by Jonathan W. Platt

Special thanks to  
Paul L. Kelley, Ph.D.

Copyright Jonathan Platt, 1982

#### The CRT Display System

The display system consists of three major chips: the DP8350 CRT Controller (CRTC); the CRT-8002 Video Generator (VDAc); and the MM5035 80 bit x 8 shift register.

The CRTC generates all the timing to display 24 rows of 80 characters each. Each scan row is divided into ten scan lines. During the first scan line of a row, a horizontal blank signal is generated causing a BUS REQUEST to CPU-1 and an interrupt. The controller takes the buses and reads 80 characters from the CRT memory map which begins at F800H (the upper 2K of RAM).

The address at which the CRTC begins reading the 80 characters is determined by the Row Start Register (RSR) of the CRTC. The RSR is the working register for the CRTC address counter. It determines the first video character address on a scan row to scan row basis. The 80 characters are loaded into the 80 x 8 shift register. The data in the shift register is then used by the CRTC during the next 9 scan lines to produce one row of video characters. The video generator supplies character font and other character attributes discussed later. There are 24 DMA cycles (or horizontal blanks) per frame.

There are a total of 25 interrupts generated - one for each scan row as described above and one more during vertical blanking. During the first 24, the interrupt routine in the SuperBrain's

*Continued on Page 2*

## Technical Corner, Continued from Page 1

monitor sets or resets PPIC-1 (character blanking) depending on whether that row is displayed or not. The monitor knows if there are any characters on a given line. If not, that line is not displayed. During the 25th interrupt (and BUS REQUEST), the interrupt routine initializes the CRTC address registers to the top-of-page and also updates the cursor address.

There are 60 vertical blanking interrupts per second at 60 Hertz. The line frequency is very useful for implementing a system clock. Any routines which implement auto-repeat or buffered type-ahead should also be done in the vertical blank section of the monitor.

The CRTC has 3 registers: the Top-of-Page Register (TOPR); the Row Start Register (RSR); and the Cursor Register (CR). These three registers may be changed under program control during either a vertical blank or horizontal blank. Looking at PPIB-2 will differentiate between a vertical or horizontal blank. It will be set for a vertical blank, reset for a horizontal blank. A load to a CRTC register is accomplished by setting PPIC-0 and then moving the register select as data to a location in memory corresponding to the desired register value between zero and 2K. The CRTC data lines are A0. All of the CPU's address bus and the register select lines are D0 and D1 of the data bus.

After loading the desired registers, PPIC-0 must be reset. Care must be taken not to enable the register load from a program in the first 2K of memory. The address lines in this area are write-only to the address/data lines of the CRTC while the register load is enabled.

Register Load Table

D0	D1	PPIC-0	Register Access
0	0	0	No Select
0	1	0	Top-of-Page
1	0	0	Row Start*
1	1	0	Cursor
X	X	1	No Select

\*During vertical blanking a load to the RSR will load the TOPR.

For example, to place the cursor at the beginning of the second row the code would be:

```
MVI    A,1      ;Set register load mode
OUT   PPICW    ;Control Word to PPI sets PPIC-0
LXI   H,80      ;Addresses start at zero-so 2nd row.
MVI   M,3      ;This will send the Cursor
              ;\Register Select via the data
              ;\lines, and the address to the
              ;\CRTC via the address lines.
```

Any other of the three registers may be loaded here as well.

```
XRA   A
OUT   PPICW    ;Disable register load mode
```

The beginning of the screen's memory map is at F800H (the upper 2K). The addresses held in the CRTC registers may be thought of as indexes from this address into the screen map.

The TOPR holds the address of the first character of the first video row. This register allows display scroll with the CRTC without the use of external memory address adders.

The RSR is the working register for the CRTC address counter. It determines the first video character address on a row to row basis. Modification of this register will modify the address counter outputs at the start of video on the next row. If the RSR is never externally loaded, the CRTC address outputs will be sequential from row to row from TOPR contents at the start of the video page. With external loading, row to row non-sequential operation of the CRTC address outputs is possible, thus row to row edit capability. A load to the RSR during vertical blanking will also load the TOPR.

Intertec has written their software such that the screen map is sequential in memory from row to row. So they only load the RSR (and thus the TOPR) during a vertical blank. They keep account of scrolling by adding 80 to the Top-of-Page after every scroll. There are over 25 lines of storage available in 2K of memory. The other method of row to row loading of the RSR (a nonsequential memory map), although it creates a bit more overhead in the interrupt routine, can make line insert/delete trivial and fast whereas if line insert/delete were done with a sequential map, a block move and probably padding to the terminal would be necessary at high baud rates.

I have written a non-sequential memory map monitor for the SuperBrain which works well with line insert/delete. A curious problem arises, however, with the location of the cursor on the screen which I have not been able to solve. The cursor block is displayed seven scan lines too early. Obviously some sort of timing problem, but still very mysterious.

The CR holds the present address of the cursor. When a match with the CR and the address register occurs a pulse will appear at this output at that video character time (character field width) for every line in that row.

The video generator supplies the character font to the CRTC for display to the screen. The Line Buffer Clock from the CRTC tells the shift register to send a character to the video generator. The video generator then sends the dots of that character for the working scan line to the CRTC.

The video generator also controls various character attributes. Strike-through and underlining are available although they have no real use since the entire row is underlined or struck through; no one single character can be selected. Blinking is also available and can be done from character to character by setting the high bit of that character in the screen map. There is an undocumented escape sequence to turn blinking on and off. They are:

<ESC><><B> will blink every subsequent character printed to the screen.

<ESC><><b> will turn it off. Blinking characters will remain blinking. Reverse video is not controlled through the video generator but can be accomplished by setting PPIA-7. No escape sequence exists in Intertec's software for setting this, although in their infinite ability to plan ahead and not carry through, there is a sequence to turn it off. It is <ESC><><N>. It may also be turned off, of course, by resetting PPIA-7. Starting with DOS 3.1, Intertec has changed the escape code's meaning to turn blink mode off. So instead of adding a reverse video sequence, they have chosen to ignore the concept completely.

The video generator has four modes, of no obvious use, except Internal Mode. Internal character mode is the normal operating mode. The modes are:

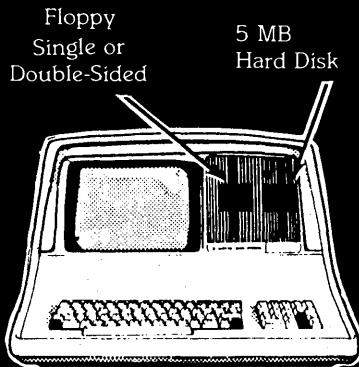
Mode	PPIA-0	PPIA-1
Wide Graphics	0	0
Thin Graphics	0	1
External Character	1	0
Internal Character	1	1

*Continued on Page 8*

# SUPERBRAIN™ 5 MB Plus (K System Five)

Now available INTERTEC's amazing SUPERBRAIN with built-in 5MB Hard Disk Storage. The K SYSTEM FIVE looks and operates like a normal SUPERBRAIN but with the advantage of 5 MB hard disk storage and hard disk speed that are immediately available to the operator.

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## —Guest Article—

### A SUPERBRAIN AND A SELECTRIC: A MARRIAGE THAT WORKS

by David Storti

The ELF 1 Interface, priced at 'under \$600', is intended to inexpensively convert a Selectric I, II or II typewriter into a letter quality printer. Since, for example, a NEC Spinwriter can run close to \$3,000, Escon's idea is a very attractive one to anyone doing word processing on a SuperBrain or CompuStar on a budget, particularly if one already owns a Selectric.

Recently I bought and installed an ELF 1 in my eight-year-old Selectric II and connected it via the serial port to my quad SuperBrain. Despite problems that resulted in an eight week hiatus between purchase and the day I got the first perfectly printed sheet (discussed below), I believe the unit does exactly what it is supposed to do, does it well, and, if some serious limitations are acceptable, should definitely be considered when shopping for a printer.

#### THE COMPANY

Though the ELF 1 is made by Escon, my unit came from IPEX International, (213) 710-1444, a Calabasas, California distributor for Escon. Throughout the period of getting the unit up and running, the people at IPEX were helpful, cooperative and patient. Because they were pleasant and obviously trying hard, they made the somewhat painful process of getting the printer up and running much easier.

#### OPERATION

The ELF 1 works in a very straightforward manner: an electronic interface takes ASCII output from the SuperBrain, translating it into on/off voltage levels used to activate one or a combination of solenoids installed in the typewriter. The solenoids are connected in turn to lever assemblies which, when pulled, trigger the correct latches for the required character. Six latches control character selection and six more are used to activate shift, tab, carriage return, space, backspace and print (which must be activated once for each printed character). The unit draws its power from the typewriter, so it is only on when the typewriter is on.

#### HARDWARE

As delivered, the unit consists of three manuals, a pre-assembled electronic interface, twelve solenoids with their attendant mounting hardware and lever assemblies, and a PC board with ribbon cable attached - used to terminate the solenoid wiring. All necessary wires and cables are included.

The components all seem to be of good quality and the sheet metal and aluminum mounting brackets are heavy gauge and well-designed. One touch I liked was the inclusion of spares for some small Selectric parts that tend to get lost in assembly.

#### CONSTRUCTION

Installing the unit consists of taking the case off the typewriter, doing some minor disassembly, screwing the mounting brackets (with attached lever and solenoid assemblies) into existing holes in the typewriter frame, running the solenoid wires and soldering them to the PC board, tapping into the typewriter's power cord (for 120 V to power the electronic interface), and then reassembling the typewriter.

The assemblies are designed to fit into already existing spaces in the typewriter mechanism, so no modifications to the case are necessary, and only very minor modifications to the machine itself.

Assembly was reasonably painless, but if the thought of tinkering with the mechanics of a thousand dollar typewriter is daunting, the factory will do the work for you for \$150.

If you elect to do the installation yourself, get the big service manual from IBM (about \$7.50). As I read the Escon manuals now, after the fact, they are complete and to the point, but in the actual process of installation I was often confused by them, particularly when trying to find a specific IBM part for the first time. There is nothing actually bad about the manuals, but neither do they follow the Heathkit

*Continued on Page 7*

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# **-New Products-**

**MIKEN OPTICAL COMPANY**  
53 Abbet Avenue  
Morristown, New Jersey 07960  
(201) 267-1210 or (201) 543-7372  
Contact: Robert J. Lurie

**SOFTWARE:** Markets IBIOS, an interactive BIOS for CP/M. It overcomes CP/M's most serious weakness as a single user operating system. CP/M locks you into a running program without giving you any way to interrupt it. The only commands you can execute are those that conform to the provisions of the program with respect to function, syntax, and time of issuance.

IBIOS requires no interrupt hardware. Nevertheless, with IBIOS you are able to interrupt any program that performs any I/O. You define the IBIOS command functions and command syntax. IBIOS then lets you execute these commands almost immediately from any program environment. With IBIOS you are at all times just a keystroke or two away from accessing your calculator, debugger, or monitor in high memory, reassigning your I/O devices, bank-switching your memory, write protecting your disks, turning your drive motors on or off, disabling your keyboard, or displaying time and date.

IBIOS is completely transparent not only to the currently running program but to CP/M itself. It loads automatically and fits into the space that CP/M assigns to BIOS. Positioned at the bottom of the program hierarchy, IBIOS puts you in continuous control of your computer and lets you define its functionality.

Installation requires a knowledge of assembly language programming and CP/M system alteration procedures.

IBIOS is available in the form of annotated 8080 source code listings, complete with command examples, for \$60.00 – U.S.; \$75.00 – foreign, single user non-commercial use only.

**THE DATALEX COMPANY**  
1431 Twelfth Avenue  
San Francisco, California 94122  
(415) 665-4467  
Contact: John J. Tibbetts

**SOFTWARE:** The new DATALEX Extended BIOS Includes the following features:

- conforms to the full p-System "ADAP-TABLE" XSBIOS specification as documented in the "UCSD Pascal User's Manual".

- much faster disk writes.
- high-speed console and remote queuing (64 character queues) to provide accurate type-ahead and communications capabilities.
- "Repeatamatic" keys which perform a key repeat function by holding the key down. The time parameters of this key repeat are configurable by the new CONFIGURE program.
- Pascal programmer access to all the system functions which previously required "assembler" programming, including:
  - physical disk I/O
  - disk formatting
  - baud rate setting
  - remote port checking and access
- implementation of the Pascal Time function. This requires no SuperBrain hardware modification. The clock is driven by the CRT hardware and, in most instances, is accurate within 30-60 seconds to the hour.
- newly-revised documentation.

Don't write on a label that has already been applied to a disk. The pressure of the pen will imbed dust particles in the magnetic surface and drastically reduce the reliability of the diskette.

Don't expose a diskette to magnetic fields. Electric motors and the degaussing coil around color-TV picture tubes are the greatest offenders.

## **Control Characters in Submit Files**

### **CP/M 2.2, Submit Patch #1**

SUBMIT does not allow any control characters in .SUB files. Certain control characters are recognized by SUBMIT when preceded by an up arrow. The two characters "↑z" should be interpreted by SUBMIT as a "control Z".

The following procedure using DDT will fix this problem. Make sure the listing shown here matches yours before patching.

A<ddt submit.com  
DDT VERS 2.2

NEXT PC

0600 0100

-1441

0441	SUI	61
0443	STA	OE7D
0446	MOV	C,A
0447	MVI	A,19
0449	CMP	C
044A	JNC	0456
044D	LXI	B,019D
0450	CALL	02A7
0452	JMP	045E
0456	LDA	OE7D
0459	INR	A

-s442  
0442 61 41  
0443 32 .  
-g0

A>save 5 submit.com  
A>

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Pictured: MAGIC WAND KEYTOP KIT FOR "SUPERBRAIN"

## Letters to the Editor

This letter is an account of one system house's effort to use the SuperBrain to market its software system. This letter is also a request for help in solving two basic problems still haunting the SuperBrain.

In order to tailor the SuperBrain to meet our specific requirements, we have modified each unit to date as follows:

- A PC board attaches to the main board and
  - 1) doubles the size of the standard font to yield 40 x 24 characters, and,
  - 2) generates characters in reverse video.
- A PC board with a ten-year battery-operated time-and-date clock can be used as a software controlled timer to start and stop computer.
- A full keyboard cover with lock and key limits access.
- A drive cover conceals the drive discs.
- All key topping on the numeric pad is special for the application.
- The EPROM has been reprogrammed to stop the disc drives after three seconds of inactivity.

As of this writing, North Ridge Data maintains 55 SuperBrain (DD & QD) sites. Since the first installation in February of

1980, we have repaired the SuperBrain power supplies approximately 150 times. In spite of the twelve different line filters and suppressors we have tried, the rate of power supply failure has not sufficiently decreased. If anyone knows of someone who has successfully externally fused the SuperBrain unit, we want to know.

The most severe hardware deficiency which threatens the success of our entire effort is the non-recoverable disc read errors. Essential and non-recoverable elements from our disseminated data bases are lost daily relegating reliability to a laughing matter.

As a solution to our CRC problems, we have concluded that a phase-lock-loop data recovery circuit must replace the present Intertec circuit. If someone has a PPL circuit, please contact this writer before we get deeper into our own development.

With these power supply and data reliability problems solved, we look forward to receiving years of tolerable service from our SuperBrains.

NORTH RIDGE DATA  
1700 Southwest 12th Avenue  
Boca Raton, Florida 33432  
(305) 392-6740

Do you have any suggestion as to how a SuperBrain owner might gain access to the CP/M Users Group library? This library seems to have a large amount of useful software for a relatively low price. I have written to CP/MUG, who reply

that they do not distribute in Intertec format. Is there anything to do next? Do you know of a SuperBrain user or users group which might be working on this?

Sincerely,

Jeff Bangert  
721 Tennessee  
Lawrence, Kansas 66044

*Editor's Note: Soon, we will be providing an 8" "down-loading" service to our readers. One of the first assignments will be to transfer the CP/MUG library to 5 1/4" SuperBrain format. There will be a small fee for this service. We'll be announcing it shortly.*

Please alert your readers that there is a problem with Structured Systems Group software. It is great software, friendly as hell, and my NAD and Q-Sort work wonders. The problem is with that of the line which requires a "CRT.DEF" configuration. In my case it is Letteright. It prints fine and does great mailmerges, etc., but it is impossible to use in composition. There is no SuperBrain.DEF configuration for it. SSG ships about a dozen CRT.DEF programs with the heavy software, and only one will even shape it up on a SuperBrain CRT, that being the one for ADDS terminals. But it will not work on the command lines; for example, "erase to end of line." SSG has even been nice enough to offer to write one for the SuperBrain for my benefit and for future customers, but they need the CRT data for the SuperBrain. Intertec does not supply it in the quantity necessary to do the configuration, and refuses to supply it because it is "proprietary."

*Continued on Page 8*

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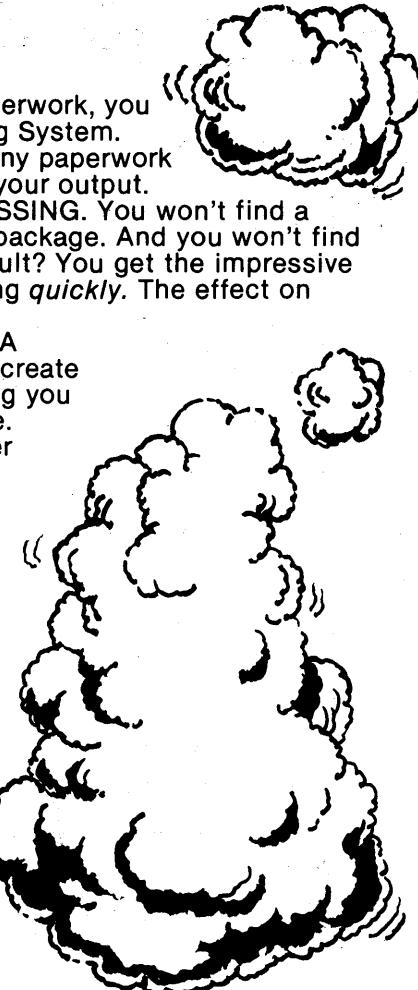
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### **Guest Article, Continued from Page 3**

model of absolute clarity for the absolutely inexperienced. And if you run into problems with the typewriter itself (as I did) the IBM manual is invaluable.

Once everything is installed, the solenoid linkages need to be adjusted. To help with this, the electronic interface has two test routines programmed into it. The first repetitively operates each solenoid, either alone or in combination; the second types all characters, first shifted, then unshifted, over and over. Using the first test, the linkage between each solenoid is accomplished by bending the heavy gauge wire with two pairs of pliers until it is just the right length. This may sound cumbersome, but in fact this kind of linkage is sturdy, very reliable and once set, can't slip out of adjustment.

Once the adjustments are correct and the second test pattern will run correctly, the typewriter can be closed and the unit connected to a computer. A DIP switch sets the interface's BAUD rate: up to 9600. I have had the best luck with mine set to 110, even parity, and XON/XOFF handshaking.

### **PROBLEMS**

I mentioned earlier that it took eight weeks to get the first perfectly printed sheet: true enough, but the fault lay with my typewriter, not with the ELF 1. My machine is about eight years old, and because I earn my living at it, it has seen hard usage and not enough preventive maintenance. Some parts were worn, others were dirty, and all had more play in them than a new typewriter would have. It typed perfectly, but when I finished the installation and started printing out a file, I found that the typing element's home position had been knocked out of adjustment. This meant that the element wasn't rotating far enough each time a character was selected, and all printout was garbage.

I suspect the reason for the problem was an odd bit of aluminum, possibly shaved off a fitting, that fell into the works and caused one of the rotate latches to bind. Eventually it was knocked loose and dropped out, returning everything to normal. Whatever it was, the lesson here is to be sure that your Selectric is in very good shape before interfacing it. While the mechanical forces the interface generates are not great, any weaknesses in your machine could lead to rather strange and frustrating results. A full service job on the typewriter cleared up the problem. It works beautifully now.

### **REAL COSTS**

The ELF 1 is advertised as 'under \$600'. That's true, but a bit misleading. If you

## **SUPERBRAIN OWNERS—**

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- greater disk capacity
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- automatic spindle motor shut off
- more reliable operation
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We also offer special keycap support for word processing, and interfacing for hard disk. Our communications software package, IE/Modem\*, allows file transfers between a CP/M\* based computer system and another computer system.

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IE Systems Inc.

### **Information Engineering**

Box 359 Newmarket, NH 03857

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need to underline, you need the bell, backspace and tab option for \$65. Unless you can wire an RS232 cable yourself, you need to buy one from them for \$30. With California sales tax (6%) added in, the total bill came to \$731.40. Adding in the \$75 service charge for IPEX's work on the typewriter itself, plus the \$36 for the adjustment my own service man made, my total cost to get the interface running was \$842.40 — not counting 160 miles worth of gas. It was not IPEX's fault that my Selectric was in such bad shape, but I suspect many typewriters have seen the same hard usage, so I would strongly recommend having any older machine serviced before attempting the installation. It will up the cost a bit, but it may well save money later (particularly if you aren't within driving distance of Calabasas, California).

### **LIMITATIONS**

If this type of interface to your SuperBrain is to be of any value, its limitations must be acceptable. First of all, it's slow: 12.5 cps or about 150 words per minute. Compare that to 55 cps (660 wpm) for a NEC Spinwriter. It won't print bidirectionally

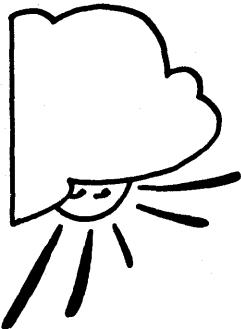
either, which means time wasted on carriage returns. And since a Selectric II won't do proportional spacing, text can only be justified by inserting full spaces between words. In short, the output copy will look typed, not printed. If that and the slow speed are acceptable, the ELF 1 will be useful.

As far as reliability is concerned, it's too early for me to tell. If I have problems, I'll report it here in Superletter.

### **SUMMARY**

In conclusion, the ELF 1 is a well-designed and executed unit that seems to do the job it was designed to do very well. The problems I had with my Selectric were, I suspect, very atypical (as IPEX kept insisting) — nevertheless, have your machine serviced thoroughly before installation. The IPEX people do their jobs well and are a pleasure to deal with. If you have or can get a Selectric I, II or III and can live with the slow speed and non-proportional printing, this might be exactly the way for you to get letter quality printing from your SuperBrain at a bargain price.





## FIRST CLASS

Beverly Hills, CA 90212  
P.O. Box 3121  
**SUPERLETTER**

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### Letters to the Editor, *Continued from Page 5*

One problem, as an example, is that you type your input line, then do a return to enter it into the copy block. Great. However, it still remains in the input line and you never really know when typing over it where the new line ends and the old line is still viewed. It is slow and torturous to say the least.

I know you would want to be alerted to this problem and maybe be able to get the necessary data to create a CRT.DEF for SuperBrain use of SSG software.

Thanks for the great newsletter – it is read over and over again and I appreciate the ads. But, particularly, to be able to get software that will work on the SuperBrain will be a great long-term benefit from you.

Sincerely,  
Edward F. Sayle  
2522 North Upland Street  
Arlington, Virginia 22207

*Editor's Note: A copy of this issue which includes your letter and the CRT data in the "Technical Corner" is being sent to Heather Shanklin at Structured Systems Group. Stay in touch with us and SSG as the problem is examined by their technical staff.*

## SuperClassifieds

**SACRIFICE PRICE** for never-used Peachtree programs for 64K DD Super-Brain! P/R, G/L, Power Text, A/P, A/R, Magic Wand (2), Inv. Mgt., Mail Address. \$200.00 per program, or \$1,200 for all. Manuals never opened. Call Jim Rachels, ABS Sales, (919) 895-2878.

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**CP/M Software, SB/E Proms, Graphics Packages** and much, much more are now available to SuperBrain owners at special discount prices. To order, call: Abrams Creative Services, (213) 277-2410.

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**Great Programming Aid** – PEARL Level III program with complete documentation available at substantial discount below list. C-Basic language required. Language disc and manual also available if needed. Strictly new merchandise. **Contact Cedar Micro Systems, 9818 Cedar Drive, Overland Park, KS 66207 (913) 648-3899.**

### Technical Corner, *Continued from Page 2* The Keyboard

The keyboard is attached to the Keyboard Encoder – the only chip central to serving the keyboard. The PPI contains all the status information output from the KB Encoder. Four ports are associated with the keyboard – the actual character port from the encoder (port 50H) and three test ports on the PPI. When PPIC-7 is set, new character tests may be done at PPIB-0. The Data Ready (DR) line on the encoder will set that bit when a new key is depressed. This prevents multiple inputs of a character. PPIB-1 will be set if a key is currently down. This is essential for character repeat. Resetting, then setting PPIC-7 will enable the new character test. This should be done immediately after any NEW character is input.

*Editor's note: The "Hardware Information on the SuperBrain" may be purchased in its entirety from Jonathan Platt for \$50. He also has "SOS," a new BIOS for the SuperBrain. Write to:*

Jonathan Platt  
Pine Villa Apt. 114  
200 East University Blvd.  
Melbourne, FL 32901 (305) 724-6148

# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

April/May 1982  
Vol. 2 No. 2

**Y**our attention is drawn to the April issue of BYTE, specifically pages 74 and 75 (a two-page spread by Intertec) and page 434, which goes into detail about a new price cut plus a return and refund policy now being initiated by the factory.

In a nutshell, prices have been hacked on the entire Intertec line and the factory will now begin reimbursing freight expenses to customers for any new computers that must be returned to the Columbia plant during the warranty period.

We urged this type of customer protection action over a year ago in an open editorial. We're happy to see Intertec's actions. It's only a start, but an important one.

The BYTE article on page 414 also goes on to say that Intertec will now feature a company sponsored users-group and a new magazine for users. That raised eyebrows here, as you can imagine. Having published without a break for the last year and a half, we know what it takes to provide a true and beneficial service to computer users.

By the way, interfacing a SuperBrain to an 8" drive is a lot more difficult than we first imagined. Have any of you been able to do it at a reasonable price? Let us know. The CP/M Users Group software will have to wait until it's all ironed out.

Instead of listing the comparisons of the different BIOSs now becoming available, we're printing a complete run-down of each separately, so that you can decide (considering costs and features) which you prefer.

Incidentally, we do not sell, trade or give away the names of subscribers to any magazine, advertiser or mailing service under any circumstance. We believe in protecting the privacy and confidentiality of our subscribers.

In the same vein, we must be very strict about not permitting any unauthorized copying of our articles or pages for distribution to other parties. If you have friends or business associates who like to read Superletter or borrow articles, please

suggest they subscribe. Everybody benefits if we are able to grow and thus service your information needs even better in the months ahead.

*Albert Abrams*  
EDITOR

## Technical Corner

### HARDWARE INFORMATION ON THE SUPERBRAIN

*Third in a Series*

by Jonathan W. Platt

Special thanks to  
Paul L. Kelley, Ph.D.

Copyright Jonathan Platt, 1982

#### The Communication System

This system is comprised of three chips; two 8251 USARTs and the baud rate generator. The baud rate for each USART can be set by writing an eight bit digit to the generator (port 60H). The upper four bits output to the generator determine the main port baud rate while the lower four bits set the auxiliary port baud rate. There are 16 baud rates available. See further discussion, below, about the multipliers of the baud rates.

Upper or lower nibble (hex)	Baud Rates x 1	x 16	x 64
0	800	50	12.5
1	1200	75	18.75
2	1760	110	27.5
3	2152	134.5	33.625
4	2400	150	37.5
5	4800	300	75
6	9600	600	150
7	19200	1200	300
8	28800	1800	450
9	32000	2000	500
A	38400	2400	600
B	3600	900	
C	4800	1200	
D	7200	1800	
E	9600	2400	
F	19200	4800	

Communication to the outside world is done through the main and auxiliary serial interface ports. The main port has been made a bit more useful than the auxiliary port. It will support RTS, CTS, DSR, DTR, RI and internal and external transmit/receive clocks enabled by the dipswitches on the processor board. The RI (ring indicator) can be tested via PPIB-6. The auxiliary port will support only RTS and DSR. RTS for the auxiliary port, which is not documented in the manual, is shown on the schematics but may not be active.

A printer which supports reverse channel is well suited for connection to CTS of the main port. CTS must be true to transmit. DSR must be handled by specific software which is slower than a hardware protocol. If you have a device which needs no extensive protocol, it is better off on the aux port since DSR would probably be quite sufficient whereas the main port should be saved for higher speed devices. I recommend that the printer (e.g. NEC 5520) be put on the main port and the modem be put on the aux port (unless you need the ring indicator). Intertec, of course, recommends the opposite.

The 8251 USARTs are minimally programmable. The 8251 is programmed by writing two to four command codes to the status port. When the 8251 is first powered up or is reset, its logic assumes that a Mode Select Command Code will be the next byte of data sent to the status port. If the Mode Select Command specifies synchronous mode, the 8251 logic expects the subsequent command input to be the SYNC character - or if specified in the Mode Select Command, two SYNC characters; SYNC1 and SYNC2. As soon as a Mode Select Command Code - and SYNC characters, if needed - has been received, 8251 logic switches to expecting Control Select

*Continued on Page 2*

# New Products

## SuperBrain Operating System (SOS) 3.4

Jonathan W. Platt  
Pine Villa, Apt. 114  
200 East University Boulevard  
Melbourne, Florida 32901  
(305) 724-6148

### Product and Pricing Sheet

SOS 3.4 is a field tested SuperBrain BIOS with many features which extensively use the SuperBrain's real potential that the standard Intertec system does not provide. Increased versatility and ease of use makes this SOS system truly a Super System!

#### SOS Features Include:

##### DISK SYSTEM (All selectable under program control)

- IE Systems PROM feature-compatibility
  - Variable track to track seek rate
  - Variable number of tracks (35 or 40, even 128)
  - Motor shut-off
  - BIOS call for disk rotation speed check
  - Read-After-Write disk verification
- Single or double-sided disks settable for each drive

##### I/O SYSTEM (All selectable under program control)

- Full IOBYTE implementation
- Main and Auxiliary Port Communications:
  - 23 Selectable Baud rates
  - Synchronous or Asynchronous operation to both ports
  - Four selectable protocols (DSR, ^S/^Q, ETX/ACK or None)
  - 256 byte input buffer on READER device
  - 256 byte output buffer on LIST device
  - Warning beep every 10 seconds if data is sent to a port and there is no device attached
  - Selectable BREAK key sends the break signal to the PUNCH device and flushes the type-ahead buffer and the LIST output buffer if set to the same port
- Console/Screen:
  - Selectable video field
  - Time display (Intertec TIME program compatible)
  - Internal date (Intertec DATE program compatible)
  - 35 Programmable function keys. Five and three characters.
  - Any number of function keys can be "linked" together to create functions greater than five characters

- Selectable key-click volume
- Selectable auto-repeat delay
- Selectable auto-repeat rate

#### OTHER (All accessible through BIOS)

- Timer word keeps number of seconds since last cold boot
- More than thirty BIOS calls including:
  - Direct-to-device I/O and status
  - READER and PUNCH device status
  - Set key-click volume, repeat delay, repeat rate
  - Push/Pop cursor position (Up to 256 levels)

To receive any of the products summarized below, send check, certified check or money order for the amount listed payable to the above address.

When purchasing the SOS, send one diskette that has been SYSGENed on your machine. This makes your end-price cheaper since no royalties have to be paid to Digital Research with this "Software Consultant" method.

SOS 3.4 will only work on SuperBrains with 512 bytes/sector and 10 sectors/track using CP/M 2.2. Any IE Systems PROM or Intertec DOS 3.0 and above fit those requirements.

Upon request, a listing of the commented source for SOS 3.4 will be sent with the system and manual for an additional \$200. The SOS system itself must be bought for the right to buy the source. The source code, which is not usually available with any other systems, will allow a more comprehensive understanding of the SOS program. This will enable a user to change the SOS to satisfy his own personal needs should there be one that the SOS can't handle.

For those of you who are exasperated at the lack of technical information for the SuperBrain from Intertec, "Hardware Information on the SuperBrain" is a 20 page document describing the circuitry of the SuperBrain, the various subsystems and how they function from the system programming viewpoint.

#### Price Summary

"Hardware Information on the SuperBrain" .....	\$ 50.00
SuperBrain Operating System (SOS) 3.4 plus "SETSYS"	
SOS Configuration Program	
SOS User's Manual, and partial BIOS listing .....	\$ 140.00
Commented Source Copy of SOS 3.4 .....	\$ 200.00
Commented Source Copy of SETSYS 1.0 .....	\$ 100.00
User's Manual .....	\$ 50.00
SOS PROM 3.4 .....	\$ 50.00

\*All prices include shipping\*



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**Technical Corner, Continued from Page 1**  
Codes. This persists until the 8251 is reset or a special Control Select is output forcing the choice back to Mode Select. No buffering is necessary between commands (i.e. NOPs).

Intertec has CONFIGUR set the 8251 clocks to 1/16 the baud rate produced by the baud rate generator. This multiplier produces the baud rates as described above. If an even higher or lower baud rate than available is desired, a different multiplier may be used. The other multipliers available on the 8251 are one and 1/64 times the baud rate. The 8251 can run from DC up to 615/16K baud in asynchronous mode or 56K baud in synchronous mode. So you could go as low as 12.5 baud or as high as 38.4K baud via the baud rate generator. Even so, at 38.4K baud there is only time enough for about 150 CPU instructions before another character will arrive - not a whole lot of time to process it. The baud rate generator rates may be bypassed by using an external clock through the dipswitches as described in the user's manual. Of course, the clock rate should not exceed the system's clock frequency.

With the advent of Intertec's new DOS 3.1 (and a few more bugs), they have included code to handle the programming for synchronous mode. CONFIGUR now gives you a choice of asynchronous or synchronous mode with the main port only. They have their values a little mixed up, however. And until they get it fixed, when you specify one SYNC character, the code sets it for two SYNC characters and vice versa. Also, Clear-to-End-Of-Screen (CLEOS) does not work properly, the ^T time display toggle will turn on display but will not turn it off and when the break key is hit, the main port break signal turns on and STAYS on. At the time of this writing, Intertec just released DOS 3.2 which (hopefully) will alleviate those problems.→

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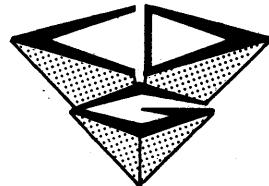
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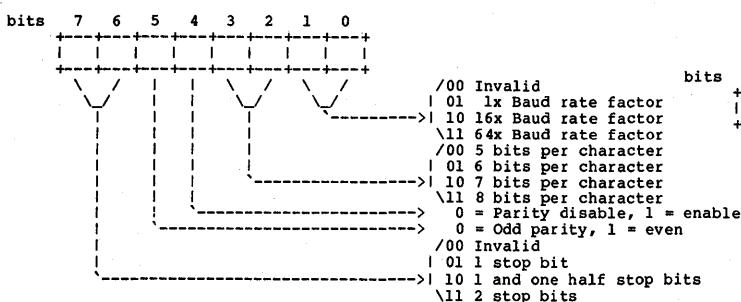
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**(213) 829-7619**

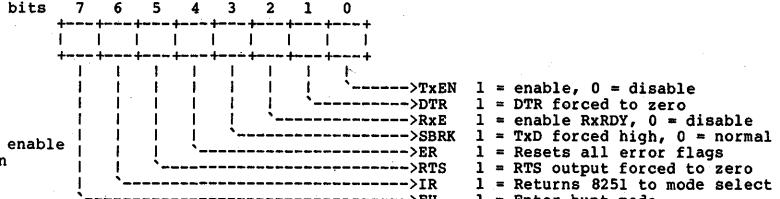


The Mode Select Command formats are as follows:

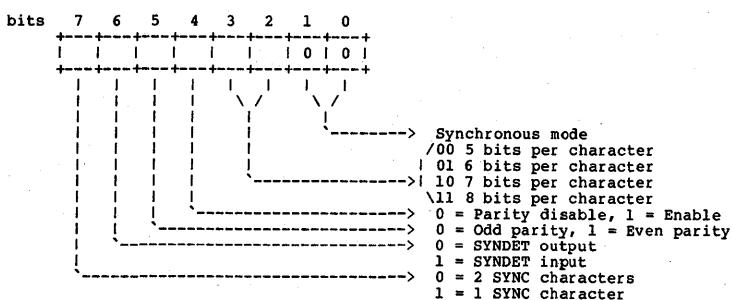
Asynchronous Mode Select



After the Mode Selection and SYNC character(s), if necessary, the Control Command is written in the following format. Any subsequent write to the status port after this will be the Control Command unless bit 6 is set.



Synchronous Mode Select



Input from the status port is as follows:

Bit	Information
0	Set for transmit ready
1	Set for receive ready
2	Set for transmitter empty
3	Set for parity error
4	Set for overrun error
5	Set for framing error
6	SYNDET (SYNC character DETect)
7	Set for data set ready

*Continued on Page 8*

# ABRAMS

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# —Guest Article—

## The SuperBrain and a Lathe Machine: A Unique Application

by Henry Munro

Bristol Engineering Company  
210 Beaver Street, Box 696  
Yorkville, Illinois 60560

In early 1980 we started using the SuperBrain to store and transmit programs to a CNC lathe. We have a Sheldon H1710 lathe with a Bendix System 5 control, purchased in 1976. From the beginning we were searching for a system to eliminate the punching, handling and storing of the paper tapes. We got very little encouragement and finally pretty much struck out on our own. The first and primary hurdle was providing a suitable I/O interface between the CNC system and any computer system we might buy.

All Bendix had to offer was a "high speed punch output" accessory designed to drive either a Facit or Remex punch. This unit supposedly had baud rates available up to 600, which was still slow, but a lot better than the 110 baud output of the standard teletype connection. For an input to the system, Bendix offered a "BTR" (behind tape reader) manufactured by Dwight Instrument Co. of Lyndhurst, NJ. Both of these units provided an RS232C port for connection to the computer.

We had these two items installed on the Bendix control, and then got our first SuperBrain and began the marriage. There has never been any trouble with the output system provided by Bendix. This was their own design, and although it was advertised to go only to 600 baud, we found that there were DIP switch settings that provided much higher baud rates. We found the best (highest without garbling) rate to be 2400 baud. [Transmission is over a shielded, 3-conductor cable 110 feet long.]

Dwight Instrument's BTR was quite another matter. We found before we had made a good start on the marriage that the knowledgeable people had all left Dwight Instrument, and were at Digital Design, Inc. (Ed Gerry and Lou Dicianni, 201-839-8808.) Although these gentlemen were helpful to a point, it was apparent that they were not ready to do the amount of modification necessary to get the system working. This left us on our own.

Designed and programmed to receive data from a tape reader, the Bendix System 5 had certain characteristics and requirements that complicated the problem. If we had been in a position to modify the executive program for that unit we might have had an easier time, but getting help in that area was at least as difficult as getting programming help from Intertec.

This unit received the data in bursts of 256 characters, stopping briefly to dump the buffer into memory at the end of each burst. We quickly found that each time the transmission was stopped (the DSR signal went low) we lost one character. In trying to figure out how this BTR could have been used successfully elsewhere, we could only assume that it was used in a system that transmitted a block at a time, blocks being separated by a carriage-return-line-feed combination. Most machines receiving that type of transmission would act on the carriage-return, and probably never miss the line-feed character that was lost.

As each character transmitted serially to the BTR was received, a sprocket pulse output was generated, which caused the character to be entered into the machine in parallel. Since there would normally be one character in transit at the instant that the machine buffer became full and the DSR signal went low, this character must be stored in the UART until the next time the DSR signal goes high. No such gating of the sprocket pulse existed in the BTR as received, and this last character was dumped during the time the machine could not receive it. By adding a gate to the "Data Ready" output of the UART, preventing a sprocket pulse and the resultant "Data Ready Reset" from being generated, we were able to retain the otherwise lost character.

Bendix designed the System 5 to accept either EIA or ASCII code. Which code is to be received is determined by the first carriage-return (or EOB) character received. If this is a 0DH then all subsequent characters have to be in ASCII, and more specifically in even parity, or a parity error occurs. If a 80H (EIA EOB) is received, then all subsequent characters have to be odd parity.

This system would work beautifully except for a quirk of the SuperBrain for which we have been unable to get help from anyone. The only command we have been able to use to get output from the main port is PIP PUN:. (On our first SuperBrain, with which most of this was worked out, the DSR was not implemented on the AUX port.) PIP PUN: is supposed to output a string of nulls before and after the file transmission for leader and trailer on the tape. For some unknown reason, the SuperBrain will not willingly output nulls, and instead outputs a random mixture of a few nulls, a lot of 80H codes, and a lot of C0H (@) codes. Now, the C0H codes don't hurt anything, but the 80H codes are EIA EOB codes, and cause the Bendix system to start looking for EIA code. Of course, the very next character, and practically all subsequent characters are then considered as parity errors.

Fortunately, along with a lot of other unnecessary logic, the BTR included its own parity checking system. This at first seemed to be giving us trouble because it was hard wired to accept even parity and locked up whenever one of the 80H codes was received. However, by rewiring this to gate the sprocket pulse output whenever a parity error occurred (just dropping the character rather than setting an alarm) we were able to filter out all the 80H codes, and get past the garbage that the SuperBrain was outputting.

Another problem came in developing a system that would properly terminate transmission and allow the computer to advance to the next step (in a SUBMIT program) to verify the transmission. When reading a tape, the Bendix system looks for either an "M02" or an "M30". On an "M02" followed by a carriage return, the tape reader is stopped, and the program is dumped into memory. An "M30" performs the same operation, except that the tape reader is reversed to rewind the tape, and a percent sign is searched to stop the rewind. In either case, the reader-forward signal (translated into the DSR) was terminated immediately upon receipt of the carriage-return. This left a line feed and a string of nulls for the computer to transmit before it was ready to proceed. If the "M02" or "M30" was omitted from the end of the program, the computer finished its transmission in great shape, but the Bendix system would not store the program.

Solving this mess involved several more changes in the logic of the Dwight Instrument BTR. It was necessary to generate a DSR output to the computer while the

*Continued on Page 6*

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## **Guest Article, continued from Page 5**

Bendix unit was giving the "rewind" signal (tape reader reverse). Then it was necessary to include a timer to keep this signal high long enough for the computer to finish transmitting its string of nulls. In order to make these modifications work, each transmission is ended with an M30, CR, %, CR. When the "M30" is read, the reader forward signal stops, and the reader reverse signal goes true. This starts the timer and continues the DSR output to the computer. When the percent sign is received, the reader reverse signal goes false, but the timer maintains the DSR high long enough for the computer to dump everything.

Obviously, with the filtering of parity errors and other uncertainties of the system, it is necessary to verify all transmissions. The SUBMIT programs used to transmit and record the CNC programs provide for this. After the file is transmitted to the machine, the operator retransmits (punches) it back to the computer. It is stored as the same file except with type .VER. A BASIC program is then run which compares this file with the original file, line by line. Both versions of each line in which there is any variation are printed out (the line from the original file with a prefix "S" and the received line with the prefix "R"). This printout may then be taken to the machine and any errors corrected with the edit facility at the machine.

After a program has been run on the lathe, it is retransmitted to the computer for storage. (Frequent edits occur during the running as tooling and other conditions vary.) The program is "punched" back to the computer twice, and filed once as type .REC and once as type .VER. These two files are then compared with the same verification program used before. Then the type .REC file is compared with the original file. This final comparison gives the Engineering Dept. a listing of all edits that have occurred during the running of the program. If all edits are acceptable, and the revised program is to be filed, then the original program is renamed type .OLD and the type .REC file is renamed type .DAT. The type .VER file is erased.

It probably should be noted that the recording (or "punching") operation, which utilizes the Bendix designed high speed punch output, has been very nearly perfect, errors almost never showing up in the verification procedure. Unfortunately, there is still some room for improvement in the BTR and its ability to accurately receive the data as transmitted.

In summary, the SuperBrain has given us a very handy system for generating and

storing our CNC programs. However, anyone venturing into this kind of program should be aware that there's more involved than just transmitting data. You must be aware of the peculiarities of both systems as to what they require to initiate and terminate each transmission, and what they are able to output in initiating and terminating transmission. Compatibility in these areas seems to have been the biggest problem once the system was made to retain all characters when transmission was interrupted.

Most recently, we have added a Corvus 20 Mbyte disk to the system, but that's another story.



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## **- Book Review -**

**How To Patent Computer Programs**, by S. Pal Asija — a patent attorney who successfully secured a patent for a program that he designed.

Until the Asija patent, it has been generally assumed that patent protection is not available for computer programs, which are generally referred to as "software" by the computer trade. Such programs had to be protected by trade secret and by copyright, both of which afford the program developer much less protection than is available with a patent.

Like all patentable inventions, not every program will be patentable. It must be genuinely unusual — a program that is not obvious to those of ordinary skill in the art of computer programming. But if a program has the unique qualities of an otherwise patentable invention, it is no longer excluded from patent consideration merely because it is a computer program.

This unique "How To" guide is an appropriate reference book in the library of every company that develops any type of proprietary computer program, every attorney who is involved in copyright or patent law, and attorneys or accountants who are involved with research and development ventures.

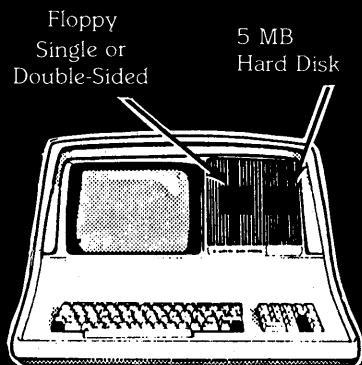
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# Letters to the Editor

## DEAR SUPERLETTER:

I have been receiving Superletter since the beginning and really look forward to it. There should be more pages but at least it concentrates on my computer.

The reason I'm writing is to bring your attention to my experiences with Systems Integration in New York. Like many others, I started out with the TRS-80 but at that time it wasn't capable of serious computing. Since the SuperBrain was being used where I worked, I decided to purchase one.

Fortunately, I bought it from Dale Walker of Systems Integration along with his implementation of CP/M called IOS. Not all of us have the time and experience to write system utilities or even to figure out things available from the CP/M networks. IOS did everything very nicely. With the operating system I received the following:

- Batch Monitor
- Sorted disk directory with attributes
- Memory tester
- Selective file eraser with recovery capability
- Keypad programmer (including top row of regular keyboard)
- Interface with clock from user program
- Directory sorter
- File splitter
- Spooling capability
- XFER (like PIP with much more)
- Auto program upon power-up
- And much, much more...

With IOS my access time is 6ms and would you believe that loading MBASIC requires only four seconds. My configuration is now so flexible that I can swap keypad assignments with ease.

Even better than his software is his knowledge of the SuperBrain and his willingness to share it. Finally, a vendor who will tell you which language is best for your application instead of just sending you the package off the shelf.

System Integration has my highest recommendation. I hope Superletter will someday interview Dale Walker for real insight into the world of SuperBrain.

Keep up the good work.

Darrell Bushnell  
23 Vineyard Place  
Passaic, New Jersey 07055

## DEAR SUPERLETTER:

RE: Your letter to Heather Shanklin, Sales and SUPERLETTER Feb/March 1982 Vol. 2 No. 1

1) The information provided indicates that machine code can be written to address the CRT. At this time the language we develop our programs in, CBASIC, is not linkable to machine code directly but works through an interpreter.

2) It would be most helpful if we could get more information on the ESCAPE sequences used (page 2, col. 2, para. 7). We could then modify the ADDS, CRT definition to compute the program commands.

Again, thank you for your time and effort in this matter. Please let me know if you can help us obtain the needed CRT information.

Barbara W. Carleton  
Manager  
Customer Service Department  
Structured Systems Group, Inc.

*Editor's note: We're still working on this problem. We'll keep our readers informed.*

## DEAR SUPERLETTER:

I would like to personally thank you for supplying the necessary information, making it possible for me to interface the Microline 83A printer by Okidata. I have enclosed all of the necessary settings, so that it may help others who are trying to use Microline 83A printer with the SuperBrain.

### SuperBrain Auxiliary Port Configuration

Baud Rate	110*
Stop Bit	1
Character Length	8
DSR	enabled
No parity	

\*Note: The character losses at baud rates 300-1200 were too extensive for any use!!!

### RS-232-C Pin Connections

SuperBrain                    Microline 83A

1 (protective ground)	= =>	1 (protective ground)
3 (transmitted data)	= =>	3 (received data)
7 (signal ground)	= =>	7 (signal ground)
20 (data set ready)	= =>	20 (data terminal ready)

*Note: M83A's pin #11, supervisory send data or BUSY equivalent, is not used. This pin should only be used when using higher baud rate than 300, and this also requires a X-on, X-off protocol.*

### Microline Dip Switch Settings

#### Front Operating Panel Dip Switches

SW1	OFF:	Setting selects US ASCII character set.
SW2	OFF:	8 code unit.
SW3	OFF:	Automatic carriage when received CR. Do not move paper up one line.
SW4	OFF:	Ignore DEL code.
SW5	OFF:	Low speed serial interface. (OFF / parallel)
SW6	ON:	
SW7	OFF:	
SW8	ON:	

#### Rear Control Circuit Board (LEPV-1) Dip Switch Settings

SW1	OFF:	Pin #11, SSD polarity/Mark when Ready, Space when Busy.
SW2	OFF:	Baud Rate 110.
SW3	OFF:	
SW4	OFF:	
SW5	OFF:	NOT USED
SW6	OFF:	No parity.

#### Rear Control Circuit Board Short Plugs Jumper Connections

SP1	SIDE B:	DTR Signal is for space (ON) after power on.
SP2	SIDE A:	Unused state.

### Implementation of 2K High Speed Buffer Card on the Microline 83A

General Comments: At 1200 baud rate, the 2K buffer fills up after about five pages of text; and while the buffer is dumping, the buffer loses approximately two pages of text thereafter. The Supervisory Send Data, pin #11 on the printer, can be used to switch the polarity and send out the BUSY signal to the SuperBrain when the buffer is down to 139 characters or less. But the polarity does not switch back once the buffer is empty, unless one has the capability of X-ON and X-OFF Protocol. Therefore, I configured the SuperBrain's Auxiliary Port Baud Rate at 600 and did not use the SSD signal of the Microline printer.

### SuperBrain Auxiliary Port Configurations

Baud Rate	600
Stop Bit	1
Character Length	8
DSR	enabled
No parity	

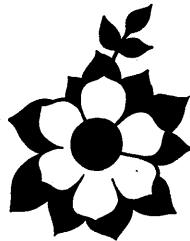
### RS-232-C Pin Connections

SuperBrain	Microline HS Buffer
1 (protective ground)	= => 1 (protective ground)
3 (transmitted data)	= => 3 (received data)
7 (signal ground)	= => 7 (signal ground)
20 (data set ready)	= => 20 (data terminal ready)
	'-> absolutely necessary.
7 (signal ground)	= => 7 (signal ground)
20 (data set ready)	= => 20 (data terminal ready)

### Microline Dip Switch Settings

SW1	OFF:	US ASCII character set.
SW2	OFF:	8 code unit.
SW3	OFF:	Auto carriage/no line feed at CR.
SW4	OFF:	Ignore DEL code.
SW5	OFF:	Parallel interface (used even though RS-232-C option is used on the buffer card.)
SW6	OFF:	
SW7	OFF:	
SW8	OFF:	

*Continued on Page 8*



## FIRST CLASS

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**SUPERLETTER**

**Technical Corner, Continued from Page 3**  
The following was inadvertently omitted from Technical Corner's first installment of "Hardware Information on the SuperBrain" in the December 1981/January 1982 issue.

**CPU-2 Ports**

	Hex	Chip Location
LS174 clock pin	10	
FD1791-B01 FDC		
Status/Command register	08	
Track Register	09	
Sector Register	0A	
Data Register	0B	



## **SUPERClassifieds**

**EXTENDED ASSEMBLER:** Finally an assembler with the sophistication of mainframe software, designed specifically for the SuperBrain. Encompasses entire Z-80 instruction set, listing control, conditional assembly, macros, external text assembly, and the usual. An accompanying manual contains complete documentation and easy to reference tables. Only \$125, includes binary, 2 demo programs, manual, AND THE SOURCE CODE!... Send check or money order to Morrow's Super Software, Box 307, San Luis Rey, California 92068-0307.

**Letters to the Editor,  
Continued from Page 7****Rear Control Circuit Board (LEPV-11)  
Dip Switch Settings**

SW1	OFF:	SSD polarity/Mark when Ready, Space when Busy.
SW2	OFF:-	
SW3	OFF:	600 Baud Rate.
SW4	ON:-,	
SW5		NOT USED.
SW6	OFF:	No parity.

**Rear Control Circuit Board Short Plugs Jumper Connections**

SP1	SIDE B:	DTR signal is for space (ON) after power on.
SP2	SIDE A:	Unused state.

**Buffer Card Interface Circuit Board (RSCL-2) Dip Switch Settings**

SW1	OFF:	Even parity (invalid when SW2 is ON.)
SW2	ON:	No parity.
SW3	OFF:	8 data bits.
SW4	ON:-,	
SW5	ON:	600 baud rate.
SW6	OFF:-,	
SW7	OFF:	Block end code (LF) invalid in CENTRONICS UNBLOCKED MODE.
SW8		UNUSED
SW9	OFF:-	
SW10	OFF:	Centronics Unblocked transmission mode.
SW11	ON:-,	
SW12	ON:	Space always after power on switching.
SW13	ON:	SSD polarity/Space at Busy state.

SW14     OFF:     Ready to receive regardless of Mark or Space of CD (PIN #8) signal.

SW15     ON:     RS-232-C interface selection.

SW16     ON:     Change of current loop function (two-wire system).  
\*) invalid in RS-232-C interface mode.

*Note: Centronics Unblocked (mode-d) has a free block transfer format. Also, if SSD is used, the BUSY signal is sent out when buffer is less than or equal to 139 characters.*

*If Centronics RS-232 (mode-c) is selected, then the control-A must be sent to the printer to indicate SOH.*

*Other communication modes are a) Oki Simplex Busy, b) Oki Simplex Acknowledge, f) Centronics Blocked Duplex, and g) Dec Duplex.*

**Buffer Card Interface Circuit Board Short Plugs Jumper Connections**

SP4	SIDE A:	Current supply to receiving circuit
		*) Not supplied
SP5	SIDE B:	Current supply to transmitting circuit
		*) Not supplied

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# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

June/July 1982  
Vol. 2 No. 3

**S**uperBrain news continues to pour in from all directions.

New Intertec models have been introduced. New lower prices are staying in effect. And, a working 96 MB CDC hard-disk has finally appeared in the marketplace for the CompuStar computer line.

In our continuing series of articles bringing you up-to-date about various enhanced BIOS packages, this month we introduce SUPER-IOS from Systems Integration, Inc., which leads us to further happily report that our CP/M Users Group software search has ended successfully.

Systems Integration will down-load any of the public-domain CP/MUG programs. Single-sided diskettes are \$15; \$10 for the double-sided. This "mix-down" service is also available for all general purposes as well. See their ad for the address and phone number.

Dr. George Corliss in Milwaukee is also considering initiating a SuperBrain mix-down service. You may reach him at (414) 224-6340 during the day, or (414) 691-9239 in the evenings.

All of the CP/MUG volumes and directory of programs are available from the CP/M Users Group, 1651 Third Avenue, New York, NY 10028.

This is "show" month, and we thank Telecompute Integrated Systems of Toronto, the makers of TIS-APL for the SuperBrain, for their help in distributing Superletter at the NCC.

We'll also be visiting Comdex. If you're going to be at either show, and you see something that would be of interest to our readers, please let us know. We'll be sure to pass on the information in our next issue.

Thanks again for all your continuing comments and articles. We certainly benefit from them, and we know our many readers do too.

*Albert Abrams*

EDITOR

## Technical Corner

### HARDWARE INFORMATION ON THE SUPERBRAIN

*Last in a Series*

by Jonathan W. Platt

Special thanks to  
Paul L. Kelley, Ph.D.

Copyright Jonathan Platt, 1982

#### The Floppy Disk System

This system is the most important aspect of the SuperBrain and also the most varied of all the subsystems of the SuperBrain. There are at least three major versions of the SuperBrain by Intertec and other companies; all recognized by their differences in this subsystem. There is one version, however, where the user is supplied hardware mods and the software needed to give the SuperBrain graphics capability. The three most marketed versions are:

- I Single-sided; 35 tracks; 30 sectors/track; 128 bytes/sector
- II Single-sided; 35 + tracks; 10 sectors/track; 512 bytes/sector
- III Double-sided; 35 + tracks; 10 sectors/track; 512 bytes/sector

In keeping with CP/M's standard, version I is officially 26 sectors/track. The other four sectors on each track are undocumented, but are used. The 35+ is because Intertec has equipped the SuperBrain with drives from several different sources. Except for the Shugart drives, most of the drives now implemented in the SuperBrain will operate using either 35 or 40 tracks per side. If you wish to use all 40 tracks on your drive, then the PROM must be able to accomplish that also; it is not enough that a BIOS can handle it.

The floppy disk system is comprised of three main chips and memory. They are the second CPU, a Floppy Disk Controller (FD1791-B01), a Hex D Flip-Flop and the

2K PROM and 1K of static RAM. The second CPU (CPU-2) of the SuperBrain controls all the operations of the disk interface.

Upon the commencement of a disk operation, CPU-1 obtains CPU-2's bus and places all necessary parameters (function, unit, track and sector) into CPU-2's static RAM at a pre-specified location. It then sets a status word in CPU-2's memory which CPU-2 continually checks. After CPU-2 gets its bus back, it sees that the status word is set, sets the 'disk busy' (PPIB-5), disseminates all the information given and sends the appropriate control signals to the FDC. Any errors encountered are recorded into an error byte set up by CPU-2. CPU-2 gets its programming from the 2K PROM.

If a write operation is done, CPU-1 also puts one sector of data into the static RAM and CPU-2 instructs the FDC to put that data onto disk. If a read is done, CPU-2 instructs the FDC to retrieve one sector of data, byte by byte, and put it into the static RAM; DMA is not done by the FDC.

After an operation is completed, CPU-2 resets the 'disk busy'. When CPU-1 sees this, it gets CPU-2's bus and either transfers the data from the static RAM to the DMA address specified by a program and retrieves the error byte or just retrieves the error byte, depending on whether a read or write was done.

If a DMA address is specified which either begins in, or extends into bank 2 of memory (8000H-BFFFH) a small problem arises since that bank is switched out to access CPU-2's static RAM. The reason it is switched out is because the amount of memory used on CPU-1 is the maximum that the Z80 can support. The SuperBrain's monitor deals with this by setting up a temporary DMA address in high memory. Data to be written is transferred here before switching if that data is in bank 2. Data which was read is sent to the temporary address and then transferred to the real DMA address after

*Continued on Page 4*

## Letters to the Editor

DEAR SUPERLETTER:

I recently installed IE's SB/E Prom on our SuperBrain and encountered a problem with the automatic spindle motor shut off. After connecting the wire between the 7405 IC and the appropriate hole in the PC board, the computer would not boot up. Mark Kline of IE Systems, Inc. suggested a solution that solved the problem. I connected a 1-ohm, 5-watt resistor in series on the 12-volt power line to the Shugart disk drive motors. This dropped the voltage to 11.1 but the motors appear to start and run properly and the computer boots up at all times except when it is initially turned on. Pressing the red buttons executes the cold boot.

Gene Maas  
CompuType Business Services  
P. O. Box 3052  
Riverside, California 92519

DEAR SUPERLETTER:

I note that in your April/May copy of Superletter you have a reader, Elvin Park, who is having problems with a Microline 83.

We have been using Microline 83 and Microline 83A printers for some time with the SuperBrain at 1200 baud without difficulty. In fact, the manual we print is made on one of these printers using the SuperBrain.

The only modification these printers have is the Serial Interface Board option which allows the SuperBrain to run at 9600 Baud with handshaking.

Mike Alford  
Syntax Software Limited  
16 Leyland Avenue  
Enfield Middlesex

**Editor's Note:** We received many responses on this subject. Dave Smith of CSC informed us that the new Intertec DOS 3.2 enables a Microline 83A to run at high-speed with no trouble. The older DOS's are where the problems arise. Pin connection with DOS 3.2 should go 1 to 1, 3 to 2, 7 to 7, and SB pin #20 to Microline #11. Change switch 2 to ON, 3 to OFF, and 4 to ON for the higher baud rate. And, switch #1 is on the A side, not on the B side.

DEAR SUPERLETTER:

I just received my first subscription issue of "Superletter". I found it quite informative.

I own a "SUPERBRAIN" 0.4 which I believe must have been one of the early models that Intertec produced.

The DOS is 64K SuperBrain DOS 1.0. I would like to know if I can run CP/M 2.2 on this machine? I was told by someone that I cannot. Do you know a way of upgrading it? Does anyone out there in "SuperBrain" world have a similar problem? I would like to hear from them.

Arthur Lichtenstein  
11 Duncan Street  
Toronto Ont. M5H 3G6

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## Potpourri

### WordStar 3.0 on SuperBrain DOS 3.1 Patch Sheet

To allow WordStar 3.0 to run on SuperBrain DOS 3.1, install for SuperBrain (selection '+' on Terminal Menu #3); then, using Install's label patcher, change location 02EDH to 00H; location 02F1H to 1DH; and location 02F2H to E7H. Be sure to disable the clock function (I don't know if this is possible) before invoking WordStar, or it could appear anywhere on the screen, causing obliteration of help menus or text.

### Fix for CONTROL-W Problem in WS/SuperBrain CP/M 3.0 Systems

In a number of the WordStar's for SuperBrain 3.0 (and all WordStar's down-loaded from the SuperBrain DOS 1.x and 2.x to 3.0 versions) the CONTROL-W cursor motion keying sequence will be unresponsive. The following patch will correct this condition. This patch also eliminates the AUTO-BAUD SET routine since this "enhancement" has proven to be more satisfactorily managed with the CONFIG.COM utility provided by Intertec on the CP/M system disk.

For WordStar Version 2.0, 2.1, and 2.25 replace existing code starting at 02A4H (INISUB:) with the following hexadecimal values:

C3, E0, 02, C3, E9, 02

Starting at location 02E0 (MOPAT:) replace the existing code with the following hexdecimal values:

3E, 00, 32, 17, E5, 32, 18, E5, C9, 3E, FE,  
32, 17, E5, 3E, 17, 32, 18, E5, C9

Either the LABEL PATCHER in INSTALL.COM or the Substitute command in DDT, SID or DEBUG may be utilized to effect these code changes.

### Patches for DataStar and Formgen using SuperBrain DOS 3.0/DOS 3.1 for WordStar 3.0 and Earlier

In the file DATASTAR.COM and FORMGEN.COM make the following changes:

Location	For DOS 3.0	DOS 3.1	DOS 3.2
	Change to	Change to	
2A7	C3	C3	
2A8	DC	DC	
2A9	02	02	
2DC	3E	3E	
2DE	FF	FF	
2DF	32	32	
2E0	18	1D	20
2E1	E5	E7	
2E2	C9	C9	

## —Guest Article—

### My Experience with Super-IOS

by Brent Brolin  
New York City

I came to Super-IOS as a professional writer, rather than as a programmer, a novice at word processing, whose only "technical" qualification consisted of having used Magic Wand-CP/M for a little more than a year. Having been pleased with the change from typewriter to word processor—my friends would probably say ecstatic—I could not imagine that the switch to Super-IOS would produce a change of any great magnitude. But, in all fairness, I must admit that the feeling I got when I changed from Wand-CP/M to Wand-IOS was—with only a slight exaggeration—very much like that sense of new-found power I had originally experienced when I went from my plodding old correcting Olympia typewriter to the SuperBrain.

I do not hesitate to say that my heartfelt thanks first went out to Super-IOS when I discovered how easy it was to "un-erase" a file that had been killed accidentally. When I began working with the SuperBrain, I never imagined I would be so stupid as to erase a valuable file. But, as I soon found out, I was. Under CP/M, these lost files were no more than fond memories for a novice like myself. And for that reason, I have come to love the miraculous little Super-IOS program called Recover. With fewer than half a dozen keystrokes, it "un-erases" lost files and saves countless hours of laborious reconstruction.

Being a writer, and not a "computer person" (whoever they are), one of the more appealing aspects of Super-IOS was the options it offered for customizing the video display. Knowing so little about the whole business to begin with, it seemed to add insult to injury to be tied to someone else's idea of how soon a key should begin repeating once depressed, or how fast the cursor should find its way to the other side of the screen. And why, if I prefer silence when writing, should I be forced to listen to "beeping" keys, or be tied forever to a black or a white background. Under Super-IOS I am able to fine-tune these and more system attributes, with CONFIGOS. When I first tried SuperIOS, I found the default, fast-blinking cursor disturbing. I was not guilt-ridden because of writer's block, but when that little white square winked at me every second, I felt like my word-per-minute output was being monitored. So I told it to remain "on" for three seconds, and to blink "off" for a discreet 2 milli-seconds. In these days of automation, it warms the heart to be able to control even a small part of the technology you come up against.

For me, one of the most valuable features of Super-IOS is what the manual calls the "user-programmable keypad." I call it a remarkably convenient tool, which I would never again want to be without. It lets me program the 18 keypad keys to enter anything I want—from "A:" for the A drive, to complete sentences (up to 184 characters)—in one key stroke. A key can be re-programmed in seconds, and there is no limit to the number of different "keypads" you can have. I use three regularly; one linked to EDIT/IOS, one to PRINT/IOS, and one unlinked, or "general service" keypad (Startup.Com).

Magic Wand users know that if you don't want to have things like sub-section headings or beginnings of lists or tables left at the bottom of a page, you must insert conditional commands (IF %LINES<15, NP). Wand users also know that when you insert them individually, you almost invariably mistype one or two of them, which means that the machine stops during the printing of that file, asks what the problem is, and you must retype the corrected command. I am no longer bothered by this particular problem because the "IF" commands are now part of my EDIT/IOS keypad. I also use the keypad to insert centered breaks between sections (three asterisks separated by four "hard" spaces), standard headings and footings, and other embedded Print commands.

The PRINT/IOS keypad contains, among other things, all the basic Wand formatting commands (top, bottom, left and right margins, line spacing, indentations, intensity of bold face, conditional page command, etc.), which means I need not bother to embed these in a short-term, temporary file. Instead, I enter them at print time—with two key strokes.

If KEYPAD is the feature I find most useful, SPLIT probably takes the "sleeper" prize; I thought I would have little or no use for it, and find out that I use it almost daily. SPLIT chops large files into small, equal pieces, neatly labeling them with the filename of the original, followed by 1, 2, 3, etc. (If you don't specify how big you

want the chunks, it makes them 16K, or one extent). Like many Super-IOS features, I find that this one makes it easier for me to pay attention to what I'm doing, without having to worry about the nuts and bolts of things—is the file I'm working on becoming too unwieldy, and how will I go about adding all the files together for a chapter that may be as long as 250 pages? My writing is done in small sections, which end up as files ranging from 20K to 32K. When the time is right, I XFER these into one mega-file, then SPLIT it into trim, consecutively numbered files such as STORY1, STORY2, STORY3, etc., ready for the next round of editing.

One of the first things I discovered when I began working with Super-IOS was that in certain cases I could double the number of files on a single-sided disk. Since I started out with Wand, I have been collecting Print routines that I find especially useful: to print envelopes of various sizes (with and without return addresses), postcards (individually or from a master address file), labels, invoices, letterheads, type out address files, and so on. (Some of these have been gathered together and are available through Systems Integration as "Magic Formats".) These are usually small files—1K or less—

*Continued on Page 7*

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## Technical Corner, continued from page 1

CPU-1 switches bank 2 back in. In Intertec DOS versions 2.x and lower, a temporary DMA address is only set up if any part of the DMA area reaches into bank 2. In later versions (which includes QD machines) this checking is done away with and a temporary DMA area is always set up.

The Hex D Flip-Flop sends drive, side and head load select signals to the disk drives and sends the 'disk busy' line to PPIB-5 on a clock pulse generated by setting address line 3 (8 hex) on an 'OUT' from CPU-2. The FDC handles all other signals except MOTOR ON which is hard wired to +5V by Intertec. IE Systems, Inc. offers a very fine package including a PROM and one hardware mod to automatically shut off the drive motors after 10 seconds of idle time—the way it should be done.

### FDC Interfacing Signals

The following describes the signals and protocol involved with using the Floppy Disk Controller. The 1791 is the successor of two previous versions—the 1771 and the 1781. The 1781 was the first to use either single density or double density formats. This would be how some companies make the first two tracks (the system boot tracks) single density while the rest of the disk is double density. Intertec (bless their hearts) does not do this.

The Type I commands cause the read/write head to be moved from one track to another across the diskette surface. All Type I commands expect the track register to hold the address of the current track. The track register is updated automatically with each command. The Restore command directs the disk drive to move the head to track zero. The seek command seeks a track number which has been loaded into the data register. The Step In/Out commands move the head a distance of one track towards the center or towards the outer edge, respectively.

The two Type II commands read or write a sector to disk. Both commands assume that the sector register has been loaded with the desired sector address prior to the point when the Read or Write Sector command is loaded into the command register.

The Type III commands are special purpose read and write commands that will typically be used when performing diagnostics or initializing a diskette. The Read Address command simply reads an unspecified sector ID from the diskette at its current position and transfers the contents of that field to the microprocessor. The Read and Write Track commands read/write an entire track of information from/to the disk—including gaps, the ID field and CRC characters. The Write Track command is used primarily to do the initial formatting of a new diskette.

The single Type IV command is the Force Interrupt Command. This command performs two functions: It terminates any command that is already in progress; and it causes a conditional interrupt to be generated depending on the lower four bits of the command.

### FDC Command Summary

Stepping Motor Rate at 2MHz									
r1,r0	00 = 6 ms	Times are double if CLK = 1 MHz (5" disks) instead of 2 MHz (8" disks)							
	01 = 6 ms								
	10 = 10 ms								
	11 = 20 ms								
Verify Flag V	0 = Do not verify								
	1 = Verify destination track								
Head Load Flag H	0 = Do not load head								
	1 = Load head at beginning of command								
Update Flag U	0 = Do not update track register								
	1 = Update track register as head is moved								
Data Mark A0	0 = Data mark of FBH is written								
	1 = Deleted data mark of F8H is written								
Multiple Record Flag M	0 = Single record								
	1 = Multiple record								
Enable HLD and Delay E	0 = Head assumed engaged. No delay								
	1 = Enable HLD, HLT and 10 ms delay								
Interrupt Conditionally I	Interrupt generated by bit set if:								
	10 = Not Ready-to-Ready transition								
	11 = Ready-to-Not Ready transition								
	12 = Every index pulse								
	13 = Immediate interrupt								
	X = Don't care								

Type	Command	7	6	5	4	3	2	1	0
I	Restore	0	0	0	0	H	V	r1	r0
I	Seek	0	0	0	1	H	V	r1	r0
I	Step	0	0	1	U	H	V	r1	r0
I	Step In	0	1	0	U	H	V	r1	r0
I	Step Out	0	1	1	U	H	V	r1	r0
II	Read Sector(s)	1	0	0	M	X	E	0	0
II	Write Sector(s)	1	0	1	M	X	E	X	A0
II	Read Address	1	1	0	0	0	1	0	0
III	Read Track	1	1	1	0	0	1	0	X
III	Write Track	1	1	1	1	0	1	0	0
IV	Force Interrupt	1	1	0	1	I3	I2	I1	I0

Continued on Page 8

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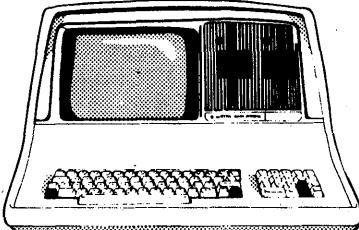
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## Guest Article, continued from Page 3

but I discovered that even the smallest of them took up 2K worth of space under CP/M; so 20 files used up a valuable and unnecessary 40K space on a single-sided, CP/M diskette. Under Super-IOS, a 1K file uses 1K of disk space.

Super-IOS offered so many little "extras" that, as a "civilian" (one who knows little or nothing about the insides of a computer) I assumed they were aimed primarily at the erudite programmer, and as such would be excess baggage as far as I was concerned. I was surprised to discover that this was not so, and soon found myself making use of a number of these gadgets, for the simple reason that they were easy to use—even for me—and made my everyday work a little easier. To give you an example, I have a general-work disk, which I use for writing letters and doing odd jobs, and it periodically gets overloaded with left-over, temporary files. Erasing them under CP/M was something of a chore. I would print a copy of the directory, check off those to be deleted, then return to the screen and enter "ERA" commands for each file I no longer needed. This became a one-step process with the Super-IOS program called ERASE; you tell it to "erase" all the files of a certain type (\*.BAK, for instance), and it lists each one, asks you if you want it erased, and you simply enter "Y" or "N." I now zip down a line of fifteen or twenty BAK files in a matter of seconds, saving the important ones and killing the others.

Other Super-IOS refinements made my work considerably easier in other ways. Finding one file on a disk which has 90 or 100 others was a bit of a needle-in-a-haystack operation under CP/M. Now I invoke XDIR. It lists the files alphabetically (and/or in numerical order), so it is a simple matter to find the one I'm interested in. I have also become fond of the program that allows me to LABEL a disk, giving it a name that is then displayed whenever a DIR or XSTAT is requested. The disk that has my most recent revisions of Chapter One is labeled ONE, its backup is labeled ONE/COPY. Thus, although the directories may be identical, the label removes any doubt as to which one is the up-to-date version.

COPY also gives me useful options: I can copy an entire disk, or copy only those tracks that are in use. Either option can be executed from any drive, to any drive, according to your specifications.

XFER, the program that transfers files, has its own helpful options. You can XFER with or without on-screen verification, link files together, even compare two

files to see if they are the same—XFER will even list the bytes that are different if you like.

"Typeahead" is also invaluable. I often enter a half-dozen commands while EDIT/IOS is loading a large file, and then go off to pour myself a cup of tea while the machine finishes loading the file and then executes the series of commands.

XSTAT too goes beyond the bare essentials of its CP/M counterpart, showing the disk label, type of directory (single- or double-sided), size of the user memory, total disk space, how much is used and how much remains, total number of directory entries available, how many are used and how many left, etc. And I get all this information with the stroke of a key, XSTAT being one of the 18 commands in my "Startup.Com" keypad.

When I switched from single- to double-sided drives recently, I was pleased to see that IOS continued to offer easily understandable, useful tools that simplified my work. Super-IOS automatically differentiates between different disk formats, so I can work from my old, single-sided disks and the new double-sided ones at the same time. Super-IOS's FORMAT program has an option that lets me *interleave* the tracks on my double-sided drives; it formats the outside tracks first, leaving the inner tracks till last, to be used only if you want to pack the diskette 340K bytes-full. These inside tracks are the ones that most often give problems in terms of reading and writing. Other systems fill one side of a double-sided disk, and then the other; which means that half of this problem area falls right smack in the middle of your usable storage space. A program called CONVERT not only converts files from CP/M to IOS (and back again, if you please), but also lays single-sided files down on double-sided diskettes.

If good, solid CP/M could be called the Volkswagen of operating systems, I would have to say that Super-IOS comes close to being the Rolls Royce.

## SuperClassifieds

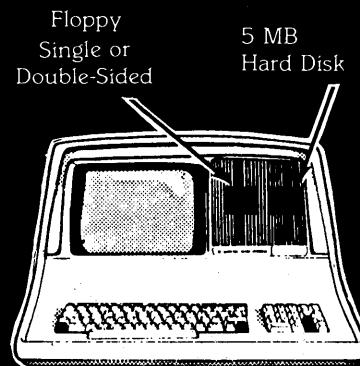
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**SUPERLETTER**

*Continued from Page 4*

### The FDC Status Register

When a command is received, the busy status bit is set and the rest of the bits in the status register are updated or cleared for the new command. The format of the status register for each command type follows:

#### Type I Status

Bit	Name	Description
0	Busy	Set while command is in progress. Reset when completed.
1	Index	Set when an index mark was detected on the diskette.
2	Track 00	Set when head is positioned over track zero
3	CRC Error	Set when a CRC error is detected. Reset upon new command.
4	Seek Error	Set when designated track could not be verified. Reset upon new command.
5	Head Loaded	Set when head is loaded against the diskette surface
6	Protected	Set when diskette is write protected
7	Not Ready	Set when disk drive is not ready to do a read/write

#### Type II and III Status

Bit	Name	Description
0	Busy	Same as Type I
1	Data Request	Set when data register is ready to be read or written
2	Lost Data	Set when data register is not read within one byte time
3	CRC Error	If bit 4 is also set, this bit indicates that an error was found in an ID field; otherwise error in data field
4	Record Not Found	Set when desired sector or track not found
5	Record Type/ Write Fault	On a read command, this bit indicates the type of data address mark that was read. Not used on Read Track. On a write command, this bit indicates that the write fault input from the disk drive was detected.
6	Write Protect	This bit indicates that the diskette is write protected.
7	Not Ready	Same as Type I except that Type II and III commands will not execute unless drive is ready.

**CORRECTION:** We noticed a typographical error which may mislead the readers. On page 2, paragraph 3, line 10 of the Feb/March, '82 issue it reads, "The CRTC data lines are A0. All of the CPU's...". It should read, "The CRTC *data* lines are A0. All of the CPU's...". **Editor**

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# SUPERLETTER

Serving SuperBrain® Owners and Users Around the World

Aug/Sept 1982  
Vol. 2, No. 4

**P**reliminary first-reports coming in about the new SuperBrain II and CompuStar line of computers have been positive.

Intertec seems to be installing even better, more reliable components, including a new power-supply, which is one problem of the older models. And, the new enhanced screen attributes, including the lower-case descenders, have been enthusiastically received.

Intertec appears to be healthy in these economically quiet times. We're also encouraged by Intertec's new aggressive consumer policies regarding customer support and quality control.

We will begin publishing a thorough evaluation of the new model line starting with our next issue. But if any of you are currently using any of the new models, send us your comments.

We've made arrangements to provide you a quality state-of-the-art 10MB hard-disk, with a full one year warranty, completely configured and pre-tested for the Intertec computer for \$2,500. (Plus shipping.) But we can only offer this system if there are enough orders. Let us know soon if this product interests you.

Superletter readers love programs. Several important ones are printed inside. And, through the courtesy of Dr. Ned Estridge and David Storti, we have two exclusive programs available for the users of Spellbinder and the SuperBrain. One program allows you to use non-ASCII thimbles on an NEC or similar printer. The other is a complete mailing system with sorting features and culling out of duplicates. Send us a dollar for copying and postage and we'll mail them along to you.

Your continued enthusiasm for Superletter is appreciated. Thanks for letting us know when you've found valuable information for your fellow SuperBrain and CompuStar users. We enjoy your sharing your discoveries with us.

*Albert Abrams*  
EDITOR

## Technical Corner

### DISK DRIVE SPEED ON THE SUPERBRAIN MODEL I by Jonathan Platt

Rotational speed is a very important topic of discussion, especially to those of you with an abundance of CRC errors, etc. A variation of approximately more than 1.5% (3000 microseconds) per revolution from drive to drive will make data at the inner tracks unreadable. It is crucial to match the drive speed of both drives to as near a perfect setting as possible. It has been my experience that the typical rotational drift is about 300 microseconds (.15%) on a good day.

I saw some mention of power supply problems in the Feb/March issue of SUPERLETTER. I suspect that good drives such as the Tandons I have or MPIs (CDC drives are truly bad on their own) aren't really as bad as the drifting indicates. More likely, it is a power supply problem where it just can't regulate the power properly, causing constant drifting. I've seen drive speeds drop 1000 microseconds per revolution just from an air-conditioner kicking on. This obviously can't be good for reads or writes when voltages are constantly fluctuating.

Some may wonder why the expensive diskette they just received from a non-SuperBrain oriented software vendor is full of CRC errors. The reason is probably one of two things; either the vendor sent the disk in non-Intertec format or the speed at which the disk was formatted and recorded does not correspond with the customer's drive speed. I've adjusted new SuperBrains where the rotational speed had been considerably off-mark. The fact that Intertec used a data separation circuit meant for a single-density system right out of a Western Digital book doesn't help matters either.

Both Information Engineering (IE) and I sell a PROM which is capable of reporting drive speed. IE will sell you a

DISKTACH program which will constantly monitor drive speed while you adjust the drive via a potentiometer on the drive board. I supply a similar program with my SOS BIOS for free. If you already bought your system from IE then I highly recommend purchasing their DISKTACH program so you can adjust your drive speeds to optimum.

In any case, adjusting the drive speed is not quite enough. If you only adjust the drive speed, you will have perfectly timed drives but you still have diskettes which were recorded at the wrong data rate. You must keep one drive (drive A) at the speed which the diskettes were recorded at and the other (drive B) at the optimal speed. Then you must format a disk on B and PIP everything from drive A over to drive B. You should also SYSGEN the diskette in drive B at this point. When you have finished copying all the diskettes from drive A to B, you may then complete the operation by adjusting drive A to the optimal speed.

For those of you who have bought my SOS and PROM or IE's system and didn't like the fact that the hardware change, necessary to enable the drive spindle shut-off feature, makes the Intertec PROM inoperable, here's one solution:

Go out to any electronic shop (e.g. Radio Shack) and buy a single-pole, double-throw miniature switch and some #30 insulated wire-wrap wire. You will also need a soldering iron and some Super-Glue.

Orienting from the component side of the PC board in its normal position, I super-glued the switch to the non-component side of the processor board at the right side edge, just south of the lowest chip on that edge such that only the toggle appears from underneath. I placed it there to be the closest to the motor-off circuit without gluing it on over any traces.

First, remove the jumper that enabled the motor-off feature. Next, solder a wire

*Continued on Page 8*

## Letters to the Editor

DEAR SUPERLETTER:

I got the SuperBrain to properly drive the Diablo 630 printer. Details follow.

Configure the auxiliary port for 9600 baud (corresponding to the Diablo dip switch setting), 7 bit character length, 1 stop bit, even parity, and DSR enabled.

Wire the RS232C cable as follows:

SuperBrain      Diablo 630

1-----	1
2-----	2
3-----	3
"	4-I
"	--I
"	6-I
7-----	7
"	"
"	"
"	"
20-----	11

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DEAR SUPERLETTER:

Comments on the June/July 1982 issue:

1. Opening column, p. 1, down-loads to SuperBrain disks, \$15 for single-sided, \$10 for double-sided?

2. Factory news, p. 5, announcing SuperBrain II, would be of interest to someone buying a computer, but leaves owners of "old" SuperBrains with the question: which, if any, of the new features are available for existing machines?

Your readers might be interested in a service offered by Dream Electronics of Corvalis, Oregon. They take data from the SuperBrain DD disks (or "moved" by telephone) and send you "type" composed by a Compugraphic unit on Kodak Type S paper. This is useful for someone who wants to "go to press" with something a little better than he can get from his computer printer but whose budget won't cover the re-keyboarding he would have to pay a local typesetter.

Using a text editor (such as WordStar in the "non-document" mode), the user can control the typeface, size, line length, vertical spacing and get tabulation and

special characters not in the ASCII character set. In my own case, the savings in printing costs from getting almost twice as many words on a page more than cover the cost and the improved appearance costs only the "nuisance" of learning some codes to insert in the text.

Jack E. Monroe  
1345 N. Orange Drive, #1  
Los Angeles, CA 90028

**Editor's Note:** There are usually more diskettes involved with single sided mix-downs, thus the higher price. And no, none of the new SuperBrain II attributes are available for the older models as yet.

DEAR SUPERLETTER:

We are presently becoming a member of the CP/M Users Group.

Since we have both an IMS International Series 8000 computer system with 8" floppy drives, and a SuperBrain QD (with an "SD" on order), we will be happy to provide the "mix-down" service for SuperBrain owners in the South Florida area.

We feel that the cost should be nominal, and are proposing a \$10.00 per disk charge.

Also, we will be happy to convert any other user-owned programs to or from SuperBrain format and 8" formats.

Robert H. Reilly  
Vice President, Operations  
AmeriSoft Business Systems, Inc.  
4203 Ponce De Leon Boulevard  
Coral Gables, Florida 33146  
(305) 444-1613

DEAR SUPERLETTER:

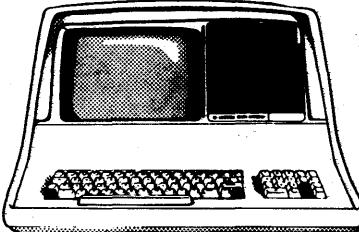
I recently installed IE's SB/E Prom on my SuperBrain and am pleased with the improvements in my system. Initially I had problems using the ADM 31 terminal option for WordStar, but by patching with the INSTALL program was able to get my system working.

The ADM 31's highlighting control code is the SuperBrain's blinking code. Thus, the WordStar menu would always be flashing as I attempted to edit any document. The IVON and IVOFF options must be disabled by setting all bytes in these routines to zero (0) through the INSTALL program.

Gordon L. Wong  
8052 Ainsworth Lane  
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# Programs

## LISTING FILE: SCRENDMP.ASM

### Screen Dump Program for the Intertec SuperBrain

by Jonathan Platt  
2804 Fairway Drive  
Melbourne, Florida 32901  
(305) 724-6148

These are released as public domain programs. Anyone can use them, abuse them or change them without fear of recrimination.

These assembly and Basic programs will work with my SOS BIOS or any Intertec DOS 3.0 and above. These are meant as a subroutine to be called when a screen dump to the LIST device is desired.

These programs will NOT work with the IE DOS. They don't keep their address counters at the same place as Intertec and I. You'll have to hunt for them on your own and change the value for SCRCNT. They also do not use the line display enable flag technique. So if you do find out how to implement these programs on an IE system, you won't need the line display logic portion of these subroutines.

The high bit of the character is stripped and if the character is a control character, a space is printed in its place.

```
SCRCNT EQU 0E416H ;Address of scroll counter
TOP EQU %f800H ;Start of screen map (Top-Of-Page)
LINFLG EQU 0E434H ;Row display enable flags
LPF EQU 24 ;Rows per frame
CPR EQU 80 ;Columns per row
CR EQU 13 ;Carriage-return
LF EQU 10 ;Linefeed
SPC EQU 20H ;Space character
```

;Your assembly program goes here and calls SCRDMP

```
SCRDMP: EQU $
LHLD 1 ;Get warm jump vector address
LXI D,12 ;Offset to LIST device vector
DAD D ;Add to base address
SHLD LISTV+1 ;Save at LIST call location
LHLD SCRCNT ;Get scroll counter offset from Top-Of-Page
LXI D,LINFLG ;Get a pointer to line display flags
MVI C,LPF ;24 rows on screen
ROW: PUSH B ;Save row counter
XCHG ;HL = line display address
MOV A,M ;Get line display flag
ORA A ;Is the enable flag set?
XCHG JZ NODISP ;No, go to next line
MVI B,CPR ;80 characters per row
ROW1: MVI A,0F8H
OORA H ;Mask T-O-P onto pointer
MOV H,A
MOV A,M ;Get character
ANI 7FH ;Strip high bit
CPI 20H ;Control character?
JM CNTRL
MOV C,A
CALL LIST ;Print character
JMP NXTCHR
CNTRL: MVI C,SPC
CALL LIST ;Print a space in place of non-printing char.
```

NXTCHR:	INX	H	;Point to next character, regardless
	DCR	B	;Done all characters on this line?
	JNZ	ROW1	;No, print next character
CRLF:	MVI	C,CR	;Finished the line - print a CR to printer
	CALL	LIST	
	MVI	C,LF	;Now a linefeed
	CALL	LIST	
	INX	D	;Point to next line display flag
	POP	B	;Get line count
	DCR	C	;Done?
	JNZ	ROW	;No, do next line
	RET		;Yup, return to calling routine
NODISP:	LXI	B,80	
	DAD	B	;Add one row to screen character pointer
	JMP	CRLF	
LIST:	PUSH	H	;Save everybody
	PUSH	D	
	PUSH	B	
	PUSH	PSW	
LISTV:	CALL	\$-\$	;Filled at init
	POP	PSW	
	POP	B	
	POP	D	
	POP	H	
	RET		
DONE			

## LISTING FILE: SCRENDMP.BAS

### Screen Dump Program for the Intertec SuperBrain

```
100$SCRCNT = 58390!
:TOP = 63488!
:LINFLG = 58420!
:LPF = 24
:CPR = 80
:CR$ = CHR$(13)
:LF$ = CHR$(10)
:SP$ = CHR$(32)
110 TOPOFF = (PEEK(SCRCNT + 1) AND 7)*256 + PEEK(SCRCNT)
:CHRLOC = TOP + TOPOFF
:FOR ROW = 1 TO LPF
120 IF PEEK(LINFLG = 0 THEN 170
130 FOR COL = 1 TO CPR
:IF CHRLOC 65535! THEN CHRLOC = TOP +
(CHRLOC-65536!)
140 CHR = PEEK(CHRLOC) AND &H7F
:IF CHR VAL(SP$) THEN LPRINT SP$; ELSE LPRINT
CHR$(CHR);
150 CHRLOC = CHRLOC + 1
:NEXT
160 GOTO 180
170 CHRLOC = CHRLOC + 80
180 LINFLG = LINFLG + 1
:LPRINT CR$;LF$;
:NEXT
190 RETURN
200 END
DONE
```

*Continued on Page 5*

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BSTMS .....	\$145	WordMaster .....	\$115	✓ Ada .....	\$223
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**Programs, continued from Page 3**

**PARPRNT.ASM**  
**For the Intertec SuperBrain**

Program written for use with a Centronics 737 printer and a parallel printer interface designed by M. J. Coulombe. The port addressed is A0 Hex.

Use [PmTn] in PIP, where m is in range 55-60 and n is the tab column.

When overwriting BIOS for SYSGEN use negative offset of 4180H for 64K or C180H for 32 K.

See end of this listing for ^W information.

```
OFFSET EQU 9400H ;OFFSET FOR 64 K = 9400H
;OFFSET FOR 32K = 1400H

;
ORG 4AAFH + OFFSET ;BIOS ENTRY POINT FOR LST:
;
LIST: JMP PPRINT ;MODIFICATION OF BIOS FOR NEW LST: VECTOR
;
MSGOUT EQU 4DA3H + OFFSET ;LOCATION FOR VIDEO OUT
;
;
ORG 4E3BH + OFFSET ;ORIGIN OF SIGN ON
;AND PARALLEL
;PRINTER ROUTINE
;
```

sgnon:

```
DB FOOBAR'S SUPERBRAIN {07/28/82},
0AH, 0DH, 80H
```

;change to customize sign on and keep track of version

```
*****
* insert user routines here
*
*****
USRSTRT EQU $ ;USER START ADDRESS
USRSIZE EQU 5000H + OFFSET-$ ;NUMBER OF BYTES
; AVAILABLE (HEX)
USREND EQU 4FFFH + OFFSET ;USER END ADDRESS
```

**PARALLEL PRINTER PORT DRIVER**

written by P. L. Kelley  
with assistance from M. J. Coulombe

Program assumes 737 linefeed after carriage return is not disabled and does not output linefeeds after carriage returns. Not disabling auto linefeed prevents overwriting of text if number of characters output is longer than the printer can handle. Program also keeps track of position on page and handles formfeed, half linefeed forward, half linefeed reverse, and backspace. Full linefeed reverse has not been implemented as the author sees no reason to do so. Note that when line numbers are commented on below, the author intends that they be understood as half lines not full lines.

```
PPORT EQU 0AOH

;
PPRINT: IN PPORT
RAR JNC PNCON ;GO IF PRINTER IS NOT CONNECTED
RAR RAR JNC PNPWR ;GO IF PRINTER HAS NO POWER
RAL JNC
```

PBUSY:	IN	PPORT	
	ANI	08H	;PRINTER BUSY?
	JNZ	PPRINT	;LOOP IF PRINTER IS BUSY
	LXI	H,BSFLG	;POINT TO BACKSPACE FLAG
	MVI	A,01H	;LOAD FLAG SET VALUE
	CMP	M	;TEST FOR FLAG SET
	JZ	BSRST	
	MOV	A,C	;CHARACTER IN REGISTER C ON ;ENTERING ROUTINE
	CPI	20H	;TEST FOR NOT CONTROL CHARACTER
	JNC	CHAR	
	CPI	08H	;TEST FOR BACKSPACE
	JZ	BKSP	
	CPI	0AH	;TEST FOR LINEFEED
	JZ	LFEED	
	CPI	0CH	;TEST FOR FORMFEED
	JZ	FFEED	
	CPI	0DH	;TEST FOR CARRIAGE RETURN
	JZ	CARET	
	CPI	1CH	;TEST FOR HALF LINEFEED FORWARD
	JZ	HLFFWD	
	CPI	1EH	;TEST FOR HALF LINEFEED REVERSE
CHAR:	LXI	H,CRLFG	
	MVI	M,00H	;POINT TO CR FLAG
	INX	H	;RESET CR FLAG
	MVI	M,00H	;POINT TO CRLF FLAG
OUTPUT:	OUT	PPORT	;RESET CRLF FLAG
	RET		;PRINT CHARACTER
PNCON:	LXI	H,PNCONB	
	CALL	MSGOUT	;DISPLAY PRINTER NOT ;CONNECTED MESSAGE
	JMP	PERLP	
	DB	0AH,0DH,	*** PRINTER NOT CONNECTED *** 0AH,0DH,80H
PNPWR:	LXI	H,PNPWRB	
	CALL	MSGOUT	;DISPLAY PRINTER HAS NO POWER MESSAGE
	JMP	PERLP	
	DB	0AH,0DH,	***PRINTER HAS NO POWER *** 0AH,0DH,80H
PNONL:	LXI	H,PNONLB	
	CALL	MSGOUT	;DISPLAY PRINTER NOT ONLINE MESSAGE
	JMP	PERLP	
	DB	0AH,0DH,	*** PRINTER NOT ONLINE *** 0AH,0DH,80H
PERLP:	IN	PPORT	
PERLPA:	MOV	B,A	;SAVE INPUT
	MVI	A,00H	;CLEAR TO GET NEW INPUT
	OUT	PPORT	
	LXI	H,50000	;WAIT AWHILE
WLOOP:	DCX	H	
	CMP	H	
	JNZ	WLOOP	;WAIT LOOP
	IN	PPORT	;GET NEW INPUT
	CMP	B	;TEST FOR ERROR STATUS CHANGE
	JZ	PERLPA	;LOOP IF NO CHANGE
	JMP	PPRINT	;RETURN IF STATUS CHANGE
CARET:	CALL	INCLN	
	CALL	INCAGN	;CALL LINE # INCREMENT ROUTINE
	LXI	H,CRFLG	;REPEAT LINE # INCREMENT
	MVI	A,01H	;LOAD CARRIAGE RETURN FLAG
			;LOAD THE VALUE OF THE CR ;AND CRLF FLAGS
	CMP	M	;WHEN SET
	JZ	CRLFRP	;TEST FOR CR FLAG ALREADY SET
	MVI	M,01H	;JUMP TO OUTPUT LF IF SET
	INX	H	;SET CARRIAGE RETURN FLAG
	CMP	M	;POINT TO CRLF FLAG
	JZ	RCRLFF	;TEST IF FLAG SET
			;JUMP TO RESET CRLF FLAG AND ;OUTPUT LF
RELOAD:	MOV	A,C	;OTHERWISE OUTPUT CR
	JMP	OUTPUT	;RESTORE CHARACTER
CRLFRP:	MVI	A,JAH	
	JMP	OUTPUT	;LOAD LF
RCRLFF:	MVI	M,00H	
	JMP	CRLFRP	;RESET CRLF FLAG
			;JUMP TO OUTPUT LF
INCLN:	LXI	H,PAGEL	
	MOV	A,M	;POINT TO PAGE LENGTH
	INX	H	;LOAD PAGE LENGTH INTO A
INCAGN:	INR	M	;POINT TO LINE #
	CMP	M	;INCREMENT LINE #
	JZ	NEWPG	;COMPARE PAGE LENGTH TO LINE #
	RET		;JUMP IF NEW PAGE

*Continued on Page 6*

**Programs, continued from Page 5**

```

NEWPG: MVI M,00H ;NEW PAGE
RET

LFEED: LXI H,CRFLG ;POINT TO CR FLAG
MVI A,00H ;LOAD CR FLAG RESET VALUE
CMP M ;COMPARE WITH FLAG
JNZ LFRST ;JUMP IF LINE FEED FOLLOWS
                CARRIAGE RETURN
CALL INCLN ;CALL LINE # INCREMENT ROUTINE
CALL INCAGN ;REPEAT LINE # INCREMENT
JMP RELOAD ;OUTPUT LF
LFRST: MVI M,00H ;RESET CR FLAG
INX H ;POINT TO CRLF FLAG
MVI M,01H ;SET CRLF FLAG
RET ;DON'T OUTPUT ANYTHING

```

FFEED:

Instead of linefeeds this routine outputs a space followed by a carriage return to prevent the ribbon from lifting above the print head when too much vertical paper motion occurs. The problem occurs with tractor feed paper.

```

MVI C,20H ;LOAD A SPACE
CALL PBUSY ;OUTPUT A SPACE
PUSH H ;GIVE TIME
POP H ;FOR BUSY
PUSH H ;SIGNAL TO
POP H ;TURN ON
MVI C,0DH ;LOAD CR
CALL PBUSY ;OUTPUT CR
LXI H,LINEN ;POINT TO LINE #
MVI A,00H ;TOP OF PAGE LINE #
CMP M ;TEST FOR TOP OF PAGE
RZ ;RETURN IF AT TOP
INR A ;ONE LINE BELOW TOP OF PAGE
CMP M ;TEST FOR ONE LINE BELOW TOP
                OF PAGE
JZ HLFREV ;BACKUP ONE LINE
JMP FFEED ;OTHERWISE REPEAT

```

```

HLFFWD: CALL INCLN ;CALL INCREMENT LINE # ROUTINE
JMP RELOAD ;OUTPUT A HALF LINEFEED
                FORWARD

```

```

HLFREV: LXI H,LINEN ;POINT TO LINE #
MVI A,00H ;TOP OF PAGE LINE #
CMP M ;TEST FOR TOP OF PAGE
JZ BOTM ;JUMP IF AT TOP
DCR M ;DECREMENT LINE #
JMP RELOAD ;OUTPUT A HALF LINEFEED REVERSE

```

```

BOTM: INX H ;POINT TO LAST #
MOV A,M ;LOAD A WITH LAST LINE #
JMP RELOAD ;OUTPUT A HALF LINEFEED
                REVERSE

```

```

BKSP: LXI H,BSFGL ;POINT TO BACKSPACE FLAG
MVI M,01H ;SET THE FLAG
JMP OUTPUT ;OUTPUT A BACKSPACE COMMAND

```

```

BSRST: MVI M,00H ;RESET THE BACKSPACE FLAG
JMP RELOAD ;OUTPUT NUMBER OF BACKSPACES

```

```

PAGEL: DB 84H ;PAGE LENGTH
LINEN: DB 00H ;INITIAL LINE #
LASTL: DB 83H ;LAST LINE #
CRFLG: DB 00H,01H ;INITIAL CR AND CRLF FLAG
                VALUES
BSFLG: DB 00H ;INITIAL VALUE OF BACKSPACE
                FLAG

```

The following code gets rid of the misfeature concerning ^W. Otherwise ^W is converted to ^@ and the screen is shut off when the ^W is followed by a carriage return. Incidentally, if the misfeature is retained then a second ^W carriage return turns the display on again. Eliminating the misfeature allows the Super-Brain to be used with the full command set of Mince and (so the author has been told) Wordstar.

ORG 5117H + OFFSET

```

NOP
NOP
NOP
NOP
NOP

```

The following code is inserted to turn on read verification.

```

; ORG 5B07H+ OFFSET
; RAW: DB OFFH ;DISK READ AFTER WRITE
;       ;00H = NO READ VERIFICATION
;       ;FFH = READ VERIFICATION
;
```

END



## Book Review

Many people in the microcomputer industry know a lot about chips, wires and programming but may lack common business sense vital to eventual success in the marketplace.

And there have been few books, if any, that dealt with this problem, until now. Victor Wild's two-volume set of **Your Fortune in the Microcomputer Business** has filled a major void in the wild and wooly goldrush days of micros we are all experiencing.

To be honest, we did not expect much from books with such a presumptuous title, but the author delivers. At times, you not only feel you get your money's worth from these books, but you get much more.

Fortunately the author is concise, to the point, and extremely well-structured in the delivery of his main message: If you want to make it in the microcomputer industry, get organized, have specific business goals, and use street-smarts to know when to adapt to changing market conditions. Examples gleaned from real-life situations in the marketplace dramatically prove his point.

**Your Fortune in the Microcomputer Business.** Good reading and good business advice for the computer entrepreneur, from Wildfire Publishing, P. O. Box 420, Carpinteria, California 93013.



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# -New Products-

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1623 Third Ave., #24FW  
New York, N.Y. 10028  
(212) 831-5229  
Contact: Dale Walker

## SOFTWARE:

Intertec Compatible Family of Operating Systems

Systems Integration announced the availability of two new products for the Intertec line of computers. SUPER-I/OS now supports the SB II line of computers, providing system access to the permanent Real-Time-Clock and supporting the five character attributes, mixable on a character by character basis.

Also released is the SUPER-NET family of operating systems which support the CompuStar network environment. It includes two operating systems for the DSS10/96 and the VPUx series for the VPU nodes. For the DSS10 they offer NET-I/OS, the basic service-only Network Control System. HUBMASTER is an advanced, multi-tasking background processor for the more demanding, extended networks. The VPUx series provides a flexible environment for the user who is part of a network, allowing trade-offs between total user memory and system flexibility. Record and File lockout have been implemented so that it is easy to use with existing applications software. Spooling is available in two forms, as a background task on each VPU, and as a background task on the CompuStar DSS10 which eliminates the need to tie up a VPU just to print a document. Or it can automatically monitor and service an external modem. True resource allocation is designed into the basic structure of the system and will be available in the third quarter of 1982.

**Garagekeeper**  
Computer Assistance, Inc.  
82277 Weiss Road  
Creswell, OR 97426  
(503) 895-2012  
Contact: Patricia Swift

**SOFTWARE:** This computer-based inventory system is designed specifically to solve the problems facing independent garages, automotive specialty shops and small auto dealerships using QD SuperBrain and hard-disk systems.

The package is menu-driven, very user-friendly, and fast, having been written in Fortran.

Detailed printed brochures with sample reports are available to end-users and SuperBrain dealers.

**D.B. Power for dBASE II**  
American Training International  
3800 Highland Avenue, Suite 300  
Manhattan Beach, CA 90266  
(213) 546-4725  
Contact: Frances Gaskins

**SOFTWARE:** With self-education software packages beginning to appear in the marketplace, we were happy to receive this one on SuperBrain format.

dBASE II, by far, is the industry's most popular data-base product. But to use it a person has to learn its own special language and commands.

That's where this program comes in. It guides an end-user, step by step, on the screen and with its hand-size booklet, through the basic set-up of dBASE II data files and the correct input of data. And this it does well.

The only missing ingredients, however, are instructions on how to set up the more complex program files (the command instructions files) that are integral to later manipulating the dBASE II data files you have created.

But as a powerful starter for learning to use dBASE II, D.B. Power does its job

admirably. The documentation and the screen instructions are written in clear, easy-to-understand English, a rarity these days. We just hope that the creators will take new dBASE II users even further in the months ahead.

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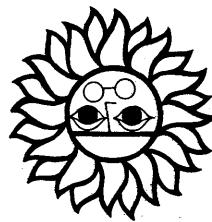
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**Technical Corner, continued from Page 1**  
running from the middle prong of the switch to the on-chip part of the pin which had to be cut and from where you had just removed the original jumper. I ran this wire from the switch to a through-hole just to the right of the affected pin, through the hole and to the pin. Next, solder a wire running from one of the two remaining prongs to the through-hole where IE had you attach the other end of the original jumper. Finally, solder a wire running from the remaining prong to the underside of the pin-hole on the PC board that the chip pin was cut away from. The job is complete. You now have the choice of keeping power on all the time the Intertec way or using the motor-off feature which both IE and SOS support.

The reason I made this change was not for compatibility but for power supply reasons. My power supply and probably many others are only marginal. When power is applied, the switching power supply tries to come up about three times before they can get enough juice to do it. On some SuperBrains, this can be so bad that the power supply will go into a "pumping" cycle forever, never quite getting up to power and clamping down to start the cycle all over again. This is the most common problem with the SuperBrain's power supplies.

I found that the problem is worse with

the single-sided type drives which must physically load the head against the diskette surface. This draws enough current to initiate the pumping action, causing the drives to click on and off repeatedly. With a marginal power supply like mine, it may take a few hours of operation before the supply "gets tired".

With double-sided drives, the problem is not so noticeable since the heads are always against the diskette surface, but the consequences can be even more disastrous. I have discovered this out personally. The pumping action still happens, but almost imperceptibly. You may notice the head load lights on the front of the drives blink dimly a few times before actually coming on fully. With the heads already loaded against the diskette surface this power flux can (and will) destroy data on the diskette. If it doesn't get to the data, it could change some of the data address fields which the floppy disk controller uses to keep track of where it is. The most common error this produces is the infamous CRC error.

To avoid this problem, I am forced to leave the drives on all the time, lessening both my disk drive and diskette lifetimes, until a reasonable and more reliable power supply can be manufactured for the Super-Brain. I am actively pursuing a solution to this problem as well as other data integrity problems.

### INTERTEC COMPUSTAR ★★★ USERS ★★★

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HSAVE (backup) will automatically prompt when one diskette is full and next diskette is to be inserted.

HLOAD (restore) will also prompt for the proper sequence of diskettes to be restored to the hard disk.

The cost for both programs is \$179.00. The programs will be supplied on quad-density diskette along with instruction documentation. A single-system license will be required.

**KELCO DATA SYSTEMS, INC.**  
2 Mt. Prospect Ave.  
Dover, NJ 07801  
(201) 361-3331

# SuperBrain LETTER

Serving SuperBrain and CompuStar Users Around The World

Oct/Nov 1982  
Vol. 2, No. 5

## Technical CORNER

### INSIDE THE SUPERBRAIN II

by Jonathan Platt  
Copyright 1982

#### A Review

The new line of Intertec Data Systems microcomputers introduced as the "SuperBrain II" includes all the CompuStar models as well. Certainly the most visible features of the new microcomputers are the excellent video enhancements comprised of character-by-character reverse video, half intensity, blinking and underlining, features sorely missed by users of the original machines. Equally refreshing is the addition of a continuous power time/date clock in hardware.

Intertec's new microcomputers show a marked improvement on all counts - and they are cheaper. Early reports from conversations with Intertec dealers indicate a substantial increase in reliability. The DOA rate which occasionally approached 50% with the old machines has now dropped to practically nil. Factory support for the end-user also seems to be improving. Outdated parts such as the hard-to-use triple-supply EPROMs have been replaced with the much simpler single supply EPROMs. Circuitry has been improved and the same circuit boards and power supplies used in the new SuperBrains are used in the CompuStars. The hard-disk port cables are just tied off in the back of the SuperBrains.

If both machines are the same, why doesn't everyone just get the CompuStars? They are more expensive. The CompuStars are supplied with the interface board for Intertec's DSS system and two extra ports out the back for the DSS cables. If you are absolutely sure that you will never want to expand to Intertec's DSS system, get the SuperBrain II. But how often have you asked yourself,

*Continued on Page 3*

As promised, we now begin a series of reviews of the new SuperBrain II computers.

We will be following Jon Platt's Technical Corner with end-user oriented articles in the future to give you an overall look at this new generation of SuperBrains and CompuStar.

Digital Research has announced the upcoming release of CP/M 3.0 which will replace the current CP/M 2.2 version. Improvements will include faster response time, easier-to-use operating commands, and, at last, new easy-to-understand instructions and documentation.

We will strive to keep you up-to-date about the new release and the cost for upgrading. Your current software and diskettes will all be usable with CP/M 3.0.

We are making plans for regional SuperBrain and CompuStar seminars around the U.S. Dealers, distributors and end-users will be invited to attend.

The meetings, if there is enough interest, will provide technical workshops, a market to demonstrate new products and add-on devices, and an open forum for the exchange of ideas and information.

We would like to cap the seminars with a Super Sunday at the NCC in Anaheim in 1983. If you'd like to participate in any aspect of these shows, please let us know. Also, if you would like to initiate a similar meeting in Europe, we'll help you publicize the event. Plans are for the U.S. meetings to be held in Boston, Atlanta, Los Angeles and Seattle.

Those of you who have the talents and ingenuity should take advantage of the growing need for graphic EPROMs that will work in the SB II line. We have been asked by several companies if we know of any firms or individuals currently making these EPROMS. Something to think about and act on if you want to corner the market.

A new graphics board for the Model I SuperBrain is going to be released soon by an American company doing business in Japan. We'll have more details in our next issue. But it appears that you will be able to get reverse video, underlining, strike-through, blinking and highlighting on all or parts of the screen. The graphics, through dip-switches, will be under both computer and software control.

Many thanks to reader Edward Sayle for his positive mention of Superletter in a recent edition of "Desktop Computing" Magazine. His article considered our software sales a "bright spot" in the jungle of direct-mail software dealers.

Incidentally, you can still take advantage of our 10 MB Hard-Disk offer. They are still available for a limited time at the \$2500 wholesale price tag.

In addition, we have made arrangements with another wholesaler to offer you the new 40 CPS Daisywriter letter-quality printer, (with sheet-feeder!) for only \$2395 complete.

Our next prey? A 1200 Baud SuperBrain compatible modem with all the features of a top-of-the-line model for less than \$550.

If you would like to send us an article for publication, please send it on diskette with CR's at the end of each line. We will send you back the diskette after the type has been set. This method saves us time and insures better spelling accuracy before printing.

We'll be at COMDEX in Las Vegas at the end of November. If you're planning to attend, let us know and we'll arrange a time to meet and chat at the show. But even if you aren't able to make it, let us hear from you. We value and look forward to your feedback.

*Albert Abrams*  
EDITOR

# Letters to the Editor

## DEAR SUPERLETTER:

We have a copy of the CP/M User's Group Library on SuperBrain 5 1/4" quad diskettes. There are 47 diskettes full of public-domain programs in the library.

We can sell the entire library, including the costs of all diskettes and shipping. Or, if a reader wants a selective program, we will sell them a directory, and any program diskettes individually.

Vernon Lemens, Jr.  
Southwestern Computer Services  
1509 Guadalupe, Suite 300  
Austin, TX 78701  
(512) 476-2609

## DEAR SUPERLETTER:

I have a CompuStar system and I'm using it in business applications.

I have most of the system at one store and a remote site communicating via DC Hayes SmartModems with enhancement of SuperSoft's Term III communications package. (Somewhat a problem to get implemented, but it's beautiful!)

My problem is getting the remote site communicating with the DSS-10 without disabling a complete console. I understand it can be done by changing the BIOS, in particular the IOBYTE.

Hopefully, one of Superletter's readers can offer me some help.

Tom Yarbray  
Yarbray Television Center  
2717 Pinecraft Road  
Greensboro, NC 27407  
(919) 855-0390

## DEAR SUPERLETTER:

CMC is looking for Superletter readers who are providing secondary Eproms for the SBII addressing the area of Graphics, ASCII, Foreign, etc.

We are also looking for anyone who has a tape drive running off the SuperBrain. And, we would be happy to consider any new SuperBrain/CompuStar proprietary software developed by your readers in our dealer software directory.

Rick Wicklund  
CMC International  
11058 Main Street, Suite 220  
Bellevue, WA 98004  
(206) 453-9777

## DEAR SUPERLETTER:

We thought you readers would be interested in some of the reliability problems we have encountered using a SuperBrain DD and some solutions for them.

### 1. Disk Drive Problems:

As reported in the August/September issue, some SuperBrains will not read and write reliably, since different disk drives were interchanged in machines built at the factory. This is true even for newly aligned drives. To test for this, we have written and sell a drive test-program that writes, verifies and reads on all tracks of the disk surfaces. Based on our experience, Tandon drives all appear to be okay.

### 2. Spindle Motor Problems:

For long-term reliability, it is important to turn off the disk drive motor when not in use. Intertec publishes an ECO showing how to disconnect the drive motor control signal from the edge connector and strap it to the select line. The drive motor will then go on and off with the activity LED. There is a possible race condition between the motor getting up to speed and disk data transmission, but so far we have not had problems as the head access time always appears to be longer than the motor acceleration time. Unfortunately, the current required by simultaneous drive head select and motor startup presents a transient load to the 12 V power supply that aggravates another reliability problem.

### 3. Power Supply Problems:

The 5 and 12 volt power supply seems to collapse at times, giving it a reputation as

unreliable. Actually this power supply works well over a power line voltage range of 80 to 105 VAC. In the range of 105 to 125, especially at 125, it will fold back into current limiting under disk transient loads. A test for this is to verify reliable operation at 125 volts line while switching between drives A and B. Use Control/C from drive B. If the power supply collapses, trim the Q1 Emitter Resistor (about 0.5 ohms) by placing a 5 ohm resistor in parallel with it or insert a 30 ohm 5 watt resistor in series with the power supply AC input.

### 4. Intensity Jitter:

Several units have developed jittering CRT displays, marked by intensity and position variations. This has been caused by loose connections at capacitor solder terminals on the video board. Intertec uses vertically mounted capacitors, and the larger sizes stress their solder joints during shipping vibrations, causing some intermittent connections. The solution is to inspect and resolder as required.

If anyone has additional practical procedures to enhance SuperBrain reliability, or comments on our findings, we would appreciate hearing from them.

Arthur Zuc  
Optimized Devices, Inc.  
220 Marble Avenue  
Pleasantville, NY 10570  
(914) 769-610

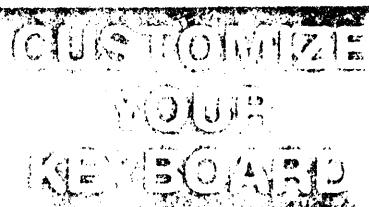
*Editor's Note: Our own SuperBrain has always had intermittent jitters. Now we know why! To be fair, we would like to note that Intertec has already made a determined effort to eliminate many of the problems outlined above. But we always appreciate close scrutiny and critical reviews from our readers.*

## DEAR SUPERLETTER:

I recently purchased a KayPro II, a portable CP/M-based computer, to take to classes with me at the University of Alaska. I have a SuperBrain at home and I want to move programs back and forth between the two machines. I'd like to do it directly without going through a downloading to a Xerox 820 disk, which the KayPro II reads.

Bob Hickey  
P.O. Box 222  
Eagle River, AK 99577  
(907) 688-9185

*(Editor's Note: You can try a hard wire transfer of data via the serial ports at 9600 Baud. Woolf's "Move-It", Microstuf's "Crosstalk" or Byrom's "BSTAM" are software packages designed for this purpose.)*



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#### Technical Corner, Continued from Page 1

"How can I get more storage space out of this thing?" I believe that the continuous flood of requests for information regarding eight inch floppy and hard disk drive interfaces for the SuperBrain is a good indication of just how many people have asked this question.

After using one of the first of the new machines, I was very disappointed that Intertec STILL had not implemented motor-off. Now three months later, both the SuperBrain II and the CompuStar models have magically turned up having this feature. Thus, buyers of the early new machines were short-changed. Not only is motor-off built in but the drives are also run independently. Power is applied only to the active drive. This provides a substantial increase to the useful life span for diskettes and the floppy drives.

Still lacking in reliability however, is the data separation circuit for the floppy drives - perhaps the most important aspect of the data storage/recovery system. Chances are, there will be little decrease in disk errors. If Intertec would simply use either a Phase Lock Loop (PLL) data separation circuit, or even better, the new Western Digital FD 2791, which has its own internal PLL separation circuit, CRC errors and the like would be unheard of. Perhaps when the "SuperBrain III" is introduced...

defined character sets and logic for four character by character attributes. The old CRT video display generator (VDAC) has been discarded. Discrete video logic is used in its place. No attempt will be made here to analyze how it works. How to use it is examined instead.

#### The Character Set EPROM

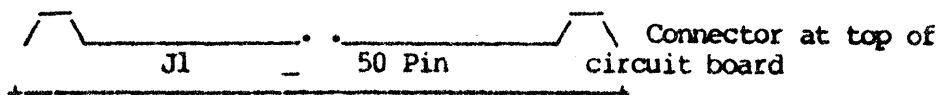
Refer to the map below for character set EPROM assignments. Intertec schematic nomenclature is used.

The TMS-2516-35 is a 16,384 bit (2K x 8) Erasable Programmable Read Only Memory (EPROM). Its usage is greatly simplified by the single +5 volt power supply. The -35 suffix signifies an access cycle rate of 350 nanoseconds.

As you can see there are sockets for two character generation EPROMs. The EPROM on the right (designated A) is the primary character set EPROM. If there is only one EPROM, this is where it resides. An alternate character set (designated B) may either be purchased from Intertec or you can make your own. It is placed in the socket on the left. This can be used for such applications as graphics or emulation of another terminal's character and graphic set.

These EPROMs provide the character bit pattern for a ten scan line by seven column set of pixels. The character field is the same size as the character font, giving access to every pixel on the screen via the character EPROMs. The EPROMs hold 128 character definitions with 16 bytes of 8 bits each devoted to every character (2K bytes total). Each byte of a character group defines one scan line with one bit to spare since a character is only seven pixels wide. So the first ten bytes of a character group define the entire character field displayed. There are six bytes to spare since four address lines have to be used to count from zero to nine (ten total) making character group resolution every 16 bytes.

*Continued on Page 6*



Alternate Character Set (B)	Primary Character Set (A)
-----------------------------------	---------------------------------

275      280

2516-35    2516-35

Single Voltage	Single Voltage
-------------------	-------------------

# -New Products-

## MEDIA CONVERSION SERVICE

TriStar Data Systems  
Cherry Hill Industrial Center  
2 Keystone Avenue  
Cherry Hill, NJ 08003  
(609) 424-4700 or (215) 629-1289  
CONTACT: Dan Brown

## SOFTWARE:

TriStar announced the beginning of its "Media Conversion Service", to act as a translator between different microcomputer formats, such as 5 1/4" hard sector to soft sector, diskette to mag tape, 8" to 5 1/4" and visa versa. The service is to include formats for the SuperBrain/CompuStar family as well as other micros. No prices or date of commencement of this service was announced.

## CYC-48 BAR CODE READER/DECODER

Abrams Creative Services  
369 S. Crescent Drive  
Beverly Hills, CA 90212  
(213) 277-2410



## HARDWARE:

Those little black and white striped square bar codes you see on magazines, labels and packages at the supermarket are becoming the standard for encoding valuable information in a small space.

And now, SuperBrain/CompuStar users can read and create these important bar codes using the serial ports on their computers.

We have been asked to represent and market the CYC-48, with its special reading wand, that translates CODE 39 alphanumeric bar code format into computer readable ASCII form. Conversely, ASCII data can be turned into bar code format form as well. The bar codes can then be printed on a wide variety of labels or papers using many of the popular dot matrix printers, such as the Epson MX-80.

These striped labels can be affixed to products on assembly lines, on inventory shelves, or for whatever suitable purpose where encoded data is important. Among applications being used include inventory

control, parts tracking, file tracking, point of purchase and repair control.

Voice output can be used as an extra option to verbalize both scanned data and replies from the computer.

The CYC-48 is a major breakthrough in the use of micros for retail and industrial use and is a faster, accurate alternative to keyboard input of important information about products.

BAR-GEN Bar code generating software ..... \$395

CYC-48 Bar Code Reader/Decoder ..... \$695

## DIRECTORY OF ONLINE DATABASES

New York Zoetrope  
80 East 11th Street  
New York, NY 10003  
(212) 420-0590  
Contact: Susan Cohn

This is the first comprehensive guide to all known existing databases available via computer terminals.

All of the well-known databases are listed such as CompuServe and The Source. But there are hundreds more listed in detail, in-

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These programs can save time copying files to and from the hard disk. It beats trying to figure out what files will fit on a single diskette using PIP.

HSAVE (backup) will automatically prompt when one diskette is full and next diskette is to be inserted.

HLOAD (restore) will also prompt for the proper sequence of diskettes to be restored to the hard disk.

The cost for both programs is \$179.00. The programs will be supplied on quadruple-density diskette along with instruction documentation. A single-system license will be required.

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cluding such exotic ones as INIS, the International Nuclear Information System, and INFOLAW, a database for lawyers.

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## ATARI-CP/M CONNECTION

USS Enterprises  
708 Landerwood Lane  
San Jose, CA 95120  
(408) 997-0264

## HARDWARE:

Now you can buy an inexpensive Atari 400 and have it use the keyboard, disk drives and printer on your SuperBrain or CompuStar computer. (Note: the difference between the Atari 400 and the 800 is the keyboard).

You get assembled and tested cables, RS-232 interface, power supply and software. For a detailed review and even more information see the July 26th issue of InfoWorld.

Price: \$147 complete.

## CATALOG

SRX Systems  
2812 Westberry Drive  
San Jose, CA 95132  
(408) 926-9411  
Contact: Ruth E. Wood

## SOFTWARE:

CATALOG, a master-disk cataloging system for CP/M files.

Unless you're on a hard-disk system, you're plagued by the ever-present question, "I wonder what's on this diskette?"

CATALOG scans every diskette you place in Drive B, lists them, provides you space for descriptions of each file, indexes them, prints them out in a master sheet, and dates them according to last examination.

You end up with an organized master printed catalog of all the various diskettes you have stacked away in drawers, office cabinets and boxes. Each diskette is given a number and can be listed by that number or by the file summary and description you specified.

Priced at \$75, the time saved in organization more than pays for this package when you consider it can mark the end to diskette whereabouts and filename confusion.

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dBase Power	\$69	Pascal Z	\$399	Report Gen	\$145
ARTIFICIAL INTELLIGENCE		Pascal BZ (Business Version)	\$399	Menu Gen	\$70
Medical	\$820	Pascal Z and BZ Combo	\$599	Convert.	\$55
Dental	\$820	KEY BITS		SORCIM	
ASPEN SOFTWARE		WordSearch	\$175	Pascal/M	\$349
Grammatik	\$140	String 80	\$82	Pascal/M (8086)	\$425
Proofreader	\$125	String 80 (Source)	\$275	STAR COMPUTER SYSTEMS	
Both	\$250	LIFEBOAT		... Call for discount prices on all modules.	
FRONTIER/ASYST DESIGN SOFTWARE		T/Maker	\$249	STRUCTURED SYSTEMS	
✓ Prof Time Accounting	\$525	METASOFT		... Call for discount prices on all modules.	
✓ Fixed Asset Management	\$325	The Benchmark	\$399	SUPERSOFT	
✓ General Subroutine	\$262	The-Benchmark Mail List	\$219	Ada	\$263
✓ Application Utilities	\$429	MICROPRO PRODUCTS		Diagnostic II	\$85
BYROM SOFTWARE		WordStar	\$299	Forth (Z80 or 8080)	\$149
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BSTM	\$145	WordStar/Mail-Merge	\$365	Fortran w/Ratfor	\$287
CAXTON		DataStar	\$239	Tiny Pascal	\$84
Cardbox (Card File)	\$199	WordMaster	\$115	Disk Doctor	\$84
✓ CHANG LABS		SuperSort II	\$195	Utilities I	\$54
Microplan	\$349	SpellStar	\$169	Utilities II	\$54
COMPUTER CONTROL		CalcStar	\$225	Nemesis	\$40
Fabs	\$155	Customization Notes	\$350	Dungeon Master	\$40
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✓ Condor II	\$595	Microsoft Basic Compiler	\$324	Scratch Pad	\$258
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PL/I-80	\$450	Macro 80	\$144	Optimizer	\$174
MAC	\$83	Mu Math/Mu Simp	\$219	TARGET	
SID	\$63	Mu Lisp/Mu Star	\$170	PlannerCalc	\$50
Z-SID	\$68	M-Sort	\$170	MasterPlanner	\$290
TEX	\$88	Edit 80	\$100	UNICORN	
DeSpool	\$48	Multi-Plan	\$259	Final Word	\$269
BT-80	\$175	MICROSTUF		Mince	\$145
CB-80	\$450	Crosstalk	\$139	Scribble	\$145
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Access Manager	\$279	Level III (Partnership)	\$700	Access 80, Level I	\$241
DJR ASSOCIATES		Combined package (II and III)	\$1,500	Access 80, Level II	\$400
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✓ Accounting Plus		Zip (MBasic or CBasic)	\$149	Lynx	\$199
... Call for discounts on all modules.		Zip COMBO	\$159	Quic-N-Easi	\$319
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Microstat	\$219	The Word	\$70	SB/E PROM and BIOS	\$165
EPIC COMPUTER		The Word Plus	\$140	SB/E Diagnostic	\$165
Supervyz	\$99	ORGANIC SOFTWARE		Syntax CP/M Self-Tutor	\$120
FOX AND GELLER		Textwriter III	\$109	Catalog	\$75
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		QUALITY SOFTWARE		Superfile	\$179
		GBS Data-Base	\$295	Ten OPUS 5 1/4" SSDD Diskettes	\$25
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### EPROM Character Group Layout

The following chart shows how the EPROM is set up internally for character generation. Bits having no effect on character display are filled in with zeros. They could just as well have random garbage - it makes no difference. Each bit (dot) represents a character pixel on the screen. If a "1" is placed in a bit, that pixel will turn on. If a "0" is placed in a bit, that pixel will be off.

The rightmost bit (zero) will appear on the left edge of the character displayed on the screen. This is because the bytes defining each scan line of a character are shifted right and out into the video stream which runs left to right on the screen. So to get the real picture of the character in the EPROM chart below, it must be rotated on its "vertical" axis such that bit zero is on the left and bit seven is on the right. But ignore bit seven since it is not used.

The program which Intertec supplies for making your own character set, CSEDIT, allows you to create characters on-screen without having to mentally transpose them. It will let you intuitively enter the character patterns and then swap the bits for you to create a memory image file of your character set.

Base = ASCII Character Value (0 through 127) multiplied by 16.

Bits

	7	6	5	4	3	2	1	0	bits
Base + 0	0	0	.	:	:	:	:	0	
Base + 1	0	0	.	:	:	:	:	0	
Base + 2	0	0	.	:	:	:	:	0	
Base + 3	0	0	.	:	:	:	:	0	
Base + 4	0	0	.	:	:	:	:	0	
Base + 5	0	0	.	:	:	:	:	0	
Base + 6	0	0	.	:	:	:	:	0	
Base + 7	0	0	.	:	:	:	:	0	
Base + 8	0	0	.	:	:	:	:	0	
Base + 9	0	0	.	:	:	:	:	0	
Base + 10	0	0	0	0	0	0	0	0	
Base + 11	0	0	0	0	0	0	0	0	
Base + 12	0	0	0	0	0	0	0	0	
Base + 13	0	0	0	0	0	0	0	0	
Base + 14	0	0	0	0	0	0	0	0	
Base + 15	0	0	0	0	0	0	0	0	

Earlier, I mentioned that the cursor was displayed one scan line too high. Character patterns indicate that Intertec uses BASE + 0 as their blank scan line to separate rows. If every byte in the character field were shifted up one and BASE + 9 was used as the blank scan line, the character field relative to the cursor would be correct. This would also solve the problem of the underlines passing through the last scan line of a lowercase descender since the BASE + 9 position is used for underlining. The character EPROMs are not addressable by either CPU. It would have been nice to

be able to place a compatible static RAM in the alternate EPROM socket and dynamically create characters. Instead, some hardware modifications would have to be made to implement this feature.

### New Video Logic

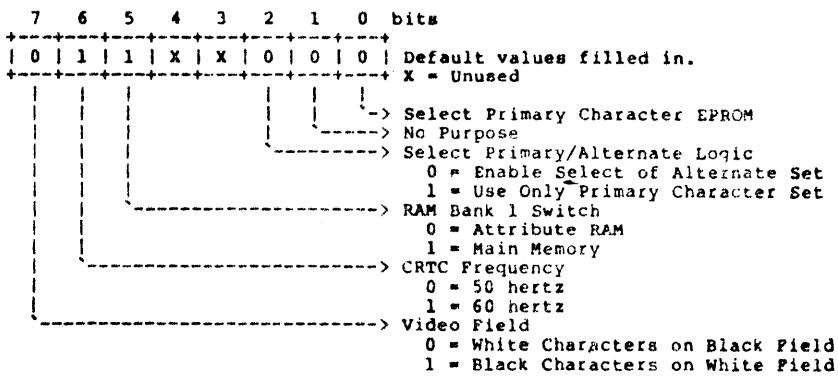
The only hardware change in the new machines not transparent to controlling software (i.e. BIOS) is the bit definitions for port A of the Programmable Peripheral Interface (PPI) and the meaning of the high bit in the screen memory map. The new PPIA bit assignments are as follows:

is always used. In the original logic this transferred use of the high bit to character blanking dependent on the value of PPIA-1 and the character's high bit.

PPIA-3 and PPIA-4 are not used.

PPIA-5, when reset, switches bank one into the character attribute RAM (discussed later) so that the various character video attributes may be turned on or off according to escape sequences used. PPIA-5 must be set for normal execution of programs in the range of bank one (4000H to 7FFFH).

PPIA-6 and PPIA-7 have retained their original definitions. PPIA-6 selects the pro-



PPIA-0 selects which EPROM is used for generation of the primary character set. When the high bit of a screen character (from the video memory map) is reset (zero), the primary EPROM will be used to obtain the video definition for that character. Conversely, when the high bit of the character is set (one), the alternate EPROM will provide the character's video definition. The default is for EPROM "A" to be used as primary. An escape sequence allows you to reverse this, affecting the entire screen retroactively.

PPIA-1 and PPIA-2 are not used for any real purpose now. Intertec had originally planned to use a different EPROM to which logic from these lines apparently controlled a character blanking (invisible character) feature.

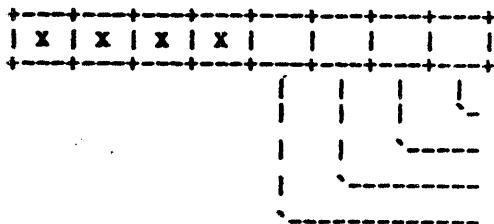
While PPIA-1 no longer has any real function, PPIA-2 has a side effect which was part of the original logic. With PPIA-2 normally reset, the high bit of a video map character will select whether the primary or alternate character set is used to display that character. But if PPIA-2 is set, selection of the alternate character set is disabled. In effect, the high bit of the video character is ignored so that the primary set

per line frequency for your supply of power. Europeans use 50 Hertz. PPIA-7 selects the video field as it did before. This affects the entire screen, reversing video on all character fields. Intertec has finally included an escape sequence in their DOS for setting reverse or normal video. Reverse video is a white field with black characters. A single character that is already reverse video will, of course, become reverse reverse (normal) video.

### The Video RAM

Bank one of CPU-1's address space is switched into the video attribute RAM by resetting PPIA-5. Bank one spans locations 4000H to 7FFFH. Of course there need only be 2K of attribute memory to represent the 2K screen memory map. Thus, video attribute RAM addresses "wrap-around" every 2K, or 800H. The standard practice is to address memory which wraps around beginning at its base address. So in effect, the video attribute RAM is addressed from 4000H to 47FFFH when it is switched into memory. From this wrap-around effect, location 4000H is the same as location 4800H. 4001H is 4801H is 5001H and so on to the end of bank one.

The video attribute RAM is 2K in length and four bits wide. The lower four bits of the data byte are the video bits. These four bits determine the video attributes of one given character. Any number of bits may be on or off at the same time. The upper four bits are indeterminate since they do not exist in hardware. Each video attribute byte corresponds with a character byte in the screen's memory map. The memory map begins at location F800H. For example, the attributes for the character stored at location 0F81FH in the memory map are at attribute memory location 0401FH.



**The Internal Time/Date Clock**  
The internal clock is National Semiconductor's MM58174 Real Time Clock (RTC). It has a battery attached to it to keep time even when the machine is turned off for long periods of time. This chip is an old version which has a few bugs in it. While disassembling Intertec's TIME program, I found that they have messages which are only useful to the new version of the chip (MM58174A). Apparently, Intertec plans on changing over to the new chip and may have already done so. The new chip does an automatic leap year calculation except for centennial leap years. This did away with the Years Status Register so it was replaced as a mode select for 12 (AM and PM) or 24 hour operation (military). The bugs were also worked out.

Hex Port Address	Clock Function	Addressing Mode
30	Test Only	Write/Only
31	Tenths digit	Read/Only
32	Units of seconds	R/O
33	Tens of seconds	R/O
34	Units of minutes	Read/Write
35	Tens of minutes	R/W
36	Units of hours	R/W
37	Tens of hours	R/W
38	Units of days	R/W
39	Tens of days	R/W
3A	Day of the week	R/W
3B	Units of months	R/W
3C	Tens of months	R/W
58174	Leap Year Status	Write/Only
58174A	Hours Mode	Read/Write
3D	Start/Stop	Read/Write
3E	Interrupt & Status	Read/Write

The test function (30) is for production testing only and has no system use. For normal operation the chip must be set to the non-test mode by writing a zero to the test port. This only has to be done once. If it is

set to one, the 32 kHz oscillator input is connected directly to the tenths of a second counter. The time and date functions (31 through 3C) all use BCD representation with the lower four bits of the data bus. The upper four bits are meaningless because the RTC does not use them. If, during a read operation, the addressed register is being updated, the illegal BCD code of "1111" (0FH) will be returned. Software must check for this after the read and try again if 0FH is returned. The typical retry limit is ten retries. If any other illegal BCD code is received it probably means that the clock has been improperly initialized.

reset to zero when the clock is stopped.

The RTC has an interrupt feature (function 3F) which Intertec has left unattached and thus, cannot be used unless a modification is made to the processor board. Pin 13 is the interrupt output pin. Interrupts may be coded in single or repeated intervals of 0.5, 5.0 and 60.0 seconds. Further interrupt programming information for the technically inclined can be found on this chip's data sheet.

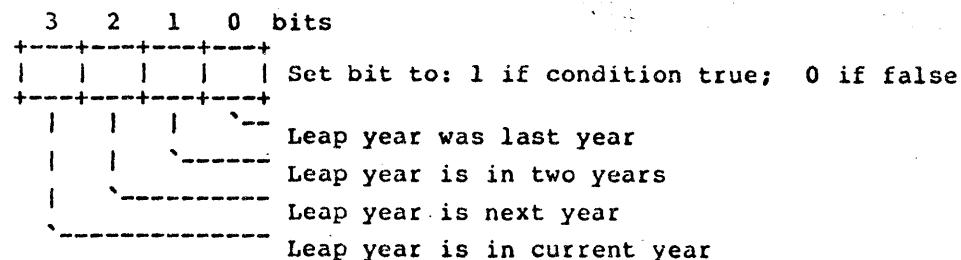
### New Escape Sequences

All these sequences control attributes of one sort or another. The sequence is issued with ESCAPE TILDA and followed by an attribute qualifier. The hexadecimal representation of this is 1B 7E cc where cc, the qualifier, is one of the following characters. Any number of these sequences may be in effect at the same time.

The following take effect character by character from the point of their selection. They will not affect what already appears on the screen even when their corresponding alternate is selected.

B (42H) - Turn blinking on  
b (62H) - Turn blinking off  
H (48H) - Turn half-intensity on  
h (68H) - Turn half-intensity off  
R (52H) - Turn reverse video on  
r (72H) - Turn reverse video off  
S (53H) - Select alternate character set  
s (73H) - Select primary character set  
U (55H) - Turn underlining on  
u (75H) - Turn underlining off  
N (4EH) - Normalizes. Turns off B,H,U

The leap year function (3D) on the older chip is used to indicate which year is the leap year. The Years Status register is a shift register of four bits. It is rotated left every year midnight December 31-January 1 to place a "1" in bit 3 if the new year is a leap year or a "0" in bit 3 if it is not a leap year. Thus, the "1" will wrap around into bit 3 once every four years.



The Hours Mode Select register (3D) on the new version of this chip selects either civilian (AM and PM) or 24 hour (military) format. Writing either a zero or one to this register selects which mode is used. Reading the register will return mode and AM or PM if it is in the 12 hour mode. This is only preliminary and may not be quite accurate.

The start/stop function (3E) allows loading of time and date into the clock and its precise starting. The low bit of the data byte set to logic "1" and written to port 3E will start the clock running. A logic "0" will stop the clock. Units and tens of seconds are

and R attributes beginning with next character printed  
The following four escape sequences affect the entire screen retroactively.

A (41H) - Switches screen to normal video  
a (61H) - Switches screen to reverse video  
G (47H) - Select EPROM A as primary and B as alternate  
g (67H) - Select EPROM B as primary and A as alternate

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Dear SuperBrain/CompuStar User:

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# 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*

# Letters to the Editor

DEAR SUPERLETTER:

We use SuperBrains in our construction company home office. My son has recently joined the firm and will be in charge of a project in another city. He owns an Osborne. Is there any way we can use our current SuperBrain accounting programs on his Osborne? We would like to be able to interchange data disks.

We enjoy and benefit from your publication.

H.S. Roberts, Jr.  
Buddy Roberts, Inc.  
P.O. Box 7097  
Columbus, GA 31908

**Editor's Note:** See the next letter.

DEAR SUPERLETTER:

Going back several issues, you mentioned that you were having trouble getting an 8 inch standard IBM format disk system hooked up to your computer for the purpose of copying the CP/MUG software. I am a member of the First Osborne Group Computer Club. They have the entire CP/MUG library plus a lot of other things on disk for the Osborne that any member can copy for free. Since I have both an Osborne and a SuperBrain, and since I have the Wolf Software transfer program to transfer the files between the two, if any of your readers would like the entire CP/MUG library on disk in the SuperBrain format I'm sure that I could arrange it.

Walt Beaudry Jr.  
Lucero's Tax Service  
11 S. San Joaquin St.  
Stockton, CA 95202

DEAR SUPERLETTER:

I think I have something interesting for SuperBrain users, especially those in countries who use 50 Hz frequency on the MAINS-power-network.

In Europe we use 50 Hz (220 volts), and because of the american origin of the SuperBrain computer, it is hardware-wired for 60 Hz operation. Changing over to 50 Hz is possible via the CONFIGUR-program from CP/M. But when (in 50 Hz countries) you switch-on the SuperBrain, an irritating

screen-jitter occurs, because it is still in its original 60 hz mode. In fact, the change-over to the on-standard (50 hz) frequency-mode is made during booting-up (Only if you enter a diskette which was configured for 50 Hz, of course !!!)

The switch to another frequency-mode results in an earthquake-like motion of the screen, which looks rather "cheap" for a computer of this class.

The solution for this problem is a hardware configuration for 50 Hz, which is a very easy job for anyone who has some experience with IC-handling. When the cover is removed (by loosening the four bottom-screws at the front and the back-side of the device) an earth-connection has to be made to the Integrated Circuit (IC) which is situated in the center top area of the mainboard. Sitting at your SuperBrain as you normally do, the IC is located about 2.5 inches above the right-bracket/zero key.(From the two centered IC's which are almost touching each-other, it is the one closest to video-screen and is numbered 8350.) Carefully remove this IC using a flat pocket-knife or a little screwdriver, by inserting the tool between the socket and the IC alternately on both short sides, and lift it up out of the socket. IMPORTANT: Never touch the pins, because you can damage the electronics inside the IC by static electricity on your fingertips.

Now, bend-up the third pin, counting from the top side of the left row of pins.

(This is pin No. 3, if you have a pin-layout of this IC). Put the IC back in its socket, by first inserting the left row of pins, and after this the remaining row, or use your own method. Be sure that all pins (except pin

No. 3) slide back in their own socket hole. If you think you can't manage all this, ask an electronic hobbyist or radio-amateur in your neighborhood to do this precision-job for you, otherwise you could damage the IC.

If you succeeded in folding up pin No. 3, then you are ready to perform the next step.

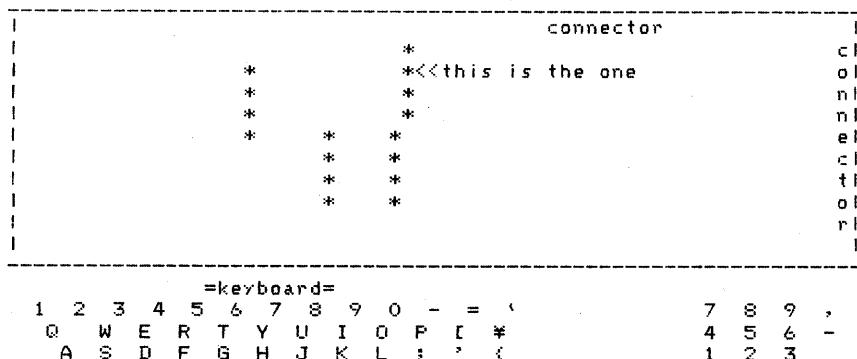
Take a little soldering-iron (not exceeding 10 watts, otherwise you will burn-out the IC) and solder a (fitting) black insulated wire of about 6 inches to pin No. 3.

Also remove insulation from the loose end of this wire and connect it to the metal main-chassis, by first loosening the hexagon-screw that is one of four screws used for mounting the video-screen on the main-chassis.

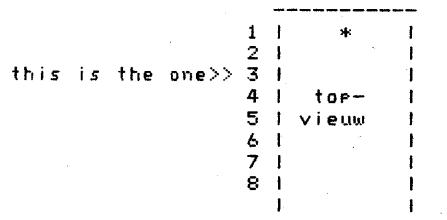
Now you made a connection from pin 3 of IC type 8530 to earth, which sets the SuperBrain to 50 Hz mode, regardless of how the CP/M disk is set for 60 Hz or 50 Hz.

Robbert J. van Herksen  
27 van Karnebeeklaan  
4102 BZ CULEMBORG  
The Netherlands

*Drawing of the MAINBOARD  
lay-out for locating the correct IC and pin No. 3*



*=PIN-LAYOUT OF THE IC 8530=*



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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 shutdown, 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.

### SETSYS

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 Configur 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.**  
8403 Dixon Avenue  
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### 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.

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**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 40×24 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 CRTL 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.

**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
      call   stringf      ; Display prompt
      call   constaf      ; Get console status
      ora    a
      jz    lpl
      call   coninpf      ; If char ready
      call   intohex      ; then read and echo
      call   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   0FOH
            ; high order nib
```

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, CRTL 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-

ging, 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.

```
cpi   0AH
      int3      ; if >= 10
      jm       55      ; then A..F
      adi   55
      jmp   int4      ; else 0..9
      int4      mov   e,a
      call  conoutf    ; Display high order bit
      pop   psw
      push  psw
      ani   0FH
      cpi   0AH
      jm       int1      ; if >= 10
      adi   55      ; then A..F
      jmp   int2      ; else 0..9
      int1      mov   e,a
      call  call
      call  putcr      ; Display low order bit
      pop   psw
      ret
      int2      mov   e,a
      call  call
      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) = OFFH 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
      lpl
      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 0FOH           ; High order nib
      rrc
      rrc
      rrc
      rrc
      cpi 0AH
      jm int3            ; If >= 10
      adi 55              ; then A..F
      jmp int4
      adi 30H             ; else 0..9
      int3
      int4
      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            ; If >= 10
      adi 55              ; then A..F
      jmp int2
      adi 30H             ; else 0..9
      int1
      int2
      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 1              ; If nothing
      jz coninpf         ; then wait
      mvi a,0EH           ; Reset port
      out kbrset
      mvi a,0FH           ; Read data port
      out kbrset
      in  kbdta           ; Save char
      mov b,a            ; Handle CAPS LOCK flag from
      mov a,c
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
      sui 1AH             ; If char > 'z'
      jp chcvl
      adi 5BH             ; Convert lc char to UC
      ret
      chcvl mov a,b       ; Restore char
      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) = OFFH IF CHARACTER IS READY
;          = 00H OTHERWISE
;
constaf:      ; Console status. Like BDOS function 11
              ; except for direct port read
              ; Returns:    (A) = 0FH if char ready
              ;             = 00H otherwise
      in  kbstat          ; Read status port
      ani 1              ; If nothing
      rz
      mvi a,0FFH           ; then return 0
      ret
;
; END

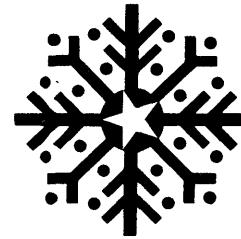
```

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          IN      ( MACHINE LANGUAGE PRIMITIVE TO )
      69               L      ( READ CONSOL STATUS PORT )
      A                LD
      0                H      ( HL = STATUS )
      $PUSH            JP      ( STATUS ONTO STACK )
EDOC
CODE  PORTRST           IN      ( MACHINE LANGUAGE PRIMITIVE TO )
      OE               A      ( RESET CONSOL INPUT PORT )
      A                6B    OUT
      OF               A      LD
      A                6B    OUT
      $NEXT            JP
EDOC
CODE  CONIN             IN      ( MACHINE LANGUAGE PRIMITIVE TO )
      50               L      ( READ CONSOL INPUT PORT )
      A                LD
      0                H      ( 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
  PORTRST CONIN          ( EXIT IF A CHAR IS WAITING )
CHAR )                  ( RESET THE PORT, AND READ THE
;
: KB-SCAN              ( READ THE KEYBOARD AND ECHO CODE
GENERATED )
BEGIN-
  CONINPF DUP DUP .
  4 SPACES COUT CR .  ( GET CHAR AND ECHO CODE )
  1A =                ( ECHO CHARACTER )
END
;

```



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# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

Feb/Mar 1983  
Vol. 3, No. 1

**W**ord-processing is one major reason why you bought your computer. And keeping up with the leading word-processing software products is an area of high interest to us.

This issue features articles to help you better use WordStar on your SuperBrain and CompuStar. It's a popular package, but one that has often plagued Intertec users for one reason or another. Also, MicroPro recently increased the cost of their software by 40%! You will no longer see low discount prices for their products. A questionable marketing move.

Magic Wand, once the best word-processor for microcomputers, in our opinion, has undergone inexcusable deterioration at the hands of Peachtree. Intertec format was once easy to get --and it worked. Now, with the Peachtree "improvements" and changes, the INSERT function has to clear the entire screen to work, as well as REVERSE SCROLLING. A big waste of time.

We tried on several occasions to reach Peachtree to let them know about the specific needs of the SuperBrain user. All attempts failed and none of our calls were returned. At this point, we are strongly recommending that you consider other word-processors for purchase.

Lexisoft, on the other hand, has been aggressively working out the necessary changes required in the operation of Spellbinder on the new SuperBrain II. As usual, Lexisoft has been extremely responsive and desirous of making their product work perfectly. We tried out the new Spellbinder for SuperBrain II and it works like a charm, with reverse graphics effect for underlining of text. It's still, by far, the best buy in word-processing/office management software.

Another package we will hope to be reviewing soon is Benchmark. We'll keep you posted.

The graphics board we promised you for the older SuperBrain I is completed and ready for sale. It fits in easily and provides a multiple use of graphic capabilities. Com-Shute in Yokohama, Japan created the product just for the Intertec line. You get underlining, blinking, reverse video or a combination of the three on the screen. The package comes with an add-on chip board and menu-driven software. Call us for more information.

The price of Intertec stock has been slowly rising over the last few weeks which fuels our suspicion that something new is going to be presented at the NCC this Spring. The stock price rise is an interesting development.

We are now providing a new down-loading service to transfer data from one computer formatted diskette to any another format (8" or 5½" or vice versa) within five days of an order. Our price-list is being prepared, but costs range between \$29 to \$49, plus diskette and shipping charges, depending on the amount of data on each master. This service is available now.

The dbase II vs. Selector V debate seems to have stirred some interest. There seems to be strong advocates on each side. We hope to bring you articles about both packages, as they pertain to use on the SuperBrain, in the near future.

We are preparing a special Superletter for the upcoming big NCC show. If you are interested in having an ad appear in this issue, please contact us for a rate card.

As always, thank you for your continuing support. We appreciate the contributions all of you are making. There are few other newsletters in the world devoted to a specific computer system that has such loyal subscribers.

*Albert Abrams*  
EDITOR

## Technical Corner

SuperBrain/CompuStar

WordStar Patch

for

SOS 3.X or 4.X

Intertec DOS 3.X

by

Jonathan Platt

2804 Fairway Drive

Melbourne, Florida 32901

(205) 724-6148

WSPATCH.ASM (page 6) contains commented assembly language instructions to assemble and place into the Wordstar program. The patches involved will work only with SOS or Intertec's DOS versions 3.X and 4.X. You must assemble WSPATCH with ASM to find out what values to put in which locations. The assembled listing file, WSPATCH.PRN, will give you this information.

Before patching, you must first INSTALL WordStar normally, selecting the SuperBrain as your terminal. If INSTALL has a selection for CompuStar by now and you have that machine, select CompuStar. The reason you must tell INSTALL the terminal type before using the patches below is because WordStar has its own internal patches for each terminal. If you enter your patches first and then INSTALL WordStar for the terminal type, your patches will be wiped out by the INSTALL program's patches. If the terminal type has already been selected, specifying "no change" for terminal type will preserve any terminal patches you have previously made.

Using WSPATCH.PRN, fill in the hex values with INSTALL. Once that is done, exit INSTALL patch mode and tell INSTALL everything is O.K. Alternatively, you can

*Continued on Page 6*

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# —Guest Article—

Jack E. Monroe, C.P.A.  
1345 N. Orange Drive #1  
Los Angeles 90028

I bought my SuperBrain primarily for word processing, using WordStar and an Epson MX-80F/T dot matrix printer.

Epson announced an upgrade kit called "Graftrax plus" (it is now standard equipment), that would make my \$500 printer produce italic characters, extended (wide) characters, very tiny characters that printers call superior and inferior (Epson says "superscript" and "subscript"), and underscores in one pass.

Installing it required me to learn more about the SuperBrain, WordStar, and the printer than I had needed to use the original equipment.

Inside the Epson case is a serial interface board which the Graftrax-plus kit says must be #8151 or 8155. The board itself doesn't have any such number; I finally found it on the outer case, just under the power cord. It turned out I had the older #8641, so I needed to update my interface in order to use the Graftrax-plus.

Along with the Graftrax kit you get an Epson printer manual written by Dr. David A. Lien of CompuSoft fame. Dr. Lien manages to cover boring technical details with a light-hearted touch. (If every computer manufacturer would hire him to prepare their manuals, we would read no more groaning complaints about documentation).

Dr. Lien's manual told me (Appendix B) what codes I needed to send from the computer to the printer to get all these wonderful tricks. But he told me how to get those codes using BASIC. Here's how to get WordStar (or similar word processors) to produce the same codes.

Point One: Computer equipment uses an eight-bit character code (ASCII) which makes 256 possible characters. WordStar uses the eighth bit of all characters internally; it's how the program "marks" those "soft hyphens" and "soft carriage returns". That leaves us with a seven-bit code, or 128 possible characters, to deal with.

Point Two: Some of those 128 characters--mostly the ones we refer to as "control" or "super shift" letters"--are interpreted by WordStar as "commands," not as characters to be retained on the disk. But we can get them onto the screen (control-S displayed as  $\wedge S$ ) and into the disk file by pre-

ceding them with Control-P (which doesn't show up on the screen). WordStar users will recognize my description as WordStar's method for indicating words to be underlined.

Point Three: Some things can be done in more than one way. For instance, when you want words or sentences underscored, WordStar gives you two methods: enclosing the words with  $\wedge S$  (which will survive any reformatting operation, but rather maddeningly refuses to underscore the space between words), or putting in your own underscore on a separate "overprint" line (reversing the virtue and drawback). You may continue to use these WordStar methods, or you can use the Epson underscore by putting the codes to "start underscore" before the words you want underscored and the codes to "stop underscore" afterward. Then you have these advantages:

1. The codes will survive WordStar reformat operations.
2. The underscore continues under spaces.
3. The printing is continuous line instead of the "broken" line.
4. The underscore prints with the character instead of taking extra lines.

Point Four: You will need to choose which Epson features you will use frequently, and whether you want to give up your SuperBrain's number pad to make it simpler to enter some of the codes needed by Epson-Graftrax. Study the code list in Appendix B carefully, and keep in mind that the N values called for in some codes have to be ASCII values (a single character), not numbers from the keyboard.

If you decide to give up using the number pad, you enter the substitute codes you want when you press those keys in one of the screen menus in the CONFIGUR program. You can change the disk operating system on the WordStar disk ONLY and still have the number pad (and time of day) for non-WordStar applications.

Point Five: You should make full use of WordStar's printer control code for your "most wanted" features because they do not interfere with WordStar's character count and line justification. Other codes will count, leaving your line "short" (and print, instead of being hidden, on any non-Epson printer).

Point Six: If you use the Epson as a draft printer and a thimble or daisy wheel printer for finished work, you need to consider what effect the Epson codes will have. I recently used an NEC printer to get the final copy of

an 80 page manual. It ignored most of my Epson codes (and the .CW and .UJ codes for the NEC were ignored by the dot printer), but the  $\wedge Y$  caused the carbon ribbon to go into "off" mode until I removed it from the files.

Now, here are my choices:

WordStar intends their  $\wedge Y$  as a ribbon color switch, to control printing using a black-and-red ribbon or to get "blind" printing with a carbon ribbon. Epson can't use this. WordStar puts a  $\wedge Y$  in its disk files, and during the printing operation, substitutes  $\wedge Y$  with the control code(s) the printer needs.

You can change your WordStar program to get  $\wedge Y$  to give you "emphasized print" (the print head moves across the lines at half speed, striking the pins for each character twice to give a more fully formed image).

From your CP/M prompt A>, type INSTALL. Your SuperBrain will load the WordStar installation program and the screen will ask "Do you want a normal first-time installation of WordStar?" Respond "N" and you are given four choices; you want D (modify a program already installed and rewrite it in A:WS.COM). You will then be taken through a series of four choices to which your responses should be "U" (unchanged) and "Y" (to confirm). Then you are asked, "Are the modifications to WordStar now complete?" Your response should be "N" because you want to go into the "patch" part of INSTALL.

The  $\wedge Y$  codes are contained under two "labels," RIBBON: and RIBOFF:. There is room for five characters in each, and these are entered with a two-digit hexadecimal code (each "digit" being either a regular digit or letter A, B, C, D, E, or F). These codes are followed by an H when written to remind you that you're working in a number language closer to the computer's silicon heart.

The first character must tell WordStar how many characters it should transmit to the printer. We need two codes, ESCAPE and E, to turn on emphasized print, so you first type 02 [enter]. The screen will ask the next patch location; [enter] gives you RIBBON+0001 automatically; then 1B (hex for ESCAPE) [enter], RIBBON+0002 45 (hex for cap E) [enter]. Appendix B of the Epson manual provides both the English and the hex codes. The hex codes will do the job; I need the English to keep all of this making sense. The extra cautious can go on to RIBBON+0003 and +0004 to check that their present value is 00H and [enter] to keep them that way.

*Continued on page 5*

# Letters to the Editor

## DEAR SUPERLETTER:

I am the legitimate purchaser of the Magic Wand word processing program intended for use on the SuperBrain. I have had the program approximately 18 months. Shortly after I took delivery of the program, I realized that there were certain aspects of the program which I could not make work. I was assured that as I became familiar with the program, I would learn how to use these features.

Having become very familiar with the SuperBrain and the Magic Wand program, I now realize that there are "glitches" in the program which prevent it from operating properly. My original dealer says "how unfortunate, I no longer handle SuperBrain or Magic Wand." Peachtree who has bought the Magic Wand program says "we only bought the assets and not the liabilities. We can't help." At this point, I am turning to my fellow SuperBrain users. If there is one among us who has a SuperBrain program which functions properly, I would like to make arrangements to obtain a copy. I have been generally satisfied with the word processing program but am severely limited because of the defect particularly in the print commands.

Sincerely,  
Howard Lieberman, P.E.  
434 White Plains Road  
Eastchester, N.Y. 10709  
(914) Spencer 9-3773

## DEAR SUPERLETTER:

I keep hearing of people who have a "copy" program in their CP/M operating system and most of the books on the subject indicate that there is a "copy" program that does an entire disk copy including formatting a fresh disk at a much faster speed than is performed by PIP.

Does anybody have available such a program that will run on SuperBrain version 3.0 or 3.1?

Sincerely,

Jary C. Nixon, Attorney  
25 Davis Boulevard  
Tampa, Florida 33606  
(813) 251-0515

**Editor's Note:** We have just received a copy of this program. Call us for more details.

## DEAR SUPERLETTER:

I have installed our printer on the MAIN port of our CompuStar Model 40. This allows the use of CTS (Clear To Send) in receiving the READY signal of our printer (a DATAROYAL IPS 5000A). This is quite useful, as pointed out in Superletter's Technical Corner Vol. 2, No. 2. With Jon Platt's SOS BIOS all one has to do is change the IOBYTE from 81H to 01H. However, with Intertec's BIOS, you must make the following patch to C540CPM.COM.

Address 203 EH -- Change D0H to F4H. This changes a JMP to the AUX port routine to a JMP to the MAIN port routine. This can be found in the BIOS listing as:

LIST:

JMP AUXOUT (DED0H)

PUNCH:

JMP MNOUT (DEF4H)

Copy the address for MNOUT in place of the address for AUXOUT in the LIST: JMP statement.

Steve Forester  
Fife Corporation  
P.O. Box 26508  
Oklahoma City, OK 73126  
(405) 755-1600

## DEAR SUPERLETTER:

I have a question on the SuperBrain. In all the publications that I have I cannot find out how to format the CRT screen using Microsoft Basic. The standard command, PRINT @256, doesn't work or perhaps I don't know how to use it. HELP! And thank you.

A new SuperBrain user,  
Orrin "Denny" Joiner  
1644 Jason Street  
San Diego, Ca 92154

## DEAR SUPERLETTER:

I would like to thank you for the prompt answer to the request for back issues. This information is very useful to me since I have just switched from another home computer to the SuperBrain.

I would like to add a little more to the discussion on Okidata 83A interfacing. I have an Okidata 82A which I assume has exactly the same low speed serial protocol as the 83A and if so then 1200 Baud transmission

*Continued on page 4*

## HIGH RESOLUTION GRAPHICS FOR SUPERBRAIN, COMPUSTAR, Z-89 & TRS-80 MODEL II.

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**MAXTEK, INC.** 2908 Oregon Court, Torrance, CA 90503  
Available in Europe from Micronex Ltd., Chew Magna, England 3042 (STD 027-589 3042)  
TRS-80 is a registered trademark, Tandy Corp. Superbrain is a trademark, Intertec Data Systems  
Micronex and Tektronix are trademarks, Tektronix Inc. CPM is a registered trademark, Digital Research

can be accomplished via the Auxiliary port with the following connections.

SuperBrain	Okidata
pin 3 TD	to pin 3 RD
	pin 20 DTR to pin 6 DSR
pin 20 DSR	to pin 11 SSD
pin 7 GND	to pin 7 GND

This wiring is exactly as illustrated in the Microline 82A manual on page 47, illustration "b". The switch settings are identical to the ones illustrated in your April/May 1982 issue except the SSD polarity selection switch 1 on the control circuit board (the board in the back of the unit) is "on", and of course the Baud rate selection switches are set to 1200 (sw2 on, sw3 off, sw4 on).

Also, I am glad to send you the information regarding alternate character sets for the new SuperBrain II that I would like you to market for me.

The information includes a program that accesses the characters to allow plotting of curves and shapes on the screen. The format of this set is such that plotting is done similar to the Radio-Shack TRS-80, with the exception that a subroutine must be included to perform the equivalent operation of the SET command. This routine is provided in the listing of the Cycloid plotting routine.

The Cycloid program was written by John R. Sherburn and published in "MICRO" issue No. 10, 1979. John's version centered around a machine language plotting utility and worked for a Commodore Pet.

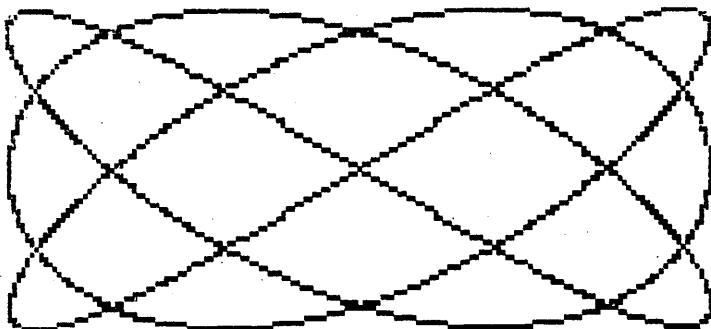
I find that this program shows well the capability of pixel graphics. The resolution 160 by 72 is adequate for representing mathematical functions if you can overlook the slightly irregular appearances caused by the unequal block sizes.

In the near future I will send you more programs illustrating ways to use the histogram characters and methods of blending characters from both sets simultaneously.

I will supply and support this character set through Superletter, and include a program example, and a set directory. I will also be glad to assist anyone who wishes to design their own custom character set. A layout sheet can be provided that will be completed with the desired character elements indicated by marking the appropriate box and identifying the character with the desired hexidecimal or decimal address below each character. The charge for custom characters will be fifty cents per character set-up fee added to the regular cost of the character set.

The price of each character set EPROM is \$60.00 plus shipping. Please have any interested subscribers or customers contact you for further information.

D. Mowrey  
Dayton, Ohio



```

1 REM HIGH RESOLUTION PLOT USING PIX-GRAFICS
2 REM
3 REM PLOT PROGRAM DESIGN BY John R. Sherburn
4 REM
5 REM SET SUB AND ADAPTATION BY Dean E. Mowrey
6 REM
10 DIM SC$(23)
20 FOR N=0 TO 23 : SC$(N)=STRING$(80,64)+CHR$(1): NEXT N
30 PRINT CHR$(12)
100 REM PICTURES FOR THE SUPERBRAIN
110 DELTA = 2 * 3.14159265# / 900
120 P=3 : Q=4
130 FOR I=0 TO 900 STEP .6
140 THETA = DELTA * I
150 Y = INT (79.5+78*COS(P*THETA))
160 X=INT (33.5+32*SIN(Q*THETA))
170 GOSUB 1000
180 NEXT I
190 IF INKEY$="" THEN 190
1000 REM SET SUB
1005 REM THE GRAPHIC SCREEN CONSISTS OF A GRID OF 160 BLOCKS ACROSS AND
1007 REM 72 BLOCKS DOWN THEREFORE THE X VALUE MUST BE BETWEEN 1 AND 160
1009 REM AND THE Y VALUE MUST BE BETWEEN 1 AND 72
1010 REM TEST SIZE OF X AND Y
1020 IF X<0 OR X>160 THEN RETURN
1030 IF Y<0 OR Y>72 THEN RETURN
1040 REM DETERMINE THE LINE NUMBER FROM X
1045 REM LNX = LINE NUMBER
1047 REM DOTX= DOT POSITION IN CHR 1 2 OR 3
1050 LNX =INT(X/3) : DOTX=INT((X/3-LNX)/.3+.5)
1050 REM DETERMINE THE CHARACTER POSITION IN THE LINE
1055 REM CPX = CHARACTER POSITION CDX= DOT POSITION
1070 CPX =INT(Y/.2) : CDX=INT((Y/2-CPX)/.5+.5)
1080 REM CONVERT TO GRAPHIC CHARACTER
1090 REM FIRST CHECK SCREEN ID ARRAY FOR PREVIOUS ENTRY
1100 AX=ASC(MID$(SC$(LNX),CPX+1,1))
1110 AX = AX OR (2^(2*DOTX) * (2^CDX))
1112 IF AX>95 THEN AX=64
1115 MID$(SC$(LNX),CPX+1,1)=CHR$(AX)
1120 PRINT CHR$(27);":Y";CHR$(LNX + 32):CHR$(1 + 31):
1120 PRINT CHR$(27);":`";SC$(LNX):
1140 PRINT CHR$(27);":`":
1160 RETURN
2000 REM PRINT SCREEN ON OKIDATA PRINTER
2010 LPRINT CHR$(14)
2020 FOR N=0 TO 23:PRINT SC$(N):NEXT N
2030 LPRINT CHR$(15)
2040 RETURN

```

## -New Products-

**NAMOR**  
**Shape, Inc.**  
122 Spanish Village  
Suite 615  
Dallas, TX 75248

**SOFTWARE:**  
It's always been a puzzle to us why there's been a lack of quality CP/M software packages to help create and maintain professional-level mailing lists.

NAMOR is a new software product that provides all the features and functions one could want out of such a program. With it you can build lists, merge them, sort them on different fields, maintain codes, print labels and cards, and extract names from existing lists created with other software packages.

We've kept an eye on this company since it began and we've come to see how dedicated it is to individual customer support and continuous upgrading of the product with a minimum charge for new features. There was great enthusiasm for incorporating the screen codes and terminal configurations necessary for SuperBrain/CompuStar users.

Price: \$150

*Continued on page 7*

## Guest Article *Continued from page 2*

The Epson needs two more codes, ESCAPE and F, to turn off emphasized print. Label RIBOFF: (you need to enter the colon) gets 02 (for the number of characters) [enter]; RIBOFF+0001, 1B [enter]; RIBOFF+0002, 46 [enter].

Slow going? Sure, until you've tried it. Look at the good side. When you're finished, your \$500 "cheap" printer will be printing your sentence in italics and your next sentence back in regular type while, to get the same effect, your neighbor's \$3,000 "letter quality" printer is still buzzing for a daisy wheel change.

We can speed things up by listing the codes in a table

Epson--Turn on compressed character mode: SI (that stands for Shift In, a Teletype term that may remind us of the ancient history behind the ASCII code).

WordStar--Code  $\wedge A$ , label PALT, characters 01, code 0FH.

Note: Emphasized print and compressed characters are not compatible. If you are in emphasized print and want to go to compressed characters, you will need  $\wedge Y$  to get out of one before  $\wedge A$  to get into the other.

Epson--Turn off compressed character mode: DC2.

WordStar--Code  $\wedge N$ , label PSTD, characters 01, code 12H.

The next four WordStar codes don't have any purpose defined by WordStar;  $\wedge Q$ ,  $\wedge W$ ,  $\wedge E$ , and  $\wedge R$  are set aside just for us. Intertec generates code NUL (00H) from Control-W instead of the industry standard ETB (17H), which explains why Control-W doesn't cause the downward scroll you expect from WordStar. We will need the NUL code, but using Intertec's provision for it causes extreme operator confusion. In WordStar,  $\wedge P$ , ESCape does NOT put an ESCape code on either the screen or disk. My solution was to combine these two codes and let WordStar give them to us from the  $\wedge Q$  key.

Epson--NUL (00H), required value for N in some printer codes; ESCape (1BH) alerts printer that the following character is to be considered a command instead of being printed.

WordStar--Code  $\wedge Q$ , label USR1, characters 02, codes 00H, 1BH.

Epson--Turn on double width mode to end of line: SO (0EH).

WordStar--Code  $\wedge W$ , label USR2, character 01, code 0E.

Epson--Italic character sent on: ESC, 4 (1B, 34H).

WordStar--Code  $\wedge E$ , label USR3, characters 02, codes 1BH, 34H.

Epson--Italic character set off: ESC, 5 (1B, 35H).

WordStar--Code  $\wedge R$ , label USR4, characters 02, codes 1BH, 35H.

That completes my choices for "patching" WordStar. Enter 0 for the next label location, confirm your four earlier "unchanged" choices, and your SuperBrain will load your "new" WordStar so you can try out your Epson Graftax.

Point Seven: It will help to know that the ASCII values for the digits 0 through 9 are 30 more than the digits themselves (type 5 to get a value of 35). You can figure out the other values, if needed, from Appendices A, B, and C of Dr. Lien's Epson manual.

I like to print my rough drafts "5 lines to the inch." The Epson code to set line spacing other than the standard 1/6 of an inch is ESCape, 3, N, with N representing n/216". The closest equivalent of 1/5 is 43/216; from the tables I find "+" has a value of 43, so my WordStar code is Control-P,  $\wedge Q$ , 3, +. (This appears on the screen as  $\wedge Q3+$ . The last two characters will add to WordStar's column register and subtract from the line length. If this is a problem, I type Control-P [return] to get an "overprint line."

If you use the more customary double spaced drafts and don't like the double spacing on the screen and double line feed codes used by WordStar's  $\wedge OS$  2 method, keep WordStar in single space and use a value of 72, which happens to be cap H:  $\wedge Q3H$  will give you a double spaced prin-

of a single spaced file. If you still want WordStar to handle page numbering and jumps, you'll need to set PL 33 and have the default values for top and bottom margins and footing and heading margins.

The Epson codes for underscore are ESCape, hyphen, N with N = 0 to stop underscore and N = anything else to start it. To start, I type Control-P  $\wedge Q$  - + (screen shows  $\wedge Q$  - +); to stop, Control-P  $\wedge Q$  -  $\wedge Q$  [space]. Now you see why I put the NUL code before the ESCAPE in setting up the outputs for  $\wedge Q$ . The second  $\wedge Q$  will also generate an ESCape code; which would cause Epson's circuitry to gobble up my next character a la PacMan; the space prevent this. The printed result: Epson gives much variety in printing at a reasonable price.

The illustration below is an example of using many of these codes to develop an income tax worksheet. Using a pencil, it usually required about ten drafts to perfect the design and then a final drafting to make a version the typesetter could understand. Using the SuperBrain and Epson printer, it takes twice as long to get the first draft in the machine, but the revisions are very fast and the final version is ready for the typesetter.

Point Eight: At the end of each WordStar file which includes any Epson codes, you should put a code  $\wedge Q@$  to "reset to normal." Otherwise, printing file No. 2 (or repeating file No. 1) may give unintended results if the computer and printer have not been turned off after printing file No. 1.



12/21/82 D=125      CR-5      FOREIGN TAX CREDIT      198

Name \_\_\_\_\_

Citizen of:  United States

Use to provide alphabetic information and numeric detail when Form 1116, with partial or complete calculation of the credit, is to be produced by computer. Use a separate CR-5 for each country.

**PART A--FOREIGN TAXES PAID  OR ACCRUED**   OR ACCRUED

Foreign Country or U.S. Possession \_\_\_\_\_ Date(s) Paid (Jan. 1 to Dec. 31 unless noted)

Amounts in: Foreign Currency U. S. Dollars As proof of amount attach one of:

Withheld at <input checked="" type="checkbox"/> Dividends	1. _____	4. _____	<input checked="" type="checkbox"/> Foreign country tax return
the source on: <input checked="" type="checkbox"/> Rents & Royalties	2. _____	5. _____	<input checked="" type="checkbox"/> Withholding statement
Other tax accrued or paid	3. _____	6. _____	<input checked="" type="checkbox"/> Cancelled check
Total (lines 4, 5, and 6)	7. _____		

**PART B--FOREIGN TAXES AVAILABLE FOR CREDIT**

8. Amount from Line 7 above and from all other W/S CR-5 . . . . . 8. \_\_\_\_\_  
If foreign tax paid exceeds the credit, the excess MUST be carried back two years; balance may be carried forward.

9. Carryovers from 19\_\_ \$ \_\_\_\_\_, 19\_\_ \$ \_\_\_\_\_, 19\_\_ \$ \_\_\_\_\_ 9. \_\_\_\_\_

10. Income excluded on Form 2555 . . . . . 10. \_\_\_\_\_

11. Earned income subject to foreign tax less allocable deductible expenses . . . 11. \_\_\_\_\_

12. Line 10 divided by Line 11 . . . . . 12. \_\_\_\_\_

13. Foreign tax (Line 7) multiplied by Line 12 . . . . . 13. \_\_\_\_\_

14. Other reductions--Sections 901(e), 907(a), 6038, Form 5713 . . . . . 14. \_\_\_\_\_

15. Available for credit (combine lines 8, 9, 13, and 14). Enter in Box 621, 2A . . . . . 15. \_\_\_\_\_

**PART C--GROSS INCOME FROM SOURCES OUTSIDE THE UNITED STATES**

G  Nonbusiness interest  from a DISC or  If income is in more than one category (Q, R, S, or T),  
R  Dividends  former DISC  figure the credit on each category separately on manually  
S  Foreign oil related income  prepared Form 1116s. Enter total credit in D/S 2A Box  
T  All other income from sources outside the U.S.  621. Leave other boxes blank.  
R  16. Dividends . . . . . 16. \_\_\_\_\_

(Illustration showing use of special Epson codes.)

## Technical Corner *Continued from page 1*

get into DDT assembly mode and enter it with mnemonics. Then you can warm boot and save it from CP/M. That may be easier for you if you are experienced with DDT. The save size is 3EH or 62 decimal.

If you enter the patches under DDT, do not be tempted to read in the assembled file with the "R" command. This won't work since you are trying to patch only specific locations, not an entire section of code.

Once all this has been completed, WordStar is ready to run on any version of my SOS or Intertec DOS 3.X and up. It will be very fast because of the direct usage of the memory map. The clock, if displayed, will be in its correct position. The screen will be cleared at the start and end of your WordStar session. Note that this patch does not attempt to clear the  $\wedge$ W problem that the older Intertec DOS had. Poking around in the BIOS after some code which will change location from version to version is a very definite no-no. Intertec has since changed  $\wedge$ W to  $\wedge$ @ which does not interfere with WordStar.

Anyone wishing copies of WSPATCH.ASM or correct copies of the screen dump utilities previously printed in Superletter may send me a SASE and a note specifying which you want.

I would like to use this last paragraph to provide an acknowledgement to TriStar Data Systems in Cherry Hill, New Jersey, for their generous cooperation during the research for my last article, "Inside the SuperBrain II."

```
; SOS File WSPATCH.ASM
;

; Jonathan Platt
; 2804 Fairway Drive
; Melbourne, FL 32901
; Phone: (305) 724-6148
;

; This file may be used and copied as long as references to SOS
; and the author are retained.
; Assemble only with ASM.COM! - M80 DWs aren't assembled the same.
;

FALSE EQU 0
TRUE EQU NOT FALSE
PPIA EQU 68H ;PPI port A address (video control)
;

; MDLII selects the type of Intertec computer you have. If
; you have an old model SuperBrain or CompuStar, set MDLII to
; FALSE. If you have a new model, set MDLII to TRUE.
;
MDLII EQU TRUE
CLEAR EQU 12 ;Control code to clear screen, reset pointers
ROWS EQU 24 ;Number of rows on CRT
SPACE EQU ' ' ;..., the final frontier."
MCNPAT EQU 02E0H ;WordStar user patch area
ATTRIB EQU 04000H ;Model II screen attribute memory address
CONOUT EQU 0DE0CH ;Console output vector
LISTST EQU 0DE2DH ;LIST device status vector
CRTPOS EQU 0E412H ;Storage for cursor offset into screen
LINFLG EQU 0E434H ;Row enable flags
VIDMAP EQU 0F800H ;Video memory map
LDIR EQU 0B0EDH ;280 LDIR instruction
SDED EQU 053EDH ;280 LD (nn),DE instruction

ORG 0264H
UCRPOS: JMP CURPOS ;User cursor position routine
ORG 02A4H
INISUB: JMP INIT ;Initialization subroutine
UNISUB: JMP INIT ;Uninitialization subroutine
```

```
ORG 02AAH
USELST: DB 0FFH ;Flag that last screen position available

ORG 02AEH
DELCUS: DB 0 ;No delay for cursor commands
DELMIS: DB 0 ;No miscellaneous delays
MEMAPV: DB 0FFH ;Flag that video memory map exists
MEMADR: DW VIDMAP ;Tell WordStar where the memory map is at

IF MDLII
;
; If you have a new model and you have an alternate character set
; EPROM which highlights normal characters, patch HIBIV non-zero.
; Such an EPROM, for example, could be a reverse video character
; set EPROM.
;
IF 02B3H
HIBIV: DB 00H ;Patch non-zero for special EPROM
ENDIF

ORG MORPAT
;
; INIT will clear the screen. In doing so the following
; important events will occur:
;
; - Row enable flags disabled. Memory map clear won't be
; visible on screen (looks messy while clearing).
; - Top-Of-Page becomes actual start of video memory map.
; - Cursor offset pointer cleared to Top-Of-Page.
; - Clock offset cleared to top right corner of screen.
;
INIT: MVI C,CLEAR ;Clear screen and set pointers
CALL CONOUT
LXI H,VIDMAP ;Start from top of memory map
LXI D,VIDMAP+1 ;Point to next byte
LXI B,07FEH ;Bytes to clear
MVI M,SPACE ;Clear first byte for all to follow
DW LDIR ;Clear video memory map

; Memory cleared. Now enable screen display.
;
LXI H,LINFLG ;Enable all CRT rows
LXI D,LINFLG+1
LXI B,ROWS-1
MVI M,OFFH ;Set first row active
DW LDIR ;Flag all rows other as active

; This next routine clears the attribute memory if MDLII
; equate set for new model.
;
IF MDLII
;
; Clear out attribute memory
;
DI IN PPIA ;Don't let interrupts play with the banking
PUSH PSW ;Get current video state
ANI 11011111B ;Save it
OUT PPIA ;Mask in attribute memory bank select
LXI H,ATTRIB ;Switch banks if not already there
LXI D,ATTRIB+1 ;Load parameters to clear attribute memory
LXI B,07FEH
XRA A
MOV M,A ;Clear first byte for all to follow
DW LDIR ;Clear all character attributes
POP PSW ;Retrieve old bank select state
OUT PPIA ;Restore to old condition
EI ;Resume normal interruptions

ENDIF
RET

CURPOS: DW SDED,CRTPOS ;Store new cursor position
RET
;

; If your printer is on your LIST device, this small routine
; will test the busy status of the device. This improves response
; time while editing and printing at the same time.
;
; Do not patch in the following code if your printer is not
; on the LIST device.
;
BSYTST: CALL LISTST ;Get LIST device status (FF or 0)
INR A ;A = 0 if ready; 1 if busy
RAR ;Set CY flag = 1 if busy
; ; 0 if not busy
RET
ORG 0717H

CSWTCH: DB 0
HAVBSY: DB 0FFH
LIBSY: JMP BSYTST
LIBSY: DB 0
LIBSY: JMP BSYTST
END
```



## -Program #1-

**PURPOSE:** The SuperBrain uses the CTRL-W key to turn screen scrolling on and off. The Wordstar software program uses CTRL-W for line down scrolling. A method of reassigning the on/off scrolling function to CTRL-@ is presented here, which should resolve the conflict.

**CHANGE:** The modification was made using the DDT function of CP/M version 2.2. The only change to be made for using this procedure for the different models would be in the operating program name, i.e., SB31CPM.COM or SB32CPM.COM, etc.

The user input is underlined. Do not enter the underlining when making the change. <CR> indicates entering a RETURN.

A> DDT SB32CPM.COM<CR>

DDT VERS 2.2

NEXT PC

3100 0100

-S28A0<CR>

28A0 17 00<CR>

28A1 CA <CR>

-CTRL-C

A> SAVE 48 NEW32CPM.COM<CR>

At this point you have a version of the NEW32CPM.COM in which the screen scrolling has been assigned to CTRL-@. To install in the system, use the following procedure and assume the disk to be changed is disk A.

A> NEW32CPM<CR>

SYSGEN VER 1.4

SOURCE DRIVE NAME (OR RETURN TO SKIP) <CR>

DESTINATION DRIVE NAME (OR RETURN TO REBOOT) A<CR>

DESTINATION ON A, THEN TYPE RETURN <CR>

FUNCTION COMPLETE

DESTINATION DRIVE NAME (OR RETURN TO REBOOT) <CR>

John M. Stockberger  
2 S 643 Nelson Lake Rd.  
Batavia, IL 60510

## -New Products-

*Continued from page 4*

CP+

Taurus Software

670 Market Street

Suite 815

San Francisco, CA 94102

SOFTWARE:

Remember what it was like when you first

## -Program #2-

; SOS File GETROM.MAC  
;  
; Programmer: Jonathan Platt  
; Zilog Mnemonic Z80 Source Code

;  
This program will pluck the SuperBrain's or CompuStar's PROM from hiding. It is to be used with DDT. The screen will flicker slightly but it's nothing to worry about.

;  
; Procedure:  
;  
;A>DDT GETROM.HEX  
;DDT Version n.nn  
:-C4500,aaaa ;Where aaaa is the breakpoint address (see below)  
;-D100,900 ;and a dump of your PROM will magically appear!  
; Then, to put it in a disk file, do:  
; -^C ;Reboot  
;A>SAVE 8 PROMxx.COM ;Where xx is the version number (8 pages equals 2K)  
;A> ;You now have a machine image COM file of the PROM  
;  
;

<pre> PPIB EQU 69H PPICW EQU 6BH  ASEG  ORG 4500H ;Base program above bank zero  LD HL,0100H LD DE,0101H LD BC,4000H LD (HL),0 LDIR ;Clean up bank zero  DI ;Musn't have interrupts with bank zero out LD A,0AH OUT (PPICW),A ;Generate a BUS REQ  FOO: IN A,(PPIB) ;Get CPU-2 status RLA ;BUSAK? JR C,FOO ;No, wait... LD A,5 ;Yup, now switch out bank zero... OUT (PPICW),A ;...by setting PPIC-2  LD HL,0 ;Source (PROM) starts at location zero LD DE,5000H ;Destination - out of bank zero LD BC,0800H ;It's a 2K PROM LD LDIR ;Send data from source to destination  LD A,4 ;OK, got the data - Switch bank zero back in OUT (PPICW),A LD A,0BH ;Give CPU-2 its bus back OUT (PPICW),A  EI ;Now that we're back, interrupts can happen  LD HL,5000H LD DE,0100H LD BC,0800H ;Move memory image of PROM to TPA base for save  NOP ;***** SET DDT BREAKPOINT HERE ***** NOP  END </pre>
--

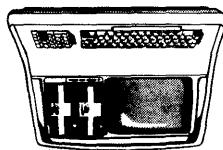
tried to understand CP/M after you got your SuperBrain? Remember your opinion of the documentation and CP/M function commands?

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configuration menu. What a surprise! And it worked perfectly. The only trouble is it came three years too late for us to truly enjoy its many features and sophistication. But we recommend it for all new SuperBrain users and for dealers who need to make the computer's housekeeping functions easy for their customers to use, the first time and every time.

CP+ came with SuperBrain II listed on the

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# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

April/May 1983  
Vol. 3 No. 2

**S**uperBrains and CompuStars continue to sell even in the midst of the intense war going on in the microcomputer marketplace.

Why? We think it's because they've become popular with business, government and educational institutions who aren't necessarily swayed by mass marketing hype.

The used-SuperBrain market is still hot. People do not want to separate themselves from their Intertec machines. Don't believe it? Try and buy a used SuperBrain or CompuStar. The ones that are advertised here usually sell within five days of publication.

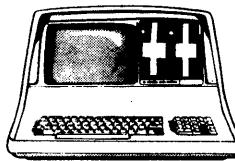
Also, the 16-bit dream is slowly becoming a nightmare. Software has just not materialized for that level of computers. The operating systems offered to run 16-bit computers still have bugs in them. So, while the 8-bit CP/M user happily goes on his or her way choosing from over two hundred available working software packages, (with more coming out each day), the 16-bit user has to pick through about only twenty, and the development of new software products looks just as bleak. And we should know. We've been selling computer software around the world for over two years.

Modems and modem software have been the hot items lately. It seems that people are definitely connecting their micros to the many proliferating data/information services. The Source and CompuServe are only two of some very powerful and valuable databases available now. In our opinion, the telephone/computer connection is a major trend that will continue to grow rapidly in the months ahead.

As many of you know, we are sold out of several back-issues of Superletter due to over-demand. Thus, we are preparing a special volume of all the important technical articles, product reviews and stories from past Superletters prior to January, 1983. The entire journal will sell for \$35.

We are accepting ads in all sizes for the book from dealers, distributors, software publishers and any other businesses that wish to get their message to the Intertec computer user. These ads will be unique. They will be part of a permanent publication we know will be extremely valuable as the months and years go by.

In addition, we are preparing a giant SuperBrain Shoppers Guide, packed with all the printers, software, modems, cables, BIOS packages, graphics disk drives, S-100 add-ons, data services, covers, surge protectors, games, hard-disks, and other peripherals approved by us for guaranteed operation on all the Intertec machines. We will also include the many RS-232 pin configurations for all of the published peripherals.



If any of you are going to attend the NCC, please let us know. We'd like the chance to personally meet and discuss your use of your computer. That's how we get stories and spot trends. Call us and let us know where and when you'll be attending the show.

It's always a pleasure to talk to each of you. And thanks for your letters.

*Albert Abrams*  
EDITOR

## Technical Corner

Switching Disk Drives on  
the SuperBrain

by Steve R. Riskin  
Computer Assisted Law, Inc.  
1327 Palms Blvd.  
Venice, CA 90291  
(213) 399-8160

Recently the "A" drive on my SuperBrain died while I was in the midst of litigation. I knew I wouldn't be allowed to enter a floppy disk into the legal records, so I had to do something fast. But I could not boot up, could not get to drive B, and could not print. The only thing I could do, it seemed, was find a way to switch drive B into drive A's slot.

With the cover removed, it appeared that the drives were held in with two allen-head screws from the bottom of the aluminum shelf on which the drives rested. The only visible wiring to the drives was a three wire nylon plug on the PC board on the upper left side of each drive. I labeled these A and B and gently removed them, being careful not to damage the PC boards.

The plugs are placed in sockets. I learned to extract the plugs only after trying to remove the plugs and sockets together. Here are directions for the rest of the replacement procedures.

Once the wires are disconnected, (they're the conduits for the power supply to the drives), gently pull the B drive forward and disconnect the ribbon cable at the bottom of the PC board. That should free drive B. Label the drive so it will not get mixed up with drive A.

If you are retrofitting for the increased efficiency of dual-sided Tandon drives (and both your Shugarts are okay) label each drive as you remove them anyway - they are

*Continued on Page 2*

**Technical Corner** *Continued from page 1*

different and you will need to take those differences into account. Pull drive A forward and disconnect the ribbon cable from the edge connector. Both drives are now out and labeled.

Inspect the PC boards of the two drives. Notice that drive A has more material on it than drive B. A has a removable IC in a socket. B has an empty socket in the corresponding place. Notice also they both have sockets with what looks like an IC but is a device with rows of little metal 'bow ties' down their spine.

Some of these little bow ties are broken and some are not. The pattern of broken and unbroken bow ties between the two devices on each drive is different. Note that there may be some 'extra' spaces in the sockets into which the IC and the bow tie are plugged. Also note toward which end of the socket the IC and the bow tie device are oriented.

Mark the appropriate end of the IC's and the bow tie device, and then move the IC from drive A to drive B.

Then switch the two bow tie devices. Drive B is now Drive A! Put in the new drive A. Connect the ribbon cable to the edge connector and the three wire nylon plug. Now you can boot up.

I decided to upgrade from my 35-track, single-sided, 30ms Shugarts to double-sided, 35 tracks per side, 6ms Tandon drives. The SuperBrain will take 2 Tandon TM 200-21s. These are speedy, double-density double-sided drives. They are fully compatible with the SuperBrain. However, you do need a quad operating system to read both sides of the disk. You can, however, continue to operate with your present DOS until you can get the quad-density operating system.

You will also need to upgrade the disk drive power-supply. The one provided with the SuperBrain will run the new Tandon double-sided drives but you're right on the border line. If a large appliance should cut in while the SuperBrain is addressing a drive you may set the power supply out of sync with the drives. The result: the drive begins turning on and off about twice a second and will not read data correctly.

Some older SuperBrains have a single power-supply for the whole machine and some have a separate power-supply for the disk drives. You can determine which you have by inspection.

The separate disk-drive power-supply is located on a board which hangs vertically on the back of the disk-drive shelf. It's connec-

ted to the main power-supply by two wires that originate from a terminal strip to which the fan is connected. If your SuperBrain is so configured, it is very easy to retrofit it with the Tandon drives.

If you are cautious, you may simply disconnect the disk-drive power-supply (by disconnecting the two screws that connect it to the terminal strip) and replace that board with a commercial power supply with increased output.

The Tandons require 900 M amps on the 12 volt line and 600 M amps on the 5 volt line per drive. There is plenty of room inside the SuperBrain so you can choose from a number of commercial power supplies if you like. I liked the Condor LFM 410 with 4 amps on the 5 volt output and 2 amps on the 12 volt output.

The only other requirement, the quad operating system, can be bought from the people at Superletter or from your SuperBrain dealer. But once you have made the hardware change-over you can continue to use your old single-sided (DDSS) disks if you like with either the old operating system.

You can even mix disks of the old format freely with your new double-sided disks (since each disk has its own DOS resident.) (Remember how they were SYSGENED!)

You don't even need to mark them (though I do) and the only difference you will note is that when you STAT a new disk the disk will have 320 K of space instead of 160 K. You can even get the machine to read 40 tracks per side on the Tandons if you are a real glutton for memory. But you cannot mix 40 track (or 80 track) and 35 track (or 70 track) disks!

To install the Tandons: perform the procedures mentioned above, and add the IC from the old (Shugart) drive A to the new Tandon drive A.

There will be a 'dummy' IC on the new Tandon drives in the socket in which the IC you are transferring should go. The corresponding sockets will be in different locations on the new Tandons. Don't worry — the number of sockets is two — one for the IC and one for the device. Everything else is soldered to the PC board. You can tell which socket is for which by inspection. The dummy IC is in the socket which takes the old Shugart IC.

Remove the dummy IC and save it in case you have to carry the Tandon back to the place of purchase. Remove the fresh bow tie device on the new Tandon (it has none of the bow ties broken.) You can reproduce the appropriate design or merely replace the virgin device with the one from the old

*Continued on Page 7*

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# Letters to the Editor

DEAR SUPERLETTER :

You keep asking about what we do with our SuperBrains. My single sided 64K SB is 18 months old next week, and my friend's (who lives 300 miles away), is 15 months. I sell solid fuel domestically and my friend is a retail butcher. Both our businesses are quite small with under 10 employees and turnovers around \$1,000,000 each. Specific software in compiled Basic, plus financial, sales etc., forecasting, and bookkeeping routines using SuperCalc are written by me. Purchased software, apart from the cost, is not capable of doing things the way we want.

A Cambridge Micro Computer SBS-100A, S-100 adapter (this piggybacks into the Z80 socket) was installed by me some 12 months ago. It is a single socket type and I would like to be able to plug a sort of multiplug into it which would allow one S-100 board to be plugged straight in on top, and a lead going straight from this multiplug to another one or two blank sockets. A Rostronics "Prestel" S-100 board is currently in use. I require S-100 boards for a modem (more later) preferably 300-1200 baud - the Prestel board transmits at 75 and receives at 1200 - and another to input "Teletext" to SB. Though for the latter I haven't heard of anyone who makes one.

I am just beginning to sort out a "kit" for reception of Meteosat & Gorizont (amongst others) satellites, and feel that SB should be incorporated there somewhere, but I haven't figured out just where yet!

Service, reliability and factory dealings have been quite satisfactory throughout. My machine, at 6 months, developed lines collapse, immediately followed by frame collapse after about 10-15 minutes running. After a trip to the local dealer to buy an exchange video board off the shelf, I was up and running again in 2 hours. My buddy had one failure under warranty, fixed within 3 days by a non-supplying dealer. I have had two occasions to write to the factory regarding things I was trying to do software-wise, and on both occasions, their technical department replied within a few days and offered useful advice.

I have some comments on various Superletter items in all the issues to date.

Vol-1 No-2 Page 6. Technical Corner.

Modifications to SYSGEN22 for elimination of "Source Drive Name" will work on Vers 3.0, but not on Vers 3.1. The mods for

automatic execution of command line at cold start don't work on either system.

Vol-1 No-2 Page 7. Readers letters.

- a) Reader request for data on 600-1200 baud modems.
- b) Reader request for general review of modems.
- c) Editor's note inviting articles.

I am firmly convinced that the area of microcomputing to show the biggest growth will be that of communications. From the number of advertisements for modems in BYTE, it seems to have started already in the U.S. - nobody makes them in Europe other than British Telecomms, at one hell-of-price. (Obviously intended for minis, or mainframe users who don't know any better). Hayes & Novation obviously have sufficient business as after more than a month they have not responded to my request for information. I have, as a stop-gap, ordered an Anchor Signalman, primarily to see if a standard U.S. unit is compatible with the British phone system.

Vol-1 No-6 Page-1 Editorial:

Here you state that SuperCalc is not compatible with the BIOS of I.E. Systems EPROM. It is compatible with Jonathan Platt's, and also his is compatible with Microshell. I am interested in their EPROMs for disk-drive spindle speed-checking.

Vol-2 No-1 Page-2 Technical Corner:

The 3rd paragraph mentions a problem with cursor positioning. I have noticed a similar anomaly when using, in MBASIC-PRINT CHR\$(12). The solution in this case is to put an extra PRINT: in front. Very useful in the same paragraph, I now use <Esc ~ B> and <Esc ~ N> to put up blinking messages of importance.

Vol-2 No-3 Page-2 Potpourri:

I have the ^W problem mentioned in my Vers 3.1 though with type-ahead it is fairly irrelevant as I just hold down ^E. The patch quoted for Vers 3.0 doesn't fix my 3.1 but blanks out part of the screen. The second problem mentioned of "clocks appearing all over the screen" is simply cured by only entering Wordstar after a re-boot with the red keys. The third problem is a patch to run Wordstar 3.0 on SB 3.1. Micropo also gives a solution to this in the Sept., 82, Lifelines. The snag is that none of the solutions work on my 3.1.

| Location | Current | Patch | Micropro | I use |
|----------|---------|-------|----------|-------|
| 02EDH    | CO      | 00    | 00       | CO    |
| 021FH    | D5      | 1D    | 18       | 18    |
| 02F2H    | E5      | E7    | E7       | E7    |

If location 02EDH is changed from CO to

OO, this really mucks things up. After a few ^E & ^X the screen is left completely blank, and it stays that way!

I have found the following to be extremely useful :

Lifelines, Aug '82. Patching PIP for multiple file transfer.

Lifelines, Sept.'82. A query-driven erase function.

Finally, where and when can I get Vers 3.2 and an upgrade to SBII features? Also your quote of the SBII factory recommended prices seems to indicate that it is for the U.S. market only. The 110volt conversion to 240volts is no problem, but it must be a 50Hz unit for use here. Are they available in the U.S.?

**Editor's note :** Getting the 3.2 BIOS is no problem. Any dealer can sell you the BIOS. If not, let us know. There is no upgrade to SBII available. However, the Com-Stute graphics package we sell for the SBII will give you many of the same attributes on the screen.

Trevor Smith  
12 Tollgate Road  
Hamsterley Mill,  
Rowlands Gill,  
Tyne & Wear.  
NE39 1HF  
ENGLAND

*Continued on Page 4*

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**Letters to the Editor**  
*Continued from page 3*

**DEAR SUPERLETTER :**

In the Oct / Nov., 1982 issue it was reported that loose solder joints at the vertically mounted capacitors on the video board were causing intensity jitters. Two of our units developed screen jitters of another type, a sudden reduction in screen size (an overall shrinkage of about 15%) or a complete blanking of the screen. A high amplitude low frequency pulse applied to the left rear of the cabinet (known in the high-tech world as a "brogan adjustment") seemed to temporarily fix the problem but it was felt that since the 'BRAINS' were probably not designed for low cycle fatigue testing we would be best advised to find a more permanent cure. An inspection of our video boards revealed that we had cracked solder joints at the connector pins of the two white connectors in the middle of the board. A resoldering of all of these pins gave us a rock steady display.

We recently installed the XCEL® Graphics Unit from MAXTEK, INC. The physical installation is a thing of joy, the entire procedure takes about thirty minutes and

requires no tools but a screwdriver; a well engineered add-on. However, if the hardware is rated as a 10, then the software must be a 5. Our central dissatisfaction lies in the display restrictions imposed by the 50/60 hz. input power differences. The XCEL® GRAPHICS TERMINAL, a Tektronix® 4010 emulation package, is virtually useless since it cuts off the lower 16 pixels. This alone wouldn't be too bad, but the software then tries to display in the center of the screen anything which was to have appeared in this lower region. I suppose that routines written to display only on an XCEL® equiped 'BRAIN would function O.K., but that fits only a small portion of our needs; most of our packages must run on the original Tektronix® too. Further, the XCEL® Screen Printer cuts off thirty two pixels of either the left or the right of the display on an Epson MX - 80 due to the apparent 480 dot limitation of the printer. Since the Epson 8155 Serial Interface with 4K buffer allows 960 dots in its high resolution mode it would appear that some software rewrite is in order. Ideally MAXTEK should upgrade the software to take advantage of hardware limits, but certainly as a minimum they should insure normal performance on the power circuits of the user country. Any reader experience and comments on the use of these packages

would be appreciated.

John Adams  
General Electric Co.  
Mail Drop K-60  
1 Neumann Way  
Cincinnati, OH 45215  
(513) 243-5426

**Editor's Note:** MAXTEK responded quickly. Their letter follows. Your answers are in the mail.

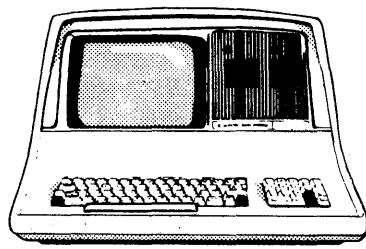
**DEAR SUPERLETTER :**

In response to the letter from John Adams of General Electric: We have forwarded his letter to Micronex, Ltd. in England who are the original developers of the XCEL™ Graphics Software. They were able to provide us with some answers on this matter and we would like Superletter to forward the technical documents to Mr. Adams directly.

We appreciate this opportunity to reply to Mr. Adams' questions and concerns. Please let us know if we can be of more help.

Sincerely,  
Janet Diem  
Marketing  
MAXTEK

*Continued on Page 7*



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## SOFTWARE:

OMNIPAC is a new release designed specifically for SuperBrain and features a 20 item menu to call various games, the most asked for statistical routines, a tutorial on advanced basic programming tricks for the SuperBrain and a checkbook/tax advisor program. The games feature both action and intellectual challenge. Included at an additional cost of \$7.50 is a copy of "Modem 7" for communication with computer bulletin boards. Omnipac is available only in SuperBrain format. Price direct is \$29.50 plus \$3.00 shipping and handling.

~~~~~  
**SmartKey**  
Heritage Software  
2130 S. Vermont  
Los Angeles, CA 90007  
(213) 737-7252  
Contact: Mr. Stan Brin

## SOFTWARE:

This CP/M utility program is growing in popularity and comes formatted for the SuperBrain/CompuStar computers. It provides the user intelligent keyboard facilities.

The program allows individual keys of the console keyboard to be redefined to represent different character codes or strings than those produced by the hardware.

Frequently used commands, phrases or control characters can be redefined on rarely used graphic or special keys. A long address that an end-user must insert frequently into documents, for example, can be defined on the "%" key which would save having to type that phrase over and over again.

Even word-processing commands can be defined on any key to save time for the typist or programmer. But all the key definitions can be changed back or made into new commands easily.

Commonly used definition can be saved as a special file that be brought into use at any time. Thus, several key definition files can be on a disk whenever a particular set is needed for use.

Once installed, the program is transparent to the user allowing full use of all CP/M functions.

## SuperBrain I Graphics Package

Com-Stute, Inc.  
Yokohama, Japan

## HARDWARE:

This hardware/software product provides graphics capabilities to the SuperBrain I computers.

Complete with a fully-developed chip board, software and installation instructions, the package provides the end-user with the ability to generate the following four video attributes:

### REVERSE VIDEO, UNDERLINE, STRIKETHROUGH, AND BLINKING.

The displays can be changed at any time since the program is under both machine and user-control.

Available through Superletter.

support four drives. I plugged the new cable and drives into the SuperBrain, did a cold boot using the newly generated system with disks in all drives. DIR C : and DIR D : produced the directories of both drives.

### Listing 1

```
;DBBASE EQU $XLTO,0000H
DPE0 DW 0000H,0000H
      DIRBUF,DPE0
      CSV0,ALV0
;
;DEFINITION FOR DISK B (512 BYTES/SECTOR)
DPE1 DW XLTO,0000H
      0000H,0000H
      DIRBUF,DPE0
      CSV1,ALV1
```

### Listing 2

```
;BEGDAT EQU $31
ALV0: DS 16
ALV1: DS 31
CSV1: DS 16
```

### Listing 3

```
;seldsk:
;select disk
lxi h,0000 ;error return code
mov a,c ;selected disk number
sta sekdsk ;seek disk number
cpi 2 ;max no. of disks
rnc
mov l,a ;disk number to HL
mvi h,0
dad b ;multiply by 16
dad h
dad h
lxi d,dpbase ;base of parm block
dad d ;hl=.dpb(curdsk)
ret
```

### Listing 4

```
;DBBASE EQU $XLTO,0000H
DPE0 DW 0000H,0000H
      DIRBUF,DPE0
      CSV0,ALV0
;
;DEFINITION FOR DISK B (512 BYTES/SECTOR)
DPE1 DW XLTO,0000H
      0000H,0000H
      DIRBUF,DPE0
      CSV1,ALV1
```

### Listing 5

```
;DEFINITION FOR DISK C (512 BYTES/SECTOR)
;DPE2 DW XLTO,0000H
      0000H,0000H
      DIRBUF,DPE0
      CSV2,ALV2
```

### Listing 6

```
;DEFINITION FOR DISK D (512 BYTES/SECTOR)
;DPE3 DW XLTO,0000H
      0000H,0000H
      DIRBUF,DPE0
      CSV3,ALV3
```

### Listing 5

```
BEGDAT EQU $31
ALV0: DS 16
CSV0: DS 31
ALV1: DS 16
CSV1: DS 31
ALV2: DS 16
CSV2: DS 31
ALV3: DS 16
CSV3: DS 16
```

### Listing 6

```
;seldsk:
;select disk
lxi h,0000 ;error return code
mov a,c ;selected disk number
sta sekdsk ;seek disk number
cpi 4 ;max no. of disks
rnc
mov l,a ;disk number to HL
mvi h,0
dad b ;multiply by 16
dad h
dad h
lxi d,dpbase ;base of parm block
dad d ;hl=.dpb(curdsk)
ret
```

Installing the drives was a snap. I bought two Shugart 35 track 5.25 inch drives and the box with power supply from a local computer fixit shop. They set the addresses to C and D on the drives, and made new cables to

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**Technical Corner Continued from page 2**  
drives. The sockets into which the IC and the device go on the new Tandon have more spaces for legs. That is, there may be 16 leg sockets but you may be placing a 14 leg IC and a 12 legged device in that socket. Ignore the extra socket holes but make sure the IC and the device are up at the proper end of the socket.

Remember, you marked the IC and the socket just to make sure. If your socket is a 12 legged beast it may be crutched up with a jumper wire in the 7th set socket holes on your old drive. Transfer the jumper wire also - or, if you reconfigure the virgin device, it will have 14 legs and so the jumper wire is not necessary. Just don't break the last bow tie and it will serve in place of the jumper wire.

Everything done, replace drive A first. It is easier to connect the ribbon edge connector first to drive A and then to drive B.

Then slide in drive B. Connect the three wire nylon plug to each drive and turn on the machine. Familiar messages should appear on your CRT and the disks should boot. SYSGEN the new quad density operating system onto some disks and then STAT up more memory than ever you thought you would see on a SuperBrain disk.

If you have one of the commercial BIOS chips in your SuperBrain the new disk drives should shut off when not addressed. If you do not, your new drives may run the drive motor when not addressed even if your Shugarts didn't. There are three ways to get your new drives to turn off. One is to buy a new ROM chip.

You can do what Tandon's engineers recommended or you can do what CMC's engineer recommended - or you can, like I did, do a combination of both.

Tandon's engineer recommended the following. Note: this is not a recommendation of Tandon's. This information was offered informally and Tandon will void your warranties if you bring back your drives with these modifications. Locate IC E3. The board has labels next to every IC. Cut pin 1 on E3. Do this for both drive A and B. Pins are numbered from the top left side of a chip - the top is the end side with a notch or half circle mark in the plastic - down the left side sequentially.

Thus pin 1 is left top, pin 2 is left next, pin 3 is on the left just under pins 2 and 1, etc. When you go from pin 8 to pin 9 you will be starting up the other side of the chip - up the right side.

Be careful when you do the cutting not to

mar the board underneath. The board has wiring just under the painted surface. Locate the bow tie device. On drive A put a jumper from pin 2 to pin 8. That is a jumper down the left side of the bow tie. On drive B connect pin 3 to pin 8.

That's the information from Tandon's engineer. When I completed those procedures drive A worked beautifully, shutting on and off as addressed. But drive B would balk and not read data!

I talked to CMC in Seattle since I had just bought a hard disk of theirs through Superletter and the hard disk I/O board uses the socket the commercial IC goes in - hence rendering the commercial IC useless. My question to them was how to solve this problem.

They stated that the problem could be solved this way: locate the edge connector on the Tandon drive. This is the copper keyboard around which the ribbon cable clasps the PC board. Count up 8 'keys.' As you pass number 2 there should be a slot between 2 and 3. Use a piece of scotch tape, trimmed to size, to isolate the top only, so that when the ribbon cable is connected, 'key' 8 is disconnected.

Do not cover the bottom side - the ribbon connector connects both top and bottom but each side is a different line. I suggest you let the tape overlap the bottom side a sixteenth of an inch so that when the ribbon connector is put back on, it does not push the tape off, exposing the connection you attempted to isolate.

Tape is fragile so if you remove the ribbon connector again you will have to make sure the scotch tape mask has not been moved to expose part of the copper surface. Now jump - on the device - from 8 to 9. This is a horizontal jump across the last pair of sockets on the bottom. Also since the Shugart device is a 14 pin socket, and the Tandon is a 16 pin socket, it is real easy to do. Nothing else shares these socket holes; and bent paper clip works beautifully. (CMC, by the way, calls the device a "shunt pack.")

I did all these changes - but remember I had performed Tandon's changes as well. The two sets of changes do not bide well with each other and now drive A balked but B would shut off when addressed. So I experimented with a series of combinations of the moves. The successful configuration is as follows.

On drive A I have edge connector 8 covered. Pin 1 on E3 was and remains cut. There is no jumper from 2 - 8; no jumper from 7 - 10; but there is a jumper from 8 - 9. On drive B, edge connector 8 is not covered; there is a

jumper from 3 to 8; no jumper from 7 - 10; and there is a jumper from 8 - 9. Pin 1 on E3 is cut.

Now, my drives work beautifully; but without the commercial IC I don't know how to get them up to their potential 6ms speed. No matter, data is firmly read and written to and from disk and disk memory is up 100%.

## Letters to the Editor

*Continued from page 4*

### DEAR SUPERLETTER

I am interested in the possibility of adding one of the new semi-conductor "disks" to my SuperBrain. Presently, I could add an S-100 adopter and then an S-100 semi-disk. Do you or any Superletter readers have experience with or suggestions about such a product?

Sincerely,

Dr. George Corliss  
Dept. of Math., Stat., & Comp. Sci.  
Marquette University  
Milwaukee, WI 53233

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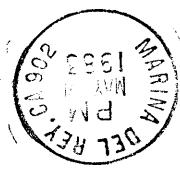
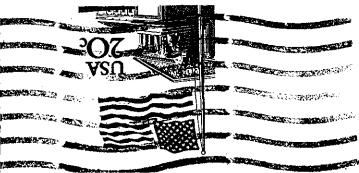
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# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

June/July  
Vol.3 No.3

**S**everal issues back we mentioned our hesitation to recommend Peachtree products due to that company's failure to support the Intertec format.

We visited Peachtree's booth at the NCC and had several phone conversations with their technical people since then regarding the problems SuperBrain II and CompuStar users were having with the "improved" Peachtext word-processing software.

Now, Peachtree has formally told us they will not support the SuperBrain II format. They do not want to buy the machine and will not list it as a computer for which they will provide help.

They intend to move their interest into the 16-bit computer market and will limit their software support only to the 8-bit computers they have on hand.

Considering the thousands of Intertec computers being used and purchased for government and business, including IRS and FAA national installations, we question the soundness of this business decision.

**Editor's note:** As we went to press, Peachtree called and said they were reconsidering their position. They wanted to know if a SuperBrain II could be made available to them in the Atlanta area to work on. We put them in contact with Equipment Resources, Inc. We'll stay on top of the story.

Turning back to the subject of the NCC, we had the opportunity to visit Intertec's exhibit and speak to some of the people working there.

The exhibit itself was in a large, prominent area of the Anaheim Convention Center. A CompuStar multi-user system was in operation with seats in front of various VPU models for hands-on demonstrations. SuperBrain II's were featured in their own area.

We found the exhibit busy and the salespeople quite attentive. We gleaned from the

show that Intertec will be having an introduction of new products coming out soon, including the Irwin-technology internal hard-disk drive machines.

In reality, there was nothing new. But that isn't necessarily bad.

It means Intertec is focussing on its current line and not feeling the need to follow the rush to frantically put out new products at every other trade show. In a sense, that's good for the current owners, because it provides more stability in the areas of service and support for the current model lines.

We are impressed with the continuing flow of new software products now coming out for the Intertec machines. Two of them, "MCS", and "Seek and Search," were designed on SuperBrains, then being adapted for other CP/M machines following their debut in the market. The same goes for "The Ultimate", which takes advantage of the new SuperBrain II graphics character enhancements. We will be reviewing the latter two products in our next issue.

On the hardware scene, we have been given early notice of a new development in Intertec add-on products coming out by a third-party manufacturer. These include an enhanced color monitor with dense pixel graphics, and an add-on memory board with high RAM storage. We hope to be the source for these products for you in the very near future.

There is a special national BBS phone number just for SuperBrain and CompuStar users, courtesy of Dr. Paul Kelley. Crosstalk, Move-It, or other modem software will get you on-line in seconds. Call (617) 862-0781 at 300 Baud and have fun!

*Albert Abrams*  
EDITOR

## Technical Corner

### IOBYTE IMPLEMENTATION OF SUPERBRAIN CONSOLE AND PORT DRIVER ROUTINES

Written by

**James N. Herron, Ph.D.**  
University of Utah, Biochemistry Dept.  
410 Chipeta Way  
Salt Lake City, UT 84108

As a research biochemist, I use my SuperBrain for writing manuscripts and processing experimental data. In addition, I have developed software which allows the SuperBrain to emulate a DEC VT-52 terminal for a PDP-1170 minicomputer system. Over the past two years, I had amassed more than a hundred floppy disks and decided to consolidate these on a CMC Targa 10 megabyte winchester disk, obtained through SuperLetter.

I had been previously using Information Engineering's SB/E enhanced BIOS and was disappointed to learn that the new BIOS provided by CMC was a hard disk extension of Intertec DOS 3.2. Several of my programs made heavy use of SB/E's flexible IOBYTE reassignments, using both the main and auxiliary ports to drive a printer and digital plotter. Additionally, my installation of WordStar used the CP/M list device connected through the main port at 9600 BAUD with XON/XOFF software handshaking. Clearly, neither the above programs nor WordStar would work with the CMC BIOS. Rather than change my programs and WordStar to run on the new BIOS, I decided to modify the CMC BIOS to emulate SB/E's IOBYTE reassignments and software handshaking.

The routines listed below provide full I/O device reassignment and software hand-

*Continued on Page 2*

## Technical Corner *Continued from page 1*

shaking for both ports. Either Intertec DOS 3.x or CMC Targa BIOS for the SuperBrain I can be modified. Not having seen Intertec's DOS for the new SuperBrain II, I'm not sure if these routines will work without further modification. I used Z80 assembler mnemonics to facilitate use of the Z80 relative jump and bit test instructions. Fitting the new routines into the CMC BIOS was quite a squeeze, and since a relative jump can be encoded with only 2 bytes, I used them quite liberally. I have added two locations (XON and XOFF) to the end of the Intertec configuration area, for storing the transmission control characters for software handshaking. Currently, ^ S (13H) and ^ Q (11H) are stored in these locations, but they can be modified as required.

Incorporation of the modified BIOS into your operating system requires an assembler which recognizes Z80 mnemonics and produces relocatable code. Merger of the assembled BIOS with the SYSGEN utility requires that the code be relocated from high memory into the transient program area (TPA), without changing operand addresses. I used Microsoft's MACRO-80 to assemble the modified BIOS, putting the SuperBrain configuration area in the data relative segment (DSEG), and the actual code in the program relative segment (CSEG). Correct addressing for the two segments was encoded through use of MACRO-80's PHASE AND DEPHASE directives. Use "PHASE 0EF00H" to phase the configuration area and "PHASE 0DE00H" to phase the BIOS, followed by "DEPHASE" at the end of each segment.

Modification of Intertec DOS 3.x is relatively easy because there's enough room for everything in the Intertec BIOS area. Remove the following Intertec routines: CONST, CONIN, CONOUT, LIST, PUNCH, READER, AUXIN, AUXOUT, MAININ, and MNOUT, and replace them with the new routines listed below. Assemble the modified BIOS and relocate the BIOS to location 1F80H and the configuration area to 3080H. Make sure to generate a HEX file so that the modified BIOS can be patched into SB31CPM.COM using DDT. The following is an example of this procedure using Microsoft's M80 assembler and L80 linking loader:

```
A>M80 = NEWBIOS/L
A>L80 NEWBIOS/P: 1F80/D:3080, NEWBIOS/X/N/E
A>DDT SB31CPM.COM
-NEWBIOS.HEX
-R
NEXT PC
3100 100
-GO
A>SAVE 48 NEWCPM.COM
```

Finally, execute SB31CPM1 to write the

modified operating system onto a diskette. Then boot the diskette and try it out.

Modification of CMC Targa BIOS is more difficult, because the I/O driver routines have to be split into two parts. First, remove the same routines that were removed from the Intertec BIOS, and replace them with: CONST, CONIN, CONOUT, LIST, PUNCH, LPOUT, READER, TTYST, TTYIN, TTYOUT, AUXIN, and MNOUT. Then add PORTST, PORTIN, PRTOOUT, and GETST to the end of the CMC hard disk driver routine (starting at location EE01H). The contents of CSEG and DSEG have to be carefully ordered to prevent overlapping errors during linkage. DSEG contains the Intertec configuration area (EF00H), and the uninitialized RAM data areas starting at EF80H. Be sure to zero fill

the area between the end of the configuration area and EF80H, or else the linker will start the uninitialized data area immediately after the configuration area. This can be accomplished by putting "DS 0EF00H-\$" at the end of the configuration area. Don't forget to PHASE and DEPHASE each data area to get the proper addressing. CSEG begins with the standard BIOS starting at DE00H. As with the data segment, blank spaces will have to be zero filled. The first of these is the space following the autoboot command: DS 32-(-\$-AUTOLD). The standard BIOS ends at E400H, while the hard disk and port drivers start at EC00H. CMC has inserted two patches in this area which gives us three spaces to zero fill. An example of the organization of both data and program segments is given below:

INTERTEC CONFIGURATION TABLE		
*****		
DSEG	PHASE	0EF00H
BAUD	DB	0EEH
*	*	
*	*	
XOFF	DB	13H
XON	DB	11H
	DS	0EF80-\$
	DEPHASE	
*****	MODIFIED CMC BIOS	*****
CSEG	PHASE	0DE00H
JMP	BOOT	
*		
*		(JUMP TABLE)
AUTOLD	DE	3, 'DIR', 0
	DS	32-(-\$-AUTOLD)
*		
*		(BIOS)
USRSTRRT	EQU	\$
USRSIZE	EQU	0E400-\$
	DS	0E549H-\$
	DW	STACK1 (CMC PATCH #1)
	DS	0EAES5H-\$
	DW	STACK3 (CMC PATCH #2)
	DS	0EC00H-\$
	DEPHASE	
*****	UNINITIALIZED RAM DATA AREAS	*****
DSEG	PHASE	0EF80H
BEGDAT	EQU	\$
SEKDSK	DS	1
*		
*		(UNINITIALIZED DATA AREAS)
*		
ENDDAT	EQU	\$
DATSIZE	EQU	\$-BEGDAT
	DEPHASE	
*****	HARD DISK AND PORT I/O DRIVERS	*****
CSEG	PHASE	0EC00H
RETRIES	EQU	10
*		
*		(HARD DISK AND PORT DRIVERS)
*		
GETAUX	IN	A, (AXSTAT)
	RET	
	DEPHASE	
	END	

*Continued on page 3*

## Technical Corner *continued from page 2*

Assemble and link the modified CMC BIOS as described above. However, after the NEWBIOS. HEX file is generated some editing is required to keep the Intertec video and floppy disk I/O drivers from being destroyed. Use a text editor to remove areas 2580H-2D7FH and 30C0H-3436H from the NEWBIOS. HEX file. Remember to remove entire lines, because making changes within a line will invalidate the checksum. Leave the last line in the file intact, because it flags End of File. Finally, use DDT to patch the edited NEWBIOS. HEX file into CPMH10S. COM (or any of the other CMC sysgen programs). An example is given below:

```
A>M80 =NEWBIOS/L  
A>L80 NEWBIOS/P: 1F80/D: 3080, NEWBIOS/X/N/E  
A>EDIT NEWBIOS.HEX  
Use text editor to remove areas  
2580H-2D7FH and 30C0H-3436H  
A>DDT CPMH10S. COM  
-INBIOS. HEX  
-R  
NEXT PC  
3200 100  
-GO  
A>SAVE 49 NEWCPM. COM
```

### IOBYTE IMPLEMENTATION OF SUPERBRAIN CONSOLE AND PORT DRIVER ROUTINES

The following drivers provide a full implementation of CP/M IOBYTE device reassignments for the Intertec SuperBrain. The assignment of physical to logical devices emulates that provided by Information Engineering's SB/E:

Logical Device	STAT device Assignment
CON: TTY:	CRT: BAT: UC1:
RDR: TTY:	PTR: UR1: UR2:
RUN: TTY:	PTP: UP1: UP2:
LST: TTY:	CRT: LPT: ULI:
Logical Device	SuperBrain Assignment
CON:	Console, Main, Batch, Aux
RDR:	Keyboard, Main, Aux, Null
RUN:	Screen, Main, Aux, Null
LST:	Screen, Main, Aux, Null

### FEATURES:

- 1) The CP/M batch device is implemented, which takes its input from the current reader and outputs to the current list device.
- 2) A remote terminal may be attached to the SuperBrain by reassigning the console device to either the main or auxiliary ports.
- 3) Undesired I/O can be eliminated by assigning logical devices to the null device.
- 4) The port output driver supports software handshaking. The transmission control

character may be changed by storing different values in locations XOFF and XON. Currently, ^ S and ^ Q are the respective XOFF and XON characters. If software

handshaking is desired DSR handshaking must be disabled by storing 00H in location HDSHAK. Software handshaking is disabled by storing 00H in location XOFF.

### SUPERBRAIN CONFIGURATION AREA

```
; Note: Locations XOFF AND XON are placed at the end of the
; SuperBrain configuration area as shown below:
;
BAUD: DB      0EEH ; BAUD RATE (9600) FOR MAIN & AUX PORTS
MNMOD: DB     4EH ; MAIN PORT MODE (8 BITS, 1SB, NO PAR)
MNCMD: DB     17H ; MAIN PORT COMMAND
AUXMOD: DB     4EH ; AUX PORT MODE (8BITS, 1SB, NO PAR)
AUXCMD: DB     17H ; AUX PORT COMMAND
FREQ: DB      4BH ; 4BH=60HZ, 0BH=50HZ
HDSHAK: DB     00 ; DSR DISABLED = 00H; DSR ENABLED = 01H
RAW: DB      0FFH ; DISK READ-AFTER-WRITE
; 00H = NO READ VERIFICATION AFTER WRITE
; FFH = READ VERIFICATION
TIMENB: DB     00H ; 00 = TIME FUNCTION DISABLED; FF = TIME ENABLED
SYNC: DS      1 ; SYNC CHARACTER VALUE STORED HERE
CLKENB: DS      1 ; INDICATES KEY CLICK STATUS
; DS      3
KEYPAD: DB      81H, 82H, 83H, 85H, 0DH, 2CH, 2DH, 2EH, 30H
;           31H, 32H, 33H, 34H, 35H, 36H, 37H, 38H, 39H
;
XOFF: DB      13H ; THIS CHARACTER STOPS PORT TRANSMISSION
XON: DB      11H ; THIS CHARACTER STARTS PORT TRANSMISSION
;
```

*Continued on page 4*

\*\*\*\*\*

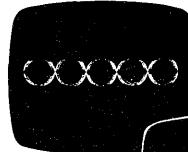
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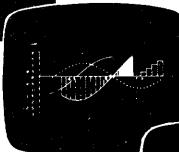
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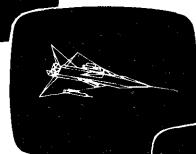
### GRAPH PLOTTER- \$175

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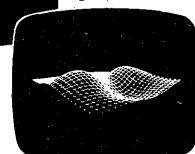
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# Letters to the Editor

DEAR SUPERLETTER:

We market the SuperBrain and its derivatives, and find your Superletter extremely useful and enlightening.

We would be grateful if you would permit us to copy extracts from the Superletter on occasion to include in our own newsletter which we circulate free of charge to our customers. Please let us know.

Yours faithfully,  
 Pete E. Beckles  
 Interactive Systems Ltd.  
 6 Stanmore Avenue  
 Port of Spain  
 Trinidad & Tobago, West Indies

**Editor's note:** We appreciate your asking prior to publication. The answer is yes.

Continued on page 5



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## Technical Corner continued from page 3

```

; *****
; ***** EQUATES REQUIRED BY IOBYTE IMPLEMENTATION ROUTINES *****
; *****

; Note: These equates should be provided by your current BIOS. They
; are included here to enable independent assembly of IOBYTE
; implementation routines.

AUXDAT EQU 40H ;AUXILIARY DATA PORT
AUXST EQU 41H ;AUXILIARY STATUS PORT
MNDAT EQU 58H ;MAIN DATA PORT
MNSTAT EQU 59H ;MAIN STATUS PORT
PFICW EQU 6BH ;PPI (8255) CONTROL PORT
STACK2 EQU 0F3BFH ;STACK DURING CONOUT (32 BYTES) - INTERTEC DOS
STACK2 EQU 0F540H ;STACK DURING CONOUT (32 BYTES) - CMC TARGA DOS
CRTIN EQU 0E409H ;KEYBOARD INPUT ROUTINE
CRTOUT EQU 0E40CH ;SCREEN OUTPUT ROUTINE
CONSTK EQU 0E402H ;TEMP AREA FOR SAVING STACK POINTER
KBUFF EQU 0E45BH ;CCP'S KEYBOARD BUFFER
BUFCNT EQU 0E45DH ;TYPE-AHEAD BUFFER COUNT
;

;***** IOBYTE IMPLEMENTATION OF I/O DEVICE DRIVER ROUTINES *****
;***** Notes: These I/O device driver routines replace the
; following SuperBrain BIOS device drivers:
; CONST CONIN CONOUT LIST PUNCH
; READER AUXIN AUXOUT MAININ MNOUT
; *** Z80 OP CODES ***
; .Z80 ;MICROSOFT MACRO-80 INLINE SWITCH
; ...FOR Z80 OP CODES

; *** CONSOLE STATUS ***
CONST: LD A,(0003H) ;GET IOBYTE
       AND 03H ;MASK FOR CONSOLE BITS
       CP 00H ;TTY?
       JR Z,TTYST ;JMP TO TTY STATUS ROUTINE
       CP 01H ;MAIN?
       LD B,10H ;SET FLAG FOR MAIN
       JP Z,(PORTST) ;JMP TO PORT STATUS ROUTINE
       CP 03H ;AUXILIARY?
       LD B,01H ;SET FLAG FOR AUX
       JP Z,(PORTST) ;JMP TO PORT STATUS ROUTINE
       LD A,0FFH ;BATCH, ALWAYS READY
       RET

; *** CONSOLE INPUT ***
CONIN: LD A,(0003H) ;GET IOBYTE
       AND 03H ;MASK FOR CONSOLE BITS
       CP 00H ;TTY?
       JR Z,TTYIN ;JMP TO TTY INPUT ROUTINE
       CP 01H ;MAIN?
       LD B,10H ;SET FLAG FOR MAIN
       JP Z,(PORTIN) ;JMP TO PORT INPUT ROUTINE
       CP 03H ;AUXILIARY?
       LD B,01H ;SET FLAG FOR AUXILIARY
       JP Z,(PORTIN) ;JMP TO PORT INPUT ROUTINE
       JR READER ;BATCH=READER

; *** CONSOLE OUTPUT ***
CONOUT: LD A,(0003H) ;GET IOBYTE
        AND 03H ;MASK FOR CONSOLE BITS
        CP 00H ;TTY?
        JR Z,TTYOUT ;JMP TO TTY OUTPUT ROUTINE
        CP 01H ;MAIN?
        LD B,10H ;SET FLAG FOR MAIN
        JP Z,(PRTOUT) ;JMP TO PORT OUTPUT ROUTINE
        CP 03H ;AUXILIARY?
        LD B,01H ;SET FLAG FOR AUX
        JP Z,(PRTOUT) ;JMP TO PORT OUTPUT ROUTINE
        JR LIST ;ELSE, BATCH (CONTINUE TO LIST)
; ...JR LIST ISN'T NEEDED IF LIST
; ...IMMEDIATELY FOLLOWS CONOUT
;
```

Continued on page 5

```

; *** IOBYTE IMPLEMENTATIONS OF LIST AND PUNCH ROUTINES ***
;

LIST: LD A,(0003H) ;GET IOBYTE
      AND 0COH ;MASK FOR LIST BITS
      JR LPOUT ;JMP TO IOBYTE OUTPUT DISPATCH ROUTINE

;

PUNCH: LD A,(0003H) ;GET IOBYTE
        AND 030H ;MASK FOR PUNCH BITS
        RLCA ;ROTATE TWICE, INTO LIST CONFIGURATION
        RLCA

LPOUT: CP 00H ;TTY?
       JR Z,TTYOUT ;JMP TO TTY OUTPUT ROUTINE
       CP 40H ;MAIN?
       LD B,10H ;SET FLAG FOR MAIN
       JP Z,(PRTOUT) ;JMP TO PORT OUTPUT ROUTINE
       CP 80H ;AUXILIARY?
       LD B,01H ;SET FLAG FOR AUX
       JP Z,(PRTOUT) ;JMP TO PORT OUTPUT ROUTINE
       RET ;ELSE, NULL

;

; *** IOBYTE IMPLEMENTATION OF READER ***
;

READER: LD A,(0003H) ;GET IOBYTE
        AND 0CH ;MASK FOR READER BITS
        CP 00H ;TTY?
        JP Z,(TTYIN) ;JMP TO TTY INPUT ROUTINE
        CP 04H ;MAIN?
        LD B,10H ;SET FLAG FOR MAIN
        JP Z,(PORTIN) ;JMP TO PORT INPUT ROUTINE
        CP 08H ;AUXILIARY?
        LD B,01H ;SET FLAG FOR AUX
        JP Z,(PORTIN) ;JMP TO PORT INPUT ROUTINE
        LD A,00H ;ELSE, NULL
        RET

;

; *** Z80 TRANSLATION OF INTERTEC KEYBOARD AND SCREEN DRIVER ROUTINES ***
;

; *** TTY INPUT STATUS ROUTINE ***
;

TTYST: LD A,0FH ;RESET KEYBOARD
       OUT (PPICW),A
       LD A,(BUFCNT) ;ANYTHING IN THE BUFFER?
       OR A
       RET Z ;RETURN IF EMPTY
TTYST1: LD A,0FFH ;CHARACTER READY STATUS
       RET

;

; *** TTY INPUT ROUTINE ***
;

TTYIN: LD HL,KBBUFF ;BDOS'S KEYBOARD CHARACTER
       LD A,(HL) ;GET CHARACTER
       OR A ;ANYTHING THERE?
       JR Z,TTYINI1 ;NO, TRY TYPE-AHEAD BUFFER

;

LD (HL),0 ;INDICATES NO CHARACTER
RET

;

TTYINI1: LD A,(BUFCNT) ;TYPE-AHEAD BUFFER COUNT
          OR A ;ANYTHING THERE
          JR Z,TTYINI1 ;NO, WAIT UNTIL THERE IS
          JP CRTIN ;KB CHARACTER RETURNED IN REG A

;

; *** TTY OUTPUT ROUTINE ***
;

TTYOUT: LD (CONSTK),SP ;SAVE STACK POINTER
        LD SP,STACK2
        PUSH HL ;SAVE HL
        CALL CRTOUT ;CHARACTER IN REG C
        POP HL
        LD SP,(CONSTK) ;RETRIEVE STACK POINTER
        RET

;

;

; *** Z80 TRANSLATION OF INTERTEC AUX PORT SERIAL DATA INPUT ROUTINE ***
;

AUXIN: LD B,01H ;FLAG AUXILIARY
       JP PORTIN ;JMP TO THE PORT INPUT DRIVER

```

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Jeff A. Ferris

## Letters to the Editor

*Continued from page 4*

### DEAR SUPERLETTER

Having acquired a Kaypro II, I wanted a patch so as to be able to keep my Super-Brain disks compatible with my Kaypro running UNIFORM. My SuperBrain has 40 tracks, single side, double density, running under IE's prom. In looking around in Micro Solution's UNIFORM with DDT, I discovered that the newly acquired version I just updated from my dealer was a bit different from UNIFORM's earlier versions of SETDISK and INITDISK. I have found the addresses to patch to change the Super-Brain format from 35 tracks with 165K to 40 tracks with 190K and I've included them for your readers.

	CHANGE	CHANGE
ADDRESS	FROM	TO
SETDISK, Version 1.01	1022	51
SETDISK, Version 1.02	109F	51
INITDISK, Version 1.0	0E1C	23
INITDISK, Version 1.02	0E45	28

UNIFORM allows the Kaypro II to read and write to 13 additional disk formats and is produced by Micro Solutions, Inc. 125 S. Fourth Street DeKalb, IL 60115 (815) 756-3421

Yours faithfully,  
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# -New Products-

## MCS MENU CONTROL SYSTEM

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Contact: Mr. Jeff Ferris

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*Continued on page 7*

## Technical Corner *continued from page 5*

\*\*\* Z80 TRANSLATION OF INTERTEC MAIN PORT SERIAL OUTPUT ROUTINE \*\*\*

--- CTS MUST BE TRUE TO TRANSMIT ---

MNOUT: LD B,10H ;FLAG MAIN  
JP PRTOUT ;JMP TO THE PORT OUTPUT DRIVER

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

## PORT I/O DRIVERS

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

The following port drivers implements full software handshaking for both the main and auxiliary ports. The code is a general port driver which tests register B for the selected port.

B = 10H, MAIN  
B = 01H, AUXILIARY

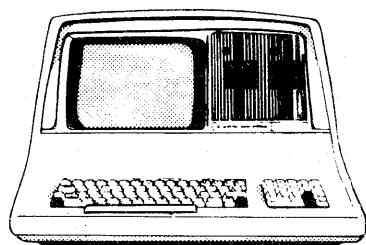
The output routine allows user customization of the handshake characters by storing the "TURN-OFF" character in location XOFF, and the "TURN-ON" character in location XON. If 00H is stored in XOFF, then the output routine assumes that no software handshaking is desired. It is not possible to use both DSR, and software handshaking. So if software handshaking is desired, the DSR should be disabled by storing 00H in location HDSHAK.

Filename: PORT.MAC

Page 6

Note: If CMC/TARGA DOS is being modified, port driver routines will have to be relocated to the end of the hard disk driver routines. Insert the port drivers at location 0EE01H (immediately after HDISK:).

*Continued on page 7*



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## Technical Corner continued from page 6

```

; *** PORT STATUS ROUTINE ***
PORTST: CALL    GETST      ;GET STATUS BYTE
        AND     02H      ;MASK FOR CHAR READY
        RET     Z         ;RETURN IF NO CHAR
        LD      A,0FFH    ;CHAR READY
        RET

; *** PORT INPUT ROUTINE ***
PORTIN: CALL    PORTST    ;GET STATUS BYTE
        OR      A         ;CHAR READY?
        JR      Z,PORTIN  ;WAIT FOR CHAR
        BIT    4,B       ;MAIN?
        JR      Z,PRTIN1  ;IF NOT, HAS TO BE AUX
        IN      A,(MNNDAT) ;GET CHAR FROM MAIN
        RET

PRTIN1: IN      A,(AUXDAT) ;GET CHAR FROM AUX
        RET

; *** PORT OUTPUT ROUTINE ***
PRTOUT: PUSH   HL        ;SAVE CONTENTS OF HL
        LD      A,(HDSHAK) ;LOAD DSR CONTROL BYTE
        AND   B          ;DSR ENABLED?
        JR      Z,PRTOT1  ;NO DSR
PRTOTO: CALL   GETST      ;GET STATUS BYTE
        AND   80H      ;MASK FOR DSR=1
        JR      Z,PRTOTO  ;WAIT UNTIL DSR=1
        JR      PRTOT3    ;JMP TO CHAR OUTPUT
PRTOT1: LD      A,(XOFF)  ;GET HANDSHAKING CONTROL BYTE
        OR      A         ;CONTROL CHAR PRESENT?
        JR      Z,PRTOT3  ;IF NOT, JMP TO CHAR OUTPUT
        CALL   PORTST    ;CHECK PORT FOR INPUT CHAR
        OR      A         ;ANYTHING THERE?
        JR      Z,PRTOT3  ;IF NOT, JMP TO CHAR OUTPUT
        CALL   PORTIN    ;GET CHAR
        LD      HL,XOFF   ;POINT TO XOFF
        CP      (HL)     ;CHAR = XOFF?
        JR      NZ,PRTOT3 ;IF NOT, JMP TO CHAR OUTPUT
        CALL   PRTOT3    ;ANOTHER CONTROL CHAR READY?
        OR      A         ;ANYTHING THERE?
        JR      Z,PRTOTZ  ;IF NOT, WAIT FOR ANOTHER CHAR
        CALL   PORTIN    ;GET CONTROL CHAR
        LD      HL,XON    ;POINT TO XON
        CP      (HL)     ;CHAR = XON?
        JR      NZ,PRTOTZ ;IF NOT, WAIT FOR ANOTHER CHAR
        CALL   GETST      ;GET STATUS BYTE
        AND   01H      ;MASK FOR TRANSMITTER EMPTY

PRTOT2: CALL   PORTST    ;WAIT UNTIL EMPTY
        OR      A,C      ;GET CHAR
        POP   HL        ;RESTORE CONTENTS OF HL
        BIT   4,B       ;MAIN?
        JR      Z,PRTOT4  ;IF NOT, HAS TO BE AUX
        OUT   (MNNDAT),A ;CHAR TO MAIN
        RET

PRTOT3: OUT   (AUXDAT),A ;OUTPUT CHAR TO AUX
        RET

; *** COMMON SUBROUTINE FOR FETCHING STATUS BYTE ***
GETST: BIT    4,B       ;MAIN?
        JR      Z,GETAUX  ;IF NOT, HAS TO BE AUX
        IN      A,(MNSTAT) ;GET STATUS BYTE FROM MAIN
        RET

GETAUX: IN      A,(AUXST) ;GET STATUS BYTE FROM AUX
        RET

; *** SWITCH BACK TO 8080 OP CODES ***
        .8080      ;MICROSOFT MACRO-80 INLINE SWITCH
        .        ;FOR 8080 OP CODES
        END

```

## New Products continued from page 6

gram, such as word processing and never see a menu displayed. User passwords, and batch job streams can be setup and be operational in minutes.

The Electronic Mail feature (Network System) provides quick daily communications to your computer operators. If mail has been left for an operator, a signal message will be displayed to them each time they sign on the system until their mail is answered. A blanket message feature provides a display at all terminals as soon as the password screen display is activated.

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# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

Aug./Sept.  
Vol. 3 No. 4

**M**odem communications continues to grow as an important use of microcomputers. It forms the third part of the triad we feel is the foundation of a contemporary micro's main use: i.e., word-processing, financial spreadsheets, and telecommunications.

Hayes has set the standard with its 1200 Baud model, the SmartModem. Now, even its features are being surpassed -- the new Cermetek InfoMate, for example. Prices are dropping as well.

Speaking of prices, we're having our very first sale for Superletter subscribers. Take 10% off any hardware or software product (except WordStar) until October 30th. You can use this discount on 10 and 20MB hard-disks, modems, cables, diskettes, computers, printers and CP/M software. Just mention the Superletter Fall Special. But you must be a subscriber. Naturally, all regular tax and shipping costs still apply.

Maxtek is participating with a special sale on their high-resolution graphics product. \$995 gets you the entire package -- hardware and software -- for either the SuperBrain or CompuStar system. An excellent deal through the end of November.

Finally, the rumor mill about Intertec has started up again regarding a new line of products to be released soon. At this point any comments or hunches would be pure speculation. An IBM-PC DOS compatible machine wouldn't be a bad idea. But that's just wishful thinking.

Or is it?

*Albert Abrams*  
EDITOR

## Technical Corner

### File Transmission Using the SuperBrain

By Steve R. Riskin

For a long time now SuperBrain users have been searching for ways to enter the fascinating world of free software. The CPMUG groups have nearly a hundred volumes of free software available but not for SuperBrain 5 1/4" disks. From time to time someone offers to sell the entire library in SuperBrain format but such a purchase is an expensive way to gain access to what is, and should remain, free software.

Also, everyone has some computer buddy with whom, for a variety of reasons, one would like to transfer files. Commercial file transfer programs are notoriously better at advertising their benefits than providing them, and, of course, the classic example of free software is the Ward Christiansen series of Modem programs available from your local RCPM (Remote CP/M) system.

### Bootstrapping Your Way to the New World.

Unlike other commercial CP/M's, SuperBrain's CP/M comes with an enhanced PIP utility. Prepare a disk with STAT, PIP, LOAD, ASM, and the editing part of your word processor. Test PIP by entering "PIP Q=INP:". Your screen should delay for a fraction of a second and then ask you (ECHO Y/N). Wonderful! Answer Y and then write some letters to the screen. End with a control Z. Did your disk drive turn on? Did it write your words to a disk file? Splendid. The "Q" can be replaced by an "ufn" (unambiguous file name) and this will be extremely useful in the processes that follow.

Reboot and try "PIP OUT:=CON:" (watch the apostrophes they are required!). Does nothing happen? Excellent; now hit CR. The (ECHO Y/N) should now appear. If all this has worked, you now have access to the wonderful world of free software. If not, get a proper copy of PIP or buy one from SuperLetter. You may patch one by using the explicit instructions in the July, 1983 issue of MicroSystems (the article on PIP-MODEM, or by using the instructions appended to this article.)

### Getting Started

To get started: Turn on your modem. I use the Hayes SmartModem connected to my SuperBrain's main port. Enter the command "PIP OUT:=CON:". The screen remains blank and nothing happens. Enter a "CR" and PIP will ask (ECHO Y/N). Answer "Y". Later, when you become an experienced user you will want to avoid the ECHO (having everything you enter at the keyboard appear twice on your screen) but now that is preferable to having nothing appear at all. You are now connected to your modem through the main port. All commands entered at the keyboard will either address your modem (depending on whether they are recognized by your modem's command structure) or, if they are transparent to the modem, will be sent out through the modem to your destination.

Enter commands your modem requires to dial a number, The Hayes requires "ATDT 1-xyz-abc-defg CR". It is useful at this point to have a list of RCPM Systems or CBBS's (CP/M Bulletin Boards). The July issue of Microsystems has an updated list. A useful number is the SuperBrain remote bulletin board at 1-617-862-0781 (in Massachusetts) or the dBASE II bulletin board at 1-408-378-8733 (in Campbell, California, near San Jose). For starters, of course, a local number is best. It will take a

*Continued on Page 2*

## Technical Corner

continued from page 1

few hours to get these routines down pat and with long distance rates being what they are you will not want to practice on a long distance board.

If you are successful in reaching the remote source your modem will indicate that it has made a connection. If you are using the Hayes you will be able to hear the connection being made through the modem speaker. There will be a few rings, a high pitched whistle, and the satisfying sound of a connection being made. Other modems simply print on the screen "Ring, Ring, Ring, Connect!".

The remote board will now take over and prompt you for various bits of information. Some of it, at the very beginning is trivial but technical. Just brave your way through: How many nulls? answer 0; Is lower case OK? (those poor Apple users!-they could have had SuperBrains for the same price), answer Y. Then give them whatever particulars about yourself that the "Sysop" (System Operator) desires. If they assign you a password or a user number start your notebook recording that information. Shortly you will have a great deal of information making it highly practical to keep a looseleaf notebook for data transmissions.

After the remote gives you a great deal of information about itself-and how to avoid this information in the future-it will give you a command line. This looks something like "Command: A, B, C, D, E, F, Q, W, E, R, T, Y, 2, 4, etc." ending with the option of, HE, or HELP for help. Choose the expedient alternative and type HELP. Experiment with the board; read messages; search out levels of messages; enter messages; do whatever you like. This, by the way, is all you can do with most commercial modem software: play around with the bulletin board material and information. They assume your desire for remote computing will be exhausted by contact with the Source and the like.

The interesting command, however, is the one that precipitates you to the remote system's CP/M level. Type Help again and find the command that puts you in the remote system's CP/M. Here, just as when you are at your own computer, you can use the DIR command to list to screen the files available on the remote system. Now you can see what you have been after: lots and lots of new software just there for the plucking. DIR both the A: and the B: disks. Try C: and D: to see how extensive the library of programs available is. Some systems have User Levels (more on that later) but if they do they will instruct you at the beginning

how to view the directories on the various levels. (More information to record in the notebook). These commands will take something like the form DIR A: \$ADL(note the space between the : and the \$).

### Capturing Information from Remote Systems

Some magic: you can, at any time once you have established modem contact and connected with a remote system, reboot your system without breaking the connection with the remote system! This is extremely useful for the following kinds of tricks. Remember the "PIP Q=INP:" command above? Remember the effect of control Z afterwards? Before you give the remote board the DIR command, when you are at the remote CP/M prompt 'A', reboot your system and enter "PIP Q=INP:". At the query (ECHO Y/N) choose what you will, hit CR and your system will respond with the remote CP/M prompt. That is, you are now back in contact with the remote system.

You can tell it is the remote prompt because it will shimmer (literally-it sort of bounces) and is sometimes followed by a 0: thus it looks like A0. Now type DIR; go onto B: and when you get the B0, type DIR, wait, and then write to your own disk all the preceding information by typing control Z! You will write to your own disk whatever transpired between the time you issued the command "PIP Q=INP:" and the control Z. There, on your disk, under the appellation "Q", will be the remote board's directories for you to dump to hard copy at your leisure and not at long distance rates. After this maneuver you are back on your local system but your remote connection has not been broken.

### Going In and Out of the Remote System

At various times you will want to go back to the remote directory from local CP/M. Any time you wish to do this (after you have rebooted your system to issue local CP/M commands, or have precipitated to your local CP/M by typing control Z) you can do so by typing "PIP Q3=INP:". Be careful here for sometimes you will be doing this command to end with the control Z to preserve instructions, directories, files etc., received from the remote system, and sometimes merely to get yourself back to the remote system after rebooting your own system. I use a number addition to distinguish my intentions for if you are merely getting back, as it were, you will not end that portion of your session with the remote board with a command of control Z. Thus your local directory, depending on how

many times you enter the remote and exit by rebooting locally, will fill up with \$\$\$ files.

I use the one file appellation: Q3 because it matters little if the empty file is written to again and again. But since it is sometimes necessary to enter and exit a number of times this bit of housekeeping keeps your local disks relatively clean. At the end of the session, to complete your disk housekeeping chores, you can erase all \$\$\$ files. If you use the conventions herein described there will be only the one: Q3.\$\$. What you don't want to do is overwrite a 'saved to disk file of information', which ended with a control Z, with an empty file just used to get back to the remote system. Perhaps, the first time around, you should create every file with a different directory title: Q, W, E, R, T, Y etc. and then only ERA the ones with the \$\$ extension at the end of the session.

### Capturing a Copy of MBOOT3.ASM

At this point, however, you are going back to retrieve MBOOT3.ASM. Therefore, use a command such as "PIP MBOOT3.ASM=INP:" (Remember: any "ufn"!) This

Continued on page 3

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**Technical Corner** continued from page 2 will prepare a space on your local disk for the program. It will also get you back to the remote CP/M prompt. Once you have the remote A0 CP/M prompt, go to the drive that has MBOOT3.ASM- probably the B: drive-since most remotes keep their interesting files on B:. Type "TYPE MBOOT3.ASM" CR and watch it flash by on your screen. Remember that you have prepared a disk file called MBOOT3.ASM and everything that is read into your RAM will be written to the disk file after you type control Z. Don't forget the control Z or all will be lost. When the whole file has flashed by type control Z. Now you have captured MBOOT3.ASM.

You can use the above procedure to get a few more files once you are connected and in order to practice. Go back to the remote with some dummy file name: "PIP W=INP:" and DIR the remote. When you see something interesting TYPE it and then end with a control Z. It is now written to your disk. Short .BAS files will come across this way and some short .DOC files also. Some boards will chastise you for using TYPE for any files except the MBOOT3 file but if it works, it works. Prepare a separate PIP 'ufn.ext'=INP:" for each file you transfer over. This means going in and out of local CP/M but you know how to do that! The main task, however, lies ahead.

### Capturing and Reconfiguring MBOOT3.ASM for your Modem

The simplest way to do this is to capture the MBOOT3.ASM from the SuperBrain RCPM at the above number. This is fully configured for the SuperBrain and requires only a little installation work. What needs to be done is to install it for your particular modem. If your modem is connected to the main port you will need to know that the Main Port Data address on the SuperBrain is 58H and the Main Port Status Port is 59H. For the Auxiliary Port these addresses are: Date 40H; Status 41H. Use your word processor to list the MBOOT3.ASM program. Notice that about 24 lines into the program there are the lines:

IF NOT PMMI AND NOT DCH AND  
NOT VT180

```
MODCTLP EQU 3DH ;Put your modem control
                  port here
MODSNDB EQU 04H ;Your bit to test for send
MODSNDR EQU 04H ;Your value when ready
MODRCVB EQU 01H ;Your bit to test for receive
MODRCVR EQU 01H ;Your value when ready
MODDATP EQU 3CH ;Your modem data port
ENDIF etc.
```

For the SuperBrain, the date and status ports are as listed above (58H and 59H; or 40H and 41H.) The transmit empty buffer

mask, and the receive buffer full mask (for that is what they are asking for) are 01 and 02 respectively. (They don't ask but some modems require this info: The polarity of the Transmit and Receive masks are 1: and there are no initialization bytes.) So, over-type 59, 01, 01, 02, 02, 58 after the EQU and before the H and then save this version as per your word processor's command to save a file.

### Next Steps

Use ASM.COM to create a HEX file of MBOOT3.ASM. Type ASM MBOOT3 and wait. When the program is finished there will be a MBOOT3.HEX file on disk and a .PRN file. Use LOAD.COM to create a COM file from the HEX file. Type LOAD MBOOT3 and wait. When the LOAD program is finished there will be a COM file on disk! Lovely. Now the door is open.

### Through the Looking Glass

This file is most useful for obtaining remote COM files (called .OBJ files so you are prevented from running them on the remote system-and screwing everything up). The one file you are looking for, however, is MODEM7xx.AQM. If you have the Hayes SmartModem you are looking for SMODEM 7xx.AQM. Notice the Q in the middle slot of the remote file's extension. This means that the files is 'squeezed' to save remote directory space. Notice the strange extensions on almost all the remote files. You are going to need some new software to handle these strange extensions.

One of the first programs you will need to bring over is USQxxx.OBJ or any such version. Any .OBJ file brought over can be renamed to make it runnable on your system: Ren UFN.COM=UFN.OBJ. That is sufficient to make it a .COM file which your system will recognize. The USQ.COM file is necessary to unsqueeze files that have been compressed on the remote system. Type USQ UFN.xQx and the program will respond: POOFOO.xQx -- POOFOO.ASM The resulting program is ready for further processing.

Other files you will want to bring over can be best determined either by the existence of .DQC files (compressed DOCument files) or by the DISKMENU program on the remote. The DISKMENU program describes all files on the remote system and makes very good bedtime reading. These are the goodies in the candy store yours for the plucking. The .DOC files are your manuals. Take a few of these first to see if you want the corresponding programs. Things you should look at, beside the MODEM or SMODEM and USQ sine qua

nons are SWEEP, NEWCAT, LU-xxx, ZCPR, ZESOURCE and the like.

### Transferring Files

Now you are armed with MBOOT3.COM configured for your system. Big Guns indeed but not the biggest. To bring over files go into the remote directory. Choose what you like. While in the remote type XMODEM S UFN.EXT. The remote will call up its Xmodem program and tell you how large the file is and how long it will take to transmit it. Then it waits. If you watch your modem, and your modem has indicator LEDs to show you, you will see that the remote board tries, every ten seconds, to send the program. Reboot your system and type MBOOT3 UFN.EXT and get a prompt line that says ESC to start. When you hit the ESC key the program says FILE OPEN, READY TO RECEIVE. But nothing happens. Wait a bit; remember the sending program only tries once every ten seconds. After a few moments everything should be flowing splendidly. Go have some coffee but return within the time the XMODEM program said the transmission would take. Watch the transmission end and the whole file written to your disk!

After the local disk write you are in local CP/M. Write another INP: file to get back and XMODEM something else. You can proceed in this fashion as long as you like but you will want to bring over MODEM7xx or SMODEM7xx and their corresponding .DQC files to learn how to use them.

### Appendix One: Reconfiguring PIP

Use DDT to patch PIP to support the INP: and OUT: functions. These are procedures reserved at beginning addresses from 110H to 1FFH in the PIP program. For input, PIP will jump to location 110H from 103H and for output to 120H from 106H. A byte received is put in location 109H and output it at 128H. This routine is set for Super-Brain's Main Port. The status and data port addresses are therefore 59H and 58H respectively. Change this if your modem is set to the Auxiliary port.

103H	JMP	110H	;Jump to input
106H	JMP	120H	;Jump to output
110H	IN	58H	;Get Status
112H	ANI	2	;Mask bit
114H	JZ	110H	;Loop
117H	IN	59H	;Get data
119H	ANI	7FH	;Clear the high bit
11BH	STA	109H	;Save the data
11EH	RET		;Return to PIP
120H	IN	58H	;Get status
122H	ANI	1	;Mask it
124H	JZ	120H	;Loop
127H	MOV	A,C	;Place the char in a register
128H	OUT	59H	;Move it out
12AH	RET		;Return to PIP

Continued on page 5

# Letters to the Editor

## DEAR SUPERLETTER:

First: thanks for sending the BASIC-test programs written by Dr. Kelly from Boston. Only it's a pity that the 'SuperBrain DISPLAY EXERCISER' - program is not compatible with SuperBrain II. Most of the OUT PPIA, XXXX statements give strange effects and do not work, so I had to change the above mentioned statements into escape-control sequences.

Second: when the SuperBrain II came on the market, I had an arrangement with my dealer, to give back my "old" SuperBrain-I and change it for a new SuperBrain II. Enclosed in the box I found a 14 page preliminary SB-II-manual from Intertec saying: "This bulletin will serve as interim documentation of these new products until the SuperBrain-II User's Manual is available". Now, my dealer still says that there is no SuperBrain-II manual. And I don't believe him!! Can you please tell me if there is a new SuperBrain manual?

Thanks in advance. Another thing is this:

## SEEK AND SEARCH

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In the SB manual there is no description of the ASM.COM (CP/M assembler) error-messages U and S. My system-diskette came with an ASM.COM (the CP/M Assembler) on it that prompts:

(CP/M ASSEMBLER-VER 2.0)

But in the (odd) manual on page 18 in the chapter 8 (sample session) the CP/M assembler prompts:

CP/M ASSEMBLER - VER 1.0.

So Intertec "forgot" to update the manual, when the new (2.0) ASM came out. Therefore I say: "This manual needs to be updated by Intertec".

Can a reader give me all new error-codes (plus their meanings) including the errors "E" "U", that I discovered by myself?

Thanks again!!

Yours sincerely

Robert Jan van Herkens  
27 van Karnebeeklaan  
4102 BZ - CULEMBORG  
THE NETHERLANDS  
EUROPE

## DEAR SUPERLETTER:

I would like to bring your attention to JRT Systems PASCAL package. At \$39.95 it is one of the truly great bargains of the personal computing industry. It is not the fastest nor the best Pascal on the market, but it has such a low price that it is a great way to learn about Pascal. It comes in the SuperBrain format and has a nice (although not perfect) manual. You might want to alert your readers to this bargain. (JRT Systems, P.O. Box 22365, San Francisco, CA 94122)

Thank you,  
Richard Ross  
3631 E. Flower, Apt. G  
Tuscon, AZ 85716

## DEAR SUPERLETTER:

We market the SuperBrain and its derivatives, and find your Superletter extremely useful and enlightening.

We would be grateful if you would permit us to copy extracts from the Superletter on occasion to include in our own newsletter which we circulate free of charge to our customers.

Please let us know.

Yours faithfully  
Peter E. Beckles  
Interactive Systems Ltd.  
6 Stanmore Avenue  
Port of Spain  
Trinidad & Tobago, West Indies

**Editor's Note:** Yes, you may. Thanks for asking.

## DEAR SUPERLETTER:

When I received the April/May Vol.3 No.2 issue, I was very surprised to see my letter published. I thought that you would like an update.

The current configuration of my machine is:

SuperBrain I S.S./D.D. modified to 2×800K + 1×200K drives.  
Johnathan Platt's SOS operating system and PROM.  
Cambridge Micros S100bus adapter  
Rostronics S100 clock/calendar  
Phonelog  
Epson MX-80F/T printer.  
Maplin modem-300 Baud CCITT  
Anchor Auto'-300Baud Bell 103  
Xtec 75/1200 Baud modem  
Phone answer hardware

and it is used to operate the FIRST CBBS (Ward Christensen's) this side of the Atlantic. It is one of only 5 boards in Britain, and there is only 1 other operational board in Europe.

We are CBBS NORTH-EAST, Tel: 0207-43555 14.30-09.00 CCITT tones, but will be adding Bell 103 in the near future, Plus tel: 0207-32447 19.00-00.00 CCITT 00.00-08.00 Bell 103

I would like you to give publicity to this, because from what we can gather, there are a growing number on your side of the 'pond' who wish to communicate with Europe.

A CCITT modem kit for £39.95 (a really excellent job - we use it) is obtainable from: Maplin Electronic Supplies Ltd., P.O. Box 3, Rayleigh, Essex. SS6 8LR Tel: 0702-552911 Part No: LW99H

Trevor Smith  
12 Tollgate Road,  
Hamsterley Mill,  
Rowlands Gill  
Tyne & Wear.  
NE39 1HF  
ENGLAND

## DEAR SUPERLETTER:

I'd like to know how in MBASIC, ver. 5.1, I can have an input at the keyboard tested without having to press CR.

I know only partly how to do it with one letter tapped but the problem is I return to CP/M at MBASIC.

Perhaps one of Superletter's readers can help me.

Thanks.  
Normand Beaudoin  
3479-A St. Dominique  
Montreal, P.Q. H2X-2X5  
*Continued on page 6*

## **Technical Corner continued from page 3**

Work only with copies of your system disk for if you have a non-standard PIP (for SuperBrain) there is no telling what may happen. There are more explicit instructions, and another approach, in the July, 1983, issue of Microsystems in an article on "PIPMODEM".

### **Editor's Note:**

#### **PUBLIC DOMAIN SOFTWARE FOR CP/M**

There are thousands of programs and utilities available free to anyone able to download them from most RCP/M's. Generally, no single system has them all, but many of the more useful or popular programs are available on the Intertec.

The following is a partial list of the 100-plus public domain programs found on Software Centres' RCP/M (213) 296-5927. Listed is the program name as it may appear, its approximate size, and a brief description of its use:

**DU-V77.COM 6k** Disk Utility program: allows direct modification of disk files.

**DU-V75.DOC 8k** Documentation for above.

**ERAQ.COM 2k** Erases files, but asks first one at a time.

**FILEFND8.ASM 16k** Searches all user areas and drives for the specified file. Wild cards are accepted.

**FBAD-V54.ASM 24k** This program checks for bad sectors and, if found, locks them out, saving the rest of the diskette. Version 5.4.

**SCRAMBLE.COM 2k** This can encrypt a file using a password of 8 unique characters. The file must be run through a second time to restore it. Note: encrypted '.COM' files may cause crashes.

**SCRAMBLE.ASM 8k** 8080 assembler source code for above.

**OSETAUTO.COM 2k** Sets the autostart section of system tracks on single density disks for the Osborne-1.

**SHOW.COM 2k** Lists files on the screen with pauses every 24 lines. Spacebar to view next page.

**UNERA.COM 2k** Restores files that were accidentally erased. If there have been files added, it will try to determine if the erased file is lost.

**WASH14.COM 4k** Self documented multifunction utility. Combination of 'PIP' and various CP/M commands. Menu driven.

**RAMDRIVE.ASM 8k** Allows you to use

selected portions of RAM memory as an additional high speed disk drive.

**RAMDRIVE.DOC 4k** Documentation for setting up the above. D-27A .ASM 16k A directory utility that keeps track of changes in the directory. Usually found on RCP/M's as 'WHATSNEW'.

**CRCK.COM 2k** Gives a checksum value to verify accurate reception of files from RCP/M's.

**DIF.COM 16k** Part of system that allows updates by separating only the changes in a file to reduce transfer time.

**PRNTSQ.COM** Prints squeezed files without unsqueezing the disk file.

**SQ.COM 16k** File compression utility. Can save 30-40% on transmission time or storage space. Most files on RCP/M's are squeezed using this program.

**SQ/USQ15.DOC 2k** Brief document about the squeeze files.

**SQUEEZER.DOC 24k** Documentation on the finer points of squeezing and unsqueezing of various files.

**TYPESQ.COM 8k** This file allows you to view a squeezed ASCII file without expanding it. Format: A)TYPESQ Fn.Ft(cr).

**UNSPOOL.COM 2k** Allows you to use your computer while listing a file on the printer. It will send data to the printer when the keyboard is inactive. Caution: it may crash with certain programs which overwrite 'UNSPOOL'. Format: A) UNSPOOL Fn.Ft (cr).

**USQ.COM 14k** Reverses the file compression process. Use on any file with a 'Q' in the second letter of the filetype.

**OTERM404.COM 32k** Modem program designed for the Osborne. Version 4.04.

**OTERM4.DOC 50k** Documentation for the above.

**OSETAUTO.COM 8k** This file is for adding extended function keys. This allows automatic signon and dialing routines. This prog used with OTERM.

**OTSET4.DOC 4k** Document for the above.

**?COMM7.ASM 125k** Current version of the 'MODEM' program at its greatest state written in 8080 source code that can be modified for virtually any CP/M computer.

**?COMM7.DOC 48k** Document for the above.

**SMODEM3.ASM 96k** Modem program for SmartModem users. Takes advantage of many of the features of the SmartModem. Present version is 3.8.

**SMODEM3.DOC 38k** Documentation for the above.

\* **RESOURCE.COM 6k** 8080 disassembler. Produces INTEL mnemonics.

**RESOURCE.DOC 30k** Document for the above.

\* **ZESOURCE.COM 8k** Z80 disassembler. Produces ZILOG mnemonics.

**ZESOURCE.DOC 4k** Document for the above.

**AMORT.BAS 4k** MBASIC program that figures amortization rates.

**OZCPRGEN.COM 4k** Generates the ZCPR environment on the current system diskette for the Osborne-1.

\* **Z80ASM.COM 10k** Assembler for the Z80. Works just ASM.

**Z80ASM.DOC 6k** Document for the above.

**ADVENTUR.COM 24k** The Original Adventure game with the colossal cave and all its myths and adversaries.

**ADVENTUR.WRK 24k** Work data file for the above program. You have to have both ADVENTUR files on the same disk to play the game.

On most RCP/M systems, all of the .COM files are renamed to have an .OBJ filetype so they cannot be executed on the host system. Everything else will more than likely be squeezed to conserve space, and will be evident by the "Q" in the middle of the filetype extension.



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# -Programs-

## PATCH YOUR PERSONAL HELP-LEVEL INTO WORDSTAR

When I used WORDSTAR for the first time, I was very pleased to find all those HELPing menu's on the screen, because then it wasn't necessary to look-up the most-used command-codes in the manual. But after I had worked with this word-processing-program many times, I got used to all codes, and it became slightly irritating, to see those (editing-space-consuming!!!) explanatory prompts, that I already knew by heart very well.

One can, of course, set the HELP level to another (lower) value, but this change has to be made EACH time (by using the  $\wedge$ JH command) when you start-up WORDSTAR, because standard HELP-level is 3. Here's a HOW-TO description to patch your personal HELP-level into WORDSTAR.

## HOW TO CHANGE THE DEFAULT HELP LEVEL.

You have to patch-in your personal "standard"-HELP level, and what you need is:

- A diskette with WORDSTAR (any version) and INSTALL.COM and
- Just 5 minutes of your time.....

Boot up CP/M with the above mentioned diskette in drive-A and wait for the "A>" prompt.

Now type: INSTALL and press the <RETURN>-button.

Answer the next question: "Do you want a first-time installation of WORDSTAR?" by typing N(o).

Now, the INSTALL-program asks how you like to install WORDSTAR. There are four possibilities (A,B,C,D). Press C

Answer WS.COM to the question: "Filename of WORDSTAR to be installed?", and give a <RETURN>.

(Give this filename ONLY if your WORDSTAR has the filename WS.COM, but if your WORDSTAR has another FILENAME, then enter this other name. Answer WS.COM to the question: "Filename for saving installed WORDSTAR" and give a <RETURN>.

(The saved "name" of your WORDSTAR will then be: WS.COM).

Now, answer the next eight questions, by only hitting RETURN. (So hit RETURN eight times). In any case: stop giving <RETURN> if you see the question:

## "ARE THE MODIFICATIONS NOW COMPLETE?"

Answer N to this question, and you will see the following text:

YOU MAY MODIFY ANY LOCATION DESCRIBED.....etc  
and the prompt:

LOCATION TO BE CHANGED (0=END) :

Now, type 0360, and give <RETURN>  
You will see:

OLD VALUE: 03H  
(03)=the HELPlevel)

\*\*\* caution \*\*\*

\*\*\*\*\*  
If you DON'T see 03 or 02 or 01 or 00 HERE,  
THEN CHECK IF YOU ENTERED THE  
CORRECT LOCATION 0360.  
\*\*\*\*\*

Enter YOUR favorite "standard"-HELP-LEVEL (= 03, 02, 01 or 00), by typing 03, 02, 01 or 00 (you have to enter TWO decimals, the first decimal is always ZERO).

Then give a RETURN and answer Y(es) to "OK? (Y/N)". Drive-A activates, and your patched wordstar will be saved on disk. After this, WORDSTAR will come up now within 10 seconds.

## TESTING THE NEW HELP LEVEL

Edit a text now, and WATCH YOUR SCREEN. If you entered an other HELP-level than THREE, now you'll see that the whole screen can be used to edit a text, and HELPING explanations will only be displayed if you really want them to see, by typing:  $\wedge$ Q or  $\wedge$ K or  $\wedge$ J or  $\wedge$ P or  $\wedge$ O.

-----  
; Program-name : ROM1 (See also ROM2)  
; Made for : INTERTEC SuperBrain-II  
; DESIGN : Robert J. van Herksen  
                  (PA3BKL)  
                  27 van Karnebeeklaan  
                  4102 BZ CULEMBORG  
                  THE NETHERLANDS  
                  Phone: 03450 - 14379  
; Dated : May 9th 1983  
; Function : Switch-on PRIMARY or  
                  SECONDARY character set.  
                  (can be modified, to switch  
                  ON/OFF other video-attributes.)  
; Algorithm : Send string  
; Primary : "ESC + 7E(hex) + 47H + CR + LF"  
; Secondary : "ESC + 7E(hex) + 67H + CR + LF"  
                  to CON: sole by BDOS-call  
                  and return to CCP  
                  (WARM BOOT).  
\*\*\*\*\*

; ; NOTE:

; ; In order to switch ON/OFF another  
; ; video-attribute, 47 (hex) (secondary  
; ; = 67(hex)) in the string has to be  
; ; replaced by another ATTRIBUTE code (see  
; ; your SUPERBRAIN-II manual):

42H = blinking ON  
62H = blinking OFF  
48H = half-intensity ON  
68H = half-intensity OFF  
47H = primary character-rom  
67H = secondary character-rom

etc.

For instance: you want a routine for switching-on the BLINKING attribute, then:

- Copy this file (ROM1.ASM) to BLINKON.ASM  
(PIP BLINKON.ASM=ROM1.ASM)  
IF you like to keep THIS routine
  - Change ATTRB EQU 47H  
to ATTRB EQU 42H (useWORDSTAR  
or any EDITOR)  
Secondary=  
ATTRB EQU 67H  
to ATTRB EQU 42H
  - Assemble it with the CPM-assembler,  
(ASM BLINKON)
  - Change the BLINKON.HEX file into  
BLINKON.COM by loading it. (LOAD BLINKON)
  - Try it out, by typing : BLINKON, and you'll see the characters on the screen in blinking mode.
- \*\*\*\*\*

BDOS expects the character in register E  
and the BDOS function in register C

Continued on page 7

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## Letters to the Editor continued from page 4

### DEAR SUPERLETTER:

I have been driven crazy trying to get my SuperBrain to work with a Hayes Smart-Modem 1200. Everything seemed to be set up right, but there appeared to be no communication between the computer and modem.

A call to Intertec yielded a test for communication from the main port.

Use paper clips into the main output socket and jumper pins 2 to 3 and pin 20 to 5. With the Master disk brought up type: PIP OUT: = CON: SPACE, CR. The screen shows ECHO(Y/N). Answer Y. Then everything typed on the keyboard is shown twice on the screen. If this works, the main port is O.K. Next they suggested opening the case and inspecting the dip-switch on the processor board under the disk drive. 3 and 4 should be on; 1, 2 and 5 off. Mine were all on. Corrected this, plugged in the modem and all works fine.

M.N. Estridge, M.D.  
399 East Highland Ave.  
Suite 520  
San Bernardino, California  
92404

## Programs

### continued from page 6

: ASCII-characters:

CR	EQU	0DH
LF	EQU	0AH
ESC	EQU	1BH
TILDE	EQU	7EH
ATTRB	EQU	47H

; tilde =  
; attribute = characterset 2  
; (see also note)

: Secondary set:

CR	EQU	0DH
LF	EQU	0AH
ESC	EQU	1BH
TILDE	EQU	7EH
ATTRB	EQU	67H

: CP/M BDOS "write to CONsole":

WCONS: EQU 2

:CP/M addresses:

WBOOT	EQU	3	; warm boot
BDOS	EQU	5	; system-call entry
TPA	EQU	100H	

ORG TPA

LXI HSTRING  
CALL COSTR

STRING: DB ESC, TILDE, ATTRB, CR, LF, O; output string...

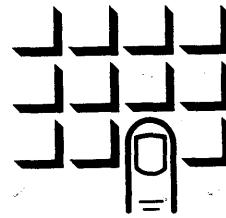
; Subroutine for sending 1 character to CON:  
CHROUT PUSH B : save registers  
PUSH D  
PUSH H  
MVI CWCNS: BDOS functioncode in C  
MOV E,A : character in E  
CALL BDOS : use CP/M BDOS  
POP H : restore registers  
POP D  
POP B  
RET

: Main-routine

COSTR:	MOV	A,M
	ORA	A : O = end of the string, stop
	RZ	: check for 0
	CALL	CHROUT: send a character
	INX	H : to CON: Increment
	JMP	COSTR : counter. Loop back
	JMP	WBOOT : Ready, generate a : WARM BOOT

END

R.J. van Herksen RO  
V. Karnebeeklaan 27  
Culemborg  
The Netherlands



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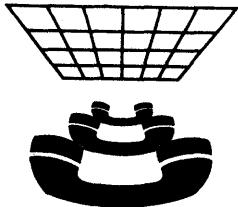
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# SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

Oct. / Nov.  
Vol. 3 No. 5

**S**uperletter's offices will be closed from November 7th through December 27th due to international travel.

No news yet from Intertec regarding their new product line. Early reports from good sources speak about an 8/16 machine with a detached keyboard that will run as a multi-user system with CP/M 80, CP/86 and MP/M. Still no confirmation the new products will be able to use IBM-compatible software.

Rumors lately about Intertec's financial health have not been encouraging. Yet we also get conflicting information from certain dealers and those close to the company that Intertec is here to stay and any news otherwise is false.

We're hearing grumblings about the video portions of the SuperBrain II's which are going down due to weak solder and contact points on the *underside* portion of the video boards. Actually, it's a comparatively simple problem to fix, but if you don't know what to look for, it can be a headache.

The life of Superletter is dependent on a fragile connection between thousands of Intertec users, the factory and us. In order to have a strong end-user network, we need your continued support. Subscriptions and ad dollars help dealers, vendors and us maintain a presence in the marketplace.

As other computer clubs fold or gently disappear, we move forward. As of now, we are one of the longest-lived, if not the oldest, professionally published microcomputer newsletter devoted to a single computer system.

Our aim is to always be here for your needs, regardless of what happens in the rapidly changing computer landscape.

Have a Happy Holiday Season!

*Albert Abrams*  
EDITOR

## Technical Corner

### Floppy Disk Motor Shutoff, Extended Storage Capacity, and Variable Seek Rates for the CMC Targa BIOS.

by

**James N. Herron, Ph.D.**

University of Utah  
Dept. of Biochemistry  
410 Chipeta Way  
Salt Lake City, UT 84108

With the addition of a CMC Targa 10 MB disk drive to my SuperBrain, I was distressed to learn that the CMC PROM did not support the extended floppy disk features which had been provided by Information Engineering's SB/E PROM. Most of my diskettes were formatted at 40 tracks per side, and a 40 TPS operating system was needed in order to dump them onto the hard disk. Inspection of the CMC BIOS revealed provisions for several different disk formats. Unfortunately, CMC did not follow through and implement these formats at the PROM level. Additionally, with the hard disk in operation, the floppy disks sit idle most of the time, and it would be quite advantageous to turn them off between their infrequent operations.

The solution to these problems is to use a different PROM, one which knows about extended floppy disk functions. A "quick fix", which works with the SB/E PROM is provided though use of CMC's BOOTHD utility. BOOTHD is a program which runs in the CP/M transient program area (TPA) and loads the CMC operating system from the hard disk's system tracks. First, boot the SuperBrain with SB/E and optionally use ACTIVATE to establish the desired floppy disk parameters. This will modify two addresses in CPU2's RAM, which control disk motor shutoff, seek rate, and tracks

per side. Then run BOOTHD, which will overlay SB/E with the CMC operating system. Because the control bytes are in CPU2's address space, they aren't modified by the CMC BIOS. This procedure may also work with the SOS PROM, but I've never had an opportunity to try it.

A more elegant solution involves modification of the CMC BIOS so that it initializes the floppy disk control bytes in CPU2's RAM during a restart operation. The following patch for CMC BIOS was designed for the SB/E EPROM. It's build around two of the Intertec DOS 3.2 floppy disk subroutines, which swap CPU2's RAM in and out of CPU1's address space. Information Engineering placed the two disk control bytes starting at location 8800H in CPU2's RAM. Location 8800H controls disk motor shut off and seek rate, while location 8801H contains the number of tracks per side. The low order nibble of 8800H controls the seek rate, with values of 0, 1, 2, and 3 selecting respective seek rates of 30ms, 20ms, 12ms, and 6ms. The high order nibble controls disk motor shutoff, with a value of 8 activating disk motor shutoff, and a zero value deactivating it. For example, storing 83H at location 8800H selects disk motor shutoff and 6ms seek rate.

I located the patch in GOCPM, immediately after CALL TRANS, which initializes floppy disk control bytes during a cold start. It's also possible to put the patch at the beginning of WMRET, in which case the control bytes are initialized during a cold start and updated with every warm start. Values to be stored at locations 8800H and 8801H can be added to the end of the Intertec configuration area to allow software modification of floppy disk characteristics. When you add the patch to CMC BIOS, make sure that the HFIRST equate is set to TRUE, which selects the hard disk as disk A. Also set an equate for the desired floppy

*Continued on Page 2*

## Technical Corner

Continued from Page 1

disk format (35/40/70/80 tracks per side, single/double sided). Assemble the patched BIOS and incorporate it into CPMH10S.COM (SPMH10D.COM for a double sided system) using DDT. Run CPMH10S and write a copy of the new operating system onto both the hard disk and a floppy diskette. Unfortunately the SB/E PROM doesn't know that the hard disk is there, so you'll have to start the system by placing the floppy that you SYSGENed with CPMH10S, in drive A and pressing both reset buttons. This procedure boots the CMC operating system from the floppy disk, but all subsequent warm starts default to the hard disk. A better solution would be to program a new PROM which contained both the hard disk boot loader and the extended floppy disk driver routines (a hint to reader with an EPROM blaster).

### CMC BIOS Patch for Disk Motor Shutoff Variable Seek Rate and 40 Tracks per Side

Dr. James N. Herron

University of Utah, Biochemistry  
410 Chipeta Way  
Salt Lake City, UT 84108

```
; Equates
DMA1 EQU 0EB99H ;Select CPU-2 RAM
DMA2 EQU 0EB98H ;Select CPU-1 RAM
SETFD EQU 08800H ;Bottom of control byte area

; Configuration Area
; Note: add these bytes to the end of the
; Intertec Configuration Area (location 0EF20H)
DB 89H ;Disk motor shutoff, 6ms seekrate
DB 28H ;40 tracks per side

; Code Segment
CALL DMA1 ;Select CPU-2 RAM
LHLD INTFD ;Load HL with control bytes
SHLD SETFD ;Store them at 8800H
CALL DMA2 ;Restore CPU-1 RAM
```

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4. "Mail Merger" pulls out specific information from your records in the "Data Base Manager" area and automatically inserts it into another document which you just produced on the "Word Processor". An example of this would be a form letter to club members or clients, or Board members, etc. "Mail Merger" neatly types in the required information such as name and/or address to create what seems like a personal letter.

Available for both the CompuStar and SuperBrain, I and II.

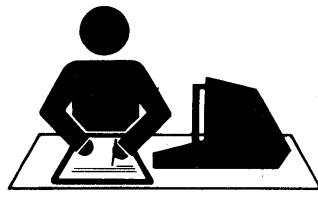
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Contact: Ms. Blossom Kramer

The "poorman's" breakout box has been made available by REMARK DATACOM INC. The Model 51 MINI-PATCH BOX provides all users of devices employing RS-232 interfaces with the ability to reconfigure the connections, or signal paths. This is usually necessary when interfacing new devices such as printers and CRT terminals.

The Model 51 is equipped with a male and female, DB-25, 25 pin connector. This allows the placement of the MINI-PATCH BOX in series with any RS-232 cable path. Of the 25 pins, pin 1 (Frame Ground) and pin 7 (Signal Ground) are carried thru from the male to the female connector. The remaining 23 signals from each connector terminate on female jack receptacles. Sup-

Continued on Page 7



# Technical Corner II

## FLOPPY DRIVE MOTOR SHUT-OFF for any SUPERBRAIN or COMPUSTAR by JONATHAN PLATT Copyright 1983

I have been accumulating information on the subject of motor shut-off for some time. It is at a point now where I think I can present it to the readers of Superletter with some authority and detail. It has been my tradition to provide not only the how-to but the how-comes, the background and sometimes theory as well. No sense in breaking tradition.

Several methods of implementing a motor shut-off feature on the SuperBrain or CompuStar have been employed thus far. IE was the first with their SB/E BIOS and EPROM. They use drive select D to signal whether the motors are on or off. Of course, a hardware modification and their special EPROM is required. SB/E allows only two drives on a system. Both drives run when the motor signal is activated. The motors are turned off after ten seconds of idle use and there is a delay of one second when reactivated to let them come up to speed.

Quite some time later, Intertec released Engineering Change Order (ECO) number E030038. Part to the method covered with this ECO is a bit crude because it asks you to cut a trace on each floppy drive board. In addition to isolating each drive from the motor-off signal, one jumper must be installed on the drive's shunt block socket for all but CDC drives. This jumper's function is to use the drive select signal to also turn on the selected drive's motor. In this manner only the drive being used has its motor running, dramatically increasing every drive's lifetime. It is also much easier on those frequently flaky power supplies. The motor is turned off after three seconds of idle use and there is (or should be) a delay of 0.25 seconds when reactivated to let it come up to speed.

I have supplied my customers with instructions on how to implement motor shut-off in a less destructive manner. I advised them to cut the one conductor which carries the motor-off signal from the main board to the floppy drives under the assumption that a ribbon cable makes for a cheaper cutting board than a floppy drive. Well, this worked with most drives but not Shugarts. The reason was that even though the conductor was cut, the Shugart drives did not keep the signal isolated from the back section of cable (on the other side of the cut.) Thus,

more than one drive would be selected at once. Other drives did not have this problem.

One of my customers offered what I think is the best solution which is completely reversible if you decide that motor shut-off is not what you need. This is a streamlined version of my old method and is still functionally identical to the way Intertec implements it. But before I tell you what to do, let me tell you what it does.

### TECHNICAL BACKGROUND

The boot EPROM initiates a drive operation by sending a command to the Floppy Drive Controller (FDC). When the FDC receives the command it activates a signal called Head Load (HLD). The HLD signal is the input to what is called a "one-shot". A one-shot basically delays a signal for a certain time set in hardware with a resistor and a capacitor. Intertec set it for 121.5 milliseconds delay. After the delay the one-shot outputs the HLD signal back to an FDC input called Head Load Timing (HLT). Only after HLT becomes active will the FDC continue with the disk operation specified in the EPROM'S command.

Under Intertec's drive logic, a drive will only be selected when both the EPROM has the drive selected and HLD is active. So after one of the drives is selected by the EPROM and the FDC receives a command, HLD is activated. This sends a select signal to the selected drive. The select signal activates the drive and with the modifications it also turns the motor on.

Meanwhile, the one-shot is delaying HLD back to the HLT signal, giving the drive motor time to come up to speed before the FDC continues with the disk operation. Drive manufacturers specify a maximum time of 250 milliseconds (one quarter second) before the drive motor will be at its proper speed.

Once a disk operation had been completed, the FDC will count 15 revolutions of the disk and then turn off its HLD signal. Since the drive motors turn at 300 RPM, it works out to three seconds. When the HLD signal goes inactive, the drive is deselected and the motor turns off.

When Intertec designed their one-shot delay, they made it for 121.5 milliseconds. They were only thinking of the time it would take for the read/write head to load against

*Continued on Page 4*



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## Technical Corner II

Continued from Page 3

the diskette surface. Even this was a little long since 30 milliseconds is the standard for mini-floppies. This was long before they even heard about turning motors off. But even after Intertec finally learned how to accomplish motor shut-off, they still shipped their machines with the 121.5 millisecond delay. I believe they later released an ECO with the proper resistor value change to bring the delay to about 250 milliseconds.

The main effect of not waiting enough time for the drive to come up to speed would be CRC errors. This was not only a symptom of the wrong hardware delay but also some deficient programming in the EPROM. I received Intertec EPROM version 4.2 with my CompuStar 30, the equivalent of a QD SB II, last December. I studied their programming closely. The machine came with motor shut-off already installed but still had the wrong resistor value in the delay circuit.

If there has been no new EPROM released since 4.2, then the bugs are still there as well. First, the internal programmed delay for drive speed is about 138 milliseconds instead of 250. Second, when the same drive is accessed after the three second idle shut-off time, the EPROM does not delay at all. Again, there should be a delay of 250 milliseconds. Luckily, they did think of delaying when going from one drive to another even though the three second time out has not occurred. This must be done since each drive runs independently. Think of how PIP goes back and forth between drives.

Any SuperBrain or CompuStar ever made will support motor shut-off. But if you are using an Intertec boot EPROM then you may have to make one hardware modification. The time allowed for the drive motor to come up to speed is crucial. The hardware delay problem can be remedied by replacing a resistor. The problem with the Intertec EPROM can only be fixed by buying a better EPROM unless they have fixed theirs by now. At the risk of sounding unhumble, the SOS BIOS EPROM handles all timing properly even without the aid of the one-shot. So any hardware change would not be necessary with this EPROM.

If you are using the SB/E BIOS motor-off feature, either stick with what you have or undo the damage your hardware modifications did and use the SOS EPROM. Intertec's EPROM will not respond to disk features of the SB/E BIOS.

### MODIFICATIONS

If you are implementing motor shut-off with the Intertec EPROM, you will need to do

the board modification. If you are using the SOS EPROM skip the board modification. It involves removing a resistor from the PC board and replacing it with a new one of higher value. Drive modifications should be followed under all circumstances. If you use any other EPROM, check with the manufacturer before continuing.

If you are not certain about any of the terms used in the following directions then you would be better off by having a technician do the modifications for you.

### BOARD MODIFICATION

First take the cover off and locate the floppy drive cable connector on the upper right edge of the main board. To the left of the connector are two columns of chips. Counting from the top edge downward, the resistor is between the second and third chips of those two columns. Just below the resistor there should be a capacitor between the third chips of those two columns. The resistor is color coded with a red, violet, orange and gold band in that order. It is also known as a 27K Ohm resistor.

Remove the resistor and put a 56K Ohm resistor in its place. This involves soldering, so if you do not know what you are doing let a technician do it for you. A 56K Ohm resistor is color coded with a green, blue, orange and gold band in that order. The gold band means that it has a five percent tolerance.

This hardware change will increase the delay before a disk operation to 252 milliseconds. Now the drives will have enough time to come up to speed before trying to attempt any disk access.

### DRIVE MODIFICATIONS

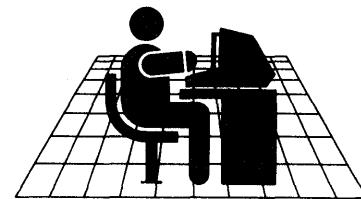
Take the cover off and remove the disk drives. Cut a piece of heavy adhesive tape about one inch long and one eighth inch wide for each drive. I usually use clear stranded packing tape. The tape will cover a conductive connector strip on each drive. On a table, orient the drives as they would normally stand in the computer. Find the eighth gold connector strip up, counting from the bottom strip. Cover this strip on both sides of the connector tab.

If you have CDC drives in your computer, the drive modifications are complete. If you have Tandon, Shugart or other similar drives, continue by locating the shunt block socket on your drives. They usually have the break-away tabs plugged into them. If the sockets are labeled they will have DS0, DS1, DS2, DS3, MX, HM and HS printed on the board beside the socket. Jumper both HS and HM. HS should already have

been jumpered anyway. The drive modifications are complete. Put the connectors back onto the drives making sure the tape stays in place. Put the drives back where they belong, replace the cover and test the system.

If the signals are not labeled, the best I can do is give you examples. On the Tandon drives which have a sixteen pin socket, the additional jumper goes from pin eight across to pin nine. On the Shugart drives which have a fourteen pin socket, the additional jumper goes from pin seven across to pin eight.

Have a Super day!



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# -Programs-

These programs offer a good way to move files between CP/M machines, even with totally different disk systems. The only requirement is that each have a serial port. Transfer can be made with either a direct interface cable or a pair of modems. The programs are very tolerant of timing and contain the facility for retransmitting records containing transmission errors.

## Listing 1

### Program to transmit a CP/M file

```
; Program to transmit a CP/M file through a serial port
; Accesses port directly, bypassing the BIOS
; Assumes an 8-bit word length and no parity
;
; Version of 9/2/83
;
; If required, place serial port initialization code here
;
TX: LDA TFCB+1           ;Check for filename
JNZ OPEN
LXI D,FNMR              ;Print error message and reboot
ABORT: MV1 C,9
CALL BDOS
MV1 E,04H
CALL XMTBYT             ;Send EOT character
JMP BOOT                ;Return to CP/M
OPEN: LXI D,TFCB
MV1 C,15
CALL BEGS               ;Open file
JNK A
JNZ FOUND               ;File present
LXI D,FNPER              ;Point at error message
JMP ABCRT               ;Print and reboot
FOUND: XRA A
STA TFCB+32             ;Set next record byte to zero
MOV C,A
MOV COUNT1               ;Set record count in buffer to zero
READY: PUSH H             ;Save record count
MV1 C,11
CALL BDOS
POP B
ORA A
JZ REALY1               ;No key pressed
PUSH B
MV1 C,1
CALL BDOS
POP B
JPI 03H
JNZ REALY1
ENEXMT: LXI D,LCRMSG    ;Print EOT message and abort
JMP ABCRT
READY1: IN SIODAT        ;Read serial status port
AN1 IFLAG
JZ READY                ;Wait for character to be received
IN SIODAT               ;Get received character
AN1 7FH
CP1 04H
JZ ENDXMT               ;End transmission
CP1 01H
JZ XMTREC                ;Transmit next record
CP1 02H
JZ READY                ;Ignore other characters
LHLL DATPTR
D,-0080H
DAE D
SHLD DATPTR
INR C
XMTREC: LCR A
STA RPTFLG
CZ COUNT
XMTRC1: DCR C
LDA EOFFLG
JP XMTRC2
LDA EOFMSG
A
JZ READFL               ;More in file
LXI D,EOFMSG
MVI C,9
CALL BDOS
MVI E,03H
CALL XM1BYT              ;Send EOF byte
READFL: LXI H,DATBUF
SHLD DATPTR
INR C
READ: PUSH B
PUSH D
MVI C,26
CALL BDOS
LXI D,TFCB
MVI C,20
CALL BDOS
POP D
POP B
ORA A
JNZ NOMORE              ;EOF detected
LXI H,0080H
DAE D
INR C
MVI A,BUFREC
CMP C
JNZ READ
JMP XMTRC1
;
;
```

*continued*

*Listing 1, continued*

```
NOMORE: MVI A,1
STA BOPFLG
JMP XMTRC1
XMTRC2: LDA RPTFLG
INR A
MOV E,A
CALL XMTBYT
LHLL DATPTR
MVI B,80H
MVI D,0
XMTRC3: MCV A,M
INX H
MOV E,A
ADD D
MOV D,A
PCLR B
JNZ XMTRC3
MOV E,D
CALL XMTBYT
PUSH B
MVI C,4
MVI E,00H
XMTRC4: CALL XMTBYT
C
JNZ XMTRC4
SHLD DATPTR
LXI D,RECMSC
MVI C,9
CALL BDOS
RPTFLG
OR A
JZ NEXTLN
LXI D,AGAIN
MVI C,9
CALL BDOS
D,CRLF
MVI C,9
CALL BDOS
RPTFLG
POP B
JMP READY
COUNT: LXI H,RECCNT+4
COUNT1: INR M
CMP M
RNC
MVI M,'0'
DCX H
MOV A,M
JNZ COUNT1
MVI M,'0'
JMP COUNT1
IN ANI OFLAG
XMTBYT: IN SIODAT
ANI XM1BYT
JZ OUT
MOV A,E
OUT SIODAT
RET
;
PNAME: DB 'File name missing',0DH,0AH,'$'
FNPER: DB 'File not found',0DH,0AH,'$'
EOFMSG: DB 'Transfer complete',0DH,0AH,07H,'$'
EOTMSG: DB 'Transfer terminated',0DH,0AH,07H,'$'
RECMSC: DB 'Record #'
RECCNT: DB ' '
RECCNT1: DB 'Record # transmitted'
AGAIN: DB ' again$',0DH,0AH,'$'
CRLF: DB ' ',0DH,0AH,'$'
DATPTR: DW DATBUF
EOFFLG: DW 0
RPTFLG: DW 0
DATBUF EQU $ ;Data buffer
;
END
;
```

## Listing 2

### Program to receive a CP/M file

```
; Program to receive a CP/M file through a serial port
; Accesses port directly, bypassing the BDOS
; Assumes an 8-bit word length and no parity
;
; Version of 9/17/83
;
; If required, place serial port initialization code here
;
RX: LDA TFCB+1           ;Check for filename
JNZ OPEN
LXI D,FNMR              ;Print error message and reboot
ABORT: MV1 C,9
CALL BDOS
MV1 E,04H
CALL XMTBYT             ;Send EOT character
JMP BOOT                ;Return to CP/M
OPEN: LXI D,TFCB
MV1 C,19
CALL BDOS
LXI D,TFCB
MVI C,22
CALL BDOS
INR A
LXI D,LCRMSG
JZ ABORT
START: MVI C,30
MVI E,00H
NULS: CALL XMTBYT
LCR C
JNZ NULS
IN SIODAT
READY: LDA RPTCTR
CPI RETRY
MVI E,01H
;
;
```

*continued*

**Listing 2, continued**

```

JZ READY1 ;First time for this record
INR E ;Change request character to 02H
ORA A ;Test repeat counter
JNZ D,EOTMSG ;Try again if not zero
ENDXMT: LXI D,EOTMSG ;Print EOT message and exit
JMP ABORT
READY1: CALL XMTBYT ;Send prompting byte
READY2: MV1 C,11
CALL BDOS ;Get console status
ORA A
JZ READY3 ;No key pressed
CALL BDOS
CALL CPI 03H
JZ ENDXMT ;Terminate if control-C pressed
READY3: IN SIODSTA ;Read serial status port
ANI IFLAG
JZ READY2 ;Wait for character to be received
IN SIODEAT ;Get received character
ANI 7FH ;Mask off bit 7 for ASCII codes
CPI 63H
JZ CLOSE ;Flush buffer and close file
CPI 64H
JZ ENDXMT ;End transmission
CPI 61H
JZ RCVREC ;Receive next record
CPI 62H
JZ READY2 ;Ignore other characters
RCVREC: MV1 B,86H ;Byte count for record
MV1 D,0 ;Initialize checksum
LHLD DATPTR ;Prepare to store data
RCVRC1: CALL RCVBYT ;Get a byte
MOV M,A ;Store in data buffer
INX H
ADD D
MOV D,A ;Update checksum
DCR B
JNZ RCVRC1 ;Continue for 128 bytes
CALL RCVBYT ;Get checksum
CMP C
PUSH PSW ;Save status
JNZ RCVRC2 ;Bad read
SHLD DATPTR ;Save new record pointer
RCVRC2: LXI D,RECMSC ;Save record
MV1 C,9
CALL BDOS ;Print received record message
LDA RPTCTR
CPI RETRY
JZ RCVRC3 ;First try
LXI D,AGAIN
MV1 C,9
CALL BDOS ;Print 'again'
RCVRC3: LXI D,CRLF
MV1 C,9
CALL BDOS ;Print CRLF
LXI H,RPTCTR
DCR M ;Decrement repeat counter
POP PSW
JNZ START ;Successful read
STA H,RECNT+4 ;Reset counter for next record
LXI M,VU1 ;Over 9?
CMP M
COUNT: INR M,A,'9' ;Over 9?
CMP M
JNC BUFCCHK ;File name missing
MV1 M,'0'
TCX M
MCV H,A,M

```

*continued*

```

CP1 COUNT
JNZ M,'0'
MVI COUNT ;Put 0 in message
BUFCHK: LHLL DATPTR ;Put 0 in message
LXI L,-(LATBUF+BUFREC*128)
PAC CC
JMP FLUSH ;Flush buffer if full
READY ;Go look for next record
LATBUF ;Start at beginning of buffer
LATPTR ;Compare to see if empty
JNZ MCV ;More to go
CMP H
JNZ CMP L
MIV A,E
JNZ FLUSH2 ;More to go
LATBUF ;Reset data pointer
LATPTR ;Set DMA address
MVI C,26
CALL BDOS ;Set DMA address
LXI D,TFCB
MVI C,21
CALL BDOS ;Write record
POP D
ORA A
JZ FLUSH3 ;Good write
LXI L,UFER ;Disk error
JMP ABORT
FLUSH3: LXI H,0060H ;Point to next record
PAI I
XCHG JMP FLUSH ;Go write it if present
CLOSE: CALL FLUSH ;Flush buffer of data
LXI I,TFCB
MVI C,16
CALL BDOS ;Close file
LXI L,EOFMSG
MVI C,9
CALL BDOS ;Print EOT message
JMP HOOT ;Reboot
RCVBYT: IN SIODSTA ;Receive byte from serial port
ANI IFLAG
JZ RCVBYT ;Bad read
IN SIODAT
RET
XMTBYT: IN SIODSTA ;Transmit byte to serial port
ANI OFLAG
JZ XMTBYT ;Bad read
MOV A,E
OUT SIODAT
RET
; FNMR: DB 'File name missing',0DH,0AH,'$'
; DDFER: DB 'Disk or directory full',0DH,0AH,'$'
; EOFMSG: DB 'Transfer complete',0DH,0AH,07H,'$'
; EOTMSG: DB 'Transfer terminated',0DH,0AH,07H,'$'
; RECMSC: DB 'Record # received'
; RECCTN: DB 'Record # received'
; AGAIN: DB 'Received',0DH,0AH,'$'
; CRLF: DB 'Again',0DH,0AH,'$'
; DATPTR: DW 'CRLF sequence'
; RETRY: DB 'Pointer to next storage location in buffer'
; DATBUF: EQU $ 'Counter for repeated record'
; DATA: DB '$ Data buffer'
; END

```

## New Products

### Continued from Page 2

plied with 25 jumper plugs, the interconnect circuitry is patched by the user; for those applications where many signals must be patched together the MINI-PATCH BOX provides two bussing areas where multiple signals maybe connected together.

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PDIR is a Paging Directory Display Program for CP/M 2.2. PDIR lists the directory file names in alphabetical order, as do most other directory display programs. PDIR stops when the screen is full before going to the next screen, like most other Directory Display Programs. Thats where the similarity ends.

With PDIR you can back up to the first screen of file names then go to the second screen-toggle between screens-without restarting the program.

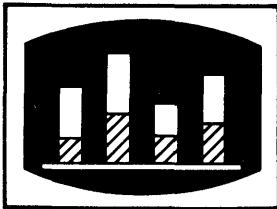
Not only does PDIR toggle between pages it

also can toggle between disk drives. If you look at the file names on drive 'A' then want to see what is on drive 'B' PDIR will switch and display the file names in drive 'B' without restarting the program. You can then go on to 'C' or back to 'A' or to whatever USER number you want on whatever drive.

PDIR also displays how many file names are being used, the amount of disk space used and remaining disk space for the current USER.

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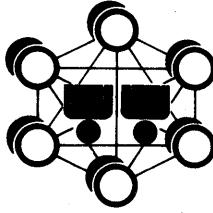
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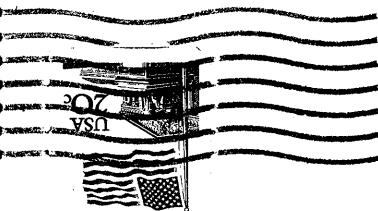
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