

SUPERLETTER

Serving SuperBrain and CompuStar Users Around The World

April/May 1983
Vol. 3 No. 2

SuperBrains 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.

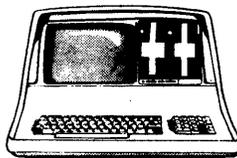
Also, the 16-bit dream is slowly becoming a nightmare. Software has just not materialized for that level of computers. The operating systems offered to run 16-bit computers still have bugs in them. So, while the 8-bit CP/M user happily goes on his or her way choosing from over two hundred available working 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

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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 synch 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 connect-

ed 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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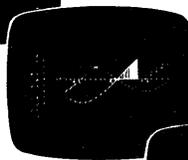
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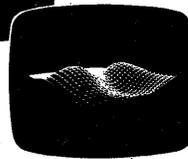
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Letters to the Editor

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 Ros-tronics "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 nonsupplying 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 main-frame 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. Micropro 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 SBI 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.

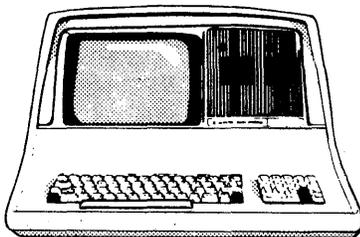
DEAR SUPERLETTER :

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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Contact: K. David Steidley, Ph.D.

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.

-Programs-

HOW TO GET FOUR DRIVES TO RUN ON THE SUPERBRAIN

Richard L. Most

18348 8th NW
Seattle, Washington 98177
(206) 542-2998

My suspicions were confirmed when I got my first look at the schematics for my SuperBrain SD 1. The hardware was all set up to support four disk drives. All I needed to do was rewrite the BIOS to support the two extra drives.

Listings 1,2, and 3 below are the original code taken from Intertec's 32BS5/5.ASM. Listings 4,5, and 6 are the replacement code that adds two more drives to the BIOS.

System generation :

- Edit 32SB5/5. ASM replacing old code with new code (see listings).
- Assemble new BIOS using ASM.COM.
- Insert new BIOS into 64CPM5/5.COM using DDT.COM with offset of 4180H.
- Exit DDT and save 48 pages of memory as SB4DSK.COM.
- Execute SB4DSK.COM. Do a return to skip and a B to place new system on drive B. Intertec incorporated SYSGEN.COM into 64CPM5/5.COM.

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

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

```
DPBASE EQU $
DPE0 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV0,ALV0
;
;DEFINITION FOR DISK B (512 BYTES/SECTOR)
DPE1 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV1,ALV1
```

Listing 2

```
BEGDAT EQU $
ALV0: DS 31
;
CSV0: 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 sekdisk ;seek disk number
cpi 2 ;max no. of disks
rnc
mov mvi l,a ;disk number to HL
mvi h,0
dad h ;multiply by 16
dad h
dad h
dad h
lxi d,dpbase ;base of parm block
dad d ;hl=.dgp(curdisk)
ret
```

Listing 4

```
DPBASE EQU $
DPE0 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV0,ALV0
;
;DEFINITION FOR DISK B (512 BYTES/SECTOR)
DPE1 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV1,ALV1
;
;DEFINITION FOR DISK C (512 BYTES/SECTOR)
DPE2 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV2,ALV2
;
;DEFINITION FOR DISK D (512 BYTES/SECTOR)
DPE3 DW XLT0,0000H
      DW 0000H,0000H
      DW DIRBUF,DPB0
      DW CSV3,ALV3
```

Listing 5

```
BEGDAT EQU $
ALV0: DS 31
CSV0: DS 16
ALV1: DS 31
CSV1: DS 16
ALV2: DS 31
CSV2: DS 16
ALV3: DS 31
CSV3: DS 16
```

Listing 6

```
;seldsk:
;select disk
lxi h,0000 ;error return code
mov a,c ;selected disk number
sta sekdisk ;seek disk number
cpi 4 ;max no. of disks
rnc
mov mvi l,a ;disk number to HL
mvi h,0
dad h ;multiply by 16
dad h
dad h
dad h
lxi d,dpbase ;base of parm block
dad d ;hl=.dgp(curdisk)
ret
```

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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 adaptor 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
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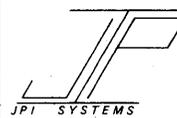
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