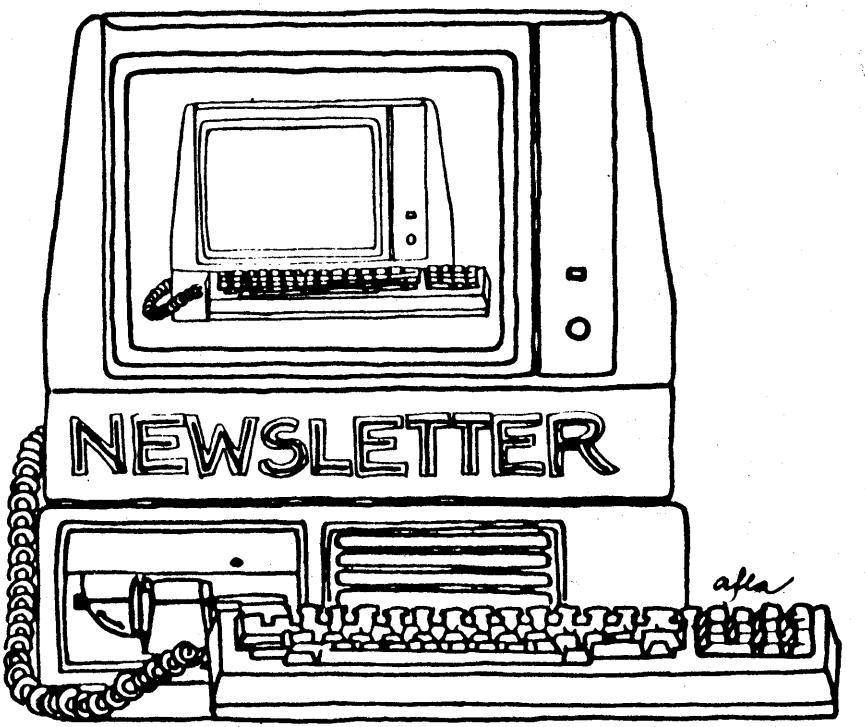
July 10, 1987 Volume 5 Issue #5

BAY AREA MICRO DECISION USERS ASSOCIATION

BAMDUA



A MUTUAL SUPPORT NETWORK FOR USERS OF MORROWS' MICRO DECISION COMPUTERS-
P.O. BOX 5152, BERKELEY, CA. 94705
415: 644-2805

BAY AREA MICRO DECISION USERS ASSOCIATION

BAMDUA, the Bay Area Micro Decision Users Association, is open to all who are interested in Morrow's Micro Decision computers. Membership fee is currently $16 per year and includes a subscription to our monthly newsletter. For information, membership application forms, etc., please send a self-addressed stamped envelope to the BAMDUA P.O. Box 5152, Berkeley, CA 94705.

The main BAMDUA meeting is held the latter part of each month. On alternate months, it is the last Tuesday of the month or the last Saturday of the month depending on our meeting place. The next meeting is on Saturday, July 25, at the Chabot Science Center.

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+++ Next main BAMDUA meeting: ++++++++++++++++++++++++++++++++++++
+                                                                  +
+   WHEN:    Saturday, July 25, 1987, 7:30 p.m.                    +
+   WHERE:   Chabot Science Center                                 +
+            4917 Mountain Blvd., Oakland (off Highway 580)        +
+   GUEST:   David Mitchell                                        +
+   TOPIC:   Demonstration: the AMSTRAD COMPUTER! a new CP/M       +
+                computer manufactured in Britain.                 +
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There is no BAMDUA meeting in August. The September meeting will be announced in your September Newsletter.

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NEWSLETTER SUBMISSIONS

Please submit material to the Newsletter on disk, in a WS or NW file so it can be easily formatted to our style. Include your name, address and telephone number. Send to: Editor, BAMDUA Newsletter at P.O. Box 5152, Berkeley, CA 94705.

We reserve the right to edit articles submitted for publication. In keeping with the spirit of "public domain" we grant permission for articles appearing in this Newsletter to be reprinted by other users' groups as long as proper identification is made of author and source. We cannot guarantee the accuracy of information printed here, but we do assume that all authors take an interest in providing responsible information to the best of their ability.

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BAMDUA PBBS/RCPM

A system of the Bay Area Micro Decision Users' Association

Micro Bulletin Board System (tm) Sysop: Steven Wartofsky
Phone: (415) 654-3882
Access: Registration (See Bulletin on line). 24 hrs.
Baud rates: 300, 1200, 2400
Hardware: Morrow MD-5 running CPM+ (CP/M 3.0)
1 Floppy Drive (B), 2 Hard Disks: (A-5 meg; C-16 meg)
Software: PBBS, BYE510, KMD21, SFILE26, LD, MAP

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BAMDUA OFFICERS

PRESIDENT.....Rick Charnes
VICE PRESIDENT.....Peter Campbell
NEWSLETTER EDITOR.....Georgia Babladelis
SECRETARY.....George Borys
LIBRARIAN.....Gene Korte
TREASURER.....Wesley Johnson
MEETING PROGRAMMER.....Ilbert Butler

PBSS SYSOP:
Steven Wartofsky

MEMBERS AT LARGE:
Sypko Andreae
Frank Oechsli
Lee McKusick

EVENTS CALENDAR

BAY AREA COMPUTER SWAP - Cow Palace, San Francisco; July 11, 1987 and again August 1, 1987; at the Santa Clara County Fairgrounds on August 29, 1987. All events are on Saturdays, from 10 - 5. Admission: $5; children under 12, free. For information, call 415/340-9113 or write MICROSHOWS, 1209 Donnelly Avenue, Suite 203, Burlingame, CA 94010.

LOCAL MORROW USER'S MEETINGS:

The CP/M Users of Santa Cruz County (formerly SCMDUG) will meet on the 2nd Tuesday of the month at 7 p.m. at the Branciforte Branch of the Public Library, 230 Gault St., Santa Cruz. Written inquiries should be sent to 376 Lucinda St., Scotts Valley, CA 95066. For information call 408/438-0662 or 408/423-1462.

Stanford Morrow Users' Group, (S.M.U.G.) meets on the 2nd Wednesday of the month at 7:30 PM, Stanford campus: Polya Hall, Room 111. Info: Ed Gallaher (408) 749-9285 (H)

PETMUG (Petaluma Users' Group) meets on the 4th Thursday of each month at Advanced Information Management, 245 North McDowell Blvd. (in Petaluma Plaza), Petaluma, CA. For info. contact: Don Waite, 707/763-6891 or Dick Hoffman, 707/762-8286 or mailing address: P.O. Box 948, Petaluma, CA. 94953.

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HELP LIST

The following people have kindly offered their help to BAMDUA members:

George Borys: CP/M operating system; hardware-related problems. Call between 7-11 p.m., 415-582-7615.

Peter Campbell: General questions, including NewWord and dBase. Call during day or after 7 (up to 10) p.m., 415-527-3387.

Rick Charness: General questions, also specific ones about modem communications, ZCPR, Word Processing. Call in the mornings up to 11 a.m., or evenings and weekends, 415-826-9448.

Gene Korte: General questions, and ZCPR. Call 7-10 p.m. or weekends, 415-525-8944.

Lee McKusick: Turbo Pascal. Call a.m. only, 415-849-9053.

Stan Naparst: WordStar. Call 415-525-2086 (may leave msg.).

Frank Oechsli: General questions. Call evenings, 415-527-6089.

FROM THE PRESIDENT'S DISK

by Rick Charnes

A revolution appears about to hit the Morrow community in the form of the Z280 chip. For all of us who have stuck with our trusty MD2's and MD3's through thick and thin, wondering if and when we'd ever be able to equal the upstart newcomers in the IBM world in terms of power and speed, our ship seems to be finally pulling into dock. This particular microprocessor has been causing shock waves throughout the CP/M world like nothing I've ever seen before and it may be docking in our ports soon.

The main component in a computer, the part that gives it its identity so that a CP/M computer knows it is a CP/M computer (or an IBM knows it is an IBM, etc.), is something called a chip, a microprocessor chip. Chips have different names and they do very different things depending on who they are. The chip that we have in our Morrows is called a Z80, named after the company that manufacturers it, Zilog. I know as much about about computer chips as I do about nuclear physics, but I do know that it is this chip that gives us our famous 64 kilobytes of RAM, Random Access Memory, which is just a fancy way of saying "working area for programs."

The programs we've come to know and love - WordStar, NewWord, Correct-It, SuperCalc, dBase II, etc., etc. -- all run fine in this environment. The descendants of our Z80, however -- such as the chip that comes with the popular IBM machines -- have much more working area and are able to run giant programs such as WordPerfect and Lotus 1-2-3 which are ubiquitous in the business world. Unfortunately, and it took me months to understand this, you can't just remove a Z80 and replace it with one of the IBM-compatible chips. The rest of the machine just won't adjust. And most important, a program written for one chip in most cases simply won't run on one written for another.

For the main thing that most folks do with their computers -- word processing (statistics have confirmed this) -- a CP/M machine like our Morrow is perfectly adequate. But many of us have always wanted the ability to run larger programs, fancier and more complex programs, and especially to run those that we now have faster. Well, our long wait is about over. The Z280 chip, as the wonderful article in our newsletter by fellow CP/M-er George Havach, The Zilog Z280 Microprocessor explains in better detail, can run all of our CP/M software. It is a powerful grandchild of our venerable Z80; it now has come home to take over the (CP/M) family business and to look after the farm; make sure the cows get milked, the goats fed.

And here's the most interesting thing: with this chip we are leapfrogging over the mainstream IBM world, which is still primarily using "2nd generation" computers, and moving directly to the "3rd generation": **multitasking.** (believe it or not, something that the IBM microcomputer world does not yet have). Basically, multitasking refers to the fact that one can run more than one program at the same time. Suppose you're working on a chapter of your new

bestseller when all of a sudden you remember that you promised your publishers to send them your (long) list of readers and other fans (to send them advanced notices, naturally) and it should be in the mail today! You have a database file with the requisite names and addresses but it must be reindexed. You are loath to exit Wordstar, load up dBase, wait for it to churn away on your drives, then reload Wordstar and get back to work. You really don't want to have to take time away from your writing while you're being bit by the Muse.

With the Z280 you'd be able to have dBase II do this reindexing while you continue to work in WordStar. The chip has the ability to let the operating system divide its work area ("memory") into many "partitions." Each program runs inside its own partition and there's plenty to spare to let the others do their own thing. Since our CP/M programs require only 64k and this chip can address 1 megabyte and more of memory (that's **15 times** what we have now) there is room for a number of programs to run simultaneously. Furthermore, with the new chip all our presently existing programs will run much faster. One thing that determines the speed at which programs run is the "clock rate" of the chip. Our Z80s run at 4 megaHertz; the Z280 runs at 12!!

The details of how exactly the operating system will handle the multitasking haven't yet emerged fully. The author, Scott Moore, described the following scenario as becoming possible: you've just finished up that first chapter and are eager to start on the second. But first you want to check for spelling errors on what you've just done. Normally you would have to wait some 4-5 minutes while Correct-It laboriously grinds through your document. It's important for you to be there to make the decisions when it finds the individual errors, but all that time that it checks through the document first and reads in your dictionary is time that you just have to sit and stare out the window. With the Z280 operating system you can be working on your second chapter while Correct-It is running in the background!

Actually, it is possible to do that now, but a difficulty remains about how the screen display of the two programs will be coordinated. At the present time, the operating system, RP/M, is set up so that display from one screen will simply overwrite the other. He is working on a version that will allow for the switching of screen displays a la Backgrounder ii, and ultimately will allow for windowing, one task per window.

Of course running existing (64k) CP/M programs concurrently is not the only purpose of all this added memory. New and higher-powered software programs will emerge that use this additional memory for their internal operations. In browsing through the Zilog trade magazine The Last Word I saw that one company is already preparing for release of a Z280-based C compiler. It's only a matter of time before much more becomes available.

I must emphasize that as I write (late June) the hardware and software for this are not fully ready. One company, Zedux Inc. in

Van Nuys is almost ready to go with their Accel 280 board, complete with the RP/M (Remote Partition for Microcomputers) operating system. This is a generic "add-on" board that will plug into existing CP/M computers. What we're all waiting for is the "official" release of the chip by Zilog. Even though distributors have been notified, data and specification sheets are being circulated, and the plant is tooling up for production, the chip is still in the "sampling" stage. This is standard procedure with any new product. Hence one proviso must be added to the information in George's article: the Accel 280 has everything but the chip at this point and is not fully ready to ship. When Zilog gives the official go-ahead, and I cannot speculate as to a date, the board will be ready. Zedux has had their sample chips since the beginning of the year and have developed their product with them.

Another company, High Tech Research in Redding, California is readying their Kaypro-specific Z280 add-on board, called the UltraBoard, for production later this year. There is an article on our BAMDUA BBS describing this board which gives it nothing but praise. They, too, are waiting for official release of the chip.

Release of the Z280 has eclipsed -- and in my opinion rightfully so -- the earlier release of the also-CP/M-compatible HD64180. The latter, though certainly superior to our Z80's, is far less powerful than the Z280.

The cost for the Accel 280 is not low, and it will be of most interest to those who are serious about an upgrade. It will be somewhere in the neighborhood of $350-$400. See George's article for details and phone numbers. I have contacted Zedux and will keep you informed about group purchases.

Tonight, June 23, our BAMDUA board of directors is meeting for the first time with the full BAKUP board (Kaypro users group) for serious discussion of joint venture. Lots more in store for us Bay Area CP/M and Z-system users...

A plug for a superb CP/M and Z-System-oriented magazine that unfortunately very few of us know about: The Computer Journal. Write editor Art Carlson at 190 Sullivan Crossroad, Columbia Falls, Montana 59912 (sub. $16/year) for one of the few magazines besides Morrow Owners Review still dedicated to our world.

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SPECIAL ANNOUNCEMENT

A class for beginners on ZCPR3/ Z-SYSTEM is offered by Chabot Science Center (4917 Mountain Blvd.). The class starts on July 23 (7:30-9 p.m.) and runs for 10 weeks, plus an optional lab on Saturday mornings. It will be taught by RICK CHARNES! It is important to call Chabot if you are interested: 415/531-4560.

LIBRARY NEWS: THE FABULOUS FIFTY!

CONSIDER THIS YOUR "GOLDEN" OPPORTUNITY TO GET A VERY USEFUL AND INFORMATIVE DISK CONTAINING THE CATALOG AND DESCRIPTIONS OF THE BAMDUA PUBLIC LIBRARY, PLUS THE NAMES, ADDRESSES AND TELEPHONE NOS. OF THREE DOZEN CP/M SOFTWARE COMPANIES!! T IS -BAMDUA.050!

**GOOD NEWS:

At long last the complete BAMDUA library disk directory is out! For the first time members can search a program in our huge library by name only. The entire library is arranged alphabetically file by file; also, a complete listing of each volume is on disk describing each of the programs in that volume (taken from the "READ.ME" blurbs that accompanied the announcement of each volume in the Newsletter. What this means is that you have available on disk the catalog of the BAMDUA public domain library (using NCAT) as well as the blurb describing each program. So, any time you want to know where program RUNME.COM is, enter the catalog's alphabetical listing. It will tell you that your desired program is in BAMDUA Volume .00X. If you do not remember exactly why you want RUNME.COM and wish to refresh your memory about what it does, enter the descriptive file and scroll to Volume .00X and read all about it. Nice, huh? Many, many thanks go to Gene Korte and Ilbert Butler for making this disk available.

How do you get it? Same as always. You may order it from BAMDUA in the usual manner. Or, come to a meeting and pick it up. If you order by mail, the cost is $8; if you buy it at a meeting, the cost is $5.

**MORE GOOD NEWS:

Ah, yes, Gene and Ilbert thought of everything! If you want a hard copy instead of or in addition to the disk (saves a lot of time printing it out), that, too, is available! Same pricing applies: $8 by mail and $5 in person.

**BONUS FEATURE:

The disk contains a file listing names, addresses, and phone numbers of over 3 dozen CP/M software companies. Over half of those companies have produced products that have been reviewed in this Newsletter. See how many you can identify and correctly pair up with the product reviewed in these pages! If you know of CP/M software companies not on this list, drop a note to the editor so we can update the list when the time comes to do so.

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IMPORTANT NOTE: WE WILL NO LONGER PUBLISH THE SUMMARY OF THE PUBLIC DOMAIN LIBRARY IN A "REFERENCE" ISSUE (SEPT.) OF THE NEWSLETTER. NOW THAT WE ARE ON A BIMONTHLY PUBLICATION SCHEDULE, WE NEED THAT SPACE TO BRING YOU ARTICLES, NEWS, REVIEWS, ETC.

RE-INVENTING YOUR MORROW MICRODECISION

by Phil Hess

Part VIII: Upgrading to a rev.2 motherboard

(Editor's note: This is the conclusion of Part VIII continued from the previous Newsletter, V.5, #4, May 1987).

Software incompatibilities

It's important to keep in mind that when you change the motherboard, ROM, and BIOS on a computer, you end up with a different computer. While the revision 1 MD2 and the revision 2 MD3 are in some sense the same computer on the application level, they are certainly not the same on the system level. As a result, any system or hardware modifications to one may not work on the other.

An example of this is Software Techniques' upgrade kit for the MDT-20 terminal. This is a nifty little kit that vastly improved a lackluster terminal. With a special cable and a BIOS patch, a type-ahead buffer could be added. If you've used a system with a type-ahead buffer, you won't want to give it up. With a type-ahead buffer, you can continue typing without losing characters even when the computer isn't ready to read from the keyboard.

The upgraded MDT-20 terminal runs fine with the new motherboard. However, the program which installs the BIOS patch no longer works. In addition to sticking the patch into an unused place in upper memory, the installation program also replaces two IN instructions in the CONST (console status) and CONIN (console input) parts of the BIOS with calls to the patch code instead. It does this by getting the locations of the CONST and CONIN routines and searching up through memory until it finds the IN instructions.

This is a clever approach which should be independent of BIOS revision, except for one thing: In later revisions of the BIOS, the IN instruction in CONIN has been moved to a place lower in memory, to a new routine call GETCHAR. As a result, the installation program continues to scan past the end of the CONIN routine and erroneously replaces an IN instruction in the CONOUT routine. Once patched in this way, the system is no longer functional.

One solution is to go in with DDT and make the installation by hand. Another approach would be to make the patches to the BIOS source and reassemble if you have the right assembler (ASM.COM won't do). But these solutions bring up another little problem: Using the patch address of FB80 (hex) puts the patch code right in the middle of the free space buffer in upper memory. In early revisions of the BIOS, this wasn't a problem, since this buffer wasn't used for anything. In later revisions, however, this space is used both for the in-memory submit buffer and the BIOS function key definition table. If you use either of these features, you could write over

the patch code, locking up your system.

So now the question is where to put the type-ahead patch code. It's only 39 bytes long and can go anywhere in memory since it's completely relocatable. But first another problem.

In Part VI of this series, I presented a BIOS patch which added a screen-dump facility to systems with the upgraded MDT-20 terminal. Well sure enough, the Turbo Pascal program I included for testing out the patch doesn't work with later BIOS revisions. Again, the reason is that something the program is looking for has been moved. In this case, most of the code in the SELDSK (select disk) routine has been moved from the BIOS to the ROM. Since my screen-dump patch resides in and replaces the allocation vectors for virtual drives D and E, the installation program changes the number of valid drives from 5 to 3 in SELDSK. With later BIOS revisions, the installation program can't find the value it's looking for and halts, thinking the patch has already been made.

A solution is to make a small change to the program so that it doesn't attempt to make this SELDSK modification. The installation then proceeds nicely. But now there's no way to prevent the user from trying to use virtual drives D and E and locking up the system. Again, a better solution would be to add the patch to the BIOS source and reassemble. Or, lacking the proper assembler, to leave the virtual drive allocation vectors alone and find a better place for the screen-dump patch. But where?

My solution was finally to use MOVCPM to move the system down in memory by 1K, creating a 63K system (and reinstalling it using the INIT files and TERMINAL.DAT file included on the CP/M 2.2 distribution disk). This leaves the upper 1K in memory free for whatever I want to put there. The loss of 1K is not noticeable either. Unfortunately, the patches to the BIOS image are now more complicated, involving not only changes to the BIOS code, but a change to the BIOS BOOT routine and the system boot loader. This is necessary in order to "poke" the patches into this upper 1K at boot time.

I won't go into any more detail here. This discussion applies only to the upgraded MDT-20 terminal and so I may only be addressing a handful of users. However, if you're in this group and need help with the patches or are interested, let me know and I'll send you what I have.

Hardware incompatibilities

The problems described above involve a mistake which programmers commonly make: assuming that the BIOS or other system details won't change. They can and they do. The following is a similar problem: assuming that the hardware won't change.

After all the trouble I had getting Kenmore Computer Technology's Z-Time I clock to work on my MD2, I was quite

disappointed to discover that it no longer would work with the revision 2 motherboard. To make certain that I hadn't damaged it in some way, I even went so far as to put my old system back together again. Sure enough, the clock still worked with the revision 1 board. So I put the revision 2 board in and tried it again. Still no luck. I changed the jumpers on the clock back to the way they were when shipped. This was the configuration which was supposed to work on revision 2 boards only. It wouldn't work either. I called Kenmore (for the 14th time now). They had no clues. It was supposed to work as is on the later boards.

This was back in September 1986. Somebody from technical support was supposed to call me back later in the week, but never did. I have not called Kenmore since. I'm a little tired of dealing with them and so it doesn't look promising for my Z-Time. If someone solves this problem, please let me know.

When I originally installed the Z-Time on my revision 1 MD2, it locked up the system completely. With the revision 2 board, the system would still come up normally, but the clock wouldn't return the correct time, just gibberish. This doesn't sound quite as serious as the earlier problem, but still it's a problem I'm incapable of solving.

Note that even if the Z-Time clock had worked with the revision 2 board, I would have needed a new address to poke the 108-byte QP/M clock routine (as described in part V) for the same reason given earlier: the address (FB00 hex) I was using falls right in the middle of the free space buffer in upper memory. Note, however, that QP/M's static date and time stamping (no clock) is unaffected by which board you have.

In-memory submit

Later revisions of the Micro Decision BIOS added a powerful new type of batch facility called in-memory submit. With IMS, one or more commands which would normally be typed at the keyboard can be injected all at once into what is called the IMS buffer. The BIOS then feeds these commands to the operating system. The effect is that multiple commands can be executed automatically without typing them one by one at the keyboard or creating a SUBMIT (.SUB) file.

Unfortunately, there was no IMS program on the CP/M distribution diskette I received. I knew that IMS.COM came with the hard-disk Micro Decisions. Also, the source code for IMS.COM is available now, so it must have been included at some point. Perhaps it was inadvertently left off some system disks.

As a result, I wrote my own IMS program. The program (IMS.COM) and the source (IMS.ASM) are included with this article (Ed.'s note: it will be available on the forthcoming library disk completing Phil's reinventing series). One advantage of my program is that it can be assembled by ASM.COM. The IMS.MAC file written by Morrow requires a more sophisticated assembler.

Here are some of the things you can do with IMS.COM:

```
A>IMS DIR\STAT
```

This lists a directory of the disk in drive A and then lists the amount of space left. Only one line needs to be entered to execute two commands. Separate commands with a backslash. Morrow's IMS program uses a semi-colon instead of a backslash. However, ZCPR3 also uses the semi-colon for its multiple command line. If you have the bootable Z-system, Morrow's IMS won't work properly. If you don't like the backslash in my IMS, you can change it to something else by editing IMS.ASM and reassembling.

One of the complaints about Turbo Pascal has always been that it can't be used to compile in batch mode. In other words, you always have to run the program and interactively enter the compilation parameters. Well now with IMS.COM you can batch compile with Turbo as follows:

```
A>IMS TURBO\YWprogname\OCEC100\QCQ
```

This command will compile PROGNAME.PAS to PROGRAM.COM using an ending address of C100 (hex), then exit and return to CP/M.

Better yet, you can compile from a batch file. Create a file named TURBAT.SUB (TURBAT.QSB if you're using QP/M or TURBAT.ZEX if you're using Z-system) containing:

```
IMS TURBO\YW$1\OCE$2\QCQ  (use @ instead of $ with QP/M)
```

To compile:

```
A>SUBMIT TURBAT progname C100  (use QSUB with QP/M or
                                ZEX with Z-system)
```

This is much simpler and easier to remember, although a little slower to execute than the first method.

You might be interested to know that the reason why this works with Turbo is that the BIOS console status (CONST) returns FALSE (i.e., no character is ready to be read) when IMS is active. Even though Turbo constantly checks the console status during compilation to see if you've struck a key at the keyboard, it doesn't "see" the last "q" in the IMS buffer during compilation because of this feature of IMS.

IMS can be used in this way with a number of programs. For example, my disk catalog program EC-Catalog can now batch catalog a disk as follows:

```
A>IMS EC\CBN\Q
```

This command would catalog the disk in drive B, without prompting for file comments, then exit and return to CP/M.

Similarly, to use with a batch file, create a file named ECBAT.SUB containing:

```
IMS EC\C$1N\Q
```

Then run like this:

```
A>SUBMIT ECBAT B
```

IMS can also be used so that a program doesn't read in all of the command line. This can be done by following the program with a vertical bar (|). For example:

```
IMS NW|ERA *.BAK
```

This would run NewWord and, upon returning to CP/M, erase all .BAK files. If we had used \ instead of | to separate the commands, the BIOS would have fed "ERA *.BAK" to NewWord instead of waiting until we exited to CP/M.

KEY.COM

Another feature of later BIOS revisions for both the floppy disk and hard disk Micro Decisions is built-in function key support. Whenever a Ctrl-\ (ASCII 28) is read in, the BIOS waits for the next key to be pressed. This key is then checked against the function key table maintained by the BIOS in high memory. If a match is found, the key's definition is injected into the IMS buffer, where it acts as if it had been typed at the keyboard. If no match is found, the key is returned with its parity bit set (i.e., 128 is added to the key's ASCII value).

This feature was intended for use with later terminals such as the MDT-60 and MT-70. These terminals have dedicated function keys which return a two-character sequence in which the first character is always Ctrl-\. A program called KEY.COM included on the distribution disk can be used to load new definitions from user-created files into the BIOS function key table.

This feature can also be used with any terminal, even the original MDT-20 with its non-functional function keys. All you have to do is type Ctrl-\ first, followed by the defined "second" character. Ctrl-\ allows you to treat every key on the keyboard as a function key, much like SmartKey's "supershift" key. However, we don't need SmartKey to define these "extended" keys, only KEY.COM. For example, you could create a file called MYKEYS.KEY containing the following definitions:

```
F8      dir_RTN       ;Ctrl-\ G
^F8     stat_RTN      ;Ctrl-\ g
^F8     era *.bak     ;Ctrl-\ Ctrl-G
```

KEY.COM expects you to use special function key "names" which refer to the MT-70 keyboard. Of course, the MDT-20 terminal doesn't have keys like this which return a two-character sequence. But by

knowing what the second character is, we can still use KEY.COM to define our "function" keys. For example, the second character returned by the MT-70 terminal when F8 is pressed is the upper-case "G". Similarly, Shift-F8 returns "g" and Ctrl-F8 returns Ctrl-G as the second character. Hence, if we want to define our Ctrl-\ g combination, we simply enter a definition for F8, and so on. (Don't ask me why unshifted function keys return upper-case letters and shifted function keys return lower-case letters.)

Once this definition file has been loaded by typing KEY MYKEYS, entering Ctrl-\ followed by "G" enters "dir". Ctrl-\ and then g enters "stat". Ctrl-\ followed by Ctrl-G types "era *.bak" but doesn't enter it. In this way we can decide not to erase all files with a .BAK extension on the default disk by deleting the command. Or we can simply press RETURN to proceed with executing the command.

I have included with this article a complete table that you can use when creating .KEY files. I've supplied normal, shift, and control combinations for all function keys on the MT-70 terminal. Using this table you can define over a hundred function key combinations on any keyboard, even the MDT-20.

You may want to obtain some documentation on the format of .KEY files, as this is not included on the distribution disks. Check with someone who has an MD3 user's guide. ###

Table of function keys' second characters

Once Ctrl-\ has been typed, typing the indicated character returns the definition associated with the corresponding unshifted, shifted, or control function key "name". The extended ASCII code is the value returned if the function key has not been defined by KEY.COM (revision 2.4).

For example, to use the Ctrl-\ G combination, define F8 in your .KEY file. Use Ctrl-\ g to invoke the ~F8 (shifted) definition, and Ctrl-\ Ctrl-G to invoke the ^F8 (control) definition.

This table should apply to BIOS revisions 2.5 and greater on CP/M 2.2 systems (QP/M or Z-system too), regardless of terminal.

Key "name" used in .KEY file	Unshifted	Extended ASCII code	Shifted	Extended ASCII code	Control	Extended ASCII code
0 (keypad)	0	176	space	160	Ctrl-P	144
1	1	177	!	161	Ctrl-Q	145
2	2	178	"	162	Ctrl-R	146
3	3	179	#	163	Ctrl-S	147
4	4	180	$	164	Ctrl-T	148
5	5	181	%	165	Ctrl-U	149
6	6	182	&	166	Ctrl-V	150

7	7	183	'	167	Ctrl-W	151
8	8	184	(	168	Ctrl-X	152
9	9	185	)	169	Ctrl-Y	153
.	*	170	+	171	,	172
Enter	-	173	.	174	/	175
-	:	186	;	187	<	188
,	=	189	>	190	?	191
F1	@	192	`	224	Ctrl-@	128
F2	A	193	a	225	Ctrl-A	129
F3	B	194	b	226	Ctrl-B	130
F4	C	195	c	227	Ctrl-C	131
F5	D	196	d	228	Ctrl-D	132
F6	E	197	e	229	Ctrl-E	133
F7	F	198	f	230	Ctrl-F	134
F8	G	199	g	231	Ctrl-G	135
F9	H	200	h	232	Ctrl-H	136
F10	I	201	i	233	Ctrl-I	137
UP (arrow)	J	202	j	234	Ctrl-J	138
DOWN	K	203	k	235	Ctrl-K	139
LEFT	L	204	l	236	Ctrl-L	140
RIGHT	M	205	m	237	Ctrl-M	141
HOME	N	206	n	238	Ctrl-N	142
HELP	O	207	o	239	Ctrl-O	143
FA	\	220	|	252	Ctrl-\	156
FB	]	221	}	253	Ctrl-]	157
FC	^	222	~	254	Ctrl-^	158
FD	_	223	DEL	255	Ctrl-_	159

Note that 26 characters apparently cannot be defined using KEY.COM (i.e., they will always be returned with the parity bit set). These characters are as follows:

Character	Extended ASCII code	Character	Extended ASCII code
P	208	p	240
Q	209	q	241
R	210	r	242
S	211	s	243
T	212	t	244
U	213	u	245
V	214	v	246
W	215	w	247
X	216	x	248
Y	217	y	249
Z	218	z	250
[	219	{	251
Ctrl-Z	154	Ctrl-[	155

(Editor's note: this is the last in an 8 part series by Phil Hess on reinventing your Morrow Micro Decison. Phil promises more this fall. Look for these splendid articles in future issues. Meanwhile, many thanks to Phil Hess for providing them).

THE ZILOG Z280 MICROPROCESSOR

Copyright (c) 1987, George A. Havach

Think Z80. Think 16 MHz. Think 24 address lines. Think 16 megabytes of RAM. Think multitasking. Think coprocessors.

Now, think Zilog Z280 MPU.

Surely the product announcement of the year for all us "underdogs" in the 8-bit CP/M world is the new Z280 superchip from Zilog, the company that brought computing power home to most people who'd never heard of a CPU before. No longer need we feel like second-class citizens in the Information Age, or view our trusty machines as outclassed by the latest wave of power-hungry data-bangers from the big-name suppliers. A new day is dawning!

It's easy to get excited about this newcomer to the computing scene. For one thing, its pedigree is impeccable: the Z280 is designed to interconnect with whole families of microperipherals--support chips that handle the onerous chores of I/O and data transfer. It has a bimodal data bus, configurable for either 8-bit (Z80-style) or 16-bit (the "Z-Bus") throughput. This feature, by itself, should clue us to the sheer range of engineering applications that the Z280 can span. And that's just a bare beginning.

The Z280 MPU is a pontifex, a bridge-builder between disparate functional realms. On the one hand, it's object-code compatible with all existing Z80 software, so at the very least it behaves like a "fast" Z80--just as Intel's 80386 in its simplest implementation is just a "fast" 8086. On the other hand, the Z280 is the offspring of the Z80,000, Zilog's full-featured 32-bit CPU that compares well with both the Intel 80386 and the Motorola 68020: full 32-bit registers, 32-bit address and data buses, 4-gigabyte upper limit of RAM, multitasking. Incredibly, that chip is already five years old; the lessons Zilog learned with it have now been etched into the Z280 (its full designation is "Z80,280", which puts it in proper context). **Essentially, the Z280 is a Z80,000 scaled down for compatibility with the Z80.** Think about **that** for a while.

Any account of the state-of-the-art design features incorporated into the new Z280 would be mere wishful thinking, were it not within the reach of most Z80 microcomputer owners. One company, Zedux Inc. of Van Nuys, Calif., has already begun shipping its Accel 280, an accelerator card that plugs directly into the CPU socket, supplementing (not replacing) it with a Z280 and simultaneously expanding the working memory. Another company, High Tech Research of Redding, Calif., is readying its 1-megabyte Ultraboard for owners of the graphics series of Kaypro CP/M computers. As word gets around, the CP/M community will soon awaken to what next lies in store: an upgrade path to boost it well beyond the IBM crowd, which still feeds on pipedreams and vaporware as far

as any true multitasking goes.

So, keeping in mind the imminent acquirability of these wonders, let's take a closer look at this baby. Unlike the Z80, the Z280 is square, with 68 instead of 40 pins. Architecturally, it is significantly more complex, including on chip 256 bytes of cache memory (for high-speed bus transactions), a three-stage instruction pipeline, a clock oscillator, three counter/timers, wait-state generators, memory-refresh logic, a memory-management unit (MMU), four direct-memory-access (DMA) channels, and a universal asynchronous receiver-transmitter (UART). Otherwise, the arithmetic-logic unit (ALU) is much like what we're familiar with in the Z80, with both main and alternate register sets ("primary and auxiliary files"), index registers, and--whoops!--**two** stack pointers, because the Z280 has two corresponding operating modes: in user mode, a number of instructions are "privileged," i.e., inaccessible to programs and reserved for system mode (background functions). Sounds like "protected" mode in the 80386, eh?

Assembly-language programmers will be intrigued by the expansions to the Z80 instruction set offered by the Z280: a total of 1,491 possible combinations (versus 698 on the Z80), including 8- and 16-bit signed and unsigned multiply and divide (MULT[U][W], DIV[U][W]), purge cache (PCACHE), load control register (LDCTL--there are **many** such!), test-and-set (TSET), and three new addressing modes: long-indexed (index register plus 16-bit signed offset), stack-pointer-relative (useful for high-level languages), and base-indexed (HL or index register plus another index register). In addition, many familiar instructions have new options. On the Z80, all "EX" can do is exchange AF for AF', and HL for DE or (SP); now, on the Z280, you can swap the accumulator with any register or memory content: EX A,r; EX A,(HL); EX A,(addr); EX A,(IX+dd); EX A,(SP+dddd). Two new conditional jumps have been added: jump on auxiliary accumulator/flag (JAF) and jump on auxiliary register file (JAR). There's a system-call instruction (SC) for controlled access to operating-system functions. Finally, we have a special set of extended instructions pertaining to so-called extended processing units (EPUs)--coprocessors, which can even be emulated in software.

And if all of that isn't enough to take your breath away, listen to this:

An operating system with true multitasking capability has already been written and is now available for the Z280, and it's totally compatible with CP/M 2.2.

It's from Zedux Inc., called RP (for Remote Partition)--or, more suggestively, RP/M(!)--a memory-resident monitor with many features similar to ZCPR, such as multiple-command lines, named directories, paths, aliases, flow-of-control operators (IF, ELSE, UNTIL, WHILE, REPEAT, GOTO LABEL), and expanded built-in commands (including TIME, DATE, COPY, MOVE, and HELP). Its sheer elegance is revealed by the simplicity of its command-line structure (which permits nested SUBMIT-like operations): multiple commands may be entered,

separated by a semicolon (';') for **sequential** execution (begin next command on completion of previous), or by an ampersand ('&') for **concurrent** execution (run commands in parallel). Each program runs on a virtual copy of CP/M in its own memory space (hence, remote partition), so that any bizarre tricks it may perform will never crash the overall system, overseen by RP/M. Zedux Inc. currently even has an electronic bulletin board running RP/M, which you can access for an online demo of this astonishing new software.

Besides its Z280-specific operating system (which, by the way, runs on any Z280 hardware arrangement, not just the Accel 280 board), Zedux has a Z280 assembler (one-pass!) and linker (AS) for software developers. These people evidently have done all their homework. How in the world could an obscure company named Zedux scoop mighty Microsoft with the first multitasking operating system for microcomputers? Well, apparently it's much easier to program a Z280 than to tackle the raging bull elephant of an 80386, which whole teams of highly paid professionals have yet to tame for an expectant business marketplace.

One clue to Zedux's early success is the fact that the Z280 programmer need be concerned only with 16-bit logical addresses, which the onchip MMU automatically translates into 24-bit physical addresses, immensely simplifying the design task and permitting interference-free multitasking for your typical 64K-tops CP/M programs. The headaches inherent in 32-bit absolute-addressing schemes must be enough to make Bill Gates himself queasy. Can you imagine trying to figure out how to coordinate several "ordinary" DOS packages, all doing several levels of interrupts and each striving to hog the whole of available physical memory? Their whole "house of cards" threatens to come crashing down about their ears at every turn of a hard disk.

Nonetheless, one thing we microcomputing folk should realize is that Zilog hasn't exactly developed the Z280 MPU with us in mind. No doubt they intend this addition to the Z80,000 family primarily for industrial MPU-controlled devices--smart "workhorse" machines that do increasingly more of the world's daily work but never make any headlines in InfoWorld. The global marketplace for smaller, cheaper, faster, more reliable, more energy-efficient, more adaptable electronic equipment is simply staggering, while that for desktop computers is relatively marginal, despite all the hoopla. So, it's our unique opportunity to provide an immediate application for the Z280 upon its introduction into such a competitive arena.

It's not merely encouraging to be able to envision upgrading our cherished hardware to take full advantage of these advanced new capabilities; it's also almost vital to our sanity to maintain effective continuity with earlier programming achievements. The interplay between software and hardware is nowhere more critical than at CPU level, and any breakthroughs here depend on both hardware design and software realization. Zilog's Z280 MPU promises to fulfill many of our dreams for expanded memory and parallel processing, while allowing us to move our favorite furnishings (some

of it "modern antique") intact into our new workspace. The people at Zedux, too, deserve our gratitude for forging the hardware and software links that effectively assure a future for CP/M and the Z80.

Whether the industry press pays it any attention or not, Zilog's Z280 chip unquestionably will decisively influence 8-bit computing for years to come. Who knows?--in these days of "more for less," it could even have a greater impact than the original Z80 chip. Within the next few months, the Z280's capabilities should excite a mounting wave of CP/M programming efforts, for parallel operation in expanded memory, without the necessity of bank switching or other subterfuges. At this moment, Zilog's Z280 MPU deserves our careful scrutiny as a technical basis for more intelligent personal computing than we previously imagined possible on our "obsolete" 8-bit machines.

Acknowledgment.--I thank Rick Charnes, president of BAMDUA, for searching discussions on the Zilog Z280 and for pointing out several crucial features of Zedux's RP/M operating system.

Zedux, Inc.
14402 Hamlin Ave. #C
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(818) 787-0113;
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# # #

SOFTWARE REVIEW: HEADLINE

by Georgia Babladelis

Program: **HEADLINE**
Company: MicroCost
2201 Marine View Dr. So.
Seattle, WA 98198
System: MS-DOS; CP/M
Cost: $35 (Special discount price available to Bamdua members)

So you think you have seen everything! Wait until you see this program, which permits you to make headlines of various sizes using a daisy wheel printer.

HEADLINE is a graphics font software. At present only Sans-Serif is implemented in three sizes (24 point, 30 point, 36 point). Other fonts are planned. After you have made a working copy, all you do is enter the font name and size at the command line; e.g., A>SANS-30 (CR). The program runs with any daisy wheel printer compatible with the Diablo 630. It works fine on my MP200 (aka Silver Reed). When using any one font program, on printing a disk file, you can switch between that font and 10, 12, and 15 pitch. In this current version, however, you cannot mix different graphics fonts on one file printout due to memory constraints.

Two possibilities for printing currently exist. You may make a single line entry for a quick print out by using the Control W option. If you want to produce a headline to use for your newsletter or whatever, that would be a quick way to do it. Otherwise, you can print out any file you have aleady created with WordStar (or others) by using the Control F option. Although you cannot create text files with Headline, you can print them out without having to switch back and forth from a big headline size to a smaller "normal" text size. The current version of Headline permits the printing out of normal size text in a choice of three pitches: 10, 12, 15 in addition to the font size selected. This is done by using WordStar or a compatible text editor to insert control characters into text.

If you want to produce some attractive headlines to paste up on your Newsletter, using the quick mode and the font size of your choice is the way to go. If you are producing a flyer, though, you might want to consider using this software to vary the size and pitch of parts of your text at print out time. The print process is relatively fast; the daisywheel printer moves the paper up and down and "creates" each letter using the graphics mode (dots). It's even fun to watch it. You can move the print head to various locations on the paper using arrow keys (or control j,k,l,h) or line things up with the daisywheel version of Typewriter if you have it.

I made several headlines using each of the three font sizes (24, 30, 36) and using different print wheels (Courier 10, Proportional Spacing, Orator). This latest version of Headline allows you to pause print (e.g., to change print wheels), underline, boldface, as well as change pitch. If you are involved in heavy duty desk top publishing, then this program will not suit you. If, on the other hand, you have occasional need to produce headlines, flyers, ads, notices and the like, then this program may be just the thing you are looking for.

As usual, MicroCost produces good, single-purpose, inexpensive software and gives you reliable and responsive service. If you are interested in having this program, it is available to BAMDUA members for $17.50 (+ $2.50 S & H). Send me a check for $20, made out to MICROCOST, with a note about your equipment (type of printer, computer system, etc.). Include a SASE or PC if you want some confirmation, have questions, etc. Send it to Editor, 1064 Sterling Avenue, Berkeley, CA 94708.

SOFTWARE REVIEW: POOR MAN'S NETWORK

by Greg Smith

Product: **POOR MAN'S NETWORK** (Version 2)
Company: Anderson Techno-Products
947 Richmond Road
Ottawa, Ontario, Canada K2B 6R1
System: Two CP/M 2.2 computers required
Cost: $69 (special group discount available to BAMDUA members)

Version 2 of **POOR MAN'S NETWORK** has been released. Version Two allows for more convenient setup and operation of the network. It also includes:

1. You no longer need to specify what drives to share and how to share them each time you activate the network (you can set up default values that will be used if none of the parameters are given). Since I've found that one particular setup suits my needs for the majority of my networking appications, those who aren't so computer literate needn't worry about "What do you mean by parameters?" when trying to initiate the network.

2. When setting up the network, a user needed to have a disk in each drive that was legal, whether or not you intended to share or even use that drive. This made use of Morrow's virtual drive feature a nuisance because when initiating the network, the program actually logged onto the virtual drive (which means swapping floppies everytime you established the network). So long as you do not wish to share a virtual drive, Version 2 makes keeping the virtual drive available much easier because it does not check for a disk in the virtual drive unless you actually read or write to that drive. (Sharing a virtual drive is out of the question due to the time required to access it and the constant changing of floppies).

3. You may now exchange disks even when the network is active, making the package less limiting on floppy based systems.

4. Establishing the network is faster in Version 2 (Version 1 established a network in about the same amount of time it would take to open a medium size document in NewWord which wasn't a problem, but the faster the better).

5. The method of handling directories has been improved. It is now faster when accessing large directories (such as are found on a hard disk) that are sparsely populated.

6. One major improvement over Version 1 is the ability to have two users reading and writing to the same disk through the use of some new BDOS calls (a BDOS call is what your program uses to handle things like reading and writing to files, and printers etc.). The only problem is that since the BDOS calls are specific to **POOR MAN'S NETWORK**, most software doesn't make use of them. A sample program (including source code) is included with Version 2 to demonstrate

the new BDOS calls. Using the BDOS calls is very straight forward, if you can write your own programs. My database (which is the file I'm most concerned about being able to have more than one user read and write to) is in Personal Pearl which, of course, is unaware of these new BDOS calls. The bottom line is that both users can continue to have read access, but only one can have write access to a drive (see the review of Version 1 for more info) unless you can write your simple programs to make use of the new BDOS calls.

As for CP/M 3.0 (the operating systems that Morrow MD5s, MD11s, and MD16s use), an RSX file (a short extension that attaches to the Operating system) should allow hard disk owners to use the network. At the moment, operation of the system under this RSX seems buggy (although this is more a function of the RSX file that I supplied, not the network itself). I suspect the problems can be worked out relatively easily. We'll keep you posted (CP/M 3 version is in development).

My overall impresion of the program is the same as before: it does what it claims to flawlessly. If you have an application for a network within these boundries, you'll love **OOR MAN'S NETWORK.**

(Poor Man's Network retails for $69. A special 30% discount is available to BAMDUA members for a group order. If you are interested, send a check for $48.30, made out to Anderson Techno-Products. Send to me: Editor, BAMDUA Newsletter, 1064 Sterling Ave., Berkeley, CA 94708. Include a SASE in case I need to get in touch with you or in case a group order does not materialize and I can return your check).

# # #

SOFTWARE REVIEW: LONG & LOUD!

by Georgia Babladelis

Product:	**LONG & LOUD!** (Version 2)
Requirements:	Available for most systems (e.g., CP/M, MS-DOS, PC-DOS Radio Shack TRS-80 Model 4; supports nearly every printer capable of dot graphics).
Company:	Spectre Technologies, Inc. 22458 Ventura Blvd., Suite E Woodland Hills, CA 91364 Telephone: 1-818-716-1655
Cost:	$34.95; (special upgrade fee available).

LONG & LOUD! (version 2) has replaced **TWIST & SHOUT!** which was reviewed in this Newsletter, V.4, #5, April 1986; the review also appeared in Morrow Owners' Review, V.4, #2, April/May 1987. At that time I told you that I thoroughly enjoyed the program and gave it a glowing review. My enthusiasm is unabated for version 2 with its new name of **LONG & LOUD!**

The program, which was a model of simplicity to install in the first place, is even easier to install now. An "install" file is provided which lists dozens of printers from which you select the one you are using. This action will install both programs (**LONG** and **LOUD**) for your printer. Indeed, the company boasts that if your printer is NOT supported (or cannot become supported) they will give you your money back. If your printer is not on the list of supported printers, they offer to write a custom printer driver for you at no charge and to help you get it going or give you your money back! Such an offer on top of a rather low price to begin with for a program that is fun and easy to use seems to me to be an irresistable bargain.

LONG works much like **TWIST** before it with a few enhancements added. Four type sizes (small, normal, large, extra large) are allowed instead of the previous two. Line count, for figuring out the length of your document segments (e.g., to place two segments that were previously separate, alongside eachother on one page) is enhanced with a preview feature. Otherwise, all works as simply as before with a clear menu from which to make your choices. In case you have forgotten, the program "twists" data files sideways for your printout. It's terrific for printing out spread sheet information. I have used it for the much more convenient viewing of printouts of data I keep with SuperCalc. It can be used on numerous files; e.g., WordStar, CalcStar, SuperCalc, Perfect Writer, Perfect Calc, MicroPlan, Multiplan, Symphony, Lotus -- virtually any ASCII file.

LOUD, which works much the same as **SHOUT** before it, also boasts several enhancements: (1) The original 3 type faces, Times Roman, Sans Serif, and Olde English, now include lower case as well as upper case; (2) Two new fonts have been added: Script is a full upper and lower case font that approximates handwritten script; Symbols is loaded with graphics and pictures to add pizzazz to your banners. As before, the number of lines of text allowed on your banner is limited by your printer. On my Gemini-10X dot-matrix printer, I am allowed 4 lines. That is plenty for the kind of communication one wants to make with a banner! As before, you may opt to have your message centered or right/left flush; printed with any type face or different ones for each line or even mixed type faces within a line of text - only now you have a choice of 4 text fonts plus the capability to sprinkle your banner with graphics! The graphics/pictures currently available are: happy face, star, club, diamond, heart, spade, up or down arrows, left or right arrows, musical note, cross, and floppy disk. In this version of the program all of the typefaces are stored on disk and not in memory so that all fypefaces are available to all users, regardless of available memory. As previously, the menu provided is clear and easy to use. Additionally, a "preview" feature informs you how long your proposed banner is.

To recap: **LONG & LOUD** has replaced **TWIST & SHOUT. LONG** provides you with the ability to turn text sideways for printing it. A variety of print size and density is possible. **LOUD** lets you make

very attractive banners, choosing among a variety of type faces and graphics. The programs fit on a single or double sided disk, can be run with nearly any operating system, and support nearly any printer capable of producing dot graphics. And it costs only $34.95 per version or $49.95 for a combination of versions (e.g., both CP/M and MS-DOS).

If you want to upgrade from **TWIST & SHOUT** to **LONG & LOUD,** return your original disk plus $5 and you will get a new disk with the upgrade pages. If an upgrade is ordered at the same time any other product is purchased, the $5 fee is waived although the original disk must be returned. Write to SPECTRE Technologies Inc.

# # #

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EDITOR'S NOTE

Write me about what you want to see in the Newsletter. Do you want more "tips"? Do you want reviews of any particular software? hardware? Do you enjoy the articles about upgrading? Do you want any helpful hints for programs you are using, or solutions to problems you have encountered? Are you too shy to write -- well, just don't sign your name!

I have heard people talk about what they have done with their RAM disk, or with their SUPERCALC, or new ways for getting the most out of their WORDSTAR, but no one bothers to write about it to share with others. I fear that most of us think that our "little improvements" would not be of interest to others -- or, even worse, we think that "everyone else" already knows it! It just isn't so! Write about it! Keep the information flowing! LOOK FORWARD TO HEARING FROM YOU!

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Includes: Dual Floppy; 640K RAM; Clk/Cal; Mono-Graphics Mon & DOS $1,195
With 20Mb Hard Disk $1,495

CORDATA AT (IBM-Compat-8MHz)

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With Color Monitor $2,295

ZENITH Z-158 (IBM Compatible)

Dual Speed
Includes: Floppy Drive; 640K RAM; Mono-Graphics Monitor; DOS; and 20Mb Hard Disk $1,895
With Color Monitor $2,195

DOT MATRIX PRINTERS

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OKI Cut Sheet Feeder $175

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Primage 90: 52 cps with single bin cut sheet feeder & tractor $995
Okidata Laser Line 6 $1,595

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Print Wheels $18

MODEMS

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Volksmodem-300 $25

CABLE/SWITCH

Parallel Switch $89
Serial Switch $79
Parallel Cables $16

SOFTWARE FOR MORROW MD

Supercalc II $195
Turbo Tutor $29
Turbo Tool Box $39
Turbo Pascal ver. 3.0 $52
Reachout Upgrade for MM 300 $15

LOCAL AREA NETWORK

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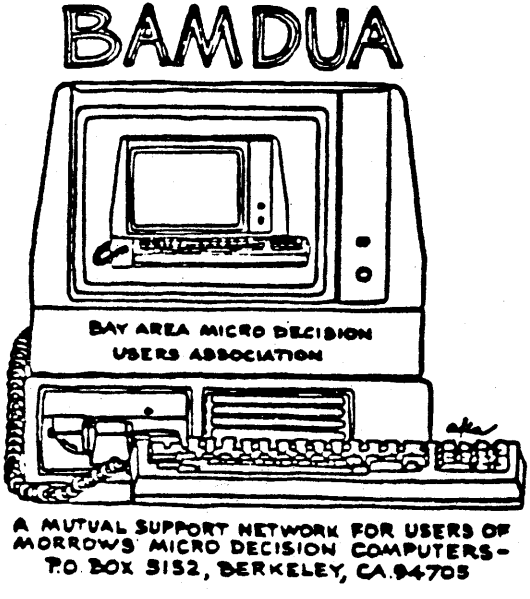
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