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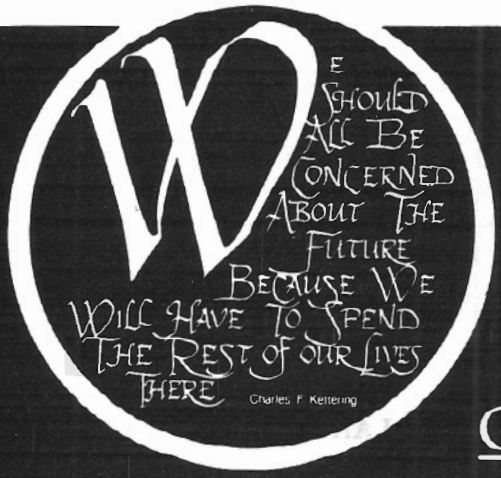
The journal for business, professional, and scientific members of the TRS-80 community



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Editor-in-Chief/Publisher **Richard H. Young**
Managing Editor **Barbara S. Albert**
Art Director **Timothy P. Schleif**
Director of Advertising/Circulation **William R. Holland**
Administrative Assistant **Fay L. Smith**
Contributing Authors **Roger Conant, William J. Elliott, Arnold Fischthal, David Gash, Richard Jensen, Jim Kloosterman, R. D. Langer, Robert VanNatta**

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NOTES AND COMMENT

MainStream Microcomputing

Our plans to launch a new monthly magazine entitled *MainStream Microcomputing* have made little progress. A headlong effort to develop *MainStream* as a separate publication might jeopardize the stability of *two/sixteen*.

We are often asked what will happen to *two/sixteen* once the machines in the II/16/12 family have been replaced with other, perhaps radically different, machines. This is likely to occur within the next two to three years. And it's my opinion that the II/12/16 family (and, I suspect, their RS successors, whatever they may turn out to be) are capable of being among the most effective mainstream machines when used with CP/M (8 or 16 bit), XENIX, RMCOS, Oasis, p-code, or other machine-independent operating systems.

After much study of these considerations, I've decided to take the following steps:

1. Beginning with the September-October issue of *two/sixteen*, a subtitle will be added to the magazine's caption, so that it will read *two/ sixteen, including MainStream Microcomputing*. The amount of editorial material devoted to II/12/16 matters will not be reduced, but an additional section will be added to deal with mainstream operating systems, languages, and applications. Because the II, 12, or 16 can run virtually any of this software without modifying the hardware, this additional material will be of immediate or long-term interest to most of our current subscribers.

2. In early 1984, the title of the magazine will be changed to *MainStream Microcomputing, with two/sixteen*, and the magazine will be published monthly. Again, the amount of II/12/16 material *per issue* will not be reduced, but will be augmented by considerable mainstream material. My target for the monthly magazine's size is 150 pages by mid-1984, with no more than one-third advertising. The magazine will be differentiated from others in the micro field in that it will continue to cater to the needs of business, professional, and scientific users to the exclusion of home and hobbyist interests. It will also continue to follow the mixed journal/magazine format of *two/sixteen* and will emphasize usefulness and understandability of content instead of gaudiness and drama. We will leave most hardware announcements to the other publications and will concentrate primarily on software.

As part of this program, we are seeking additional correspondents who will regularly cover each of the principal software products currently in the mainstrea (such as CP/M 2.2 and 3.0, CP/M 68k, Xenix, p-code, and the leading languages). We will also hire full-time field reporters to seek out developments in the major microcomputer company locations (Mass., Texas, & California), and we will be adding to our regular editorial staff in Lancaster. Readers who are interested in participating in this program should contact Barbara Albert or myself.

Promotion of *MainStream* to the general business micro market will soon begin in earnest.

80-US Journal becomes *Basic Computing*

Effective with its July, 1983, issue, *80-US Journal, the Basic Computing Journal for the TRS-80*, changes its name to *Basic Computing, the TRS-80 User Journal*. This is being done "to more clearly identify the magazine's purpose and goals as a publication."

80-US has historically concentrated on Model I matters. In the June, 1983, issue there are three articles exclusively labeled for the Model I, six articles for the I/III, three for the Color Computer, one for I/II/III, a review of the Model 4, and three designated "for all models." There were articles devoted specifically to Mod. II/12/16. The June issue contained 112 pages, including covers.

Basic Computing is published monthly at an annual subscription price of $16. Subscribing information can be obtained at 3838 S. Warner, Tacoma, WA 98409, telephone (206) 475-2219.

COBOL Programming Service

We've just received information about a COBOL programming service that may be of interest to readers who need custom programming or custom modifications to the Radio Shack "3-disk" accounting systems.

The Software Craftsmen use their own tools for developing RM/COBOL programs, including QUIK-SPEC definition forms and a COBOLCRAFT application program generator. They state that "if for any reason your programs fail to meet the specification we originally agreed upon, we will fix them without additional charge."

If interested, contact The Software Craftsmen, Clint Kreitner, President, American Information Systems, Inc., 16 Pearl Street, Wellsboro, PA 16901, telephone (7 724-1588.

CP/M '83 East

The highly successful CP/M '83 exposition and conference (San Francisco, January, 1983) is being repeated in Boston's Hynes

Auditorium on September 29 through October 1. Nearly one hundred conference sessions are scheduled. Admission is $10 for a one-day Exhibits-only ticket or $25 for a three-day Exhibits and Conference ticket.

Warning: based on the crowds (estimated at 50,000) at the San Francisco show, it's likely that the Boston show will be wall-to-wall people, with movement greatly restricted and conference sessions SRO. But the show will be worth it if you're using CP/M or considering getting into the mainstream. If you need hotel accommodations, reserve them *now*.

For more information, contact Northeast Expositions, 822 Boyleston Street, Chesnut Hill, MA 02167, telephone (800) 841-7000 or (617) 729-2000 (in Massachusetts).

New Communications Package for CP/M

Pickles & Trout has announced a new version of LYNC, called the LYNC 3.0 Data Communication Package, selling for $155. It includes "not only improved LYNC and TERM 'modes' for micro-to-micro and micro-to-mainframe communications, but a new menu-driven installation program and a new Remote 'mode' that allows a microcomputer running LYNC 3.0 to be controlled by remote microcomputers and terminals."

LYNC can transfer files between machines running CP/M, MP/M, and a few other operating systems with full error-checking protocol. It can automatically log onto a timesharing system and upload or download (and save) files. Its remote mode (which includes optional password protection) allows another computer or standard terminal to run any program which the host (LYNC) micro can access.

We are planning to review this exciting communication product in the near future. For more information, contact Pickles & Trout, P. O. Box 1206, Goleta, CA 93116, telephone (805) 685-4641.

CP/M 3.0 (alias CP/M Plus)

We've been hearing some unpleasant things about CP/M 3.0. For one thing, it looks like the leading vendors of CP/M for our machines (Pickles & Trout, Aton) are not going to produce 3.0 versions. Several authoritative sources have indicated that there are fatal or near-fatal problems with the product as applied to Models II/12/16. It appears that the RS version will *not* have bank-switching, and the TPA (transient program area, where application programs reside) will be limited to 48K. It is said that a TPA this small will not permit the running of most popular data base programs or spreadsheet programs, for example.

We understand that the RS version, being developed by a sub-contractor for Digital Research, will probably not be available until about September. (It was announced in January.)

All this is rather disconcerting, as we had been looking forward to the time-and-date file directory attributes. It would be nice if Digital Research would simply produce a 2.x version of CP/M which added *only* the time-and-date features.

Tandy Computer Business Users' Group

This issue contains an article by John Esak, editor of the *TCBUG Newsletter*. The article describes the users' group and provides highlights of the three-day first national meeting. I was there and recommend that any business user who can make the time available to participate actively should do so. This group has the potential to exercise considerable influence on Tandy.

Local Tandy users' groups should affiliate with the national organization. Contacts are listed in John's article.

Persons wishing to start local users' groups (or chapters of the national group) are welcome to free use of our mailing lists for their areas. Our lists of II/12/16 users, including subscribers and non-subscribers (duplicates and undeliverables removed) now contain in excess of 14,000 names. Contact me for details.

Another Magazine for Tandy Users

Portable 100, the magazine for Model 100 users, is scheduled to debut on newsstands in mid-August with a September cover date. It will be a monthly, with 64 pages planned for the initial issue, and its annual subscription rate is $24.95.

Many Model II/12/16 owners are purchasing Model 100s as a convenient enhancement to the larger machine. (At least 10% of the attendees at the Fort Worth TCBUG meeting, including yours truly, were carrying Model 100s.)

Portable 100 will carry both business and hobbyist coverage, though it was initially planned to contain exclusively business coverage. For more information, contact Computer Publishing Company, Highland Mill, Camden, ME 04843, telephone (207) 236-9621.

And Another User Group

A National TRS-80 Model II Users' Group has been formed. It plans to issue a user directory and newsletter. For more information, send a stamped, self-addressed envelope to Bob Stewart, P. O Box 234, Ada, MI 49301, telephone (616) 676-2339.

Oasis Bulletin Board

The Oasis Users Group (OUG) has initiated a bulletin board service (CARAVAN). It is open to anyone interested in the Oasis operating system, and is available twenty-four hours per day, seven days per week, at (805) 965-5415. Current baud rate is 300 only.

CARAVAN offers a message facility for users, and also provides on-line enrollment for those who wish to join OUG. Membership in OUG is $35 and includes a two-volume introductory package.

Further information may be obtained from The Oasis Users Group, P. O. Box 2400, Santa Barbara, CA 93120, telephone (805)965-0265.

Directory of Software Distributors

If you write programs for sale and are looking for distributor(s), this new publication may help you. It contains profiles of more than 150 companies actively seeking programs for resale. It costs $95 and can be obtained from Software Research Company, Drawer 1, P. O. Box 9524, Washington, DC 20016, telephone (202) 364-8700.

UNIX: BASIC to C Converter

We've received an announcement of a new product (BASTOC) which translates any of several dialects of BASIC (Microsoft BASIC is the default) to the C language. This allows maintenace and enhancement of programs using the many software development tools available in the UNIX environment.

BASTOC can be used as a conventional BASIC compiler in conjuction with a C compiler. (BASTOC is configured as a preprocessor to the C compiler.) This feature may consideraby improve execution speed in the XENIX-BASIC environment.

BASTOC has been in use at Beta test sites since early May. Deliveries will start in July. It is priced at $300 and is available from JMI Software Consultants, Inc., 1422 Easton Road, Roslyn, PA 19001, telephone (215) 657-5660.

Richard H. Young,
Editor-in-Chief/Publisher

VanNatta on

It's Here! CP/M 68K

Robert VanNatta
222 South First Street
St. Helens, OR 97051

For you frustrated Model 16 owners, I have some good news and some bad news. The good news is that the CP/M-68k operating system is up and running on the Model 16. The bad news is that clever programs are not yet available to make much practical use of this new found computing power.

I took delivery on my Model 16 in July 1982 based on the optimistic assumption that software would be available "real soon now." Radio Shack has been pushing Xenix, to the tune of "real soon now" without bothering to tell anyone that the hardware upgrades to make the Model 16 run Xenix were going to cost almost as much as the original purchase. There is, however, a limit as to how many years a computer can be on the market without an operating system before someone gives up and writes one.

In The Making Since Early '82

Trade rumors (mostly in *InfoWorld*) in early 1982 convinced me that Digital Research intended to transport CP/M to the 68000. A trip to Pacific Grove, California in July 1982, to attend a seminar sponsored by Digital Research found Gary Kildall and Gordon Eubanks speaking openly about CP/M-68k that was then "running in the back room." It was likewise accepted as fact that the Digital Research family of languages, particularly the CBASIC Compiler (CB80) and Pascal MT+, would be transported to this operating system.

The announcement earlier this year of Shack support for CP/M+ without any comment about CP/M-68k took me down a couple of notches. It was only when TriSoft announced that they had CP/M-68k running on the Model 16 that I began to smile. My patience was finally rewarded.

It is a whole lot easier to announce new products than it is to deliver them, so I tried not to start holding my breath as soon as I saw the first announcement of CP/M-68k. Deliveries actually started in late March.

As I write this article in late May of 1983, I am actually looking at an honest-to-goodness released and running version of CP/M-68k for the Model 16.

CP/M-68k Comes On Six Floppy Disks

It is delivered on six (that's right, six) single-sided, single density disks and comes with a whole armload of three-ring binders, which together make up the documentation. When I opened up my new package and saw six floppy disks rattle out, I was almost as horrified as I was when I saw the multiple disks furnished by Tandy for Xenix.

I was able to reassure myself, however, after reviewing the documentation. It discloses that CP/M-68k requires only a computer with at least one floppy disk drive and at least 64k of memory (and not more than 7 megabytes). My two-floppy-powered Model 16 with 128k met those specifications so I felt much better.

To make CP/M-68k work, you need only five files that, when combined, take up a total of 38k disk space. These files are only needed to get the system booted, and technically they don't need to remain "on line" once the boot is accomplished.

Why Five Other Disks?

The six disks furnished contain generally the following:

DISK 1: Relocatable code for the CP/M utilities
DISK 2: MC68000 assembler (AS68) and Dynamic Debugger kDDT)
DISK 3: "C" compiler and related routines

It's Here!

DISK 4: "C" library and "C" archive utility
DISK 5: Sample BIOS and TriSoft BIOS modification utilities
DISK 6: Operating system and utilities including all familiar CP/M utilities, such as PIP, STAT, etc.

Unlike the runtime package for Xenix, all of these disks are single-sided, single density format (241k per disk), so their mass is not as great as it might seem at first. Realistically speaking, unless you are a program writer, there is nothing on Disks 1 through 5 that you will use. Everything you really need to get CP/M-68k up and running is on Disk 6.

How Does It Work?

In order to understand how CP/M-68k works in the Model 16, it is first necessary to understand a little bit about how the Model 16 is designed.

All of us who have Model 16s have vaguely recognized that it has a Z80 side (which we have used) and a MC68000 side (which we have not used). Less obvious was just how these "sides" relate to each other.

In the hardware sense, they are really not "sides" at all. There is no way to "turn off" the Z80 and "turn on" the MC68000. When the Model 16 is functioning in the Z80 mode, everything is quite conventional. The Z80 processor is the center of attention, and the associated memory (RAM) and the various peripheral devices such as CRTs, disk drives, etc. are connected to it.

If the Model 16 truly had a MC68000 side, you would expect to find a similarly organized assortment of connections to the MC68000 processor with a switch somewhere allowing you to "cut" the system over to the other processor. This is not the way the Model 16 is designed. As stated in the TriSoft documentation: ". . . Tandy chose not to connect ANY external I/O devices directly to this [MC68000] processor. Instead Tandy created in hardware a 'window' through which the Z80 processor may examine and, if desired, alter the contents of bytes of MC68000 memory."

Crudely stated, Tandy didn't bother to "wire" the MC68000 into all the various

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You'll have your first working disk in ten minutes.

Only $200.

The floppy disk version of Pickles & Trout CP/M is $200. The hard disk versions (for Tandy, Corvus, and Cameo) are $250, except for the multi-user Cameo, which is $400.

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devices, such as the disk drives, printer, CRT etc.; rather, they simply wired the MC68000 into the Z80 which in turn was already "wired" into this other equipment.

Conceptually this means that the MC68000 package could be mostly a self-contained package which is really only "hooked into" the rest of the computer in one place (the Z80 processor). In engineering talk, the Z80 controls the input/output (I/O) of the MC68000.

Booting The 68000

If you contemplate the consequences of the hardware design for a moment, you will understand why TRSDOS-16 is something that can be loaded only after loading a Z80 version of TRSDOS, and why TriSoft politely says that their CP/M-68k runs in conjunction with CP/M-80.

Since the Z80 controls all the I/O for the MC68000, the only way you can get it up and running is to first boot the Z80 and then use the Z80 to boot the MC68000. This necessarily implies that you must have an operating system to control the Z80, if you are going to get the MC68000 to work.

TriSoft's preferred version of CP/M-80 for use in conjunction with CP/M-68k is Pickles and Trout, although their documentation claims compatibility with both Lifeboat and ATON.

The failure of Lifeboat to support double-sided drives makes their variant the worst choice of the three for the Model 16, and my review copy of CP/M-68k refused to work with Lifeboat 2.25d or with ATON Level I. I made a bug report to TriSoft, and they quickly furnished a trivial patch to "cure" the incompatibility with Lifeboat 2.25d. It seems that TriSoft did their beta testing with Lifeboat 2.24, and the more recent version has a new set of I/O drivers.

My opinion of ATON CP/M has risen somewhat since my review of these various versions in the Jan/Feb issue of *two/sixteen*, but unfortunately I could not get the Level I version of ATON to work with CP/M-68k either. There is no good excuse why TriSoft CP/M-68k shouldn't run with any version of CP/M for the Model II/12/16, including the (hopefully) forthcoming CP/M version 3.0. I think that you can assume that these problems will be solved "real soon now."

How To Get Going

The very first task you will need to undertake when using CP/M-68k is to get CP/M-80 going. If you don't already know how to use CP/M-80, you better learn that first. As you have seen, CP/M-68k uses the Z80 as an I/O slave, so it only follows that all the configuration must be done with CP/M-80. If you haven't already suffered through it, you must first get a working version of CP/M-80. This means using the SETUP, SYSDEF, and CONFIG type utilities to get things matched to your hardware.

One of the beauties of CP/M 68K is that all the files are compatible with CP/M 80

Once you get this done, you need to format and generate a systems disk for drive A following the instructions appropriate for your type of CP/M-80.

The next project is to do enough housecleaning on your new systems disk so there is at least 240k of empty space. All of this can be done before you ever open the CP/M-68k package.

The next task is to transfer the contents of TriSoft Disk #6 onto your disk A. The utility PIP will accomplish this task, but for your convenience TriSoft furnishes a submit file on Disk #6 which has the necessary PIP command in it. One of the beauties of CP/M-68k is that all the files are compatible with CP/M-80; hence you will be able to move these files around just as you would any other file. (How could they be otherwise, since CP/M-80 is doing the disk reading and writing)?

Once you have moved the contents of Disk #6 onto a drive A, you are ready to boot CP/M-68k. First you must stick the bootstrap loader into the MC68000 memory by executing a utility called LDM68.COM. It's a small file and only takes a few seconds to load. As soon as the system returns to "A prompt," you can switch to CP/M-68k at will by simply entering "M68." This loads a command file off of disk, and in a few seconds you get the 68K copyright notice, and there you are. The familiar "A>" displays, and you're ready to go. You may return to the Z80 mode at any time by entering "Z80." The biggest problem is keeping track of which mode you are in because their behavior is so similar that you may not "feel" the difference.

You will find all the familiar utilities such as STAT, PIP, DDT, COPY and ED; they all fit like an old shoe. Absent are FORMAT, SYSGEN, and SETUP, which are not needed because the formatting and setup activities are responsibilities of CP/M-80. SYSGEN (part of RESIZER in P & T CP/M) is irrelevant because its purpose is to write the operating system onto the system tracks, and no part of CP/M-68k is ever placed on the system tracks. There is a SIZER utility which is the logical equivalent of MOVCPM.COM; its purpose is to relocate the system to the highest available portion of memory (which, of course, changes when you add more memory boards).

Switching Modes

Once you have inserted the bootstrap loader (LDM68.COM) in the MC68000, you can freely switch from the Z80 mode to the 68k mode by alternately entering "Z80" or "M68." The time required to make the switch is comparable to executing a familiar command, such as STAT *.*. You can even hop into the 68k mode from the "R" command of Wordstar. Then you can perform any activity you desire on the 68k side and finally return to Wordstar by entering "Z80."

All of this means that it is very practical to use a familiar Z80 based editor to write programs or other materials that you intend to use on the 68k side. I wrote a portion of this article using the 68k version of ED just to see if it worked (it does), but when I got tired of using ED, I was able to switch to Wordstar in a flash.

For those of you who have a Model 16 but who are not familiar with CP/M, I would observe that ED is a line editor functionally similar to EDIT16 furnished with TRSDOS-16. The difference between the two is that ED in

either the 8- or 16-bit version executes all commands without annoying delay. By contrast, the authors of EDIT16 left a horseblanket in the I/O port (or something); it's the slowest thing I have ever seen.

Differences Between CP/M-80 And CP/M-68k

The differences between CP/M-80 and CP/M-68k are very minor. Digital Research has gone to great lengths to maintain compatibility and has done a commendable job of it.

The CCP

The most conspicuous difference between the two versions of CP/M lies in the CCP (for further explanation of a CCP, please refer to the review of the P & T ACP elsewhere in this issue). The CCP in CP/M-68k is not designed to be overwritten by user programs. You can hardly disagree with this change. CP/M-80 was written in the days when 16k was a lot of memory, and, under those conditions, a CCP that could be overwritten was certainly appropriate. Given the memory addressing capability of the MC68k, however, it now seems reasonable to give the CCP its own dedicated memory area. The advantage of this is that no disk access is necessary in order to execute a warm boot.

The SAVE command has been entirely dropped from the CCP; its function has been replaced by a "W[rite]" command in DDT.

SUBMIT and DIRS have been added to the CCP as built-in commands. The built-in SUBMIT performs comparably to its counterpart in CP/M-80, but this new version has two delightful enhancements. First, you don't have to actually type the word SUBMIT; you need only enter the name of the submit file. For example, the commands necessary to activate the three separate programs comprising the C compiler are provided by Digital Research in a file called "C.SUB." To activate this file, you just hit the letter "C," followed by <ENTER>. The second enhancement relates to the fact that the SUBMIT facility no longer writes the "$$$.SUB" file on drive A. This means you need not have drive A logged-in to get the SUBMIT facility to work. Taken together, these improvements should make the SUBMIT facility much more convenient.

DIRS displays the directory of files that have the "system" attribute set. It differs from the TRSDOS system directory command in that it displays the system files only. You still use STAT to set the system attribute and may, in fact, use either the CP/M-80 or the 68k version to accomplish the task.

The user numbers work in a fashion identical to that of the P & T ACP, i.e. USER 0 is public, and if the user number is not zero, then the prompt will appear as, for example, "1A>" to denote that drive A user 1 is logged in. Even with this improvement over standard CP/M-80, there seems little reason to believe that this will make the USER facility viable.

One improvement made to the built-in commands involves a minor improvement in user friendliness. Specifically, if you enter one of the built-in commands without the required associated file name, you will be prompted to enter the file name. Someone at Digital Research has discovered that additional user input can be prompted by the use of some symbol other than a "?"!

BDOS

The BDOS (Basic Disk Operating System) has six new functions:

Function	Number
Get Free Disk Space	46
Chain to Program	47
Flush Buffers	48
Set Exception Vectors	61
Set Supervisor State	62
Get/Set TPA limits	63

I have some difficulty getting "worked up" over CP/M function calls, but Function 46 and Function 63 seem to be the most exciting. Function 46, as its name implies, will return the number of free sectors on a designated drive. This allows a user program to detect an impending "disk full" condition **BEFORE** it happens. What a pleasant change from the CP/M-80 tradition of going into never-never land first and then telling you it didn't bother to save your data because there wasn't any place to put it.

Function 63 is designed to identify or set the upper and lower limits of the Transient Program Area (TPA). A user

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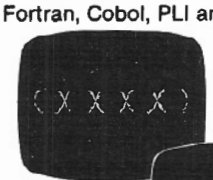

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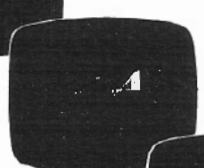

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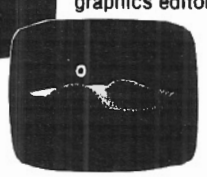

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program is thus permitted to identify "legal" portions of memory, which, in turn, permits implicit memory protection for the operating system.

The program loading routines in CP/M-68k are among the more interesting of the features not available in CP/M-80. As we know, a command file will load under CP/M-80 beginning at 100h, and then control will jump from the CCP to 100h to begin program execution. This program loading convention has served CP/M-80 well, but by its nature, it includes a limitation that becomes increasingly burdensome on larger systems. This limitation is, of course, that the program must always commence execution in the same place and must always be loaded in the same place. Try loading two programs in different parts of memory. Ha!

The program loading conventions of CP/M-68k allow programs to be loaded and execution to commence anywhere in the TPA. Before the program is loaded, the program file's requisite parameter block, containing information identifying the program segments, the load address, and the address at which execution is to begin, is read. The program is then loaded. If the CCP is doing the loading, the reentry address for the CCP will be pushed onto the user stack so that when the job is done, you can find your way back to the CCP. The program chain function (#47) is, by contrast, a one-way street. It unconditionally transfers control to the new program and does not maintain a return path.

This structure implies the feasibility of loading several unrelated programs in various memory areas and executing them sequentially at the user's whim. It is also reasonable to believe that CONCURRENT CP/M-68k is somewhere over the horizon, and if and when it shows up, you can expect to execute multiple programs at the same time!

DDT

Contrary to popular rumor, DDT is not some outlawed flyspray. Rather, it is the Dynamic Debugger. In one sense, it is the ultimate editor in that it allows you to peer directly at the contents of your memory and optionally alter what you see. DDT68 has some changes from its 8-bit cousin, and they are mostly for the better. The major

CP/M 68k is here now, it works and as nearly as I can tell, works well

functional change is that the "A" (assemble) command is lost.

The biggest improvement from an ease-of-use standpoint is the addition of a "W" command. A "W<filename>" command will write out to disk a file consisting of the same segment of memory loaded by the last previous "R" (read) command. A command in the format "W<filename>,S,F" will write to the designated file a memory block from "S" to "F" where "S" and "F" are memory addresses. Goodbye, SAVE command. There is also a "V" command that will show the file beginning and ending pointers.

There is one no-no relating to the use of DDT that I quickly identified. Thou shalt not attempt to exit DDT with a G0 command. You **must** use the BREAK key. Address 0 on the 68k is part of the operating system which is not intended for use as a target for DDT, and an attempt to force execution at that address is bound to produce undefined results. For you tyros, an "undefined result" is merely computer talk for "disaster."

The C Language

I have been writing on this article every day for a week, all along hoping I could dream up a way to tell you about the C Language without making a fool of myself. I have decided that's impossible. Accordingly, I shall proceed to describe the C Language, but if at any time you get the feeling that I know what I am talking about, whack yourself on the side of the head, because you have missed my point.

The C language has traditionally been sort of an undocumented language, and Digital Research did not break tradition in this release. The manual for the C Language compiler that comes with CP/M-68k is just over 100 pages in length. It begins by announcing: "The C language under CP/M-68k is easy to read, easy to maintain, and highly portable. CP/M-68k can run most applications written in C for the UNIX operating system. . . ." The manual goes on to say that it is not a tutorial and . . . "is best used by programmers familiar with the C language. . . ."

I suspect that I shall never know whether it is "easy to read" or not as I can't read it at all. Similarly, the suggestion that it is "best used by programmers familiar with the C language" is the understatement of the century. What they are trying to say is that it is incomprehensible to anyone who does not already know C.

The manual then proceeds to define the library functions. The functions are in alphabetical order, and one of the first ones is the abs function. I suspect that its use is similar to the ABS(x) function in BASIC. Digital's explanation, however, consists of three lines: "The abs function takes the absolute value of a single argument. This function is implemented as a macro in <stdio.h>; arguments with side effects do not work as you expect." I am curious how the author of this masterpiece of prose knows what I expect.

"The inclusion of a version 7, C-compatible compiler is a tremendous enhancement," says *Dr. Dobb's Journal* (April '83), in speaking of CP/M-68k. I can't disagree with this conclusion, but personally I am glad that Digital Research limited themselves to only one "tremendous enhancement."

What Is C Anyway?

They say that ignorance breeds contempt, and I have just shown plenty of both. The C language has its origins in Bell Laboratories where its development has been hand-in-hand with UNIX. As nearly as I can figure, it is sort of a cross-breed between PASCAL and assembly language. The compiler actually generates assembly language source code that is then assembled using an appropriate assembler.

Program generation, as implemented on CP/M-68k, is a five step procedure.

1.) CP68 is a preprocessor. It passes through the original source code file and produces a file with all #define and #include statements resolved.

2.) The second pass of the compiler is made by the parser (CO68). It creates an intermediate code file.

3.) The third pass is by C168 which is the code generator. It produces an assembly language source file from the intermediate code file.

4.) The Assembler, AS68, generates relocatable code for the linkage editor.

5.) The fifth and final step in producing an executable program is to hook up the library using the linker, LO68.

The utility of C, as I understand it, is not as a substitute for BASIC or PASCAL, but rather as a substitute for hand coding assembly language. The problem with writing in assembly language is that the code becomes uniquely dedicated to the processor for which it was written.

Since the C compiler is essentially a code generator for the assembler, it is possible to transport programs written in C from one chip (with its instruction set) to another (with quite a different instruction set) by only writing a new compiler. It seems doubtful if C will replace BASIC and PASCAL for general ledger programs and the like, but it appears to be a very appropriate tool for replacing most assembly language work in the 16-bit area.

If you are not interested in systems level programming, I am not sure C is worth learning. But I am sure that if it does catch on, somebody can make a buck preparing a tutorial on how to write in C.

Limitations In Implementation

When I first heard that somebody had implemented CP/M-68k on the Model 16, and that it required the use of CP/M-80 to make it work, I visualized a cobbled-up, half-cocked variant of CP/M-68k that would forever be a non-standard "fruitcake."

I was greatly relieved to find that, contrary to my fears, the implementation, at least as far as any 68k program will know, is completely standard. As nearly as I can tell at this juncture, the only thing that is different about CP/M-68k from what you might expect to find on other 68k machines is that on the Model 16 you must boot CP/M-80 first, and then boot CP/M-68k from the 8-bit side, whereas you may expect competitive machines to cold boot directly from disk.

An interesting possibility on the Model 16 is that it appears all the hooks are present to permit the design of a 68k program, the execution of which could be suspended while the user actually exited CP/M-68k and went over to the Z80 side and did whatever he wanted. On subsequent re-entry, the user could resume execution where he left off. It is doubtful if too many people will write such programs because they would be machine dependent, but the concept is fascinating.

Problem Areas

The irritations in the implementation of CP/M-68k are actually very minor. TriSoft documents three problem areas.

1.) Keyboard buffering. This is not a Digital Research feature and a modification of the Control S facility makes it impossible to implement keyboard buffering in CP/M-68k. This non-feature will appear on all 68k systems.

2.) Density Selection. CP/M-68k becomes hopelessly confused if a disk change also involves a density change when it is under the control of Pickles & Trout and apparently ATON CP/M. This is not a fault of CP/M-68k. Rather it is a limitation in the implementation of these versions of CP/M-80. The problem is that these versions only check for a density change when you reload the CCP by hitting the <BREAK> key, and provide no way to accomplish this task by remote control. Thus if you want to swap from a single density disk to a double density one, you must exit CP/M-68k, hit the <BREAK> key, and re-boot to the 68k side. This problem should go away when a corrected version of CP/M-80 becomes available. This bug is not present in Lifeboat 2.25d, and so if density changes are more important to you than double-sided drives, you might take a look at using Lifeboat.

3.) Video display. The hardware design of the Model 16 precludes the implementation of a memory-mapped video display from the 68k side of the computer. There are only a few programs around that support the memory-mapped video display anyhow, but Wordstar is a conspicuous example of one that does. TriSoft predicts that a 68k version of Wordstar will be disappointing on the Model 16 for this reason.

Conclusions

CP/M-68k is here now, it works, and as nearly as I can tell, works well. Performance appears outstanding, at least compared to the rather lethargic TRSDOS-16. I find absolutely nothing about CP/M-68k that is inconsistent with its use on floppy-based Model 16s (or for that matter upgraded Model IIs).

If I really have seen what I think I see, a 128k Model 16 will provide a net of about 100k of user program area (compared to a net of around 56k on CP/M 2.2). The availability of unsegmented memory in quantities like this should set the stage for the development of some truly outstanding programs. Spreadsheets that don't run out of memory are one thing that comes to mind, or how about a combination word-processor/spreadsheet?

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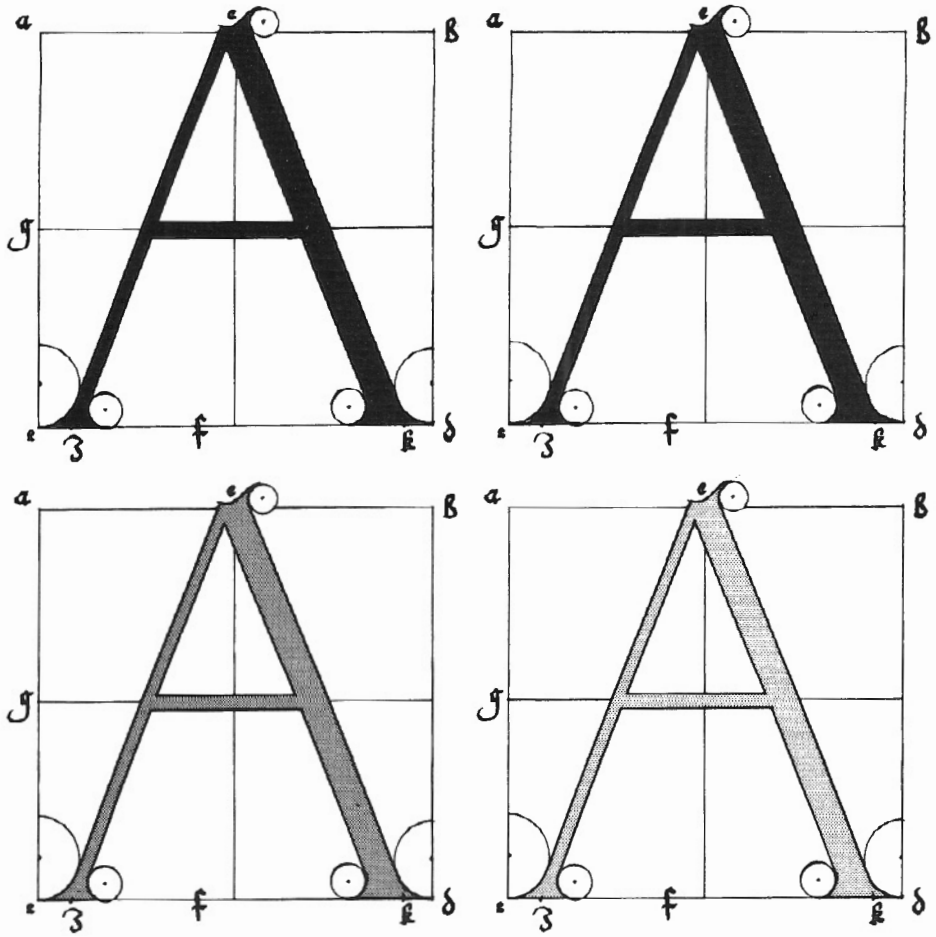

VISICALC

and the disappearing print

Ralph Gandy
1876 SE Park Avenue
Des Moines, IA 50320

I use my Model II and Radio Shack's VisiCalc to generate rate manuals for the insurance company I work for. Recently, I needed to produce some pages using the 132 character (condensed text) format supported by the Epson MX-80 printer. Since these pages were to be reproduced using photo offset techniques, I also needed the darkest copies possible. The printer ribbon had been changed, but our print shop was still complaining about the quality of the copies they received.

In an attempt to obtain darker copies, I decided to try the double strike capability of the Epson in conjunction with the condensed text. I set up the necessary print codes in a "DO File" (See Listing One), which was run before VisiCalc was called. Then the appropriate worksheet was loaded and the standard VisiCalc print commands were issued.

This is when the print disappeared.

What Happened?

The printer would barely start printing when VisiCalc would issue a "not ready" message. VisiCalc had lost contact with the printer, but I could see it was busily over-printing the first line of my rate page. No matter what sequence of print commands I used, VisiCalc would not wait for the printer to double strike.

My first solution was adequate but not good; I restarted the VisiCalc print function at the point where it had suspended printing. This approach allowed me to step through a rate page and obtain the needed printout. It was also tedious, time consuming, and error prone. I needed a better way.

Then it occured to me what I needed was to be able to print the pages without using VisiCalc, but how? I have WordStar, but it runs under Pickles & Trout CP/M, and I didn't know if a word processor could read VisiCalc files. I am not faint hearted when it comes to experimenting with the computer, so I backed-up my VisiCalc files and charged ahead. Pickles & Trout supplies a utility for moving files from TRSDOS to CP/M, so I tried it. I moved my VisiCalc files to CP/M, loaded WordStar and tried to access the files. Wrong! What I saw looked nothing like my worksheet. The format of the file was totally useless. It contained VisiCalc cell references, formulas, and VisiCalc file header information — not what I expected. What had gone wrong with my experiment?

ASCII File To The Resuce

After much thought (and some unpleasant comments about computers), I realized what was wrong. I needed an ASCII file for WordStar to use. Where to get one?

Back to the VisiCalc manual I went. On page 153, I found what I hoped was my answer. The manual said that a VisiCalc worksheet could be printed to a file instead of the printer. This sounded promising, so I decided to give it a try. I rebooted TRSDOS, called VisiCalc, and loaded my worksheet. With a /PF command, I told VisiCalc to print my worksheet to a disk file. VisiCalc asked for a file name, which I supplied, and then it stopped. Nothing was happening. It took me a minute to realize VisiCalc expected me to enter the reference for the lower right cell of my print range (just as it does when printing hard copy). Once I had supplied the appropriate coordinates, the "print to file" process continued.

After the disk write was completed, I exited VisiCalc and returned to TRSDOS. A DIR command confirmed the presence of my new file. Files printed from VisiCalc to disk have a file

extension of /PRF. As noted in the VisiCalc manual, this extension is automatically assigned to files created by the /PF command. When naming your file, do not use an extension; let VisiCalc do it.

Now that a disk file had been created, it was back to CP/M so I could transfer the ASCII file to my WordStar disk. Once again I used the Pickles & Trout transfer utility TRS2CPM.COM. Using WordStar, I attempted to access the file. It worked! I was looking at my VisiCalc worksheet. Column references, formulas, and header information were nowhere to be seen.

When I asked WordStar to print the worksheet using condensed text, double strike mode, it did so without any hesitation or error. I was elated!

An Added Benefit

As an added benefit, I found I could now edit my worksheet using WordStar. In fact, I could use all of the WordStar functions to help me format my worksheet. I now had a method which utilized the strengths of both VisiCalc and WordStar — VisiCalc for calculating rate pages and WordStar for printing them.

You will find, as I did, more uses for this technique than being able to print in condensed double strike mode. I now use it to obtain variable column widths in the printouts of my VisiCalc worksheets. It allows me to merge rate pages with other manual pages previously created using WordStar and run the printout as one consecutively numbered job. I can also insert headers, page breaks and page numbers into VisiCalc worksheets.

So, if you use VisiCalc and have a job which calls for better printer control than VisiCalc offers, try using the "print to file" capability of VisiCalc in conjunction with your favorite text editor. The results may amaze you; they did me.

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```
Title: SETUP

VERIFY DETECT OFF
CLS
PAUSE  Epson MX80 Forms Initialization
       Make sure Printer is ON & ON LINE
FORMS P=0 L=0
CLS
BASIC EPSON1 -f:2
VC


10 'THIS ROUTINE SETS UP VARIOUS PRINT OPTIONS ON EPSON MX-80
20 'IT IS CALLED FROM A DO FILE
30 'CREATED BY RALPH GANDY  02/23/83
40 ON ERROR GOTO 130
50 CLS:PRINT "THIS ROUTINE SETS UP THE EPSON PRINTER"
60 PRINT:PRINT TAB(5);"1. CONDENSED MODE (132 CHARACTERS
                         ON 8.5 X 11 IN. PAPER)"
70 PRINT TAB(5);"2. EMPHASIZED MODE (PSEUDO LETTER QUALITY)"
80 PRINT TAB(5);"3. DOUBLE STRIKE MODE (USE WITH 1 OR 2
                   TO PRODUCE DARKER COPY)"
90 PRINT TAB(5);"4. DEFAULT MODE ( 80 CHARACTERS PER LINE
                   8.5 X 11 PAPER)"
100 PRINT TAB(5);"5. QUIT
110 PRINT:PRINT"WHICH (1 TO 5)"
115 A$=INPUT$(1):ON VAL(A$) GOTO 160,210,260,300,350
120 GOTO 50
130 PRINT"Printer Not Ready--
         Ready Printer And Press ANY Key Or Q to Quit"
140 E$=INPUT$(1):IF E$="Q" THEN END ELSE RUN
150 '*** THIS TURNS OFF ALL OPTIONS AND SETS CONDENSED MODE ***
160 LPRINT CHR$(127);CHR$(27)+CHR$(70);CHR$(27)+CHR$(72)
170 LPRINT CHR$(15)
180 LPRINT"CONDENSED MODE SET"
190 GOTO 50
200 '*** THIS TURNS OFF OPTIONS THEN SETS EMPHASIZED MODE ***
210 LPRINT CHR$(127);CHR$(146);CHR$(27)+CHR$(72)
220 LPRINT CHR$(27)+CHR$(69)
230 LPRINT "EMPHASIZED MODE SET"
240 GOTO 50
250 '*** THIS SETS DOUBLE STRIKE ***
260 LPRINT CHR$(27)+CHR$(71)
270 LPRINT "DOUBLE STRIKE MODE SET"
280 GOTO 50
290 '*** THIS RETURNS TO DEFAULT SETTINGS ***
300 LPRINT CHR$(146);CHR$(27)+CHR$(70);CHR$(27)+CHR$(72)
310 LPRINT CHR$(127)
320 LPRINT"DEFAULT MODE SET"
330 GOTO 50
340 '*** THIS ISSUES FORM FEED AND RETURNS TO CALLING DO FILE ***
350 LPRINT CHR$(140)
360 SYSTEM
```

Listing One

UNIVERSAL SVC DRIVER

Jim Kloosterman
Hammond Bay Software
Post Office Drawer 48
Rogers City, MI 49779

The Universal SVC Driver permits the use from BASIC of any of the published Supervisor Calls (SVC) listed in your Owner's Manual. Considerable care is necessary in such usage and, being universal, the Driver is not very efficient most of the time. However, it can permit quick and easy utilization of any SVC from within a BASIC program with a minimum of effort on the part of the programmer.

Begin with a "clean" TRSDOS-BASIC disk or one having only our previous PEKPOK/CMD file (see Mr. Kloosterman's article, "Model II Peek and Poke" published in Vol. 1, #6 of *two/sixteen*, p. 24).

Start your Model II and at TRSDOS READY, type:

DEBUG ON <ENTER>

If you have the previous file, type:

PEKPOK/CMD <ENTER>

In any event, type:

DEBUG <ENTER>

Press:

<X>

to be certain you are in heX addressing mode.

Press:

<M>

and A . . . . will appear, asking you for an address. Type:

EF30

EF30 will appear atop the left column. The sixteen two-digit hex values in a line following EF30 represent the current contents of RAM at addresses EF30, EF31, EF32, EF33, through EF3F. The next line following EF40 shows the values in addresses EF40 through EF4F.

Consult Figure One. If you loaded PEKPOK/CMD you should have *both* of the first two groups correctly in place — but check them carefully. Press:

<F1>

to move the cursor into the RAM area, then use the arrow keys to maneuver as necessary. Type in all values shown in Figure One and then check very carefully.

```
SVC/CMD

EF30  ?? ?? ?? ?? ?? ?? ?? 21   00 00 3E 03 CF C0 22 42
EF40  EF C9 FF FF 2A 42 EF 3E   03 CF C9 46 3E 1B CF C9


PEKPOK/CMD

EF50  5E 23 56 EB 22 59 EF FD   21 7E 72 5E 23 56 EB C9
EF60  CD 50 EF 5E FD 73 02 C9   CD 60 EF 16 00 FD 72 03
EF70  C9 CD 60 EF 23 56 FD 72   03 C9 CD 50 EF FD 5E 02
EF80  73 C9 CD 7A EF 23 FD 56   03 72 C9 ?? ?? ?? ?? ??


UNIV/CMD

EF80  ?? ?? ?? ?? ?? ?? ?? ??   ?? ?? ?? CD 50 EF 7D 2A
EF90  59 EF FD 5E 08 FD 56 09   D5 DD E1 23 23 4E 23 46
EFA0  23 5E 23 56 23 6E FD 66   07 CF FD 2A 59 EF FD 75
EFB0  06 FD 74 07 FD E5 E1 77   23 3E 00 77 23 71 23 70
EFC0  23 73 23 72 23 23 23 DD   E5 D1 73 23 72 0E 01 23
EFD0  77 30 01 71 23 77 23 77   20 01 71 23 77 D9 FD 71
EFE0  0E FD 70 0F FD 73 10 FD   72 11 FD 75 12 FD 74 13
EFF0  D9 C9 1A 20 48 65 78 20   53 74 72 69 6E 67 20 19
```

FIGURE ONE

```
-----------------------------------------------

R(0)      MSB = 0 none   +1        LSB = A        +0
R(1)      MSB = B        +3        LSB = C        +2

R(2)      MSB = D        +5        LSB = E        +4
R(3)      MSB = H        +7        LSB = L        +6

R(4)      MSB = MSB IX   +9        LSB = LSB IX   +8
R(5)      MSB = 0 none  +11        LSB = carry   +10

R(6)      MSB = 0 none  +13        LSB = zero    +12
R(7)      MSB = B'      +15        LSB = C'      +14

R(8)      MSB = D'      +17        LSB = E'      +16
R(9)      MSB = H'      +19        LSB = L'      +18

Register Assignments in integer-array R(0) thru R(9)

+Numbers show byte position relative to LSB R(0)
```

FIGURE TWO

You may move the display window by pressing <F2> and <ESC> and then pressing the up or down arrow keys. Press <M> and <F1> to get back into type-in mode.

When you have finished and checked and double-checked, press:

<F2> <ESC> <S>

After TRSDOS READY, carefully type the following:

DUMP UNIV/CMD START=EF37 END=EFFF RORT=R <ENTER>

That will place the entire group of M-L programs on your disk under the file-spec UNIV/CMD.

Now type:

DEBUG OFF <ENTER>

Type:

DO UNIV <ENTER>

```
10 CLEAR100:DEFINT I,R:DEFSTR S' File: UNIV/BAS
20 I=0:R=0:SI="?":S="BASIC "+"string":DIM R(9)
30 DEFUSR3=&HEF68:DEFUSR4=&HEF71:DEFUSR7=&HEF8B
40 '
50 '  Try VDINIT,  The SVC version of 'CLS'
60 R(0)=7:R(1)=&H0101:GOSUB200
70 IFR(6)=0THENPRINT"ERROR ON VDINT":STOP
80 '  Try VIDLINE on a hi-RAM string
90 R(0)=9:R(1)=&H0E0D:R(3)=&HEFF2
100 PRINT"M-L String @ EFF2 = ";:GOSUB200
110 IFR(6)=0THENPRINT"ERROR ON VDLINE":STOP
120 '  Try VIDLINE on a BASIC string
130 R(0)=VARPTR(S):R=USR3(VARPTR(R(0)))' Length
140 I=R(1):R(0)=R(0)+1:R=USR4(VARPTR(R(0)))' Address
150 R(3)=R(1):R(0)=9:R(1)=I*256+13
160 PRINT"BASIC STRING  S = ";:GOSUB200
170 IFR(6)=0THENPRINT"ERROR ON VIDLINE":STOP
180 PRINT:PRINTTAB(35)"Test Ended":END
190 '   UNIV SVC Driver Subroutine
200 R=USR7(VARPTR(R(0))):RETURN
210 ' End of Listing
```

LISTING ONE

and then type:

UNIV/CMD

on the first command line of our DO file and press:

<ENTER> and <ENTER> again

On the second command line type:

BASIC UNIV/BAS -M:61239 <ENTER> <ENTER>

The DO file will be handy later, but not now.

Next type:

BASIC -M:61239 <ENTER>

After BASIC READY, type in the BASIC program in Listing One. When finished, check it carefully. DO NOT RUN!

Type:

SAVE"UNIV/BAS" <ENTER>

When it is safely copied to the disk, then you may type:

RUN <ENTER>

If the BASIC and M-L programs operate correctly, you should get a fast CLS of the screen and then:

M-L String at EFF2 = Hex string
BASIC STRING S = BASIC string

Test Ended

The words "Hex string" should be in black on a white background.

BASIC Program Analyzed

Let's analyze the BASIC program providing that not-overly-impressive result.

Lines 10 and 20 define the variable types and list all of the variables used and DIMension integer array R(0) through R(9). Line 30 sets up start addresses of three USR functions we will call PEEK, PEEKS, and UNIV.

SVC VDINIT

To operate the SVC VDINIT (function code 5) Line 60 loads R(0)=7 and R(1)=&H0101. Consult Figure Two. The only possible registers requiring preset values before entering *any* SVC are A, BC, DE, HL, and IX. In BASIC, the values can be loaded into integers R(0) through R(4). As indicated in the figure, the value desired for the A-Register (a decimal 7 in this case) should be loaded into the Least-Significant-Byte (LSB) of R(0). Values desired for

the BC-Register should be loaded in R(1) with the B value in the Most-Significant-Byte (MSB) and the C value in the LSB. In this case, we wish to have the normal white-on-black mode and 80-characters-across sizing so we need non-zero values for both B and C. The value 01 is as good a non-zero value as any. As per Figure Two, had we desired to load any other registers, we would place the values in R(2) through R(4).

Once we have preset the integer array properly, we need only execute R=USR7 (VARPTR (R(0))). I have placed that in a minimal subroutine at Line 200 just to avoid typing the convoluted expression over and over. The result of the USR7 function is to give the M-L program at EF8B a "pointer" to the variable-name-data table for R(0) through R(9). That program proceeds to load each of the registers from the array. Then it executes the SVC.

Finally, the values in all of the registers shown, including the "prime" registers B'C', D'E', and H'L' and the flag bits C (carry) and Z (zero) are loaded back into the R(0) through R(9) array. Control is then returned to the BASIC program. In BASIC, it is then easy to test or utilize any of the returned data from the integer array.

For example, Line 70 tests R(6) for zero. If R(6)=0 then we know an error occurred in the SVC, and a note is printed and the program stopped. R(6) has the value of zero if the Z flag was zero, otherwise it has the value of one. The NZ error condition reported by the SVC is the equivalent of R(6) or Z being zero.

SVC VIDLINE

Line 80 sets up for the VIDLINE SVC. R(0) is set to 9 decimal, the function code of VIDLINE. R(1) is set to &H0E0D as we wish the B-Register to hold 0E hex, 14 decimal, the number of characters to be displayed AND the C-Register to hold 0D hex, 13 decimal, the ASCII code for carriage-return (<ENTER>) to end the display print-out. R(3) is set to &HEFF2, the RAM address of the first character of our string. After the regular BASIC print of the introductory message, the Line 200 subroutine is used to execute USR7. The NZ-error case is detected in Line 110.

Applying VIDLINE to a BASIC string is more difficult because we have to determine the current length and beginning-address of the string by consulting the Interpreter's internal table. First, R(0) is set to VARPTR(S). The USR3, one-byte PEEK developed in our previous article ("Model II PEEK and POKE," Vol. 1, #6, p. 24) is used to get the length of the string in R(1). That's stored temporarily as I. Then, R(0) is incremented and the USR4, two-byte PEEKS (also developed in our previous article) is used to get the address of the first character of the string in R(1).

R(3), to become the value in the HL-Register, is set to that address from R(1). R(0) is set to 9, the function code to be put into the A-Register. Finally, the number of characters in I is multiplied by 256 to shift it to the MSB and decimal 13, the code for carriage-return (<ENTER>) is added and the result stored in R(1) to be directed to the B and C Registers. After the introductory message, the subroutine is called to execute USR7 in Line 160. Line 170 tests for an error. Line 180 ends the program.

```
USR7, UNIV at EF8B hex, 61323 decimal

Address  Command        Assembler          Comment

EF8B     CD 50 EF       CALL EF50          *ABS CALL FIND
EF8E     7D             LD A, L             HL=R(0)
EF8F     2A 59 EF       LD HL,(EF59)       *ABS HL->LSB R(0)
EF92     FD 5E 08       LD E, (IY+8)        E = LSB R(4)
EF95     FD 56 09       LD D, (IY+9)        D = MSB R(4)
EF98     D5             PUSH DE
EF99     DD E1          POP IX              IX=R(4)
EF9B     23             INC HL              +1
EF9C     23             INC HL              +2
EF9D     4E             LD C, (HL)          C = LSB R(1)
EF9E     23             INC HL              +3
EF9F     46             LD B, (HL)          B = MSB R(1)
EFA0     23             INC HL              +4
EFA1     5E             LD E, (HL)          E = LSB R(2)
EFA2     23             INC HL              +5
EFA3     56             LD D, (HL)          D = MSB R(2)
EFA4     23             INC HL              +6
EFA5     6E             LD L, (HL)          L = LSB R(3)
EFA6     FD 66 07       LD H, (IY+7)        H = MSB R(3)
EFA9     CF             RST 8               DO the SVC <---
EFAA     FD 2A 59 EF    LD IY, (EF59)      *ABS IY->LSB R(0)
EFAE     FD 75 06       LD (IY+6), L        LSB R(3)=L
EFB1     FD 74 07       LD (IY+7), H        MSB R(3)=H
EFB4     FD E5          PUSH IY
EFB6     E1             POP HL              HL -> LSB R(0)
EFB7     77             LD (HL), A          LSB R(0)=A
EFB8     23             INC HL              +1
EFB9     3E 00          LD A, 00
EFBB     77             LD (HL),A           MSB R(0)=0
EFBC     23             INC HL              +2
EFBD     71             LD (HL),C           LSB R(1)=C
EFBE     23             INC HL              +3
EFBF     70             LD (HL),B           MSB R(1)=B
EFC0     23             INC HL              +4
EFC1     73             LD (HL),E           LSB R(2)=E
EFC2     23             INC HL              +5
EFC3     72             LD (HL),D           MSB R(2)=D
EFC4     23             INC HL              +6
EFC5     23             INC HL              +7
EFC6     23             INC HL              +8
EFC7     DD E5          PUSH IX
EFC9     D1             POP DE              DE=IX
EFCA     73             LD (HL),E           LSB R(4)=LSB IX
EFCB     23             INC HL              +9
EFCC     72             LD (HL),D           MSB R(4)=MSB IX

EFCD     0E 01          LD C, 01            C=1, A=0 above
EFCF     23             INC HL              +10
```

```
EFD0    77          LD (HL),A           LSB R(5)=0
EFD1    30 01       JR NC, $+3
EFD3    71          LD (HL),C           LSB R(5)=1 ?
EFD4    23          INC HL              +11
EFD5    77          LD (HL),A           MSB R(5)=0
EFD6    23          INC HL              +12
EFD7    77          LD (HL),A           LSB R(6)=0
EFD8    20 01       JR NZ, $+3
EFDA    71          LD (HL),C           LSB R(6)=1 ?
EFDB    23          INC HL              +13
EFDC    77          LD (HL),A           MSB R(6)=0
EFDD    D9          EXX
EFDE    FD 71 0E    LD (IY+14),C        LSB R(7)=C'
EFE1    FD 70 0F    LD (IY+15),B        MSB R(7)=B'
EFE4    FD 73 10    LD (IY+16),E        LSB R(8)=E'
EFE7    FD 72 11    LD (IY+17),D        MSB R(8)=D'
EFEA    FD 75 12    LD (IY+18),L        LSB R(9)=L'
EFED    FD 74 13    LD (IY+19),H        MSB R(9)=H'
EFF0    D9          EXX                 RESTORE
EFF1    C9          RET                 RETURN TO BASIC
EFF2    1A                              WH BKGND
EFF3    20                              space
EFF4    48                              H
EFF5    65                              e
EFF6    78                              x
EFF7    20          string data         space
EFF8    53          0E hex, 14 dec      S
EFF9    74          characters          t
EFFA    72          @ EFF2 hex          r
EFFB    69            61426 dec         i
EFFC    6E                              n
EFFD    67                              g
EFFE    20                              space
EFFF    19                              BLK BKGND
```

LISTING TWO

To Use The SVC Driver

In general, to use the Universal SVC Driver for any of the SVCs, you must (1) have the M-L program loaded in hi-RAM; (2) have BASIC loaded to protect hi-RAM (-M:61239 here); (3) load all appropriate integers, R(0) through R(4) as desired to "program" the Z-80 register contents; and (4) Execute R=USR7 (VARPTR(R(0))).

Upon return to your BASIC program, it is important to test to see if an error occurred in the SVC. Any data "passed-back" by the SVC, including error code, etc., are readily accessible as all register values plus the C and Z Flags have been loaded into the integers R(0) through R(9) by the M-L Driver program.

A generic assembly-code listing of the M-L program is given as Listing Two and Listing Three. It is long but straightforward, even "brute-force." The contents of R(0) through R(4) are placed in the appropriate registers, an RST 8 is executed, and all of the register contents and the C and Z flags are shifted into R(0) through R(9) before control is returned to BASIC.

Summary of All M-L Programs in UNIV/CMD

Load UNIV/CMD and limit BASIC by -M:61239. R and R(0) through R(9) are BASIC integter variables.

<BREAK> ENABLE
DEFUSR0=&HEF37 R=USR0 (R)
R may have any value.

<BREAK> DISABLE
DEFUSR1=&HEF44 R=USR1(R)
R may have any value.

SCROLL-PROTECT
DEFUSR2=&HEF4B R=USR2 (R)
R = number of top lines to be protected, 0 through 22.

PEEK
DEFUSR3=&HEF68
R=USR3(VARPTR(R(0)))
R(0) = peek-address, Value returned in LSB of R(1)

PEEKS
DEFUSR4=&HEF71
R=USR4(VARPTR(R(0)))
R(0) = peek-address, Value from address returned in LSB R(1) and value from address +1 returned in MSB R(1).

POKE
DEFUSR5=&HEF7A
R=USR5(VARPTR(R(0)))
R(0) = poke-address, Value to poke in LSB of R(1).

POKES
DEFUSR6=&HEF82
R=USR6(VARPTR(R(0)))
R(0) = poke-address, Value to poke in LSB of R(1) Value to poke in address + 1 in MSB of R(1).

UNIV
DEFUSR7=&HEF8B
R=USR7(VARPTR(R(0)))
R(0) through R(4) carry values of registers for entry to SVC as per table of Figure Two. Upon return to BASIC, the content of all registers and C and Z flags are recorded in R(0) through R(9) as per Figure Two.

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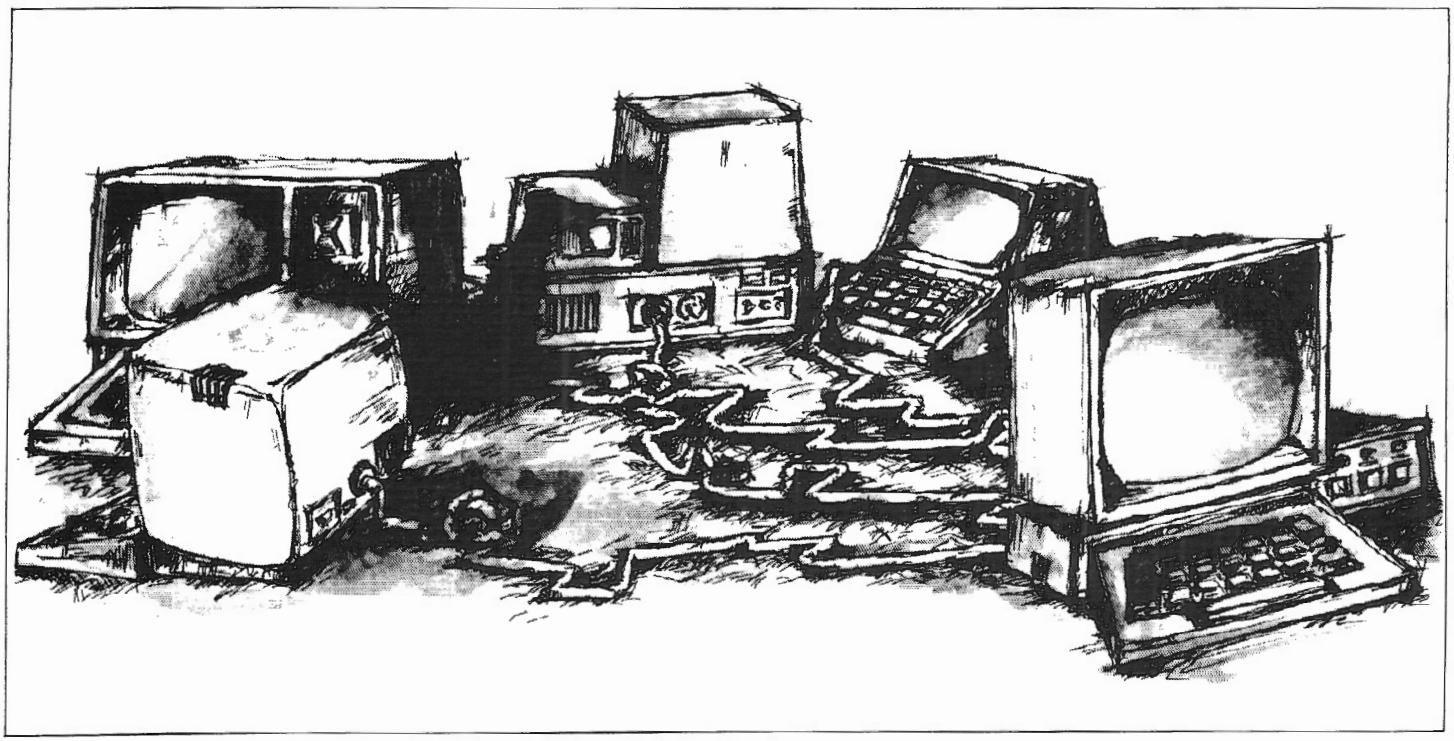


XENIX Impressions

Robert R. Jenkins
Milex Southern, Inc.
Drawer M
Weatherford, TX 76086

Milex Southern, Inc., an Ob-Gyn Specialty Distributor in Weatherford, Texas, has a Model 16 upgraded to 384K, a 12 meg hard disk, and two DT-1 data terminals. We use the Radio Shack General Ledger, Accounts Receivable, and Order Entry applications programs, and we have been running under TRS-XENIX for about six weeks now.

TRS-XENIX

As you all know by now, TRS-XENIX is an operating system, a collection of programs resident in the computer at all times which are designed to control the computer's resources. TRS-XENIX is derived from UNIX, an operating system developed at Bell Labs for use on large computer systems.

TRS-XENIX is a multi-user and multi-tasking system. It allows more than one user simultaneous access to the computer's system and programs and allows more than one job to run at the same time.

TRS-XENIX/TRSDOS

To run under TRS-XENIX, you have to re-initialize your hard disk. Of course, this act wipes out *all* of the hard disk's resident programs. Most of these programs will still run on floppy disks, so be sure to save your TRSDOS-II programs and data to floppy disks.

Since you can't run TRS-XENIX and keep TRSDOS programs on the hard disk at the same time, you can't use your existing Scripsit, Profile, VisiCalc, or any other programs on the hard disk; you have to buy Radio Shack's upgraded versions of these programs to run under TRS-XENIX. If you already own TRSDOS versions of the COBOL programs, Radio Shack will sell you the upgraded versions for the *difference* between the old price and the new.

The Conversion Process

The actual process of converting from TRSDOS-16 or TRSDOS-II to TRS-XENIX is very simple. Once you have re-initialized the hard disk, you load the information from several TRS-XENIX master floppy disks into the computer. The instructions for doing this are complete and well written, and I had no problem understanding or completing them. It was much easier than initializing the hard disk under TRSDOS-16.

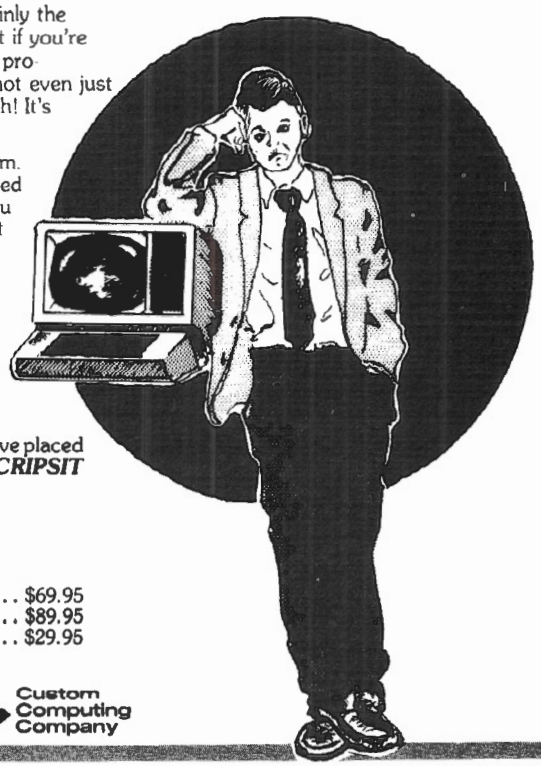
Then you must load your Radio Shack programs, one at a time. Only TRSDOS-II 4.0 or later files can be transferred to TRS-XENIX. If you have any TRSDOS 2.0a or 2.0b files you want to transfer to TRS-XENIX, you must first convert them to TRSDOS-II.

TRS-XENIX stores information on the hard disk in files. If you don't have any previously created files for a program, then TRS-XENIX will automatically do a file setup for you. If you do have previously created files (as I did), then you must transfer them to TRS-XENIX using the CONVERSION program. I had some trouble making the conversion from TRSDOS 16 to TRS-XENIX because our data files would not transfer properly. When we tried to use the parts of the program that accessed the Customer File or the Open Item File, we would get an "ERROR 98" or a "BUS ERROR-CORE DUMPED." We ultimately determined that the file index was being scrambled when we attempted to make the transfer.

SCRIPFIX*

One of the weakest points of Model II Scripsit^ is the fact that if something happens to glitch **ONE** of the documents, the whole document menu is ***UNUSEABLE.***

The only advice that Fort Worth has to offer is to make backups. That advice is certainly the best, and as long as you do it often enough you'll never need ***SCRIPFIX*. BUT,*** what if you're like most of us and forget, or maybe you were in a hurry and just skipped the backup process the last few times and ***THEN*** something happens. Disaster . . . . Sometimes it's not even just a matter of retyping, which is bad enough, but it could be that creative work is lost. Oh! It's such a sad thing to see a grown-up cry!



Well, dry away the tears, because, now, there's a solution to this all too frequent problem. ***SCRIPFIX**** restores your files to a readable state. After a Scripsit^ disk has been worked on by ***SCRIPFIX****, the Scripsit^ menu will once again be readable. Even files which you purposely deleted will be shown in the menu. So, if you accidentally delete a document that you wanted, ***SCRIPFIX**** will get it back for you.

If all the documents in a full file had to be retyped, it would take a typist 20 hours averaging 50 words a minute just to key it in, no proofreading or editing. ***SCRIPFIX**** takes about 2 minutes.

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Fortunately for us, the Tandy Tower in Fort Worth is only a forty-five minute drive from my office, so I was able to take my data files directly to the National Customer Service Center for unscrambling. It took them about a week to get the files to transfer without scrambling the index. The problem was related to both the length of one of my files (over 1 meg) and a problem with the TRS-XENIX Transfer program. I understand that this problem has now been solved with a new version of RUNCOBOL for TRS-XENIX. Of course, if you are not converting existing data, you won't have this problem anyway.

How TRS-XENIX Works

Once the transfer problem was solved, the system has worked *beautifully*! TRS-XENIX is *much, much* faster than TRSDOS which makes the accounting programs with their multiple menus so much easier and more pleasant to use. In addition, I have not noticed any decrease in operating speed even with both terminals running at the same time as the console.

The log-on procedure is simple to set up and simple to use. When logging in, you give the machine a name and a password. Once this is done, the programs work pretty much the same as they always have — only much faster. Each user logs in to the system under a separate name and is assigned a user directory of his own. TRS-XENIX restricts indiscriminate access to many system files and provides a protection mechanism to allow users to restrict use of their own files.

One designated "super-user" has unlimited access to the system. He is the operator who brings up the system and is the only one who can, for example, add or remove users. Because the "super-user's" access to the system is unlimited, any simple mistake can cause unbelievable damage to both the system and to user files; he can possibly bring down the entire system.

Extra Terminals

The ability to use two extra terminals is really nice. You just log-on to the terminals about the same way you log-on to the console. Then you run the programs as you normally would. The difference is that you can run a different application on each terminal, or you can run the same application on all three stations at once.

This has been a big help in balancing out the workload in my office. If, for instance, we have a large number of orders come in, we put more people to work entering orders. On the other hand, if we receive a lot of checks, we concentrate on them and have only one person entering orders. This is *much* better than the old TRSDOS system where we had only one work station and not enough hours in the day to get everything done. Now we have not only caught up for the first time in a long time, but we are able to stay caught up easily. There are a few applications, such as posting to accounts, that can only be run on one terminal at a time, but you probably would not want to run them on more than one terminal anyway.

TRS-XENIX Features

One great new feature offered by TRS-XENIX occurs when printing reports. Instead of outputting directly to the printer, the report is SPOOLED to a file on the hard disk and then printed out. Once the SPOOLING is completed, you can run another process while the report is being printed. You can even stack up several different reports in the SPOOL file at once. This is a great time-saver.

When printing invoices and statements, there is no SPOOLING. This seems to be a safety feature to prevent accidental printing of invoices or statements on regular paper rather than special forms.

BACKGROUND, PIPE, and TRSSHELL, new features unique to TRS-XENIX, are exciting and useful. TRSSHELL is a user-friendly "shell" for TRS-XENIX which allows you to enter commands with easily remembered words rather than letters or abbreviated commands. PIPE is a way to connect the output of one command to the input of another command so the two run as a sequence of commands called a "pipeline." BACKGROUND allows you to run one process "in the background" while running another process "in the foreground."

TRS-XENIX And Remote Use

The TRS-XENIX system works very well for remote use. You edit one of the files to inform the computer that one or both of the terminal channels will be remote. Then hook up a 300 baud or a 1200 baud modem to each output channel and set the proper input-output parameters on the remote terminals. Now, when you log in from a remote location, the system will switch back and forth between 1200 and 300 baud until it receives something it understands. This works out very well for us. We use Hayes Smartmodem 1200 modems, both at the console and from the remote locations. These are 1200-300 modems which respond to both 1200 and 300 baud communications. I also have a TRS-80 Model 100 Portable Computer with a built-in 300 baud modem. My setup enables me to call in with either a terminal and a 1200 baud modem or with my Model 100. It is necessary to edit one of the TRS-XENIX files so the computer will recognize the Model 100, but this is very easy to do.

Availability

The XENIX "core" package is available at no charge to anyone who has a Model 16 or a Model II with a Model 16 Upgrade Kit. You do have to upgrade your computer to at least 256k. We chose to upgrade to 384k since we were going to be running several long accounting programs with two extra terminals. The "core" package contains only what is necessary to run RS applications software. If you wish to do developmental work, you must purchase the TRS-XENIX Development Package (about $750.00) and a language package (about $250.00).

As of now, the only programs I know of available to work under TRS-XENIX are the COBOL General Ledger, Accounts Payable, Accounts Receivable, and Order Entry packages. Tandy is working on new versions of many of their other programs and on some entirely new programs which will run under TRS-XENIX. Sales Analysis is due out in June. Multi-Plan, a third-generation electronic spreadsheet, is due out in another month or two. I have seen a preliminary version of it, and it is certainly far superior to VisiCalc.

To Sum Up

I am very happy with TRS-XENIX. This may be because I only have TRSDOS to compare it against. All I know is that we are able to get more work done at my office in a day now than we were able to do in a week running under TRSDOS.

I would recommend converting to TRS-XENIX even if you have no plans to run more than one terminal; the extra speed alone makes it more than worth the money.

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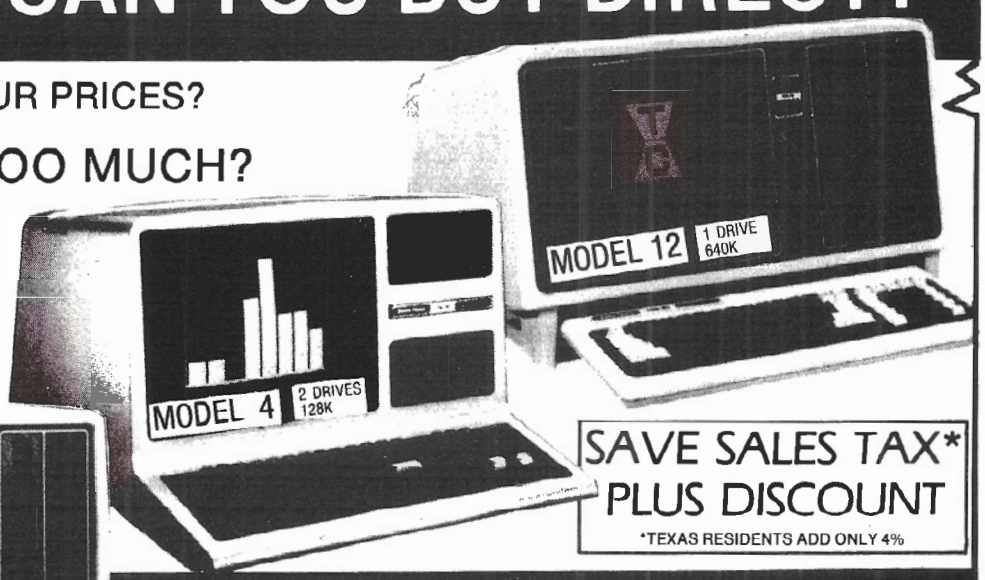

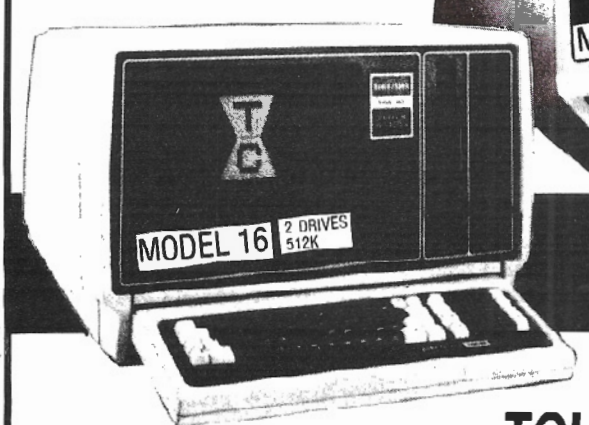

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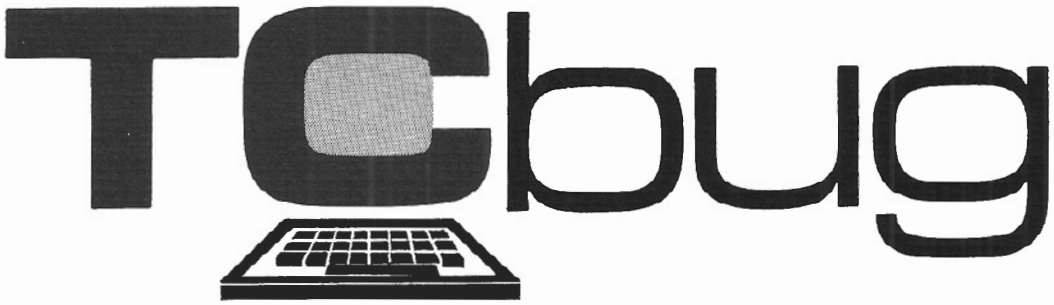
TANDY COMPUTER BUSINESS USERS GROUP



ISSUE 1 JULY/AUGUST 1983

TANDY COMPUTER BUSINESS USERS GROUP, TCBUG, whose originating members come from Fortune 1000 companies and companies that directly service these firms, was formed in response to a growing need for more meaningful information and support for their Tandy microcomputer systems.

Notes From The Convention

The first convention of the newly organized TCBUG was held at Fort Worth's Americana Hotel in early May. The three day event consisted of presentations from Tandy and third party software manufacturers, luncheons, question and answer sessions with Tandy officials, and a planning meeting for the future development of TCBUG.

TCBUG is completely separate from Tandy; the sole connection between the two groups is TCBUG's status as Tandy's only officially recognized business users group. "This first convention was organized and brought to reality with much assistance from Tandy, and their help is greatly appreciated. But, we are not a 'sweetheart organization'," said TCBUG's President, Ira Tolmich of Coca-Cola Co. In an opening address to the members, Mr. Tolmich outlined the purposes and goals of the organization.

He also discussed the agreement between the Board of Directors of TCBUG and the Tandy people; i.e., for the organization to be valuable, it must be able to point out the problems and shortcomings of Tandy equipment and services with as much force as necessary to effect solutions. Carrol Reeves, liaison from Tandy, concurred by stating that TCBUG represents a significant market for Tandy, and the group and its input would be treated with serious concern and cooperation. He expressed the corporate feelings that both Tandy and TCBUG would benefit from the relationship more fully if the organization were not responsible to and funded by Tandy.

Presentations from Tandy opened with an address by Mr. Ed Juge, Director of Computer Merchandising, and continued with talks by people working on word processing and data base programs for XENIX, the Model 4 computer, ARCNET, and other developments at Tandy.

Among some of the good and bad things learned: the DT-1 terminal will not support a local printer under XENIX control, (at least not at this time), and the word processing for multi-user will be far more powerful than current SCRIPSIT and will include true proportional spacing and other new functions.

Following the Tandy presentations and talks from outside software houses like Microsoft and Digital Research (CP/M), question and answer meetings were held with Tandy software people and technical service management. Questions not directly answered were to be researched and answered by Tandy in writing in the near future, and a copy of those answers is being distributed by Tandy to the members of TCBUG this month. It was suggested that a list of phone numbers for various people at Tandy who could solve problems for the business user be distributed, and that list follows:

Carroll Reeves
Director, Special Markets
817/390-3921

Bill Wash
Director,
Computer Customer Services
817/390-3560

Bill Boren
Manager,
National Account Support
817/390-3240

Ed Cagle
National Account Manager
Southeast
817/390-2893

John Patterson
National Account Manager
West
817/390-3095

Jay Smith
National Account Manager
Northeast
817/338-2229

Tudor ApMadoc
Manager,
National Account Support
817/390-3001

The convention ended with a planning meeting during which developments and structure of the convention were discussed and plans were made for a second convention to be held sometime next March. This next convention will also be held at Fort Worth. New members of the Board of Directors were announced, and the budget was discussed. The

convention fees covered the cost of the convention, and a substantial amount collected from dues remains to begin the organization's treasury. Much talk over regional chapters/meetings and special interest groups dominated the session.

More About TCBUG

TCBUG is off to an auspicious start and is determined to be a meaningful force in the development of Tandy's plans for micros in the business environment. It is looking for new members and offers substantial benefits to those affiliating themselves with the organization. A newsletter will be sent out periodically with articles, reviews, and information on Tandy equipment from the user viewpoint. A Special Interest Group (SIG) is being established on CompuServe as an electronic forum for the interchange of information. Special Interest Groups are forming now in areas such as COBOL, XENIX, networking, and regional chapters are organizing local meetings for information exchange.

TANDY COMPUTER BUSINESS USERS GROUP and the Tandy Corporation have agreed to work closely together for mutual benefit. For instance, Tandy has agreed to make available to TCBUG members any new developments important to the business user before general release. This seemingly small concession will allow corporate buyers the opportunity to plan with greater confidence.

As for communications between TCBUG and Tandy, Tandy has agreed to answer any and all questions as completely as possible and to take actions which will solve problems and not create others. Tandy views TCBUG as a one voice organization that will express the concerns and problems of the business user, and TCBUG has stated its objective to delineate these problems, ideas, and questions fairly and in a manner that will be conducive to solutions.

TCBUG also feels that since its members have had the experience of operating Tandy micros around the world and have solved problems on a daily basis, it may be able to establish a technical support section as good, if not better, than Tandy's own team. Simple interaction and communication among users may solve many "thought to be" difficult situations, since one can generally find another who has been working on the same problems and applications. To this end, technical information will be released through the newsletter and CIS (CompuServe Information Service).

The TCBUG Newsletter welcomes any articles; send them to:
TCBUG Newsletter
John Esak, Editor
50 Chuckanutt Drive
Oakland, NJ 07436

Dues to join the organization are $100 for a Regular (voting) membership and $75 for an Associate (non-voting) membership.
Membership requests/payments should be made to:
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P.O. Box 17580
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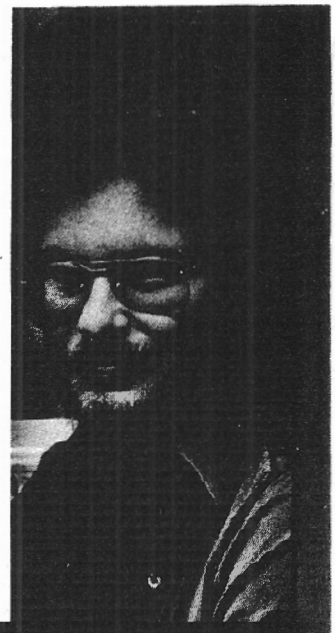

The Snappware College Educated Garbage Collector (SNAPP-VI) is an intelligent processing function which greatly improves performance of typical BASIC applications. And here's why.

Microsoft uses a 'variable length string' in the BASIC interpreter. Each time the string is assigned a new value, it is relocated in a string pool. Periodically the string pool must be reorganized and condensed into a single contiguous area. Performing this string space reclamation is time consuming and inefficient because this approach evaluates and collects each string individually. The time required is roughly proportional to the square of the number of active strings in the resident program. During reclamation the system seems to 'lock-up' and does not respond to the operator until the process is completed.

This time consuming approach requires a better solution. Snappware has developed a solution which takes advantage of the auxiliary memory available. SNAPP-VI requires only four bytes per active string as a work area. When free storage space is available, our system temporarily borrows, uses and returns the space to the free storage pool when completed. If storage is not available, our system will temporarily transfer out to disk enough of the BASIC program to make room for our work area and return the 'paged out' information to its correct location when completed.

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Fancy Font

James F. Waters
Department of Biology
Humboldt State University
Arcata, CA 95521

Would you like your dot-matrix output to look more like real printing? Do you need special characters which your printer does not have? Are you fascinated by diverse alphabets? Then you will be excited by this elegantly designed software. With Fancy Font, your Epson printer can produce Roman and Italic fonts for your business correspondence and reports, Greek and mathematical characters for scientific work, draftsman's alphabets, cartographic and weather symbols, even script alphabets for your love letters. You can design and print your own logo, letterhead, or alphabet.

SoftCraft has brilliantly adapted the nearly 1600 characters from Dr. Hershey's catalog of alphabets and symbols (National Bureau of Standards Spec. Publ. 424) for the use of microcomputers. They have edited some of these as necessary and designed additional characters and fonts. Their system includes three major programs: Pfont for printing your text; Cfont for compiling additional fonts to your specification from Hershey's set; and Efont for editing fonts or incorporating your own characters. All of these, and the 96-page user's manual with its nine appendices, have been designed with thorough care, professionalism, and real understanding of the user's needs.

Fancy Font requires CP/M, an Epson FX- or MX-80 or -100 printer with Graftrax, and at least 48K of memory (64K makes printing faster). I think a second disk drive is essential. Fancy Font comes on two 8" single-density standard CP/M disks. It is completely copyable for backups and creating specialized working disks.

I have been running Fancy Font on a Model II with a second drive, Epson MX-80 with Graftrax, and Pickles and Trout CP/M. In a month or two I have only begun to tap the resources of the system, but I have had no problems with the software so far. The manual is, on the whole, excellently clear. Commands are mnemonic. There are numerous help facilities, compact and informative, on-line when you need them. Error trapping is excellent; Fancy Font helps you correct your errors without losing your work. Fancy Font is extremely flexible yet comfortable to use, and an introductory page with a demonstration example gets you started on fancy printing immediately.

How To Use Fancy Font: Pfont

Let us consider Pfont, the printing function, first. Your next letter or memorandum can be really special.

Type your text ("text.ff") with your usual word processor (the manual includes an appendix on using WordStar). Pfont provides 18 commands which you embed in the text to change fonts, justify or center lines, leave room to paste in a graph, etc.

For example, you might center the title by typing "\c"(<control><9><c>) before it. /f1 before the first letter would flag what followed to be printed in font #1. /v0054 would provide 54 points, or 3/4 inch, of white space before the next printed line. Start the first line of the text with /t (or <tab>) for a tab-stop, /j to justify the entire document, /f0 to specify font #0. At the end of the paragraph, type /b to break justification for that line.

SCRIPSIT users must type <enter> at the end of each line. Your text must be converted to an ASCII file, and you will need a specially prepared disk to have room for it (see p. 77 of the SCRIPSIT 2.0 manual). Then copy the file to a CP/M disk. Add line feeds as you convert from TRSDOS to CP/M. (I like SCRIPSIT, and I bought CP/M so I could use Fancy Font, but working back and forth between two operating systems while altering my documents is a

The quality of Pfont's printed output is high, suitable as camera-ready copy for photolithographic reproduction

terrible nuisance.) Once in CP/M, rename the text file to add the optional .ff suffix; don't use the suffix on the TRSDOS disk.

Switch 2-3 on the printer must be set to the right (off) position. Put Disk 1 of the Fancy Font system into drive A; your text file may be on this disk or in another drive.

Load Pfont. On the command line, name the text file which you want to print, or combine more than one into a single printout. Specify any of 27 parameters you want to invoke.

You can, for example: choose up to 10 fonts per document (and change them with each printing if you like) (thirty fonts come with the system, ready for use, and you can compile many more or design your own) (more on this later); print header or footer lines, on every page or on each page but the first; set numerical values for margins, tab stops, and line spacing; change paper between pages; preview the letter, on the screen only, or on paper in one of two fast rough-draft modes. Explicit messages tell you about lines that are too long or other formatting errors. (See Exhibit 1.)

Pfont then prints your text in the beautiful alphabets or other symbols you have chosen for it. Even a simple memorandum takes on immense dignity in 12-point Gothic type with 18-pt. Lombardic capitals.

If you use a particular format frequently, you can write its specifications into a separate prarameter file (e. g., "letter.ffi").

Introduction to histology

Tissues are made up of many individual cells which are similar in function, and of materials which they have secreted. Since these cells are similar in function, they are similar in appearance, are grouped together, and are differentiated from their surroundings.

How are tissues identified, or differentiated? By the size, location, and

Introduction to histology

Tissues are made up of many individual cells which are similar in function, and of materials which they have secreted. Since these cells are similar in function, they are similar in appearance, are grouped together, and are differentiated from their surroundings.

How are tissues identified, or differentiated? By the size, location, and

This is 8-pt. Roman (Hershey's Complex Roman).
This is 10-pt. Roman.
This is 10-pt. Roman italic.
This is 10-pt. Roman bold.
This is 12-pt. Roman.
This is 10-pt. Sans Serif (not a Hershey font).
This is 12-pt. Sans Serif italic.
This is 12-pt. Script.
This is 18-pt. Old English (Gothic English).
This is 12-pt. Lombardic (Gothic Italian).

SCREENPIX

Take advantage of your Model II/16's limited graphics capability without special hardware. Screenpix is a general purpose TRSDOS Z-80 machine language utility that enables you to create, edit, and store screen images using the 256 displayable characters of your system.

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The thirty fonts provided with the system are:

- Roman in 8, 10, 11, 12, 18, and 40-point sizes (one point is about 1/72 inch), plus 8-pt. subscript and superscript fonts
- Roman italic in 10, 11, 12, and 18
- Roman bold in 10, 11, 12, and 18
- Sans Serif in 8, 10, 11, 12, and 18
- Sans Serif italic in 12
- Old English in 18, 20, and 40
- Script in 12, 14, 18, 20, and 40-pt. sizes

(See Exhibit 2.)

Most of these include 95 characters (ASCII codes 32-126). Three more partial fonts provide a few additional special characters, including an attractive gray border for surrounding a line of text.

The quality of Pfont's printed output is high, suitable as camera-ready copy for photolithographic reproduction. I have used the Roman 12-pt. and related fonts to prepare Thermofax mimeo masters for class hand-outs. They stayed legible, though smaller fonts probably would not.

On ordinary computer paper, the 8- and 10-pt. sizes tend to close up a bit. A harder, non-absorbent paper would help eliminate this effect, as would a drier ribbon. The Fancy Font characters are slightly narrower than Hershey's, I think because they are adapted to the Epson printer's 120 × 216 matrix, an awkward ratio difficult to convert back to a square. Spacing between characters is overly close (this is trivially easy to change with Efont, see below). These are minor criticisms, and it would be ungrateful to give them much weight.

Printing is naturally slower than with the regular Epson fonts, as the printer is operating in graphics mode and makes several passes per line. The results are certainly worth the wait of 10-15 minutes for a page.

Printing with Pfont, like anything else worthwhile, demands some extra care and planning. When preparing your text file, you must adjust the length of line to suit the font you intend to use. The 12-pt. Roman font, for example, runs about 88 characters per line. (It would be helpful if SoftCraft would give us this information for all of the included fonts.) Each character has its own width, just as in metal type, and these widths are different in the different typefaces as well as in different sizes. Pfont's proper letter spacing and word spacing make a handsome page, but you must be willing to do a trial run or two, working back and forth between Pfont and your word processor, to get the optimal number of words on each line. We are trying to simulate metal type, after all, and typesetting in metal is vastly more demanding.

The part of the manual explaining Pfont and the type fonts is worthy of praise. It is unusually well planned and presented, in conceptual design, usefulness, and typography (printed, of course, by the Fancy Font system). Each command is clearly explained, with suggestions on how to use it, syntax and examples, description of error messages, and other explicit and helpful commentary.

Cfont

The program Cfont is used to "create" fonts (actually to compile them out of the Hershey collection, which occupies 100K! on Disk 2 of the system).

Appendix 6 of the manual is a printout of the 1593 characters included. Do you need Leroy lettering for a map or architectural drawing? It is here, in about 10- and 18-pt. sizes. Roman characters in a different point size? Cartographic symbols? It will take you about half an hour to compile a font, but then it will be permanently available for Pfont to use in any of your future printing.

To create a custom font, load Cfont, which will map the desired characters to your keyboard and prepare a font file. A one-line menu appears. (Type a "?" for a screen display explaining the options).

Type "m" (for "mapping"). Cfont will ask you for the ASCII number of a key, then the number of the Hershey character which you want this key to represent. (Both of these numbers are in the appendices.) Upper- and lower-case alphabets and numerals can be mapped quickly. Punctuation marks have to be done individually, as the ASCII and Hershey sequences are different. The logic of Cfont's menu choices makes either process easy and efficient.

After mapping each character or group, you have a choice: You can enter "m" again and map some more characters, or you can type "s" and save the mappings as a file (e. g., "leroy.map"). The "s" command is useful if you do not feel like mapping the entire font at one sitting; you can reload the file into Cfont later (type "l") and go on mapping. After the map file is completed, save it and use it later to generate fonts of Leroy letters in different sizes.

Now you can generate a font file to be used for printing. You can adjust the size of the printed characters with the "f" command or use the default, which will give about 18-pt. capitals. Enter "g," tell the prompt that the Hershey file is on drive B, and go away for a cup of coffee. Cfont will translate the Hershey coordinates for each character into an array of dots for the printer. As it progresses, Cfont keeps you informed of what it is doing, character by character, task by task — evidence of how thoroughly Fancy Font is designed with the user in mind.

Five to 20 minutes later, Cfont will ask you to name the font file (e. g., "leroy18.fon"). It then saves the font file to disk and returns to its menu.

The range of possible sizes is very great. An individual character cannot be more than an inch high, and many of the fonts will probably not work well below 8 or 10 points. Particularly small characters may need some retouching via Efont (below) and your text editor.

Hershey was a mathematician who used his own system to print complex equations. I believe that Fancy Font could be so used, and the symbols are available, but multi-line equations would be very difficult to set up.

Perhaps SoftCraft might give us some beginner's advice on predicting point size. What size is each font as it is generated with the default scaling factor? And what scaling factors should I use, for example, to compile a 12-point Russian alphabet?

I felt that this part of the manual was not so helpful. The commands are listed, and they are well described, but it took me a while to figure out how some of them (load, map, save, generate) were to be used, in what sequence, and even what you use them for. The nature and utility of the mapping file are not explicitly presented in the manual and caused me some trouble at first. This portion of the manual could be expanded, with a step-by-step example, to make it as clear to the new user as is the long chapter on Pfont.

Efont

Efont, the font-editing program, permits detailed study or modification of individual characters. You can load a font file, then display or print out a large-scale pattern of asterisks showing the construction of any character. Efont will make an ASCII file of these asterisks and spaces. You can alter this pattern with your text editor, then reload Efont and insert the edited character back into the font. Then you can print out sample strings of characters to see how the changes look. A simple command changes letter spacing for the entire font. Efont has a menu and help facilities much like those of Cfont.

The most exciting feature of all is that Efont compiles your scratch-designed graphics or characters into printable fonts! You can create your own typeface, additional terrain symbols, anything you like. Adapt a 19th-century typeface for the Epson printer. Construct a font for printing bar graphs. If your logo is too big for the maximum 72 x 80-pt. rectangle (just over a square inch), make it of several such characters. Design special characters to subdivide your invoices.

The hardest part is designing your character in terms of dots and spaces. Because of the Epson's 120 x 216 matrix, you cannot lay a letter out on ordinary graph paper. Can anybody send me graph paper ruled 4 vertical lines by 7 horizontal lines in the square? (If you can modify an existing font, you can sidestep this problem.)

Write each character as a separate text file, using spaces and asterisks for the dots. Remember to specify right and left margins and height of character and to end each line with <enter>.

Save or convert the file to ASCII format. Its name as a CP/M file must be "a(nn).edf," (nn) being the ASCII code of the key which will produce the character. SCRIPSIT users must remember to add linefeeds when converting and to avoid ."edf" suffix until in CP/M. Copy these files to disk with Efont on it.

The most exciting feature of all is that E font compiles your scratch-design graphics or chart into printable fonts

Load Efont and type "r." Efont will compile these files into a font file usable by Pfont. (Be sure that all of your .edf files on the disk belong to a single font.)

I had more trouble figuring out this procedure than I did with Cfont. The section of the manual dealing with Efont says little about compiling the individual files of scratch-designed characters. The procedures, like those in Cfont, are straightforward enough once I understood what they are. These two sections of the manual are excellent as reference but do not provide the sort of introductory text and detailed examples which the chapter on Pfont does. I imagine that SoftCraft simply has not had time to develop these sections fully and has, justifiably, concentrated on the printing function which most people will use most of the time.

Conclusions

SoftCraft's Fancy Font system is thoughtfully designed, both software and documentation, to enable the professional user or amateur typographer to do a difficult and worthwhile task flexibly, rapidly, inexpensively, and conveniently. I encourage all users of CP/M with an interest in attractive and imaginative presentation of reports, letters, or other documents to buy Fancy Font and devote the necessary brief time to learning to use it.

SoftCraft plans to start a Users' Group through which ideas, applications, tricks, uncopyrighted fonts or special characters, and samples of typography could be exchanged.

Fancy Font is available from:
SoftCraft
8726 S. Sepulveda Blvd., Suite 1641
Los Angeles, CA 90045
213/641-3822
$180.00

MECHANICAL & STRUCTURAL ENGINEERING PROGRAMS

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EASI Software
2 Windsor Court
Jackson, New Jersey 08527
(201) 367-5735 1-7pm EST

A TINY UTILITY

Gerald Lippey
The Lippey Company
210 South Bundy Drive
Los Angeles, CA 90049

Here's a "tiny utility" that lists a file to the video without all the nonsense that LIST produces. The program simply turns DUMMY MODE and DUAL on and then issues TRSDOS's PRINT command.

List File On Screen

This program, named TYPE, is used exactly like a TRSDOS command: Key TYPE, followed by a space, followed by the filespec of the file to be displayed.

If you key in the object code, note that it is not relocatable.

The data beginning at line 33 has been directly addressed. For those who have difficulty reading that section of this disassembly, the contents of F140 may be any value. F141 through F145 contain the five ASCII letters P R I N T. They are followed by 42 (decimal) bytes containing the 0D (hex) character.

If the machine code is entered, it may be stored on disk with the command

DUMP TYPE START=F100,
END+F16F

Then, "TYPE filespec" will display a file on your screen.

If you wish to decipher or modify this program, the following comments may be helpful. The first six lines find the blank which follows the program name; that, in turn, locates the filespec. The length of the entire PRINT command is then placed in F140. The four instructions beginning at line 10 move the filespec into the area following "PRINT." The next six turn on the special modes. Lines 20 through 24 issue the PRINT command.

A PATCH FOR "DO" FILES

Roger Conant
1108 SEO
University of Illinois
Box 4348
Chicago, IL 60680

The BUILD editor for DO files seems clumsy to me, and it is alot easier to edit a file of DO-commands using the TRSDOS EDITor. However, the DO program in TRSDOS does not accept such a file as legitimate. The program checks to see if the first byte of the file is HEX D0 (that's Dee Zero, a sort of Radio Shack pun, I suppose) and if not, the file is rejected. This check can be defeated by the following patch:

PATCH SYSTEM64
R=22 B=45 F=2038 C=0000

After this patch, the first byte will be read, but then thrown away. Thus DO files can be constructed with EDIT, or even with BASIC programs, though the user must remember to put in a garbage first byte (a space, $, anything).

How To Send A Non-

Roger C. Conant
University of Illinois
Circle Campus
Box 4348
Chicago, IL 60680

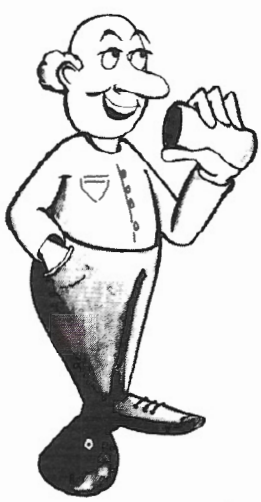

ILLUSTRATION BY JAMES KINDER

I often like to interleave messages to myself with other operations in my DO files. With TRSDOS, the only way to do this is to use PAUSE. If you insert a line in the DO file that says: *PAUSE This is a message to be displayed on the screen*, there are several difficulties.

One is that when this line in the DO file is executed, everything stops and an operator must *"PRESS ANY KEY TO CONTINUE"*, which might not always be what you want. A second difficulty is that you cannot route the message to the printer, except by turning DUAL ON before the message and OFF after it, which is very clumsy. A third difficulty is that PAUSE prints not only the message but also precedes it with the word "PAUSE," which is inelegant.

Following is a simple program named MSG that solves all these problems. To send the message to the screen only, execute the line

MSG This message will be displayed on the screen

Or, to send the message to both the screen and the printer, execute

```
TRS-80 Model II DEBUG Program
3000    06 04 21 05 27 7E FE 2D   20 11 3A 06 27 FE 50 20   ..!.'..- .:.'.P
3010    0A 06 07 3F 01 32 34 28   21 08 27 3A 00 27 90 D8   ...>.24(!.':.'..
3020    47 0E 0D 3E 09 E5 C5 CF   C1 F1 3A 34 28 FE 01 C0   G..>......:4(..
3030    3E 13 CF C9 00 FF 00 00   00 00 00 00 00 00 00 00   >...............
3040    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
3050    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
3060    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
3070    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
   PC    SP  SZHPNC  AF   BC   DE   HL   IX   IY   AF'  BC'  DE'  HL'
 2800  21FE  000000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

```
01          F100 4E              LD   C,(HL)
02          F101 0D      AGAIN:  DEC  C
03          F102 23              INC  HL
04          F103 7E              LD   A,(HL)
05          F104 FE20            CP   20
06          F106 20F9            JR   NZ,AGAIN
07          F108 3E06            LD   A,06
08          F10A 81              ADD  A,C
09          F10B 3240F1          LD   (F140),A
10          F10E 0C              INC  C
11          F10F 0600            LD   B,00
12          F111 1146F1          LD   DE,F146
13          F114 EDB0            LDIR
14          F116 0607            LD   B,07
15          F118 3E5F            LD   A,5F
16          F11A CF              RST  8
17          F11B 060E            LD   B,0E
18          F11D 3E08            LD   A,08
19          F11F CF              RST  8
20          F120 2140F1          LD   HL,F140
21          F123 46              LD   B,(HL)
22          F124 23              INC  HL
23          F125 3E26            LD   A,26
24          F127 CF              RST  8
25          F128 060F            LD   B,0F
26          F12A 3E08            LD   A,08
27          F12C CF              RST  8
28          F12D 0608            LD   B,08
29          F12F 3E5F            LD   A,5F
30          F131 CF              RST  8
31          F132 3E24            LD   A,24
32          F134 CF              RST  8

33                       F140:   DS   01      (00H)
34                               DS   05      50 52 49 4E 54
                                              P  R  I  N  T
35                       F146:   DS   42      (0DH)
```

Paused Message

MSG -P This message will be displayed on the screen and the printer

Although my chief use of this program is in DO files, it may be used any time, not only in DO files but at TRSDOS READY. For example, the second form above provides a convenient way to print any miscellaneous note on the printer, like

MSG -P This printout is wrong — THROW IT OUT!

To get this program working for you, enter it using DEBUG. The entire process will take you about three minutes. Type:

CLEAR <ENTER>
DEBUG ON <ENTER>
DEBUG<ENTER> (You get a display of memory locations)
M3000 (You see an empty memory area starting at 3000 hex)

Push the<F1> key to position the cursor at cell 3000 hex. Now you type in the 3S5h lines of characters shown in the figure below, which is the DEBUG display. Check to see that the display is exactly like that shown!!

When these characters are in place, push the <F2> key to save them, and then type O (the letter O, not zero) to turn DEBUG OFF. Next type in:

DUMP MSG (START=3000 END=3035 TRA=2800 RELO=2800) <ENTER>

And you're done. Test the program by typing:

MSG This is my first message using "MSG"
MSG -P This one goes to the printer too!
MSG
MSG -P

The first two should work, and the last two should do nothing.

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Special Feature

VOLUME No. IXXVII No. 97 1983 JULY/AUGUST

SCRIPSIT Receives Mixed Reviews From Two/Sixteen Readers

Compiled by Barbara S. Albert
Editor, **two/sixteen**

SCRIPSIT, Radio Shack's word processing system which combines flexibility and versatility in one powerful, comprehensive program, has been designed to improve office productivity by reducing writing, typing, and re-typing time.

SCRIPSIT is advertised as "easy to use — no special training required." Be that as it may, it does display special and specific prompts at various steps during document creation that ask you what you want to do. A complete menu of all SCRIPSIT's possible choices will be revealed at your command.

SCRIPSIT will spoil you; you'll never be satisfied working on an old-fashioned typewriter again. Typos are fixed by merely typing over them — say goodbye to eraser dirt and correction fluid. "Wordwrap" eliminates the need for manually entering carriage returns at the end of each line; text is automatically moved to the next line. Centering text on a page is done with two keystrokes — no more counting characters and backspacing! Deleting text — whether a single character, or an entire word, sentence, or paragraph — can be accomplished quickly. You can format margins and tabs to any special configuration you want and then store them away to be recalled at a keystroke for future use. Blocks of text can be moved and re-arranged, within the same document or even between different documents. Adding to existing text couldn't be easier. And standard phrases you use repeatedly can be programmed into SCRIPSIT's super user-defined keys so all you need do is press one key, and your standard letter closing (or whatever) is automatically on the screen and in your letter.

SCRIPSIT's powerful and sophisticated features greatly simplify routine tasks. Global Find/Delete/Replace, Un-edit, Renumber Pages, Assemble, Repaginate, Block Move, Merge, and various other features work together to give you freedom of choice and a level of control over your finished work.

But you know all of this; what's the big deal? It seems that not all of these wonderful features work the same way at the same time for the same people. In fact, SCRIPSIT is quite controversial.

SCRIPSIT: you gotta love it. But then again, maybe you don't.

SCRIPSIT is dynamite — easy, fun, and powerful if you can keep it from blowing up in your face.

Reader Responses

SCRIPSIT received mixed reviews from those of you who were kind enough to take time out and respond to my request for comments about your experiences with SCRIPSIT. It appears that from Canada to the Dominican Republic, from Manhattan to San Diego, people are going through a love/hate relationship with their SCRIPSIT.

The following are excerpts from the letters received from your fellow subscribers. Contained therein are the helpful tips and useful tidbits that make life so much easier for all SCRIPSIT users. The complaints and criticisms may prompt you to respond — maybe you know a way to avoid the problems mentioned. I've included complete names and addresses so you can communicate directly with the author. Or you may respond to me; I'd be glad to keep the SCRIPSIT lines of communication open for sharing.

***

FROM: Jack Chastain, c/o two/sixteen magazine:

Miscellaneous Observations

SCRIPSIT was the first word processor I learned to use. I enjoy SCRIPSIT primarily because the different control functions are logical, such as <CTRL> D for **D**efine, <CTRL> U for **U**tilities, etc. For the most part, there seems to be a very nice relationship between the keyboard and the operator in SCRIPSIT. If you are good at memory pegs or associative thinking, SCRIPSIT seems to be very easy to get the hang of.

Contrast this to an un-modified WordStar. It's marvelous as micro word-whackers go, but the very devil with control codes.

I learned my SCRIPSIT usage straight out of the book and tape course, forcing myself into about a two hour study session after work every day until I had it. For a person in business for themselves, or someone trying to learn the system for office use, this can be the downfall of the entire system. An office worker cannot be expected to learn such a sizeable program while trying to answer phones and solve problems other than how to get to the next page.

SCRIPSIT Special Functions

I like to make use of SCRIPSIT's many special functions, the user-defined keys in particular. I was writing quite a few letters requesting dealership information. I would type in a company's name and write a letter to that company. Then I would use the user-key sequences to take the address, generate a MERGE file that would both print a letterhead and an envelope, and then save the whole works to a separate letter and address file. All with the touch of one or two keys!

As for tricks I use: I was writing an ad, and I had a particular section I wanted to highlight with a box around

the information. Try it! Try putting a box around some text on a page. The initial thought is to either use a dashed line and some sort of vertical surrogate, but look what happens to the text in the box. The box is justified, but the text isn't! What now?

First I developed a print code for a true vertical bar by using the User Print Codes section of SCRIPSIT. It let me set up the output character <7C> whenever I asked for a user code V. This gave me some very nice vertical bars instead of something that looked like garbage.

The next trick was justifying the text in the box. There's no choice: you must have strictly text with no box or it won't justify. What to do? I almost gave up until I hit on the solution. "Roll To Top Of Form" will return you to the beginning of your present form. It's usually used to print multi-column text on one page and is great for pamphlets, flyers and, as it turns out, BOXES!

I put my box on page 2, counting carefully to be certain everything was in the right place and correctly sized. When I printed the page, the text was beautifully justified. At the end of the page, the printer scrolled to the top, came down to my text and put the nicest looking box around the justified text that you would ever care to see! I was insufferable for hours!

The "Sour Side" of SCRIPSIT

Now, what about the sour side of SCRIPSIT? I sound pretty glowing up to this point, I guess. In truth, if I could spring for Pickles & Trout CP/M and get WordStar for the II, I would use it exclusively instead of SCRIPSIT. The reason has to do with the way SCRIPSIT stores data. It might be nice for some but is a pain in the neck for me.

SCRIPSIT takes everything you write and puts it in one great big file called "DOCUMENT/CTL." It strings the addresses to each document in a manner that requires the computer to know where the first one is to tell where the second one will be, and so on. Sometimes the program loses the ability to find either where it is or where it is going. This leads to a *totally* unreadable file! Unless you have some way out, such as SCRIPFIX, you just grin sadly and hope you backed everything up! If not, well, happy re-typing!

I much prefer WordStar's way of saving everything in individual files, each with its own back-ups. This also lets me easily edit machine language source files.

I believe SCRIPSIT is much too prone to errors when saving than most other word-processing systems. I have had to recover my disks over five times in April alone. If you like frustration, you'll LOVE SCRIPSIT!

Other quirks: Hard disk SCRIPSIT (SCRIPSITHD) runs on TRSDOS 4.1. Radio Shack has dumped 4.1 for 4.2 on which it will NOT run (as of April 8, at least, and no patch available and no date on availability).

If you have eyes on TRS-XENIX, watch out! None of the present programs will run under XENIX. At least with MP/M, you could automatically switch the 8-bit processor in and out. Forget multi-user word processing until a special (and I'll wager expensive) 16 bit SCRIPSIT comes along.

SCRIPSIT is dynamite — easy, fun, and powerful if you can keep it from blowing up in your face.

***

FROM: William H. Kneedler, Assistant Director, Plainfield Public Library, 8th Street at Park Avenue, Plainfield, NJ 07060:

Especially Good Features Of SCRIPSIT

Scripsit runs on a computer with an 80-character width screen. For most applications, you can see the entire width of the text. Word processing with a screen narrower than 80 characters is frustrating and leads to careless errors which the eye doesn't pick up when scanning the screen. This, in turn, leads to wasted print-outs (the eye finally sees the error in the hard copy), time, and paper.

Not all of SCRIPSIT is loaded into the CPU at one time. This is an advantage in that it frees up CPU memory for sophisticated operations. When an operation is needed which is not in the CPU, it is automatically called up from the disk in short order.

The outline format, and the ability to store formats, are enormously useful features. The outline format allows for hanging indentations while retaining the text spill-over feature at the end of each line. This means that insertions and deletions can be made easily. Anyone who prepares briefs, outlines, contracts, specifications, and orders will see the immediate benefit to business applications.

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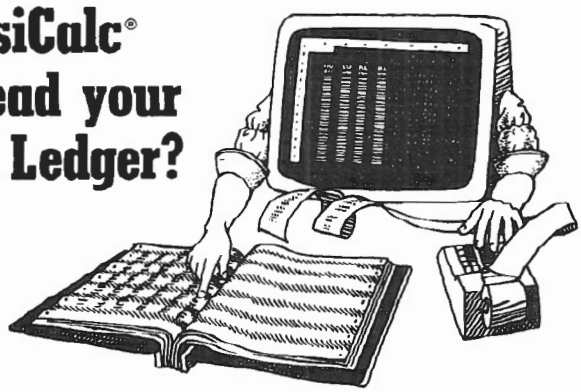

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Such operations as reformatting text, defining text in order to alter it (delete, move, duplicate, hyphenate, or lock), repagination, and so forth are simple and fast.

The user-defined keys are such an important feature that no small business word processing software should be without them.

The non-printing "comment lines" are another tremendously powerful feature.

Most users find it handy to have text automatically broken up into pages. The repagination feature offers the user the option of quickly changing page lengths or reallocating the text after additions or deletions have been made. This feature works for unusual line spacings (1SSh space, for example) too.

With versions 2.0 and 2.1, it is easy to jump from SCRIPSIT directory to TRSDOS without having to reboot. This facilitates making patches, selecting a different printer driver, and using such non-Tandy utilities as Racet's FASTBACK and Skyline's's KWIX. It is also a time saver for programmers.

Doubling up of key strokes for certain operations is nowhere near as bad as with some computer software combinations. With more function keys, the situation would be even better.

Some Features We'd Like To See

It would be nice if an option were available whereby the SCRIPSIT directory could be arranged alphabetically by file name. In its present form the directory is arranged chronologically by file creation date — not the most useful approach. On a full disk you have to sift through pages and pages of directory to find files.

Another desirable feature for the SCRIPSIT directory would be access to SCRIPSIT file names by key word. This would be another way around the laborious process of leafing through the directory pages. Currently one has to either search through directory or key in the *exact* file name, with correct spacing and punctuation.

Curiously, there is no quick way of changing words, sentences, or large blocks of text from lower to upper case or vice-versa. Many's the time we would like to have done this to headings or for emphasis. Currently, you have to retype all of the text you wish to change.

There is often a need to print each page of a document as it is completed. The user should have the option, after printing, of having the screen return to the document for continuation of the work, rather than to directory as is presently the case.

Some Routines We Especially Like

Envelope Addressing: To prepare for this, place the following commands into any of the user defined keys:

<CTRL> D B <F2> [deletes previous address in this file]
<CTRL> R [inserts new address into file]
<CTRL> D B F [reformats new address]
<CTRL> U P <ESC> [activates Print mode]

Let's assume we put this in User Defined Key #7.

Create a new file entitled ENVELOPE. For a standard business envelope to be typed in 12 pitch, set the format with "o" at position 35, left margin ({) at 39, and right margin (}) at 70. This will ensure that if any line is too long, it will spill over to the next line, indented. If the defaults are not set for 12 pitch, these margin settings will have to be adjusted accordingly.

SCRIPSIT will spoil you; you'll never be satisfied working on an old-fashioned typewriter again

Now we're ready for action. Before printing out a business letter, place the cursor on the business address, define the entire address, and type "D" for "Duplicate." The address is now being held in temporary memory.

Print out the letter (screen will automatically return to directory). Insert a business envelope in the printer, positioned to the line where the address should begin.

Find the ENVELOPE file in the SCRIPSIT directory and type:

O <ENTER>
<ESC>
<ESC> 7

When you open a file in Model II SCRIPSIT, you can type ahead. What you have done is type "O" for "Open," <ENTER> for the password prompt (no password is used for the ENVELOPE file), <ESC> signifying acceptance of the "Open File" menu, and then <ESC> 7 to activate user key #7. This can all be done in two seconds. The old address in ENVELOPE will be deleted, and the new address inserted, reformatted, and printed. You can sign your letter while the envelope is being prepared.

Printing Mailing Labels for Packages: All procedures are identical to "Envelope Addressing" above, with one exception. Instead of using the ENVELOPE file, create another file entitled MAILING LABEL. Use the same concept of outline marker and margins, but move the markers far enough left to match the format of your mailing label. Then substitute MAILING LABEL for ENVELOPE throughout the "Envelope Addressing" instructions.

Reformatting Long Files: This routine is used only if the same format is to be used throughout the document. It involves the use of two user-defined keys; let's say #5 and #6.

In User Key #5, type:
<CTRL> D B F [Reformats page]
<CTRL> N [Gets next page]
<ESC> 6 [Activates User Key #6]

In User Key #6, type:
<CTRL> D B F [Reformats page]
<CTRL> N [Gets next page]
<ESC> 5 [Activates User Key #5]

Now open the document and set up the desired format. With the cursor at the top of the first page, press <ESC> 5. A loop is created whereby pages are continually reformatted until the end of the document is reached. While this is going on, you may wish to take that hard-earned coffee break . . . .

A number of routines can be done throughout a document, using this looping technique with different commands and pairs of user-defined keys.

Creating Tabular Forms (or Anything Repetitive): An example of this would be a log sheet with columns for date, time, signature.

Choose the format and type in column headings, then <ENTER>, <ENTER>. (This concludes the line and leaves a line of space.)

Now type in a line containing the needed underlining and tab markers, then <ENTER>, <ENTER>.

Place cursor on the beginning of the line with the underlining and tab markers, type <CTRL> D B to define all text below, then type "D" for "Duplicate." Type <HOLD> <DOWN-ARROW> to move the cursor to the bottom of text. Type <CTRL> R. This will duplicate the underlining and tab markers,

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Cedar Falls, IA 50613
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plus the line of space following it, on a new line.

Repeat the process of going to bottom of text and re-inserting. To speed up replication, after you have three or so lines of underlining and tab markers, return cursor to the beginning of the first line with the underlining and tab markers. Type <CTRL> D B, then D, then <DOWN-ARROW>, replace, and so forth. Now you are inserting 3 lines of text, plus 3 lines of space, at a time.

Using this method, forms become almost a joy. (Bad thought — will this mean more forms to complete?)

Updating Information in Documents

The biggest danger in saving contracts, specifications, and other documents for future use is that they may not be revised adequately when there is a need to use them.

Certain types of information are particularly prone to becoming outdated: dates, legal references, names of officers, etc. Once we know what is outdated, it is a simple matter to make revisions by using Global Search & Replace. The trick is identifying what is outdated.

The non-printing "comment line" comes to the rescue. Comment lines are enclosed by a pair of comment-line markers (<ESC> ,). Before each personal name, date, legal reference, or whatever, flag that location by typing XX within the comment line markers. Do not type in additional spaces — the final <ESC> , adjoins the item being flagged. We use XX because this character string normally does not appear in text. (If a user had specifications with a lot of model numbers containing XX, he might want to substitute ZZ or some other string which does not appear in his text.) Another short-cut is to put this sequence (<ESC> , XX <ESC> ,) onto a user-defined key!

Before using the document, do a Global Search for XX. Set the menu so that each successive search will begin at cursor position. Each time you reach a flagged section of text, cancel the search, make changes as needed, and then reactivate Global Search by typing <CTRL> U G <ESC>. That sequence can be on a user-defined key also. Aren't those keys wonderful?

Another Tip About Comment Lines: When a "comment" occurs within text and is not followed by <ENTER>, the text will automatically close up during the printing operation. However, if a comment is on a separate line followed by <ENTER>, text will not close up and the printer will skip the line where the comment was located on the screen. This leaves an undesired empty line in the text of the printed page.

The solution is to use the reverse line feed print code, which should follow the second comment marker and precede <ENTER>. On SCRIPSIT versions 2.0 and 2.1, this code is included in the defaults as <CTRL> X C. The effect of this procedure is to cause the printer to reverse one line to compensate for the one-line advance for the Comment line.

Centering Headings With Invisible Printer Markers: The line-centering utility works well except when invisible printer markers are used, for example, for underlining, bold-face, or super- or subscript.

The problem is that for the purpose of centering a line, SCRIPSIT counts the invisible markers as characters, but since the markers are not printed, the text will "collapse" leftwards and the heading will print left of center.

The solution is simple. Before centering the line, count the number of invisible markers the line contains, with the exception of the <ENTER> marker. Move the cursor to the beginning of the line and using <F1>, insert an equal number of "required spaces" — use <ESC> [space bar] for each of these. The required spaces will compensate perfectly for the invisible markers.

Centering Lines With Outline Format

If the outline tab is placed to the left of the left margin setting [--o--{----}--] (this is done to indent every line but the first), the line-centering utility will center a line between the actual margin settings, not between the outline tab and the right margin setting. Thus the "centered" line will be to the right of the actual center of text.

To correct this, briefly change format so that the left margin setting [--{--] is where the "o" (outline tab) was. Center the line. If the line still is not where it should be, define the line and reformat it [<CTRL> D P F]. Now change back to the original format if there is additional text to type.

Problems

All of the word processing files are stored within the SCRIPSIT files and do not appear separately on the TRSDOS directory. This means that useful TRSDOS operations cannot be performed directly on SCRIPSIT files — a real disadvantage.

Model II SCRIPSIT's print mode is geared heavily to the Daisy Wheel II Printer. It is a happy marriage. But the new printer drivers for the DMP printer series (only in version 2.1.0) are less than satisfactory in two respects: it is time-consuming to switch from one printer driver configuration to another (for example, from Daisy Wheel II to DMP-400), and the end results — particularly with respect to printing speed and underlining — are disappointing. As usual, in the documentation Tandy points the general direction for customizing the printer drivers to competitive brands of printers but does not actually provide detailed instructions for the common brands and models as do many manufacturers. The user without programming knowledge is unlikely to figure it out. Tandy tends to overprotect its own.

To change the printer driver in version 2.1.0, you must jump to TRSDOS and use a TRSDOS utility called PRTPCH. The change is a menu-selected patch which remains on the disk, which means that if you forget the printer driver has been changed, your printer may behave strangely. You may, for example, be sending DMP-400 driver instructions to a Daisy Wheel II. There will be no prompts to tell you what is wrong. You may even take the printer to be serviced, and will be informed that your printer works fine. But at home (using your software) printing will be unsatisfactory again. Such service visits could be repeated many times until someone guesses: you forgot to change back to your regular driver selection.

***

This concludes Part One of our Special Scripsit Review; look for Part Two next issue. If you have anything to add, comment on, or disagree with, let us hear from you.

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STARTREK™© A large version with lots of graphics of the classic computer game. Takes about two hours to complete. ™ Designates trademark of the PARAMOUNT PICTURES CORPORATION.
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STARSHIP/1© (By Richard H. Young, Editor of two /sixteen magazine.) This is a save-the-galaxy type game based on the venerable STARTREK games which have been played on large mainframes for more than ten years. It is specifically designed for the RS Model II/12/16 and features a constant console display with no scrolling. It is a "strategic" game (Opposed to "tactical" games which involve reflex action but little thought). However, STARSHIP requires quick thinking, as all events are timed. STARSHIP requires quick thinking, as all events are timed. STARSHIP comes with a disk instruction file which can be listed on your printer. It can also be listed on the screen at the beginning of a session. In addition, STARSHIP contains a few undocumented "surprises" at advanced levels of play (there are ten levels of difficulty).
TRSDOS® $39.00

GAME PACK I© (by ADD, Inc.) Four games that use enhanced graphics not available from Radio Shack. INTERCEPT and REVERSEM for two players; LUNAR LANDAR and SINK THE BATTLESHIP for one player.
920-0001 TRSDOS® $50.00

GAME PACK II© (by ADD, Inc.) Consists of the four games in GAME PACK I© and two additional games. They are EAT'UM where you control a snake moving around the screen trying to catch its prey and REVERSEM II where it's you against the computer.
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GAMES/TRS-80© (by Lance Micklus, Inc.) Contains the following six games:

THE MEAN CHECKERS MACHINE® — The game is played just like regulation Checkers. To win, you must eliminate all of your opponent's pieces from the checkerboard.

STARFLIGHT® — This is a Star Trek type game. The object is to collect data about Omega VI, an unexplored area of the galaxy; to locate and destroy the 20 Klingon Invaders.

CONCENTRATION — The computer will make up the game board. You will try to find the matching prizes. After each correct guess, you will have a chance to guess at the secret number. Guess right, and you win all of your prizes.

TREASURE HUNT — The Lumas caves, located in Lumusville, Vermont, are said to have 20 hidden treasures in them. Few explore the caves because it is said that pirates and dragons live there, and there are deep pits which many have fallen into and died. You, a smart and brave human, and I, an alert computer, will explore the caves and try to find the treasure.

BANKO — The Game is similiar to Black Jack. You draw numbers stopping before the total point value exceeds 11. If you go over 11, then your hand will be zeroed. If you draw 5 times without going over 11, then you'll receive bonus points equal to the value of your hand at the time you end your turn.

DOG STAR ADVENTURE® — The evil General Doom and his Roche Soldiers are ready to launch an attack against the forces of freedom lead by Princess Leya. While traveling to her secret command center, Doom attacks Princess Leya's ship. She is now being held prisoner on one of General Doom's battle cruisers. We must try to save the Princess and the treasury of her freedom fighting force.
TRSDOS® $75.00

ADVENTURES 1-12© (by Scott Adams of Adventure International) By definition, an adventure is a dangerous or risky undertaking; a novel, exciting, or otherwise remarkable event or experience. On your personal computer, Adventure is that and much more. In beginning any Adventure, you will find yourself in a specific location: a forest, on board a small spaceship, outside a fun house, in the briefing room of a nuclear plant, in a desert, etc. The top portion of your video display will tell you where you are and what you can see; the bottom section of the display is devoted to inputting commands to your robot computer and receiving messages that may arise as the result of your orders.
The object of a game is to amass treasure for points or accomplish some other goal such as preventing the destruction of the automated nuclear plant in Mission Impossible. Successfully completing a game, however, is far easier to state than achieve. In many cases you will find a treasure but be unable to take it until you are carrying the right combination of objects you find in the various locations.

#1 ADVENTURELAND — Wander through an enchanted realm and try to recover the 13 lost treasures.

#2 PIRATE ADVENTURE — The lost treasures of Long John Silver lie hidden somewhere — will you be able to recover them?

#3 MISSION IMPOSSIBLE ADVENTURE —In this exciting Adventure, time is of the essence as you race the clock to complete your mission in time —or else the world's first automated nuclear reactor is doomed!

#4 VOODOO CASTLE — The Count has fallen victim to a fiendish curse with you his only possible hope. Will you pull off a rescue, or is he down for the Count for good?

#5 THE COUNT — It begins when you awake in a large brass bed in a castle somewhere in Transylvania. Who are you, what are you doing here and WHY did the postman deliver a bottle of blood?

#6 STRANGE ODYSSEY — At the galaxy's rim, there are rewards aplenty to be harvested from a long-dead alien civilization. Will you be able to recover them and return home?

#7 MYSTERY FUN HOUSE — This adventure puts you into a mystery fun house and challenges you to find your way through and back out of it.

#8 PYRAMID OF DOOM — This is an Adventure that will transport you into a maddening dangerous land of crumbling ruins and trackless desert wastes — into the very PYRAMID OF DOOM!

#9 GHOST TOWN — You must explore a once-thriving mining town in search of the 13 hidden treasures.

#10 SAVAGE ISLAND PART I — A small island in a remote island in a remote ocean holds an awesome secret — will you be able to discover it? This is the beginning of a two-part Adventure, the second half concluding as SAVAGE ISLAND PART 2, Adventure #11.

#11 SAVAGE ISLAND PART II — The suspense begun with Adventure #10 now comes to an explosive conclusion with SAVAGE ISLAND PART II!

#12 GOLDEN VOYAGE — The king lies near death in the royal palace. You have only three days to bring back the elixir needed to rejuvenate him.
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INTERACTIVE FICTION® (by Robert LaFore) The ability to actually interact with characters and situations — to take part in the story-sets INTERACTIVE FICTION™ apart from the competition. the The actions begins when you react to a given situation or event, and then key in your response. You aren't limited to a couple of words; using full sentences is encouraged. You can enter the same situation time and again, and by using a different response, experience new twists of the adventure.

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HIS MAJESTY'S SHIP "IMPETUOUS" —You are at the helm of HMS Impetuous. As captain, your decisions could bring either fame or fortune or utter disaster to you and your crew.

SIX MICRO STORIES is an excellent introduction to the world of Interactive Fiction. They are six short, but complete, stories which involve you, the reader, in a variety of fascinating scenarios. They include THE FATAL ADMISSION, EMPTY WORLD, and four other stories.
TRSDOS® $49.95

TYCOON® (By Barry Ansin) This is a monopoly like game that you can play against the computer.
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BIORHYTHMS® This will print on 8½ by 11 paper or display biorhythms charts of an individual starting any date and for as many days as desired. Includes date subroutines, which are used for testings, converting, and calculating time between dates.
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TANDY'S 153,600 PIXELS FOR THE MODEL II/16

William John Elliott @ ARAMCO
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Graphics on the Model II/16 has been, at best, a very low resolution affair. Now, the Tandy Towers has opened the door of our favorite machine on 153,600 individual pixels. That is the total number of dots in the 640 (horizontal) by 240 (vertical) high resolution matrix made available to Model II/16 users by Tandy's new high resolution Graphics Board.

Installation

The installation of the Graphics Board has the standard Tandy "let us do it, or your warranty is void" warning which should be followed unless you know what you are doing. Since I knew what I was doing (and the nearest Radio Shack store was an hour away in beautiful, downtown Al Khobar, Saudi Arabia), I proceeded to void my warranty.

Whether you install the board in the Model II or the Model 16, the procedure is essentially the same. The Model 16 has two extra boards for the 68000 processor and 128K/256K of memory in its standard form, and a third board for another 256K in its expanded form. For the full house Model 16 with 512K of memory, one board position remains open for either a hard disk installation or the Graphics Board. This lack of space in the Model 16 has already forced one user I know to reduce his 512K of memory to 256K in order to install both the hard disk and the Graphics Board.In the Model II there are plenty of slots, as long as you don't try to convert it to a Model 16.

After making sure all your equipment is unplugged and taking the appropriate static electricity protection measures, remove the two screws from the rear cover and lift the cover from the chassis exposing the card box. Next, remove the card retaining bar from the rear of the box. The Graphics Board comes with two cables (one short and one long) and two empty IC sockets on the board. It is necessary to remove two ICs (C68037 and MC6845P) from the Video Board and plug them into the Graphics Board empty sockets. The Video Board can be identified by finding the two ICs indicated. Remove the Video Board and carefully remove the appropriate ICs. Important note: watch the orientation of the ICs since IC C68037 is rotated 180 degrees when installed in the Graphics Board. The notches in the sockets and the ICs should match.

Without bending the pins, insert the two ICs in the empty sockets on the Graphics Board. The purpose of the cables is to bridge from the now empty sockets in the Video Board to the connectors on the Graphics Board. The long cable requires a 180 degree twist to compensate for the 180 degree rotation of IC C68037. When the cables have been installed in the sockets on the Video Board, replace it. Then install the Graphics Board in the next slot.

When both boards are seated in their slots, connect the two new cables to the connectors on the edge of the Graphics Board. After checking all cables and other connections, reinstall the card retaining bar. This is the most difficult part of the installation. In fact, I was unable to completely seat the bar due to the interference of one of the new cables. It makes you wonder if Tandy ever installed the card in a Model 16. Test the installation with the cover off to make sure everything is operating, then reinstall the rear cover and its two screws.

This is a reasonably easy installation, but care must be taken to insure all parts are properly seated in the correct position.

Documentation

Documentation for the Graphics Board takes the form of a familiar Radio Shack TRS-80 brown hard-back three ring binder, containing one eight inch floppy disk and 220 pages of loose leaf instructions. I was impressed with the clarity of the instructions which live up to Tandy's usual high standards. Some people may disagree with Tandy's tendency to oversimplify some aspects of their products, but I appreciate getting "spoon fed" when trying to start something new.

The manual does not cover the installation since Tandy expects you to come to them to get the board installed. However, it does cover a wide variety of subjects associated with programming the Graphics Board. Those looking for a "how to" graphics programming book will be disappointed. What the manual does cover is how to program the Graphics Board in the new graphics BASIC language (BASICG), assembly language, and how to use the FORTRAN Graphics Subroutine Library included on the floppy disk. There is

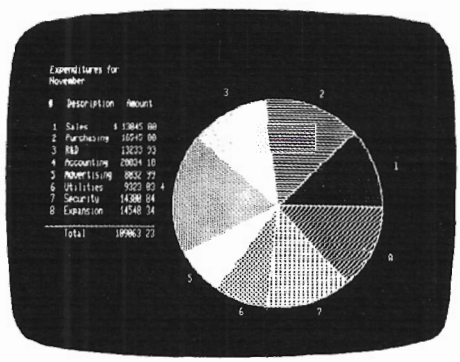
also a chapter on interfacing the Graphics programs with COBOL. At the end of the manual are seven Appendices covering subjects like the Pixel Grid, Line Style, BASICG Utilities, and Subroutine Language Reference Summaries, Sample Programs, and Error Messages.

To illustrate the power and flexibility of the Graphics Board and demonstrate a few of its many possible uses, Tandy supplies the user with an eight-inch floppy disk containing a TRSDOS operating system, an expanded Graphics BASIC (BASICG), and several Utilities and Subroutines for use with COBOL, FORTRAN, and Assembly language.

Naturally, before using the disk, I made a Primary backup of the Primary master. Since I was on a Model 16 with Tandon disk drives, I chose to build a TRSDOS 2.0B disk and copy the programs from the Graphics disk onto it. On the Model II, a simple FORMAT and BACKUP is the best way to proceed since the disk contains TRSDOS with its utilities. After making the backups as required, it was finally time to see what this marvelous new device would do.

Operation

I began by inserting the Primary Active copy of the Computer Graphics disk into Drive "0" (Drive "A" for you CP/M users) and waited for the TRSDOS date request. Having dispensed with the amenities and getting the TRSDOS READY signal, I called DIR to see what was available. The following is a brief summary of the programs I was able to access:



*ASMEXMPL/TST (Type "ASMEXMPL/TST <ENTER>"). An assembly language test program lasting approximate 90 seconds. Just sit back and watch.

*FOREXMPL/TST (Type "FOREXMPL/TST <ENTER>"). A twenty-five minute FORTRAN test with some interesting graphics and a lot of boredom.

*BASICG (Type "BASICG<ENTER>"). As with regular TRSDOS BASIC, this puts you into communication with the language used by most individuals to program TRS-80s. The BASICG has the power of regular BASIC, but adds ten new graphics commands including CIRCLE, LINE, PAINT, SCREEN, VIEW and others to allow direct access to the Graphics Board. Tandy placed several interesting BASICG sample programs on the disk to illustrate various practical applications. Those familiar with Tandy's Extended Color Basic for the Color Computer will find many similar commands in BASICG.

*PECANPIE/GRA (Type "BASICG PECANPIE/GRA <ENTER>"). By

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Austin, Texas
78751
1-512-453-2233

1-800-531-5170

- CP/M, CP/M 2.2, CP/M-68K ™ Digital Research
- TRS-80 Model 16 and Model II ™ Radio Shack/Tandy
- 68000 ™ Motorola
- Z80 ™ Zilog

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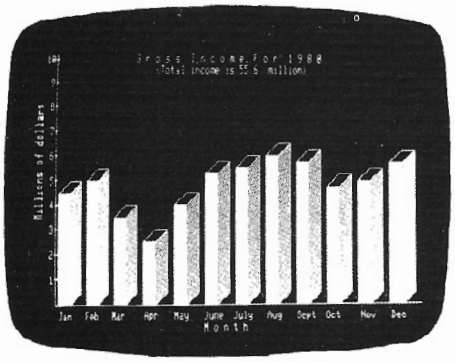
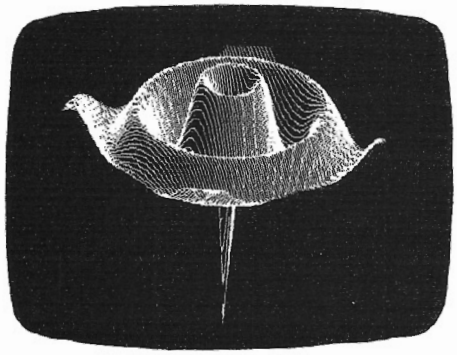
entering some mythical figures into the prompt lines, this program draws an expenditure Pie Graph with segments proportional to the amounts you insert — a very good base for your own Pie Graph programs.



*THREEDEE/GRA (Type "BASICG THREEDEE/GRA -F:1 <ENTER>"). Uses an input like the Pie Graph above but displays a three dimensional block-tower type graph.

*ACLOCK/GRA (Type "BASICG ACLOCK/GRA<ENTER>"). Displays an analogue clock face which is synchronized with the TRSDOS time keeping function. Interesting.

*TWOCOL3D/GRA (Type "BASICG TWOL3D/GRA <ENTER>"). Just a picture showing two rows of block-tower type graphs with a three dimensional background grid.



*SALESBAR/GRA (Type "BASICG SALESBAR/GRA <ENTER>"). A version of the familiar vertical bar graph.

*PIE1/GRA (Type "BASICG PIE1/GRA <ENTER>"). A six segment Pie Graph illustrating January through June information.

*COMPCHRT/GRA (Type "BASICG COMPCHRT/GRA <ENTER>"). A company management structure chart.

*PIE2/GRA (Type "BASICG PIE2/GRA <ENTER>"). A Pie Graph with one segment separated for emphasis.

*TWOVBAR/GRA (Type "BASICG TWOVBAR/GRA -F:1<ENTER>"). A comparison double vertical bar chart "PAINTED" in contrasting patterns called "tilting."

*LINEGRPH/GRA (Type "BASICG LINEGRPH/GRA <ENTER>"). Three dissimilar lines on a graph background.

*KINETIC/GRA (Type "BASICG KINETIC/GRA <ENTER>"). A graceful arcing "string-art-in-motion" type of picture. Not a graph, but a simple form of art illustrating the animation potential of the Graphics Board.

The disk also contains TRSDOS utilities which emulate many of the BASICG commands directly for the operating system. There are even utilities accessing graphics routines from COBOL programs.

One of the impressive things about the Graphics Board is that its circles are round. Distortion, usually due to pixels that are rectangular instead of square, causes problems with round circles in computer graphics. The Graphics Board has rectangular pixels, but has also put in an automatic scaling factor to compensate for this on the screen. Alas, this is not carried over to the hard copy world.

Printing the screen is a simple process if you are using a Tandy Line Printer VII or VIII. You simply dump the 32K graphics memory to the printer with the command GPRINT (from TRSDOS) after you have combined the graphics and text screens with a VDOGRPH command. Unfortunately, distortion will occur due to the difference between the screen and printer pixel size and spacing. Compensation of this type has always been a pain, but a necessary pain.

Conclusions/Recommendations

Here we have a reliable, easy to use enhancement for the Model II/16 which fills an obvious need in the world of business. For anyone who is committed to TRSDOS and the Tandy way of doing things, I do not hesitate to recommend the purchase of the Tandy Graphics Board for the Model II/16. It will do what it says with a minimum of fuss and bother. It is (dare I say it) "user friendly."

However, for those of us who use CP/M, the only way to use this board is to completely change operating systems. It can be done. There is a good split between graphics and text type work. But it is such a bother.

Perhaps there is hope. TENON Software Services* has a couple of program patches which allow TRSDOS BASIC and TRSDOS VisiCalc to operate under CP/M. Could it be possible that they, or some other software house, could be working on a BASICG Surrogate to allow the CP/M user to access this marvelous advance in capabilities? I can hardly wait to see.

*TENON Software Services, Inc.
1910 Fairview Avenue East
Seattle, WA 98102
(206) 324-0116
BASIC Surrogate $75
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REPLACING THE PICTURE BOTTLE IN THE TRS-80 MICROCOMPUTER

Jim Weir
Radio Systems Technology
10985 Grass Valley Avenue
Grass Valley, CA 95945

Our venerable Model II microcomputer has been an absolute workhorse for my company for over three years. I'm talking WORK here — inventory, invoicing, bookkeeping, word processing, manual writing, sales analysis, (and, if the truth be told, a little Star Trek late at night) — to the tune of 12-14 hours a day, seven days a week. In all this time, our computer operators have only had one long-standing complaint: the display gave them a headache from both glare and the white-on-black presentation.

Oh, we tried all the tricks. The green plastic caused more glare than it stopped. The nylon mesh filters *really* gave us a headache. We even tried a large sheet of frosted mylar to bond the tube face. None of these patchwork cures helped. Then I saw an ad in *two/sixteen magazine* for a cathode-ray-tube (CRT or "picture bottle" in slang) that had a green phosphor and a no-glare etched face, and would exactly replace the old black and white CRT that came stock in our Model II.

Why The Model II Causes Headaches

The company that makes these tubes, Langley-St. Claire, has done their homework on why the Tandy black and white CRT causes headaches. It seems that the white phosphor used in the Tandy tube has an extremely short "glow" time.

Without going too deeply into the theory of electrophosphorescence and the human eye, suffice it to say that each character on the screen is being turned on and off 60 times a second. Your eye presents the brain with the image of the character, but there is a little subroutine the eye goes through to "fool" the brain into seeing the characters without this 60 cycle per second "flicker." As we all know, subroutines take time. In the eye's case, this time is translated into effort, and too much effort causes the brain to ask its human for some relief. It sends the message in the form of a headache.

Enter Langley-St. Claire. They make their picture bottles with a very slow decay green phosphor or a slow decay orange phosphor, your choice. The net effect of a slow-decay phosphor is to cause the screen to glow continuously from one refresh cycle to the next. This relieves the eye from doing its little subroutine trick and therefore prevents "flicker headache." In the bargain, the face of the tube is very lightly "frosted" (etched) and cuts glare to near zero. (If you would like to go deeper into the theory of short versus long decay phosphor, Langley-St. Claire will send you — free — a fact sheet on their products.)

We decided to buy the green phosphor. One quick call to Langley, and the tube arrived a scant five days later.

Removing the Old CRT

20 minutes after the tube was delivered, I was actually installing it. Langley's instructions are fine — first rate, actually — but I found a couple of tricks that I think will help you make the installation easier.

The first trick, of course, is to read the instructions. Then read them again. And again. Get it through your head that you are working with a glass bubble that, if dropped, will send glass shards flying all over the room.

What might cause you to drop the tube? The "bug" or anode connection on the side of the tube makes a fairly good capacitor with the external black aquadag coating of the tube. The capacitor is charged to 12,000 volts, so you can see that this tube will retain a large fraction of the voltage until the "capacitor" inherent in the tube is discharged. A screwdriver-wire combination will work, but your body will work just as well. Or at least up to the point where reflex action causes your arms to jerk back. In accordance with Newton's first law, the CRT will then plummet to the floor.

With these precautions in mind, it is time to open up the computer. Unplug the computer, coil the power cord and put the cord on a shelf. Remove the two screws holding the top shell to the bottom shell, and remove the top shell. It will be necessary to remove or break the factory seal joining the two shells on the back of the computer. Remember that breaking this seal voids any Tandy warranty, but if the computer is more than 90 days old, there is no warranty anyway. You WILL, of course, remember to put all the hardware you remove from the computer into a box of some sort, won't you?

Then remove the two screws in the keyboard recess underneath the CRT and the two screws on the inside top of the chassis. This allows the front CRT bezel to fall forward, away from the computer, and exposes the actual CRT hold-down hardware.

Before we remove the old picture bottle, there is something you should know about handling the CRT. The CRT is actually a pretty sturdy little device, but don't exert any side torque at all on its neck. So long as the pressure is straight up, the CRT may be lifted quite easily by the neck, but forget any thoughts of holding it horizontally by the neck.

When placing the tube down to rest, place it face down on a soft cloth. (A scratch on the CRT face will drive you bananas after looking at it for a few hundred hours.) Last, keep your hands away from the bug (high voltage connector). Some CRT capacitors actually have "memory." Even though you have discharged the capacitor, a phenomenon known as dielectric absorption will recharge the capacitor to a somewhat lower, although quite respectable, voltage.

Connect an alligator cliplead to a narrow blade screwdriver, connect the alligator to ground, and slide the screwdriver underneath the rubber bug cover, which will discharge the CRT capacitor. Use the screwdriver to gently compress the "fork" type spring that keeps the bug lead attached to the CRT. Gently lower the bug lead to its natural resting level.

Loosen the screw that clamps the yoke (that white plastic thingey with all the small copper wire coils) onto the neck of the CRT. Those little steel blocks on pivots on the yoke plastic are actually linearizing magnets — try not to move them.

The yoke — the whole assembly — should now freely rotate on the CRT neck. It is possible that wax or other weak cements (lacquer, polyethylene) have leaked onto the CRT neck over the years and cemented the yoke to the neck. It may be necessary to use *gentle* rotational pressure to loosen the yoke. BE EXTREMELY CAREFUL not to exert any side pressure on the CRT neck. It will probably be necessary to remove tape from the CRT neck to allow the yoke to slip off the CRT. Remove the socket from the base of the CRT neck.

Now Comes The Hard Part

There are four screws holding the CRT metal band to the chassis front. Between two of those screws is a metal wire-spring assembly that grounds the "dag" or black conductive outer surface of the CRT. Loosen the screws holding this grounding spring and unhook the wire ends of the spring. Leave the black ground wire going to the power supply board attached to this board, and drape the spring out of the way.

You keep one hand on the face of the CRT and one hand just forward of the yoke, underneath on the bell of the CRT. Have someone else remove the remaining two screws and aid you in getting the yoke off the neck without breaking wires, necks, or other expensive pieces. Slide the CRT out the front of the chassis and place it on a towel or soft cloth.

This is as naked as your computer is ever going to get. Now might be a nice

PROGRAM #1

```
10 REM  PROGRAM TO DRAW PROGRESSIVELY SMALLER SQUARES FOR LINEARITY TESTS        FILE NAME SQUARES/BAS
15 REM  WRITTEN BY JIM WEIR, RADIO SYSTEMS TECHNOLOGY, GRASS VALLEY CA  95945
20 CLS:FOR I=0 TO 10:PRINT@(I,0),SPACE$(3*I);STRING$(80-(6*I),151);SPACE$(3*I);:NEXT
30 FOR I=10 TO 0 STEP -1:PRINT@((23-I),0),SPACE$(3*I);STRING$(80-(6*I),151);SPACE$(3*I);:NEXT
40 FOR I=0 TO 10:FOR J=I+1 TO 22-I:PRINT@(J,3*I),CHR$(149);:NEXT:NEXT
50 FOR I=0 TO 10:FOR J=11-I TO 12+I:PRINT@(J,3*(I+16)+1), CHR$(149);:NEXT:NEXT
60 FOR I=11 TO 12:PRINT@(I,33),STRING$(14,"*"):NEXT
100 PRINT@(23,0),CHR$(02);:A$=INKEY$:IFA$="" THEN 100
```

PROGRAM #2

```
10 REM  PROGRAM TO DRAW PROGRESSIVELY SMALLER SQUARES FOR LINEARITY TESTS        FILE NAME FATSQUAR/BAS
15 REM  WRITTEN BY JIM WEIR, RADIO SYSTEMS TECHNOLOGY, GRASS VALLEY CA  95945
20 CLS:FOR I=0 TO 10:PRINT@(I,0),SPACE$(3*I);STRING$(80-(6*I),150);SPACE$(3*I);:NEXT
30 FOR I=10 TO 0 STEP -1:PRINT@((23-I),0),SPACE$(3*I);STRING$(80-(6*I),150);SPACE$(3*I);:NEXT
40 FOR I=0 TO 10:FOR J=I+1 TO 22-I:PRINT@(J,3*I),CHR$(148);:NEXT:NEXT
50 FOR I=0 TO 10:FOR J=11-I TO 12+I:PRINT@(J,3*(I+16)+1), CHR$(148);:NEXT:NEXT
60 FOR I=11 TO 12:PRINT@(I,33),STRING$(14,127):NEXT
100 PRINT@(23,0),CHR$(02);:A$=INKEY$:IFA$="" THEN 100
```

PROGRAM #3

```
10 REM FILE NAME BURNIN/BAS  WRITTEN BY JIM WEIR  RADIO SYSTEMS TECHNOLOGY        GRASS VALLEY CA  95945
20 FOR I=1 TO 10000:OPEN "D",1,"DUMMBURN":CLOSE1:FOR J=1 TO 2500:PRINT CHR$(02);:FOR K=40 TO 200:PRINT
CHR$(K);:GOSUB 30:NEXT:NEXT:NEXT:GOTO 20
30 A$=INKEY$:IF A$="" THEN RETURN ELSE CLOSE:CLS:SYSTEM
```

time to clean out the innards. Do NOT go around brushing the boards off with a nylon bristle brush unless you have a particular fondness for your local TANDY fix-it shop. Instead, blow the chassis dust out with a metal, grounded air nozzle or dust with a damp rag. Keep your big paws away from the board cage.

A Few Hints On Installation

Put your bright, shiny, new CRT into the chassis in reverse order of removal. The directions from Langley on how to install the picture bottle are quite good, but there are a few hints I would like to pass on that they did not cover.

First, due to manufacturing tolerances, the odds of your new CRT fitting exactly to the bezel alignment of your old tube are nil. If you will notice, there are up-down and left-right adjustments on all corners of the CRT supports. Each adjustment is locked into place with two sheet metal screws, so that you will probably have to loosen, adjust, and re-tighten 16 screws. Some of these screws have been tightened at the factory by Gus the Gorilla, so I suggest you at least loosen them a wee bit when the CRT is out of the chassis.

After you readjust the internal brightness control as per the instructions, you must square the video display up and set the vertical linearity and height, which Program #1 will help you to do by providing a linearity test display. Then you must "burn" the tube in for a few hours.

You will also have to readjust the focus control (which they don't tell you about). On the Motorola video board, looking at the board from the top and from the side closest to the edge of the computer case, there are four potentiometer adjustments. The blue one next to the high voltage transformer is the internal brightness, then away down at the bottom edge of the board, almost hidden by a capacitor is the white focus adjustment, and then come the vertical linearity and height adjustments just above the vertical output transformer (the only thing on the board that resembles a "real" transformer).

When you first turn the computer on after replacing the CRT, the raster will most probably have a tilt to it which happens when the yoke is not reinstalled perfectly vertical. The fix is really quite simple. Loosen the yoke clamping screw until the yoke assembly just rotates on the neck of the CRT with a little friction. Then observe the raster on the face of the CRT and *gently* rotate the yoke with an *insulated* tool until the display straightens up. Shut the computer down, wait the normal length of time, and then carefully tighten the yoke clamp. You will probably find that the raster has again rotated, so it is back to loosen, rotate, observe, tighten until the raster is square with the CRT.

You may also notice a linearity problem. This means that the lines on the bottom of the screen are closer together than those on the top of the screen. Adjust the vertical linearity control until the lines are all the same width apart. You may also find a height problem, where the vertical portion of the picture extends above the top of the CRT or is all compressed into the center of the CRT.

There should be exactly 3 cm (1.25") between the raster and the edge of the CRT on any side. If there is a large gap at the top or one side and a small gap at the bottom or other side, you should adjust the centering rings to center the picture. The centering rings are just forward of the yoke clamp, and each one (there are two) has a tab by which to gently push the ring around. You will find that rotating the rings around the yoke will let you place the raster wherever you wish it on the screen.

It is possible that the raster will exhibit "pincushioning," where the raster is linear in one corner but nonlinear in the other. On the yoke housing there are two small square magnets which will rotate on their own individual pivots. You will also notice that there are half a dozen unused pivots around the front of this housing. Rotate the magnets and observe the display. (Note: you may find Program #2 useful for this adjustment.) You should be able to get the display into almost perfect geometric alignment by pivoting one or the other of these magnets. In some cases, you may find that it will be necessary to remove the magnet from its original pivot and replace it onto an unused pivot to remove the pincushion from one particular part of the screen. Note that the magnets have the greatest effect on that portion of the raster closest to them. Thus, a magnet mounted on the upper left corner of the yoke housing will affect the upper left portion of the raster.

After all is said and done, you may want to use Program #3 to do a focus "fine tune." This program will also be useful for burn-in, as it never allows the electron beam to keep a constant character on the screen for any length of time.

Warnings

Langley warns you that you may experience one or two "pops" or flashes as the CRT burns itself in. Quite normally, these "pops" will be small pieces of dust or phosphor burning themselves out between elements of the CRT and are quite normal for any new CRT. However, memory will probably be reset, you will lose your resident program, and the video will go blank. Just turn the computer off, wait a minute, and turn it back on. You may on occasion lose a disk, so use an old "junker" disk that you can afford to have wiped clean.

I would be negligent in my journalism if I failed to report that my tube flashed about five times. The last flash wiped out part of my video controller board. This wipeout took the form of severe "Christmas treeing" of the video display, where the top scan line was compressed into about 2 mm, and the rest of the scan lines got progressively wider, until the raster was practically normal width at the bottom. To their everlasting credit, not only did Langley-St. Claire replaced my defective CRT, they paid me for the repair to my computer, also. In my opinion, this is standing behind your product to the fullest, and I commend to you the Langley-St. Claire CRT folks if you want the finest presentation possible from your TRS-80. For more information, contact:

Langley-St.Claire
132 West 24th Street
New York, NY 10011
800/221-7070

from page 47

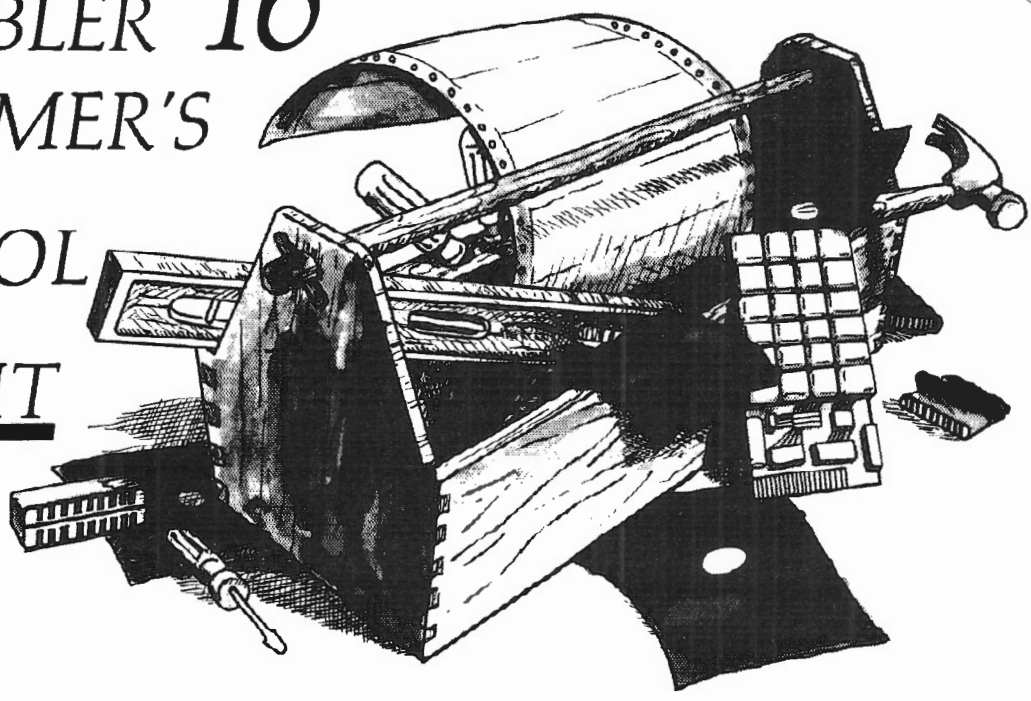
shared stories of his long experience with Microstat with me, says that technical assistance has been good and that Ecosoft has been eager to identify and correct bugs.

Conclusion

In all, this is an excellent general purpose statistics package. It lacks certain advanced features (factor analysis, complex time series techniques), but with the exceptions noted, the features it does offer run very well and very fast.

Microstat (ver.3.01)
Ecosoft, Inc.
P. O. Box 68602
Indianapolis, IN 46268
$395 with baZic

Assembler 16 Programmer's Tool Kit



Bill Pollock
Key Industries
P. O. Box 389
Fort Scott, KS 66701

I recommend programming the TRS-80 Model 16 using Assembler-16, Tandy's M68000 assembly language. You have likely read of the difficulty of assembly language programming. It is more tedious than programming with higher-level languages, true. But Assembler-16 is much easier to program with than Z80's assembly language.

TRSDOS-16's Supervisor Calls offer some of the convenience of higher level language statements. You can write your own subroutines to do the same. DEBUG lets you see in detail what the CPU is doing with your inspired software (and your foolishness as well). Best of all, your extra efforts will be rewarded with a program more closely suited to your needs that will run as fast as a program "ought" to run — like greased lightning.

The proliferation of higher-level languages speaks eloquently of the limitations inherent in them all. The assembly language programmers who developed them made decisions for you that you might not have made for yourself. A higher-level language is like an off-the-rack suit: it aims to fit everyone, and fits very few perfectly.

Assembler-16 is much easier than Z80 assembly language to program with. The more numerous general purpose registers (16 with 32 bits in the M68000 compared to 6 with 16 bit in the Z80) reduce the need to move data between RAM and register. Hardware MULtiply and DIVide in the M68000 replace a lot of Z80 software. M68000's MOV operation moves data independently of the general purpose registers. These and other features make assembly language programming much easier with Assembler-16 than with the Z80.

Assember-16 is much easier than Z-80 assembly language to program with

TRSDOS-16's SVCs work well and mostly as advertised. I did find one error in the Owner's Manual. KBCHAR returns the keyboard input character in SVC Block Byte-Offset 10-11, not 8-9. The "character present flag" (H'FFFF) is returned in Byte-Offset 8-9, not 6-7. The Manual's Addendum refers to this error, but simply repeats it instead of correcting it. I wrote Tandy about this, and got a nice "Thank you" letter saying that . . . "my assumptions appear to be correct." My programs do work based on my assumptions; they did not work based on the Manual's description of KBCHAR.

The SVCs are similar to higher level language commands. VIDKEY, for example, is similar to BASIC's INPUT$ command. VIDKEY demands a bit more of the programmer since he must load the SVC Block with four data items whereas INPUT$ only requires one. That VIDKEY/INPUT$ comparison is typical of the difference between BASIC and Assembler-16 with SVCs.

The flexibility of assembly language shows up best when the programmer wants to do something not easily available in a higher level language. I wanted a numeric input routine in which the operator could not enter irrelevant codes. I wanted to limit the number of characters on either side of the decimal point and to control the sign input. I wanted more accuracy than four bytes per number, but thought eight bytes was unnecessary. I therefore wrote my own NUMerical INput routine (NUMIN). You can "roll your own" in assembly language. You might get a BASIC or what-have-you program to do the same with some difficulty, but certainly with a much slower operation.

I recommend that you set up a SVC list like that on the first page of Exhibit 1. You can COncatenate this into a new program and DElete the unneeded lines.

WARNING: Your next SAVE will automatically write your current pro-

ILLUSTRATION BY JOHN HOCH

by Bill Pollock,

```
        TITLE   "TEMP/SRC
*
* SVC = Supervisory Calls to TRSDOS
*SVC                SVC     Manual
*Mnemonic           CODE    Page
*--------           ----    ------
ACTL     EQUB       100     129
ARCV     EQUB        96     131
ATX      EQUB        97     133
BCTL     EQUB       101     135
BRCV     EQUB        98     137
BTX      EQUB        99     139
CLOSE    EQUB        42     141
CLOSEF   EQUB       133     142
CLRXIT   EQUB       257     143
CURSOR   EQUB        10     144
DATE     EQUB        45     145
DEBUG    EQUB       259     147
DIRRD    EQUB        35     149
DIRWR    EQUB        44     151
DISMOUNT  EQUB      139     153
DOSCMD   EQUB       270     155
DUMP     EQUB       130     156
ERRMSG   EQUB        52     158
ERROR    EQUB        39     159
EXECUTE   EQUB      263     160
HLDKEY   EQUB        29     161
JP2DOS   EQUB       264     163
KBCHAR   EQUB         4     164
KBINIT   EQUB         1     166
KBLINE   EQUB         5     167
KILL     EQUB        41     169
LOAD     EQUB       131     170
LOCATE   EQUB        33     172
MOUNT    EQUB       138     173
MOVBUF   EQUB       267     175
OPEN     EQUB        40     177
OPENDO   EQUB       140     180
PRCHAR   EQUB        18     183
PRCTRL   EQUB        95     185
PRINIT   EQUB        17     189
PRLINE   EQUB        19     192
READNX   EQUB        34     194
RENAME   EQUB        47     196
RESET    EQUB       129     198
RS232C   EQUB        55     199
SETBRK   EQUB       269     202
SETTRP   EQUB       266     204
UNLOCK   EQUB       136     206
VDCHAR   EQUB         8     208
VDINIT   EQUB         7     210
VDLINE   EQUB         9     212
VERSION   EQUB      137     214
VIDKEY   EQUB        12     215
WRITNX   EQUB        43     217
        PAGE
*
* Keyboard control keys, see page 167 of TRSDOS-16 OWNER'S MANUAL.
* Print driver control codes,  see page 183/4, TRSDOS-16 OWNER'S MANUAL.
* Video control codes,  see page 208 of TRSDOS-16 OWNER'S MANUAL.
*
*SYMBOL (Function)                                    CODE    <KEY>
*-----------------------------------                   ----    ---------
TURN BLINKING CURSOR ON                        EQUB    H'01    F1
TURN CURSOR OFF                                EQUB    H'02    F2
MOVE CURSOR TO PREVIOUS ROW COLUMN 0           EQUB    H'08    CTRL K
MOVE CURSOR TO NEXT ROW COLUMN 0               EQUB    H'0D    ENTER
ENTER KEY                                      EQUB    H'0D    ENTER
DUAL ROUTING ON                                EQUB    H'0E    CTRL N (print
DUAL ROUTING OFF                               EQUB    H'0F    CTRL O (print
HOME CURSOR TO ROW 0 COLUMN 0                  EQUB    H'14    CTRL T
ERASE TO END OF LINE                           EQUB    H'17    CTRL W
ERASE TO END OF SCREEN                         EQUB    H'18    CTRL X
SET NORMAL VIDEO MODE GREEN ON BLACK           EQUB    H'19    CTRL Y
SET REVERSE VIDEO MODE BLACK ON GREEN          EQUB    H'1A    CTRL Z
ERASE SCREEN HOME CURSOR TO ROW 0 COLUMN 0     EQUB    H'1B    ESCape
ESCAPE KEY                                     EQUB    H'1B    ESCape
CLEAR AND SET 80 CHARACTERS PER LINE           EQUB    H'1E    UP ARROW
FORM FEED                                      EQUB    H'0C    (print)
UP ARROW KEY                                   EQUB    H'1E    UP ARROW
DOWN ARROW KEY                                 EQUB    H'1F    DOWN ARROW
*
*
* Printer control codes,  see page 10 of LINE PRINTER V Hardware Manual.
*
*                                                ESCape Code (H'1B)
*SYMBOL (Function)                  CODE        Required.
*-----------------                  ----        ---------
LINE FEED                  EQUB    H'0A
CARRIAGE RETURN            EQUB    H'0D
UNDERLINE END              EQUB    H'0E
UNDERLINE START            EQUB    H'0F
ELONGATE START             EQUB    H'1E
ELONGATE END               EQUB    H'1F
*
CONDENSE START             EQUB    H'0E    * H'1B must precede the code.
CONDENSE END               EQUB    H'0F    * H'1B must precede the code.
BOLD END                   EQUB    H'1E    * H'1B must precede the code.
BOLD START                 EQUB    H'1F    * H'1B must precede the code.
*
ESCAPE                     EQUB    H'1B
*
*DEFinitions of symbols for use through LINK16 by other programs:
*
        DEF     PLEASE ENTER
        DEF     SUBRTN TO CONVERT BINARY NO IN D0 TO ASCII HEX AT A0
```

```
107          PAGE
108 *                                                        Byte
109 *                                                        Offset
110 SVC NUMBER                          DATAW   0            0-1
111 ERROR CODE                         DATAW   0            2-3
112 SVC RESERVED WORD                  DATAW   0            4-5
113 SVC OFFSET 6                       DATAW   0            6-7
114 SVC OFFSET 8                       DATAW   0            8-9
115 SVC OFFSET 10                      DATAW   0            10-11
116 SVC OFFSET 12                      DATAW   0            12-13
117 SVC OFFSET 14                      DATAW   0            14-15
118 SVC OFFSET 16                      DATAW   0            16-17
119 SVC BLOCK END                      RDATAW  7,00         18-31
120 *
121 *
122 SUBRTN TO CONVERT BINARY NO IN D0 TO ASCII HEX AT A0
123          STML    .D0, .D1, -@A7  *Save D0 & D1 contents.
124          LDL     .D1,.D0         *Save the Binary Number in D1.
125          ANDL    .D0,#H'F0F0F0F0  *Mask out lower nibble of each byte.
126          RORL    .D0,#4          *Move upper nibbles into lower nibble.
127          ADDL    .D0,#H'30303030  *Add H'30 (Hex.) to each byte.
128          STPL    .D0,@A0         *Store in destination's even bytes.
129          ANDL    .D1,#H'0F0F0F0F  *Mask out upper nibble of each byte.
130          ADDL    .D1,#H'30303030  *Add H'30 (Hex.) to each byte.
131          STPL    .D1,1@A0        *Store in destination's odd bytes.
132          LDL     .D1,#7          *Set up D1 as an 8-count (7 to 0) counter
133 $2       CMPB    @A0+,#'9        *Does byte @ A1 contain a Number > '9'?
134          BLE     $3              *If not, jump ahead.
135          ADDB    -1@A0,#'A-'9-1  *If so, adjust to ASCII A-F range.
136 $3       DEC     .D1,$2          *Count down 1, loop 'til done.
137          LDA     .A0, /0         *Point A0 at SVC Block again.
138          LDML    .D0, .D1, @A7+  *Restore D0 & D1 contents.
139          RET                     *Return after 8 loops.
140          PAGE
141 *PLEASE ENTER subroutine prompts operator to touch the  <ENTER>  key,
142 *awaits compliance, returns when  <ENTER>  key is touched.
143 *
144 PLEASE ENTER TEXT
145          TEXT    "Please Press  "
146          DATAB   SET REVERSE VIDEO MODE BLACK ON GREEN
147          TEXT    "<ENTER>"
148          DATAB   SET NORMAL VIDEO MODE GREEN ON BLACK
149          TEXT    "  to continue."
150 PLEASE ENTER
151          STL     .A0, -@A7                    *Save A0 contents.
152          MOVW    /SVC NUMBER,#VDLINE          *Set SVC code.
153          MOVW    /SVC OFFSET 6,#(PLEASE ENTER-PLEASE ENTER TEXT)
154          MOVW    /SVC OFFSET 8, #'            *Ending ASCII "Space".
155          MOVL    /SVC OFFSET 10,#PLEASE ENTER TEXT.L
156          LDA     .A0, /0                      *Point to SVC Block.
157          BRK     #0                           *Show text.
158          MOVW    /SVC NUMBER, #KBINIT
159          BRK     #0                           *Initialize keyboard.
160 PENKEY   MOVW    /SVC NUMBER,#KBCHAR          *Set SVC code.
161          MOVW    /SVC OFFSET 6, #1            *Set wait for char.
162          BRK     #0                           *Seek & await keybd.input
163          CMPW    /SVC OFFSET 10, #ENTER KEY.W
164          BNE     PENKEY                       *Try again if not  <ENTER
165          LDL     .A0, @A7+                    *Restore A0 contents.
166          RET                                  *Return on  <ENTER>  key.
```

Tool Kit cont.

gram to the file from which you made your latest COncatenate, unless you specifically direct otherwise. I have more than once hastily overwritten laboriously written source code with a different program.

SAVE your source code to two files. I use filename extension /SRC for my main source file, and /SAV for my spare. I SAVE to my /SRC and my /SAV files after every COncatenate. I frequently SAVE to both, DElete all of my current program from memory, and COncatenate my /SRC file back into memory. That protects me from my own goofs.

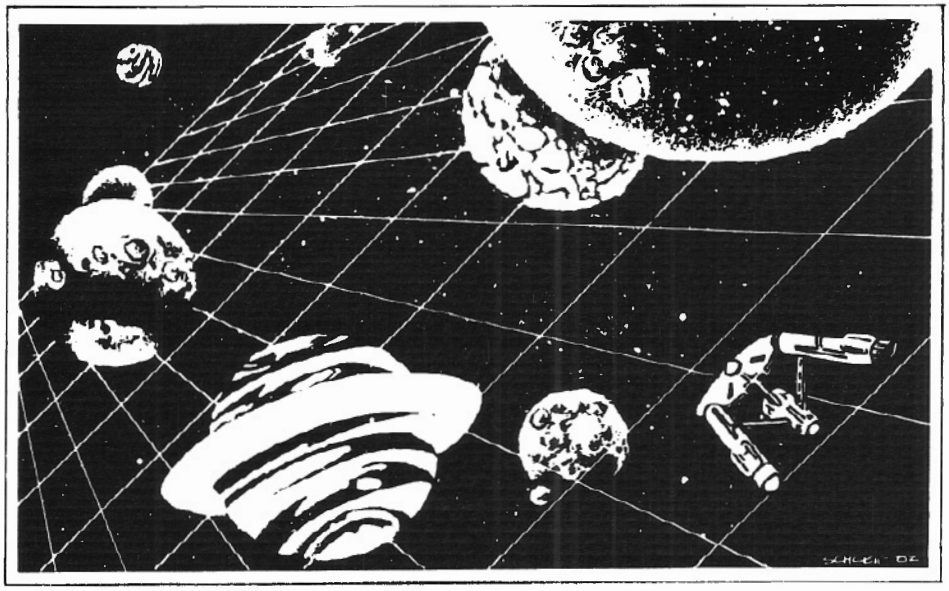
EDIT 16 only numbers those lines COncatenated into an empty work file. Newly input lines are not numbered. You can refer to a "relative line number" by its count away from the current line. If you find that to be a bit awkward, you can use the SAVE file/DELETE ALL/CONCATenate file procedure described above. EDIT 16 will number your program's lines for you in the process.

I put my SVC Block at Relative Address 0. I set register A0 to 0 at the start of each program and leave it alone. I broke my own rule in "SUBTRN TO CONVERT BINARY NO IN D0 TO ASCII HEX AT A0" (See Line 122 of Exhibit 1) and had one devil of a time figuring out why programs that called it wouldn't work. I "fixed" it with a LDA .A0, /0 command just before the RET command. A better approach would have been to not use A0 at all.

Use those long labels — up to 40 characters, not counting spaces — as part of your documentation. Local labels don't reveal much. "$8" is obscure when you return to a program after several weeks. I can't remember what it was after several minutes, let alone several weeks.

Go overboard with your documentation. Write your program as if you were going to sell it. Anything less will be vague and confusing even to yourself once you've turned your attention elsewhere for a time.

two/sixteen magazine



STARSHIP I

Arnold Fischthal
Advanced Data Design
184-08 Tudor Road
Jamaica Estates, NY 11432

I have often wondered how many of today's computer users actually became computer users because of the games that could be played on computers. For those of us who are truly "games people" and for those who just like to spend a little leisure time at the computer, playing games provides some real relaxation and enjoyment.

Alas, when you advance from the Apple II or TRS-80 Model I to the more business-oriented machines, like the Model II, 16 and now the Model 12, there is a great lack of games to play. I am happy to say that this situation is changing, albeit slowly.

A Game For Your Business Micro

I have written this review of one such game for the II/12/16, a game in the genre of STAR TREK games originally played on mini-computers.

STARSHIP/I more than holds its own when compared to other such space adventure games. It far overshadows the original Star Trek that was available for the Model I and is much more enjoyable than the others I have had the opportunity to play.

Some Very Nice Features

The first very nice feature I noticed about STARSHIP/I is that the entire command console is visible at all times. When you specify, for example, that you want to activate long range sensors, there is no disappearance of what is already on the screen, as happens in most other games of this type.

The command console provides you with long range sensors, short range sensors, damage control, system status (stardate, starship position, number of enemy remaining, etc.), and your starship assignment, as well as the entire communications panel.

A second very nice feature of STARSHIP/I is the way it utilizes the internal time clock of the computer. Essentially as you move into higher levels of play (there are ten levels), you must continually make your moves around the galaxy (consisting of sixty-four quadrants) and your actions against the enemy more time efficient. You must complete your mission in the time allotted to you, and time keeps running even as you plan the strategy of your next attack.

Various commands are available to you as pilot your ship. Should time be running low, you can alter the speed of the ship as you move (at the cost of greater fuel consumption) or slow down to conserve fuel.

Short range sensors display an 8 by 8 grid of the current quadrant in which you are located. Long range sensors are provided to give you information on adjacent quadrants, as well as quadrants already in the ship's computer.

Shields can be engaged to give protection against enemy attack. Should your shields be inadequate, damage results to various parts of the ship, making them temporarily inoperative. In the case of damage to the short or long range sensors, no information is lost, but they do freeze in their current displays and do not change (even though the ship can move) until they're repaired. The energy in the shields can be returned to the energy pool in case it is needed to navigate.

Torpedoes, as well as positron rays, are your available weapons against the enemy Zarkons. Torpedoes may be fired in salvo and a positron pulses energy which diminishes as the square of the distance to the target. When you run low on torpedoes and/or energy, you will have to return — and in some cases limp — back to a starbase.

In the higher levels of play, a mission might take some time to complete; a SAVE feature has been incorporated into the game which allows a mission to be saved to disk, and thus be continued at a later time.

STARSHIP/I comes with good instructions directly on the disk. The program is written in Radio Shack BASIC and can easily be modified by the user. Among other things, I added the following capabilities: the ability to turn unused torpedoes into emergency energy when needed, and the ability to increase the incidence and severity of ship damage at higher levels of play.

One Minor Drawback

The only drawback I can mention is that even though the mission is timed, the program often reacts slowly to command. This is, of course, due to the size of the program and the slowness of the BASIC interpreter as the program must test all possibilities of system status. Several times commands typed in were lost because they were typed in too fast. This annoying limitation can be overcome by applying the SNAPPWARE patches DOSFIX07 and DOSFIX13, found on pp. 28-29 of the July-August, 1982 issue of *two/sixteen*. These patches allow keyboard buffering from BASIC so that no keys will be lost.

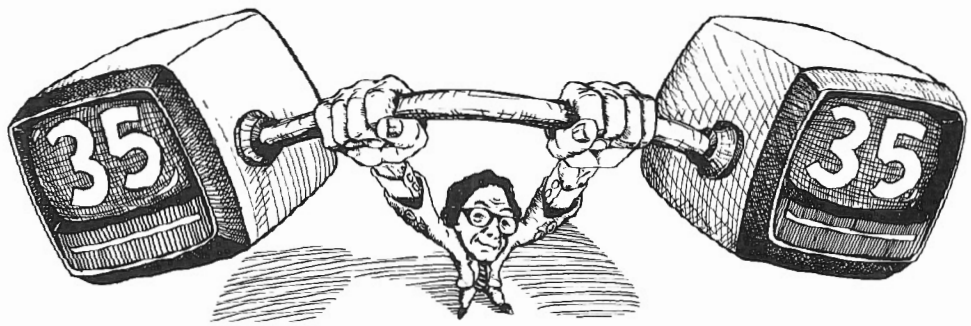
Even with this one drawback, STARSHIP/I is an addictive game; once you start it, you will want to advance in proficiency until you master the upper levels of play.

STARSHIP/I is available from:
two/sixteen magazine
131 E. Orange Street
Lancaster, PA 17602
717/397-3364
$30.00 for subscribers

MICROSTAT

An interactive general purpose statistics package

Richard Jensen
University of Illinois, Chicago
P. O. Box 4348
Chicago, IL 60680



Microstat is a fast, versatile, user-friendly CP/M statistics package with versions available to run with Microstat CP/M BASIC (similar to that which comes with TRSDOS) or for the enhanced language first designed for North Star computers, baZic (which runs under CP/M). I used the baZic version, and it dazzled me with its speed. The programs are not compiled or otherwise protected, save by the unfamiliar syntax of baZic.

Menu-Driven

The package is entirely menu-driven. The menu selections are well phrased and, happy to note, the structure of default options is well chosen. Thus, the user has to name the file to be used in each procedure, but the default is always the file used last. A quick pinkie on the ENTER key never produces trouble; in general, errors are trapped and the user prompted to enter acceptable values. When a procedure does crash, usually because of overflow conditions, typing RUN brings up the main menu.

At the end of each procedure the user has the option of looking at the screen results again, or having them printed out. Since most statistical work involves repeated recalculations, transformations, and variations on technique until the exact result is finally achieved, the ease of repetition is a big help.

How Much Microsoft Can Handle

Initialization is straight forward. At this stage, the user specifies the maximum number of variables that will be used. 35 seems to be the maximum for a 64K machine, a limitation that will trouble users with a proclivity toward transformations or those with a wealth of data to handle.

The number of cases that Microstat can deal with, on the other hand, seems to be limited only by the disk size. For the Models 12 and 16, that comes to many thousands of cases. When using the baZic version, the data sets, unfortunately, will have to be input through Microstat, for there is no provision for reading data in ASCII format that may have been generated from another project or downloaded from a mainframe computer.

The Data Management Subsystem

The core of any statistics program must be its data management subsystem. Microstat has a reasonably good one, but suffers one serious flaw.

The processes of entering, listing, and editing data is simple and fast. Variables are both numbered and named, and a descriptive header can be added to a file. Data can easily be inserted into or deleted from an old file. Ten digit accuracy is maintained (with options for 8, 12, or 14 digit precision under baZic.) A directory of data files is available without leaving the program. Missing values are handled easily: at time of data entry, a decimal point is input in place of numbers. Unlike SPSS, Microstat has no provision for multiple missing values, or for selecting them in and out of tables. As a result, any data set with numerous missing values will prove troublesome to handle. (I am not aware of any micro statistics package that handles missing data any more satisfactorily.)

The data management module has excellent procedures for transformations, sorting, rank-ordering, and even lagged transformations. Further, files and subsets of files can be moved or merged. The merge procedure has been known to have bugs in earlier versions, and, indeed, I managed to lose a case when vertically merging two data sets. (Vertical merging, called "vertical augment" in Microstat, means that the two data sets have exactly the same variables, but different cases; horizontal merging requires identical cases and different variables.) Files can be copied easily without going to CP/M for PIP.

The Main Analysis Programs

The main analysis programs are descriptive statistics, frequency distributions, ANOVA, scatterplots, correlation matrix, multiple regression, time series, crosstabulation, twelve nonparametric tests, and tests of means. In addition, chi-square, permutations and combinations, seven probability distributions, and tests for proportions are availa[illegible] These auxiliary routines do not, h[illegible] ever, use the data sets. They act more as quick tables, with the user inputting the parameters and getting back the statistic needed.

ILLUSTRATION BY JOHN HOCH

All of the main analysis programs allow for the selection of a subset of cases, but the user must specify the first and the last case number. It is *not* possible to select according to the value on a particular variable. Thus "SELECT IF VAR17=2" must be faked by sorting all the cases by variable 17, noting the starting and ending case numbers (e.g., VAR17=2 for cases 55 through 112) and entering those numbers in the subset selection routines. This is an extremely cumbersome procedure.

In a closely related problem, the descriptive statistics module lacks a procedure analogous to BREAKDOWN in SPSS. Thus it is not possible to obtain the means, standard deviation, etc. for variable 10 on subsets of the data defined by variable 5. Using the MOVE procedure, it is possible to create new data sets based on subsets of an old file, if the starting and ending case numbers for each subset are already known. The key needs in the next version will be the addition of a workable SELECT IF routine, and a procedure similar to AGGREGATE in SPSS. Weighting is not provided for — a feature I rarely use, but which ought to be included.

The procedures themselves work quite well — indeed, it was a pleasure to see an 18x18 correlation flash on the screen in three minutes flat! The regression routines allow for simple, multiple, and stepwise procedures, and produce not only the b coefficients but also their standard errors, T test values, probabilities, and partial r-squared values. The beta values should be included in the next version.

ANOVA is available one-way, two-way, and for randomized blocks. Scatterplot, the only graphics procedure, is only fair: no regression line is shown on the screen, and the axes are left blank.

Documentation

The documentation is satisfactory but on the thin side — only 45 pages of text that run through the options very quickly, plus appendices of sample printouts. (The automatic formats for the printouts are handsomely done.) Another appendix contains copies of the formulas used (obviously xeroxed from some textbook). Happily, a collection of a dozen trial data sets is included. Customer support is provided through an Indianapolis telephone number. Edward Cox, a biologist in Toronto who

cont. on page 41.

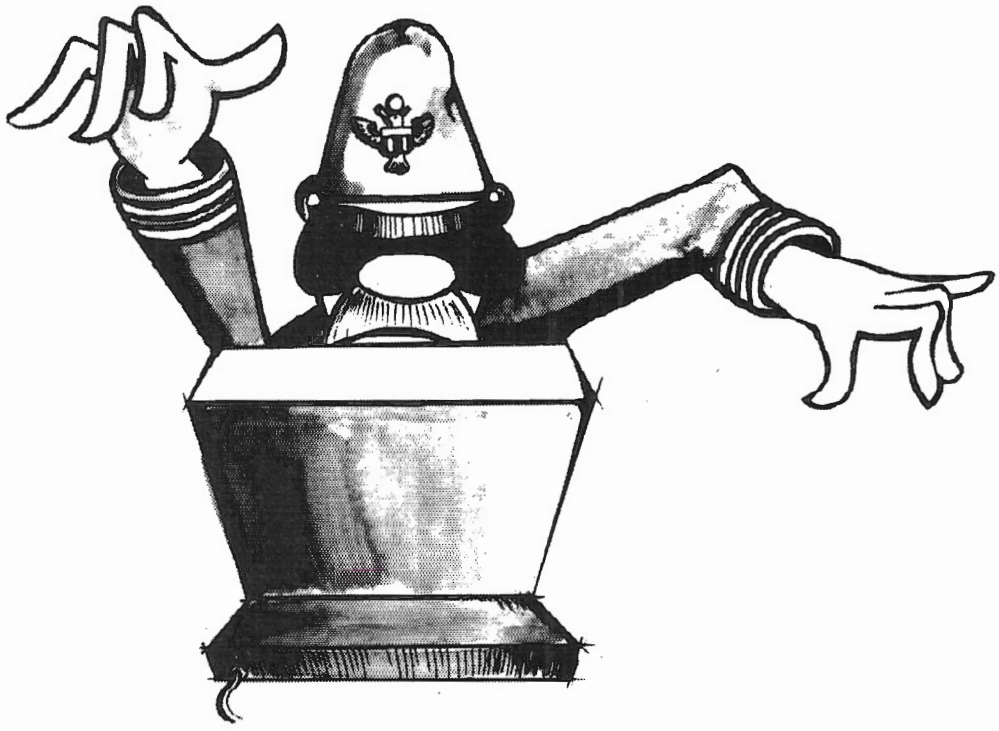


ILLUSTRATION BY JAMES KINDER

Advanced Command Processor

Robert VanNatta
222 South First Street
St. Helens, OR 97051

If you are on the Pickles & Trout mailing list, you likely got a direct mail solicitation announcing the Pickles and Trout Advanced Command Processor. It reportedly would work with most CP/M 2.2 systems.

The idea behind the Advanced Command Processor is to soup up CP/M 2.2 to make it a bit easier to use and, in particular, to improve the usefulness of the user areas.

What's A CCP?

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M/C VISA ACCEPTED.

Most of us are vaguely aware that Digital Research has divided CP/M into several modules, e.g., the BIOS, BDOS, and CCP to name a few. The BIOS is the Basic Input/Output System. The BDOS is the Basic Disk Operating system. The CCP is the Console Command Processor.

The CCP is the human-oriented portion of the operating system, the part that contains the so-called built-in commands, such as ERA, REN, DIR, SAVE and USER.

The CCP normally loads in a part of memory available for user programs. The assumption is that once a user program is loaded (a user program is any program of the filetype<*.COM>), the user program will communicate directly with the BIOS and BDOS through the CP/M function calls. This convention is advantageous because it makes a lot more memory available for user programs. Whenever a user program is loaded, it simply overwrites the portion of memory used by the CCP.

There are a couple of disadvantages, however. One is that most user programs must end with a so-called "WARM START." A "WARM START," at a minimum, involves reloading the CCP from the disk. This is why any CP/M based computer will hang if the system disk is not in the required (normally A) drive when a user program is exited. This also explains why a Microsoft BASIC command, such as SYSTEM "DIR," won't work under CP/M.

Another disadvantage is that if you have a program such as WordStar, you cannot use any of the built-in CP/M commands through the "R" command from the main menu. User programs that do allow commands similar to the built-in commands (such as renaming or deleting a file or displaying a directory) accomplish the task with function calls to the BDOS and not by magically executing the built-in commands.

Practically speaking, therefore, the CCP is only in memory and usable in response to commands from the system prompt "A>" (or "B>"). When a command is given from the "A>" that evaluates to a filename ending in "COM," this is taken as a command to load a program into the program area of memory (which includes the CCP assigned portion of memory). Control then passes to the new program and the CCP may be destroyed if the space is needed.

The ACP Is a Modified CCP

The Pickles and Trout ACP is a modified (enhanced?) CCP that takes the place of the normal Digital Research CCP. If you have followed my explanation of what the CCP is, perhaps you can begin to appreciate my frustration with the ACP. The ACP's sales claims promise "full access to user numbers" and "executing programs from any drive and user is a snap."

The idea of the ACP is that if you want to display the directory of drive B:, user 4, you can enter a command<DIR B4:> while logged into any drive or user number. You can also load programs from other user numbers in the same fashion. If STAT.COM is on drive D: user 5, it will respond to a command such as D5:STAT.

Are User Numbers Usable?

The effect of the ACP is to allow you to treat different user numbers just as if they were different drives. This has the potential to be quite useful because it should allow you to thin out those massive directories that the double-sided drive tend to generate into subdirectories, right?

If the ACP really did this I would love it. The truth is, however, it doesn't. "Why not," you say? The reason is simple. The moment you load a program, the CCP (ACP) is overwritten. Thus, if you attempt to load a program such as WordStar that is made up of several parts, you don't get very far. You can load the first program segment just fine, but this clobbers the ACP, and you crash because the program overlays can't be found. In a similar vein, none of your user programs can access files in a different user number.

If you will reflect for a moment on the amount of time you spend entering commands at the system level (where the ACP works), and compare that to the amount of time you spend with your computer executing some program (where the ACP doesn't work), you will likely come to the same conclusion that I have. Namely, it doesn't really matter how smart the CCP is; you don't use it that much anyway.

ALIAS.COM

A utility called ALIAS.COM comes with the ACP. The purpose of this utility is to allow you to generate directory entries in multiple user areas for the same file. The idea is that if you want to have a particular program such as STAT.COM available in several user areas, you can simply generate several directory entries, all of which point to the same file. If you have a dogged determination to use user areas, this utility is most useful.

There is always a catch, and the one that comes with ALIAS. COM wasn't hard to find. The problem with multiple directory entries is that you don't dare use them with any file except one you read. If you write to a file that has multiple directory entries, the file-write activity may change the size of the file, and the number of directory extents. Since CP/M does not expect multiple directory entries pointing to a single file, only one of the directory entries will be updated. This mischief sets the stage for chaos in your directory. This limitation (bug) in the implementation is well documented, and the ALIAS.COM automatically sets all files with multiple directory entries to R/O status. This saves you from the worst, but the problem limits the overall usefulness of the idea. The manual doesn't mention it, but if you want to delete one of these multiple directory entries, you must first set the directory entry to R/W status using the STAT command.

The audience for the Pickles and Trout ACP is not limited to just Pickles and Trout CP/M for Radio Shack computers. Page 1.1 of the manual declares that it works with most computers using CP/M 2. For what it is worth, a TRS-80 Model II/16 with Lifeboat CP/M is not "most computers." Under Lifeboat CP/M the ACP itself seems to work properly, but the ALIAS.COM utility crashes. Everything seemed to work okay with ATON CP/M.

The manual for the ACP is a smallish type-set paperback book printed in two colors. It is quite well written. Judging from the style, it was most probably written by the same person who wrote the Pickles & Trout Manual for their CP/M.

Conclusions

The user areas as defined by Digital Research in CP/M 2 are pretty close to worthless. The ACP is a gallant effort to turn one of Digital Research's bad ideas into something useful. I think it's a failure.

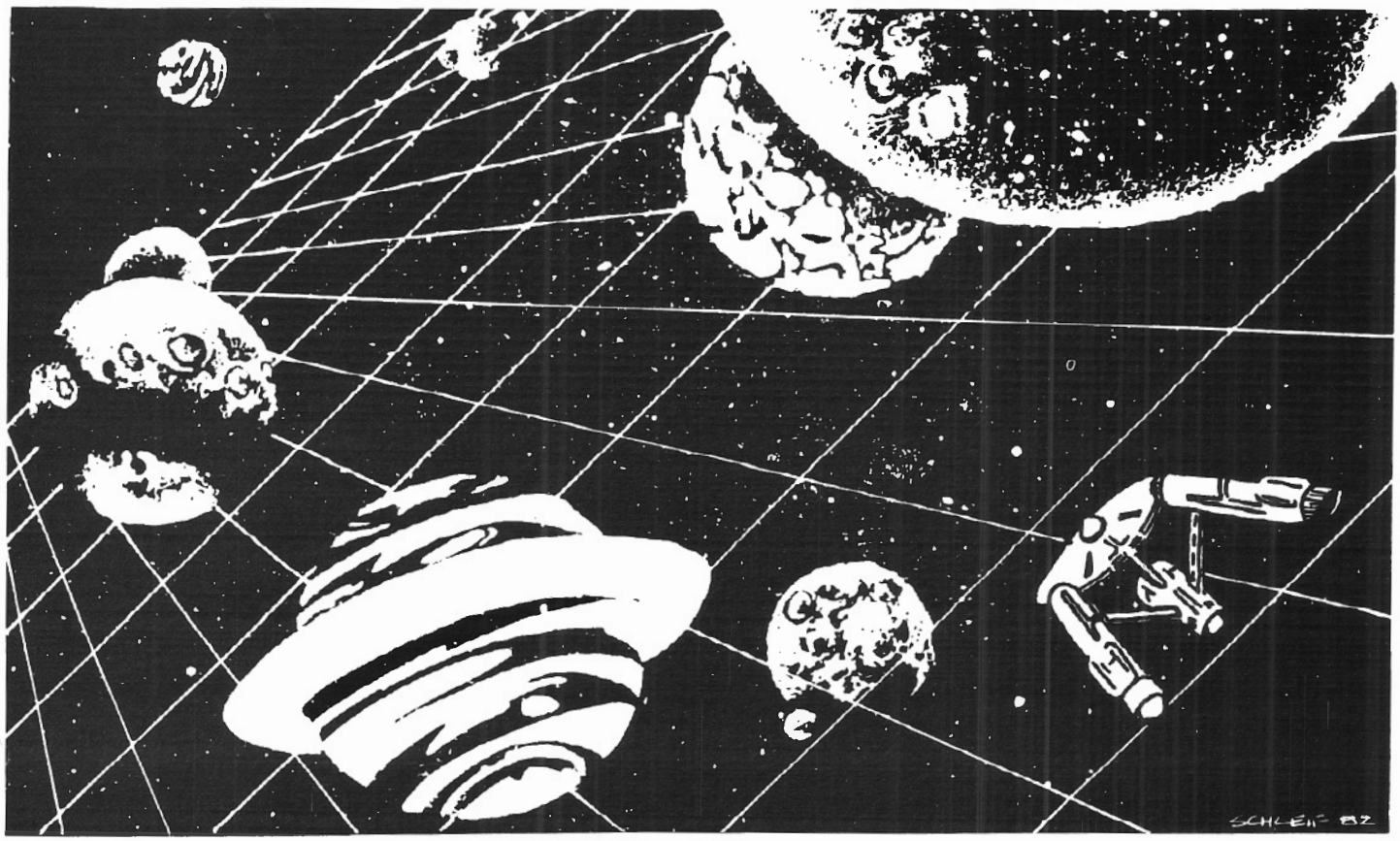
This conclusion should be subjected to an important qualification, however. My conclusion that the program is a failure is based on the subjective opinion that, even with this enhancement, user areas remain essentially useless. If, rather than applying a subjective test, one is to apply the usual objective test to this product, it would come out looking a lot better.

Objectively speaking, the ACP is well documented and performs as documented (except with Lifeboat CP/M).

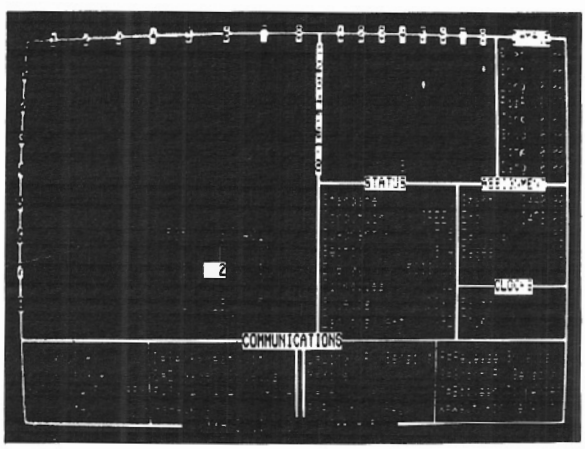
Pickles and Trout Advanced Command Processor is available from:

Pickles and Trout
P.O. Box 1206
Goleta, CA 93116
$85.00

STARSHIP I



STARSHIP/I (copyright registered) is a save-the-galaxy type game based on the venerable STARTREK games which have been played on large mainframes for more than ten years. It is specifically designed for the RS Model II and features a constant console display with no scrolling. Each game begins in a randomly arranged galaxy of 64 "quadrants," each containing 64 "sectors."



starship I

STARSHIP/I is a "strategic" game (as opposed to "tactical" games which involve reflex action but little thought). However, STARSHIP requires *quick* thinking, as all events are timed. Because STARSHIP is written in the RS BASIC interpreter language, users can modify the source code or use sections of the code as models to learn techniques which can be used to produce games of their own design.

STARSHIP comes with a disk instruction file which can be listed on your printer. It can also be listed on the screen at the beginning of a session. In addition, STARSHIP contains a few undocumented "surprises" at advanced levels of play (there are ten levels of difficulty). These surprises may be analyzed by reviewing the source code, then modified or deactivated if desired.

Games may be saved in files at any point for later play or for "duplicate" games in which several players start with the same layout and position and compete for the highest ending score.

STARSHIP/I was sold for several months at $50 through leading computer magazines. It is now available to **two/sixteen** subscribers at the special price of $30, including air mail (anywhere) in protective Kangaroo mailer.

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