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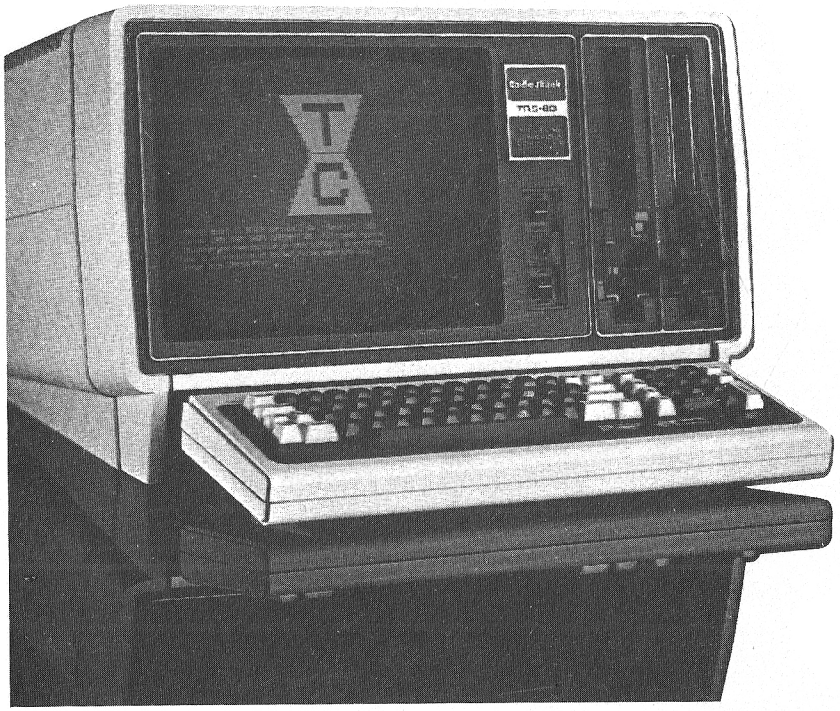

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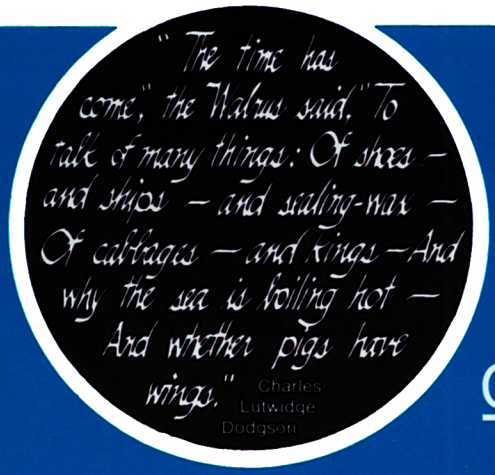
two/sixteen magazine™

Volume 1, Number 1 May-June, 1982

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



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Late Observation

As we go to press, I notice that although we are dedicated to the pursuit of excellence, it retains a long lead. While this magazine contains only 24 pages, we hope that the material will be useful to you. In commencing a new magazine on a specialized subject like Model II and 16 microcomputers, access to writers is very limited prior to publication. However, many of our subscribers have promised articles; others are giving serious consideration to producing them. It is not our intention to continue producing 24 page issues; our goal is to reach 50 pages of editorial material (plus 20-30 pages of advertising) by the third issue. By the way, we were not able to insert another (loose) copy of the reader survey form due to postal regulations. Please make a photocopy and return that to us. We need your input. And be sure to note on the back any particular subject that you'd like to see covered and any particularly vexing problems that you haven't been able to resolve. Also, I will be glad to consult (gratis) with any subscriber who calls me — (717) 393-1917 — about a problem. If we can't help, we may be able to direct you to someone who can. This business requires us to develop many very experienced and reliable contacts. And I've been pleasantly surprised by the depth of knowledge and dedication displayed by the many people who have placed a telephoned subscription order and then initiated a discussion on some aspect of our favorite computers. With your input and criticism, we're going to close the lead. Our goal is to be the most useful, if not the most bulky, of the microcomputer magazines. RHY

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Editor/Publisher Richard H. Young
Consulting Editor Richard Sinclair
Graphics and layout Ken Kirsten
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Comment: What two/sixteen will mean to you

The idea for this magazine came on the heels of Tandy's recent announcement of its new Model 16 microcomputer. (See article "All we know about the Model 16.")

Like many other Model II users, I've long felt neglected by most microcomputer magazines. Even 80 Microcomputing devotes only limited attention to our concerns. New publications (e.g., Desktop Computing, Popular Computing) seem to be even more low-end mass-market oriented. And even if we had a good high-end general micro publication, it would probably cover the broad spectrum of micro models (Model II/16, Apple III, OSI, Cromemco, Morrow, System 2800, ad infinitum). Very little that's specific to our curious — but powerful — Fort Worth Specials.

I foresee a wide proliferation of Model 16s, and believe that the Model II/16 market will now be large enough to warrant a magazine of its own. So here it is.

two/sixteen proposes to be your second line of defense. If you can't resolve a problem by consulting your primary hardware or software vendor, let us know. We will spend considerable effort to assist with any problem we judge to be of general interest or that simply interests us. Our experiences and contacts may enable us to help with your problem. If we can help, we'll do it right away (and not wait for publication). If we can't help, we'll tell you. Of course, we can't guarantee anything.

Like all new publications, we have set ambitious editorial goals. I'll list some of them now so you can remind us if we don't live up to any one of them.

1. All articles will pertain to interests of Model II and Model 16 users.

2. Authors will be familiar with their subjects in sufficient depth so that their reports will have credibility. (For example, you won't see any "quick and dirty" one-day evaluations of programs like WordStar vs. Scripsit in this publication.)

3. Subscribers will be regularly polled for information about experiences and for subjects they want discussed. Results of these polls will be promptly published.

4. Advertising will be accepted, but only for products which are likely to interest II/16 users. Ads will occupy less than 40% of the magazine (this percentage may go higher if readers approve: we'd hate to refuse revenue from advertising that readers consider informative). We will reject any ad that we believe will not benefit our readers or will detract from the magazine in any way.

5. We will include a classified advertising section in which non-dealer subscribers may place one ad per month at approximately our pro-rata cost of production. A dealer may place a single ad per month, but at a somewhat higher rate and may advertise only equipment and services for which a specified price is included in the ad.

Who are we writing this magazine for?

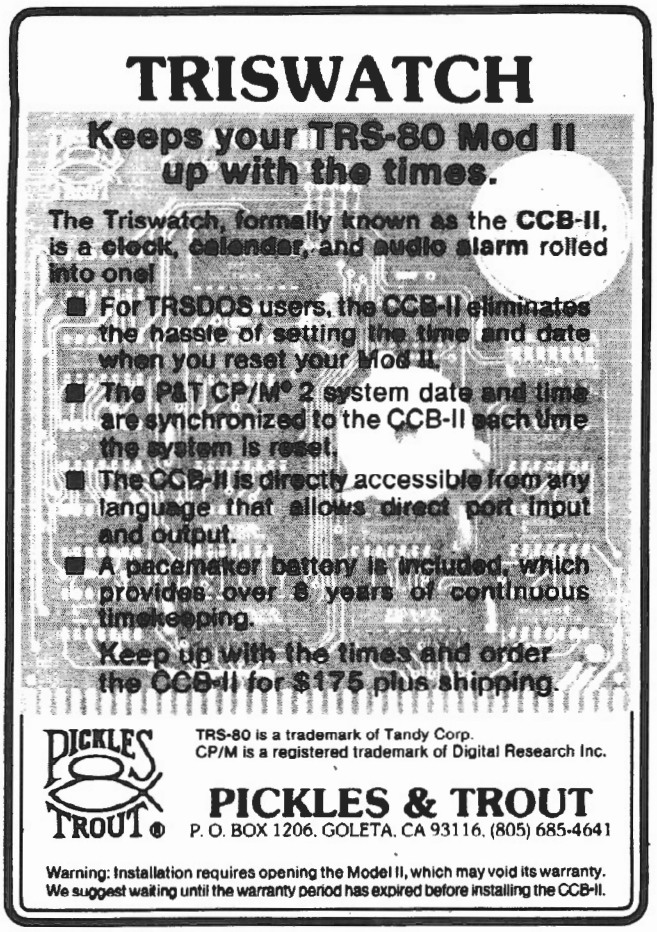
When any new magazine is produced, its editors must make some arbitrary assumptions about its readers. I've talked with many Model II users. Extrapolating from these conversations and other experience, I've concocted the following profile. It won't fit any reader completely, but I hope it's a reasonable composite. We'll try to refine it through reader surveys.

This is how we see you (the composite reader):

1. You are in business, a profession, or science, and you use your Model II in connection with your career. You are viewed by your peers as an innovator. (How many of **them** have a serious computer?)

2. In spite of your career accomplishments, you have a profound feeling of inadequacy with respect to your computer. This is an easy guess, since nearly all of us feel that way. There's never enough time and there aren't enough ready sources of information for a typical user to be able to accomplish everything he wants to do.

3. Though you can't do all you'd like with the "black box," you are getting enough done to make the



effort worthwhile, and you're having fun doing it. (Isn't it starting to realize that you can do more computation in a few minutes than your grandfathers could do in a lifetime?)

4. You want to accomplish more with your computer without having to devote a lot more time to it. You need specific, hard information you can use right away. Maybe you need a way to learn assembly language so that you can easily perform a function not otherwise available. Perhaps you need to select a faster printer, but can't get enough data to sort out all the various features that are offered.

This is how we see you. Everything we publish will be aimed at giving you more immediately usable information. All of it will be as specific as we can make it, and it will all be with the Model II and Model 16 in mind. Because of our specialization on these two compatible machines, we will be able to provide help you can use right away.

To help you the most, we need to know what your problems are. These problems will certainly change in character as you become more expert with your computer. So please return each survey we send you. Tell us what you need. Tell us what we're doing right so that we continue it. Tell us what we're doing wrong so that we can correct it. As we develop a better picture of you and your information needs, we will provide an increasingly useful magazine. ☐

Is a new beginning, a raid on the inarticulate
With shabby equipment always deteriorating
In the general mess of imprecision of feeling.

Thomas Stearns Eliot
Four Quartets

Lamentations on the Radio Shack Basic Interpreter

Discontent is the first step in the progress of a man or a nation. — Oscar Wilde

To make my unbiased position perfectly clear at the outset, let me say that, in my opinion, supplying a BASIC interpreter with a business oriented computer should be a felony! And I'm glad to see that, with the introduction of the Model 16, Radio Shack is reforming its ways.

The siren call of the simple interpreter has caused many an otherwise astute business user to head down the path to misery and perdition. The language is so easy to learn. Easy to debug. Does wonders with strings. Doesn't need any nasty labels or format statements. (Doesn't print too fast to see.)

But what happens when new applications and increased volume overload the computer? When program enhancements produce out-of-memory crashes? When line-number-labels get all tangled up? When you decide to modularize but find that the global variable "feature" of BASIC won't let you use subroutine libraries of your own without a lot of bookkeeping? What happens? You learn a serious language and reprogram everything.

There are some good things to be said for BASIC. First, it is incredibly simple to learn. Most people can attain a minimally useful proficiency in a day or two. Fairly complete mastery might require a few weeks. Other, more

powerful, languages, such as FORTRAN, may take as many months to master. But BASIC was originally designed only as a tutorial to introduce neophytes to the concepts and logic of computer programming.

"Because it's there," and because it's easy, many business users have started with BASIC. But many have stayed with it too long, and have unwittingly become committed to the eventual need to reprogram *everything.*

Here's a summary of the shortcomings of the BASIC interpreter:

1. It is extremely slow in calculation. This is because each instruction gets "interpreted" (from source code to machine language) each time it is executed. In a typical business program which reads many records, the instructions for processing each record are interpreted again each time a new record is read. By contrast, a "truly compiled" language (RS COMPILER BASIC is not really compiled at all) converts source code instructions into machine language **only once**, while the program is being developed. In straight computation, FORTRAN will probably require only 3% to 10% of the time required by the BASIC interpreter.

2. It is not source-compatible with any other BASIC. The real shocker is that it's totally incompatible with Radio Shack's own BASIC "compiler." Of course, reviewers have pointed out that the BASIC "compiler" isn't really a compiler and, incredibly, is actually slower than the interpreter for some applications.

3. Program size is limited to about 32k, and can't be increased by overlays. An overlay is a substitution of program code (from disk) for part of the code in core, preserving required variables. BASIC programs must share memory at run time with the BASIC interpreter program and with the entire BASIC source code, including comments and other included documentation.

4. Subroutine libraries are not practical. Variables are "global" to programs and their subroutines, whereas other languages treat variables as "local" to the main program or to each subroutine (or, like ALGOL, allow the programmer to choose whether a given variable is local or global). Local variables avoid conflict in naming variables in that subroutines may contain names which might be duplicated in main programs which call them. A second problem is the lack of a "link-editor," so that there is no reasonable way to append called subroutines to the main program. Link-editors (also called "linking loaders") are used with libraries of "relocatable" subprogram code which has been generated by compilers or assemblers. When invoked, they can search specified libraries and merge subprogram code with compiled main program code and make certain that all subprogram references in the programs are satisfied. Most non-BASIC languages have these features.

5. Labels are essentially invisible (hidden in the line number). Other languages contain readily visible labels, often in a specific field, so that it is easy to see where referenced lines are located. In BASIC, it is up to the programmer to figure out whether a line is referenced or not (and can be removed or changed). Naive programmers try to get around this by compounding the mess: setting rigid line number conventions (which severely inhibit program maintenance) or adopting indenting schemes (often based on a design which works well for ALGOL or PASCAL, but which usually doesn't exactly fit BASIC's structure).

6. Comments and other documentation occupy memory while the program is running and thus reduce the maximum program size. Compiled languages drop all the non-essentials when compiling so that no memory is occupied by comments at run time.

7. The program editor lacks many essential features. Compared to many program editors, the BASIC interpreters edit features are extremely frustrating. Two fatal omissions are (1) the inability to make "global" file changes (for example, change every occurrence of the string ABC1 to TEST3) and (2) the inability to move blocks of lines from one part of a file to another. Of course, under the RS BASIC architecture the "edit" features must be present in memory even at run time, so they must remain very primitive.

8. Random access requires the tedious, code-wasting, fielding of variables. FORTRAN allows a simple formatted read of a random (or "direct") file.

9. Double precision logs and exponentials are not provided, so that common interest functions (e.g., present value, accumulated value) are difficult or impossible to produce. Investment accounting for financial institutions cannot be done in RS BASIC.

Some Model II users may conclude that none of these shortcomings will ever affect them very seriously. However, as applications become more sophisticated and volumes grow, this is as dangerous a view as the classic "But I'm *certain* that I'll never need more disk storage than this."

Our advice: Review your use of BASIC periodically. Make sure you don't "paint yourself into a corner." Keep up with at least the general possibilities of more powerful and flexible languages and development systems. We'll try to help you do this with articles about other languages, alternate operating systems, and proprietary development systems. ☐

How to make your Epson smell like a Daisy with WordStar 3.0

Editors note: The procedures listed below were developed on a Model II with an Epson MX-100 printer under Pickles & Trout CP/M. However, they will probably work with other CP/M-Epson combinations. In any case, the principles can be applied so that you can adapt specific patches for your own requirements.

Getting help with WordStar is difficult. MicroPro will not assist users directly but requires its dealers to provide all service. This results in aid which is very slow, and often faulty, because typical dealers handle too many software products for too many computers to be able to be qualified with each combination. However, if you jump right into the Printer Patch Area, you'll be surprised what you can get done by yourself.

WordStar concentrates on the glamorous Daisies, ignoring the many virtues of our ignominious Dot-Matrix waifs. But you can overcome its wandering affections and get simple WordStar commands to do all this with your solid old Epson:

1. Condensed print.
2. Emphasized print.
3. Enlarged print.
4. Enlarged-condensed print.
5. Eight character per inch vertical spacing, with correct paging even when mixed with 6 per inch.
6. Full highlighting (not supported by the SpellStar patch for the P + T Mod II).
7. And even a choice of any two language character sets of the eight available on the MX-100.

The accompanying list of installation commands will accomplish all of the above for the Mod II, P + T, MX-100 combination. Notice that if you are not using SpellStar you should select terminal menu 3, terminal [(TRS-80 Mod II, P + T), and skip patches 1 and 7. To provide proper operation with SpellStar, select terminal menu 3, terminal < (ADDS 2025), and include patches 1 and 7. For all other patches, we show the WordStar switch associated with the patch right after the patch name. For the 6/8 character per inch toggle, you must also use the .lh commands in order to retain correct page length.

There are a few constraints which must be observed to get good results with the Epson-WordStar commands:

1. An emphasis or condensed switch affects printing for the entire line, no matter where the switch is in the line.
2. Emphasis must be off *prior* to the line on which condensed begins.
3. Emphasis works with normal print only (10 characters/inch).
4. Don't get carried away. If you combine emphasized print with both of WordStar's bold-face (^B) and double-strike (^D) commands, each character will be struck *twelve* times. Of course, you can use this to get readability out of a very dead ribbon.

We've used all the patch locations we thought were safe to use, yet there are more Epson features we haven't implemented in WordStar:

1. Subscripting and superscripting. This might be done by patching PSHALF: with ESC, A, 6 (hex 1B,41,36), but you will have to forego the ROLUP:-ROLDOW: patches which we have arbitrarily assigned to the 8 or 6 character per inch switch.
2. Sounding the Epson bell.
3. Deselect paper end detector (nice for printing on loose sheets).
4. Selection of additional language character sets.

You may want to substitute some of these patches for the ones we've detailed (refer to appendix F of the WordStar Installation Manual). Once you get the hang of WordStar patching, it's easy as pie. When you add all these features to WordStar's basic repertoire (bold-face, double-strike, underline, strikeover, etc.), we poor dot-matrix folks look almost as good as a Daisy (and a lot faster, too). ☆

WORDSTAR 3.0 INSTALLATION

(on Radio Shack Model II, Epson MX-100, & P+T CP/M)

COMMANDS:

```
INSTALL <ENTER>
N
B
WSU <ENTER>      INPUT FILE
WS  <ENTER>      OUTPUT FILE
3                TERMINAL MENU   /(THIS IS THE TERMINAL
<                ADDS 2025       \ SELECTION FOR TRS-80
Y                                  MOD II IF SPELLSTAR
A                PRINTER           IS IN USE, ELSE 3, I,
Y                                  AND SKIP PATCHES 1 & 7)
N                NO PROTOCOL
Y
L                LIST DEVICE
Y
N                DO PATCHES
```

PATCHES:

1. ERASE TO END OF LN:
   ERAEOL:<ENTER>
   0 <ENTER>

2. CONDENSED (^A):
   PALT: <ENTER>
   1 <ENTER>
   <ENTER>
   0F <ENTER>

   STANDARD (^N):
   PSTD: <ENTER>
   1 <ENTER>
   <ENTER>
   12 <ENTER>

3. EMPHASIS (^O):
   USR1: <ENTER>
   2 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   45 <ENTER>

   EMPH. OFF (^W):
   USR2: <ENTER>
   2 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   46 <ENTER>

4. ENLARGED (^B):
   USR3: <ENTER>
   1 <ENTER>
   <ENTER>
   0E <ENTER>

   ENL. OFF (^R):
   USR4: <ENTER>
   1 <ENTER>
   <ENTER>
   14 <ENTER>

5. 8 CHAR/IN (^T & .LH 6):
   ROLUP: <ENTER>
   2 <ENTER> <ENTER>
   1B <ENTER> <ENTER>
   30 <ENTER>

   6 CHAR/IN(^T & .LH 0):
   ROLDOW: <ENTER>
   2 <ENTER> <ENTER>
   1B <ENTER> <ENTER>
   32 <ENTER>

7. INVERSE VIDEO:
   IVON: <ENTER>
   1 <ENTER>
   <ENTER>
   0E <ENTER>

   NORMAL VIDEO:
   IVOFF: <ENTER>
   1 <ENTER>
   <ENTER>
   0F <ENTER>

ALTERNATIVE 'TOGGLES':

6. ENGLISH (^Y):
   RIBBON: <ENTER>
   3 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   52 <ENTER>
   <ENTER>
   3 <ENTER>

   U. S. A. (^Y):
   RIBOFF: <ENTER>
   3 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   52 <ENTER>
   <ENTER>
   0 <ENTER>

   SPANISH (^Y):
   RIBBON: <ENTER>
   3 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   52 <ENTER>
   <ENTER>
   7 <ENTER>

   U. S. A. (^Y):
   RIBOFF: <ENTER>
   3 <ENTER>
   <ENTER>
   1B <ENTER>
   <ENTER>
   52 <ENTER>
   <ENTER>
   0 <ENTER>

8. FINISH WITH:
   0 <ENTER>
   Y

Information Exchange

Subscribers to **two/sixteen** receive a lot more than a magazine. Because **two/sixteen's** interest is limited to matters affecting Radio Shack Model II and Model 16 users, we are able to offer the **two/sixteen** Information Exchange. Beginning in September, 1982, we plan to offer this service separately at $100 per year (including **two/sixteen** magazine). Magazine subscriptions will continue to be available alone. However, all Charter Subscribers will be entitled to this service for half price ($20 additional, currently) for as long as they subscribe to **two/sixteen.**

What is the Information Exchange?

1. Telephone consultation. If you have a problem and can't get a satisfactory answer from your primary sources, call us. We will (a) give you an immediate answer if we know it, (b) suggest a qualified source for the best answer, or (c) research the question ourselves and call you back. We intend to arrange our telephone service so that when lines are busy an answering service will take your name and number and we'll call you back. (No waiting for half an hour to find that you must call another department.)
2. Bulletin board. One of our computers will be installed on a special telephone number. It will contain all the latest information of general interest, including Tandy developments, new software information (from any source), semi-finished articles for future issues, founded and unfounded rumors, and other data of interest to **two/sixteen** users. To avail yourself of this service, you will need a modem (such as the Hayes Smartmodem) and communications software (the Model II TERMINAL program should suffice.)
3. Exchange mailbox. You may send information (we suggest transferring files to save telephone connect time) to any other Exchange member whose code number is known (a directory will be available in the system, but an exchange member may elect not to be listed). If the intended recipient has not obtained the file within one week, we will print a copy and mail it to him. This facility may also be used to correspond with **two/sixteen.** You may submit articles, questions, change of address, or general information this way.

We would appreciate comments from readers about this potential service. Is such a service of interest to enough people to make it economically feasible? Should it include software sales (at high discounts to members)? Do you think you would subscribe to such a service? What other features should be included? Please let us hear from you.

A hard beginning maketh a good ending.

John Heywood, Proverbes

Patching TRSDOS: Fear not!

From Webster's New International Dictionary, Second Edition, Unabridged (copyright 1959):

patch, n., . . . 1. Something, esp. a piece like the original material, used to mend, fill up, or cover a hole, rent, breach, or weak spot. . . .

It's almost as though Webster had the computer world in mind way back when this definition was written.

For the uninitiated, the term patch (as used by computerists) means a change to machine language program code. Patches may consist of (1) removing code (usually by replacing it with some kind of no-operation code, if instructions; or zeroes, if data) for the purpose of eliminating some program feature, (2) changing code so as to modify a feature, or (3) adding code in a preallocated area (previously filled with zeroes or no-ops) in order to activate an optional feature. In the large main-frame environment, patches are regularly released by developers of large programs (such as an operating system) to

correct "bugs" discovered in commercial use.

"Patch" is always used in this special sense and never to mean an edit to source code (even though the latter fits Webster's general definition).

Managements of large data processing installations often prohibit patches to operating systems (except, of course, for corrections provided by the original authors). The reason for this prohibition is that such large systems have many users, some of whom are not under the control of data processing management. These users are entitled to expect the operating system to perform according to its published specifications; there is always the risk that any patch, even the most seemingly inocuous, may cause an operating system feature to malfunction, producing potentially disastrous results. However, because we micro hackers are in charge of our own destiny, we need not be so concerned. Patching a micro's operating system should be no more frightful than any other program modification.

Under the TRSDOS operating system, patching is usually done with either the utility program PATCH or the TRSDOS command DEBUG. The PATCH installation will be shown here. We recommend that all patching be done from "BUILD-files" which are executed by the DO command. This practice reduces the chance of typos and provides hard-copy evidence of the patches attempted. When reasonably sure that a "BUILD-file" of patches has "taken" correctly, we append the file to another file, arbitrarily named "PATCH REC/nnn." This file provides a convenient reference to the patches installed on the disk being used (another disk may have different patches so as to provide features specific to another application).

Here are five patches. One is to the FORMAT utility. The rest are to the operating system (SYSRES/SYS). These patches have been floating around anonymously in the public domain, and we regret that we can't give credit to their original creators.

After all patches are described, we provide a composite "BUILD-file" which will install all five patches.

Now you can make your system more efficient with these five patches:

DISK DRIVE WOES?
PRINTER INTERACTION?
MEMORY LOSS?
ERRATIC OPERATION?

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Power Line Spikes, Surges & Hash could be the culprit! Floppies, printers, memory & processor often interact! Our patented ISOLATORS eliminate equipment interaction AND curb damaging Power Line Spikes, Surges and Hash. MONEY BACK GUARANTEE!

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- SUPER ISOLATOR (ISO-11) similar to ISO-2 except double isolation & Suppression $104.95
- MAGNUM ISOLATOR (ISO-17) 4 Quad Isolated sockets; For ULTRA-SENSITIVE Systems $181.95
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- REMOTE SWITCH, any model (Add-RS) ..... Add $16.00

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(617)655-1532

Reduce Format Retry Count
Patch 1 changes FORMAT's retry count to one instead of the current ten. (Would you want to unknowingly use a disk which required ten tries just to format?)

Make SYSTEM Files Accessible
Patch 2 makes system files accessible just like other passworded files. For example, this will allow you to move Tandy software from one disk to another without the horrors of XFERSYS.

Speed Up Disk Drive Head Stepping Rate
Patch 3 speeds up the disk drive head stepping rate. Our drives (Shugart 801) run noticeably quieter at the 12ms rate.

Bypass Tandy Logo Display
Patch 4 causes the Tandy logo display to be bypassed on boot-up. It's especially refreshing when you are debugging assembly language programs and have to reboot frequently.

Shortcuts with the FORMS command
Patch 5 suppresses a series of

SOUTHFORK SOFTWARE

TUTORPAK

An integrated package of 30 lessons that tutor the user in the BASIC language. Ideal for Model II owners who wish to learn BASIC in a self-paced manner ..... $30.00.

DEMOPAK

A smorgasboard of 50 programs for leisure and personal use. Included are games (28) personal finance (12), math/stat. (10). All for less than $1.00 per program! $40.00

BUDGET MONITORING SYSTEM

Monitors multiple project or personal budgets. Tracks expenditures, encumberances, and balances in user defined categories on actual and percent complete bases. Ideal for busy researchers, businessmen, or engineers who wish to monitor projects budgets $40.00

BONEPILE

A collection of Model II BASIC subroutines for those involved in program development. Date entry with verification, difference between days, menue headers, skeleton screens for data entry, day of year, file indexing, and a skeleton for establishing and operating an 1800 record random access file (index sequential) $30.00

CUSTODIAN

Implements the custodial accounting function for equipment inventories. System captures property ID#, item name, manufacture, model #, serial #, acquisition cost and date, location, and inventory date. Designed for equipment inventory management and custodial reporting $40.00

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Southfork Software
68 Fairlake Drive
Hattiesburg, MS 39401

Specify TRSDOS 1.2 or 2.0 Version with order.

extraneous questions which are asked when you use certain switches with the FORMS command. (This suppression is especially useful when you need to include a FORMS command in a "BUILD-file." It prevents a pause in processing when a FORMS command is encountered.)

This is the "BUILD-file" for the five patches:

```
PAUSE Patch 1 — Change FORMAT's retry count from 10 to 1.
PATCH FORMAT A=2942,F=0A,C=01
PATCH FORMAT A=2973,F=0A,C=01
PAUSE Patch 2 — Provide password access to system
                files. PW=KTA2.
PATCH SYSRES/SYS A=1786,F=23,C=00
PAUSE Patch 3 — Change head stepping rate from 20ms to 12ms.
PATCH SYSRES/SYS A=0CFB,F=1E,C=1D
PATCH SYSRES/SYS A=0D12,F=1E,C=1D
PAUSE Patch 4 — Kiss the TANDY logo goodbye.
PATCH SYSRES/SYS A=24D3,F=00,C=3B
PAUSE Patch 5 — Remove silly questions on FORMS command
                execution.
PATCH SYSTEM/SYS R=42,B=172,F=CD07,C=1809
PATCH SYSTEM/SYS R=42,B=225,F=CF20FB,C=000000
PATCH SYSTEM/SYS R=42,B=231,F=CD0725,C=C3FB22
RESET
```

You may want to install these patches one-by-one rather than all at once. The PAUSE lines are not required, but it's nice to include them so you can remember what the patches do.

Naturally, DO NOT install these (or any other) patches on your distribution disk, but only on working copies.

Want to reverse the patches? It's as easy as copying a new SYSRES/SYS or FORMAT from your unmodified "working master" System Diskette to the working copy you want to reverse. Another way is to produce new patches which will change the codes back. If you review the section on PATCH in the TRSDOS Reference Manual, you will find it easy to construct the reversal patches. ☐

Directory of Microcomputer Periodicals

The following list of microcomputer magazines is presented for the convenience of readers who need access to additional periodical information. It was compiled primarily from library directories. Copies of each publication's data were sent to the publisher for correction and all responses are included. If you are aware of any other periodicals that should be included, please let us know. We intend to publish updated directories at least annually.

Magazine:	80 Microcomputing
Slogan or description:	the magazine for TRS-80 users
Frequency:	Monthly
Pages:	about 400
Publisher name:	1001001, Inc.
Address:	80 Pine Street
City, State, ZIP:	Peterborough, NH 03458
Subscription price:	$25 per year
Cover price:	$2.95
First published:	January, 1980
Circulation:	100,000 (February, 1982)

Magazine:	80 U.S. Journal
Slogan or description:	The TRS-80 Users' Journal
Frequency:	Monthly
Pages:	116
Publisher name:	I. Mike Schmidt
Address:	3838 S. Warren
City, State, ZIP:	Tacoma, WA 98409
Subscription price:	$16
Cover price:	$3
First published:	September, 1978
Circulation:	20,000

Magazine:	Business Computing
Slogan or description:	The new publication for serious small business computer users
Frequency:	Monthly
Pages:	16
Publisher name:	H & E Computronics
Address:	50 N. Pascack Road
City, State, ZIP:	Spring Valley, NY 10977
Subscription price:	$48/yr
Cover price:	$4
First published:	January, 1982
Circulation:	2,000

Magazine:	Byte
Slogan or description:	The Small Systems Journal
Frequency:	Monthly
Pages:	492
Publisher name:	Byte Publications, Inc. (McGraw-Hill)
Address:	70 Main Street
City, State, ZIP:	Peterborough, NH 03458
Subscription price:	$19
Cover price:	$2.95
First published:	1975
Circulation:	245,000

Magazine:	Computronics Mod II Newsletter
Slogan or description:	
Frequency:	random
Pages:	12
Publisher name:	H & E Computronics
Address:	50 N. Pascack Road
City, State, ZIP:	Spring Valley, NY 10977
Subscription price:	$18/12 issues
Cover price:	none
First published:	January, 1982, was Volume 1, No. 7
Circulation:	4,000

Magazine:	Computronics Monthly Newsmagazine
Slogan or description:	Practical support for Model I, II, III, Color, & Pocket
Frequency:	Monthly
Pages:	
Publisher name:	H & E Computronics
Address:	50 N. Pascack Road
City, State, ZIP:	Spring Valley, NY 10977
Subscription price:	$24
Cover price:	$2.95
First published:	Now in our fifth year
Circulation:	25,000

Magazine:	Creative Computing
Slogan or description:	The #1 magazine of computer applications and software
Frequency:	Monthly
Pages:	224
Publisher name:	David Ahl
Address:	Box 789-M
City, State, ZIP:	Morristown, NJ 07960
Subscription price:	$24.97
Cover price:	$2.95
First published:	1974
Circulation:	150,000

Magazine:	Desktop Computing
Slogan or description:	The plain language computer magazine for businessmen
Frequency:	Monthly
Pages:	100
Publisher name:	1001001, Inc.
Address:	80 Pine Street
City, State, ZIP:	Peterborough, NH 03458
Subscription price:	$25
Cover price:	$2.95
First published:	October, 1981
Circulation:	60,000

Magazine:	Dr. Dobbs Journal
Slogan or description:	For users of Small Computer Systems
Frequency:	Monthly
Pages:	64 +
Publisher name:	Peoples Computer Company
Address:	Box E
City, State, ZIP:	Menlo Park, CA 94025
Subscription price:	$25
Cover price:	$2.50
First published:	1976
Circulation:	15,000

Magazine:	InfoWorld
Slogan or description:	
Frequency:	
Pages:	
Publisher name:	Maggie Canon, Editor-in-chief
Address:	530 Lytton Avenue
City, State, ZIP:	Palo Alto, CA 94301
Subscription price:	
Cover price:	
First published:	1980
Circulation:	

Magazine:	Interactive Computing
Slogan or description:	
Frequency:	
Pages:	
Publisher name:	Association of Computer Users
Address:	P.O. Box 9003
City, State, ZIP:	Boulder, CO 80301
Subscription price:	
Cover price:	
First published:	
Circulation:	

Magazine:	Interface Age
Slogan or description:	Computing for business and home
Frequency:	Monthly
Pages:	160
Publisher name:	McPheters, Wolfe, & Jones
Address:	16704 Marquardt Avenue
City, State, ZIP:	Cerritos, CA 90701
Subscription price:	$18
Cover price:	$2.50
First published:	Since December, 1975
Circulation:	72,090

Magazine:	Microcomputing
Slogan or description:	Hands-on approach to intelligent microcomputing
Frequency:	Monthly
Pages:	200
Publisher name:	Wayne Green, Inc.
Address:	80 Pine Street
City, State, ZIP:	Peterborough, NH 03458
Subscription price:	$24.97
Cover price:	$2.95
First published:	January, 1977
Circulation:	91,000

Magazine:	Micro
Slogan or description:	The 6502/6809 Journal
Frequency:	Monthly
Pages:	132
Publisher name:	Mary Grace Smith
Address:	34 Chelmsford Street
City, State, ZIP:	Chelmsford, MA 01824
Subscription price:	$24.00/yr.
Cover price:	$2.50
First published:	1977
Circulation:	21,000

Magazine:	Mini Micro Computer Report (newsletter)
Slogan or description:	
Frequency:	Monthly
Pages:	
Publisher name:	EDP News Services
Address:	7620 Little River Tpke.
City, State, ZIP:	Annandale, VA 22003
Subscription price:	$75
Cover price:	$5
First published:	1976
Circulation:	90,975

Magazine:	Mini Micro Systems
Slogan or description:	
Frequency:	Monthly
Pages:	
Publisher name:	Cahners Publishing Co.
Address:	270 St. Paul Street
City, State, ZIP:	Denver, CO 80206
Subscription price:	$30
Cover price:	
First published:	1968
Circulation:	82,239

Magazine:	Personal Computer World
Slogan or description:	
Frequency:	Monthly
Pages:	
Publisher name:	Intra Press
Address:	629 Westbourne Grove
City, State, ZIP:	London W.2, England
Subscription price:	$20
Cover price:	
First published:	
Circulation:	

Magazine:	Personal Computing
Slogan or description:	
Frequency:	Monthly
Pages:	160
Publisher name:	Hayden Publishing Corp.
Address:	50 Essex Street
City, State, ZIP:	Rochelle Park, NJ 07662
Subscription price:	$18
Cover price:	$2
First published:	1976
Circulation:	200,000

Magazine:	Popular Computing
Slogan or description:	
Frequency:	Monthly
Pages:	
Publisher name:	Fred Gruenberger
Address:	Box 272
City, State, ZIP:	Calabasas, CA 91302
Subscription price:	$17.50
Cover price:	$2.50
First published:	1973
Circulation:	

Magazine:	Popular Computing
Slogan or description:	
Frequency:	Monthly
Pages:	130
Publisher name:	Byte Publications, Inc. (McGraw-Hill)
Address:	70 Main Street
City, State, ZIP:	Peterborough, NH 03458
Subscription price:	$18
Cover price:	$2.95
First published:	First issue was November, 1981
Circulation:	

Magazine:	Small Business Computer News
Slogan or description:	Evaluations of business minicomputers & microcomputers
Frequency:	Monthly
Pages:	24-28
Publisher name:	Management Information Corp.
Address:	140 Barclay Center
City, State, ZIP:	Cherry Hill, NJ 08034
Subscription price:	$295 for 42 issues
Cover price:	
First published:	1975
Circulation:	

Magazine:	Small Business Computers
Slogan or description:	
Frequency:	
Pages:	
Publisher name:	SBC Publishing Co.
Address:	33 Wachtung Plaza
City, State, ZIP:	Montclair, NJ 07042
Subscription price:	
Cover price:	
First published:	
Circulation:	

Magazine:	Small Business Systems
Slogan or description:	
Frequency:	Monthly
Pages:	4 pp. newsletter
Publisher name:	Charles Moore Assoc., Inc.
Address:	Box 6
City, State, ZIP:	Southampton, PA 18966
Subscription price:	$39
Cover price:	
First published:	1979
Circulation:	42,000

Magazine:	Small Systems World (variant: System/3 World)
Slogan or description:	The magazine for business system managers
Frequency:	Monthly
Pages:	52
Publisher name:	Hunter Publishing Co.
Address:	950 Lee Street
City, State, ZIP:	Des Plaines, IL 60016
Subscription price:	$15, or free to qualified small business computer users
Cover price:	$1.50
First published:	1973
Circulation:	40,243

Magazine:	Softalk
Slogan or description:	(Apple only)
Frequency:	Monthly
Pages:	200
Publisher name:	Softalk Publishing, Inc.
Address:	11021 Magnolia Blvd.
City, State, ZIP:	North Hollywood, CA 91601
Subscription price:	$24
Cover price:	$2.50
First published:	September, 1980
Circulation:	80,000

Magazine:	Softline
Slogan or description:	Games and gamemaking on all microcomputers
Frequency:	Bi-monthly
Pages:	64
Publisher name:	Softalk Publishing, Inc.
Address:	11021 Magnolia Blvd.
City, State, ZIP:	North Holywood, CA 91601
Subscription price:	Free to owners of personal computers
Cover price:	$1
First published:	September, 1981
Circulation:	40,000

Help!

two/sixteen magazine needs articles on any topic of interest to Model II and Model 16 users. We are particularly interested in discussions of especially vexing problems which you have faced and resolved, and which other II or 16 users are likely to face. We also want hardware reviews, software reviews, discussions of languages, and descriptions of unusually productive applications. All articles should be based on personal experience and must be previously unpublished.

Writing should be clear, concise, and readable. Writers who are unsure about style should refer to "The Elements of Style" by Strunk and White, available in most libraries and bookstores. It is a small book, but more than adequate.

Submissions may be either in

typed form, double-spaced with one inch margins, with a minimum length of three pages (including programs, if any), or in diskette form, either TRSDOS or CP/M format, which may contain WordStar printing controls (but non-daisy wheel only). Output from other word processing programs must be in straight ASCII format. Hard copy program listings should be on unlined paper with sufficiently dark print for reproduction. Program lines should be no more than 60 characters wide, and no lines should wrap (unless unavoidable in the circumstances, and then the wrapped lines should be appropriately indented).

two/sixteen assumes no responsibility for manuscripts, diskettes, art work, photos, or other submission material. However, diskettes will be returned if sent to us in a reusable diskette mailer (e.g., Dennison Kangaroo) along with $1 for return postage. If an article submitted on a diskette is published, we will add a copy of our game, STARSHIP I, which sells for $50, to your diskette prior to returning it. This is your bonus for providing us with machinable media. Acknowledgements will be made of typed material only if a large stamped self-addressed envelope accompanies the submission.

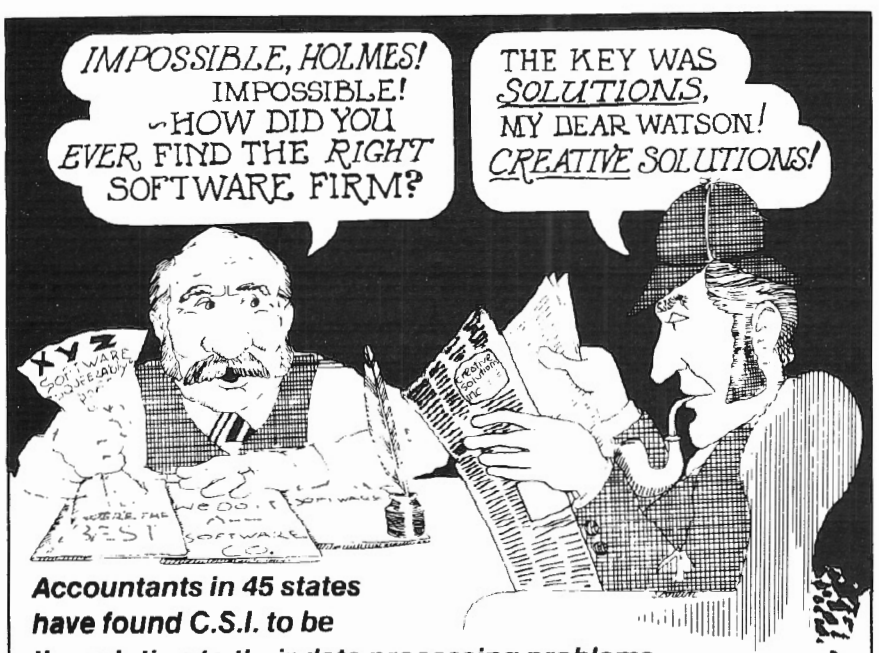
In addition to the author's name, his mailing address and telephone number will also be published with the article unless the author asks us to omit them.

two/sixteen pays $30-$60 per published page.

Submissions should be sent to Editoral Staff, **two/sixteen magazine**, 216½ West James Street, Lancaster, PA 17603. ☐

Minds that have little to confer
Find little to perceive.

Wordsworth



Accountants in 45 states have found C.S.I. to be the solution to their data processing problems

C.S.I. features the following systems for the TRS-80* microcomputers:

- Client Write-Up
- 1040 Tax Preparation
- Time and Billing
- ACRS Depreciation
- Amortization

*TRS-80 is a registered trademark of Tandy Corp.

CREATIVE SOLUTIONS, INC. 1945 Pauline Blvd. Suite 15A Ann Arbor, MI 48103 (313) 995-8811

More Help!

two/sixteen needs qualified Model II and Model 16 users to help us on a regular basis. Part-time editors, reporters, and columnists are needed.

If you are a part-time editor, we will send you articles that have been submitted to us. You will edit, correct, and criticize these articles, and recommend publication or rejection.

If you are a part-time reporter, you will seek out and research topics that you think will be of interest to a significant portion of our readers. You may also be assigned topics that need coverage and that your background and experience suggest that you could handle.

Part-time columnists will be expected to produce a column at least once every two months (each issue until we become monthly) on some general area of specialization. Examples might be business computing, mathematics, accounting, a specific language, or surveys and comparisons of a particular type of hardware (e.g., printers, hard disks, modems). If you would like to be a columnist, you should suggest your own topic.

Each part-time editor, reporter, or columnist will be listed on the masthead (as Contributing Editor, etc.) of each issue in which his work appears.

In addition to compensation, which will be comparable to that for other authors, these regular contributors will receive free subscriptions to **two/sixteen magazine** and such other perquisites as we can dream up from time to time.

If you are interested in participating in this program, please send a "resume," including whatever information you believe indicates qualification for this work. Send samples of your writing ability, published or not. We are not interested in your educational qualifications, but only in your demonstrable ability to communicate in writing to our kind of audience and in your reasonably good understanding of some important aspect of microcomputer use.

We also will be hiring a number of full-time employees for positions here in Lancaster (a pleasant town of 60,000 in the heart of "Pennsylvania Dutch" country, about 70 miles from either Philadelphia or Baltimore). Any publishing-related skill will be considered, but we do require that all employees have hands-on experience with Model II (or 16, when available) microcomputers. Hands-on experience with high quality large scale interactive computers (e.g., DEC-10, DEC-20, VAX) is a plus. (We don't care whether you smoke or not. We considered hiring only smokers so as to balance the competition, but reneged due to the possibility of asphyxiation.) We are an equal opportunity employer (male, female, race, color, creed, straight, gay, liberal, conservative, etc., but we will not permit anyone to behave more eccentrically in the office than the publisher does: RHIP).

Please send resumes to Richard H. Young, publisher, **two/sixteen magazine**, 216½ West James Street, Lancaster, PA 17603. Please do not telephone us about either part-time work or full-time positions unless we've had your material for a month without getting in touch with you.

There was an old miser named Clarence
Who Simonized both of his parents.*
The initial expense,
He remarked, is immense,
But I save it on wearance and tearance.

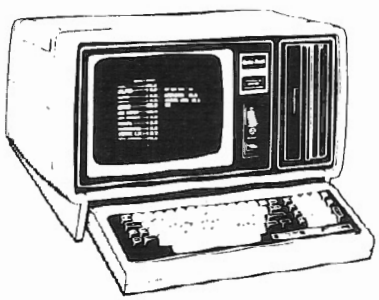
**Simoniz is a trademark of the Union Carbide Corporation*

New Product Review: Practical Peripheral's Microbuffer for Epson Printers

Printer buffers have become the new hot peripheral (if you believe the volume of advertising from the many manufacturers appearing on the scene). There's good reason for their popularity, too. How many times have you started to print a large document (say, a ten page program) and were stuck with 4-5 minutes without the use of your computer? (And we all know about the horrors of computing while the "spooler" is printing; if you don't know, you will be in for a shock when you try it.)

One drawback to most of the available buffer devices is the presence of one more box at your computer site. Another is price, which varies widely among the available devices, and is not necessarily proportional to the value of the device to a Model II user. We've seen prices above $600 for printer buffers.

The Microbuffer by Practical



MODEL II USERS

TIRED OF WAITING FOR DISK FORMATS AND BACKUPS?

FASTFMT formats and verifies a disk in 43 seconds.
TRSDOS[1] FORMAT takes 2½ minutes.

FASTBAK copies and verifies a full disk in 59 seconds (2 drives).
TRSDOS BACKUP takes 8 minutes.

These utilities make everday data backups a snap and are distributed on an 8" TRSDOS diskette for systems with 1 or more drives.

$99.95 plus $2.00 shipping VISA/MC

CP/M[2] SOFTWARE FOR THE MODEL II

Run Model II BASIC and VisiCalc[3] under CP/M.

Use the Magic Wand[4] word processor with the Daisy II printer — bidirectional printing, justified proportional spacing, more

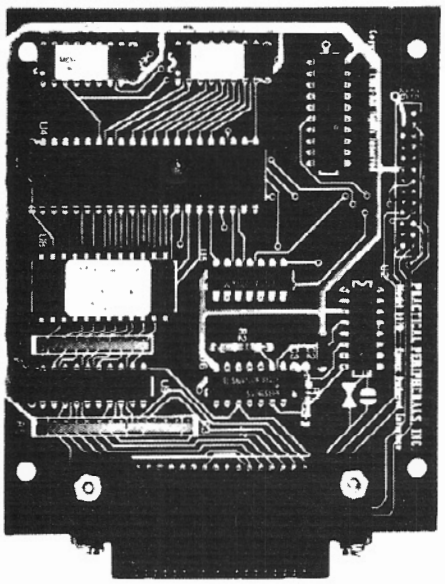
Make fast backups of your P&T and ATON system disks.

Write or phone for details.

[1]TRSDOS is a trademark of the Tandy Corp.
[2]CP/M is a trademark of Digital Research
[3]VisiCalc is a trademark of VisiCorp
[4]Magic Wand is a trademark of Peachtree Software

The MicroProgrammers
5629 University Way NE
Seattle, WA 98105
(206) 525-1466

Peripherals overcomes both of these difficulties for Epson owners (MX-80 or MX-100). The Microbuffer is a small circuit board which fits inside your Epson case (in a "slot" conveniently provided by Epson for additional features). It costs $159, which is the lowest list price we've seen for a genuine buffer.



Practical Peripherals' Microbuffer

There are two "flavors" of Microbuffer (both at $159): parallel and serial. We tested only the parallel buffer. The serial buffer (which has only 8k of buffering vs. 16k in the parallel) is of limited interest to II/16 users. We envision only one practical use for the serial buffer in II/16 environments: the rare case where a user needs two printers, an Epson attached to a serial port while another printer, say a daisy-wheel, is on the parallel port. Even in this case, it would probably be more effective to reverse the printers so that the Epson is on the parallel.

A few of us less mechanically inclined users may be chagrined at the idea of taking the Epson apart and installing a circuit board. Rest easy. The parallel unit we received for evaluation was inadvertently shipped with the wrong instruction sheet (for installing the *serial* buffer; there are some significant differences in approach). I forged ahead and got the board installed without instructions in less than 10 minutes. However, not wanting to burn out my essential Epson, I called the manufacturer to confirm that the seemingly obvious way to install the board was in fact correct. It took just five minutes to establish that it was.

So, less than a half hour from opening the box, the buffer was installed and running.

From the user's viewpoint, the Microbuffer is about as simple to use as could be. You can forget it's there. Conceptually, it simply expands the Epson one-line buffer to a 16,384 character buffer. Everything else works the same as before. If you fill the Microbuffer, it simply signals the computer to stop sending, then asks for more data as the buffer empties (at this point, the computer is slowed down to printer speed again, but it will be released when there are still 16k characters remaining to be printed). By the way, 16k is the equivalent of 240 lines of text containing 68 characters per line. This is about four pages of solid text or 8-12 pages of typical program code, depending on your personal code structuring style — about 4.5 minutes of printing. Four minutes may not *sound* like much, but it *feels* like hours when you are itching to resume work on your computer.

Of course, the buffer still has to be filled by the computer, so there is some delay. I constructed a file of 16,384 characters (the full size of the microbuffer) and printed it via several methods to determine how many seconds each method required before releasing the computer. Here are the results:

Method	Seconds
TRSDOS PRINT	35
Tandy Text Editor	26
WordStar	96
PIP (CP/M)	18

Total MX-100 print time in PIP was 278 seconds, but the computer was available after only 18 seconds — a saving of four minutes, 20 seconds!

In certain applications the Microbuffer will substantially shorten actual printing time. An example: using Mailmerge (a Micro-Pro product which extends the features of WordStar) to print from more than one file: the printer halts while disk is read, then the computer halts while the printing is done. This "leap-frogging" effect is cancelled when the Microbuffer is used, and the printer runs at full speed.

A printer buffer won't help much when you need to print a thirty page book chapter in one go (then it's time to go out to lunch or watch television). But when you are editing articles, debugging programs, or any other medium-sized-listing oriented job, you'll become dependent on it.

What happens when you have loaded the buffer and then decide to abort the print (nothing you can do from the keyboard will affect the printer buffer)? Simply turn off the Epson, then turn it back on. This will purge the buffer's memory.

In summary, if you have an Epson MX-100 or MX-80, the Microbuffer offers a neatly packaged way to release your computer from print chores at the lowest cost we have seen. And without putting another box on your computer work station. I recommend it.

Specifications:
Microbuffer™ model MBP-16, $159
Practical Peripherals, Inc.
31245 La Baya Drive
Westlake Village, CA 91362
(213) 991-8200

The past is but the beginning of a beginning and all that is and all that has been is but the twilight to the dawn. . . . A day will come when beings who are now latent in our thoughts and hidden in our loins shall stand upon this earth as one stands upon a footstool, and shall laugh and reach out their hands amid the stars.

Herbert George Wells,
The Discovery of the Future

He has the deed half done,
who has made a beginning.

Horace, Epistles, Book I

Reader Surveys: Get into the act!

This first issue of **two/sixteen magazine** has been prepared somewhat in the dark. We don't have an objective picture of our composite audience. The inserted Reader Survey form is designed to produce a simple composite of the hardware and software owned by our readers, and what's more important, what you think of each item. Please take the time to fill out this simple form and return it right away. This information will help us give you the most useful articles possible.

Of course, we'd enjoy hearing any other opinions you care to include. Put them on the back of the survey form, or, better yet, on a separate piece of paper to make sure our survey staff won't miss them. Tell us what you like and dislike about **two/sixteen** and other magazines. Give us ideas for articles, or tell us about one you would like to write for us (see "Help!," in this issue).

Let us know what subjects you would like to see reader survey results on. We are considering the following topics for surveys in future issues:

- ☐ Word processors features and uses
- ☐ Printer characteristics (what's most important?)
- ☐ Language compilers and interpreters
- ☐ Best articles you've seen in other publications
- ☐ Software documentation
- ☐ Where you've received the best (and worst) help
- ☐ Blue sky (what hardware and software features you'd like if you could have **any** wish)
- ☐ And other suggestions from you

We intend to present composite survey results to Tandy for their comment. It's likely that Tandy hasn't received any Model II-specific survey results before, and they will probably pay attention to your views if enough readers respond.

In case the Reader Survey form is missing, we have reproduced it on the back of this page. You may send us a photocopy, or just send in this page. We sincerely appreciate your help. ☐

CP/M to TRSDOS Conversions

Most of us P+T CP/M users have run the program "TRS2CPM.COM," which allows us to easily convert TRSDOS files into CP/M format. But what can we do when we need to use data developed under CP/M as input to a TRSDOS-based program? We know a software house that will develop the necessary software to accomplish the CP/M to TRSDOS conversion if there is enough interest to warrant the effort. Send us a note if you would be a potential buyer (at some reasonable price) of the reverse-conversion software. We'll pass along the responses, and we'll let you know whether or not the software gets developed. ☐

PASS FAIL

MOD II CP/M® IQ QUIZ

Does your TRS-80 Mod II:

Yes	No	
☐	☐	transfer files from TRSDOS to CP/M?
☐	☐	store 596 K bytes on a floppy disk?
☐	☐	talk to a Cameo cartridge disk system?
☐	☐	talk to a Corvus Winchester disk system?
☐	☐	support XON/XOFF, ETX/ACK and clear-to-send serial printer protocols?
☐	☐	talk to double sided floppy drives?
☐	☐	give you access to hundreds of applications programs?
☐	☐	give you a choice of a dozen or more languages?
☐	☐	run the best documented, best supported CP/M available?

If you answered no to any of these questions, raise your Mod II's IQ with

P&T CP/M® 2

Contact us, and we'll send you details on how to expand your Mod II's horizons.

Price (FOB Goleta)
$185 for standard P&T CP/M® 2
$250 for P&T CP/M® 2 for Corvus or Cameo hard disk drives.

PICKLES TROUT ®

PICKLES & TROUT

P.O. BOX 1206, GOLETA, CA 93116
(805) 685-4641

CP/M is a registered trademark of Digital Research.
TRS-80 is a trademark of Tandy Corporation.

Please return to **two/sixteen**, Box 1216, Lancaster, PA 17603 by June 15.

Based on your own experience, please rate each item of hardware and purchased software on a scale of zero to ten, where 0 = worthless, 5 = adequate, 10 = perfect.

Also, please show any product purchases you intend to make entering a P in the ratings column followed by the month and year you expect to buy it.

HARDWARE

CPU: Rating

Model II _____K _____

Model 16 _____K_____drive(s) _____

Other_____ _____

_____ _____

External floppy disk:

R.S._____drives _____

Other_____ _____

_____ _____

Hard disks:

R.S. _____ _____

Other_____ _____

_____ _____

Printers: Rating

R.S. _____ _____

Other _____ _____

_____ _____

Other hardware:

Clock board _____ _____

Modem _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

SOFTWARE

TRSDOS, Model II _____

R.S. Interactive Basic _____

Operating System, Model 16 _____

Other_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Optional responses (fill in all, any part, or none):

Name: _____

Address: _____

City, State, ZIP _____

Occupation: _____

Annual income:

_____Under $20K

_____$20K-$30K

_____$30K-$40K

_____$40K-$60K

_____$60K+

All we know about the Model 16

At this writing, about all that can be known for sure about the Model 16 is contained in Radio Shack's March, 1982, catalog. A Model 16 was in use at the San Francisco Computer Faire (March 19-11, 1982), but it was running in Model II mode because no software for the 68000 chip was ready yet. Running this way, the Model 16 has exactly the same power as the Model II. The only differences are the optional second internal drive (of course, each drive holds only 500k bytes in Model II mode) and the colors of the screen, case, and keyboard. Here's the facts (along with our comments and speculation) as they appear in late April.

Model 16 offers these very attractive features:

1. Significant Software Support — The new Model 16 will be able to run existing Model II programs (though we think it's very unlikely that we can multi-process anything but 68000 based programs, and the real power of the Model 16 can't be realized until all source code is compiled in 68000 native code).

2. Increased Speed — The 68000 chip will operate significantly faster than the Z80A chip's speed (a clock speed of 6 MHz compared to 4MHz on the Z80A). Depending on the way in which the 68000 is implemented, and on the specific application, we expect computing throughput to be four to ten times as fast.

3. Enhanced Memory — The new Model 16 is capable of having eight times (512K) as much available high-speed memory as the Model II. And the cost to get all the way there is only another $1,700 ($500 to 256K, $700 more to 384K, $500 more to the 512K limit).

4. More Storage at Less Cost — the double sided drives of the Model II read a greater number of sectors per track than the single-sided drives of the Model II. this allows the new unit to hold up to 2.5 megabytes of information — 25% more than a Model II with three expansion drives. Dollar for dollar, that means a significant savings. Compare the list prices:

Model II (64K)	$3,899
Three drive expansion	2,250
Total	$6,149
Model 16 (128k, 2 drive)	$5,798

For $350 less, we get twice the memory, 25% more disk storage (and the space the old expansion drive took), much faster computation, as well as the other "goodies." We predict a sharp drop in Tandy's Model II prices, assuming that the line is even continued. A drop of one-third, which seems appropriate, would put the Model II squarely in the Model III price bracket. This might wreak havoc on Model III sales, except that no joysticks are yet available for the Model II. (And what will all the game producers do?)

Editor's note: It seems likely that the 16's disks will have 32 sectors per track (up from 26), since the capacity per side has increased significantly. Perhaps it's too much to hope for, but we would like to see the Model 16's disk format have CP/M compatibility. Of course, differences in detail are likely to remain, as there is probably no way to make the file control block (FCB) compatible (e.g. CP/M has not had date fields in the FCB).

5. Multi-User capability — With two additional terminals (e.g., the DT-1 at $699 each), the Model 16 can handle up to three users at once "without any perceived loss of performance" to any of the users.

Among the other "goodies" are: using the Z80A processor for housekeeping chores to free the 68000 for job processing, providing an Editor/Assembler (with editor, macro-assembler, linking loader, cross-reference, and debugger) as part of the basic package, and the availability of ARCNET for local networking.

Of course, there are many questions not yet answered. What about CP/M? It's likely that current Model II CP/M operating systems will run on the Model 16 in Model II mode, but will CP/Ms be available which utilize the larger address space and the two-sided drives? Will the new 16-bit operating systems, like Microsoft's UNIX-like XENIX, function with the Model 16? And, if all this is worked out, can files be transferred (in both directions) between "TRSDOS" and UNIX, CP/M, or MP/M? How can current BASIC users realize the power of the 68000 (it will probably be several months before Tandy releases a Model 16 BASIC)?

Should Model II users convert

to the Model 16 with Tandy's new operating system, or should they go directly to a 68000 based UNIX, CP/M, MP/M, or OASIS operating system (none of these are available now, but will be in a few months) so that the next generation conversion problems are more likely to be reduced?

Can any RS-232-compatible terminal be used? Probably, since time-sharing usage has forced terminals into reasonable uniformity. But what combinations of terminals, ARCNET (the Datapoint local network), plotter, and modem can operate simultaneously on a Model 16?

We believe that the Model 16 in the current market is a bargain at the price. However, be prepared to accept the liklihood that the power of the 68000 chip will be available at first only in assembly language and RSCOBOL (and use of either of these languages will require new programming except for programs already in Model II COBOL, which is said to be source-compatible with Model 16 RSCOBOL). The March TRS-80 Microcomputer News says that FORTRAN and both compiler and interpreter BASICs will be available during the coming year, and that a fully integrated small business accounting system will be available by mid-year. The real strength of the Model 16, like that of the Model II, will probably be a result of widely-compatible non-Tandy products from Microsoft, Lifeboat, Digital Research, Pickles & Trout, Aton, and many others.

A potential drawback for present business users of the Model II: it will probably be very difficult (or at least very inconvenient) to transfer data between Model II mode programs and Model 16 mode programs. For example, a new inventory or accounts receivable system which takes advantage of the Model 16's much greater storage per disk may not be able to easily pass data to an existing general ledger system which runs in Model II mode. All existing elements of an integrated business system may have to be converted to native 68000 code to gain the added power of the Model 16.

If, like many, you adopt a wait-and-see attitude, the things to wait for are software that lets you use the 68000 chip's power: compilers from Tandy that will operate on your Model II source code (in FORTRAN, etc.) CP/M compatible operating systems and language compilers that will do the same, and important utilities, such as sorts, word processors, and relational data base management systems working under *high-level language hosts* (a sophisticated update-and-access system can't be very flexible when it is saddled with a free-standing DBMS).

However you look at it, the Model 16 has a lot to offer. Its potential will expand rapidly in the next few months. All Model II users, especially those with business applications, should continue to review its possibilities for their own applications.

Beware of all enterprises that require new clothes.

. . .

Our life is frittered away by detail. . . . Simplify, simplify.

. . .

If a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music which he hears, however measured or far away.

Henry David Thoreau, Walden

Diversions!

Several subscribers have asked about the availability of games for the Model II. Many users keep their machine at home, and would like to be able to use it for family entertainment.

We produced a game called STARSHIP I, which is a fairly elegant Model II-specific implementation of the large-computer classic game, STAR-TREK. This game is *not* a rapid-fire tactical game, but rather a strategic game (though it has many timers and real-time random events which keep you on your toes). The basic idea is to seek out and dispose of invading enemy in a large matrix. The program is written in the RS BASIC interpreter and is modifiable by the user. It also can be a help as tutorial examples of how to program with the graphic character set and how to produce some special effects.

We don't intend to push our own product in this magazine, but we want you to know it's available. It was marketed for several months at $50, however, we will sell a copy to any two/sixteen subscriber for $30 (U.S. funds) with an unconditional money-back guarantee (first-class postage, airmail overseas, included).

Here is a list of the other games we know about for our machine:

ELIZA (for CP/M users only): An early (1966) artificial intelligence demonstration program (it behaves like a psychotherapist might). This claims to include the full original program, and is worth looking into. It costs $25 for ELIZA.COM and $20 more if you want the Microsoft BASIC-80 source from:

Artificial Intelligence
Research Group
921 North La Jolla Avenue
Los Angeles, California
90046
(213) 656-7368

ADVENTURE #1-#9 (TRSDOS): Scott Adams famous series. Frankly, this type of game bores us silly, but many others are fascinated by them. We suspect that, for Adventure buffs, this may be the best

available for the Mod II. This set is available at $99.95 from:

Computronics, Inc.
50 N. Pascack Road
Spring Valley, NY 10977
(800) 431-2818

MOD II Games Pak: An assortment of games by Lance Miklus. We have no information about the games, but Miklus has a fine reputation in the games field. Available at $100 from:

Houston Micro-Computer Tech.
5313 Bissonet
Bellaire, TX 77401
(713) 661-2005

MOD II Graphics Games for 1 or 2 players: Four games, $55 from:

L. D. Associates
11078 Viacha Drive
San Diego, CA 92104

We make no recommendations about these games, as we have not seen most of them. We will probably arrange to review them and give you more details in future issues. If you know of other games, please let us know where they can be obtained. □

Future Articles

Some future articles we have in mind are:

☐ The MicroPro family and its stepchildren
(WordStar, SpellStar, Mailmerge, DataStar, CalcStar, and the various products of other vendors which add features, such as indexes in WordStar documents).

☐ The String 80 Bit adds flexibility to CP/M FORTRAN

☐ Build your own data bases with Micro B+

☐ How to teach yourself assembly language

☐ Let's find out where the II and 16 "clubs" (let's call them societies) are, and help get more started.

☐ Product reviews:

Hardware:
- The Pickles & Trout CCB-II Clock Board
- Modems
- Spike suppressors

Software:
- Alternative operating systems compared
- Business software packages
- Data base management systems
- General utilities (like Snappware, Racet)
- Word processors compared

There are two important inputs we need from you:

1. Other topics that would help you.
2. Which of the above (or any other) topics you are willing to write about. The story of how you resolved a particularly frustrating problem will probably help others avoid reinventing the wheel (or "reinventing the flat tire," as an insurance company information officer used to say). □

Postponed Articles

Due to lack of sufficient released information, we have postponed the following articles which were planned for the initial issue:

☐ Pros and cons of the II to 16 hardware conversion

☐ Multi-processing on the Model 16

☐ Networking

We plan to cover these issues as soon as useful data becomes available. In addition, we have decided to scratch the planned article on BDOS errors in CP/M. Reports from various sources have been conflicting and lack adequate support. Those who should know about the problem aren't saying much, and at least three users have experienced spontaneous long-term remission without being able to discern the cause.

The planned article comparing TRSDOS and CP/M has been postponed due to the emergence of new operating systems (e.g., TURBODOS) and a subscriber's request to include coverage of OASIS. We intend to develop a single article which includes useful comparisons of them all.

We wrote an article on hard disks, but when the April issues of other magazines arrived we discovered that much of what we said had become obsolete (rapid price drops, big capacity increases, new and unreviewed backup techniques). We'll try again in the next issue. Perhaps we'll interview a few hard disk manufacturers and get their view of where they are going. □

Classified Advertising

A non-dealer subscriber may place one ad per issue at the rate of $7 per column inch.

A dealer may place one classified ad per issue at the rate of $20 per column inch. Dealer classifieds must be for the sale of specific products or services at specified prices.

Ads must be for hardware, software, or services which would be of interest to Model II or 16 users (no mystical societies, chain letters, book clubs, etc.). Ads will be

set in the same size type as the text in the magazine.

Closing date for classified ads is the first of the month prior to issue date (e.g., the July-August classifieds will close June 1).

We reserve the right to determine what heading an ad should be placed under (e.g. HARDWARE, SOFTWARE, MODEMS, PROGRAMMING), but we will accept advertisers' reasonable requests for specific headings. □

Comparative Productivity in Computing

With your Model II or Model 16 microcomputer, you have the potential to be as productive as a fairly large sized data processing department, if that department is following "traditional" methods of "professional" data processing. This article will discuss why this is so and point out some hazards which we hope you will be able to avoid.

Traditional data processing has several major defects, including (1) emphasis on "batch" rather than "interactive" processing, (2) a perverse pride in being "professional data processors" rather than executives of the business served (to the extent of often refusing to learn anything at all about the basic business), and (3) a fragmentation of duties within the data processing organization, resulting in redundant work, communication failure, confusion, foreclosing of learning opportunities, and unreasonably long system development time (generally 5 to 50 times as long as should be required!).

How did traditional data processing get into this mess? Why can't it get out? How can you avoid making the same mistakes as your microcomputer use increases? We will suggest answers to each of these questions.

When data processing with computers began in the early 'fifties, it was an arcane art, indeed. There were no "high-level' languages like FORTRAN, COBOL, or BASIC. Even basic assembly language was not yet available. Programs had to be written in machine language (you can see a sample of machine language for your machine by running DEBUG). Writing in machine language was a very specialized art, very tedious and time consuming. And, of course, because of internal bureaucracy in the very large companies that owned these computers, control of the machines almost always resided in the same people who had previously managed the EAM (electrical accounting machine) department. In hindsight, it is fairly obvious that the skills suitable for handling punched-card computer equipment are probably inadequate for efficiently using a computer. Yet what we see today in *most* large companies' data processing systems is simply a logical extension of the 1940s punched-card method of work organization.

Let's review the method of developing a fairly simple report as a large company will probably do it:

1. An executive in an operating department perceives that he can materially improve the company's performance if he only had some additional information which currently resides in data processing tape files. He conceives a report which will provide this information and submits a request to have it prepared.
2. The request is discussed at the next, usually monthly, meeting of the "data processing steering comitee," which is charged with allocating the scarce data processing development resource. This commitee is composed of senior officers (possibly including the CEO) who spend a great deal of time rejecting most requests which they receive. We'll assume that they approve the request under discussion.
3. The data processing department receives the request and assigns it to a systems analysis unit. One or more people in this unit initiate a discussion with the originating executive. The discussion is primarily a learning process for the systems analysts. They must absorb as much as possible about the requested report, its content and uses. This is often a trying experience, especially for the executive, since the analysts usually know almost nothing about the primary business of the company. Once the analysts have a moderate grasp of the problem, they develop a comprehensive set of flow charts, decision tables, development schedules, and other bureaucratic detritus. By now, *several months* have elapsed.
4. The systems analysts' product is then transferred to the programming staff, usually sequestered in a separate part of the data processing department. A programmer is charged with producing program code solely by reference to the material provided by the analysts. In many installations the programmer is forbidden to discuss the project with the end user. If a question arises during programming that requires end user attention, it must be handled through the systems analysts. Most large businesses program almost entirely in COBOL, and use batch techniques in program development and debugging. When the programmer believes that he has adequate program code which has been reasonably debugged, he turns his product, along with that of the systems analysts, over to a "quality assurance" group.
5. The quality assurance group produces test data relevant to the project and

performs extensive testing. This procedure will probably involve conferences with the programmer and the systems analysts.

6. Once the testing is complete and any necessary corrections made, the job is scheduled in the regular production stream and the report is produced. In many companies, this process will have taken a minimum of *one year*, even for the most trivial of tasks.

This example has been oversimplified. In many companies, there are other organizational entities which will "get their oar in" and compound the problem. Some typical additional interferers are Internal Audit, Data Standards Control, and the Financial Standards Committee.

In a few companies, operating departments have developed their own internal expertise in developing information from data available from central data processing files. The most common vehicle is commercial computer timesharing (as offered by CompuServe, ADP Network, Tymshare, and others). The most successful approach seems to hinge upon the assignment of individuals who possess two essential characteristics, (1) knowledge of the business gained by direct experience and (2) a high degree of logical capability, evidenced by an IQ score of 130 or higher (here's one place where there is a strong correlation between IQ score and resulting performance) and a keen interest in solving problems.

The author initiated such a project in the financial area of one of the largest insurance company groups (12,000 employees) in 1971. The operation grew rapidly over the years as managers discovered that essential reports could be obtained in a few days instead of years. The company obtained a Digital Equipment Corporation KL-10 large-scale computer in 1978. It now has, in addition to its bevy of big IBM computers, three DEC KL-10s which produce virtually all the management reports. There are about 500 people in all departments of the company regularly using the DEC machines. For several years, FORTRAN was the principal language used in the company's interactive computing. FORTRAN is much faster to develop than COBOL, much easier to maintain, and runs in a small fraction of the time required by COBOL. For the last five years or so, a data base manager called System 1022 has been the primary "language" used on the DEC-10. System 1022 can be run as a free-standing interactive system, be programmed in its own language, or be driven by subroutines called from a high level host language such as FORTRAN. The host language facility makes 1022 so powerful that the vast majority of all recent applications have used it. For data base oriented applications (e.g. mapping a payroll data base against a corporate organizational hierarchy data base) System 1022 typically allows development in 5-10% of the time required in FORTRAN (which, in turn required only 2-20% of the time required in "batch" COBOL).

If the above example had begun in 1982 instead of 1971, it would be logical to consider microcomputers for the function instead of the large scale DEC-10s. A possible configuration would the establishment of a "local network," such as ARCNET, with several hundred Radio Shack Model 16s attached to it. In addition, the network would contain terminals attached to the Model 16s, distributed hard disc units (say, 600 lines per minute each), 9-track IBM compatible tape drives (used for both hard disk backup and reading IBM-created data tapes), and direct network connection to the IBM computers. This approach would provide more security against crashes, greater system flexibility and responsiveness to change, and lower overall cost. Tailoring parts of the system to special needs would be much easier and faster. Such a system would probably consist of many (probably a dozen) individual networks which would have interconnection nodes through a central minicomputer (e.g., DEC VAX 11/780).

With such an obviously successful example of interactive processing before them (and there are many more examples in other companies), why do "traditional" data processing departments continue their costly, inefficient, and almost unbelievably timewasting ways? Bureaucratic inertia seems to be the answer. The company mentioned has 1,000 employees in the data processing department. (This does not include the 500 people who use interactive computering in their own departments.) These people are almost entirely "batch-oriented" and many would not have the interest or ability to deal with interactive processing. in addition, interactive processing concentrates on the basic business problem. Some data processors do not seem to know or care what the basic business is. Therefore, changing toward interactive processing would require a different staff. Turnover is very high in data processing as it is. A massive shift would be difficult to manage, especially during the period when new systems were being developed and old systems had to be maintained during their last days.

How does all this apply to the Model II or 16 user?

It is my opinion that the following "lessons" can be drawn from this discussion:

1. Systems decisions and programming should be done by people whose primary interest is the basic business, not "data processing," which is nothing more than a very fast pencil.

2. When systems are developed internally (as opposed to purchasing software), *one, and only one*, person should be responsible for everything from developing the initial concept (which may have orginated with someone else), visualizing the system (but usually not making wasteful flow charts), programming the code, testing the resulting system, producing full documentation, and producing the initial system run. This practice alone will save probably 75% of the time required when "baton pass-

ing"is involved at each step. (One old rule-of-thumb is that the time required to do a system is directly proportional to the square of the number of people working on it — there's evidence to support it, too.)

3. Maintain the greatest degree of flexibility in systems design that you possibly can. Use standard languages, modularize systems, avoid "cuteness" and other practices which may make programs difficult to convert. Be ready for the next generation. The Model II is a fine piece of hardware. The Model 16 will give us one of the highest performance/price ratios available. But we "ain't seen nothin' yet." Some so-far reliable futurists are suggesting that the microcomputers of 1985 may have more power (individually) than the sum of all computers in existence today.

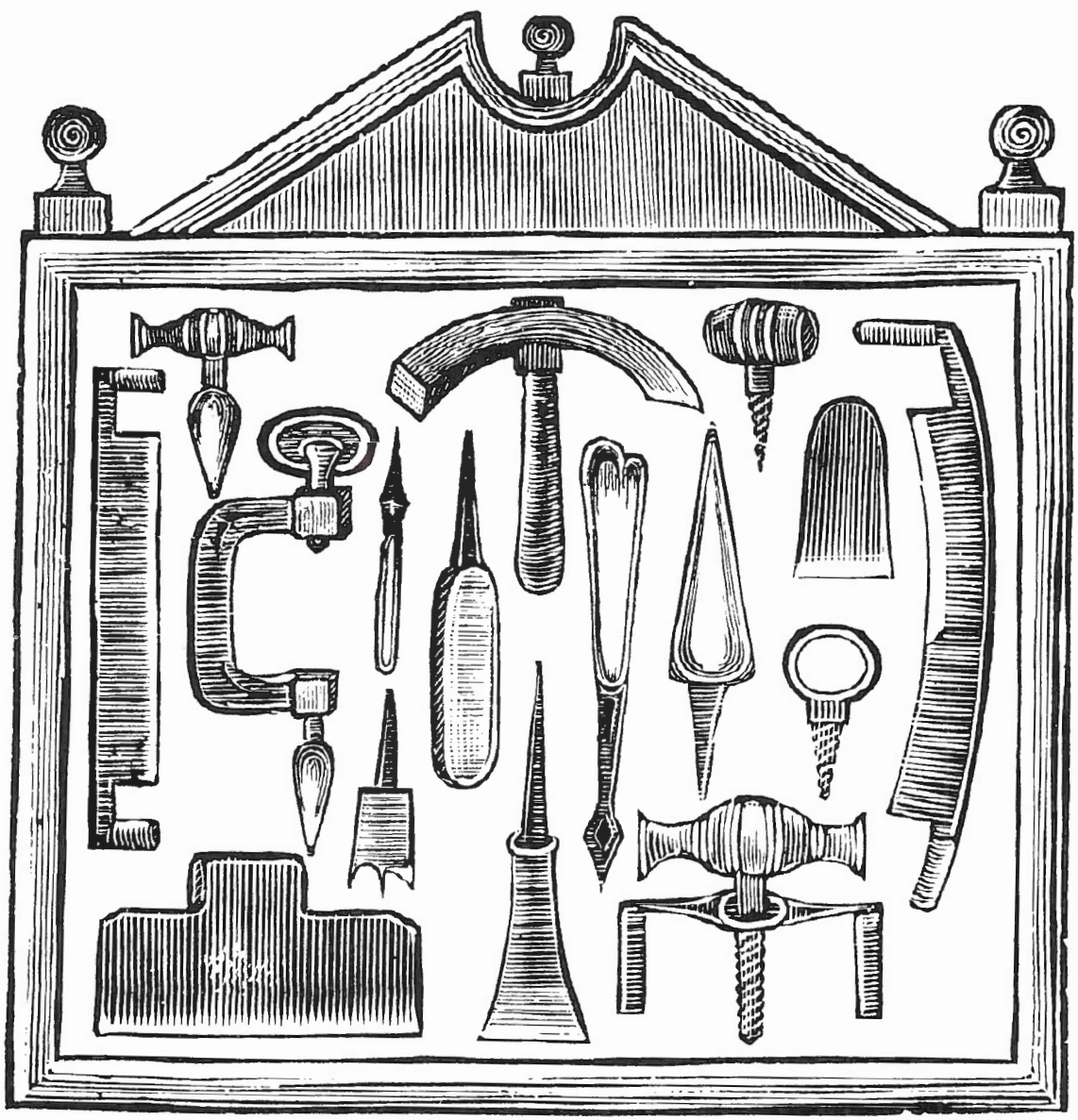
4. Keep an eye out for a good data base management system. To be adequately flexible, a data base handler should be able to be driven by a host language system as well as be operated as a free-standing interactive system. There do not yet seem to be any DBMS for microcomputers which provide the essential host language interface. Without it, you stuck in the "box" of the DBMS language structure. Simple things such as computing the present value of an investment or amortizing a bond are then difficult (usually impossible) to accomplish.

5. Avoid committees.

6. Fire the next guy who suggests forming a committee.

7. Avoid committees.

8. If you still end up with a committee, I suggest you forget the whole thing and send the work out to a service bureau. ☐



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