

# CIE TRS-80<sup>TM</sup> Bulletin

EDITORIAL CONTENT SUPPLIED BY TRS-80 COMPUTING

Vol. 1 No. 6

Bill McLaughlin, editor

May, 1979

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## Readers question vendor integrity

TRS-80 Bulletin readers have questioned the integrity of two suppliers, World Power Systems and TapeTalk magazine, and our attempted investigation turned up nothing.

World Power, which advertised in the 1:4 issue, claims to sell advanced products such as S100 interfaces, PROM programmers, expansion interfaces, etc. A recent direct-mail appeal offered disk drives for \$320.

We attempted to find out if they are shipping merchandise. A call to another magazine revealed the same story we found at home: advertising bill unpaid. This represents major obligations, since World Power contracted for large blocks of display space—four to six pages per magazine per month.

We were told that ownership had changed and the new owner would try to meet all obligations.

About half a dozen calls to World Power itself yielded no information or encouragement.

Although we called at various times of day, over a two-week period, we always were given the same story: nobody home but a receptionist. Someone will call back. Never a callback.

We left a message that we were writing an article for a 100,000-circulation publication, and wanted to be fair and have their side of this. No callback.

We called the Tucson City Attorney's office. They were unaware of any complaints and promised to launch an inves-

tigation. They suggested printing a warning in our publication.

TapeTalk magazine, in San Jose, has stopped service at the phone printed on its letterhead. A reader tells us he subscribed in September, but has yet to receive an issue. He has queried them numerous times, and received no response.

If any readers have had good luck with these vendors, please let us know. Meanwhile, readers should deal with caution. Visa and Master Charge cards offer some protection, but after the vendor closes his account card holders are probably stuck with trying to get a refund from an out-of-town, out-of-business firm, if that is indeed the case with the two outfits we have questioned.

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rushing a lot of components that don't like to be over-burdened. We turned up some problems while investigating double density and I wouldn't hold my breath.

CIE: What does the Shuffleboard do?

FULLMER: First let me say that Shuffleboard plugs into the Z-80 socket piggyback style, not into the ROM slots as previously reported. What it does is provide the circuitry necessary to rotate memory in 16K blocks in such a way that the lower 16K (including the memory-mapped video) is rotated to high memory, where it belongs. The other locations are shifted down 16K accordingly. There is also a so-called phantom-ROM on the board that allows the user to bootstrap CP/M directly into the '80.

CIE: What's a phantom-ROM?

FULLMER: It's a read-only memory that the CPU only sees once, in this case for the bootstrap, then it becomes invisible to the computer so the lower memory locations can all be the necessary random access memory. It's a common, but complicated, technique.

CIE: Will the Shuffleboard be available separately?

FULLMER: Initially they will go to Maxi-Disk purchasers, since it won't be fair to them if we run out. So we are being conservative, and we'll know more and possibly sell the item separately in the months ahead.

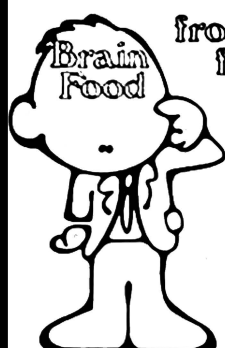
CIE: How do I get these products?

FULLMER: Initially we will be filling orders direct. Then after we establish our dealer network, we will minimize direct orders. Shipments will be on a first-in first-out basis. Direct sales will get the product out to the user who needs this power now.

CIE: How can I order?

FULLMER: You can order directly from Parasitic Engineering, Box 6314, Albany CA 94706. Check, money order, VISA and Master Charge accepted. Phone orders for VISA and MC will be accepted at (415) 527-6133.

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## President answers queries about full-sized floppy

(Parasitic Engineering last month introduced in TRS-80 Bulletin its TRS-80 full-sized floppy disk and Shuffleboard, a circuit that allows use of the lower 16K of memory as RAM. The firm has been swamped with calls and has asked us to print some commonly asked questions. Answers are by the company president, Howard Fullmer.)

CIE: What is the most often asked question?

FULLMER: When do we ship? The first week of June is when the first production models begin shipment. We have just moved into a new and larger plant in Berkeley to prepare for this. The devices are available for viewing at Computer Faire, and we hope that those who are considering any form of mass storage will come by and see us.

CIE: What does it take to install the unit?

FULLMER: You simply remove the disk controller chip from the expansion interface and pop in what is called a "piggy-back" board, and slip the controller chip, but we do provide a brand new one that is guaranteed to work with 8-in. drives. The circuitry on that board allows the controller chip to run full-size and mini (or mix and match).

CIE: You say mix and match. Can the user keep his mini-floppy on-line?

FULLMER: Yes, you can daisy-chain any variety of drives right out of the expansion interface. If you want to run TRS-DOS then you keep a mini-floppy as drive #1 and use your TRS-DOS diskette to bootstrap the system. We are providing a patch for TRS-DOS, so it handles full-sized drives correctly. We are also negotiating with the sellers of the more powerful DOSs and these may be made available for full-size users. We will keep the buyers up to date as these products become available. The full-sized floppy can be drive #2, #3 or #4 depending on how many minis the user may already own. More importantly for the user, he knows that with a 60-90 day delivery on minis from many vendors, that if he wants to sell his minis and go with 100 per cent full-sized floppies he doesn't have to worry about losing any money.

CIE: Are all the drives plugged into the same receptacle?

FULLMER: They are all hooked to the same cable. The cable plugs into the disk drive connector on the expansion interface. It's the controller chip that Radio Shack chose in the expansion interface that allows the user to run both large and small drives at the same time. We're glad they went the way they did.

CIE: What if the user doesn't have a mini drive and therefore doesn't have a cable running from the interface?

FULLMER: We will make cables available for those who need them, or they can get one from Radio Shack.

CIE: Does the user have to do anything other than plug in the piggy-back board, then plug in the drive?

FULLMER: No, and it should be noted that the board can always be removed and the machine returned to its original condition. There are no physical changes made (no soldering, trace cutting or the like). This is also true for the Shuffleboard. For the users that are reluctant to open their '80 up and make the simple change, dealers are expected to provide the service for a small fee.

CIE: What about the size and color of the unit? Also, the capacity, and who makes the drive mechanism?

FULLMER: It's gray to coordinate with the TRS-80 color scheme (or lack of it). It sits vertically to match the mini-disks and it is 9 1/4 in. high by 18 in. deep by 4 7/8 in. wide. For ruggedness and reliability, we are using the Shugart mechanism. Capacity is 250 K bytes per drive.

CIE: What about double density? Will you have it?

FULLMER: We have looked into the possibility of double density and question its reliability on a TRS-80. You know that the '80 clock is slow, to avoid

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Our competitors offer \$99 cassette word processor, \$90 sequential 'on-memory' inventory, inflexible mail system that does not produce report, 16K data base. Compare all these basic features first. If still not convinced, send \$1 and 2 self-addressed stamped envelopes.

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## TRS-80 All-Clubs Faire June 9th in Irvine, CA

By SHELTON and KATHY GREEN

The Orange County (CA) TRS-80 Users Group is doing a neat thing—planning a regional all-clubs get-together Saturday, June 9, from 10 am to 5 pm.

TRS-80 owners from as far as Santa Barbara to San Diego and Phoenix are expected to attend.

The setting is the beautiful rolling hills of Irvine, near the ocean at Newport Beach and the University of California at Irvine.

What better setting to learn more about your home computer or the benefits that await you as a personal computer owner, if you are not yet one.

Host is the University High School Computer Club, on its ultra modern campus at Culver and Campus drives in Irvine.

Planned events include:

- Giving away a TRS-80 computer.
- Holding a raffle, with computer-item prizes.
- SPEAKERS—experts will hold forums on the computer's role in education, in business, at home and many other exciting current topics.
- TRS-80 club presidents' and representatives' communications conference.
- Local and neighboring TRS-80 club representatives will be available to tell of their organization's activities.
- New products will be on display.
- Your friendly familiar vendors will be there, as will some unfamiliar ones.
- All kinds of interesting demonstrations in data communications, business uses, games, amateur radio uses, computer music, accounting and taxes, word processing, household applications, education, programming languages, and much more.
- Family picnic. Bring lunch and invite your family, friends and neighbors. They have been hearing about personal computers for several years and now they can see for themselves the many applications available.
- KIDDIES' COMPUTER CORNER. Personal computing isn't all buying and selling, business uses and adult games. Kids need computers on which they can do the things kids do (spill Orange Crush? Let's hope not!).

**GETTING THERE**—Take San Diego Freeway Culver exit south until you reach Campus drive, and you are there.

Upon arriving, you will be welcomed by a host or hostess, who will advise you of on-going activities, and answer inquiries, such as "where are the picnic areas."

Inside, you will meet with many talented computer enthusiasts. They will enjoy your interest and be glad to answer, to the best of their abilities, the most elementary to the most involved questions.

Since this is an All-Clubs Faire you will be able to learn about your local clubs and their activities. You do not have to be a member or own a computer to attend a TRS-80 user club meeting, so make it a point to find out when and where your local clubs meet and plan to attend a meeting or two.

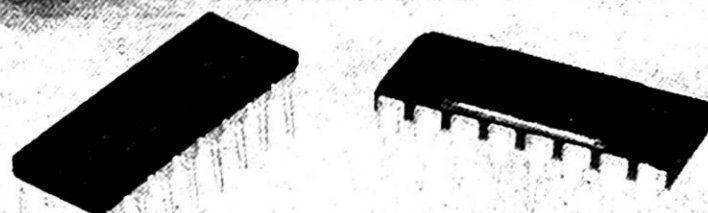
**TICKETS**—Can be purchased at the door for \$1 (children under 13 free) or by mailing with a self-addressed stamped envelope to: Shelton E. Green, TRS-80 All-Clubs Faire chairman, 1927 N. Elder Glen Circle, Anaheim CA 92807 (714) 779-0556.

Purchase of the ticket automatically makes you eligible to win the TRS-80 computer grand prize—you do not have to be present to win. Buy several for the raffle, and invite your family, friends and neighbors as your guests.

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TRUE or FALSE . . .

## All TRS-80 Memory Expansion Kits are the Same.



Dealer Inquiries  
Invited

**FALSE!** All memory expansion kits are not the same. So, read on if you are about to expand your microcomputer system. We're UHF Associates and we offer a *complete* 16K memory kit for \$95.\* We know others offer similar storage for about the same price. Unlike others, UHF gives you *speed and storage*. After all, what's storage if your system has to wait in line to get to it. We'll tell you what it is — *an inefficient bottleneck*. Pure and simple. UHF gives you both memory expansion and a *fast* 200 nano-second minimum access time.

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speaker chairman, John Foster ... 494-4888  
special interest chm., Kathy Green 779-0556  
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As a participant, you will have an opportunity to learn more of what is currently happening in the TRS-80 computer field and meet and work with fellow enthusiasts.

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possible with TRS-80

The large number of TRS-80 owners provides tremendous encouragement for exciting developments in hardware and software.

For example, several clubs are now working towards communication networks for their club, and one major goal of the Faire is to develop an organization to promote communications with other clubs.

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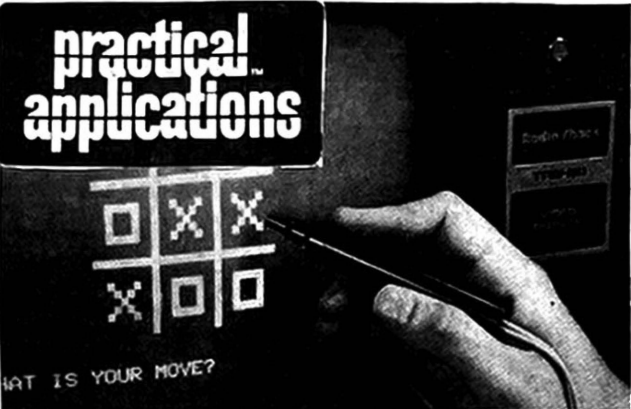
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People's Software

CONTINUED FROM BACK PAGE:

Besides the Tape 1 programs listed on back of booklet, Level II tapes have: speed reading, touch typing, sales receipt tally, decision maker, mail addressing, straight-line & double declining depreciation, revolving charge account, mastermind, tic-tac-toe, grand prix, bingo, state capitals, etch sketch, hangman.

**TAPE 2:** fully documented in "Some Common Basic Programs" by Lon Poole + Mary Borchers (Osborne & Associates, 630 Bancroft way, Berkeley CA 94710—\$7.50 plus 50¢ for U.P.S. delivery, else 4th Class Mail), programs include: Investment, future value regular deposits; regular withdrawals, initial, minimum (for withdrawals), nominal interest, effective & earned—interest; depreciation rate, amount depreciation; salvage value; discount com'l paper; loan principal, regular & last payment, remaining balance, term—loan; mortgage amortization; greatest common denominator; integer prime factors; polygon area; triangle parts; analysis, operations two vectors; radian/deg., deg./radian conversion; coordinate; coordinate conversion; coordinate, polar equation, functions plot; linear, curvilinear interpolation; Simpson's + trapezoidal rules, Gaussian quadrature integration; derivative.

**Side 2:** quadratic equation, polynomial (Newton) & half-interval-search roots; trig polynomial; simultaneous equations; linear programming; matrix addition, subtraction scalar multiplication, multiplication, inversion; permutations & combinations; Mann-Whitney U test; mean, variance, standard deviation; geometric mean & deviation; binomial, Poisson, normal, Chi-square distribution; Chi-sq., student's t-distribution test; F-distribution; linear correlation coefficient; linear, multiple-linear, Nth order, geometric, exponential regression; system reliability; future projections; Federal withholding taxes; tax depreciation schedule; check writer; recipe cost; map check; day of week; days between two dates; anglo to metric; alphabetize.

Write programs for People's Software

Here's a software exchange that will give you possibly 150 to one for your TRS-80 program, be it in Basic, assembly language, machine code, Forth, Pascal, Fortran, C, Cobol, Pilot, or any other of the many languages for TRS-80.


Give CIE a good, usable, original program which you have written (no copying off a commercial program, PLEASE!), and if we accept it, we will give you two copies of the release print containing your program. People's Software has put as many as 77 programs per cassette, so if your program is on a tape with 75 or so other programs, you will be getting back 150 for one!

We are particularly looking for useful programs, although games will be accepted. Programs may be adapted from those in books, but extensive changes must be made, and you must credit your source. Programs in magazines may be copied or adapted, providing the program itself does not bear a copyright notice or other restriction. The magazine copyright does not cover individual programs or articles.

People's Software is particularly looking for a good native-code Pilot, and for Pilot programs. Also a good text editor, formatter, for business software, utilities and tutorials.

Also, tutorials about Basic, Forth, Pilot, and all the other programs. Here is a good chance for an instructor to get published, and put his work in the public domain, and yet still make a little money on it. Do a tutorial on any programming language. We're particularly anxious to see them for Basic, Forth and Pilot. Anyone having a language tutorial written on tape, donate it to People's Software. We'll give you a couple copies, and will wholesale them to you at the dealer rate, or better (40% or more discount). You can sell them to your students, and other local

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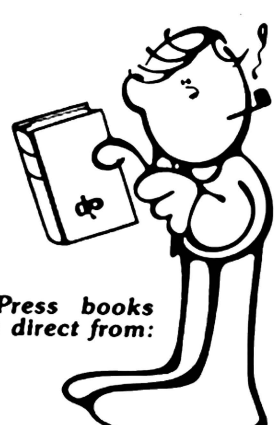
by Thomas Rugg and Phillip Feldman

At last! A flexible application software book and five program tapes for an exciting one-two punch for TRS-80 users. Program tapes include Applications, Educational, Games, Math and Graphics Display/Miscellaneous. Each tape contains 6-8 programs that can be run as they come in the package, or can be adapted to your specific uses.

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TRS-80 is a trademark of Tandy Corp. CIE579

PEOPLE'S SOFTWARE:  
77-program tape,  
all for just \$7.50

Now TRS-80 owners don't have to shell out a bundle of money—or work hard—to get a good assortment of programs for the world's most popular computer: There is People's Software—up to 77 public-domain programs on one cassette tape, for \$7.50, plus 50¢ postage and handling (CA residents add 45¢ tax—FOREIGN orders must be paid in U.S. funds, and postage is \$1 per tape, via air).

Computer Information Exchange has been concerned about how public domain software can be easily made available to the public.

Anyone with a library of computer magazines can keyboard—in a wealth of software, at no more cost than the user's time and frustration. CIE's experience has been about 150 hours for the 77-program Tape 2. Assuming that \$1 of the \$7.50 selling price of the software is medium cost (the tape), a person doing the job himself will be saving 4.33¢ per programming hour. Tape 1, even though it contains far fewer programs, half of which came from the San Diego TUG (user group), required many more hours preparation.

People's software was not brought out to compete with commercial software. CIE encourages TRS-80 users to market programs. The nonprofit organization gives free space in the Bulletin, as well as offering low-cost Bulletin ads. Good commercial software is the foundation of our TRS-80 computing, starting with our Micro Soft Level II Basic ROMs.

Just the same, personal computing can be made much more rewarding for everyone if users will share the fruits of their labor—and if a way can be found to distribute this inexpensively, in machine readable form (no 4.33¢-per-hour keyboarding!). Digital Equipment Corp. computer users, by joining DECUS, have been able to share programs inexpensively. Now Radio Shack users have People's Software.

THE COMPUTING TEACHER

This is a professional journal, designed for educators interested in the instructional use of computers and calculators.

\* Elementary School

\* Classroom materials for use with students

\* Secondary School

\* Teacher education materials

\* College/University

\* Approximately 50 pages, 8½ x 11 format

If you or your school makes instructional use of computers and/or calculators then you need this publication. It is now in its sixth year of publication, with subscribers in more than 30 states. (The name has just been changed from The Oregon Computing Teacher to reflect this nationwide circulation.) The publication is an excellent source of information about how computers and calculators are being used in education, and how they can affect the curriculum at all levels.

Send payment of \$8. for six issues (one year) or \$16. for thirteen issues to The Computing Teacher, Computing Center, Eastern Oregon State College, La Grande, OR 97850. Foreign subscriptions are \$3. extra per year.

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By HOWARD BERENBON

The TRS-80 Level I, 4K system was my first link to the most popular microprocessor around, the 8080/Z-80-based computer.

My experience has been with the (Motorola) 6800, having completed a Motorola D1 kit and a SWTP computer. I learned machine language programming on the D1. From there I wrote a commercially-successful telephone dialer program, and was asked to write an 8080 version, but didn't own an 8080.

So, I started looking for an 8080 system, and found they were expensive, starting at about \$1,500, without terminal.

When Radio Shack came out with TRS-80, I couldn't believe it, but there was a Z-80 system for only \$600.

The TRS-80 was just what I was looking for, and at half the price of other 8080-based systems. I went right down to the nearest Radio Shack and ordered a Level I, 4K system, and T-BUG machine language monitor.

About two weeks later I received my system, and about a month later I wrote a telephone dialer for the TRS-80 Level I, 4K system.

It's called the Z-80 Telephone Dialer Program, available on cassette with instructions, for \$7.95. It will dial 20 variable length phone numbers, accessed by a single letter code (A-T).

The program is loaded from cassette via Level I Basic, and requires a simple telephone interface circuit that uses only about \$4 worth of parts, available from Radio Shack. The circuit is detailed in the program documentation.

No internal connections to the TRS-80 are made. Anyone interested in receiving the dialer program may do so by sending \$7.95 to me at: 27200 Franklin, Apt. 105, Southfield MI 48034.

BACK ISSUES to TRS-80 BULLETIN are NOT available. The Bulletin's large press runs of up to 100,000 copies are fully circulated

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P02 TRU26R

4 K A pinball game

Designed for the amateur astronomer who dislikes the math but loves the beauty.

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A program for Avalon Hill Board Game.

Doom Castle, magic items, gold pieces, gems and monsters, this will entertain you for hours and may be the cheapest entertainment on the market today, it's one continuous movie.

If any tape is found to be defective, return for replacement to store or send to Rupert Corp., U.S.A., Earth.

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Percom offers 40, 77 track disk drives

Percom Data Co. has expanded its line of "add-on" mini-disk data storage systems for TRS-80 to include both 40 and 77-track drives.

One, two, and three-drive systems can be supplied with either 40-track TFD-100 or 77-track TFD-200 drives.

Percom claims a big advantage of its 40-track drives is that both sides of the mini-disks may be used for data storage—the "flippy" disk.

Capability of the FD-100 to operate as a "flippy" increases mini-disk storage capacity to almost 205 K bytes, compared to only 90 K for the usual single-sided 35-track unit.

A 77-track TFD-200 stores up to 197 K bytes, and a three-drive system of these provides 591 K bytes of on-line storage—over half a megabyte! The 77-track minidisks are single-sided.

With each disk system sold, PERCOM supplies one of its Patch Pak #1 minidisks, which includes programs to patch TRSDOS, the TRS-80 disk operating system, for 40 and 77-track operation.

Each TFD-100 and TFD-200 unit includes the drive itself, the power supply and an enclosure finished in TRS-80-style silver enamel.

Interfacing of disk drives to the TRS-80 computer is accomplished with the TRS-80 expansion interface, which includes controller electronics and a four-drive cable.

Prices for TFD-100 are \$399, \$795 and \$1195, one, two and three-drive configurations, respectively. For TFD-200 these figures are \$675, \$1350 and \$2525.

Drive systems may be ordered by dialing Percom's toll-free ordering number: (800) 527-1592. Orders may be paid by check or money order, or charged to Visa or Master Charge credit accounts. Texas residents add 5% sales tax. Percom's address is 211 N. Kirby, Garland TX 75042.

Ultimail stores 1,000 addresses on disk

Ultimail disk-based mailing/fil-label print program written by Ron Wagner packs up to 1,000 files on a one-drive system.

From Computer Generated Data, Ultimail utilizes sequential disk files and operates under all versions of TRSDOS. Minimum RAM required is 32K.

Ultimail exclusive features include HAL program monitor system which protects data against loss by protecting inputs against defective data; user-controlled spacing between printed labels allows use of various speed-mailer forms and material; user-controlled print quantity allows the user to specify how many of each label is to be printed. Labels are three-line and printed in ascending Zip code order.

Ultimail is fully self-protecting and interactive with the user, and has extensive edit and additional-files routines, and uses variables to name, save and load files.

One Ultimail program can support a limitless number of different data files, and is priced at \$55 on disk, and available from Tarzac/Computer Products, Box 10203, Norfolk VA 23513 (804) 853-2304.

Likes '80 better than timeshare monster

I have Level II-4K. Also teach Computer Science at Moorhead State College—but enjoy my small machine more than the timesharing monster! Please include a copy of your writer's guide if you have one— or information on how to submit articles and programs if you accept this material from outsiders. (Our rule is simply that material must be legible. Ed.)

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More Storage Capacity

40 tracks versus 35. Increases your usable storage capacity from 55,000 to 67,800 bytes on drive one.

Does Not Void TRS-80 Warranty

Shipped To You Ready To Run

Simply take it out of the box, plug it in and you're ready to run.

Fastest Access

The Matchless MS-80's exclusive band-positioning design sets an industry standard for fast and accurate positioning. Track to track access time is only five (5) milliseconds, which is more than twice as fast as the nearest competitor.

Reliability Specifications

MTBF . . . . . 10,000 Hours

MTTR . . . . . 0.5 Hour

Media Life . . . . . 3x10<sup>6</sup> Passes/Track

Design Life . . . . . 5 Years

Data Integrity:

Soft Errors — 1 per 10<sup>8</sup> Bits Read

Hard Errors — 1 per 10<sup>11</sup> Bits Read

Seek Errors — 1 per 10<sup>6</sup> Seeks

Preventive Maintenance—None

Track Density . . . . . 48 TPI

Tracks . . . . . 40

Rotational Speed . . . . . 300 RPM 1%

Average Latency . . . . . 100 ms

Transfer Rate:

FM Encoding . . . . . 125K Bits/Sec

Double Density . . . . . 250K Bits/Sec

Access:

Track to Track . . . . . 5 ms

Average . . . . . 75 ms

Settle . . . . . 15 ms

Head Load Time . . . . . 35 ms

Power Up Delay . . . . . 1 Sec

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BETA-1 is the answer to the many requests MECA has received for a universal tape unit. So we are proud to present the first mass storage solution for non-S100 bus microcomputers. Now you can own a BETA-1 complete, assembled and tested, for only \$399.

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Sound too good to be true? Then judge for yourself and place your order today. Call MECA, or your favorite dealer, for more details.

Dealer inquiries welcomed.

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## RACET offers digital tapes

RACET computes is now selling a special formulation cassette tape optimized for microcomputer applications. This tape, is said to have:

- Extremely broad frequency response—works well with higher baud-rate systems.
- Exceptional density characteristics—results in acceptance of high signal levels before saturation and a much broader playback range.
- Consistency in recording characteristics—most important in sensitive systems.
- Top quality tape materials to provide long life, reduced breakage, and longer usage before heads and capstans need cleaning.
- Top quality 5-screw shells with lubricated liners to provide smoother running through the tape transport and to facilitate repairs.
- It is furnished with hard plastic case to provide protection from dust and handling.

The firm's test results for several brands of audio tape, see chart, claim to indicate the overall superiority of RACET computes microcomputer tape in terms of playback range with no data loss. Test data was accumulated on both modified and unmodified TRS-80 microcomputers in both machine language and BASIC.

RACET claims its tapes will reduce problems such as lost programs, noise and extraneous bits of information in your programs, and the sheer frustration of the sensitivity of your system to critical volume settings. Prices are—C-20 cassettes at 10 for \$14.95 (postpaid) or 100 for \$119.95 (freight collect). Check, Master Charge, VISA, or C.O.D. accepted. California residents add 6% sales tax. They are at 702 Palmdale, Orange CA 92665.

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### FLOPPY DISK SALE

Verbatim 5" diskettes for TRS-80  
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### PRODUCT REVIEW:

## Clock speedup board gives TRS-80 a rush

There are times when about everyone would like to kick in an afterburner on his TRS-80 and speed through a slowpoke procedure, CSAVEing and CLOADing, particularly.

The computer's processor, memory, and other parts are all rated for faster operation. Conservative design resulted in Radio Shack setting the clock speed at 1.77 MHz, but users are finding out they can effect a 50 per cent increase with no malfunction of the computer, and several commercial products have been marketed that let TRS-80 owners clock at 2.6 MHz.

William Archbold makes a little four-IC speedup board which connects to the TRS-80 computer board with eight wires. William sent TRS-80 Bulletin a board and we installed it on one of our keyboard units.

This is not a kit. The board comes fully (and beautifully!) assembled.

We installed it in a little over an hour, which is a bit slow for cutting eight wires, stripping the ends, soldering them to the board, taking the TRS-80 apart and soldering them to it. But, like most users, we had not done it before.

Instructions are clear and detailed. An excellent diagram shows you where to connect everything. A schematic is included, for those who want to see how it works.

William designed the circuit so that software can control clock speed. For normal I/O routines, printer, disk and regular-speed tape, the clock must tick its normal 1.77 MHz.

The TRS-80 is automatically set to normal clocking on power-up. By entering the Basic statement OUT 254,1 at the keyboard or by including the statement in software, the TRS-80 will smoothly make the transition to an accelerated 2.66 MHz, without affecting memory (no program crashes). OUT 254,0 returns normal clocking.

Having had some trouble CLOADing and CSAVEing programs, we wondered if we could use the clock speed-up to get faster tape. We loaded a program at normal speed, put a blank tape in the recorder, typed OUT 254,1, then CSAVE and awaited the result. CLOAD? confirmed we had a good save. We've done this a number of times, and feel confident the 50 per cent tape speedup is about as reliable (unreliable?) as normal Level II tape.

The assembled circuit card and everything required for installation (bring your own tools) is available for \$24.95 from Bill Archbold, 106 Snyder dr., Mather AFB CA 95655.

—Bill McLaughlin

## Wants computer to copy Morse

I have obtained a copy of TRS-80 Computing from a friend and wish to say, it is the most TRS-80 info I've ever found in one place...specifically, the CTR-41 mod. If I had been aware of that it would have saved me the time and trouble of building a switch box for that purpose.

My box works, but your mod makes it so much more convenient—thanks a bunch.

My next effort is to have the TRS-80 copy Morse code for me—yes, I'm a ham, WBYMWY.

—BENJAMIN S. HALE, 770 Arton ln., Port St. Lucie FL 33452

ADVERTISE IN TRS-80 BULLETIN. If you are trying to reach the TRS-80 market, no other publication offers the pulling power of the Bulletin—yet ad rates are about one-third of what you would expect. Write for information on our low-cost ads.

## Advise cassette fix for all TRS-80s

Bob Albrecht, author of "My Computer Likes Me..." and numerous other popular books, feels that all TRS-80 owners should send their keyboard units back to Radio Shack for installation of the cassette recorder modification.

The mod is free while the computer is under warranty, others are charged a modest fee.

With machines modified, Albrecht feels, TRS-80 owners will all be able to freely exchange tapes, and the tapes will all load. This does not seem to be the case now, many feel.

MILWAUKIE, OREGON users (suburb of Portland) are meeting the 2nd and 4th Saturdays of each month. In March they met at Milwaukie Radio Shack, 13690 S.E. McLoughlin, 659-6072.

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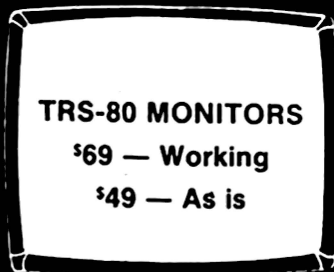
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The FDD-80 add-on drives plug right into the TRS-80 expansion unit. Each add-on drive includes: One floppy disk drive cable (4 drive connector cable available for an additional \$25), case, power supply, and regulator board. MicroComputer World unconditionally backs both floppy drive with a 90 day warranty on all parts and labor.

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See Us at The Computer Fair  
Booth 328

## Interface lets computer communicate on phone

Ever wonder why the crude audio signals the TRS-80 CSAVES couldn't be transmitted over the phone lines to other computers?

Tele-Remote Systems has a \$20 interface that lets TRS-80s do just that. Right now, it is only recommended for Level I machines, but it should not take long for some clever machine-language programmer to come up with the routines needed to slow Level II down to telephone bandwidth.

Designer David R. Long suggests buying two, and giving one to a friend. He says your computer will load directly into his, and indicate a good load with the blinking asterisks displayed on his monitor in the normal manner.

The interface requires no modification to equipment, unless the tape recorder does not supply audio to the earphone jack while in the record position.

Designated the T.R.S. Model 80A, the interface comes completely assembled and ready to use, is:

- compatible with any phone system,
- legal on any phone system,
- designed to work on any standard desk type (round) phone receiver.

Send check or money order for \$19.95 plus \$1.50 postage and handling (CA residents add \$1.20 tax) to: Tele-Remote Systems, Box 1554, La Mesa CA 92041.

## Accessory gives choice of 3 operating speeds

Mumford Micro Systems of Summerland, CA offers a TRS-80 speedup kit that will not lock up the computer on speed change, and gives the TRS-80 slower scrolling and faster tape. The kit includes five integrated circuits on a small PC board, and generates either of three clock frequencies of 880 KHz, the standard 1.77 MHz, or fast 2.66 MHz.

The board mounts inside the keyboard unit and uses 2 toggle switches to select either speed at any time without interrupting program execution. Only 4 connections are necessary to the existing circuitry.

The high speed is well suited to computational programs, slow graphics, and CSAVEing. The low speed is useful for slow listings, de-bugging, and

will also eliminate keybounce. An assembled version is available for \$29.95, kits are \$24.95, and installation is available for those who hesitate to do it themselves. California residents include 6 percent sales tax. Mumford Micro Systems is at Box 435, Summerland, CA 93067.

LIKE ADDITIONAL COPIES of TRS-80 Bulletin for your club, school, store, etc.? Just drop us a card, letter, or phone (714) 757-4849. Be sure to tell us how many you can use.

## How do you get a blinking cursor

Like most amateur programmers I am always looking for better ways to enhance my TRS-80 Level II program runs.

I've been stuck on one particular idea for some time, and to my disappointment no results. I would like to have my input statements dressed with a blinking cursor, or better yet, do away with the cursor and have a blinking graphic block.

It should be done in such a way that you could either use it in the beginning of your programs, to be used on all input or cursor operations, or used on whatever input line you desired.

If some TRS-80 owner has the answer, how about informing us through "TRS-computing." I'm sure there's many TRS-80 owners out there that would smile at the results.

## Hoch Co. board controls 'real world'

The TRS-80 owner can now use his computer to control up to 16 external devices...the coffee pot, industrial process equipment, lights, music, remote controls, alarms, chemical mixing, games, anything that can be controlled by relays.

The CP-16 board plugs directly into the rear of the Level II keyboard (or into the expansion interface if one is used). Any of up to 16 relays per board can be closed or opened with the OUT command followed by the chosen relay's numerical address and ,0 to close or ,2 to open. From 1 to 16 relays per board can be ordered as desired.

Should more than 16 individually addressable relays be needed (up to 555), additional boards and relays to be opened with one command. Complete user information is included.

CP-16 board with power supply but without relays: \$99. Cable to TRS-80: \$10. Each relay: \$5.85. Purchasers may order by mail using their VISA or Master Charge number.

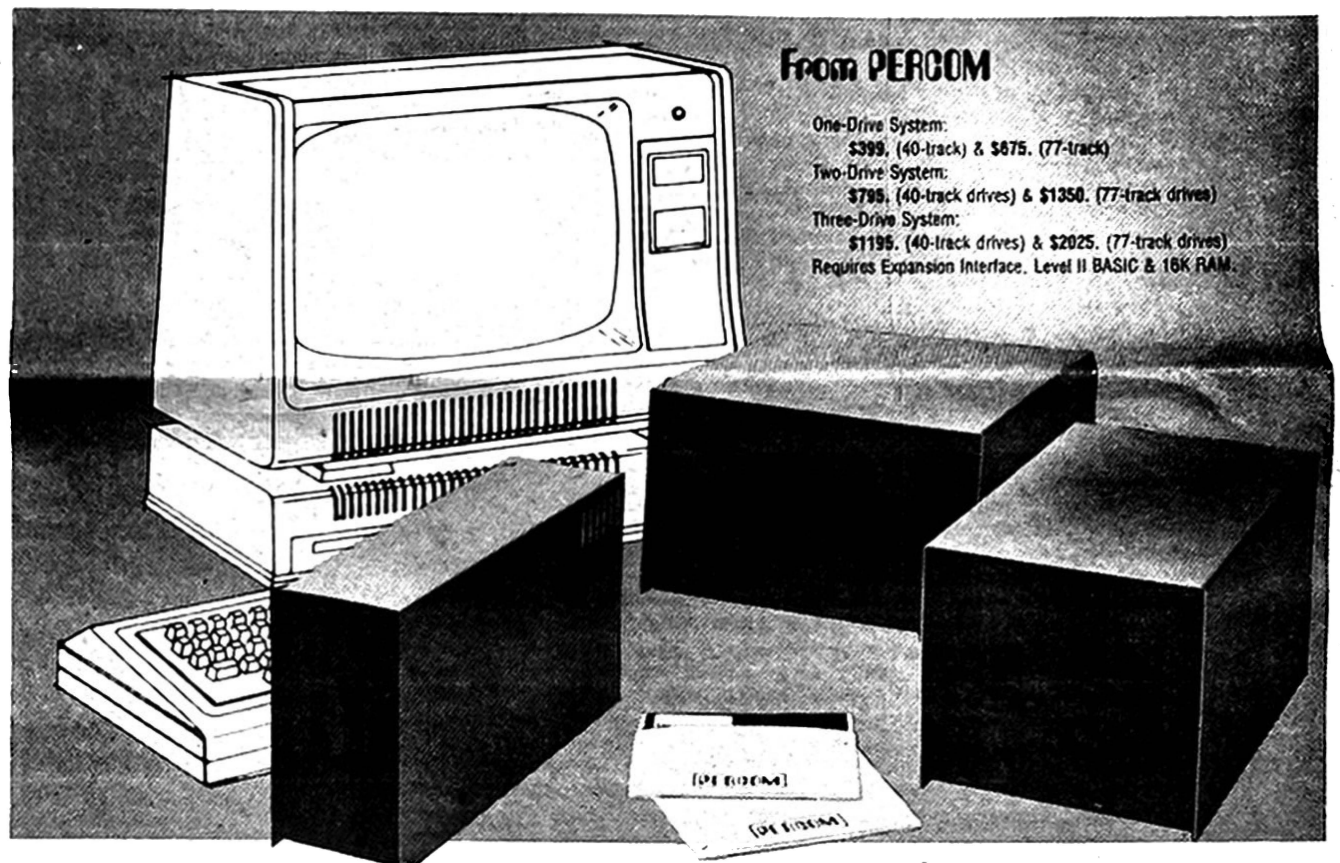
From: Hoch Co., Box 856, Corona del Mar, CA 92625, (714) 644-2571.

## Likes Bulletin

Please send me a copy of your TRS-80 bulletin and add me to your mailing list for any further bulletins.

Your service is a good idea and I'm glad there is an organization like this around.

—MRS. JOHNNIE MCKENLEY, Asa Mercer Junior High School, S. Columbian way, Seattle WA 98108



### From PERCOM

- One-Drive System:  
\$399. (40-track) & \$675. (77-track)
- Two-Drive System:  
\$799. (40-track drives) & \$1350. (77-track drives)
- Three-Drive System:  
\$1199. (40-track drives) & \$2025. (77-track drives)

Requires Expansion Interface, Level II BASIC & 16K RAM

## Low Cost Add-On Storage for Your TRS-80\*. In the Size You Want.

When you're ready for add-on disk storage, we're ready for you.  
Ready with six mini-disk storage systems — 102K bytes to 591K bytes of additional on-line storage for your TRS-80\*.

- Choose either 40-track TFD-100™ drives or 77-track TFD-200™ drives.
- One-, two- and three-drive systems immediately available.
- Systems include Percom PATCH PAK #1™, on disk, at no extra charge. PATCH PAK #1™ de-glitches and upgrades TRSDOS\* for 40- and 77-track operation.
- TFD-100™ drives accommodate "flippy disks." Store 205K bytes per mini-disk.
- Low prices. A single-drive TFD-100™ costs just \$399. Price includes PATCH PAK #1™ disk.
- Enclosures are finished in system-compatible "Tandy-silver" enamel.

Whether you need a single, 40-track TFD-100™ add-on or a three-drive add-on with 77-track TFD-200™s, you get more data storage for less money from Percom.

Our TFD-100™ drive, for example, lets you store 102.4K bytes of data on one side of a disk — compared to 80K bytes on a TRS-80\* mini-disk drive — and 102.4K bytes on the other side, too. Something you can't do with a TRS-80\* drive. That's almost 205K bytes per mini-disk.

And the TFD-200™ drives provide 197K bytes of on-line storage per drive

— 197K, 394K and 591K bytes for one-, two and three-drive systems.

PATCH PAK #1™, our upgrade program for your TRSDOS\*, not only extends TRSDOS\* to accommodate 40- and 77-track drives, it enhances TRSDOS\* in other ways as well. PATCH PAK #1™ is supplied with each drive system at no additional charge.

The reason you get more for less from Percom is simple. Peripherals are not a sideline at Percom. Selling disk systems and other peripherals is our main business — the reason you get more engineering, more reliability and more back up support for less money.

In the Product Development Queue . . . a printer interface for using your TRS-80\* with any serial printer, and . . . the Electric Crayon™ to map your computer memory onto your color TV screen — for games, animated shows, business displays, graphs, etc. Coming PDQ!

\*TFD-100, TFD-200, PATCH PAK and Electric Crayon are trademarks of PERCOM DATA COMPANY.  
\*TRS-80 and TRSDOS are trademarks of Tandy Corporation and Radio Shack which have no relationship to PERCOM DATA COMPANY


**PERCOM**

PERCOM DATA COMPANY, INC.  
DEPT. CE • 211 N. KIRBY • GARLAND, TX. 75042

To order add-on mini-disk storage for your TRS-80\*, or request additional literature, call Percom's toll-free number: 1-800-527-1592. For detailed Technical Information call (214) 272-3421.

Orders may be paid by check or money order, or charged to Visa or Master Charge credit accounts. Texas residents must add 5% sales tax.

Percom 'peripherals for personal computing'



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LISTEN TO THIS...**  
There's a CT-1  
SPEECH  
SYNTHESIZER  
for you.


The famous Computalker CT-1 Speech Synthesizer that produces highly-intelligible natural sounding speech far superior to any other synthesizer available on the market today can now be installed on your TRS-80.

Completely self-contained, the Model CT-1T comes with its own chassis and power supply, on-board audio amplifier (2 Watts), CSR1 software, and inter-connect cable. The CT-1T comes with

complete documentation and is available on either 5 1/4 inch diskette or cassette. TRS-80 Level II and 16K memory required, 32K recommended.

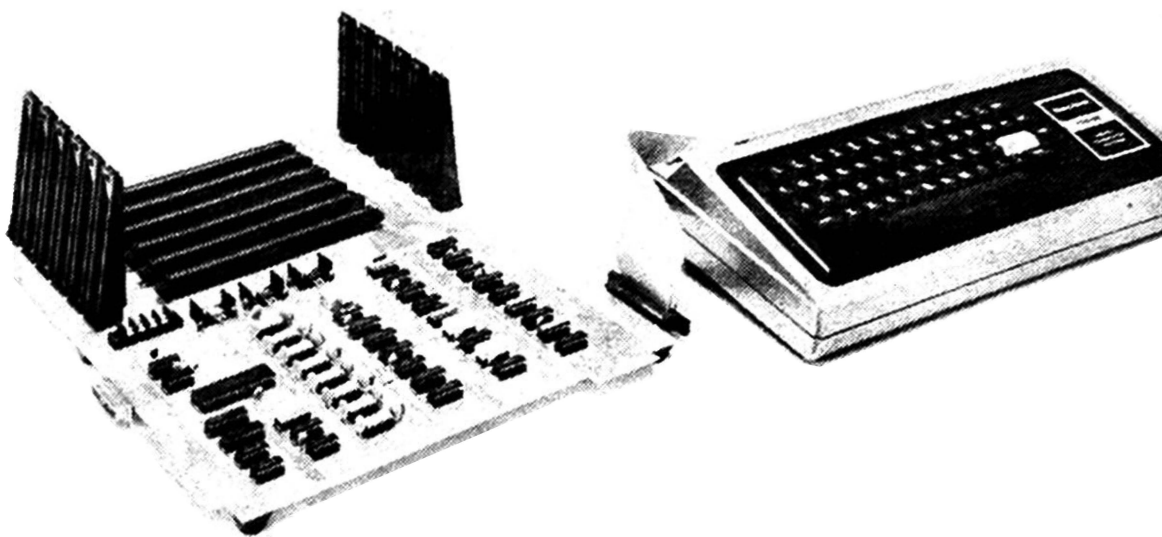
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\$495**

Suggested retail price is \$595  
Calif. residents add 6% sales tax



**COMPUTALKER  
CONSULTANTS**

1730 21st St., Suite A  
Santa Monica, CA 90404  
(213) 828-6546



HUH 8100 — Interfaces TRS-80 to S100 and provides six card slots.

## Wants program for library circulation

We possess a Level II TRS-80, which has met with great popular approval by students at this college. It has occurred to me that there should be a program somewhere that would permit use of the computer by a library for circulation control. Perhaps if someone has done anything along these lines, they might let us, and TRS-80 Bulletin, know. Chesapeake College is a two-year regional community college serving Maryland's Eastern Shore.

— JOHN O. BRONSON, Jr., head librarian, Chesapeake College, Wye Mills MD 21679

## Cassette labels have pinfeed back

Cassette labels on pinfeed backing are now available from Elliam Associates, 24000 Bessemer st., Woodland Hills CA 91367.

While pinfeed backed mailing labels have been available for years, the cassette user has had to hand write or type his labels.

Prices are \$5.90 per 100 and \$27.00 per 500. Larger quantity prices, per thousand, are as follows—\$49 on 1000, \$44 on 5000, and \$39.50 on 10,000-label orders.

In addition Elliam Associates also offers pinfeed backed diskette and mailing labels.

## S-100 bus adapter from HUH

HUH Electronics in San Mateo is offering an S-100 Bus Adapter/Motherboard for the TRS-80. Designated the 8100, it allows a Radio Shack TRS-80 computer to be interfaced to the popular S-100 bus for memory expansion and extended I/O capabilities.

The 8100 has its own built-in 6-slot motherboard which includes card guides which keep the boards in their places. The 8100 sits on a table top next to the TRS-80 and connects to it via a ribbon cable. A second TRS-80 connector allows other TRS-80 devices to be connected at the same time.

The 8100 has optional on-board support circuitry and sockets for 16K of dynamic RAM. The RAM may be split into 4K blocks which can be addressed to any 4K boundary. Four-K dynamic RAMs can be used instead of 16Ks for those left over from memory expansion of the CPU/Keyboard.

The 8100 also has optional I/O interfaces built on-board for both serial and parallel I/O. The serial interface provides RS232 or 20ma current loop with software programmable baud rate, modem control lines, word length, stop bits, etc. to an on-board DB-25 connector. Jumper selection allows the TRS-80 to look like a computer for driving printers etc., or a terminal for talking to larger computers or modems. You can even LPRINT or LLIST from Level II BASIC.

There is also an eight bit parallel input port and similar parallel output port. Both are latched, have both positive and negative strobes and have plenty of drive capability. A standard 22/44 pin edge connector is used for connecting to them.

The 8100 starts as low as \$185. The basic unit includes the S-100 Bus Interface and one edge connector/card guide set, manual, ribbon cable and sells for \$185 kit, \$245 assembled. The extra five connectors and card guide sets are \$45 kit, \$75 assembled. The RAM support option (user must supply RAM chips) is \$45 kit, \$75 assembled. The I/O option is \$85 kit, \$115 assembled.

If purchased separately, the kit prices would total \$360 but if they are all purchased together—a savings of \$135!!!

For more detailed information contact HUH Electronics, 1529 Maple st., San Mateo CA 94402 (415) 573-7359, or your local computer dealer. Prices are US domestic only. Dealer inquiries are invited.

## Computer Faire special on Web TBUFF, BEEP

Computer Faire visitors can save \$7.95 on a TRS-80 beeper, and more than \$3 on a cassette-relay buffer.

Web Associates has marked down the price of TBUFF, the relay buffer, to \$9.71, and TBEEP, to \$20.96.

The software-controlled beeper plugs into the line to the cassette interface and produces a tone similar to that of a pocket pager. It is programmed by a minimum of two Level II Basic instructions or four in machine language. It is about an inch square by two inches, sells for \$27.95 (CA residents add 6% tax) from Web Associates, Box 60, Monrovia CA 91016.

## Causes TVI

When I turn my computer on, I can kiss my TV reception good-bye. Is there any way to avoid the lines and snow on the TV?

—ROGER PELSER, 1818 Meadow ct., W. Palm Beach Fla 33406

# Expand your TRS-80. Save \$100.

Meet the Vista V80 Mini Disk System. The perfect way to upgrade your TRS-80\* system. Inexpensively. (Our \$395.00 price is about \$100.00 less than the manufacturer's equivalent.) Here's how it can help you.

**23% more storage capacity.** Useable storage is increased from 55,000 to 65,000 bytes on drive one.

**8 times faster.** While electronically equal to the TRS-80 Mini-Disk system, track-to-track access is 5ms versus 40ms for the TRS-80.

**Better warranty.** The V80 carries a 120 day warranty — longer than any comparable unit warranty available.

The Vista V80 Mini Disk System comes complete with Minifloppy disk drive, power supply, regulator board and case. And it's ready to run — simply take it out of the box, plug it in and you're ready to go. Dealer inquiries invited.

# Vista

1320 East St. Andrews Place, Suite I  
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(714) 558-8813

**At Vista, we mean business.**




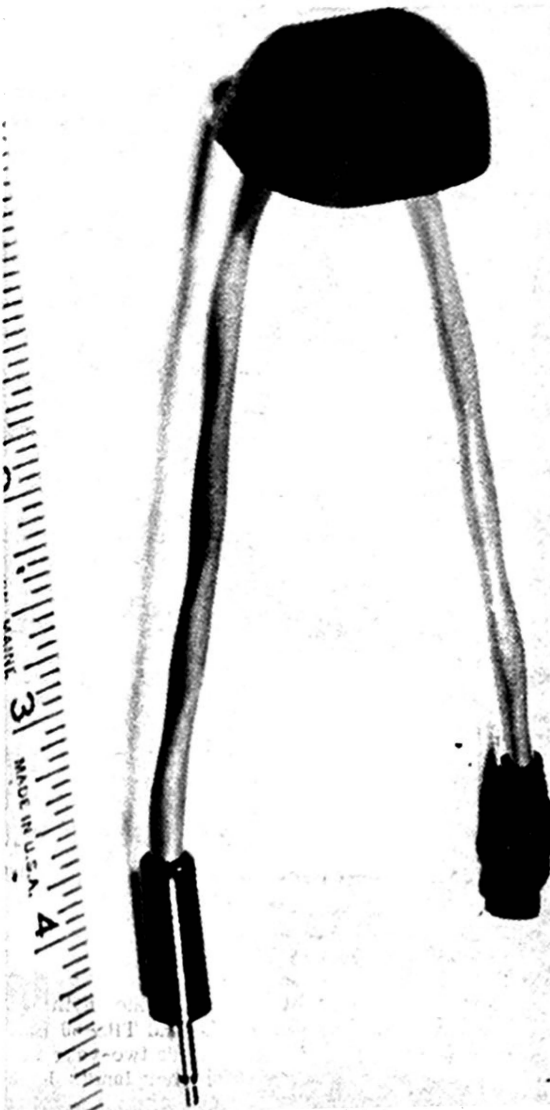
# T-BUG™ USER:

The following are machine language programs designed to link with your copy of T-BUG™, the TRS-80™ monitor.

- Super TLEIS:** Onboard relocater for T-BUG.
- a) TLEIS relocates T-BUG to your choice of high RAM.
  - b) TLEIS relocates itself too! Now T-BUG can move again from its new location.
  - c) TLEIS can relocate TSTEP and IN 1000 rak. (See below)
- Super TLEIS** allows machine level access to all programs that normally interact T-BUG. # F punch backup copies of worn commercial tapes. Now T-BUG is a resident monitor for your TRS-80.
- 16K Level II, Super TLEIS No. 1L-0 ..... \$9.95
- TSTEP:** Single-stepper for T-BUG; under the # M command the space bar advances memory like ENIBK, executing single or multi-byte instructions into either a clearable screen or a simultaneous before/after display of:
- a) Before/After display of CPU registers in # M-like format, completely user accessible, independent of T-BUG registers.
  - b) Before/After testable flag configuration.
  - c) Before/After top six stack elements, as initialized by the user or the program being examined.
- Subroutines can be either single-stepped or run directly, control remaining with TSTEP. Super TLEIS relocates TSTEP.
- 16K Level II, TSTEP No. 1L-1 ..... \$11.95
- IN 1000 rak:** Enables an implicit keypad under the T-BUG # M command for convenient on-site object code editing. Invaluable for hand assembly and debugging. Super TLEIS relocates IN 1000 rak. Includes:
- a) Backspace; advances memory like ENIBK but to previous memory location, makes T-BUG bidirectional.
  - b) Relative space; regards current memory byte as two's complement displacement and advances memory to relative location.
  - c) Insert; moves object code string terminated by FFFF one byte higher in memory, rotates wiped out byte into current address for inspection.
  - d) Delete; moves object code string one byte lower in memory, covers current byte.
  - e) CLEAR; clears the workspace.
- 16K Level II, IN 1000 rak No. 1L-2 ..... \$9.95
- EDU #2:** This innovative new program for the TRS-80 will be introduced at the 4th West Coast Computer Faire, May 11-13, San Francisco.

(include .75 mailing for each program, CA. add 6% sales tax)

T-BUG, TRS-80™ to Radio Shack/Tandy Corp.  **ALLEN GELDER**  
5914 California St.  
San Francisco, CA. 94121



## Offers \$13 cure for cassette relay hangup

Web Associates feels the all-too-common TRS-80 cassette drive hangup is something that inevitably "will happen to you" someday.

This is especially true, according to Web research, if the user is running a lot of data saves or loads, during which the cassette is turned on and off several times a minute.

The failure is caused by a phenomenon known as microwelding, which occurs as a result of excessive current and heat build-up in the TRS-80 cassette control reed relay.

The microwelding is further aided by a slight, self-holding, electro-magnetic force induced by the high recorder current. This added electro-magnetic force is why, in most cases, the hang-up goes away when the cassette is manually turned off.

In recognizing the need for a simple, inexpensive, non-repair-shop solution Web Associates has developed and is delivering their TBUFF module.

The TBUFF module simply plugs in series with the "REMOTE" cable between the TRS-80 and the recorder. TBUFF reduces to practically nothing the current passed through the reed relay in the TRS-80. At the same time, owing to careful design techniques, TBUFF delivers full power to the recorder, thus maintaining proper tape speed and volume levels.

TBUFF sells for \$12.95 (Californians add 6%) and is available for immediate delivery. Web Associates also manufactures an expanding line of other useful products. More information may be obtained by writing: Web Associates, Box 60-N, Monrovia CA 91016.

CASSETTE-RELAY BUFFER—Web Associates offers this device to protect the computer's delicate relay.

## Data Manager is do-all program

By POI POW  
Micro Architect president

IDM-III provides a general purpose, interactive, simple yet powerful solution to data base management. Ease of use by non-technical personnel has been the primary design consideration.

IDM-III allows many applications to be computerized without any programming. The basic components of IDM-III are data base initialization, data base manipulation, report formatter, and report generator.

The data initialization sub-system lets you specify the name, type, size of a field, the number of fields, the access method, maximum of records on-line.

The data manipulation sub-system lets you add, display, print, delete, or update a record.

The report writer sub-system lets you specify the format of a report on-line. The user specifies page heading, selects fields and filter criteria. Multiple sort-keys can be used. Field calculations include totals, averages, multiplication, division, etc.

The report generator enables the user to produce standard reports or reports previously specified by the user. Up to 10 reports can be specified by the user on-line and saved on disk. All reports have title, date, automatic page numbering.

Sequential and random access are both supported. You can randomly access a record by specifying a key or a record number. Technical features include hashing, blocking and buffering.

IDM-III features include:

- interactive conversation requires no user programming and no commands to remember.
- no limit on number of fields.
- specify name of field, the type (string or numeric), and size on-line.
- key random access and sequential access methods.
- blocking, hashing, and special buffering techniques.
- multiple sort fields.
- powerful report writer requires no user programming.
- field calculations include totals, averages, multiplication, division.
- report can be printed or displayed on the screen, page by page.
- powerful report writer lets you select fields and filter criteria.

IDM-III compares favorably to other data base management systems on the market. Cromemco's costs \$95 and does not have report writer and report generator. TRS-80 "File-it" system is an "on-memory" system that does not make any use of the disk system at all. Similar to several other systems, it requires some programming, has a fixed number of fields. Ohio's data base is closer in capabilities but costs about \$300. Only File-it operates on TRS-80. Most other data base managers support only the inefficient sequential method and require data re-organization. IDM-III

IDM-III requires TRS-80 DOS with 32K memory, is priced at \$49 and available from Micro Architect, 96 Dothan St., Arlington MA 02174.

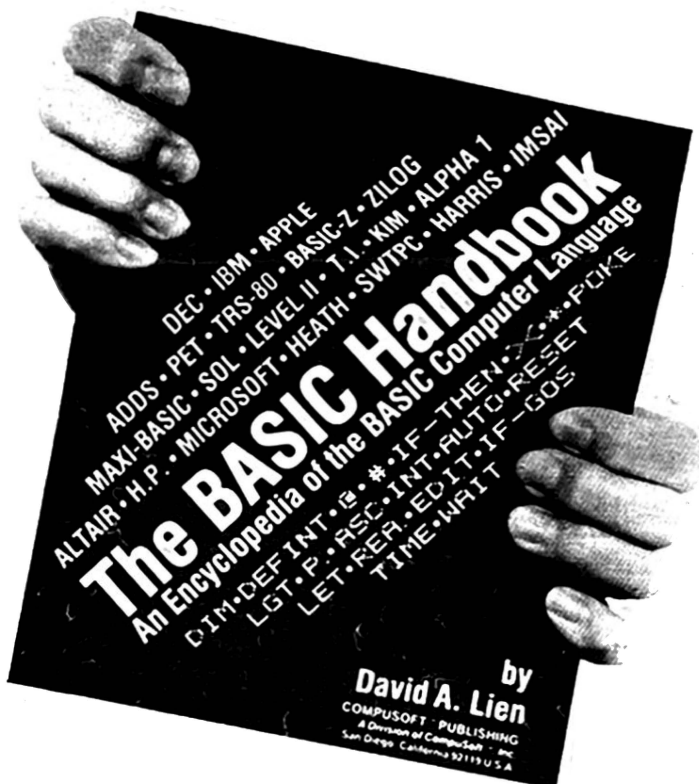
## Authors wish to test TRS-80 peripherals

Kurt Inman, Bob Albrecht and myself are writing a book for Dilithium Press which illustrates methods and devices which connect the TRS-80 to the outside world.

We would like to get word to all manufacturers of such devices that we would like to use, and review, their products in our book.

—DON INMAN, Dymax, Box 310, Menlo Park CA 94025

## CompuSoft™ Publishing Proudly Announces . . . . .



\$14.95

(360 pages - Soft Cover)

From the author of the highly acclaimed TRS-80 Learner's Manual comes the book you've been asking for! THE BASIC HANDBOOK is THE definitive reference and "idea" book which explains in detail the BASIC language as used in over 50 micros, minis and mainframes.

Not a dictionary, not a text, it is a virtual ENCYCLOPEDIA of the BASIC language. Explaining all you need to know about over 250 BASIC statements, functions, operators and commands, it is the "missing link" needed to convert programs from one computer to RUN on another.

## YES, I need the BASIC Handbook!

COMPUSOFT PUBLISHING 8643 C Navajo Road, San Diego, CA 92119

Please send \_\_\_\_\_ copies of The BASIC Handbook. My check for \$14.95 each + \$1.35 P&H is enclosed. (CA Addresses add 6% tax)

I understand my order will be shipped promptly and there is a 30 Day money-back guarantee.

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My computer is a \_\_\_\_\_



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## Percom upgrades DOS for 40, 77-track drives

Percom Data Company has announced immediate availability of new software to upgrade TRSDOS, the TRS-80 disk operating system, so that TRSDOS may be used with 40 and 77-track mini-disk storage drives.

Called Patch Pak #1, and supplied on mini-disk, the Percom software upgrade also improves TRSDOS in other ways.

A "patched" TRSDOS solves the problem of interference of disk operations by the TRS-80 "Heart-beat" pulse.

TRSDOS with Patch Pak #1 applied also eliminates most of the so-called "silent deaths" of a disk drive motor stopping prematurely during operation, a usually catastrophic interruption that destroys the programs and data in memory.

Moreover, with a patched TRSDOS an operator can recover from a "silent death" failure without pushing the Reset button—which destroys program and data in memory—and can usually close files or print totals.

Two disk drives are required if a person wishes to apply Patch Pak #1. The TRSDOS (version 2.1) system disk is inserted in one drive and Patch Pak #1 mini-disk is inserted in the other. The patches are applied "on the fly" to the system disk, and the modified system disk will display: TRSDOS + PERCOM PATCH PAK #1 VER. 2.1, when used again.

Patch Pak #1 mini-disk and application instructions are priced at \$19.95.

Patch Pak #1 may be ordered by dialing Percom's toll-free ordering number: 1(800) 527-1592. Orders may be paid by check or money order, or charged to a Visa or Master Charge credit account. Texas residents add 5 per cent sales tax. Or write Percom Data Co., 211 N. Kirby, Garland TX 75042.

## TRS-80 DISK WOES? MEMORY LOSS? ERRATIC OPERATION?

DON'T BLAME THE SOFTWARE

Power Line Surges & H-A-S-H could be the culprit! Floppies, memory & processor often interact!

Curb damaging Surges & Hash with our ISOLATORS and Suppressor/Filters.

Eliminate Equipment Interaction with our unique ISOLATORS.

ISOLATOR (ISO-1A) 3 filter-isolated 3-prong sockets; integral surge suppression; 1875 W total load, 1 KW any socket . . . . . \$49.95

ISOLATOR (ISO-2) 2 filter-isolated 3-prong socket banks (6 sockets total); integral surge suppression; 1875W total load, 1 KW any socket. . . . . \$49.95

Suppressor / Filter (SFK-31) 3-prong 1 KW load . . . . . 24.50

Suppressor / Filter (SFK-33) Three 3-prong sockets; 1250 W load . \$32.50

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171 South Main Street, Natick, Mass. 01760

LIKE ADDITIONAL COPIES of TRS-80 Bulletin for your club, school, store, etc.? Just drop us a card, letter, or phone (714) 757-4849. Be sure to tell us how many you can use.

## Percom Data Co. moves to larger plant

Percom Data Co., Texas-based manufacturer of electronic devices and systems for the personal computer and computer OEM markets, has moved into a new 10,000-sq.-ft. building.

This is the firm's second move to larger facilities in less than two years. All departments—administration, marketing, engineering, manufacturing and customer services—are now housed at the new Kirby street location.

Harold Mauch, president, said Percom-sustained growth in a market (personal computing) in which suppliers often provide only haphazard backup support is due to the firm's thorough product documentation support and strong customer service commitment.

Percom Data Company was formed early in 1976 as a proprietorship, and was incorporated in March, 1978.

Sales to the home-and-small-business computer market of the firm's LFD series of floppy disk storage systems for SS-50 bus computers, and "add-on peripherals and other "after-market" hardware and software for systems like the TRS-80 are expected to be the principal source of receipts.

Last year microcomputer retail sales in the personal computer market amounted to over \$500 million, a figure which could reach \$3 billion annually by the early 1980s, according to Business Week magazine (March 19, '79, p.37).

## Sawyer accounting now on TRS-80 tape

Pet Gazette said Accounting Pack I by Sawyer Software "can be described in one word: 'fantastic'. Anyone who has prepared a balance sheet manually will have a slight heart murmur upon using the Accounting Pack. It is amazing that the program fits in 8 K. I would say the Accounting Pack is useful and could justify the price of a PET unto itself for any small business."

Sawyer Software Accounting Pack programs, AP 1 and AP 2, are now available for 16 K Level II TRS-80. These programs generate previous-month and current-month balance sheets, income statements (previous month year-to-date, current month and current year-to-date), check journal and general ledger. They utilize cassettes for each period's data and have a checkbook reconciliation routine to aid in finding checkbook errors.

The AP 1 program uses a unique single-entry bookkeeping system and can handle up to 150 entries per period (month, week, day) with up to 75 different accounts.

AP 2 can handle up to 250 entries per period, and utilizes a printer for hard copies of all the reports. It also has a menu, allows easy addition or deletion of accounts, uses single-entry for sales transactions and has formatter for the reports.

AP 1 is \$25, AP 2 \$45, from Sawyer Software, 201 Worley rd., Dexter MO 63841.

## Portland Area Users meet 1st, 3d Thursday

We are starting a club in the Portland, Oregon area for TRS-80 owners, users, and interested folks.

We call it the TRS-80 Portland Area Users Group. We meet the 1st and 3rd Thursday of each month, usually in the Beaverton area.

Organizer is John T. Warner, 13485 SW Driftwood pl., Beaverton OR 97005.

— JAMES L. TALLMAN, 3468 SE Roanoke, Hillsboro OR 97123.



# IF YOU OWN A TRS 80 \* SELECTRA-PRINT PUTS YOU JUST A CABLE LENGTH AWAY FROM A "HARD-COPY" ( Typewriter Quality: clean, clear, high-fidelity ) Word Processing System!

... just a simple hook-up with the supplied cables and your SELECTRA-PRINT is ready to run.

For Word Processing on a TRS-80, for example, just command "LPRINT" and SELECTRA-PRINT automatically outputs clear, clean, high-fidelity, hard copy. . . . and of course you can use it to print-out any other information you might need.

### SPECIAL NOTE:

SELECTRA-PRINT is a Selectric II typewriter and although it has been modified for computer print-out, it may still be used as a standard office typewriter.

PRICE: \$1,850.00\* \*TRS-80 Version \$1925.00

### OPTIONS:

Dual Pitch	\$125.00
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Noise Reduction Feature	\$50.00
RS-232 Interface	\$195.00

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\* SELECTRA-PRINT is VERSATILE!  
SELECTRA-PRINT is compatible with most micro- and mini-computers including PET • Apple • Heath H8 • IMSAI • Cromemco • Alpha Microsystems • Space Byte • North Star Horizon • SWTP • Vector Graphic • Sol • Polymorphic • Digital Group • Ohio Scientific • Altair • Sorcerer • Xitan • Rex • KIM • EXORcisor . . .

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