

CIE TRS-80TM Bulletin

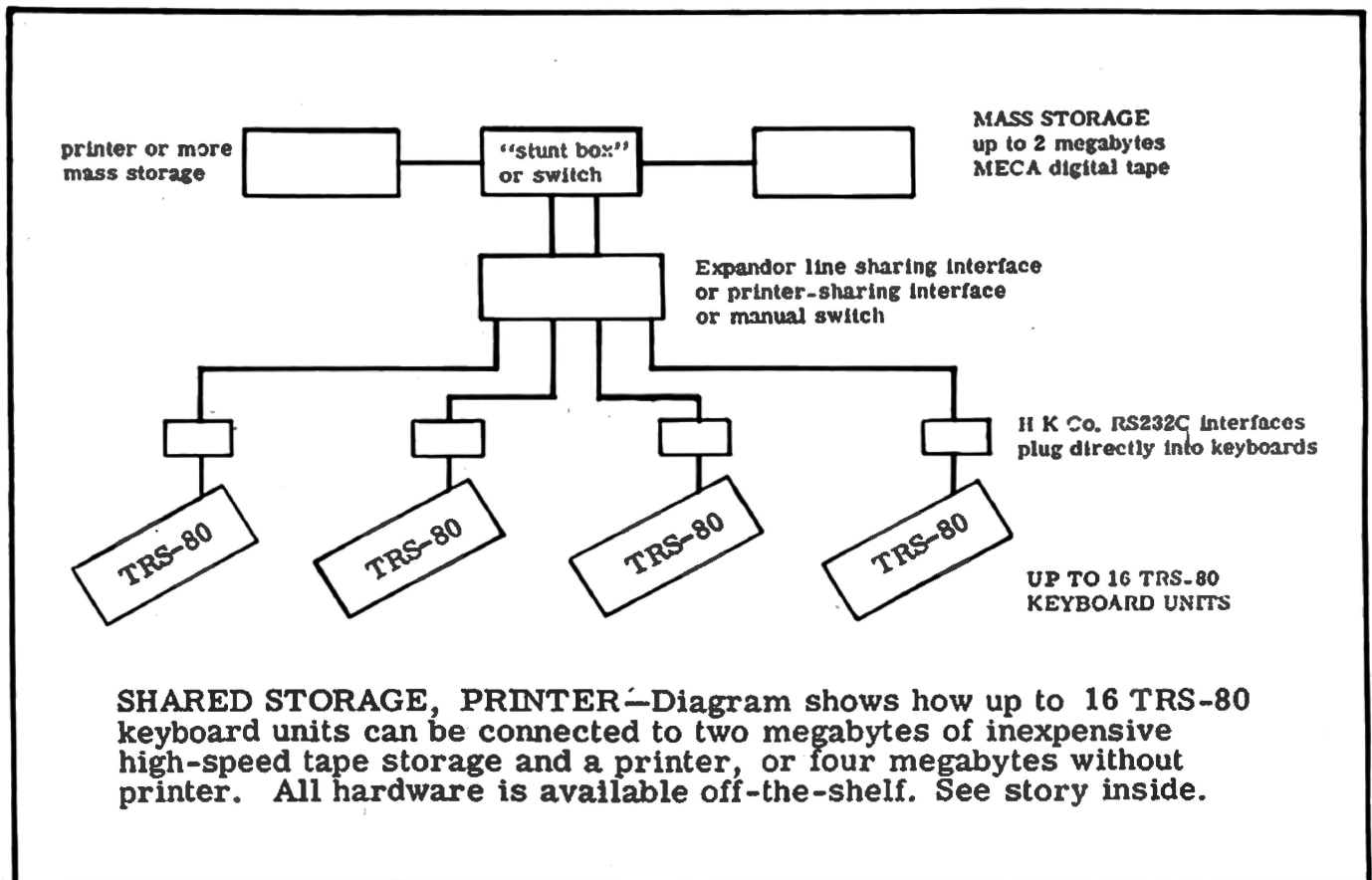
EDITORIAL CONTENT SUPPLIED BY TRS-80 COMPUTING

Vol. 1 No. 9

Bill McLaughlin, editor

October, 1979

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(Circle D on free information form)

PEOPLE'S PASCAL SELLS FOR \$15.50, RUNS IN 16K

John Alexander of Pipe Dream Software, Berwick Australia has adapted the Chung/Yuen tiny Pascal to TRS-80, and this has been made available for just \$15.50 through People's Software.

The Chung/Yuen Pascal subset was published last fall in a Byte magazine series. It was written for North Star systems.

The \$15.50 price includes \$4 in royalties to Alexander and \$2 to Chung/Yuen (who do business as SuperSoft, and have their own improved tiny Pascal, also available from People's Software). Programs supplied on People's Pascal I (CIE tape 3) are:

Editor/compiler, P-code interpreter and P-code-to-Z80-code translator (all three in Basic plus machine language), three run-time systems (in Z80 assembly language), a People's Pascal library (in People's Pascal) containing:

SET (on/off, X, Y) for graphics,
AT (cursor-posn) for display, and
RND (seed) for pseudo-random numbers.

John explains People's Pascal I in the following format:

GOOD NEWS

Integers can be used in logical expressions and for storage of character data. Write-character-string facility provided.

BAD NEWS

(Continued on page 3)

AP1 is a general ledger package with check journal, income statement, balance sheet and checkbook reconciliation routine. Designed for the small business or homeowner. Up to 50 entries and 40 accounts per period.

\$25.00

"Accounting Pack I by SAWYER SOFTWARE can be described in one word: Fantastic. Any 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 8K. I would say the Accounting Pack is useful and could justify the price of a PET unto itself for any small business."

Review in BEST OF PET GAZETTE.

AP2 has all the features of AP1, plus up to 250 entries per period, Menu, formatter for reports and more. Requires at least 16K in PET or TRS-80.

AP2 also utilizes a printer for the reports. Send device number of printer with order for PET.

\$45.00



Telephone Orders Welcome

SAWYER SOFTWARE

Quality Business Software
For PET[™] or TRS-80[™] (level II 16K)

★★★ NEW ★★★

Disk Business Software For Your TRS-80

GENERAL LEDGER— Maintains complete financial information on diskette. Generates hard copy of Trial Balance, Income Statement (with percentages), Balance Sheet and Check Journal. Includes commands to edit data, close out year end accounts and debit-credit verification.

\$125.00

PAYROLL— Computes FICA, Federal and State taxes. State is calculated on percentage of gross pay and can be customized for your particular state. Will allow use of City tax and/or other deductions. Utilizes printer for hard copy of Payroll Register, including current, quarterly and year-to-date totals.

\$125.00

All disk software requires at least 32K and one disk drive.

SAWYER SOFTWARE

201 Worley Rd., Dexter, Mo. 63841
(314) 624-7611

Payroll computes tax information and updates totals for quarterly and yearly reports. Employees can be salaried or hourly and pay periods can be either weekly, bi-weekly, semi-monthly or monthly. Any number of employees (8 per cassette for PET, 25 employees per cassette for TRS-80).

\$30.00

Payroll-16K for PET. Same as above plus ability to get hard copy of individual employee records and stores 25 employees per cassette.

\$45.00

Printer Payroll (TRS-80)— Includes same features as PAYROLL, plus utilizes a printer for hard copies of employees records and stores 25 employees per cassette.

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B.A. allows management to have available to them information for financial planning decisions utilizing ratio and growth analysis.

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Mini-floppy disks and programs are expensive. If you are losing programs and mini-floppy disks due to damaged center holes, FLOPPY SAVER is the answer.

Floppy Saver will save disks already damaged and will protect new disks for many times normal life.

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HEAVYWEIGHT BOXING— You match 40 contemporary or all time great boxers in computer fights. What-if bouts like Jack Johnson vs Ali or Marciano vs Larry Holmes are possible with this super enjoyable game program.

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STOCK MARKET— Now you can invest in the stock market with this stock market simulation for 1 to 4 players. Buy on margin, sell short, then figures your Federal Taxes! Includes calculations for long and short term capital gains.

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1979 INCOME TAX— Does 1040 schedules A, B, D, G and TC. Specify if you have a printer when ordering this program.

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WHY 2 PASCALS?

Why two People's Pascals, and which one is for you?

First came John Alexander's Pipe Dream Software tiny Pascal, then being sold for \$60 a copy. We saw tiny Pascal as something that would enable anybody with a 16K Level II TRS-80 to learn Pascal. We phoned John in Australia and persuaded him to let us distribute it at a \$15 price, with \$4 going to him.

Then we heard about SuperSoft enhanced machine-code tiny Pascal, by the original Chung/Yuen team. SuperSoft was selling it for \$40, but we persuaded them to take a \$10 royalty, plus \$2 of any Pipe Dream tape sold by us.

With these arrangements, CIE feels it has arranged the lowest-possible end-user price, while giving extremely generous royalties and offering retailers normal discounts.

Which People's Pascal is for you? The \$15.50 tape 3 is a great bargain, and an interesting system. In using it, a person could pick up considerable knowledge of compilers, translators, interpreters and other software modules. The system includes seven programs, which the user must load at appropriate times—and he also must load the TRS-80 Editor/Assembler and T-Bug.

If anyone does not have T-Bug or the editor/expensive tape 5, People's Pascal II.

The SuperSoft People's Pascal II is easier to use. One System load and the whole Pascal is in your computer waiting to be used.

SYSTEM PROTECTS BASIC PROGRAMS

Data Associates of Framingham, Mass. has a program that will automatically protect programs written for TRS-80. Called Unlist8, it runs on a single disk system with 32K memory.

By use of this program, BASIC programs can be protected against unauthorized modification, and can be made confidential.

Hidden passwords and copyright notices selected by the user are inserted and then the program is converted so that it cannot be listed or printed. The protected program can still be RUN, CSAVED, CLOADED, DISK LOADED, DISK SAVED as usual. Options permit unlisting all lines, or each nth line, or specified blocks of line numbers. This program can also be used to unprotect or relist a protected program provided that the password for that program is known.

Unlist 8 can relist each line, or blocks of specified line numbers. Certain lines that are permitted to be modified can thus be left unprotected.

Unlist8, converts any named Basic program (saved in ASCII form on disk) into the protected version and automatically saves it on the same disk under a new name selected by the user.

After the conversion is complete, a summary is displayed of the original name, the converted name, the elapsed time, as well as a count of both the input and output bytes and lines. The program displays prompting messages as needed.

Unlist8, is provided with an instruction manual and three copies on cassette. The cost is only \$19.95 postpaid form Data Associates box 882 Framingham, Ma 01701 or circle # EY.

(Circle O on free information form)

AT LAST! HIGH-QUALITY SOFTWARE AT MASS-PRODUCTION PRICES.

DISKETTE DATA BASE, IDM-III DOS & 32K \$49

You can use it to maintain a data base & produce reports without any programming. Define file parameters & report formats on-line. Advanced version \$69.

WORD PROCESSOR DOS & 16K \$39

Our WORD III is the first word processor specifically designed for the TRS-80 that uses disk storage for text. Written in BASIC. No special hardware, no text size limit. Use for letters, manuals & reports. 32K version features upper/lower case without modified keyboard. \$49.

MAILING LIST DOS & 16K \$35

Lets you maintain a data base and produce reports & labels sorted in any field. 900 labels/disk. Random access. 2-digit selection code used. 32K version features fast SHELL sort. \$49. Advanced version with report writer at \$59.

INVENTORY DOS & 16K \$39

While others use inefficient sequential file, we use 9-digit alphanumeric key for fast on-line random access. Reports give order info, performance summary, etc. 32K enhanced version \$49.

KEY RANDOM-ACCESS UTIL DOS & 16K \$19

Lets you access a record by specifying a key. Features hashing, blocking, buffering technique, etc.

ACCOUNT manages client accounts & accounts receivable. Remark fields for general use. Order entry. Print invoices, statements and many reports. Used by doctors, small businessmen, etc. 32K req. DOS \$59.

SORT & LINKED-LIST ACCESS UTIL Lev. II

Unlimited # of sort-keys. All data types. Link & unlink a record in a list. 4K. \$10 each or \$16 both.

CALC, a useful utility to add up your bank deposits, print labels and balance check book. Level II 16K. \$20.

CASSETTE WORD PROCESSOR Lev. II & 16K \$29

LEVEL I or II CASSETTE SOFTWARE:

data base manager, inventory 16K \$20 each

check balance & stock security 4K \$10 or \$15 both

MOD-II, superior, complete, integrated business software. Write for details.

Send \$5 for each manual and \$1 and 2 long self-addressed stamped envelopes for newsletters.

MICRO ARCHITECT

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C.O.D., CHECK OR MONEY ORDER ACCEPTED

"AUTO INVOICE" is a series of menu driven programs providing for the entry, storage and retrieval of invoices using the radio shack TRS-80 computer. "AUTO INVOICE" allows for parts used & labor description. The system would be useful to such businesses as auto repair shops, truck repair shops, service stations, etc. etc. It requires a 32K, 2 Disk System.

SOME FEATURES ARE

- Weekly & monthly sales reports
- Selectable number of copies during printing
- Error recovery
- Documentation including program listings and variable lists (easy modification)

EACH INVOICE ALLOWS FOR

- Customer name & address (75 char. total)
- Invoice and service dates
- Customer authorization
- Up to 8 parts items
- Up to 4 description lines (60 char. each)
- Automatic parts tax & total calculations
- Optional printing time & date
- Invoice numbers of your choice

....THE PRICE IS ONLY \$49.00....

If you need the system customized, that can be done for a reasonable cost. I will also do other programming. For prices just let us know what you need.
FOR MORE INFORMATION CONTACT

NUTBUSH COMPUTER SOFTWARE

P O Box 113 - Elmwood Park, Illinois 60635

PEOPLE'S PASCAL I, CONT.

Sixteen-bit integer and array of integer data types only.

Full set of structured programming facilities provided including BEGIN, END, IF, CASE, FOR, WHILE, REPEAT, UNTIL, PROCEDURE, FUNCTION.

No Records, Sets, Pointers, Files, Labels or Go To.

Extensions provided to read and write absolute memory locations (equals PEEK, POKE), call assembly language routines, and evaluate hex constants.

Procedure and Function parameters passed by value only.

Compiler returns to editor on encountering first syntax error after issuing appropriate error message.

Compiler has no error recovery—stops on first syntax error.

Compilation may proceed from text buffer and/or cassette file(s). Text buffer is over 3K bytes in size. Compiler optionally produces no object cassette (compiler for syntax check only).

When compiling a large program from source cassette, and producing a P-code object cassette, periodic operator intervention is required for cassette changes.

Compiler allows modular program development, with "SINCL" facility for inclusion of source code from cassette file(s) at compile time.

Compiler compiles about 10 statements per minute.

PASCAL II FASTER, EASIER TO USE

Now anybody's 16K Level II TRS-80 can run Pascal too.

The Chung/Yuen "tiny" Pascal (People's Pascal II, CIE tape 6), at only \$23.50, means you no longer need be left out of the growing group of Pascal users.

People's Pascal II gives you everything you need to write structured Pascal programs:

- tiny Pascal compiler • complete text editor for writing your programs • complete tiny Pascal monitor • sample Pascal programs • user's manual (TRS-80 Computing Issue 1:4).

People's Pascal II is both a powerful structured language and "CPU expeditor". People's Pascal programs execute at least four times faster than Basic, and often eight times faster!

Special functions open up the complete graphic capability of TRS-80. A computerist now has the easy means to write those dazzling, impressive, high-speed graphics programs that are great for games, plotting, statistics, etc., but previously required difficult assembly language.

For the expert computerist, side two of People's Pascal II contains a compiler for expanded systems and complete source to the compiler, written in Pascal. This means a user can re-compile the compiler, making changes, adding features, etc. (but this will take at least 36K RAM and a solid knowledge of programming).

With the complete People's Pascal II operating system, the computerist can save and load both source (Pascal) programs, and compiled programs, to or from cassette tape. This means that once you have debugged a program, you can save the P-code (compiled program) and thereafter, to run the program, you need only load the super-fast P-code.

Here's a partial list of People's Pascal II features:

- recursive procedure/functions • for (loop)
- case • if/then/else • one-dimensional arrays • write • read • constant • repeat/until (loop) • "peek & poke" • plot (graphics for TRS-80)

Manual alone, the TRS-80 Computing 1:4 Issue, is available for \$1.50 plus 50¢ postage/handling. See back page for ordering information.

P-code interpreter has full set of debugging facilities, and is only required for debugging. P-code interpreter runs slowly (double level of interpretation).

P-code translator generates fast Z80 code much of which is in-line. Translated programs run about five-times faster than Level II Basic. Object programs are compatible with T-Bug. Translator option optimizes for minimum memory usage and production of PIC (position independent code), or for speed.

Tandy T-Bug required for creation of SYSTEM loadable cassettes.

Editor allows creation and editing of any size files. Editor contains small but comprehensive command set. Source files may be merged or renumbered. Source files are blocked for efficiency.

Intra-line editing not provided. SET/RESET assembly language routine provided for graphics. Graphics run eight-times faster than they do with Level II basic. Callable from People's Pascal as "SET (ON/OFF, X, Y);". Other assembly-language routines can be written (e.g. for cassette I/O).

Cassette I/O not intrinsic to current version of People's Pascal I.

Translator emits code suitable for any Z80-based system.

ADVERTISE IN 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.

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.

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Radio Shack's TRS-80*



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for users of
Radio Shack's TRS-80*

TRS-80 TRANSFORMED WITH PROFESSIONAL SOFTWARE PACKAGES

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CP/M operating system modified for use with TRS-80 computer and disks. In addition to the standard CP/M utilities of Editor, Assembler, Debugger, etc., we have added DCV2 (Utility to convert system tapes to CP/M files), DISKAS & CASDISK (Utilities to back up files to tape and recover to disk), MOVER (Program to transfer files with single drive systems) \$145-\$225

All items listed below operate in conjunction with the CP/M operating system.

MAC - 3200 Macro Assembler. Full source code, listing, and manual. Produces object code, relocatable, and relocatable. Includes full source code, listing, and manual. \$199-\$215

MACRO-80 - 6800 Macro Assembler. Full source code, listing, and manual. Produces object code, relocatable, and relocatable. Includes full source code, listing, and manual. \$199-\$215

DESPOOL - Program to process simultaneous printing of data from disk and user's printer. \$199-\$215

Desk Extended BASIC - Version 5.0. Includes source code, listing, and manual. \$199-\$215

BASIC Compiler - Language compiler with full source code, listing, and manual. \$199-\$215

FORTRAN-80 - ANSI 74 FORTRAN compiler. Full source code, listing, and manual. \$199-\$215

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Also, math problems (teaches addition, subtraction, multiplication & division), queen (use your queen to checkmate TRS-80's king), Star Trek I, number guessing, wheel of fortune, and World War II bomber (trajectory exercise)

TAPE 1 LEVEL II—Includes all of above, as well as the following 10 programs: speed reading, touch typing, sales receipt tally, decision maker, mail addressing, straight-line and double-declining depreciation, revolving charge account, Mastermind, tic-tac-toe, grand prix auto race, bingo, state capitals, etch sketch, hangman.

TAPE 2, LEVEL II, fully documented in "Some Common Basic Programs" by Lon Poole and Mary Borchers (Osborne & Associates, \$9.50 postpaid via UPS, from CIE), 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 commercial paper; loan principal, regular & last payment, remaining balance, term-loan; mortgage amortization; and greatest common denominator.

Also, integer prime factors; polygon area; triangle parts; analysis, operations two vectors; radian/degree, degree/radian conversion; coordinate; coordinate conversions; coordinate, polar equation, functions plot; linear, curvilinear interpolation; Simpson's & trapezoidal rules; Gaussian quadrature integration; derivative; alphabetize.

*Written for disk systems.

TAPE 3—PEOPLE'S PASCAL Program Development system, royalty software developed by John Alexander, based on the Kih-Mun Chung/Herbert Yuen "A 'Tiny' Pascal Compiler" article in Sept., Oct., Nov. '78 Byte. Contains nine programs, three in Basic, two in Pascal, four in Z80 code. Requires T-Bug and TRS-80 Editor/Assembler.

System includes tiny Pascal editor/compiler, interpreter, demonstration Pascal source and object programs, translator, Pascal library, and three run-time systems. People's Pascal runs on any 16K Level II TRS-80 system.

TAPE 4, LEVEL I—Sixteen programs: election returns, business percentage, ups & downs of business, cross index (two programs), inventory control, sales receipt tally, payroll, and mixed monthly sales report.

Also, math problems, speech recording aid, cash register, Snoopy graphic, chase, commander-in-chief (two-program instructional game), Christmas graphic, and air raid.

TAPE 5 LEVEL II—Twenty eight programs, all in Basic: memory test, mortgage payments, tension breaker, lineprinter to screen or screen to lineprinter exchange utility, federal income tax, election returns, business percentage, vacation planner, car pool*, diet planning, mailing list*, and first aid tutorial.

Side B—spelling bee, Star Trek III, mind bender, tachistoscope, chase, common factor, Klingon capture, spelling practice, Hamurabi, animals, Snoopy graphic, cryptogram, starship graphic, ants, Yesterday (music), PILOT* (the computer-aided instruction language, requires 32K).

*Written for disk-based systems.

(Continued on page 5)

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The tape digitizer is unconditionally guaranteed for 90 days and is offered on a 10-day money-back basis to prospective buyers. Write Alphanetics, Box 597 Forestville CA 95436, or circle EZ

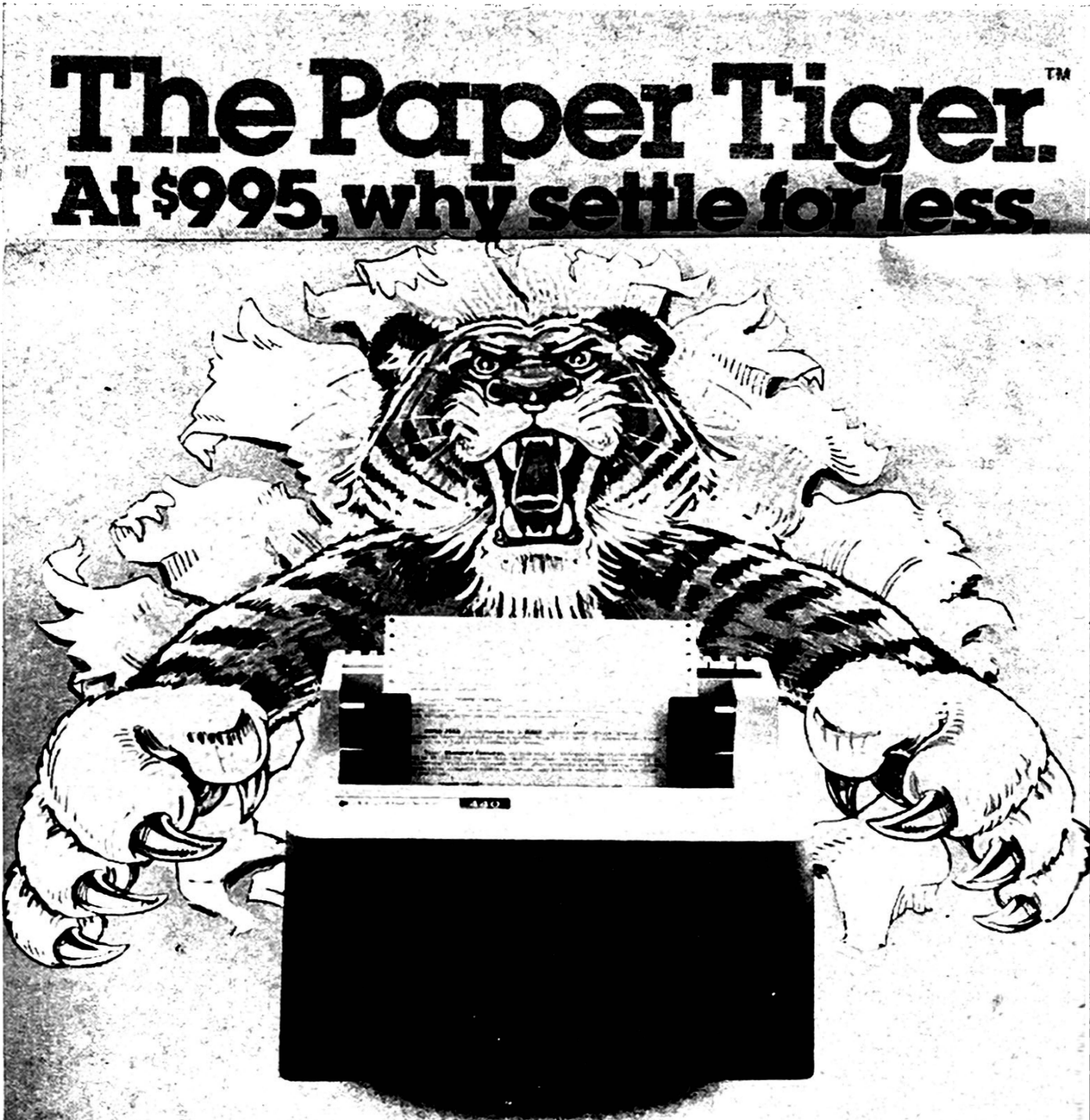
digitizer. Thus, regardless of the input level, both the copying tape and the TRS-80 receive an optimally fixed-level digital signal. At the same time, carefully designed circuits filter out hum and noise, while compensation for large volume variations enables recovery from minor tape drop-outs.

(Circle DK on free information form)



TAPE DIGITIZER EASES TRS-80 CASSETTE LOAD

Alphanetics claims to have a tape add-on device which makes TRS-80 storage and retrieval more efficient, versatile and trouble free. Packaged in a handsome, shielded metal enclosure, the tape digitizer virtually eliminates bad tape loadings, permits copying of data and program tapes without using the TRS-80 computer, and greatly simplifies the process of using a cassette recorder to store and retrieve computer data, according to the firm. Targeted to relatively sophisticated TRS-80 hobbyists and professional programmers, the tape digitizer is fully compatible with Level I and Level II tape formats. It is claimed that by use of this device can be played back on any ordinary cassette -TRS-80 combination. Two outstanding features of the tape digitizer are its ability to make copies of tapes that are better than the originals, and to make copies of 'SYSTEM' tapes, previously a very unreliable and difficult process. Excellent copies are made because the tape digitizer provides copying signals which emulate those the TRS-80 provides. The tape digitizer is said to synthesize a clean digital signal from the cassette recorder's analog signal. The tape-digitizer also is said to eliminate the bothersome volume control level sensitivity problems inherent in the TRS-80 computer-tape interface circuit design. With most tapes, very low volume levels to full volume will produce reliable loading when using the tape digitizer. This is accomplished by use of a automatic volume control compensation circuit within the tape



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Simplex Video Plotter

For Level II - 16k TRS-80's

Written in Basic, SIMPLEX VIDEO PLOTTER software enables the TRS-80 to produce video graphs of math expressions* with a minimum of operator effort. Controls and options allow convenient, logical manipulation of the graphs for problem-solving and design applications.

Some of the features and options provided by SIMPLEX VIDEO PLOTTER are: plot format (rectangular/polar), scaling (automatic/manual), plot speed (1, 2, 4, or 8), x limits (upper/lower), y limits (upper/lower), number of plots (single/dual), title entry, internal self-test, and automatic axes. The program includes menus with generous prompting and convenient default values for common applications.

In order to provide greater accuracy than that obtainable by visually interpreting tic marks along the axes or border of a static plot such as those produced by other plotting programs, SIMPLEX VIDEO PLOTTER uses a dynamic scanning technique which continuously displays "x", "y", "SLOPE", and "AREA" values for all plotted points along the primary curve.

Seven commands are available at a single keystroke: SLOW, FAST, DELAY, REVERSE, LOWER MARKER, UPPER MARKER, and NEW PLOT. These seven commands, specifically designed for convenient, interactive problem-solving, enable the user to quickly enlarge and examine intercepts, intersections, and other points of interest on the plotted curves, locating them to an accuracy of about five significant figures.

The manual, which exceeds 30 pages in length, explains the features and characteristics of the program, provides examples of functions and applications, and includes a complete program listing.

Each SIMPLEX VIDEO PLOTTER cassette is individually CSAVED and tested to eliminate defects and loading problems.

Price for cassette plus manual: \$22.50 Address orders to:

Stephen E. Gregory
3217 Celanese Rd.
Rock Hill, SC 29730

* The math expressions should be functions of the general type: $y=f(x)$. As an example, the "bell-shaped" probability curve is the graph produced by: $Y=.398942*EXP(-X*X/2)$

GAME BOOK EXPLAINS CIRCUITS

Computer Coin Games, by Joe Weisbecker, is an instructional book which employs games, illustrations and clever copy to teach readers of all ages about computers.

Geared toward teachers to use as a supplement to other teaching materials and toward individuals who enjoy learning complicated concepts painlessly, Weisbecker's book is published by Creative Computing Press, Box 789-M, Morristown, N.J. 07960 for \$3.95 (96 pages, softbound), or circle "BM." "Computer Coin Games" allows the reader to "Computer Coin Games" allows the reader to learn simple circuitry of computers just by sliding around a few pennies. The book presents a series of games with full-size playing boards that trace the paths of electronic signals through various simple computer circuits.

Beginning with the "basic penny switch flip flop", the games build in difficulty until the reader is creating intricate networks simulating a type of flip flop circuit found in computers. There are penny switch games of tic tac toe, guess a word, create a pattern and escape the network. In addition to learning about circuitry, the reader is also encouraged to develop strong problem-solving skills.

"Computer Coin Games" explains why binary math is used in computers and how it works. This is exemplified in the penny switch games. The reader learns how the computer counts, adds, subtracts, uses a number base and handles letters and words thru a series of challenging board games that simulate the path of the computer circuit.

An introduction to the complicated concepts of computer circuitry, "Computer Coin Games" features illustrations by Sunstone Graphics.

TRS-80 SOFTWARE COMPU-RITER

A line oriented, cassette based micro-text generator for the TRS-80. Allows typewriter like operation of the computer. Outputs to cassette for data storage or to a printer for hard copy. Input, output to and from cassette is 3 to 4 times faster than ordinary cassette routines. COMPU-RITER is self prompting, convenient, and very easy to use. Will fit in as little as 4K of memory and is written in Level II Basic for easy adaption to any desired format. Perfect for use as a data bank on cassette.

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*Also, for a limited introductory time only, the following programs will be included free!

LUNAR LANDER II

Excellent use of graphics makes this program outstanding. Each mission is different since the lunar moonscape landing area is never the same. Both attitude and retro-rockets are used throughout landing realism.

DESIGNS

Computer generated designs are drawn on the screen and temporarily frozen for your inspection. The computer will then comment on the resulting image and then proceed on to the next one. Like snowflakes, no two will be the same. The patterns are reminiscent of Indian mosaics, and are perfect for unattended computer displays.

TELE.# CONVERSION

This unusual program attempts to create a 7 letter word out of a given telephone number using the letters on the telephone dial. Will fascinate during its execution and the resulting display.

Send check or money order to:

Bill Wood
512 Falmouth St.
Temple Terrace, Fla. 33617

PROGRAM USEFUL TO ORGANIZATIONS

Community organizations can greatly increase their effectiveness, save dollars and scarce gasoline, by using a program for TRS-80 supplied on 28-program People's Software tape 5.

Every Sunday, special buses comb neighborhoods, picking up churchgoers who otherwise would not have transportation.

Instead of a bus, active members with cars could do this more efficiently, except that without a computer it is hard to organize such an effort.

Of course computers (TRS-80's) are now inexpensive, and a car-pool program is now available through People's Software.

Car Pool was written by Columbus (OH) Radio Shack store manager William H. Loudon, who did it by modifying a customer information program.

Central Ohio Transit Authority workers were on strike, and radio station WNCI was attempting to operate a car pool. Radio Shack gave them the program, and loaned a dual-disk 32K system.

To operate, the station simply entered volunteer driver names, addresses, and telephone numbers, zip codes of origin and destination, as well as other information. When someone needing a ride called, he was matched with someone on file who was going approximately the same route.

The radio station was happy with the operation.

In using such a program with a church, subdivisions could be used instead of zip codes, and of course destinations would all be the same.

Similar applications should become more appealing as energy supplies dwindle. Arts groups could arrange car pools at the same time they sell tickets.

Since organizations are made of people, the interpersonal relationships introduced by car pooling would strengthen them.

PILOT ON TAPE 5

CIE People's Software tape 5 contains a Pilot interpreter for use with computer-aided instruction (CIE) uses.

Pilot stands for Programmed Inquiry, Learning or Teaching. It was first developed at the University of California in San Francisco, and is widely used by educators.

Pilot is designed to be easy to use, so that those without prior computer experience can easily learn to write useful programs.

Dialogue programs, its specialty, can be rapidly constructed and tested.

The People's Software Pilot Implementation is by Ken Yankelevitz. It is written in Basic and requires at least 32K and disk.

People's Software wishes to support Pilot with user-donated applications programs, and also would like to get a smaller, machine-language Pilot that would run on 16K tape or disk systems.

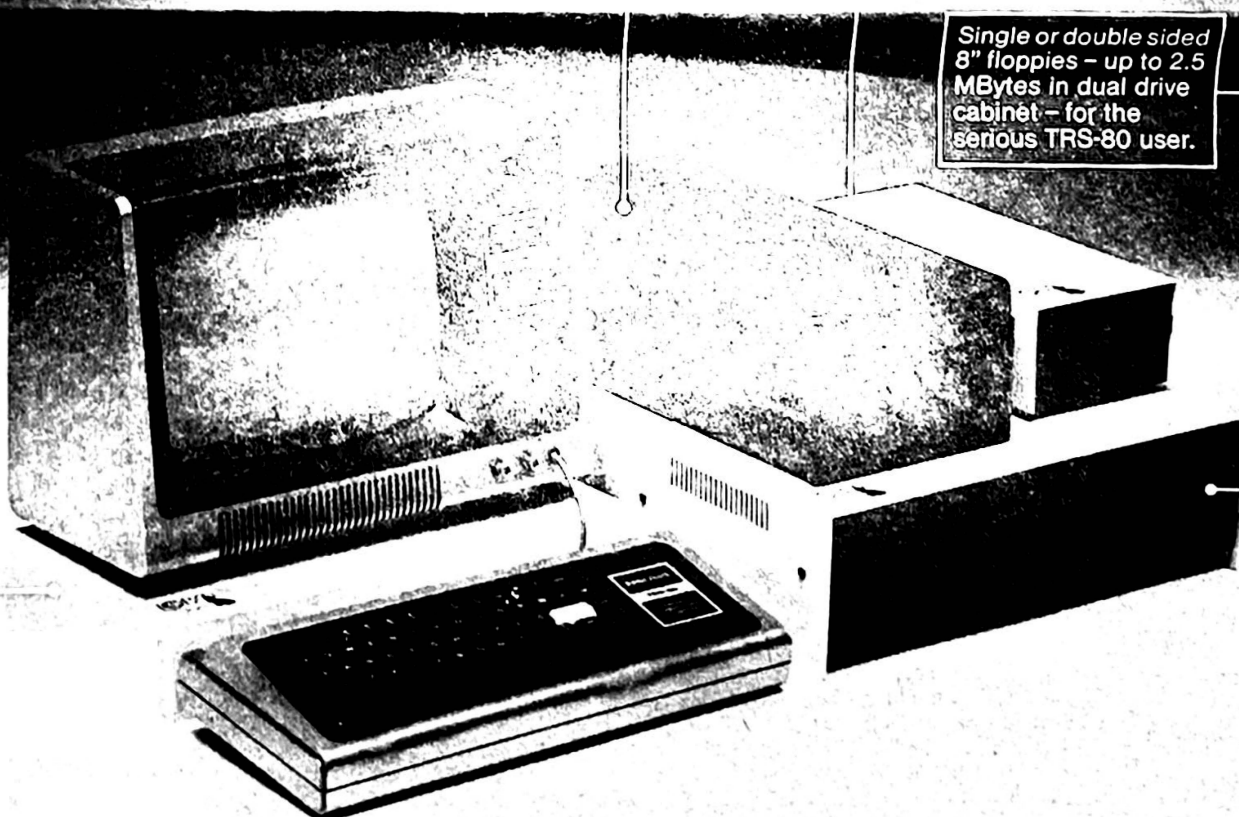
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SHARE-STORAGE ALLOWS BUDGET 'OFFICE...FUTURE'

The "office of the future" can be here today, at low cost, simply by hooking together TRS-80s and some inexpensive, off-the-shelf hardware and software (with appropriate software patches).

By "office of the future" we mean the concept of providing keyboards and CRTs at each work station, and connecting these together to an intelligent system. Much paper is eliminated, along with attendant costs. It has been assumed the intelligence would be in the central system. In what we are configuring, we have intelligent keyboards and "dumb" central storage (although it too has a processor).

Until recently, microprocessor manufacturers who proposed their machines for office work have assumed that people work alone. Programmers usually work that way, and it can be nice work when you can get it, but most people work and interact with others. It is the nature of our jobs—too big for one person to handle alone.

Nestar Systems can link microcomputers with central storage, but prices start at about \$5,000, not counting the cost of computers—one of which is dedicated to the central system.

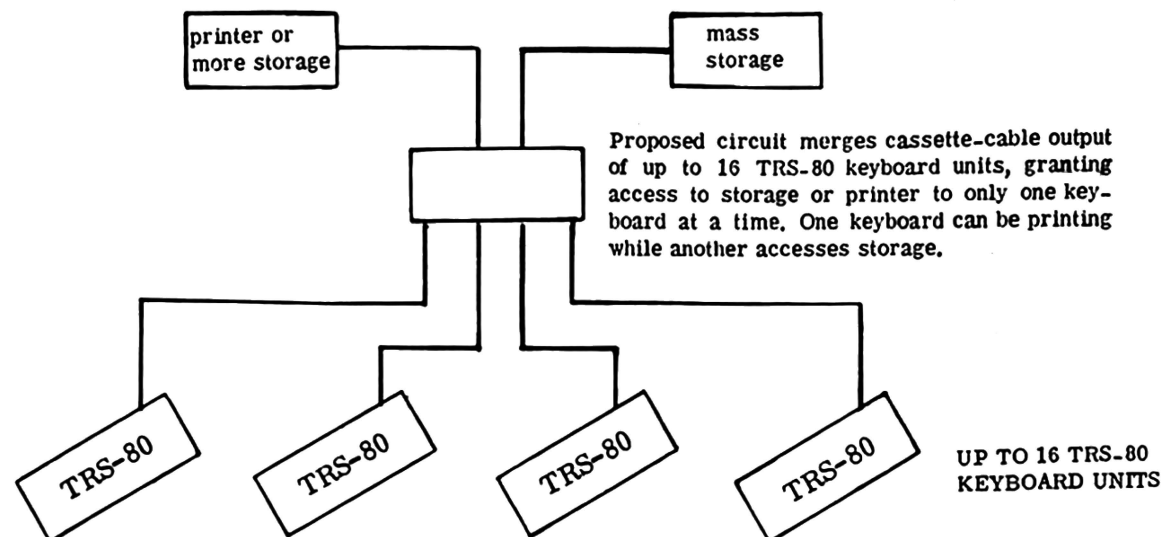
At the CIE office, several people need to simultaneously access and update mail addressing files. More than 13,000 names are stored, using the most dense-storing addressing program known, the one from Peripheral Vision. Up to 2,000 names addresses per disk are claimed for the system, but the best we have achieved was 1,500. Leaving room for expansion, the data is on about a dozen disks. We waste a lot of time switching disks, backing them up, filing and labeling them. With two people working at a time, we risk hair-pulling contests over the CA92, or NY00s, as well as delays and possible losses. Hook everyone to central storage and we feel the worst we're going to have is for someone to wait seconds or a minute or two. In other offices, organizations, schools, etc., the tasks would be different, but a similar solution would be idea.

We plan to hook TRS-80s to inexpensive RS232C interfaces. These allow one to go considerable distance on simple twisted-wire cords. RS232s will connect to a switchbox that gives each TRS-80 access to either mass storage or a fast printer. In the next generation of these devices, one computer should be able to access storage while another is printing a message. Switching can be done under software control (with so-called control characters), or manually, which is cheaper. For details, see story on Expander "Black Box" switches.

Low-cost MECA Beta-1 high-speed digital tape drives are going to be used for storage, at about one-fifth the per-byte cost of disk. "Hard" disk may become competitive here, but even if it does, tape "backup" will be desired, since a catastrophic disk failure destroys all data.

Besides MECA and Expander, we are probably going to use Teletype .0 or Printronix for fast printer.

Serial RS232C ports are less easy to choose. For about \$150, the H K Co to Knasas City offers a plug-in box that gives the user a serial port without need for TRS-80 expansion interface. And this unit accepts standard LPRINT and LLET commands, without need for special software driv-



LOW-COST NETWORKING—If someone were to develop the "black box", up to 16 keyboard units could be connected to printer and mass storage via just their cassette cables. Software would increase baud rate to 9600, and the circuit would convert to and from RS232C, and control traffic. Educators would love it, and system could be used in offices.

ers, which most other serial ports for TRS-80 require. That is a nice feature.

There is of course the option of TRS-80 RS232C boards. These, as most readers know, require purchase of expansion interfaces.

Another option is buying the new LNW Research expansion interface. See story elsewhere. These include RS232C port, and are available for \$69.95 bare-board, or \$349.95 assembled and tested. Really appealing would be something on the

order of a follow-on product based on the Small Systems Hardware serial interface circuit. This is powered by the mighty TRS-80 transformer, and connects to the cassette port. To use, one must first load software, which is a disadvantage. What would be so great about that system would be its cost. As presently configured, they are only about \$50. They also are only one-way, output to printer.

(Continued on page 9)

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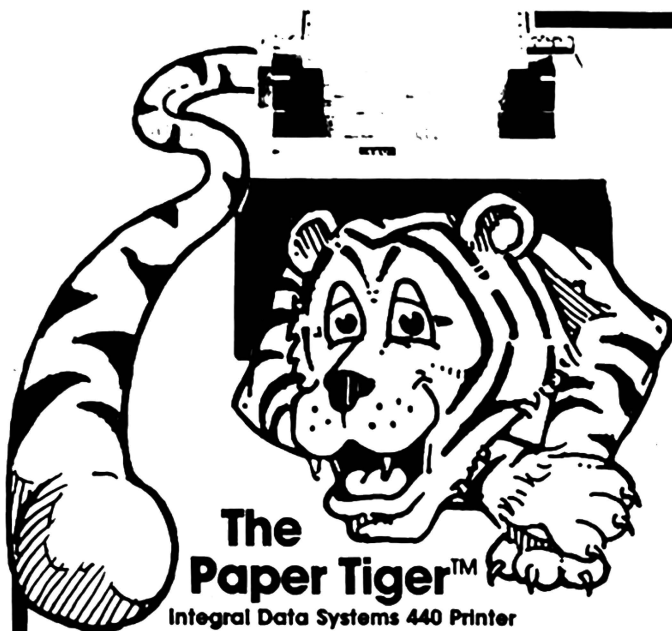
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OFFICE, CLASSROOM OF FUTURE CONT.

A networking scheme using the cassette port for input and output would eliminate the RS232C interface at each keyboard unit. The line-sharing interface and "stunt box" would be a couple of the Small-Systems-Hardware type circuits, one of them two-way, plus the circuits to lock-out all but the keyboards actively accessing storage or printing. This "future-possible" configuration would be quite a bit cheaper than the current "off-shelf" version.

Right now, anybody can put together the system shown in block diagram on the cover. CIE plans to do so.

Up to four TRS-80s, each with \$150 H K Co. RS232C ports, feed into the \$425 Expander line-sharing interface. The output of this can either go directly to MECA storage, or we can introduce a splitter, the \$350 Expander Stunt Box which, under software control, can select either the printer or storage for feeding output of the line-sharing interface.

Thus cost of a four-keyboard networking scheme would be \$1,025 without printer support, and not counting storage cost of \$449 for the first half megabyte, \$270 for each additional half megabyte (to two megabytes). Eventually a double-density option will enable four-megabyte total storage.

Adding automatic control of printer costs an additional \$350.

Substituting manual switching, a single four-position rotary switch, eliminating the line-sharing interface, costs only \$198, from Expander.

Making the printer "splitter" manual reduces its cost to \$99.

Reducing the numbers of keyboards in the network to two, and using manual switching, yields that same price as for printer switch option, \$99. So for under \$100, two TRS-80s of any size can be manually switched between mass storage, or printer. Since only the common wire is switched, it should not be difficult for a tinkerer to fabricate a similar unit for a fraction of the cost of manufactured units.

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MAPPER II includes the MAPPER I package plus a disk adapter module which allows both 5" and 8" drives to run on the same cable. Drive selection is under software control to permit easy file transfer between the drives. With cable, \$249.

CONVERSION —If you purchase MAPPER I or II and plan to use only mini-drives, Omikron will transfer CP/M® files from 8" diskette to a 5". This allows you to run software previously available to only 8" drive owners. \$25 per mini-diskette.

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The Computing Teacher will publish six issues during the academic year 1979-1980, and seven issues during the academic year 1980-1981. The publication is now in its seventh year.

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DIGITAL TAPE OFFERS STORAGE TO 2-M BYTES

Some TRS-80 users who think they must have 8" double-density disk drives for their application might well give some consideration to high-speed digital tape.

The MECA Beta-1 puts half a megabyte on-line with average access time of just 10 seconds. It loads at 8,000 bits/second.

Beta-1 has its own processor and built-in named-file operating system. Each of two tracks per cassette contain a directory which lists up to 63

(Circle EC on free information form)

We Have Solved Radio Shack's I/O Bottleneck!



Our DSI-80 Interface and Driver Software (Included with purchase) lets you use virtually any common terminal for system control or outlisting device for LPRINT/LLIST commands. You can also use the TRS-80 as a terminal, printing "hidden" control codes, a feature many expensive terminals do not offer.

For only \$199.95 we give you:

- 2 RS-232 or 20 MA current loop ports, 110 to 1200 baud.
- A cassette tape for Level II machines with driver software and sample Basic subroutines for those interested in doing it themselves.
- A manual with lots of info.
- A 6-month Limited Warranty.

The DSI-80 is built to last, burned in for a week, and tested one last time prior to shipment, and generally shipped from stock. Mastercharge and Visa accepted. Dealer inquiries invited.

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files—126 files per cassette. Both tracks of each cassette are accessible without flipping the tape. A four-drive two-megabyte system can manage 504 files—no flipping tapes!

Beta-1 comes in three versions: parallel input, \$399; serial, \$449; and TRS-80, \$499. Slave units, up to three per master drive, are \$270 each. The parallel input is not practical for TRS-80 because the expansion interface parallel port is not bi-directional.

Up to four megabytes could be connected on-line to TRS-80 by combining TRS-80-bus and RS232C master drives, each with three slaves.

Eventually, MECA hopes to have a double-density option, which also will double the loading speed. Beta-1 automatically finds any file listed on its directory, seeking forward and reverse at 100 inch/secs. Standard 300 ft. certified digital cassettes are used. For more information, contact MECA, 7026 O.W.S. rd, Yucca Valley CA 92284 (714) 365-7686, or circle FV on reader information form.

EXPANSION BOARD AVAILABLE FROM LNW RESEARCH

An expansion interface for TRS-80 from LNW Research is said to offer greater reliability than the one from Radio Shack, and lower cost.

Priced at just \$69.95 for the bare printed circuit board and user manual, the new product incorporates all Radio Shack features, plus has the serial port built in, instead of added onto, at extra cost.

The firm says each circuit and the whole board is based on "no compromise" engineering and high-quality PC design to provide the highest performance possible.

All brands of memory are said to work on the board, without tricky hand selection. CIE paid Radio Shack \$50 to be advised that Mostek memory will not work in the expansion interface, although it works in the keyboard unit.

LNW explains: "16K dynamic RAM susceptibility to noise can cause erratic and mystifying behavior. There is no substitute for good PC layout techniques, adequate supply bypassing and grounding, and series termination of the address and control lines.

"By adhering to these standards, we created a memory array that requires no hand-selected memory parts, exhibits no mysterious behavior cut...

memory array that...can be relied on for accurate data storage.

"Active termination and Schmidt trigger receivers are used to provide the utmost in data integrity. Even in an electrically noisy environment and without special buffered cables, the system expansion board will operate with 'rock-solid' performance," the firm claims.

One advantage of the LNW Research product is a user need build only what he needs. Parts lists are divided by section.

Documentation appears to be thorough. Prior to release, the company had about 20 people build the unit, and incorporated experience from that into the manual.

LNW Research is at Box 16216, Irvine CA 92713, or circle FW on reader response form.

'BLACK BOX' CONNECTION

Expander, in its Black Box line, offers a number of products that allow connection of a number of RS232C devices together, thus allowing convenient "networking" of TRS-80s.

The \$425 TSLI-2 (terminal/line sharing interface) allows either of up to four devices (TRS-80s) to use a single RS232C-ported mass storage.

Toggle switches allow any of the TRS-80s to be locked out, and all other keyboards on the network receive busy signals during the time another accesses storage.

Another Black Box, the printer-sharing interface (PSI), appears to do about the same thing, without the toggled lock-out feature—but with the advantage of being expandable to up to 16 inputs.

Pricing is as follows: \$395 for the first four inputs, \$350 for the next four, and \$100 for each four thereafter.

A printer could share TSLI or PSI output, under program control, using the programmable stunt box (PSB). That is \$350.

The PSB splits the RS232C line into two ports, one for printer and the other for storage. Each keyboard could then either print or access storage.

Expander is at 400 Sainte Claire pl., Upper St. Clair PA 15241 (412) 746-2910, or circle FU on reader information form.

HEATH PRINTER INTERFACES

A Heath H-14 printer owner has reported the Benton Arbor, MI, firm now has available a five-page application note on interfacing the matrix-printer to TRS-80 RS-232 port.

(Circle FI on free information form)

Interpret and display the execution of instructions in RAM and ROM, detail register content, program status word, and stack.

```

C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 0102 4008 4074 417C 4FFD 7000
P5U P HZ XT HF XF CH MF MC 41701 0403 0201 0070 0070 0001
7000 31 00 70 SP 7000
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 0102 4008 4074 7000 7000 7003
P5U P HZ XT HF XF CH MF MC 4FFA1 0000 0000 0070 3100 70C0 0F09
70031 CD 0F 0F CALL 0F0F
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 0102 4008 4074 7003 000F
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0F1 1F 00A
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 4123 4008 4074 4FFC 0F0F 0F02
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 7E LD A,(HL)
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 4123 4008 4074 4FFC 0F0E 0F03
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 7E LD A,(HL)
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 7020 0304 7000 4123 4008 4074 4FFC 0F0E 0F03
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 87 RLC
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0101 0304 7000 4123 4008 4074 4FFC 0F0E 0F04
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 37 SCF
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0101 0304 7000 4123 4008 4074 4FFC 0F0E 0F05
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 1F RRA
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0001 0304 7000 4123 4008 4074 4FFC 0F0E 0F06
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 77 LD (HL),A
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0001 0304 7000 4123 4008 4074 4FFC 0F0E 0F07
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 3F CCF
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0010 0304 7000 4123 4008 4074 4FFC 0F0E 0F08
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 1F RRA
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 4000 0304 7000 4123 4008 4074 4FFC 0F0E 0F09
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 23 INC HL
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 4000 0304 7000 4124 4008 4074 4FFC 0F0E 0F0A
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 23 INC HL
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 4000 0304 7000 4125 4008 4074 4FFC 0F0E 0F0B
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 77 LD (HL),A
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 4000 0304 7000 4125 4008 4074 4FFC 0F0E 0F0C
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 79 LD A,C
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0000 0304 7000 4125 4008 4074 4FFC 0F0E 0F0D
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 07 RLC
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0000 0304 7000 4125 4008 4074 4FFC 0F0E 0F0E
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 37 SCF
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0000 0304 7000 4125 4008 4074 4FFC 0F0E 0F0F
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 1F RRA
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0000 0304 7000 4125 4008 4074 4FFC 0F0E 0F10
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 47 C.A
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0000 0304 7000 4125 4008 4074 4FFC 0F0E 0F11
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 1F RRA
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 4000 0304 7000 4125 4008 4074 4FFC 0F0E 0F12
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 4C INC (HL)
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0200 0304 7000 4125 4008 4074 4FFC 0F0E 0F13
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 39 SET
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0200 0304 7000 4125 4008 4074 4FFC 0F0E 0F14
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 80 MCF
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0200 0304 7000 4125 4008 4074 4FFC 0F0E 0F15
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 80 MCF
C  A'F' B'C' D'E' H'L' A'F' B'C' D'E' H'L' I'X I'Y S'P P'C M'EAT
0020 0000 4015 4123 0200 0304 7000 4125 4008 4074 4FFC 0F0E 0F16
P5U P HZ XT HF XF CH MF MC 4FFB1 0000 0000 0000 0070 3100 70C0
0F0E1 80 MCF

```

For system instructions and cassette send

Interpretive Techniques And Timing Systems, Ltd. \$20 to:
ITATS, Ltd.
177 Merion Road
York, Penna. 17403
Tel. (717) 843-6814

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**DISK DRIVE WOES? PRINTER INTERACTION?
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Power Line Spikes, Surges & Hash could be the culprit! Floppies, printers, memory & processor often interact! Our unique ISOLATORS eliminate equipment interaction AND curb damaging Power Line Spikes, Surges and Hash.

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- *SUPER ISOLATOR (ISO-3), similar to ISO-1A except double filtering & Suppression \$79.95
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- *ISOLATOR (ISO-5), similar to ISO-2 except unit has 3 socket banks, 9 sockets total \$76.95
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Dept. ci

SERVICE DIRECTORY

Service Directory listings are \$10 per issue, payable in advance.

HARDWARE & SOFTWARE:

Consulting and repair: LTI Computer Consulting, 219 East Jacobs dr., Midwest City OK 73110.

SOFTWARE:

ACCOUNTS RECEIVABLE & related business-oriented programs for disk & printer, Jack G. Hatfield, accountant, 2895 Bedford av., Placerville CA 95667.

STORE DIRECTORY

The CPU Shop, Inc.
39 Pleasant st.
CHARLESTOWN MA 02129

Computer Cablevision, Inc.,
2617 42nd st NW, No. 2
WASHINGTON, D.C. 20007

Micro Management Systems
mini mall, downtown shopping center
CAIRO GA 31728

(Circle BI on free information form)

TRS-80 BULLETIN 1:9 PAGE 11
(Circle AC on free information form)

practical applications



LIGHT-PEN FOR YOUR TRS-80

PLUGS RIGHT IN! Exclusive design includes two sample programs and complete documentation so you can write your own programs in Basic. Long life from standard 9-volt battery.

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- ☐ Please send me _____ TRS-80 Light Pens (\$24.95 each enclosed. Calif. residents add tax).
- ☐ Send your catalogs.

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TRS-80 is a trademark of Tandy Corp.

CIE679

OPPORTUNITIES IN COMPUTERS

Technicians able to cope with the complexities of sick TRS-80 systems, and programmers who can wend their way through code could start promising careers working on other people's TRS-80 problems.

For just \$10 per month a computer technician or programmer can advertise his services in the TRS-80 Bulletin service directory. More than 60,000 copies of the Bulletin are printed and circulated monthly.

One important element in the really big computer revolution, still to be seen, is the widespread availability of independent service.

Many of the good things that are happening in TRS-80 land are dependent on independent service. These include the availability of non-RadioShack disk drives (all sizes and degrees of hardness), digital tape, hardware modifications including lowercase, real-use of computers, lower expansion costs, etc.

Software can be useless without locally-available consulting and maintenance. CIE hopes this listing service will help build grass-roots independent computer support.

DIRECTORY SHOWS '80 STORES

Wonder where you can get Level III Basic for TRS-80, or any other of hundreds of non-Radio Shack supported items?

TRS-80 Bulletin is starting a store directory of retailers catering to TRS-80 owners. Stores can be listed in the 60,000-circulation Bulletin for just \$10 per month—a truly great bargain.

Store managers wishing their locations to be listed should send CIE a check either for one or a number of months.

MAKE MONEY WITH YOUR TRS-80

Fred Blechman has an idea about how a computerist can make money with a TRS-80, and also qualify for computer-related tax deductions:

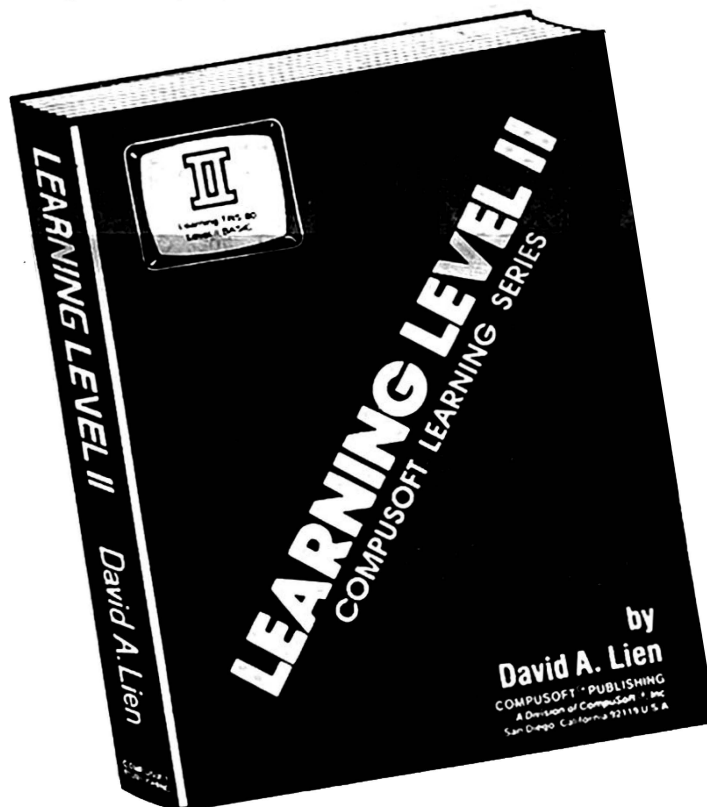
Offer to do some simple data processing for nearby Amway Product distributors. There are more than 300,000 out there!

Blechman has four programs that would help anyone do the job with a 16 K or better Level II TRS-80. No printer or disk are required.

The programs do a number of things that will save the distributor's time, such as order verification, distributor records, ledger totalling etc.

All four programs sell for \$24.95 on cassette and with documentation. Send SASE for details: Blechman Enterprises, 7217 Bernadine av., Canoga Park CA 91307.

It's Here At Last . . .



\$15.95
(soft cover)

Written by the author of your Level I Users Manual, **LEARNING LEVEL II** picks right up where the Level I Manual leaves off. It also supplies the changes needed to make the Level I Manual compatible with your Level II TRS-80.

LEARNING LEVEL II covers all Level II BASIC beyond Level I, plus much more. It shows you how to use the Editor, explains what the many error messages are really saying, and leads you thru conversions of Level I programs to Level II.

Dual cassettes, printers, the Expansion Interface with clock and other features are explained in the same easy-to-learn style that made the Level I Manual famous. **LEARNING LEVEL II** was created specifically for your Level II TRS-80!

Yes, I want to really learn how to use Level II!

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Please send _____ copies of **LEARNING LEVEL II**. My check for \$15.95 + \$1.45 P&H is enclosed. (CA addresses add 6% sales tax).

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

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COMPUTER CENTER

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912-377-7120

BLANK TAPES AVAILABLE FROM CIE

The same mastering-quality recording tapes on which People's Software is recorded are now available from Computer Information Exchange.

CIE cassettes contain one of the finest ferric oxide, pre-tensitized tapes available. Imported from Europe, it is a super ferro dynamic mastering tape virtually free of dropouts, extremely low-noise, high-output, with exceptionally high upper response and low distortion.

Cassette shells are screwed together so that all sides have equal pressure. Lubricant shields promote free tape movement, and the precision pressure pad also serves as a shield to prevent stray magnetic forces from entering the cassette during record.

Prices include shipping and handling. Californians include sales tax, total in parentheses:
C-12, 10 for \$8.50 (\$9.01) o C-20 10/\$11 (\$11.66) o C-30 10/\$12 (\$12.72) o C-45 10/\$13 (\$13.78) o C-60 10/\$14 (\$14.84)
Soft "poly" plastic boxes are 10 for \$1.75 (\$1.86). Shipment is via UPS, so street address should be given. All tapes are guaranteed against defects.

INEXPENSIVE CASSETTE DIGITIZER

Two Illinois TRS-80 enthusiasts have written an article in "73 Magazine" on a home-built digitizer circuit that reconstructs the wave form of a TRS-80 tape into the square wave outputted by TRS-80.

Comparison of wave forms into and out of the audio tape recorders used with TRS-80 show that the signal undergoes an amazing transformation. Using an oscilloscope, the casual observer might think the two signals unrelated.

Dave Miller and Paul Goelz published their E-Z Loader article in the September issue of the ham radio magazine, and by the end of the month had sold 130 bare printed circuit boards.

The authors feel that the circuit will end most of the frustrations involved in CLOADing Level II and SYSTEM tapes and would like to see as many hobbyists as possible benefit from their experience.

E-Z Loader reprocesses the sync and data pulses coming off the cassette tape, squaring and narrowing them and making the computer far less critical of audio level out of the cassette deck.

Tape-head azimuth and slight tape-speed variations on pre-recorded or exchange tapes becomes much less of a problem, as well, the authors claim.

Connecting E-Z Loader between two cassette machines allows the user to make duplicates of valuable machine-language, as well as System and Basic tapes. This allows a person to make a "working copy" and store the original of valued tapes. Miller and Goelz point out that it is not legal to duplicate copyrighted tapes for use by

BULLETIN GOING TO PAID CIRCULATION

CIE TRS-80 Bulletin carries a 25¢ price tag starting this issue and from now on will be reliably going by mail only to those who donate \$2.50 to nonprofit CIE. It will, however, continue going free to TRS-80 Computing subscribers.

Production costs are continually on the rise, and for CIE to pass all those costs on to advertisers would cut into the number of advertisements, and reduce the number of people offering new products for use with TRS-80, thus not only reducing the effectiveness of the Bulletin, but the TRS-80 system.

To be useful, computers need continual support with new hardware and software, and the availability of these products must be communicated to the user. CIE has taken on this commitment with both the Bulletin and TRS-80 Computing.

CIE knows that the Bulletin is useful enough that no regular reader would mind making a token \$2.50-per-year donation to help defray costs. Those not paying \$2.50 will continue getting the Bulletin, but on an irregular basis.

others.

E-Z Loader is connected completely externally and does not affect the Radio Shack limited warranty. It plugs between cassette-deck "ear" output and computer audio input, and its optional LED gives a visual indication that a signal is going to the computer, and aids in setting the volume control.

Boards and instructions are available for \$6 plus self-addressed, stamped envelope (SASE) from: Paul Goelz, 2228 Madison pl., Evanston IL 60202.

(Circle AG on free information form)

The Bulletin will continue to be available in stores, sometimes at a 25¢ price, sometimes perhaps free. It will continue to go to computer clubs and to schools.

(Circle AP on free information form)

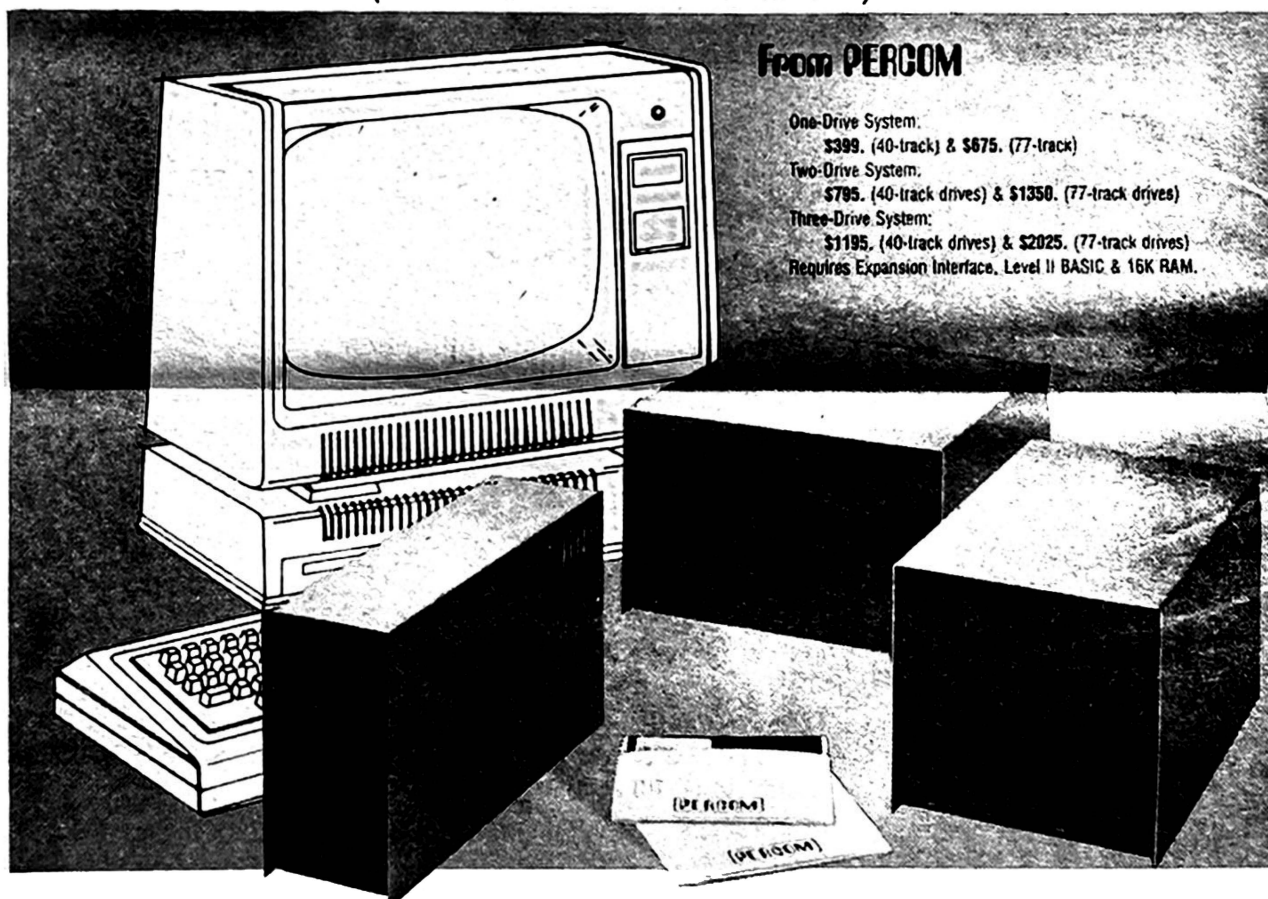
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3110 Fulton • Sacramento, CA 95821

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CITY _____ STATE _____
PHONE _____ ZIP CODE _____

ADVERTISE YOUR PRODUCT 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.



From PERCOM

One-Drive System:
\$399. (40-track) & \$675. (77-track)
Two-Drive System:
\$785. (40-track drives) & \$1350. (77-track drives)
Three-Drive System:
\$1195. (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.

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