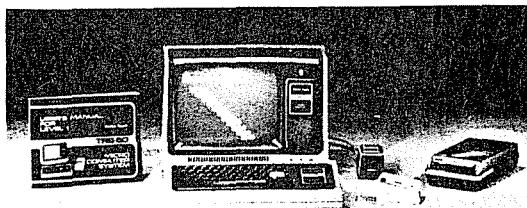
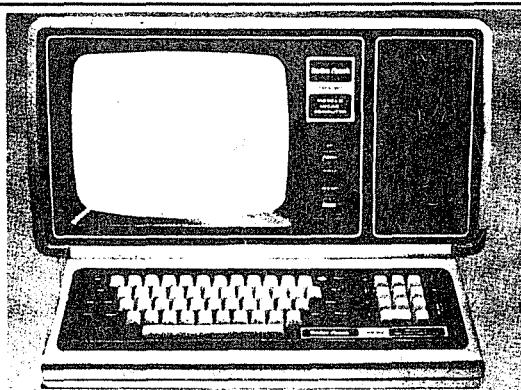
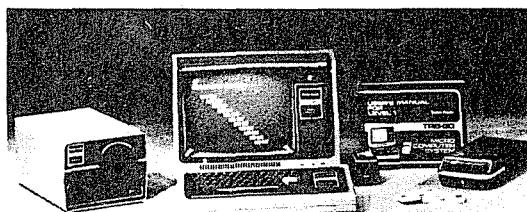


RADIO SHACK COMPUTER OWNERS TRS-80 MODEL I AND MODEL II

TRS-80TM MONTHLY NEWSLETTER



Reprint in Two Parts Issues #1 — #6
July 1978 through December 1978
Part One



- PRACTICAL APPLICATIONS
- BUSINESS
- GAMBLING • GAMES
- EDUCATION
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NEWSLETTER INFORMATION

THE TRS-80 MONTHLY NEWSLETTER IS PUBLISHED BY H & E COMPUTRONICS INC.

THE TRS-80 MONTHLY NEWSLETTER IS NOT SPONSORED, NOR IN ANY WAY OFFICIALLY SANCTIONED BY RADIO SHACK.

THE PURPOSE OF THE TRS-80 MONTHLY NEWSLETTER IS TO PROVIDE AND EXCHANGE INFORMATION RELATED TO THE CARE, USE AND APPLICATION OF THE TRS-80 COMPUTER SYSTEM.

H & E COMPUTRONICS INC. DOES NOT TAKE FINANCIAL RESPONSIBILITY FOR ERRORS IN PUBLISHED PROGRAMS, USERS ARE ADVISED TO CAREFULLY EDIT VITAL PROGRAMS.

THE TRS-80 MONTHLY NEWSLETTER ENCOURAGES COMMENTS, QUESTIONS AND SUGGESTIONS. WE PUBLISH ARTICLES AND PROGRAMS WRITTEN BY OUR READERS. COMPUTRONICS INC. WILL PAY CONTRIBUTIONS FOR ARTICLES AND PROGRAMS PUBLISHED IN THE NEWSLETTER.

SUBSCRIPTIONS ARE \$24 PER YEAR (\$30 PER YEAR-CANADA AND MEXICO, \$36 PER YEAR OUTSIDE OF THE UNITED STATES, CANADA AND MEXICO-AIR MAIL). BACK ISSUES ARE AVAILABLE (\$2 PER ISSUE).

HAVE ANY URGENT QUESTIONS? WE HAVE TELEPHONE HOURS - 9 A.M. - 5 P.M. OTHER TIMES, LEAVE A MESSAGE ON OUR ANSWERING MACHINE. WE WILL PROMPTLY RETURN ALL CALLS (COLLECT).

LOCAL TRS-80 CLUBS

THE COMPUTER CLUB OF ORLANDO (FLORIDA) - Contact M. Scott Adams - (305) 862-6917.

TRS-80 USER'S GROUP OF CHICAGO (ILLINOIS) - Contact John C. Longstreet, 1201 W. Chase Avenue, Chicago, Illinois 60626 or call 761-2742.

THE SOLANO TRS-80 USER'S CLUB - Fairfield, California - Contact Dave or Steve Irwin - (707) 422-3347.

TRS-80 USER'S GROUP OF WALNUT CREEK (CALIFORNIA) - Contact John Snyder, 712-C Country Wood, Walnut Creek, California 94598 or call (415) 938-9669.

INLAND COMPUTER SOCIETY - Contact Sandy Sparks, 3359 Second Street, Riverside, California 92501 or call (714) 256-5319 or (714) 784-3499.

TRS-80 USER'S GROUP OF SANTA ANA - Contact Arnold Vagts, 3713 S. Parton Street, Santa Ana, California 92707 or call (714) 549-7021.

TRS-80 BUG INC. OF FLORIDA - Contact Larry J. Harrell, 2100 N. Atlantic Avenue #402, Cocoa Beach, Florida 32931 or call (305) 784-0456.

ADVERTISING IN THE TRS-80 MONTHLY NEWSLETTER

\$200 PER PAGE . . . \$100 PER HALF PAGE . . . \$50 PER QUARTER PAGE . . . \$25 PER EIGHTH PAGE . . . \$10 FOR UP TO 50 WORDS IN OUR NEW CLASSIFIED AD DEPARTMENT (STARTING JULY, 1979) . . .

THESE PRICES ARE VALID FOR ISSUES 13 AND 14 ONLY. ADS MUST BE SUBMITTED BY THE 10th OF EACH MONTH IN ORDER TO APPEAR IN THE FOLLOWING MONTH'S ISSUE. PAYMENT MUST BE INCLUDED WITH AD.

Dear Subscriber,

With over 1000 subscribers, the TRS-80 MONTHLY NEWSLETTER is the largest publication devoted to the TRS-80 Computer. We are actively seeking subscribers. Our goal is to reach over 10,000 subscribers by the end of the year.

The purpose of the TRS-80 MONTHLY NEWSLETTER is to provide and exchange information (articles, programs, etc.) related to the care, use and application of the TRS-80 Computer (and accessories). The TRS-80 MONTHLY NEWSLETTER is not sponsored, nor in any way officially sanctioned by RADIO SHACK or TANDY CORPORATION.

The TRS-80 MONTHLY NEWSLETTER is your publication. Your comments and suggestions are encouraged. We want to publish your articles and programs. It is important that each individual subscriber contribute to the success of the Newsletter.

To be successful, the TRS-80 MONTHLY NEWSLETTER can not be a publisher of game programs. We will be publishing programs related to business, personal finance, money management, practical applications, statistics, mathematics, gambling and games. Every month, we will also publish one major program (such as a complete personal finance package or a complete income tax program-short and long form).

One of our major goals is to make the TRS-80 a useful tool for all TRS-80 owners. The programs that will be published will range from simple to complicated. We hope to reach beginners, as well as the experts.

Enjoy the first issue. Write and make some suggestions for future issues. Become an active TRS-80 Owner.

Sincerely,

Howard Y. Gosman, Editor

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MATHEMATICAL APPLICATIONS SERVICE™

BITS AND PIECES

by
HOWARD Y. GOSMAN

BITS AND PIECES is our monthly section devoted to random thoughts and information related to the TRS-80. Contributions from our subscribers are encouraged.

THE TRS-80 IS THE LARGEST SELLING COMPUTER

According to RADIO SHACK, the TRS-80 is unquestionably the largest seller of computers. "Since we announced the TRS-80 late August and began shipping in September, we have unquestionably shipped more computers in less time than anyone in history." (From a recent RADIO SHACK release)

BAD DELIVERIES ON EQUIPMENT

Most TRS-80 owners have had to wait for computer deliveries. RADIO SHACK is well aware of the problem. They have certainly done their best to keep up with demand. RADIO SHACK does keep its stores informed on delivery delays for its various products. Many problems have occurred due to the optimistic promises made for quick deliveries by some stores. Most store managers have been pretty honest with their customers.

LATEST DELIVERY INFORMATION

April disk orders are currently being delivered. Estimated delivery time on new orders is 2 months. The same delay applies to line printers, expansion interfaces, screen printers and Level II.

Although there is a two month delay on Level II and interfaces, you may be able to find a store that has them in stock.

According to RADIO SHACK, all backlogs of orders should be cleared up within the next 12-14 weeks. For inside order information, call 817-390-3583.

16-DIGITS OF ACCURACY?

Try this!.....`I#=.05` (ENTER) PRINT `I#` (ENTER)
.05000000074505806 is displayed. This isn't 16-digit accuracy.
If anyone has further information on TRS-80 accuracy, please write.

DO YOU STILL HAVE LEVEL I?

Most Newsletter programs will be written for LEVEL II. I suggest that all Level I owners spend another \$99 and convert to LEVEL II. Most Level I operations will work without modification on LEVEL II. LEVEL II will make your computer 100 times more powerful

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AFRAID OF LEVEL II?

If you were able to understand the Level I manual, you will be able to understand the LEVEL II manual...but, the LEVEL II manual does not take the step-by-step approach found in the Level I manual. Mastery of LEVEL II make take some time. The easiest way to master LEVEL II is to dissect published programs.

PROGRAMS, COMMENTS, QUESTIONS AND SUGGESTIONS WANTED

The TRS-80 MONTHLY NEWSLETTER will pay you \$10-\$50 for any programs published in the Newsletter. We will pay \$10 for minor programs (such as TIC-TAC-TOE)...and up to \$50 for more important programs (such as an inventory control program). We will also try to publish one major program per month. We will pay \$50 and up for any published major program (such as a complete payroll program or chess program).

CARRYING CASES

RADIO SHACK will be selling carrying cases for the video monitor and the remainder of the basic TRS-80 system. Suggested retail price is tentatively set at \$69.

FACTS ABOUT THE CASSETTE RECORDER SYSTEM

1. If you are having trouble saving or loading programs, use a cassette head cleaner and a tape head demagnifier. Many problems can be eliminated by spending a minute after 20 or 30 hours of recorder usage. It's a good idea to use the tape cleaner and tape head demagnifier after some problems with loading a program or data.
2. Record all programs at a constant sound level. It's a good idea to align a number on the sound level indicator with one of the letters in the word "VOLUME" (below the sound level dial).
3. Use a DYMO LABEL MAKER to keep track of programs on your cassette.
4. Use SUPERTAPE CASSETTES for your valuable programs. Use inexpensive tapes for other programs. Copy all valuable programs twice.
5. RADIO SHACK will soon be selling a C20 (20 minute) cassette for \$3.49. The tapes are leaderless (tape starts at 000 on cassette player) and "certified" (tested for bad spots). The price is high (but standard for such high quality "certified" tape). For normal use, avoid it.

HIGH-SPEED DIGITAL TAPE RECORDERS

RADIO SHACK has no plans to introduce a high-speed tape record (records and plays programs at a much faster rate). If you have alot of data, a disk system is faster and more economical than a high-speed tape system.

DISCOUNTS

A 5% discount is available for 50 or more computers purchased at a single location (for cash orders only)!!!

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DISK STORAGE

RADIO SHACK has no plans for additional disk storage or larger disks. The disk system presently available is sufficient. It can easily handle a mailing list containing 5000 names with complete sorting capabilities (zip code, state, name and other characteristics). With a little manipulation, the disks can handle an unlimited amount of information.

BUY TANDY STOCK

I have been told that TANDY STOCK owners receive a 10% discount on all store purchases. If this is true, it would be worth your while to purchase 1 share before buying additional equipment.

DISKETTES

Diskettes for disc system will be selling for \$5.95 or 3 for \$16.95.

LOWER CASE LETTERS

"When the TRS-80 was designed, we had to choose between lower case and graphics, and we chose graphics. It is possible to print lower case on a printer which will support lower case letters, but it is not a "straight forward" operation." (From a RADIO SHACK release)

RS-232

An RS-232 interface would allow TRS-80 users the option of hooking up several peripherals (external devices) such as a SELECTRATERM TYPEWRITER (an IBM Selectric with lower case lettering). According to a RADIO SHACK release, "Current plans call for the introduction later this year of a RS-232 Serial Interface."

"Radio Shack has no plans for an S-100 Interface, but Tandy Computers, here in the Tandy Center, does plan to make such an interface available shortly."

A COMPREHENSIVE BUSINESS PROGRAM

RADIO SHACK will have available this fall comprehensive business software for General Ledger, Bookkeeping, Payroll and Inventory Control. These packages will be available only on diskette.

DO YOU HAVE ANY SOFTWARE TO SELL TO RADIO SHACK

Mail your software on cassette tape along with documentation to: Computer Marketing, 1600 One Tandy Center, Fort Worth, Texas 76102.

FNS\$

Try using FNS\$ as a string variable. It doesn't work (and is not mentioned in the manual).

RADIO SHACK MANAGER OF THE MONTH

Do you know any RADIO SHACK managers who can answer most TRS-80 questions? Send us the name, telephone number and address of any who qualify. For now, if you need any information, call Zeke Bogossian, White Plains Mall, White Plains, NY 10601 (914) 428-4840

TECHNICAL INFORMATION

"Technical information will be available on the TRS-80 in our service manual later this summer. Limited technical information can be obtained through Customer Service, but we are not equipped to answer information about interfacing to other people's equipment." (Once again, according to a RADIO SHACK release)

TEN-KEY PAD

"A ten-key pad (calculator style) is being considered at this time, although no decisions have been made. We feel that either such a pad, or a software routine which would allow a set of keys on the existing keyboard (with a change in keytops) will be a necessity. We are investigating the merits and cost of several options." (from a RADIO SHACK release)

IMPORTANT!!!

PROGRAMS LISTED IN THIS ISSUE AND ALL FUTURE ISSUES ARE PRINTED ON THE RADIO SHACK TRS-80 LINE PRINTER. THE LINE PRINTER WILL NOT PRINT AN UPWARD FACING ARROW (USED IN EXPONENTIATION). THE LINE PRINTER PRINTS A CRACKET INSTEAD OF AN ARROW (THE VIDEO DISPLAY DISPLAYS THE ARROW). SEE APPENDIX C/2 CODE 91. REMEMBER. WHENEVER YOU SEE A BRACKET IN ONE OF OUR LISTED PROGRAMS, PRESS THE ARROW (FACING UPWARD) KEY ON THE KEYBOARD.

HELP!!!

Our goal is to reach 10,000 subscribers by the end of the year. In order to reach our goal, we are offering all subscribers \$6 for each new subscriber you can get us. Write your membership number at the bottom of our advertisement. We will send you \$6 everytime we receive a form with your membership number. Feel free to copy our advertisement or request additional copies of the advertisement. We'll be glad to provide you with additional forms on request. If you wish, you can send in the form with an \$18 payment. THIS OFFER ONLY APPLIES TO NEW SUBSCRIPTIONS CONTAINING A MEMBERSHIP NUMBER OF AN ESTABLISHED SUBSCRIBER.

YOUR MEMBERSHIP NUMBER

The number above your name is your membership number. The first four digits indicate your subscription number, the two numbers following the "-" indicate the last issue that you will receive (before renewal time). In other words, 1258-12 is subscriber #1258 who will receive the TRS-80 MONTHLY NEWSLETTER until issue #12.

LPRINT OR LLIST

LPRINT and LLIST are line printer commands. If you use these commands with the interface operating, you must have your printer connected. You can not use the RESET button to stop program execution. Also, with the interface on, you can't use reset to stop a CLOAD or CSAVE command.

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BY THE WAY...OUR CONSULTATION SERVICE

NEED ANY HELP? NEED A CUSTOMIZED PROGRAM? Feel free to call us if you have any important questions or need some advice. We do have a staff that can write customized programs for any particular application.

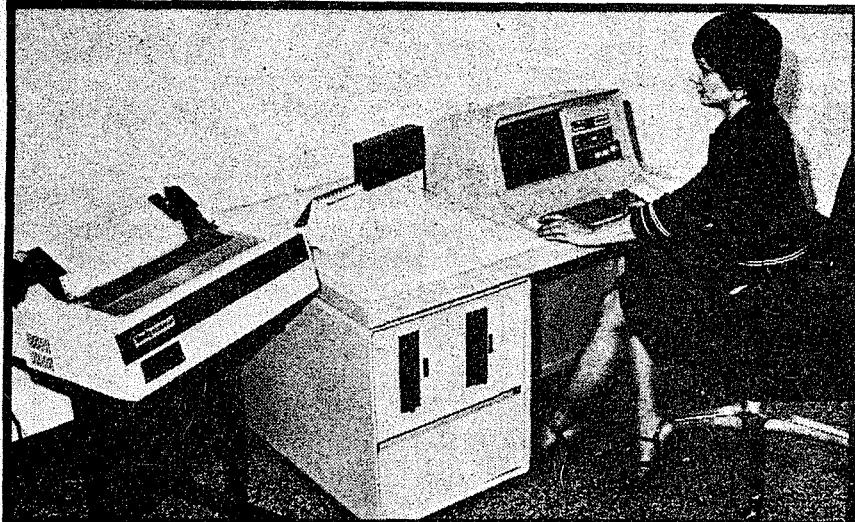
DO YOU WANT TO BUY SOME OF OUR SOFTWARE?

At this time, we do not intend to sell any programs. We do intend to publish all of our programs in the Newsletter. If you're lazy (or don't want to key in some of our long programs), we will send you any of our programs recorded on cassette for \$5 (including postage).

DO YOU WANT A LINE PRINTER PRINTOUT OF ONE OF YOUR RECORDED PROGRAMS?

Send us your cassette plus \$1 per program you want printed. Add \$1 for return postage (per cassette). In other words, to obtain 4 program listing from 1 cassette, send \$5.

Business system under \$10,000



FORT WORTH, TX — Tandy Computers had introduced the Tandy 10, a complete business computer system including a workstation with diskette drives integrated into a compact metal desk and a separate matrix printer that prints 60 characters per second. Each workstation includes a video display, a professional standard typewriter keyboard, a 10-key calculator pad for numeric entry and 15 special function keys for data editing. With optional peripherals, the station can be used as an intelligent terminal to access larger data systems. Each diskette can hold up to 256K characters, providing a total of more than 1/2 million characters online. Internal memory capacity is 40,960 characters. Screen formatting language allows user prompting for data input. The Tandy 10 comes with extended Basic. Fortran IV and Assembly Level program languages are available as options. With workstations, diskette drives and matrix printer, the Tandy 10 Business Computer System costs \$9950. For more information, Circle 133.

FEDERAL TAX WITHHOLDING PROGRAM
BY
DR. PETER SHENKIN

GET RID OF YOUR TAX TABLES. YOUR TRS-80 CAN FIGURE OUT PAYROLL DEDUCTIONS IN SECONDS.

The following program permits you to use your TRS-80 to compute the proper payroll deductions for Federal Income Tax and FICA. The program listed is for weekly deductions. The program may easily be modified to compute withholding amounts for biweekly, semimonthly, monthly, quarterly, semiannual, annual or daily payroll periods. The program can also be modified to compute withholding amounts for items such as disability, state and local taxes and other miscellaneous deductions. In future months, this program will be expanded into a full-blown payroll system. This will include an employee file containing employee personal information such as name, address, married or single code, number of withholding allowances, year to date and quarterly to date wages and withholding amounts, etc. The running of the program will automatically update the employee file. There will be a checkwriting program (printer necessary), a program to change the various files, and programs to automatically print required forms such as W-2's and 941's. The program will have a version for dual tape drive (expansion interface needed) and for the mini-disc drive.

The directions for running the FEDERAL TAX WITHHOLDING PROGRAM (PAYROLL DEDUCTIONS) are self contained. However, if you have not programmed before, you must be very careful to input the program exactly as printed on the accompanying pages. If so much as a comma is left out, the program may not run correctly or may not run at all.

To record your program:

- (1) Turn computer on.
- (2) PRESS NEW ENTER (This clears memory).
- (3) Enter program line by line.
- (4) When finished, try out sample problem below. If your results are the same as ours, you are ready to save the program on tape. If your results differ from ours, then LIST sections of the program until the error is found. If an error code appears on the screen, then correct that line.
- (5) When the program is running correctly, you are ready to SAVE on tape. Place cassette into CTR-41 recorder and wind forward until clear of the leader. You may wind forward either by disconnecting the remote plug from the recorder and pressing FAST-F or, if the expansion interface is not attached, you may PRESS CLOAD ENTER on the computer and

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the FAST-F on the recorder. When the leader is clear press STOP on the recorder. Then press the reset button under the door at the rear left of the CPU. The program may now be saved by pressing CSAVE "W" ENTER on the computer. When READY is printed on the display screen, the program is saved.

To load and run your program:

- (1) Turn computer on.
- (2) Place cassette in recorder. Be sure cassette is reqound. To rewind, either disconnect REMOTE plug from recorder and press REWIND or if the interface is not attached, press CLOAD ENTER on the computer and REWIND on the recorder. When the tape is reqound press the reset button under the door at the rear left of the CPU.
- (3) Press CLOAD "W" ENTER on the computer. This will load your program. When READY is printed, the program is loaded.
- (4) Press RUN ENTER. The program will run. Follow directions.

TABLE 1 from the accompanying IRS Tax Tables was used for data in this program. If you desire the computations to be done for other than weekly payroll, just replace the values in lines 30, 35, 40 and 45 with appropriate values from one of the other Tables displayed.

TRY THIS EXAMPLE

An unmarried employee is paid \$4.00 per hour up to 30 hours and time and a half over 30 hours. This week he worked 35 hours. Compute his salary (net) and payroll deductions).

We enter, 225 (his ID#), 30,5,4.00,2,1

ID	GROSS	FED. WITH.	FICA	NET
225	150.00	15.02	9.08	125.90

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FEDERAL WITHHOLDING TAX PROGRAM

BY

DR. PETER SHENKIN

5 CLS

```
10 DIM A(2, 9), B(2, 9), W(100, 8)
20 REM A(1, ) GIVES WAGE BRACKET BDYS. FOR SINGLE EARNERS.
22 REM A(2, ) GIVES WAGE BRACKET BDYS. FOR MARRIED EARNERS.
24 REM B(1, ) GIVES WAGE WITHHOLDING % FOR SINGLE EARNERS.
26 REM B(2, ) GIVES WAGE WITHHOLDING % FOR MARRIED EARNERS.
29 REM NEXT LINE GIVES A(1, )
30 DATA 0, 33, 76, 143, 182, 220, 297, 355, 1000000
34 REM NEXT LINE GIVES A(2, )
35 DATA 0, 61, 105, 223, 278, 355, 432, 509, 1000000
39 REM NEXT LINE GIVES B(1, )
40 DATA 0, , 16, , 18, , 22, , 24, , 28, , 32, , 36
44 REM NEXT LINE GIVES B(2, )
45 DATA 0, , 15, , 18, , 22, , 25, , 28, , 32, , 36
50 REM NOW LOAD A() AND B() ARRAYS
60 FOR I=1 TO 2:FOR J=1 TO 9:READ A(I,J):NEXT J:NEXT I
70 FOR I=1 TO 2:FOR J=1 TO 8:READ B(I,J):NEXT J:NEXT I
72 GOSUB 8000
75 CLS
80 GOSUB 7800
100 REM COMPUTE GROSS PAY
110 GOSUB 9000
140 GOSUB 9500
200 REM NOW COMPUTE FEDERAL WITHHOLDING
210 GOSUB 10000
400 REM NOW SAVE PAY AMOUNTS
410 GOSUB 11000
420 INPUT "MORE NAMES INPUT 1. NO MORE INPUT 0": Z9
430 IF Z9= 1 GOTO 80
440 IF Z9 = 0 GOTO 580
450 PRINT "INPUT ERROR. REENTER!":PRINT:GOTO 420
500 GOSUB 12000
550 REM NOW PRINT PAY ARRAY.
560 GOSUB 13000
600 END
7000 REM SUBROUTINE FOR INPUTTING DATA
7010 PRINT "INPUT ID#, REG HRS, PREM HRS, PAY RATE, MARR/SING, #EXEMT"
7020 INPUT I2, H1, H2, R1, M, N
7030 IF M=1 OR N=2 THEN 7050
7040 GOTO 7100
7050 IF INT(ND)=N GOTO 7070
7060 GOTO 7100
7070 RETURN
7100 PRINT "INPUT ERROR. TRY AGAIN":PRINT:GOTO 7010
```

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```
8000 REM SUBROUTINE GIVING INSTRUCTIONS.
8010 PRINT "THE FOLLOWING COMPUTES FEDERAL AND FICA WITHHOLDING".
8011 PRINT " AMOUNTS."
8020 PRINT "INPUT FOR EACH EMPLOYEE IS AN ID#(5 DIGITS OR LESS)."
8030 PRINT "THEN INPUT NUMBER OF REGULAR AND PREMIUM HOURS."
8040 PRINT "PREMIUM HOURS ARE OVERTIME HOURS."
8050 PRINT "PREMIUM PAY IS TIME AND A HALF."
8060 PRINT "FINALLY, INPUT 1 FOR SINGLE, 2 FOR MARRIED."
8070 PRINT "THEN PRESS ENTER KEY."
8080 PRINT "NOW DO THE SAME FOR THE NEXT EMPLOYEE, ETC."
8090 PRINT "BE SURE TO PLACE A COMMA(,) BETWEEN ENTRIES."
8100 INPUT "PRESS ANY DIGIT TO BEGIN.", Z7
8110 RETURN
9000 REM SUBROUTINE FOR COMPUTING GROSS PAY
9010 G=H1*R1 + 1.5*H2*R1
9020 RETURN
9500 REM SUBROUTINE COMPUTES FEDERAL WAGES
9510 W = G - .14 .40*N
9520 RETURN
10000 REM SUBROUTINE COMPUTING WITHHOLDING
10001 REM T1 IS WITHHOLDING. X IS BRACKET WE ARE IN.
10010 T1=0 . X=2
10020 IF W<= 0 GOTO 10200
10030 IF W<= ACM, X> GOTO 10100
10040 T1=T1 + INT((ACM, X)-ACM, X-10)*BCM, X-10+100+.50/100
10050 X=X+1
10060 GOTO 10030
10100 T1=T1 + INT((CH - ACM, X-10)*BCM, X-10+100+.50/100
10200 RETURN
11000 REM SETS UP PAY ARRAY
11010 Z = Z + 1
11020 W(Z, 1)=G . W(Z, 2)=T1 . W(Z, 3)=G*. 0605
11025 W(Z, 4)=W(Z, 1)+W(Z, 2)+W(Z, 3) . W(Z, 5)=I2
11030 RETURN
12000 CLS
12010 PRINT " ID      GROSS      FED. WITH.      FICA      NET"
12100 RETURN
13000 REM SUBROUTINE FOR PAY SUMMARY PRINTOUT
13010 FOR I= 1 TO Z
13015 AF = "#####. ####. #####. ##. #####. ##. #####. ##"
13020 PRINT USING AF, W(I, 1), 50, W(I, 1), 10, W(I, 2), 20, W(I, 3), 20, W(I, 4)
13025 IF I/16 <> INT(I/16) GOTO 13040
13030 INPUT "INPUT ANY NUMBER TO CONTINUE", Z8
13040 NEXT I
13050 RETURN
```

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Tables for Percentage Method of Withholding

TABLE 1. WEEKLY Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$33	0
Over— But not over—	of excess over—
\$33 —\$76	16% —\$33
\$76 —\$143	\$6.88 plus 18% —\$76
\$143 —\$182	\$18.94 plus 22% —\$143
\$182 —\$220	\$27.52 plus 24% —\$182
\$220 —\$297	\$36.64 plus 28% —\$220
\$297 —\$355	\$58.20 plus 32% —\$297
\$355	\$76.76 plus 36% —\$355

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$61	0
Over— But not over—	of excess over—
\$61 —\$105	15% —\$61
\$105 —\$223	\$6.60 plus 18% —\$105
\$223 —\$278	\$27.84 plus 22% —\$223
\$278 —\$355	\$39.94 plus 25% —\$278
\$355 —\$432	\$59.19 plus 28% —\$355
\$432 —\$509	\$80.75 plus 32% —\$432
\$509	\$105.39 plus 36% —\$509

TABLE 2. BIWEEKLY Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$65	0
Over— But not over—	of excess over—
\$65 —\$152	16% —\$65
\$152 —\$287	\$13.92 plus 18% —\$152
\$287 —\$363	\$38.22 plus 22% —\$287
\$363 —\$440	\$54.94 plus 24% —\$363
\$440 —\$594	\$73.42 plus 28% —\$440
\$594 —\$710	\$116.54 plus 32% —\$594
\$710	\$153.66 plus 36% —\$710

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$121	0
Over— But not over—	of excess over—
\$121 —\$210	15% —\$121
\$210 —\$445	\$13.35 plus 18% —\$210
\$445 —\$556	\$55.65 plus 22% —\$445
\$556 —\$710	\$80.07 plus 25% —\$556
\$710 —\$863	\$118.57 plus 28% —\$710
\$863 —\$1,017	\$161.41 plus 32% —\$863
\$1,017	\$210.69 plus 36% —\$1,017

TABLE 3. SEMIMONTHLY Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$71	0
Over— But not over—	of excess over—
\$71 —\$165	16% —\$71
\$165 —\$310	\$15.04 plus 18% —\$165
\$310 —\$394	\$41.14 plus 22% —\$310
\$394 —\$477	\$59.62 plus 24% —\$394
\$477 —\$644	\$79.54 plus 28% —\$477
\$644 —\$769	\$126.30 plus 32% —\$644
\$769	\$166.30 plus 36% —\$769

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$131	0
Over— But not over—	of excess over—
\$131 —\$227	15% —\$131
\$227 —\$482	\$14.40 plus 18% —\$227
\$482 —\$602	\$60.30 plus 22% —\$482
\$602 —\$769	\$86.70 plus 25% —\$602
\$769 —\$935	\$128.45 plus 28% —\$769
\$935 —\$1,102	\$174.93 plus 32% —\$935
\$1,102	\$228.37 plus 36% —\$1,102

TABLE 4. MONTHLY Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$142	0
Over— But not over—	of excess over—
\$142 —\$329	16% —\$142
\$329 —\$621	\$29.92 plus 18% —\$329
\$621 —\$788	\$82.48 plus 22% —\$621
\$788 —\$954	\$119.22 plus 24% —\$788
\$954 —\$1,288	\$159.06 plus 28% —\$954
\$1,288 —\$1,538	\$252.58 plus 32% —\$1,288
\$1,538	\$332.58 plus 36% —\$1,538

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:
Not over \$263	0
Over— But not over—	of excess over—
\$263 —\$454	15% —\$263
\$454 —\$965	\$28.65 plus 18% —\$454
\$965 —\$1,204	\$120.63 plus 22% —\$965
\$1,204 —\$1,538	\$173.21 plus 25% —\$1,204
\$1,538 —\$1,871	\$256.71 plus 28% —\$1,538
\$1,871 —\$2,204	\$349.95 plus 32% —\$1,871
\$2,204	\$456.51 plus 36% —\$2,204

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TABLE 5. QUARTERLY Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$425	0	
Over— But not over—		
\$425 —\$988	16%	—\$425
\$988 —\$1,863	\$90.08 plus 18%	—\$988
\$1,863 —\$2,363	\$247.58 plus 22%	—\$1,863
\$2,363 —\$2,863	\$357.58 plus 24%	—\$2,363
\$2,863 —\$3,863	\$477.58 plus 28%	—\$2,863
\$3,863 —\$4,613	\$757.58 plus 32%	—\$3,863
\$4,613	\$997.58 plus 36%	—\$4,613

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$788	0	
Over— But not over—		
\$788 —\$1,363	15%	—\$788
\$1,363 —\$2,894	\$86.25 plus 18%	—\$1,363
\$2,894 —\$3,613	\$361.83 plus 22%	—\$2,894
\$3,613 —\$4,613	\$520.01 plus 25%	—\$3,613
\$4,613 —\$5,613	\$770.01 plus 28%	—\$4,613
\$5,613 —\$6,613	\$1,050.01 plus 32%	—\$5,613
\$6,613	\$1,370.01 plus 36%	—\$6,613

TABLE 6. SEMIANNUAL Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$850	0	
Over— But not over—		
\$850 —\$1,975	16%	—\$850
\$1,975 —\$3,725	\$180.00 plus 18%	—\$1,975
\$3,725 —\$4,725	\$495.00 plus 22%	—\$3,725
\$4,725 —\$5,725	\$715.00 plus 24%	—\$4,725
\$5,725 —\$7,725	\$955.00 plus 28%	—\$5,725
\$7,725 —\$9,225	\$1,515.00 plus 32%	—\$7,725
\$9,225	\$1,995.00 plus 36%	—\$9,225

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$1,575	0	
Over— But not over—		
\$1,575 —\$2,725	15%	—\$1,575
\$2,725 —\$5,788	\$172.50 plus 18%	—\$2,725
\$5,788 —\$7,225	\$723.84 plus 22%	—\$5,788
\$7,225 —\$9,225	\$1,039.98 plus 25%	—\$7,225
\$9,225 —\$11,225	\$1,539.98 plus 28%	—\$9,225
\$11,225 —\$13,225	\$2,099.98 plus 32%	—\$11,225
\$13,225	\$2,739.98 plus 36%	—\$13,225

TABLE 7. ANNUAL Payroll Period

(a) SINGLE person—including head of household:

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$1,700	0	
Over— But not over—		
\$1,700 —\$3,950	16%	—\$1,700
\$3,950 —\$7,450	\$360.00 plus 18%	—\$3,950
\$7,450 —\$9,450	\$990.00 plus 22%	—\$7,450
\$9,450 —\$11,450	\$1,430.00 plus 24%	—\$9,450
\$11,450 —\$15,450	\$1,910.00 plus 28%	—\$11,450
\$15,450 —\$18,450	\$3,030.00 plus 32%	—\$15,450
\$18,450	\$3,990.00 plus 36%	—\$18,450

(b) MARRIED person—

If the amount of wages is:	The amount of income tax to be withheld shall be:	of excess over—
Not over \$3,150	0	
Over— But not over—		
\$3,150 —\$5,450	15%	—\$3,150
\$5,450 —\$11,575	\$345.00 plus 18%	—\$5,450
\$11,575 —\$14,450	\$1,447.50 plus 22%	—\$11,575
\$14,450 —\$18,450	\$2,080.00 plus 25%	—\$14,450
\$18,450 —\$22,450	\$3,080.00 plus 28%	—\$18,450
\$22,450 —\$26,450	\$4,200.00 plus 32%	—\$22,450
\$26,450	\$5,480.00 plus 36%	—\$26,450

TABLE 8. DAILY or MISCELLANEOUS Payroll Period

(a) SINGLE person—including head of household:

If the wages divided by the number of days in such period are:	The amount of income tax to be withheld shall be the following amount multiplied by the number of days in such period:
Not over \$4.70	0
Over— But not over—	
\$4.70 —\$10.80	16%
\$10.80 —\$20.40	\$98 plus 18%
\$20.40 —\$25.90	\$2.71 plus 22%
\$25.90 —\$31.40	\$3.92 plus 24%
\$31.40 —\$42.30	\$5.24 plus 28%
\$42.30 —\$50.50	\$8.29 plus 32%
\$50.50	\$10.91 plus 36%

(b) MARRIED person—

If the wages divided by the number of days in such period are:	The amount of income tax to be withheld shall be the following amount multiplied by the number of days in such period:
Not over \$8.60	0
Over— But not over—	
\$8.60 —\$14.90	15%
\$14.90 —\$31.70	\$95 plus 18%
\$31.70 —\$39.60	\$3.97 plus 22%
\$39.60 —\$50.50	\$5.71 plus 25%
\$50.50 —\$61.50	\$8.44 plus 28%
\$61.50 —\$72.50	\$11.52 plus 32%
\$72.50	\$15.04 plus 36%

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A HORSE SELECTION SYSTEM (FLATS OR TROTS)
BY
DR. HAL DAVIS

THE SYSTEM THAT FOLLOWS IS AN ELEMENTARY SYSTEM
IF YOU ARE INTERESTED IN A MORE ADVANCE SYSTEM WRITTEN
BY DR. DAVIS, WRITE TO: DR. HAL DAVIS,
C/O MATHEMATICAL APPLICATIONS SERVICE, BOX 149

```
1 REM-USE THE RACING FORM OR TRACK PROGRAM TO OBTAIN INFORMATION
2 REM-USE TOTAL INFORMATION FOR THE PAST TWO YEARS
3 CLS
4 INPUT "NUMBER OF RACES"; R
5 INPUT "NUMBER OF WINS"; W
6 INPUT "NUMBER OF PLACES"; P
7 INPUT "NUMBER OF SHOWS"; S
8 INPUT "# EARNINGS"; E
9 PRINT :PRINT
10 X=(W+P/3+S/6)+100/R+E/850
11 PRINT "THE FINAL RATING FOR THIS HORSE IS"; X
12 PRINT :PRINT
13 INPUT "TO RATE ANOTHER HORSE ENTER 1"; Y :GOTO 5
```

TRY THIS SAMPLE

NUMBER OF RACES? 25
NUMBER OF WINS? 3
NUMBER OF PLACES? 2
NUMBER OF SHOWS? 5
EARNINGS? 22000

THE FINAL RATING FOR THIS HORSE IS 43.8824



FUTURE VALUE OF AN INVESTMENT-BY HOWARD Y. GOSMAN

```
3 DEFDBL I, N, P, F, X, Y
5 CLS
10 PRINT "FUTURE PRICE AND SALARY CALCULATIONS"
20 PRINT ""
30 INPUT "ENTER THE LATEST CONSUMER PRICE INDEX VALUE"; X
35 INPUT "ENTER PREVIOUS YEAR'S C. P. I. VALUE"; Y
38 INPUT "ENTER PRESENT VALUE OF SALARY OR PRODUCT"; P
40 INPUT "ENTER THE NUMBER OF PERIODS"; N
48 REM-ENTER INTEREST RATE WITHOUT % SIGN
50 I=100*(X-Y)/Y
55 I=I/100
60 PRINT ""
70 F=P*(1+I)^N
75 F=INT(F*100+.5)/100
78 REM-FUTURE VALUE IS ROUNDED TO 2 DECIMAL PLACES
80 PRINT "FUTURE VALUE=="; F
85 PRINT ""
90 PRINT ""
95 PRINT ""
98 REM-TO END PROGRAM PRESS BREAK
100 INPUT "FOR ANOTHER EXAMPLE ENTER 1"; X :GOTO 5
```

EXAMPLE

ENTER THE PRESENT VALUE? 10000
ENTER THE NUMBER OF PERIODS? 12 <INTEREST IS COMPOUNDED QUARTERLY OR 4 TIMES A YEAR. IN 3 YEARS INTEREST IS COMPOUNDED 12 TIMES (4 X 3 = 12).>
ENTER THE PERIODIC INTEREST RATE? 1.5 <THAT'S 6% DIVIDED BY COMPOUNDING 4 TIMES PER YEAR.
 $6/4=1.5$

FUTURE VALUE== 11956.16

FUTURE PRICE AND SALARY CALCULATIONS BY HOWARD Y. GOSMAN

```
3 DEFDBL I, N, P, F, X, Y
5 CLS
10 PRINT "FUTURE PRICE AND SALARY CALCULATIONS"
20 PRINT ""
30 INPUT "ENTER THE LATEST CONSUMER PRICE INDEX VALUE"; X
35 INPUT "ENTER PREVIOUS YEAR'S C. P. I. VALUE"; Y
38 INPUT "ENTER PRESENT VALUE OF SALARY OR PRODUCT"; P
40 INPUT "ENTER THE NUMBER OF PERIODS"; N
48 REM-ENTER INTEREST RATE WITHOUT % SIGN
50 I=100*(X-Y)/Y
55 I=I/100
60 PRINT ""
70 F=P*(1+I)^N
75 F=INT(F*100+.5)/100
78 REM-FUTURE VALUE IS ROUNDED TO 2 DECIMAL PLACES
80 PRINT "FUTURE VALUE==$F"
85 PRINT ""
90 PRINT ""
95 PRINT ""
98 REM-TO END PROGRAM PRESS BREAK
100 INPUT "FOR ANOTHER EXAMPLE ENTER 1"; X :GOTO 5
```

EXAMPLE

THIS IS A VALUABLE PROGRAM USED TO PREDICT FUTURE PRICES
IN THE EXAMPLE THAT FOLLOWS, WE ARE GOING TO COMPUTE
THE SALARY NECESSARY TO STAY EVEN WITH INFLATION

ENTER THE LATEST CONSUMER PRICE INDEX VALUE? 193.3

THIS VALUE IS PUBLISHED WEEKLY IN U. S. NEWS & WORLD
REPORT-AVAILABLE AT ALL NEWS STANDS.

ENTER PREVIOUS YEAR'S C. P. I. VALUE? 180.6

C. P. I.=CONSUMER PRICE INDEX

THIS INFORMATION IS PUBLISHED WEEKLY IN U. S. NEWS
& WORLD REPORT

ENTER PRESENT VALUE OF SALARY OR PRODUCT? 300

ENTER THE NUMBER OF PERIODS? 2

2 INDICATES THAT YOU WANT TO KNOW YOUR SALARY
NECESSARY TO KEEP UP WITH INFLATION TWO YEARS FROM
NOW. IF YOU WANT TO KNOW NEXT YEAR'S PRICE OR SALARY
ENTER 1.

H & E COMPUTRONICS INC. MATHEMATICAL APPLICATIONS SERVICE™

ADVERTISEMENTS

ALL ADS PLACED IN THE TRS-80 MONTHLY NEWSLETTER ARE FREE TO SUBSCRIBERS. WE DO NOT ENDORSE OR TAKE ANY RESPONSIBILITY FOR ANY PRODUCT LISTED.

TRS-80

SOFTWARE EXCHANGE

JOIN IN ON THE FUN!!!!

THE TRS-80 SOFTWARE EXCHANGE CIRCUIT HAS FORMED

HOW TO JOIN

Send (on cassette) your best general interest program. In return, we send you one of our Circuit Exchange Cassettes (6-10 programs per tape). Programs meeting our standards are considered for retail sales, and you receive commissions on every program sold.

MARKET PLACE

SUBSCRIBE TO THE TRS-80 SOFTWARE EXCHANGE MARKET BASKET.

\$3 a year - a catalog of over 100 available software programs, prices starting at \$1.

Write: TRS-80 SOFTWARE EXCHANGE

17 Briar Cliff Drive

Milford, N. H. 03055

TRS-80 OWNER: TRS-80 Star Trek for sale. This is a complete version with 6 commands. Also included is a Computer Art program free, \$10 with cassette and complete instructions. Lunar Lander with full graphics. Prints ship status, Lander and lunar surface all in graphics, \$7.50 with cassette and full instructions with list of different modifications. Also have other programs upgraded to run in graphics. All for Level 1, 4K Machine. For catalog send SASE to: Sandy Sigal, 6851 Mammoth Ave., Van Nuys, CA 91405, (213) 989-5488.

TRS-80 USERS GROUP

For people interested in the Radio Shack TRS-80 Membership per year is \$10.00 which includes 10 issues of the newsletter. You may send an SASE (Size 10 please) to:

R. GORDON LLOYD
7554 Southgate Road, Fayetteville, NC 28304

TRS-80 CHECK TAPE

\$3.95

Detects ROM errors known to be in many Level 1 systems *Evaluate your machine and have it fixed!*

IMMEDIATE DELIVERY!

CONTRACT SERVICES ASSOCIATES
1846 W. Broadway, Anaheim, CA 92804

FOR SALE: TRS-80 Level-1 tapes and program lists. Star Trek (runs on 12K), list \$7.00, tape \$10.00; Lunar Lander (runs on 4K), list \$3.00, tape \$6.00; Bio-rhythm (runs on 4K), list \$5.00, Tape \$9.00. J.R. Menzies, 7106 Colgate Dr., Alexandria, VA 22307.

RADIO SHACK COMPUTING

non-profit newsletter

\$10 (U.S.)/12 issues payable

Computer Information Exch., Inc.

Box 158

San Luis Rey, CA 92068

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BITS AND PIECES

by

HOWARD Y. GOSMAN

BITS AND PIECES is our monthly section devoted to random thoughts and information related to the TRS-80. Contributions from our subscribers are encouraged.

LETTERS, LETTERS, LETTERS...

The response to our first issue was overwhelming. The many complimentary letters that we received from TRS-80 NEWSLETTER subscribers seem to insure the future success of the Newsletter. The TRS-80 NEWSLETTER is now the largest publication devoted to the TRS-80 Computer System. The big test concerning our future existence will occur when we reach Issue #12 (renewal time for most subscribers). In the mean time, your comments and suggestions are welcome. We need your help in making the TRS-80 NEWSLETTER successful.

FOREGIN SUBSCRIPTIONS

We have reduced the price of foreign subscriptions (outside of the United States and Canada) to \$36 per year. All issues are sent by AIR MAIL. If you have sent us \$24, your subscription will expire after Issue #8.

SIZE OF EACH ISSUE

At the present time, each issue of the Newsletter will contain 16 pages. That's just about our break-even point with 2000 subscribers. We intend to increase the size of each issue by 2 pages (1 page front and back) for each additional 500 subscribers. Due to the quantity of infromation we have obtained in the last couple of weeks, the present issue is a double issue.

WE ARE DEVOTED TO LEVEL II

All published programs are written for LEVEL II (although many can be used on LEVEL I). We surveyed 100 subscribers who called us and found that all (except 1) indicated that they have LEVEL II, are waiting for LEVEL II, or will purchase LEVEL II before the end of the summer. I believe that it would be senseless to publish LEVEL I programs that will soon be obsolete (if you disagree, please tell us).

LEVEL II is \$99 and certainly worth the price. LEVEL I users can program on LEVEL II machines almost instantly (LEVEL II does not permit the abbreviations found in CHAPTER 18 of the LEVEL I USER'S MANUAL). All of your LEVEL I programs can be easily converted to LEVEL II by using the RADION SHACK CONVERSION TAPE (that comes with LEVEL II). Once your LEVEL I program is converted to LEVEL II, you re-record the program on a new tape. You now have a LEVEL II program.

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DO YOU WANT AN ANSWER TO YOUR LETTER?

We're getting over 100 letters per week. Our staff will respond to all letters within ten days provided that you have enclosed a stamped self-addressed envelope. We can answer almost any question related to the TRS-80 system.

NEED MONEY?

Aside from using some of our programs to accumulate an income using your computer, we can use your help. (1) As previously stated, we are offering all subscribers \$6 for each new subscriber you can get us (see PAGE 5). (2) We offer \$1 for each valid name and address of a TRS-80 owner (under the condition that one out of six subscribe to the Newsletter). Currently, one out of three TRS-80 owners who receive our ad subscribe to the Newsletter. (3) We will pay you \$10 to \$250 for programs published in the Newsletter. To submit a program (LEVEL I or LEVEL II) send it in (on cassette or floppy disc) along with your name, address, telephone number, membership number and return postage (in the event that the program is not published).

FRE (string)

The FRE (string) function (5/5 of the LEVEL II BASIC REFERENCE MANUAL) is used to tell you how much string storage space is currently available. Avoid using it on programs using more than 1000 bytes (1K) of string space. With 100 bytes of string space used, FRE (string) will display the amount of available string space in 2 seconds. With 1000 bytes of string space used, FRE (string) will take close to 15 seconds. With 32,000 bytes of string space used, FRE (string) will take close to 8 hours. Many subscribers have had a problem with the customer information program (H/2 and H/3 of the LEVEL II BASIC REFERENCE MANUAL). The problem is that with more than 50 names, addresses and phone numbers, it takes too long to enter additional information. To solve the problem, just delete line 135.

NEW FROM TANDY

RADIO SHACK is now selling the LINE PRINTER with a tractor feed option for \$1599 (\$300 more than the LINE PRINTER without a tractor feed). If you already have the LINE PRINTER, your local RADIO SHACK can add on the tractor option for an additional \$300. The tractor feed is essential if you plan on printing address labels or using multiple copy forms.

FORTRAN AND COBOL

If you're interested in a more advanced computer language, RADIO SHACK is planning the release of FORTRAN and COBOL on their mini disc. Most RADIO SHACK owners aren't ready for these computer languages, but it's nice to know that they will be available.

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PUZZLED ABOUT LEVEL II?

An excellent book has just been published called BASIC FOR HOME COMPUTERS (A SELF-TEACHING GUIDE) by Bob Albrecht published by John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016...and only \$5.95. The new book is part of a series of more than 20 self-teaching guides (including Accounting Essentials, Clear Writing, Statistics, Fortran, Cobol, Guide to the Stock Market, Consumer Mathematics, Reading Skills, Probability, Calculus...). The book is easy to follow (like the LEVEL I MANUAL) and is essential for LEVEL II users without previous computer experience. BE CAREFUL!! Wiley & Sons publishes two similar books, BASIC...and BASIC FOR HOME COMPUTERS. The BASIC book includes many functions that are not found on home computers. BASIC FOR HOME COMPUTERS is brand new. Don't let your local bookstore try to tell you that it doesn't exist (published August, 1978).

TANDY COMPUTERS

As many of you probably know, TANDY COMPUTERS is a division of TANDY CORPORATION. You probably purchased your computer from RADIO SHACK which is a division of TANDY CORPORATION. TANDY COMPUTERS is opening a number of stores around the nation. They sell all RADIO SHACK computers plus a lot of non-Tandy (RADIO SHACK) computers and equipment. They will have five stores open by the end of the year (including Texas, New York City, Chicago and somewhere in California). The stores contain only computers and computer related items. They have sent out thousands of 1978 catalogs (52 pages full of goodies!). They will have a smaller 1979 catalog available at the end of the year. You can put your name on their mailing list by writing to TANDY COMPUTERS, P.O. Box 2932, Ft. Worth, Texas 76101. Don't expect to get an immediate reply. They are swamped and probably out of their 1978 catalog. You can order and get a bunch of the latest information by calling toll free, 1-800-433-1679. It's nearly impossible to get through on the toll free line. It's usually busy. Sometimes they don't answer the phone (probably due to too much business). If you keep trying, you can get through.

...Anyhow...Here's what's new and available from TANDY COMPUTERS.

(1) A SELECTRATERM (formerly called SELECTTERM) typewriter. This is a typewriter (IBM ELECTRIC) that can be hooked up to your computer (WITHOUT THE TRS-80 EXPANSION INTERFACE). It will print both upper and lower case letters. As you know, the quality of ELECTRIC PRINT (with the rotating ball) is excellent (perfect for business letters). The typewriter can be used with or without your computer. When hooked up to your computer, capital letters only are displayed on the video. To type lower case letters on the SELECTRATERM, just type out the letters on the TRS-80 keyboard (without the shift). To type capital letters on the SELECTRATERM, use the shift key on the TRS-80 Keyboard. The SELECTRATERM is an excellent machine but it is

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not made for heavy duty use. If you plan on having the SELECTRATERM type out thousands of address labels, forget it. If you want the SELECTRATERM to copy a letter 1000 times, forget it. You can use it with your computer to compose business letters and edit the letter so that you have a perfect copy without any erasures. It could be used effectively to write this complete Newsletter. You can file many letters on cassette and have them printed out on the SELECTRATERM. The SELECTRATERM is slow (about 15 letters per second). It will type a letter (using the keyboard or cassette) very quickly, but it's too slow for large quantities of printed matter. The price...\$1995 (call TANDY COMPUTERS for more details).

(2) The DIABLO typewriter. This is similar to the SELECTRATERM but it will do heavy duty work and it is quick. The type quality is equal to or better than the IBM SELECTRATERM. The disadvantage is its price, \$3300. The DIABLO is a XEROX product.

(3) The CENTRONICS PRINTERS. All TRS-80 LINE PRINTERS are made by CENTRONICS. The TRS-80 LINE PRINTER does not have lower case letter capabilities. TANDY COMPUTERS does sell CENTRONICS PRINTERS with lower case capabilities for only a couple of hundred dollars over the price of the TRS-80 LINE PRINTER. REMEMBER...If you plan on giving your printer a workout, buy the tractor feed option.

All of the above printers are reliable and can be repaired locally.

(4) S-100 BUS. What's that? It makes your TRS-80 compatible with most other computers. That means, you can hook up anything (megabyte floppy discs, other keyboards, high speed tape records, all printers...).

MORE FACTS ABOUT THE CASSETTE RECORDER SYSTEM

1. You don't have to worry about the volume setting when recording a program (as stated on PAGE 3-FACTS ABOUT THE CASSETTE RECORDER SYSTEM). The recorder sets its record level automatically. The VOLUME control and TONE seitch will have no effect on your recording. The correct VOLUME setting is essential on playback.
2. Many subscribers suggested that I try a cheaper tape (other than the expensive SUPERTAPE). They stated that the TRS-80 CASSETTE PLAYER achieves better results using a cheaper tape. Sure enough, I tried it and it worked. I am getting better results using inexpensive tapes.
3. From one of our subscribers..."Are you aware that the CTR-41 (Radio Shack Cassette Tape Recorder) may not be compatible with the TRS-80. Mr. Tandy is looking into this seriously and could be designing a new CTR. Check this. Supergold Tape is sensitive and may pick up extraneous blips which can cause errors in loading. The cheaper Realistic tape can give you a more accurate dump."

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4. RADIO SHACK now sells a combination tape head cleaner and demagnitizer. This new cleaner-demagnifier cassette is effective. The manufacturer recommends that you run it through the machine after 40 hours of play. I find it necessary to use it every 10 hours or so. If your tape is loading properly, there's no reason to use it. I use the tape head cleaner only after getting a couple of non-reads. The problem is usually corrected instantly.
5. The CASSETTE RECORDER that comes with your computer is an inexpensive machine, but it is adequate for non-essential use. If you plan on using your system in a business, buy the disc system (or use a more expensive recorder).
6. Inexpensive cassette tapes work well on the cassette recorder... but, you may have to adjust the volume (higher).

WAITING FOR SOMETHING?

The August 10 shipping update (from RADIO SHACK) appears below. CURRENT SHIPPING DATE refers to the date that an order was originally taken by a store. For example, if you ordered a Mini-Disk on April 25, 1978...it's being shipped now.

CATALOG NO.	DESCRIPTION	CURRENT SHIPPING DATE
26-0301	C-20 Magnetic Tape	5/24/78
26-0305	Diskette (Blank)	3/20/78
26-0310	Diskette (Formatted with DOS)	5/28/78
26-0405	Diskette (Blank, 3-Pack)	5/15/78
26-1001	TRS-80 4K Level I	7/26/78
26-1003	TRS-80 16K Level I	7/24/78
26-1004	TRS-80 4K Level II	6/ 1/78
26-1006	TRS-80 16K Level II	4/13/78
26-1101	16K Memory Kit	7/13/78**
26-1120	Level II Basic Kit	4/29/78**
26-1140	Expansion Interface 0 RAM	7/ 1/78**
26-1141	Expansion Interface 16K RAM	4/10/78
26-1142	Expansion Interface 32K RAM	3/25/78
26-1150	Line Printer	4/28/78**
26-1151	Screen Printer	4/10/78**
26-1160	Mini-Disk (Drive I Only)	4/25/78
26-1161	Mini-Disk (Drive II, III, IV)	4/25/78
	Software and User's Manuals	6/10/78

**Shipping date reflects an order which contains this item only.

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RADIO SHACK is well aware that there are plenty of "ticked-off" people waiting for deliveries. The August 10, 1978 TRS-80 UPDATE (to store managers) states, "DO NOT QUOTE DELIVERY DATES LESS THAN 90 DAYS ON LEVEL II AND PERIPHERALS! When you quote an expected delivery date, be sure your customer understands that this is our best estimate, NOT A PROMISE, and is based upon procurement of raw materials from our suppliers on the dates promised."

RENUM

RADIO SHACK will soon be shipping a line renumbering program for use in LEVEL II TRS-80's. It allows users to automatically renumber the lines in a basic program, with choice of starting line numbers and increments between lines. We plan on publishing a similar program in a future NEWSLETTER issue.

ERROR IN THE NEW RADIO SHACK CATALOG

According to the NEW RADIO SHACK CATALOG, the MINI-DISK is \$489. That's a typographical error. The price is still \$499.

THE 64K DISK DRIVE

Although the DISK DRIVES are capable of storing 89K (or so), the first DISK DRIVE of the DISK DRIVE SYSTEM stores approximately 64K with 25K of disk storage used by the operating system software. Each additonal DISK DRIVE will store 89K.

THE MISSING REAL TIME CLOCK

The widely distributed TRS-80 EXPANSION INTERFACE ad states that the Interface has a real time clock. This function can only be used when the Interface is connected to a Mini-Disk drive.

RADIO SHACK ATTITUDE TOWARD OUTSIDE PRODUCTS

RADIO SHACK will repair your TRS-80 for \$24 (after the 90-day warranty) provided that the system has not been altered or tampered with. There are several companies selling 16K MEMORY RAMS for \$99-\$150 (compared to the \$290 RADIO SHACK price). RADIO SHACK will charge higher prices for repairs on modified machines. According to an RS release, "A number of people are advertising 16K conversion kits. They should know that a large percentage of defective computers can be traced to the RAM chips, and that ours are carefully selected and go through extensive testing when they are installed."

NEVERTHELESS...

APPARAT, INCORPORATED, BOX 10324, DENVER, COLORADO 80210 (303) 758-7275...is selling 16K MEMORY RAMS (with complete instructions for installation) for \$99. They are easy to install. APPARAT claims that there is no danger in using their 16K RAM. They come from exactly the same place.

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My advice. I'm not mechanical and I don't do any tinkering. I paid \$290 for my RAM. Others say that the RAM installation process is simple and safe. RADIO SHACK must be making a fortune on those \$290 RAMS.

IMPORTANT ADVERTISING POLICY

MATHEMATICAL APPLICATIONS SERVICE does not endorse nor recommend any product advertised or in any way mentioned in the TRS-80 NEWSLETTER. We mention the products and services in the TRS-80 NEWSLETTER to keep readers informed on what is available. We may express an opinion... but this does not constitute an endorsement as to the safety or reliable of the product or service.

ALL ADVERTISEMENTS ARE FREE TO SUBSCRIBERS. THIS POLICY WILL EXPIRE AS OF ISSUE #6. OUR ADVERTISING RATES WILL BE PUBLISHED IN THE NEXT ISSUE (FOR ADVERTISEMENTS PLACED BEGINNING WITH ISSUE #7).

PROGRAMS PUBLISHED IN THE NEWSLETTER

DON'T TELL US THAT YOUR COMPANY LOST ONE MILLION DOLLARS BECUASE THEY DIDN'T SEE THE COLON IN ONE OF OUR PROGRAMS!! DON'T HOLD US RESPONSIBLE FOR ANY PUBLISHED PROGRAMS. TO THE BEST OF OUR KNOWLEDGE, THEY ARE ACCURATE. WE LEAVE IT UP TO YOU TO GET OUT THE BUGS. We will publish corrections as we receive them.

PROGRAM CONVERSIONS

RADIO SHACK is aware that many customers are experiencing difficulty in converting some LEVEL I software to LEVEL II. There are aware of the problem. RADIO SHACK claims that they will be publishing some addendum sheets (for store managers) to aid in the conversion of TRS-80 SOFTWARE.

REAL-TIME CLOCK

RADIO SHACK ads state that the EXPANSION INTERFACE includes a real-time clock (similar to a digital watch). You can only obtain access to this function when a Mini-Disc drive is connected to the Expansion Interface.

MINI-DISK UPDATES

1. A new D.O.S. (that's the diskette that must be placed inside the mini-disk to begin operation) will be availabe within the next couple of weeks. If you have the old D.O.S., make sure you get the updated version (free if you own the old D.O.S.).
2. According to RADIO SHACK, you should connect the 26-1160 disc drive (that's the one with the extra interconnect cable) at the last drive (furthest away from the Expansion Interface) on the system. This "can materially reduce some of the Disk problems currently being reported." The D.O.S. diskette must still be the drive

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nearest the Interface. In other words, if you have one drive, connect it to the last drive connector (furthest away from the Expansion Interface) on the system. If you have two drives, connect them to the last two positions on the cable, the closest one to the Expansion Interface would be the 26-1161 followed by the 26-1160. In a three drive system, connect two 26,1161'2 followed by the 26-1160 (in the last cable position furthest from the interface) and so forth. REMEMBER. The D.O.S. diskette must still be the drive nearest the Interface (even though the drive is the 26-1161).

I tried the method as advised by RADIO SHACK, it didn't work.

3. IMPORTANT=When you receive your MINI-DISK system, don't play around with it. You only get one copy of the D.O.S. DISKETTE. Duplicates are hard to find. The first thing you should do after hooking up your DISC SYSTEM is to make several copies of the D.O.S. DISKETTE. The process is fairly simple, but necessary.

A JOY STICK FROM MICROTRONIX

Now you can play all those video games on your TRS-80. MICROTRONIX is selling a JOYSTICK that can be used to play hundreds of pong games. MICROTRONIX is also selling the 16K RAM for under \$200 and will install it on your machine while you wait (at the 2nd ANNUAL PERSONAL & BUSINESS SMALL COMPUTER SHOW).

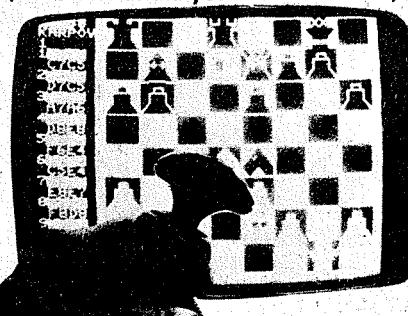
Everything you always wanted to plug into your PET, APPLE or TRS-80*

TRS-80
PET
APPLE

HARDWARE

PRINTERS	
Centronics 150 lpm, of 20, 40 or 80 char.(Upper/lower case).	
P1 Parallel Model (cable, software, add \$50)	\$395.
S1 Serial Model (cable, software add \$50)	\$549.
Anderson-Jacobsen I/O Selectric, Bidirectional.	\$995.
PET Graphics Ball	\$200.
RS 232C Serial Option.	\$200.
TRS Graphics Ball	\$100.
Expander 123P impact with tractor feed	\$495.
Integral Data IP-125 impact Upper/lower case	\$795.
PET, TRS-80 graphics option with 4 char. sizes, tractor feed \$1195, Pet Modem, \$320, Serial Int. #98, (Apple \$62), Apple Modem.	\$120
MEMORY (Save \$100 or more)	
16K Dynamic RAM (TRS-80 Specify keybd, or exp, int.\$200 16K RAM Board, options\$435 Additional 8K	\$200
CONNECTORS, ETC.	
TRS-80 40 pin edge, \$9.95, Int. ext. cord, \$19.95+\$2*(Ft-2)	
IEEE or User Port w/cover \$9.95	
Cassette w/cover	\$4.95
Dual Stereo Cassette Deck Ideal for micro tapes w/prompting \$250.	
C-10 Blank cassettes	\$1.49

(*but were afraid you couldn't afford)



Exclusive JOYSTICK package (shown with PET MICROCHESS). Uses Fairchild's unique 8-way joysticks for true user interaction. Perfect for screen cursor control in games, education and text editing.
PET 1-Joystick Kit with Maze & Breakout: \$39.95
Extra Joystick Kit with Two Player Game: \$19.95
Assembled Add \$10/Joystick. TRS-80/Apple II Kits avail.

Call or write for free brochure.
Meet us at Phila.'s P.C.'78.

microtronix

SOFTWARE

TRS-80: 1. Data Management/Report Generator Package (L-II-16K). Tape System: \$200; Disk System: \$300. Give your TRS-80 the editing features of a \$4000+ Burrough's TD800 series terminal. Automatic data entry and custom reports. Generate complete screen graphics with full cursor control. 2. MICROCHESS (L-I or II-4K) \$19.95, 3 difficulty levels. 3. Statement renumbering and cross reference.

PET: 1. Joystick Microchess-(needs dual joystick package) \$19.95

Play against an opponent while your PET checks and saves moves. Options: Play by phone, play against your PET.

2. Astrology:\$14.95. 3. Statement renumbering and cross reference:\$9.95.

APPLE II: 1. 3 Dimensional Maze (16K) \$14.95. 2. Hi-Res Graphics Editor (16K) \$17.95

3. Statement renumbering \$9.95 (8K)

TOLL FREE
MICROLINE for:
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Info, free catalogue
800-523-4550
In PA & CAN
(215) 665-1112

Cash prices shown. Major credit cards accepted.
Minimum shipping \$2.50. Pa. residents add 6%.

Post Office Box Q, Dept. K, Philadelphia, PA 19105

MATHEMATICAL APPLICATIONS SERVICE

TRS-80 MONTHLY NEWSLETTER INDEX
To be published after ISSUE #6.

SEE US AT THE PERSONAL & BUSINESS SMALL COMPUTER SHOW

We will have a booth at the PERSONAL & BUSINESS-SMALL COMPUTER SHOW, September 15-17, 1978 at the NEW YORK COLISEUM.

We will be selling more than 100 different programs on cassette or disk. Our complete list will be published in the next Newsletter (or available at the Coliseum). We will be selling many common programs as well as some advanced business, technical and game programs.

If you have any programs that you would like us to market, please call or write.

QUALITY OF OUR PROGRAM PRINTOUTS

Yes, some of those commas and periods were hard to see. We are in the process of searching for a high quality printer (to print both the NEWSLETTER as well as the program printouts). Please bear with us. We currently use the TRS-80 LINE PRINTER which is not the best for duplication purposes. We will put on a new ribbon for our printouts.

WHAT HAPPENS AFTER THE GUARANTEE?

Repair costs for the CPU, expansion interface, mini-disk system and video range from \$17 to \$24 plus parts. The big question is, how much will it cost for the parts. For example, if the 16K RAM goes after 90 days, does that mean that you will have to buy another RAM? I don't think so. If you have more facts about repair costs, please write.

HELP WANTED

Frank Ferguson of Basic-Educational Computers is desperately searching for qualified people to help develop programs. If you live in Maryland, Washington D.C., or Virginia, give Frank a call at (703) 578-0407.

OUR 16-DIGITS OF ACCURACY PROBLEM (SEE PAGE 2)

For 16-digit accuracy, you must revise your input as follows:
`I#= .05 (ENTER) PRINT I# (ENTER)`. Now, .05 is displayed. This method of entry is of particular importance in financial calculations.

CONFIRMATION OF 10% STOCK DISCOUNT (SEE PAGE 4)

All TANDY STOCK owners are entitled to a 10% discount on all store purchases.

THE LINE PRINTER PRINTS A CRACKET?

THE LINE PRINTER PRINTS A BRACKET (NOT A CRACKET as seen on PAGE 5-IMPORTANT!!!).

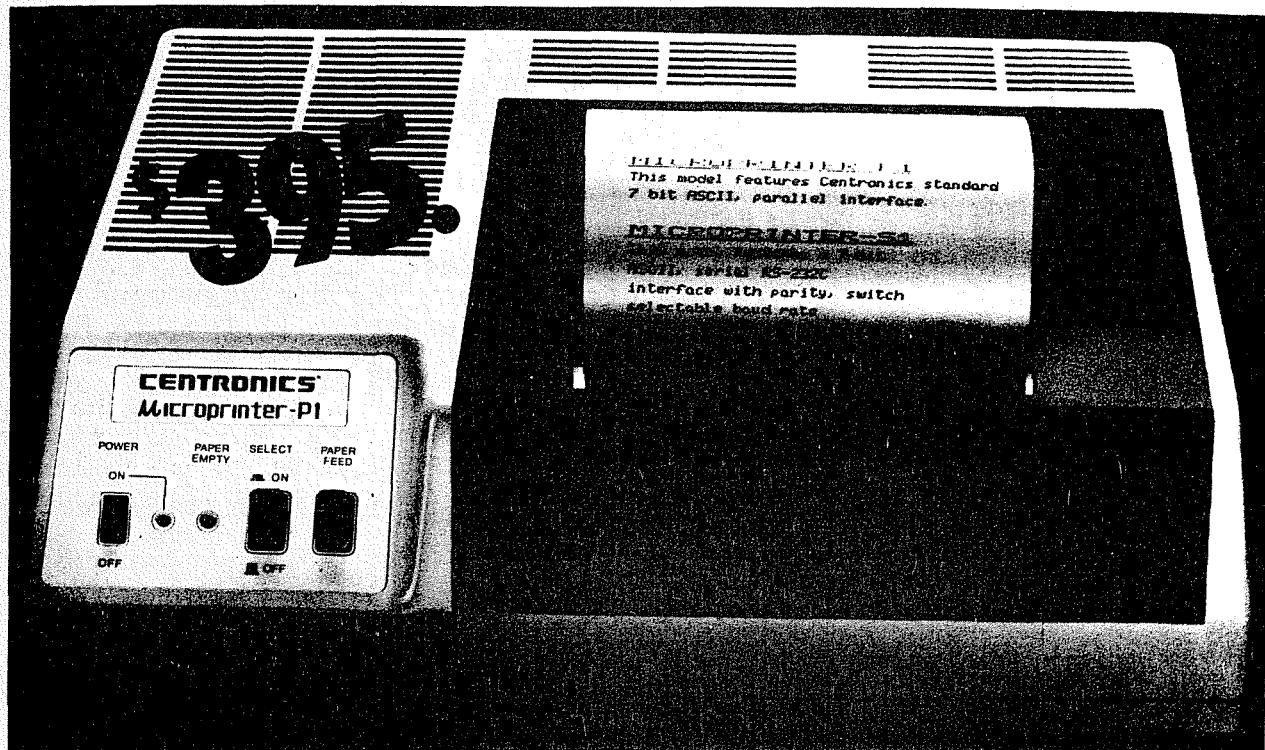
MATHEMATICAL APPLICATIONS SERVICE

THE CENTRONICS MICROPRINTER-P1

The P1 is an excellent alternative to the TRS-80 SCREEN PRINTER. It prints clean, clear dot matrix characters at a rate of 150 lines per minute. It's quiet and compact (and is backed by Centronics' - the same companies that services and manufactures the TRS-80 LINE PRINTER). It is available and ready to be plugged into your computer (without the expansion interface) from MICROTTRONIX (see PAGE 24).

The TRS-80 SCREEN PRINTER will print only what appears on the video display after you press the button on the SCREEN PRINTER. The P1 acts just like the TRS-80 LINE PRINTER.

For more information, write to CENTRONICS DATA COMPUTER CORPORATION, Hudson, NH 03051.



OUR SURVEY

Please participate in our reader's survey. Take the time to fill it out and stuff it in an envelope. We are particularly interested in finding out the rate of machine failures. Results will be published next month (and updated in future issues).

MATHEMATICAL APPLICATIONS SERVICE

\$399 DISC

APPARAT (see PAGE 22) is selling the equivalent to the RADIO SHACK MINI DISK for \$399.

CORRECTION

Several readers have called to say that they cannot duplicate our results in the example given for the "FEDERAL WITHHOLDING TAX PROGRAM" (see PAGES 7-12). To get the printed results, consider the man to be unmarried with 2 withholding exemptions. The input should be:

225,30,5,4.00,1,2

(In the original, the 1 and the 2 were transposed.) The printout will then be:

ID	GROSS	FED.WITH.	FICA	NEW
225	150.00	15.02	9.08	125.91

The NEW of 125.91 is in error by 1¢. This is due to the rounding in the PRINT USING statement, 13020, and its associated format line 13015. The actual correct FICA is \$9.075 and the correct NEW is \$125.905. These are always rounded before being paid out. To guarantee that the NET is always equal to the GROSS - the deductions, insert the following lines:

11022 W(Z,1)= INT(100*W(Z,1)+.5/100 : W(Z,2)=INT(100*W(2,2)+.5)/100

11023 W(Z,3)= INT(100*W(Z,3)+.5/100

Those readers still not able to get the program to run may be having problems in reading the printout. There are several multiple statement lines. However, the colons separating the statements on these lines have not been printed clearly. Some of the colons look like periods. This is particularly true in lines 10010, 11020 and 11025.

IRREGULAR RADIO SHACK DELIVERIES

The following sequence of events seems to be common:

You are looking for LEVEL II. You order it at RADIO SHACK STORE A and are told that you will have to wait 16 weeks. Later, you find a friend who walked into RADIO SHACK STORE B and got immediate LEVEL II delivery. Why?

STORE B either ordered many LEVEL II chips in anticipation of the demand (although RADIO SHACK discourages this practice) or an order was cancelled by another customer making the chip available. If you are in a hurry, you may be able to find LEVEL II, an expansion interface or even a mini-disk. All you have to do is call every RADIO SHACK in your area.

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LAST MINUTE INSERTIONS

DISK MANUAL

Copies of the TRS-80 MINI-DISK MANUAL are available from M.A.S. for \$7.95. You will have to read it 20 or 30 times before you're able to operate the disk system properly. Plenty of information related to the disk is not included in the manual. In all fairness, it's only the preliminary manual and will be revised.

MORE FROM MICROTRONIX (PAGE 24)

MICROTRONIX has just announced a brand new expansion interface. The price is about \$100 in kit form (slightly higher assembled). According to MICROTRONIX, you can plug in most printers right into their interface (that includes the SELECTRATERM, CENTRONICS, TRS-80 SCREEN and LINE PRINTERS, CENTRONICS P1, DIABLO and most others).

The interface will allow the user to plug in the joysticks (also sold by MICROTRONIX). The interface includes 2 RCA sound chips which make your TRS-80 a complete game center.

...even more. MICROTRONIX is selling a chip that will allow your video to display lower case letters.

I have two questions concerning all of these new chips and things...
(1) Can an electronics "dummy" connect the interface and install chips.
(2) Are they safe for the computer?

MICROTRONIX says yes to both. All of their products come with complete instructions and they will not harm the machine. I will be taking a look at the MICROTRONIX products in Philadelphia and New York (MICROTRONIX will have thier products on display). I'll report back to you in the next issue.

THE NEW D.O.S. IS OUT

If you have a MINI-DISK SYSTEM, RADIO SHACK has just released the new D.O.S. DISKETTE. They are available. You can probably make a copy at any RADIO SHACK displaying the DISK SYSTEM.

MICROCHESS

PERSONAL SOFTWARE, P.O. BOX 136, E3, CAMBRIDGE MA 02138...(617) 783-0694 has a software catalog available on request. Their programs include MICROCHESS a GRAPHICS PACKAGE and others. The MICROCHESS program (for LEVEL II or LEVEL I) displays a graphic chessboard. There are three levels of play. Just PRESS the PLAY BUTTON on your cassette player and CLOAD on the C.P.U. and the game is stored and ready to play. MICROCHESS is similar to the electronics chess games currently selling for \$15--\$250.

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BEGINNER'S CORNER

by
ELAINE TRAUM

The trivial program below illustrates an extremely important idea. As you know, pressing the SHIFT key with any letter from A-Z will not alter the video display. It is important to realize that the shift key does alter the information within your computer.

A letter with the shift key is not equivalent to a letter without the shift key.

- (1) If you have attached a printer with lower case capabilities (not the TRS-80 PRINTER or SCREEN PRINTER), using the shift key will print upper case letters...not using the shift key will print lower case letters (although upper case letters will always be displayed on the video).
- (2) Using the SHIFT KEY with STRING comparisons could cause unwanted results. Enter the program below.

PRESS RUN

WHAT IS THE LAST NAME OF THE U.S. PRESIDENT?

TYPE IN...WILLIAMS

SORRY, THAT'S THE WRONG ANSWER.
TO TRY AGAIN, PRESS ENTER.

WHAT IS THE LAST NAME OF THE U.S. PRESIDENT?

TYPE IN...CARTER

CORRECT!!
TO TRY AGAIN, PRESS ENTER.

WHAT IS THE LAST NAME OF THE U.S. PRESIDENT?

TYPE IN (USING THE SHIFT KEY FOR ONE OR MORE LETTERS)...CARTER.

SORRY, THAT'S THE WRONG ANSWER.
TO TRY AGAIN, PRESS ENTER.

```
5 CLS
10 INPUT "WHAT IS THE LAST NAME OF THE U. S. PRESIDENT"; X$
20 IF X$="CARTER" GOTO 100
30 PRINT "SORRY, THAT'S THE WRONG ANSWER."
40 INPUT "TO TRY AGAIN, PRESS ENTER.", X:GOTO5
100 PRINT "CORRECT!!"
110 PRINT :PRINT
120 INPUT "TO TRY AGAIN, PRESS ENTER.", X:GOTO5
```

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BUSINESS, PERSONAL FINANCE, MONEY MANAGEMENT

by
HOWARD Y. GOSMAN

There are several methods that can be used to alphabetize a list of names (or put zip codes in numerical order). The most common method (and slowest method) appears below.

ALPHABETIZING WITH REPLACEMENT

BY

HOWARD Y. GOSMAN

```
10 REM-ALPHABETIZE
20 CLS
30 CLEAR 10000
32 DIM A$(50)
40 I=1
50 N=1
70 PRINT
80 PRINT "(TO END PROGRAM TYPE 9999)"
90 INPUT "ENTER NAME"; A$(I)
100 IF A$(I)="9999" GOTO 140
110 I=I+1
120 N=N+1
130 GOTO 90
140 FOR I=1 TO N-1
150 FOR J=1 TO N-2
160 A$=A$(J)
170 B$=A$(J+1)
180 IF A$<B$ THEN 210
190 A$(J)=B$
200 A$(J+1)=A$
210 NEXT J
220 NEXT I
230 PRINT
240 CLS
250 FOR I=1 TO N-1
260 PRINT A$(I)
270 NEXT I
280 PRINT
290 INPUT "TO ADD ANOTHER NAME TYPE 1... TO END TYPE 0"; Q
300 IF Q=1 GOTO 330
```

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Test your program with the following list of names:

RONALD P. TERCEIRA	GREGG KENNETH S.
DONALD L. HOYT	HAZELETT TERRY
R.B. THOMPSON	HEILMAN RONALD
JIM MCCANN	HOGG ROBERT
JOHN O'BRIEN	HOYT DONALD L.
ROBERT HOGG	JONES CARLA
RONALD HEILMAN	MCCANN JIM
TERRY HAZELETT	O'BRIEN JOHN
KENNETH S. GREGG	TERCEIRA RONALD P.
CARLA JONES	THOMPSON R.B.

NOTES

You must put in the last name first in order to duplicate the names on the right (above). For example, to enter RONALD P. TERCEIRA, type in TERCEIRA RONALD P.

To start the program, type in RUN. The video will display ENTER NAME. You respond by typing in the first name on the list (TERCEIRA RONALD P.), then PRESS the ENTER KEY.

Don't use commas (although a program can be devised allowing for the use of commas).

This program will also sort zip codes. To sort zip codes, you must enter a five numeral zip code.

Try alphabetizing the following list: Jones, Baker, 34568,8.

Your video will display the following: 34568,8,BAKER, JONES. The string comparison function of the TRS-80 compares the first digit (or letter) of each number or word. If the first character is equal, the computer looks at the next character.

According to the computer, 3 comes before 8 so 34568 comes before 8. When your computer compares strings, it does not look at the value of the character. There are other computer functions that would place the 8 before 34568. Since all zip codes are 5 characters, zip codes would be placed in the correct order.

A comes before E, 5 comes before G, % comes before *. The complete list of character priorities appears on page C/2 of the LEVEL II MANUAL.

This first alphabetizing program is called ALPHABETIZING WITH REPLACEMENT. This means that the computer has repositioned the list of words alphabetized. For example, TERCEIRA is the first name on the list (on the left). After your computer has alphabetized

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the list, TERCEIRA becomes the 9th name on the list and 9th name in the computer memory. The process of ALPHABETIZING WITH REPLACEMENT is not the most efficient method to use (although most programs use this method). Ten names can be alphabetized in a few seconds. Try 50 names. Once you reach 500 names, you will have to wait a long time (several hours).

Line 30 CLEAR 10000 assumes that you have 16K. With 4K, change line 30 to CLEAR 3000 (or a little more if you calculate the exact amount of space available). Line 32 limits your list to 50 names. On 16K, you can probably use 500 names so change line 32 to read DIM A\$(500).

AFTER YOU REACH YOUR LAST NAME, THE VIDEO DISPLAY STILL DISPLAYS... ENTER NAME (that's because your computer can't read minds). To get your computer to alphabetize the list, you must enter 9999 as the last name. For example, on our list of names, after you enter Carla Jones (JONES CARLA), you must enter 9999. 9999 will not appear on your alphabetized list.

ALPHABETIZING WITHOUT REPLACEMENT

BY

HOWARD Y. GOSMAN

```
10 CLEAR 10000
20 DIM A$(50)
30 DIM N$(50)
40 I=1
42 CLS
44 INPUT "NAME"; N$(I)
46 IF N$(I)="9999" GOTO 70
48 I=I+1
50 N=N+1
60 GOTO44
70 FOR I=1 TO N
80 A$(I)=N$(I)
90 NEXT
100 CLS : K=0
110 I=1
120 FOR J=2 TO N
130 IF A$(I)<A$(J) GOTO 140 ELSE I=J
140 NEXT
150 IF N$(I)="9999" GOTO170
160 PRINT N$(I)
170 A$(I)="ZZ"
180 K=K+1
190 IF K=N GOTO 200 ELSE GOTO 110
200 PRINT
210 INPUT "TO ADD A NAME TYPE 1... TO END TYPE 0"; Q
215 IF Q=0 PRINT "END OF PROGRAM": END
220 N=N+1
230 I=N
240 GOTO 50
```

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ALPHABETIZING WITHOUT REPLACEMENT is a much faster operation (although you may not notice its speed with short lists of names). This program has not appeared in any other publication and is completely original.

ALPHABETIZING WITHOUT REPLACEMENT will display exactly the same information as in the previous program. ALPHABETIZING WITHOUT REPLACEMENT does not rearrange the list of names within the computer memory. It merely displays the names in alphabetical order without rearranging computer memory. It does this by assigning the name "ZZ" to names that are displayed. It will alphabetize 500 names in less than 5 minutes (and print out on a line printer or display the names on video).

Your computer can't display 500 names at one time. If you want to stop the computer as it is displaying names, PRESS the SHIFT KEY and the @ KEY at the same time. To continue with the listing, PRESS and KEY.

Problems will occur with the above two programs if you enter a name beginning with the letters "ZZ" (but that's highly unlikely!).

You can modify the above program so that names can be entered as it appears on the list in the left hand column above. So, it would be possible to enter the name DONALD L. HOYT exactly as it appears and still alphabetize according to last name. I was lazy and didn't write out the program. Readers are invited to submit a program that will alphabetize according to last name, but enable the user to enter names as listed. HINT-Have the computer look for the first blank space starting from the right. This marks the beginning of a last name. To use this method, two part last names must be entered without a space. For example, De Soto (last name), must be entered as DESOTO.

COMPLETE MAILING LIST PROGRAM

This program can be used to keep records, phone numbers, addresses, account files, mailing lists, etc. The program can be used with either tape or disk (or a combination of the two). 16K is the minimum memory necessary to operate the program.

LINE 5 and 10 must be modified for 16K systems. With 16K systems, change line 5 to CLEAR 11000. The DIM statements must also be modified to a number less than 500 or an error will occur.

To begin your file, TYPE RUN. Eleven choices are displayed. If you ENTER 1 (that is, TYPE 1 followed by ENTER), you will either be starting your file or adding to the file (if one was previously stored in the computer, on disk or cassette). After typing 1, your computer will ask you if you are ready? PRESS ENTER. The display asks for

MATHEMATICAL APPLICATIONS SERVICE

COMPLETE MAILING LIST PROGRAM
BY
HOWARD Y. GOSMAN

```
5 CLEAR 20000 :CLS :P1=1 :DIM A$(500)
10 DIM NL$(500), N1$(500), N2$(500), CO$(500), A1$(500), A2$(500)
20 CLS :PRINT# 10, "***MENU***" :PRINT :PRINT
30 PRINT "TO BUILD OR ADD TO A FILE TYPE 1"
40 PRINT "TO SEE THE ENTIRE FILE TYPE 2"
50 PRINT "TO SEE AN INDIVIDUAL NAME TYPE 3"
60 PRINT "TO MAKE CORRECTIONS TYPE 4"
70 PRINT "TO SAVE THE CURRENT FILE ON TAPE TYPE 5"
80 PRINT "TO INPUT A FILE FROM TAPE TYPE 6"
81 PRINT "TO PRINT THE ENTIRE FILE (LINE PRINTER) TYPE 7"
85 PRINT "TO PRINT ALPHABETIZED LIST TYPE 8"
86 PRINT "TO PRINT AN INDIVIDUAL NAME (LINE PRINTER) TYPE 9"
87 PRINT "TO SAVE CURRENT FILE ON DISK TYPE 10"
88 PRINT "TO INPUT FILE FROM DISC TYPE 11"
90 INPUT Q:ON Q GOTO 180, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100
100 INPUT"WHEN READY, HIT ENTER":X
110 FOR I=P1 TO 500 :CLS :PRINT"ENTER MEMBERSHIP #"
112 PRINT"THEN HIT THE 'ENTER' KEY":INPUT NL$(I)
115 IF NL$(I)="9999" THEN P1=I :GOTO150
117 INPUT"ENTER FIRST NAME": N1$(I)
118 INPUT"ENTER LAST NAME": N2$(I)
119 INPUT"ENTER COMPANY NAME OR APARTMENT #": CO$(I)
120 INPUT"ENTER YOUR ADDRESS": A1$(I)
130 INPUT"ENTER CITY, STATE AND ZIP CODE": A2$(I)
140 NEXT
150 PRINT"FILE CLOSED--":INPUT"TO SEE THE MENU HIT ENTER": X
160 GOTO20
200 CLS :FOR I=1 TO P1 :PRINT NL$(I)
201 PRINT N1$(I); " "; N2$(I)
202 CO#=CO$(I)
220 IF LEN(CO$)>0 PRINT CO$
240 PRINT A1$(I)
250 PRINT A2$(I)
260 NEXT
270 INPUT"TO SEE THE MENU, HIT ENTER": X :GOTO20
300 CLS :INPUT"ENTER LAST NAME": N2$
310 FOR I=1 TO P1 :IF N2$(I)=N2$ THEN 330
315 NEXT
320 PRINT"NAME NOT IN FILE":GOTO370
330 PRINT NL$(I)
340 PRINT N1$(I); " "; N2$(I)
345 CO#=CO$(I)
350 IF LEN(CO$)>0 PRINT CO$(I)
355 PRINT A1$(I)
360 PRINT A2$(I)
370 PRINT :PRINT"FOR ANOTHER NAME TYPE 1, OTHERWISE 0":INPUT X
380 IF X=1 GOTO300 ELSE20
```

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```
400 CLS :PRINT"ENTER THE LAST NAME FOR THE FILE YOU WISH TO
CHANGE"
405 INPUT N2$
410 FOR I=1 TO P1 :IF N2$=N2$(I) GOTO 430
415 NEXT
420 PRINT"NAME NOT IN FILE" :GOTO460
430 PRINT"ENTER THE CORRECTED INFORMATION"
432 PRINT :INPUT"MEMBERSHIP #"; NL$(I)
434 INPUT"FIRST NAME"; N1$(I)
440 INPUT"LAST NAME"; N2$(I)
450 INPUT"COMPANY OR APARTMENT #"; CO$(I)
452 INPUT"STREET ADDRESS"; A1$(I)
454 INPUT"CITY, STATE AND ZIP CODE"; A2$(I)
460 INPUT"FOR ANOTHER CORRECTION TYPE 1, OTHERWISE 0"; X
470 IF X=1 GOTO 400
480 GOTO20
500 CLS
505 PRINT"MAKE PREPARATIONS FOR CASSETTE. "
507 INPUT"WHEN READY HIT ENTER"; X
510 PRINT"COPYING. . . "
520 PRINT #-1, P1
525 FOR I=1 TO P1
530 PRINT #-1, NL$(I), N1$(I), N2$(I), CO$(I), A1$(I), A2$(I),
A$(I)
535 NEXT
540 PRINT"COMPLETE--NOTE TAPE LOCATION"
550 INPUT"TO SEE THE MENU, HIT ENTER"; X :GOTO20
560 CLS :INPUT"WHEN READY, HIT ENTER"; X
565 PRINT"INPUTTING. . .
570 INPUT #-1, P1
575 FOR I=1 TO P1
580 INPUT #-1, NL$(I), N1$(I), N2$(I), CO$(I), A1$(I), A2$(I),
A$(I)
585 NEXT
590 PRINT"COMPLETE":INPUT"TO SEE MENU, HIT ENTER"; X :GOTO20
700 CLS :FOR I=1 TO P1
705 LPRINT NL$(I)
710 LPRINT N1$(I); " "; N2$(I)
720 CO$=CO$(I)
730 IF LEN(CO$)>0 LPRINT CO$
740 LPRINT A1$(I)
750 LPRINT A2$(I)
760 LPRINT " "
770 IF LEN(CO$)=0 LPRINT " "
780 NEXT
790 INPUT"TO SEE THE MENU, HIT ENTER"; X:GOTO20
```

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```
800 N=P1-1
805 FOR I=1 TO N
810 A$(I)=N2$(I)+N1$(I)
815 NEXT
820 CLS :K=0
825 I=1
830 FOR J=2 TO N
835 IF A$(I)<A$(J) GOTO 840 ELSE I=J
840 NEXT
845 LPRINT N2$(I); " "; N1$(I); "-"; NL$(I)
847 A$(I)="Z"
850 K=K+1
855 IF K=N GOTO 890 ELSE GOTO 825
890 PRINT :INPUT"TO SEE MENU PRESS ENTER": X :GOTO 20
900 CLS :INPUT"ENTER LAST NAME": N2$
910 FOR I=1 TO P1 :IF N2$(I)=N2$ THEN 930
915 NEXT
920 PRINT"NAME NOT IN FILE":GOT0970
930 LPRINT NL$(I)
940 LPRINT N1$(I); " "; N2$(I)
949 CO$=CO$(I)
950 IF LEN(CO$)>0 LPRINT CO$(I)
955 LPRINT R1$(I)
960 LPRINT R2$(I)
965 LPRINT " "
966 IF LEN(CO$)=0 LPRINT " "
970 PRINT :PRINT"FOR ANOTHER NAME TYPE 1, OTHERWISE 0":INPUT X
980 IF X=1 GOTO 900 ELSE 20
1000 CLS
1005 PRINT "MAKE PREPARATIONS FOR DISC."
1007 INPUT"WHEN READY HIT ENTER":X
1010 PRINT "COPYING. . ."
1017 OPEN "O", 1, "TRS"
1020 PRINT #1, P1
1025 FOR I=1 TO P1
1030 PRINT #1, NL$(I)
1031 PRINT #1, N1$(I)
1032 PRINT #1, N2$(I)
1033 PRINT #1, CO$(I)
1034 PRINT #1, R1$(I)
1035 PRINT #1, R2$(I)
1036 NEXT I
1040 PRINT"COMPLETE."
1042 CLOSE
1050 INPUT"TO SEE THE MENU, HIT ENTER": X:GOT020
```

MATHEMATICAL APPLICATIONS SERVICE

```
1100 CLS
1105 PRINT "MAKE PREPARATIONS FOR DISC."
1107 INPUT "WHEN READY HIT ENTER": X
1110 PRINT "INPUTTING. . ."
1117 OPEN "I", 1, "TRS"
1120 INPUT #1, P1
1125 FOR I=1 TO P1
1130 INPUT #1, NL$(I)
1131 INPUT #1, N1$(I)
1132 INPUT #1, N2$(I)
1133 INPUT #1, C0$(I)
1134 INPUT #1, A1$(I)
1135 INPUT #1, A2$(I)
1136 NEXT I
1140 PRINT "COMPLETE."
1142 CLOSE
1150 INPUT "TO SEE THE MENU, HIT ENTER": X:GOTO20
```

a membership number. This membership number could represent a social security number, telephone number, customer number...or you can use the membership number to keep track of sales information. For example, a membership number of CE-\$128.37 could indicate that you have a customer who purchased item C and item E in your catalog and paid a total of \$128.37. The TRS-80 MONTHLY NEWSLETTER uses the membership number to indicate the source of your subscription, your expiration date, charges and non-subscribers. For example, a membership number of 1237-12 tells us that you subscribed as a result of an ad in a computer magazine and the expiration time of your subscription is issue 12. 5864-12 tells us that you subscribed as a result of an ad in the WALL STREET JOURNAL. 12575X tells us that you received information related to our Newsletter but haven't subscribed. Even the date is coded in the above number. After you enter the membership number, PRESS ENTER. The video asks for first name (this could represent first name or initials). PRESS ENTER. Now enter last name. PRESS ENTER. The computer asks for a company or apartment number. If an address does not have an apartment number or company name, just press the ENTER KEY. WHEN THE ADDRESS IS PRINTED ON A MAILING LABEL, ON THE SCREEN, OR ON A PRINTED LIST, NO BLANK SPACE WILL APPEAR IF YOU DIDN'T ENTER A COMPANY NAME OR APARTMENT NUMBER. For example,

1435-12
John Smith.
2845 Lee Street
Corona AL 58574

1435-12
John Smith
Tandy Corporation
2845 Lee Street
Corona AL 58574

MATHEMATICAL APPLICATIONS SERVICE

Now, enter street address, and finally...city, state and zip code.

NEVER USE A COMMA (although the program could be modified to allow for the use of commas).

It is not necessary, but you should use the two letter state code names listed by the post office. This will enable the user to sort lists according to zip code, city or state.

PRESS ENTER after entering city, state and zip code. Now you can enter a second name...third name and continue until you've entered the last name on your list. To get out of this mode, enter 9999 for the membership number (followed by ENTER to see the "MENU" or list of commands).

TYPING 2 allows the user to see the entire file. The video can't display all names at one time...to stop or freeze the display at a particular point, PRESS the SHIFT KEY and @ at the same time. PPRESSING any other key will display the rest of the file.

TYPING 3 allows the user to see an individual file (membership number, name, city state, etc.). TYPE IN THE LAST NAME ONLY. For example, for John Smith, type in SMITH. If SMITH is not in the file, the video will display NAME NOT IN FILE. There is a problem that could come up. What happens if two SMITH's are in the file? There are several ways to solve the problem. You could enter the SMITHS as SMITH 1 and SMITH 2 or SMITH. and SMITH-. Another solution is to temporarily enter one SMITH as SMITH. (using option 4). This will allow you to see a second SMITH in the file. After you see the other SMITH, then you can REENTER SMITH. as SMITH. A final alternative is to modify the program to search for files according to last name and first name. The problem with this method is that many people change their names from time to time. For example, a customer may call himself John Henry Smith one day, Henry Smith another, J.H. Smith on another day. It is advisable to keep your list of names in alphabetical order on a printout (using option 8).

TYPING 4 allows the user to change any name in the file. For example, to change SMITH to JONES, type in SMITH, then make your change. It is not necessary to retype an entire file. For example, if you have to change a membership number only...find the file through the last name, enter the new membership number, press enter for names and complete address. The original name and address will remain in the file. To delete a company name or apartment number,

MATHEMATICAL APPLICATIONS SERVICE

PRESS the SPACE BAR followed by ENTER. To delete a file (without replacement by a new file), PRESS the SPACE BAR for membership number, first name, last name, company, street address, and city, state and zip code. You can fill in this blank file at another time by pressing option 4 and using the SPACE BAR (PRESSED ONCE) as the file you are searching for.

Typing 5 is used to SAVE a file on CASSETTE. You must also PRESS PLAY AND RECORD on the cassette player.

Typing 6 is used to load a file previously stored on tape.

Typing 7 prints out an entire file using the LINE PRINTER. Spacing is provided for use with standard mailing list labels on rolls (the same size as the label used on each envelope sent to you by M.A.S.).

Typing 8 prints an entire file (names only) in alphabetical order... with membership numbers. If you do not have a LINE PRINTER, remove the L (from LPRINT) in line 845 (LPRINT used without a printer will blank out your computer).

Typing 9 allows the user to print on the line printer an individual name (spacing provided for standard sized mailing labels).

Typing 10 or 11 stores or retrieves files from the disk system. It uses a sequential file (as opposed to random access). If there is enough demand, we will print a random access program for disc systems. NOTE-If you are revising a file and reentering that file onto the disk, you must PRESS BREAK KILL GOTO 20 10 ENTER.

On storing important files...have a backup system. M.A.S. copies its files three times each time it is revised (two separate disks and on cassette). This will insure that no data will be lost. Even companies using larger computer systems follow this procedure. On Monday (for example) they make two copies of their latest files. One is usually put in a vault or safe. On Tuesday, one copy is used to enter the file into the system (on turning on system in morning). If that disk doesn't work, the backup is in the vault. On Tuesday evening, two additional discs are used. The company always has two disks available for the present day as well as two disks available from the past day. The moral of all of this is...you need plenty of backup. Of course, you should also have files printed out on paper for an extra added backup.

MATHEMATICAL APPLICATIONS SERVICE

PREDICTING STOCK MARKET TRENDS (BROWN'S TRIPLE EXPONENTIAL SMOOTHING MODEL) by Dr. Peter Shenkin

The forecasting model developed in this program allows the user to forecast values of a time series T periods into the future where T may represent any positive integer. The model is used for time series which are complicated in nature, e.g. stock price series. It is said that one virtue of this method is its ability to pick turning points of the time series it is used to analyze. In the case of the price of a share of a certain stock over a period of time, the use of this method would indicate buying when the forecast error (Predicted value-Observed value) passes from positive to negative and would indicate selling when the forecast error passes from negative to positive.

One constant the user must decide upon is the smoothing constant A , which is always between 0 and 1. An A near 1 would tend to be used with a more volatile series while an A near 0 might be used with a reasonably static series. Generally, the user would run the data for several values of A , choosing that A which makes the errors "smallest."

The example on the next page involves the closing price for a hypothetical stock at the end of each of 30 weeks. An A of .2 and a T of 1 were used. From the predicted values, see if this method does pick the turning points of the series, i.e. see if the trading strategy mentioned above does indeed earn more money than a buy and hold strategy.

SIMPLIFIED STOCK SELECTION INSTRUCTION

1. TYPE RUN.
2. Your computer asks, "Input smoothing constant A? In the example on the next page, .2 is used. In general, use a number close to 1 (such as .8) for a stock that is highly volitil (e.g. a go-go stock), use a number close to 0 (such as .2) for a static stock such as a utility. When in doubt, start with .5, then .4 then .6 until you get optimum results.
3. Next, your computer asks for input prediction period length T ? You should enter 1 (representing either a period of 1 day or 1 week).
4. Enter observed stock prices (closing prices in Newspaper...either daily or weekly).
5. After last observation, enter 9999 (this tells the computer that there are no other observations).
6. Buy a stock as soon as the error (PREDICTION MINUS OBSERVATION) has changed from positive (+) to negative (-). For example, buy the stock (on the next page), when the error went from 0.22 to -6.94.
7. Sell your stock when the error changes from (-) to (+). For example, when the stock on the next page had an error change from -1.32 to 0.29 (the + sign is not listed but anything that isn't minus is plus. This method has been proven and does work.

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TIME	PERIOD	OBSERVATION	PREDICTION	ERROR
1		40. 00		
2		39. 00	40. 00	1. 00
3		38. 00	39. 40	1. 40
4		37. 00	38. 44	1. 44
5		33. 00	37. 28	4. 28
6		34. 00	34. 22	0. 22
7		40. 00	33. 06	-6. 94
8		46. 00	36. 10	-9. 90
9		43. 00	41. 68	-1. 32
10		43. 00	43. 29	0. 29
11		43. 00	44. 16	1. 16
12		38. 00	44. 55	6. 55
13		42. 00	41. 65	-0. 35
14		43. 00	42. 16	-0. 84
15		42. 00	43. 03	1. 03
16		46. 00	42. 89	-3. 11
17		53. 00	45. 14	-7. 86
18		49. 00	50. 62	1. 62
19		43. 00	51. 40	8. 40
20		41. 00	48. 02	7. 02
21		40. 00	44. 55	4. 55
22		41. 00	41. 75	0. 75
23		40. 00	40. 64	0. 64
24		45. 00	39. 44	-5. 56
25		51. 00	41. 81	-9. 19
26		49. 00	46. 94	-2. 06
27		49. 00	48. 86	-0. 14
28		53. 00	49. 92	-3. 08
29		53. 00	52. 81	-0. 19
30		52. 00	54. 39	2. 39

A STOCK MARKET FORECASTING METHOD
USING BROWN'S TRIPLE EXPONENTIAL SMOOTHING MODEL
BY
DR. PETER SHENKIN

```

5 DIM Y(100, 2), S(3, 2)
6 REM BY DR. PETER SHENKIN - TRS-80 NEWSLETTER AUGUST , 1978
10 REM THIRD ORDER EXPONENTIAL-SMOOTHING FORECASTING MODEL
15 REM BASED UPON DATA FROM PAST TIME PERIODS. FORECASTS
20 REM VALUES T PERIODS INTO THE FUTURE.
30 REM USEFUL FOR PICKING TURNING POINTS IN HARD TO PREDICT
40 REM TRENDS. POSSIBLE EXAMPLE: STOCK MARKET
100 REM PRINT STARTING DIRECTIONS
105 GOSUB 500
110 REM INITIALIZE
115 GOSUB 700
120 REM DO COMPUTATIONS
125 GOSUB 1000
130 REM PRINTOUT NEXT. WITH PRINTER ATTACHED USE LPRINT AND
135 REM LPRINT USING INSTEAD OF PRINT AND PRINT USING IN LINES
136 REM 2010, 2030 AND 2050. DELETE LINES 2053, 2055, 2056 AND 2057
140 GOSUB 2000
150 Z=0:GOTO 150

```

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```
500 REM SUBROUTINE FOR PRINTING STARTING DIRECTIONS
505 CLS
510 PRINT "TO USE THIS FORECASTING MODEL THE IMPLEMENTOR MUST"
520 PRINT "INDICATE THE NUMBER , T, OF PERIODS HE WISHES TO"
530 PRINT "FORECAST INTO THE FUTURE. IN ADDITION, A 'SMOOTHING'"
540 PRINT "CONSTANT, A, MUST BE CHOSEN. A MUST LIE BETWEEN "
550 PRINT ".0 AND 1. CHOOSE A NEAR 1< .8 E. G. > WHEN SERIES"
560 PRINT "IS VOLATILE(E. G. GO-GO STOCK). CHOOSE A NEAR 0"
570 PRINT "WHEN SERIES IS STATIC(E. G. UTILITY STOCK)."
580 PRINT "IF UNSURE AN A OF .5 WILL DO. IF THE RESULTS ARE"
590 PRINT "POOR, TRY ANOTHER VALUE OF A."
600 PRINT "THE DIMENSIONING USED SUPPORTS AT MOST 100"
610 PRINT "OBSERVATIONS. MODIFY PROGRAM STEP #5 TO INCREASE."
615 PRINT:PRINT
620 INPUT "PRESS ENTER TO BEGIN.";X
625 CLS
630 RETURN
700 REM SUBROUTINE FOR INITIALIZATION
710 INPUT "INPUT SMOOTHING CONSTANT A";A
720 INPUT "INPUT PREDICTION PERIOD LENGTH T";T
730 INPUT "INPUT FIRST OBSERVATION";Y(1,1)
735 Y(2,2)=Y(1,1)
740 S(1,0)=Y(1,1):S(2,0)=Y(1,1):S(3,0)=Y(1,1)
750 N=2 :REM NEXT OBSERVATION NUMBER TO BE CONSIDERED.
760 RETURN
1000 REM SUBROUTINE TO INPUT OBSERVATIONS AND DO COMPUTATIONS
1010 PRINT "INPUT OBSERVATION ";N;" AND PRESS ENTER. INPUT 9999"
1015 PRINT "TO END."
1020 INPUT Y(N,1):IF Y(N,1)=9999 GOTO 1200
1030 S(1,1) = A*Y(N,1) + (1-A)*S(1,0)
1040 S(2,1) = A*S(1,1) + (1-A)*S(2,0)
1050 S(3,1) = A*S(2,1) + (1-A)*S(3,0)
1060 P1 = 6*(1-A)^2 + (6-5*A)*A*T + (A*T)^2
1070 P2 = S(1,1)/(2*(1-A)^2)
1080 P3 = 6*(1-A)^2 + 2*(5-4*A)*A*T + 2*(A*T)^2
1090 P4 = S(2,1)/(2*(1-A)^2)
1100 P5 = 2*(1-A)^2 + (4-3*A)*A*T + (A*T)^2
1110 P6 = S(3,1)/(2*(1-A)^2)
1120 Y(N+1,2) = P1*P2 - P3*P4 + P5*P6
1130 S(1,0) = S(1,1): S(2,0) = S(2,1): S(3,0) = S(3,1)
1140 N=N+1 : CLS: GOTO 1010
1200 RETURN
2000 REM PRINTING SUBROUTINE
2005 GOTO 2025
2010 PRINT " TIME PERIOD    OBSERVATION        PREDICTION        ERROR"
2020 A##"      ###"            ###. ##"            ###. ##"        ##. ##"
2022 RETURN
2025 GOSUB 2010
2030 PRINT USING A##.1,Y(1,1)
2040 FOR J=2 TO N-1
2050 PRINT USING A##.J,Y(J,1),Y(J,2),Y(J,2)-Y(J,1)
2053 IF J/12 <> INT(J/12) GOTO 2060
2055 PRINT:PRINT "TO CONTINUE PRESS ENTER."
2056 INPUT X
2057 GOSUB 2010
2060 NEXT J
2070 RETURN
```

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SOFTWARE

The SOFTWARE SECTION is a partial list of software available for the TRS-80. The software is numbered beginning with 1 for future reference in our complete software catalog (to be published at the end of the year). The letter in parentheses in the left hand column indicates the type of software (business, education, games, etc.). In our end of year catalog, software will be listed by number, source, author, title (in alphabetical order) and category. The source of the software is located to the right of the title of the program... in parentheses. LEVEL I or LEVEL II is indicated. All software is for cassette unless diskette is indicated. Please help us by sending us any additional sources of software (or corrections) that you may know of. The information below was obtained through a variety of sources. We can't vouch for the accuracy or quality of the software listed. Product descriptions were furnished by the author or distributor.

- 1(A) INCOME TAX PROGRAM (1) LEVEL II-by Dr. Peter Shenkin, available on diskette or cassette for \$19.95. A complete income tax program that can be used to prepare the long or short Federal returns. Just answer the questions asked by the computer. The TRS-80 will print out (on the LINE PRINTER or on the video) your complete income tax form. Can be used to prepare complicated returns. The program certainly replaces H & R Block! This program will be published in the NEWSLETTER (but it's a long one to copy).
- 2(B) HORSE SELECTOR FLATS (1) LEVEL I or LEVEL II-by Dr. Hal Davis available on diskette or cassette for \$50. An advanced method of horse selection created through the use of extensive research and multiple regression analysis. The program selects 39% winners or 90% win, place or show. Factors used include speed rating, % wins, places, and shows, results of last two races, earnings, and days since last race. Refund guarantee (send to Dr. Davis for further details).
- 3(B) HORSE SELECTOR TROTS (1) LEVEL I or LEVEL II-by Dr. Hal Davis available on diskette or cassette for \$50. Write to Dr. Davis for additional details.
- 4(A) BUSINESS I (2) LEVEL I or LEVEL II-\$9.95...Accounts receivable: uses data tape; interest on loans: monthly payments, total interest, and complete cost; interest on savings.
- 5(A) BUSINESS II (2) LEVEL I or LEVEL II-\$9.95...Business Ledger: Bookkeeping for small business or home; Financial Time Table: a time-proven chart of stock market trends; Conversion: metric plus others.

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- 6(B) SPACE TREK I (2) LEVEL I or LEVEL II-\$7.95, fight Lingons in galaxy of 4X4 quadrants with 16 sectors per quadrant...written by Ray Schaefer.
- 7(B) SPACE TREK II (2) LEVEL I or LEVEL II-\$7.95, challenging for most skillful commander of the Enterprise. Phasers, photon torpedoes, impulse and warp power...by Ed Juge.
- 8(B) BASIC LUNAR LANDER/INTERMEDIATE LUNAR LANDER (2) LEVEL I or LEVEL II-\$7.95, two versions of playing astronaut attempting to land "LEM" on moon...by Ed Juge
- 9(B) BEGINNER BACKGAMMON/KENO (2) LEVEL I or LEVEL II-\$7.95, Backgammon designed for the new player, but challenging. Keno is a popular Las Vegas game...by Fred Schild and Ed Juge.
- 10(B) MICROCHESS 1.5 (3) LEVEL I or LEVEL II-\$19.95, fits on 4K, easily loaded from cassette using the CLOAD command. Uses standard algebraic chess notation to describe moves. Checks every move for legality. Handles castling and en passant capture. You can play white or black, set up and play from special board situations, or even watch the computer play against itself! With 3 levels of chess play...by Peter Jennings.
- 11(B) HORSE RACE HANDICAPPING PROGRAM (3) LEVEL I or LEVEL II-\$11, let your computer make money for you using this cassette and a DAILY RACING FORM. Fantastic Reults! Picked the exact order of finish of all horses in the Belmont Stakes Race.
- 12(C) PERSONAL FINANCE PACKAGE (4) LEVEL I or LEVEL II-\$17 on cassette or \$20 on diskette, 3 programs by John DeMita.
- 13(A) INVENTORY CONTROL (4) LEVEL II (4K)-\$37, allows the small business to upgrade it's present inventory system and provide timely reports to the management. Contains 6 programs with documentation, all available on diskette for \$40...by Jerry Hicks.
- 14(D) LEVEL I RELOCATED IN LEVEL II RAM (4) LEVEL II (16K)-\$17 on cassette, \$20 on diskette, allows the user to run non-convertible LEVEL I programs or make LEVEL I compatible tapes on your LEVEL II machine.
- 15(D) DATA-SET CONTROL PACKAGE (4) LEVEL I (4K)-\$10, this subroutine provides TRS-80 LEVEL I Basic with File OPEN, READ, WRITE, and CLOSE Functions. Also included, are two utility programs and full documentation...by John DeMita.

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- 16(B) HOROSCOPE CASTING BY COMPUTER (4) LEVEL I or LEVEL II-\$12 on cassette or \$15 on diskette, a fantastic program with graphics (the LEVEL II version contains output formatted for printer... by D.L. Pittman.
- 17(C) MORTGAGE CALCULATIONS (4) LEVEL I or LEVEL II-\$7 on cassette or \$10 on diskette...by John DeMita.
- 18(E) MATH TEST (4) LEVEL I or LEVEL II-\$7 on cassette or \$10 on diskette...by John DeMita.
- 19(D) RSM-1 (5) LEVEL I or LEVEL II-\$17.95, a 21-command machine language monitor that includes memory enter, display, search, move, exchange, zero, fill, etc., plus tape writing commands. Uses about 2k...by Gary Thurmond and Tom Nussmeier.
- 20(D) RSM-1S (5) LEVEL I or LEVEL II-\$23.95, all of RSM-1 plus a 22nd command to display memory in Zilog symbolic code (a Z-80 dissassembler)! Uses about 3.9K...by Gary Thurmond and Tom Tussmeier.
- 21(D) RSL-1 (5) LEVEL I or LEVEL II-\$14.95, a graphics pattern drawing program that also plays LIFE. Patterns may be saved on tapes. Takes about 2 seconds per generation. Used on 4K systems...by Gary Thurmond and Tom Nussmeier.
- 22(D) ESP-1 (5) LEVEL I or LEVEL II-PRICE UNAVAILABLE-resident assembler, editor and monitor adapted to the TRS-80. Uses Intel 8080 mnemonics. Requires 16K...by Michael Shrayer.
- 23(C) APARTMENT ANALYSIS (4) LEVEL I or LEVEL II-\$6 on cassette or \$9 on disk...by Dick Michels.
- 24(B) SPACE AND WAR GAMES (6) LEVEL I or LEVEL II-\$6 (or 3 programs from the same company for \$15), bomber pilot, Lunar Lander I and II, Star Wars I and II.
- 25(B) RANDOM CHANCE GAMES (6) LEVEL I or LEVEL II-\$6 (or 3 programs from the same company for \$15), hockey, darts, roulette, craps, slots, RSP and Acey Ducey.
- 26(B) STRATEGY AND NUMBER GAMES (6) LEVEL I or LEVEL II-\$6 (or 3 programs from the same company for \$15), Hammurabi, Bagels, Digits, Stars, Hot 'n Cold, Gold and Piles.

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- 27(D) TEMON MACHINE LANGUAGE MONITOR (7) LEVEL I or LEVEL II-\$12.95, loads in 18 seconds, reloads in 4 seconds after reset, compatible with T-Bug programs, commands are display, write, go, load, save (with specified fields), resumes after multiple breakpoints, X (register display), displays 240 bytes at one time, cursor includes backspace delete prior to ENTER, error detection and edit.
- 28(D) TEBED MACHINE LANGUAGE LOADER & EDITOR (7) LEVEL I or LEVEL II-\$24.95, a unique tool for LEVEL I BASIC 16K RAM users, loads anytime without disturbing user program, reloads in 4 seconds, stacks more than one BASIC program in RAM, assigns new evenly spaced line numbers, reassigned branch references, merges subroutines, specified sections of programs may be CSAVED, uncrowds packed line numbers, one-past loading of multiple programs.

CATEGORIES

- A. BUSINESS APPLICATIONS
- B. GAMES AND GAMBLING
- C. PERSONAL FINANCE PROGRAMS
- D. TRS-80 SPECIALTY PROGRAMS
- E. EDUCATIONAL PROGRAMS

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- | | |
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MONROVIA CA 91016 |
| 4. APPARAT, INCORPORATED
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READERS SURVEY

IT IS IMPORTANT THAT ALL SUBSCRIBERS PARTICIPATE IN OUR SURVEY. TWO COPIES ARE ENCLOSED; ONE TO KEEP WITH THE NEWSLETTER AND ONE TO RETURN TO M.A.S. THE RESULTS WILL BE COMPILED AND REPORTED IN THE NEXT ISSUE.

1. MEMBERSHIP NUMBER _____
2. COMPLETE QUESTION 2 ONLY IF A CORRECTION HAS TO BE MADE ON YOUR MAILING LABEL (ON THE FRONT OF OUR ENVELOPE).

NAME _____

COMPANY NAME OR APARTMENT NUMBER _____

STREET ADDRESS _____

CITY, STATE AND ZIP CODE _____

3. CIRCLE THE EQUIPMENT THAT YOU HAVE.

NONE

LEVEL I

4K 16K 32K

LEVEL II

48K

INTERFACE? YES NO

RADIO SHACK VIDEO DISPLAY? YES NO
(some people have hooked-up their TRS-80 to their own TV)

SCREEN PRINTER? YES NO

LINE PRINTER? YES NO

DISK SYSTEM? YES NO IF YES, HOW MANY DISKS? _____

4. HOW DO YOU RATE YOUR TRS-80 SYSTEM (VALUE PER DOLLAR)?

EXCELLENT VERY GOOD GOOD FAIR POOR

5. IS THIS YOUR FIRST COMPUTER? YES NO

6. LEVEL I OWNERS ONLY...DO YOU INTEND TO BUY LEVEL II?

YES NO

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7. HAS ANY PART OF YOUR RADIO SHACK SYSTEM BEEN RETURNED TO RADIO SHACK FOR REPAIRS?

YES NO

IF YES, PLEASE GIVE DETAILS. WHAT PART? HOW WAS THE SERVICE? HOW LONG? ETC.

8. WHAT KINDS OF PROGRAMS WOULD YOU LIKE TO SEE PUBLISHED IN THE TRS-80 NEWSLETTER? Rank from 1-6 and insert suggestions for other.

BUSINESS _____

PERSONAL FINANCE _____

GAMES _____

STATISTICS, MATHEMATICS, SCIENCE AND TECHNICAL _____

GAMBLING _____

MACHINE LANGUAGE _____

OTHER _____

9. MANY TRS-80 OWNERS WOULD LIKE TO CONTACT OTHER OWNERS. WOULD YOU LIKE A TELEPHONE DIRECTORY OF TRS-80 SUBSCRIBERS?

YES NO (IF YES, PLEASE ENTER PHONE # _____)

10. PLEASE RATE THE TRS-80 MONTHLY NEWSLETTER.

EXCELLENT VERY GOOD GOOD FAIR POOR

11. WHAT SUGGESTIONS DO YOU HAVE TO IMPROVE THE NEWSLETTER?

SEND RESPONSES TO: MATHEMATICAL APPLICATIONS SERVICE
READER'S SURVEY DEPT
BOX 149
NEW CITY NEW YORK 10956

BITS AND PIECES

by

HOWARD Y. GOSMAN

A NEW NAME

MATHEMATICAL APPLICATIONS SERVICE is now called H. & E. COMPUTRONICS INC. We will continue using the name MATHEMATICAL APPLICATIONS SERVICE (a registered trademark) for several months.

A FIRED TYPIST!

In an effort to continuously improve the quality of the TRS-80 MONTHLY NEWSLETTER, we have fired our typist. Our new typist promises to type errorless copy.

THE TANDY COMPUTER STORE CHAIN

Tandy Corporation is expanding its pilot computer sales and service store (located in Fort Worth, Texas) into a nationwide chain of 50 outlets in a move to penetrate the booming small business systems market with its own systems. The outlets will be used to assist area Radio Shack stores in computer sales and to develop quantity sales of Radio Shack TRS-80 Microcomputer Systems and peripheral equipment to businesses and large institutions.

Previously, TANDY COMPUTERS was selling a variety of business systems (including systems manufactured by TRS-80 competitors). The new policy is not to carry any products that compete with the TRS-80. They will carry some larger peripherals made by other manufacturers.

The goal of the new stores (called RADIO SHACK COMPUTER CENTERS) is to increase sales of equipment used by businessmen (as opposed to hobbyists). Primary emphasis will be to support the TRS-80 Computer.

Each of the 50 new facilities will be able to provide service on Radio Shack computer products. This means that Radio Shack will have nearly 100 service centers.

TANDY COMPUTERS 1979 CATALOG

TANDY COMPUTERS is coming out with a 1979 COMPUTER CATALOG. Those of you who were lucky enough to get the 52 page 1978 Catalog will notice some major changes. The new catalog is about 1/4 the size ...and in keeping with the new policy (above) contains mainly Radio Shack TRS-80 related items.

SELLING SOFTWARE TO RADIO SHACK

Radio Shack is interested in obtaining first rate software. Write to Mr. Carroll B. Ray, Director of Computer Applications, Tandy Corporation, One Tandy Center, Fort Worth, Texas 76102. Mr. Ray is responsible for development and acquisition of TRS-80 software programs.

A NEW CASSETTE RECORDER FOR THE TRS-80

Radio Shack is about to release a new cassette recorder designed to operate with the TRS-80 System. Additional details are not available at the present time. The new recorder may contain a switch that eliminates the necessity of disconnecting the plug from the recorder in order to gain manual recorder control (for REWIND, PLAY or FAST-FORWARD).

CASSETTE RECORDER HINTS

IF YOU PLAN AHEAD, YOU SHOULD NEVER HAVE TO DISCONNECT THE PLUG FROM YOUR CASSETTE RECORDER.

1. When your cassette recorder is connected to the expansion interface, you can't use the RESET button on the back of your computer in order to regain keyboard control (after ENTERing CLOAD or CSAVE).
2. Use a screw driver to position your tape past the leader when CSAVE is used.
3. Pressing BREAK will not take your recorder out of the CLOAD mode. Pressing BREAK or raising or lowering your recorder volume level will take your recorder out of the CLOAD mode when entering data files.
4. ENTERing CLOAD allows the user to gain recorder control over REWIND, PLAY and FAST-FORWARD operations. To load a program (for example, beginning at 285 on your tape counter), ENTER CLOAD and press REWIND, PLAY or FAST-FORWARD until you have reached the required tape position. Press PLAY to load your program.
5. If you press CSAVE when you meant to press CLOAD, just wait for the READY indication on the video display. This is a good trick if you need temporary access to tape recorder controls. For example, let's say you have a 2K program in memory. You want to record (CSAVE) your program starting at 275 on your cassette. Press the PLAY button (FAST-FORWARD or REWIND) on your recorder. ENTER CSAVE on your computer. Position your tape at 275. Press STOP on your recorder. Now wait for a ready indication on the video. To record your program (now that you are at 275), just press PLAY and RECORD on your tape recorder (at the same time) and ENTER CSAVE on your computer.
6. As previously reported, RADIO SHACK SUPERTAPE GOLD and the less expensive RADIO SHACK REALISTIC tapes seem to work equally well. I do find that SUPERTAPE GOLD responds to greater variations in change of the volume control. My SUPERTAPE GOLD will CLOAD properly on volume settings from 5 to 7. REALISTIC CLOADS properly from 6 to $7\frac{1}{2}$. I even tried using an inexpensive under \$1 tape (for a 60 minute tape). The tape CSAVED and CLOADED as well as the REALISTIC, but only CLOADED at levels from $7\frac{1}{2}$ to 8.

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BYTE, KILOBAUD, PERSONAL COMPUTING, INTERFACE AGE AND CREATIVE COMPUTING
We have taken out 1/8 page and 1/4 page ads in each of the above publications. We do expect that these ads will bring our total number of subscribers up to 10,000 by the end of the year.

HELP WANTED, PROGRAMS WANTED

We still have several open positions on the staff. If you think you can help us, please call or write.

Most of our subscribers have been readers. PLEASE SEND US YOUR PROGRAMS, ARTICLES AND OTHER TRS-80 INFORMATION. INCREASED SUBSCRIBER INPUT IS A VITAL PART OF OUR EXPANSION PLANS.

DOUBLE ISSUES

The avalanche of new subscribers during August (and related information requests) made it impossible for us to complete our August issue on time...therefore, each subscriber was sent a double issue (August #2 and September #3). We have increased our staff and will avoid the use of double issues. As previously stated, you should receive each new issue by the first of each month.

OUR NEW ADVERTISING POLICY

WE WILL BE CHARGING FOR AD SPACE (BEGINNING WITH ISSUE #6) AT THE RATE OF \$122 PER PAGE (\$61 PER HALF PAGE, \$32 PER QUARTER PAGE AND \$16 PER EIGHTH PAGE. THE CHARGE FOR CLASSIFIED ADS IS 30¢ PER WORD.

MORE RADIO SHACK REPAIR COST FACTS (SEE PAGE 25)

We previously stated that RADIO SHACK will repair your computer system for \$17 to \$24 plus parts (after the guarantee expires). It will not cost you \$290 to repair a 16K RAM. RADIO SHACK will only replace that part of the 16K RAM that needs repair. Your 16K RAM comes in eight-2K sections so the charge could be as little as \$36.25 (plus \$24 for labor).

A 500K DISK

MICROTRONIX is about to announce a disk controller that will enable TRS-80 System owners to plug in an 8" disk drive (allowing for storage of half a million (500) k. The disk drive (aside from BASIC), will have FORTRAN and CP/M options.

ASSEMBLY LANGUAGE PROGRAMMING

Osborne & Associates, P.O. Box 2036, Department X1, Berkely, CA 94702, (415) 548-2805...has released a book designed for microcomputer users with little or no knowledge of assembly language. ASSEMBLY LANGUAGE PROGRAMMING sells for \$8.50/



INTRODUCING THE MICROTRONIX TRS-80 EXPANDABLE INTERFACE

The TRS-80 owner can now expand his computer system with a series of low cost peripheral cards. The basic interface unit uses low-power Schottky circuitry, the standard Radio-Shack 40 pin buss, and provides the following features:

- ***JOYSTICKS** - two unique 8 directional hand controllers for games, screen-editing and educational instruction.
- ***STEREO SOUND** - using two RCA 1863 programmable I.C.'s
- ***PARALLEL PRINTER INTERFACE** - with solder-free line selection.

At an introductory price of \$129.95, the interface may be ordered with a \$29.95 optional real-time clock providing HRS-MIN-SEC in memory. Joysticks and music may be controlled directly from the user's BASIC program using the INP and OUT commands.

Planned future options include:

- *Serial Interface and modem
- *Disk Controller (8" or 5", the former with CP/M & Fortran options)
- *Memory Board
- *S-100 interface and EPROM Prototype Board
- *Intelligent Printer Port with Graphics

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HOW MANY TRS-80 OWNERS?

RADIO SHACK will not officially release any information on the number of TRS-80's sold.. We have been told by a source close to TANDY that RADIO SHACK will have delivered 200,000 to 250,000 computers by the end of this year (with 100,000-200,000 sold but undelivered computers).

MINI DISK PROBLEMS

There has been an overheating problem found on some RADIO SHACK MINI DISK DRIVES. The problem is serious enough for RADIO SHACK to recommend that a small hole be drilled to let out some of the excess heat near the power supply connection.

PERCOM DATA COMPANY DISK DRIVES

PERCOM DATA COMPANY is manufacturing add-on minifloppy disk drives for the Tandy Radio Shack TRS-80. The drive will be identical to the disk drive sold by RADIO SHACK. They will be selling the drive for \$399 (\$100 less than RADIO SHACK). You should see PERCOM ads coming soon in the major computer magazines.

THE TRS-80 ELECTRIC PENCIL WORD PROCESSING PACKAGE

The ELECTRIC PENCIL is a Character Oriented Word Processing System. This means that text is entered as a string of continuous characters and is manipulated as such. This allows the user enormous freedom and ease in the movement and handling of text. Since line endings are never delineated, any number of characters, words, lines or paragraphs may be inserted or deleted anywhere in the text. The entirety of the text shifts and opens up or closes as needed in full view of the user. The typing of carriage returns as well as word hyphenation is not required since lines of text are formatted automatically.

As text is typed in and the end of a screen line is reached, a partially completed word is shifted to the beginning of the following line. Whenever text is inserted or deleted, existing text is pushed down or pulled up in a wrap around fashion. Everything appears on the video display screen as it occurs which eliminates any guesswork. Text may be reviewed at will by variable speed scrolling both in the forward and reverse directions. By using the search or the search and replace function, any string of characters may be located and/or replaced with any other string of characters as desired.

The ELECTRIC PENCIL loads into either LEVEL-I or LEVEL-II 16K computers. It will operate with uppercase letters or lower case letters with the installation of an optional lowercase modification kit.

The ELECTRIC PENCIL (created by Michael Shrayer), has previously been available to owners of SOL and other computers. It is now available for the TRS-80. The ELECTRIC PENCIL can be purchased from MATHEMATICAL APPLICATIONS SERVICE for \$99.95.

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FEDERAL WITHHOLDING TAX PROGRAM

At the request of several subscribers, we have reprinted the FEDERAL WITHHOLDING TAX PROGRAM that appeared on pages 9 and 10. Some of the punctuation found in the Issue 1 printing was not clear or readable on some Newsletter copies. This printing also includes the corrections found on page 27.

A UNIQUE TRS-80 USERS GROUP (SOFT SYSTEMS DIVISION)

You can join the TRS-80 USERS GROUP for only \$120 per year. This is what you receive: (1) free listings of any program in the users group library (postage and handling charge only), (2) program tapes or disks of any program in the user group library (postage, handling and cassette or disk cost only), (3) custom designed programs for your requirements from their professional staff of programmers at no cost (postage and handling only), and (4) twelve issues of the TRS-80 Users Group Newsletter.

The following programs are available (or will be available) for LEVEL I-4K...Business Package (limited), Investor Package (stocks, bonds, commodities), Limited Household Package, Educational System and Game Package. LEVEL I-16K...Expanded Business Package, Investor Package, Expanded Household Package, Educational System and Game Package. LEVEL II-16K...Full Business Package, Full Investor Package, Household Package, Educational Package, Industry Training and Professional Services. LEVEL II programs are also available on disk.

The TRS-80 USERS GROUP is expensive, but their services are unique. For more information write to: SoftSystems, 1720 Regal Row-#242, Dallas, TX 75235 or call (214) 634-1130.

CONTRACT SERVICES ASSOCIATES

CONTRACT SERVICES ASSOCIATES has announced a major educational device designed to teach reading. The AVS-10 EARLY LEARNING SYSTEM has been interfaced with the TRS-80. The AVS-10 "can teach a 3-year old child to read at the third grade level in just 15 weeks! The system employs a unique phono-film cartridge which contains the audio and full-color visual training presentation on a single disk. Your child responds manually via a simple key-response system. For more information, write to: CONTRACT SERVICES ASSOCIATES, 1846 W. Broadway, Anaheim, CA 92804.

TRY THIS!

PRINT 3 ARROW FACING UP 2 (PLEASE NOTE...OUR TYPEWRITER CAN PRINT ARROWS). This statement is equivalent to 3 to the second power or 3 times 3 (3×3). The answer is 9. Now, PRINT 3 ARROW FACING UP 3 (equivalent to $3 \times 3 \times 3$). The answer is 27. Now, PRINT 3 ARROW FACING UP 4. The computer displays 81.0001 . If accuracy is essential, you must be careful when working with exponents. There are ways to modify your program to give complete accuracy (to be discussed in a future issue).

BEGINNER'S CORNER

by
ELAINE TRAUM

This program can be used by children 5 and older to reinforce basic addition and multiplication facts.

To begin, ENTER RUN. Your computer will ask, "WHAT IS THE BIGGEST NUMBER YOU WANT TO ADD?" Respond with any number (let's say 10).

Next, the computer asks, "HOW MANY PROBLEMS SHOULD THE COMPUTER ASK YOU?" Respond with the number of problems (let's say 12).

Your computer will now give you 12 addition problems using numbers from 0-10 (which will give you answers from 0-20). If you give a wrong answer, your computer will let you try again. In fact, your computer will let you try the same problem up to 4 times. After you answer your last problem (12 for our example), your computer will give you a score expressed as a percent.

Your computer can also give multiplication problems by changing the appropriate operations found in steps 20 and 40.

CHALLENGE-Come up with a program that will allow for subtraction practice (without negative numbers) and division practice (whole numbers only).

ARITHMETIC TEACHER

BY
ELAINE TRAUM

```
1 REM THE FOLLOWING PROGRAM IS A SIMPLE EXAMPLE WHICH SHOWS
2 REM THAT THE TRS-80 MAY BE USED BY YOUNGSTERS IN THE
3 REM LEARNING PROCESS. THE MACHINE GENERATES ADDITION
4 REM PROBLEMS SUITABLE TO THE STUDENT'S LEARNING LEVEL.
5 REM THESE PROBLEMS ARE GENERATED RANDOMLY AND SO MAY BE
6 REM USED TO GIVE STUDENTS INDIVIDUAL QUIZZES.
7 REM THE COMPUTER KEEPS SCORE AND GIVES THE STUDENT
8 REM REASSURING MESSAGES. ENTER THE PROGRAM AND PRESS RUN.
9 CLS
10 INPUT "WHAT IS THE BIGGEST NUMBER YOU WANT TO ADD";BIG
12 PRINT
14 INPUT "HOW MANY PROBLEMS SHOULD THE COMPUTER ASK YOU";M
16 FOR I=1 TO M
17 CLS
18 FLAG=0:TRIES=0
19 A=RND(BIG+1)-1 : B=RND(BIG+1)-1
```

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```
20 PRINT "PROBLEM": I;"      ";A;"+";B;" = ";C
30 INPUT C
40 IF C = (A+B) THEN 70
50 PRINT "GOOD TRY, BUT NOT RIGHT!":;
52 IF TRIES <>3 PRINT "TRY AGAIN."
54 FOR K=1 TO 200:NEXT K
56 FLAG = 1 :TRIES = TRIES + 1
58 IF TRIES < 4 GOTO 20
60 PRINT "YOU COULD NOT GET IT CORRECT IN 4 TRIES."
65 IF I<> M PRINT "TRY ANOTHER PROBLEM."
66 FOR K=1 TO 400:NEXT K
67 CLS:GOTO 110
70 IF FLAG <> 0 GOTO 104
80 CO=CO+1
100 PRINT @34,"GOOD CHOICE. YOU ARE DOING WELL"
102 GOTO 105
104 PRINT "YOU'VE GOT IT RIGHT NOW."
105 FOR K=1 TO 200:NEXT K
110 FLAG=0:TRIES=0
130 NEXT I
150 CLS
160 PRINT "YOU GOT ";CO;" RIGHT AND ";M-CO;" WRONG."
170 PRINT
180 PE=INT(100*CO/M+.5)
190 PRINT "THAT IS A GRADE OF ";PE;" %"
200 PRINT
205 CO=0
210 PRINT "DO YOU WANT THE MACHINE TO GIVE YOU MORE PROBLEMS?"
211 PRINT "ANSWER YES OR NO."
213 INPUT "MY ANSWER IS ";AN#
220 IF AN#= "NO" GOTO 250
230 IF AN#= "YES" GOTO 9
240 PRINT "YOU MADE A SPELLING MISTAKE. TRY AGAIN."
244 CLS:GOTO 210
250 CLS:PRINT @450,"GOOD-BY. YOU'RE NICE!"
```

BUSINESS, PERSONAL FINANCE, MONEY MANAGEMENT
FEDERAL WITHHOLDING TAX PROGRAM
BY
DR. PETER SHENKIN

```

5 CLS
10 DIM A(2/9), B(2, 9), W(100, 8)
20 REM A(1, ) GIVES WAGE BRACKET BDYS. FOR SINGLE EARNERS.
22 REM A(2, ) GIVES WAGE BRACKET BDYS. FOR MARRIED EARNERS.
24 REM B(1, ) GIVES WAGE WITHHOLDING % FOR SINGLE EARNERS.
26 REM B(2, ) GIVES WAGE WITHHOLDING % FOR MARRIED EARNERS.
29 REM NEXT LINE GIVES A(1, )
30 DATA 0, 33, 76, 143, 182, 220, 297, 355, 100000
34 REM NEXT LINE GIVES A(2, )
35 DATA 0, 61, 105, 223, 278, 355, 432, 509, 100000
39 REM NEXT LINE GIVES B(1, )
40 DATA 0, .16, .18, .22, .24, .26, .32, .36
44 REM NEXT LINE GIVES B(2, )
45 DATA 0, .15, .18, .22, .25, .28, .32, .36
50 REM NOW LOAD A() AND B() ARRAYS
60 FOR I=1 TO 2:FOR J=1 TO 9:READ A(I, J):NEXT J:NEXT I
70 FOR I=1 TO 2:FOR J=1 TO 8:READ B(I, J):NEXT J:NEXT I
72 GOSUB 8000
75 CLS
80 GOSUB 7000
100 REM COMPUTE GROSS PAY
110 GOSUB 9000
140 GOSUB 9500
200 REM NOW COMPUTE FEDERAL WITHHOLDING
210 GOSUB 10000
400 REM NOW SAVE PAY AMOUNTS
410 GOSUB 11000
420 INPUT "MORE NAMES INPUT 1. NO MORE INPUT 0, THEN ENTER": Z9
430 IF Z9= 1 GOTO 80
440 IF Z9 = 0 GOTO 500
450 PRINT "INPUT ERROR. REENTER!":PRINT:GOTO 420
500 GOSUB 12000
550 REM NOW PRINT PAY ARRAY.
560 GOSUB 13000
600 END
7000 REM SUBROUTINE FOR INPUTTING DATA
7010 PRINT"INPUT ID#, REG HRS, PREM HRS, PAY RATE, MAR/SING, #EXEMT"
7020 INPUT I2, H1, H2, R1, M, N
7030 IF M=1 OR M=2 THEN 7050
7040 GOTO 7100
7050 IF INT(N)=N GOTO 7070
7060 GOTO 7100
7070 RETURN
7100 PRINT "INPUT ERROR. TRY AGAIN. ":PRINT:GOTO 7010

```

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```

8000 REM SUBROUTINE GIVING INSTRUCTIONS
8010 PRINT "THE FOLLOWING COMPUTES FEDERAL AND FICA WITHHOLDING";
8015 PRINT " AMOUNTS. "
8020 PRINT "INPUT FOR EACH EMPLOYEE IS AN ID#(5 DIGITS OR LESS)"
8030 PRINT " THEN NUMBER OF REGULAR HOURS (I. E. AT NORMAL RATE)"
8040 PRINT " THEN NUMBER OF PREMIUM HOURS (I. E. AT O. T. RATE)"
8050 PRINT "PREMIUM PAY IS COMPUTED AT TIME AND A HALF"
8060 PRINT "THEN INPUT SINGLE/MARRIED CODE-1 FOR SINGLE, 2 FOR"
8065 PRINT "MARRIED. "
8070 PRINT "THEN PRESS ENTER KEY. "
8080 PRINT "NOW REPEAT STARTING WITH ID# FOR NEXT EMPLOYEE, ETC"
8090 PRINT "BE SURE TO PUT A COMMA(,) BETWEEN EACH ENTRY FOR"
8091 PRINT "EACH EMPLOYEE. "
8095 PRINT "INPUT 0 FOR END OF DATA AND ENTER WHEN REQUESTED. "
8096 PRINT "PRINT OUT OF ALL RESULTS WILL FOLLOW. "
8100 INPUT "PRESS ANY DIGIT AND THEN PRESS ENTER TO BEGIN. "; Z7
8110 RETURN
9000 REM SUBROUTINE FOR COMPUTING GROSS PAY
9010 G=H1*R1 + 1.5*H2*R1
9020 RETURN
9500 REM SUBROUTINE COMPUTES FEDERAL WAGES
9510 W = G - 14.40*N
9520 RETURN
10000 REM SUBROUTINE COMPUTING WITHHOLDING
10001 REM T1 IS WITHHOLDING. X IS BRACKET WE ARE IN.
10010 T1=0 : X=2
10020 IF W<= 0 GOTO 10200
10030 IF W<= A(M, X) GOTO 10100
10040 T1=T1 + INT((A(M, X)-A(M, X-1))*B(M, X-1)*100+.5)/100
10050 X=X+1
10060 GOTO 10030
10100 T1=T1 + INT((W - A(M, X-1))*B(M, X-1)*100+.5)/100
10200 RETURN
11000 REM SETS UP PAY ARRAY
11010 Z = Z + 1
11020 W(Z, 1)=G:W(Z, 2)=T1:W(Z, 3)=G*.0605
11022 W(Z, 1)=INT(100*W(Z, 1)+.5)/100:W(Z, 2)=INT(100*W(Z, 2)+.5)/100
11023 W(Z, 3)=INT(100*W(Z, 3)+.5)/100
11025 W(Z, 4)=W(Z, 1)-W(Z, 2)-W(Z, 3):W(Z, 5)=I2
11030 RETURN
12000 CLS
12010 PRINT " ID      GROSS      FED. WITH.    FICA      NET"
12100 RETURN
13000 REM SUBROUTINE FOR PAY SUMMARY PRINTOUT
13010 FOR I= 1 TO Z
13015 A$ = "#####.####.#####.##.###.##.###.##"
13020 PRINT USING A$:W(I,5),W(I,1),W(I,2),W(I,3),W(I,4)
13025 IF I/10 <> INT(I/10) GOTO 13040
13026 PRINT
13030 INPUT "INPUT ANY NUMBER, THEN PRESS ENTER TO CONTINUE"; Z7
13035 GOSUB 12000
13040 NEXT I
13050 RETURN

```

RANDOM SAMPLING

by
DR. PETER SHENKIN

To a statistician, the word random means chance or unpredictable. When a statistician takes a random sample of items from a large population, all it means is that he or she is picking items from the population in such a way that every item not previously picked from the population has the same chance of being picked next. In other words, the statistician cannot predict what is coming at any step of the sampling process any better than a monkey picking a marble out of a hat, as long as the only marbles in the hat correspond to items not yet sampled from the population. Suppose you have a population of 150 men such that 10 must be picked for a special assignment. The only "fair" way of choosing the ten is via a random sample. How would you do it? Here are some possible answers:

- (1) "I'd pick ten numbers from 1-150 randomly out of my head."
 - (2) "I'd put 150 slips of paper in a hat (one for each person) and randomly pick out 10."
 - (3) "Randomly pick a number from 1-15 and choose the person corresponding to that number...Then pick the persons corresponding to every 15th number after that.
- (1) above sounds good for the know it alls. However, repeated research has shown that intelligent humans just cannot pick numbers randomly out of their heads. Certain values come up more often than they would if the sampling scheme was random, e.g. 7.
- (2) is the right idea. The only problem is that for this to be random, the slips of paper would all have to be exactly the same size and shape and they would have to be thoroughly mixed. In practice, thorough mixing is extremely difficult to accomplish.
- (3) isn't quite random since picking one number chooses all others.
- There is an alternative to the above methods. That alternative is to let a computer choose the random sample. The TRS-80 has a special function which can be used to aid in the choice of a random sample. This is the RND() function. When used in a program, the symbols RND(K) generate an integer between 1 and K if K is a positive integer, and for all practical purposes, this integer is randomly chosen. For example, RND(7) generates randomly either 1,2,3,4,5,6, or 7.

The following program will choose a random sample of size K from a population of size N where N and K are integers, K is no larger than N, and where N is only limited by memory size. To use the program,

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just number the members of the population from 1 to N, choose the desired sample size K and run the program. The program output will be K integers, each between 1 and N. Pick the population members corresponding to these numbers and you have your random sample.

For example, suppose we wish to pick a random sample of size 12 from a population of 49 members. Our procedure would be to give each population member a number from 1 to 49, load the random sample and run. The following is the man-machine dialogue (machine dialogue is underlined)

HOW MANY MEMBERS ARE IN YOUR POPULATION ? 49

HOW LARGE A RANDOM SAMPLE DO YOU WANT ? 12

THE SAMPLE CHOICES ARE PRINTED 4 TO A LINE FROM LEFT TO RIGHT. THESE CHOICES FOLLOW:

4	7	11	15
48	21	10	45
41	47	33	38

READY

I ran the program again with the same input. the results follow:

39	23	5	14
46	7	38	18
29	42	44	11

Notice the difference in the two sets of results. Could you pick the numbers which will come up on the next try? You should say, "No", as these numbers are being selected randomly.

USER NOTES

- (1) Do not forget the RANDOM statement in program line 17. This reseeds the random number generator. Without this statement in the program the procedure of turning on the machine, loading the Random Sample program and running the program will always give the same results for a given set of data.
- (2) This is just one of the many uses of the RND function. A businessman might have use for a simulation of some process. More times than not this will involve some random selections, i.e. the RND. A gambler might use the RND function to simulate a deck of cards. Do you want to play Blackjack against a computer?

**RADIO SHACK COMPUTER OWNERS
TRS-80 MODEL I AND MODEL II**

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