

TRS-80TM Microcomputer NEWS

THE MICROCOMPUTER NEWSLETTER PUBLISHED FOR TRS-80 OWNERS

Volume 2 Issue 8

The View From the 7th Floor



Last month I said I would use this month's column to talk about our new printers but, before I do, I would like to pitch our new 36-page full color computer catalog (RSC-4). It's full of new hardware, software and accessories so if you want the latest news run, don't walk, to your nearest Radio Shack and pick one up.

Included in that catalog are the details on the new printers as well as a lot of new software. New Model I software includes VisiCalc,TM* the great program for turning your computer into a super calculator and columnar pad, Tiny PASCAL on cassette and a super Astrology cassette. And for you Model II owners there are now 18 programs listed. We all worked very hard to make this catalog as complete and useful as possible and I hope you enjoy it.

I just finished presenting our computer product line to our store managers at 5 meetings across the USA. At those meetings we try to get their feedback on your needs and wants. I heard about a lot of products the managers say you would like, and we will do our best to make those dreams come true. One question I got at every meeting was how can we sell the same disk drive that is used on the Model I, in single density, on the Model III in double density. I have also seen in print that our disk drives are really 77-track but that we won't admit it. That is a neat rumor but, like most, it's simply not true.

The disk drives we sell for the Model I have always been capable of double density, which simply means they have a double density head. The expansion interface disk controller though is only

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WHAT IS TRS-80 VIDEOTEKTM?

TRS-80 VIDEOTEK is a format which will allow you to access large amounts of information which is stored in some central computer system such as the CompuServe[®] Information Service.

Radio Shack's TRS-80 VIDEOTEK format—consisting of sixteen 32-character video lines PLUS color graphics—will give you quick, affordable access to many kinds of information and data services.

CompuServe[®] Information Service—Through an exclusive agreement with CompuServe, TRS-80 VIDEOTEK users in most areas can access a wealth of information on an inexpensive "local-call" basis. CompuServe offers local, national and international news, weather and sports from a major newswire service and major regional newspapers; historical information and daily updates on 3200 stocks, bonds and commodities; a home and educational reference service; entertainment news and reviews; and more! Plus, we will institute a Radio Shack Bulletin service for TRS-80 owners.

VIDEOTEK is a two-way service, so CompuServe subscribers can also play computer games or communicate nationwide via an Electronic Mail service.

WHAT IS THE VIDEOTEK HARDWARE?

The VIDEOTEK hardware (26-5000 suggested retail price \$399) is simply an intelligent terminal which incorporates the necessary hardware items to connect directly to a standard B/W or Color television, and to the telephone system.

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Seventh Floor (from page 1)

single density because when we designed it there was no low-cost way to get double density. Early this year we did switch to a new disk drive mechanism made by a company in California. These drives are 40-track drives as required by the Model III. Some of you have received these drives for use with the Model I. Both the drive manufacturer and our engineering department feel that these drives (which work very well on both the Model III as 40-track, and on the Model I as 35-track drives), will not perform correctly on a Model I at 40 tracks. The extra tracks are at the center of the diskette where the data is most tightly packed and where soft errors are most likely to occur.

Another neat (?) rumor is that the new Level II ROMs include a serial printer driver and a lower case driver but that, again, we won't admit it. I am always amazed to read these things as, if we had been able to do that, why would we hide it? The new Level II ROMs now being shipped with Model Is contain corrections of a few minor problems and were mainly done to get rid of the cassette mod board in the Model I by fixing the cassette timing in software. That, of course, saved us a little money. The other reason for them was that we are now able to put all 12K of Level II on just two ICs instead of the three chips we had been using.

If you belong to a user group that loves to publish rumors, tell your editor that he can call our Ed Judge any time to get the facts. Ed will give an honest answer to any question except those relating to unannounced new products. The truth may not make great reading, but it seems to me that you don't have to publish garbage to keep up membership.

Printers — if you don't have one yet, before you buy brand X or Y or that rebuilt converted typewriter, come look at our 3 new products. They are really great bargains. First is our new Line Printer VI. (I know you hate all those numbers — would you rather we named them after animals? If so, this one is the Leopard, low and fast.) The LP VI is a wide bed 132 column adjustable tractor feed printer for only \$1160. The tractors are removable to make it a friction feed printer. It is as small as possible to still handle 15" wide paper being only about 24" by 13" by 6³/₁₀" high. It only weighs 28 pounds. But packed in that small case are super features. A 9x7 dot matrix head which prints upper and lower case, special symbols and graphic

characters all at 100 characters per second with bi-directional logic seeking. Software selectable print density for standard 10 characters per inch plus expanded print at 5 and 7.5 cpi and compressed print at 15 cpi. I have not seen any comparable unit near our low price. Next is our new Daisy Wheel II. This great printer is a real price breakthrough, a full feature daisy wheel printer for only \$1960. Print speed is 43 characters per second and it will print in 10 or 12 characters per inch and in proportional space mode. A multi-strike carbon ribbon provides very high "letter quality" printing. The unique double-injected plastic print wheel has a life of 40,000,000 characters, far more than other plastic wheels. We also have an optional snap-on tractor assembly for \$289.95 that is fully adjustable for all fan-fold paper and forms. The printer will do underlining and bold face and several other neat things which Model II Scripsit (available soon) will support. It's a tough rugged printer that will last for years under hard use.

The last of our new printers is a real unique product. The TRS-80 Plotter/Printer can draw characters, graphs and figures on roll paper. A ball point stylus is moved to create the output making the printer have few complex moving parts. What is most unique is that the printer understands Level II Basic (and Model II Basic) so it is very easy to create even complex figures. In the character mode it works just like any printer and will do listings of programs. In addition, under software control, the characters can be printed in larger sizes and rotated 90, 180, or 270 degrees. All of these functions are done by simple LPRINT commands. To do plots a single CHR\$(2) puts the plotter in the plot mode where it responds to LPRINT commands which will move the pen to any starting X, Y coordinate from which you can draw straight or curved lines.

By putting the LPRINT commands in a loop with a function very complex plots can be done with a simple BASIC program.

For example, the following program is all you need to draw a sine wave:

```
10 LPRINT CHR$(2): REM PUT
  PRINTER IN PLOT MODE
20 LPRINT "G50 X - 700 Y0": REM
  MOVE PEN TO X = -700, Y = 0
30 FOR X = -700 TO 700 STEP 20
40 Y = SIN(X/111.4)*300
50 LPRINT "G01 X"X"Y"Y": REM
  DRAW SEGMENT OF SINE
  CURVE
60 NEXT
```

The Plotter/Printer can thus produce very detailed plots with a resolution far higher than is possible on the video. It sells for \$1460 and is shown in the advertising section of this newsletter. You should be able to see one in your nearest computer center by next month.

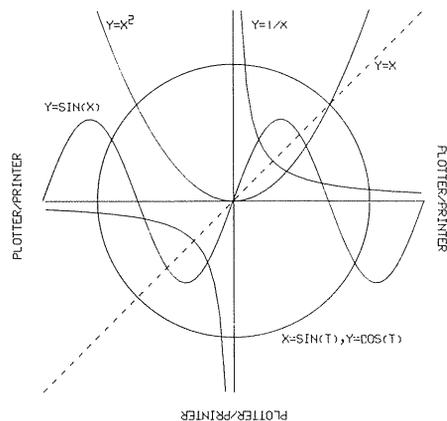
And, speaking of computer centers, as I write this in late August we are up to 77 centers with more being added all the time. We can't put one everywhere but they are in most large cities and if you get the chance to be near one please stop in, they are a great source of information on what's new.

See you next month.

Radio Shack TRS-80 PLOTTER/PRINTER

WRITING WITH BALL-POINT PEN

YOU CAN WRITE 'CHARACTERS' LIKE AS PRINTER,
'STRAIGHT LINES', 'DOTTED LINES' AND 'CURVES'.

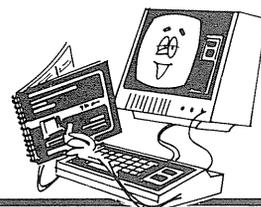


Model I Level II Manual Error (Both Editions)

An error exists in the Matrix Multiplication program listed in the Level II manual (26-2102). In the first edition, this is on page 6/6, in the second edition page 6/7.

Change line 40040 (both manuals) to read:

```
40040 C(I,J) = C(I,J) + A(I,K)*B(K,J)
```



MODEL III INFORMATION

1. There will be a few differences between the early Model III's and the later version. If you receive one of the early versions, and want or need the later version, an upgrade kit will be available for \$20.00 plus installation. The three differences are:

A. The Screen Print function is activated by pressing "S" and "P," not Shift Down Arrow.*

B. The Shift Down Arrow plus a key A-Z does NOT generate a control code. The only control keys available are <BREAK> and <ENTER>.

C. You cannot CLOAD? any Radio Shack Pre-recorded tapes, any tape created on a Model I or any tape created under Model III Disk BASIC. This is true of both early and later versions. These tapes WILL load and RUN properly, you just cannot verify them. The reason is that these tapes are loaded into memory locations other than the ones specified on the tape, and the CLOAD? function cannot take this into account.

An addendum, listing these differences, will be included with each of the early version Model III's shipped.

2. All printer cables used with Model I will be used with Model III.

There are some printer cables which have a 40-pin edge connector instead of a 34-pin. Before you buy a printer cable for a Model III, be sure that the edge connector is a 34-pin and not a 40.

The 40-pin connector will NOT fit through the opening in the Model III case.

3. The Model III reference manual should be free from errors. One omission we have identified, is that ASC and SIN are missing from the index.

Daisy Wheel Printer 26-1158

In a BASIC program, this printer does NOT underline space characters. This feature is provided to allow easy underlining of text while leaving spaces open. If you want a space to be underlined, use the underline character.

Model II Technical Reference Manual

The Model II Technical Reference Manual (26-4921 suggested retail price \$29.95) is now available from your local Radio Shack store or dealer.

Model I SCRIPSIT and Line Printer IV

YES — Line Printer IV (26-1159) can be used with Model I SCRIPSIT (26-1505, 26-1563).

YES — You can use the Line Printer IV in proportional space mode with SCRIPSIT. BUT, right justification will NOT work properly in proportional space, and most columnar information will NOT line up properly. If you must have right justification, or are printing columnar information, DO NOT use the LP IV in proportional space mode.

Model I SCRIPSIT will NOT underline, overstrike, bold print, subscript, superscript, or utilize any other of the Line Printer IV's special capabilities.

Patches for Model II TRSDOS 1.2

Problem: Some host systems use a "Marking" parity during ASYNC transmission. Our current communication software detects this as a parity error.

Normal programming to handle this is done by ignoring parity errors in application programs. The following patches will allow the TERMINAL program to ignore the error conditions of parity, framing, or overrun. Caution should be used, however, since using any of these patches will allow true errors to go through unreported. You can use any one of these patches, or all three of them, depending on your needs.

Patch to ignore PARITY errors:

```
PATCH TERMINAL A = 33D7 F = CB67
C = 1804
```

Patch to ignore OVERRUN errors:

```
PATCH TERMINAL A = 33DD F = CB6F
C = 1804
```

Patch to ignore FRAMING errors:

```
PATCH TERMINAL A = 33E3 F = CB77
C = 1814
```

Model I Software Update from Computer Services

26-1504 Tape Payroll

Problem:

Tape payroll continues to deduct FICA after the deduction reaches \$1587.67 or the pay for the year reaches \$25,900.

Solution:

Change lines 7000 and 7010 in the payroll processing program to read:

```
7000 IFG(I,0) > C(3) THEN TX(I,0) = 0:
      GOTO 7040
7010 IFG(I,0) + PR#(I) <= C(3)
      THEN FG = PR#(I) ELSE FG =
      C(3) - G(I,0)
```

26-1556 Disk Payroll

State taxes in our payroll program are computed by using the computer formulas given in *Payroll Management Guide, Volume II*, from Commerce Clearing House, Inc. The formulas are set up to compute tax including any exemptions. Because the formulas compute the tax on the exact wage, while tables compute the tax for a range, there may be occasional minor differences between the value calculated by the computer, and the value derived from a prepared tax table.

Model II Software Tips from Computer Services

26-4501 General Ledger

If you wish to change the month your system is running in, follow this procedure:

1. Go into Account Maintenance
2. Hit the <BREAK> Key.
3. Type: FM = #
where # is the month number.
4. Type: CONT
5. Hit the F1 key.
6. Go to System Status to make sure the month is correct.

If your General Ledger's year is closed out, and the last month was not the twelfth month, System Status does not reset to one. The fix for this is:

1. Type: LOAD "Income"
2. Type: 1490 FM = 0
3. Type: SAVE "Income"

26-4502 Inventory Management

In some cases, you may wish to change the current period, beginning date of the period, or the beginning date of the year. The following program will allow you to make these changes:

1. From TRSDOS READY type in:
BASIC - F:1
2. In BASIC enter and run this program:
10 CLS
20 PRINT "ENTER THE FOLLOWING INFORMATION"
30 INPUT "CURRENT PERIOD SYSTEM SHOULD BE IN"; PD

(Continued on Page 4)

(From Page 3)

```

40 INPUT"BEGINNING DATE FOR
PERIOD";BP$
50 INPUT"BEGINNING DATE FOR
YEAR";BY$
60 OPEN"D",1,"CONTROL/DAT",96
70 FIELD 1,10ASDU$,
2ASPD$,6ASDM$,
9ASPB$,9ASYB$
80 GET 1,2
90 LSET PD$=MKI$(PD):LSET
PB$=BP$:LSET YB$=BY$
100 PUT 1,2
110 CLOSE
120 SYSTEM"IMS"
    
```

3. When the IMS program menu loads, check the period and date to make sure they are correct.

All dates must be entered in the following way: Three characters for the month, two integers for the day, and four integers for the year, with no spaces. Example:

```

JAN011980
MAY211979
OCT031980
    
```

Problem:

Some problems have been found in the Inventory Management Review/Edit section of the program.

Solution:

Change the GOTO184 in line 182 of the "IMS/BAS" program to:

```
:IFI>NRTHENGOSUB372:RETURN
```

Problem:

In the Receive Purchase Order section of IMS, if the purchase order created was a large one and the quantity received left the number not shipped greater than 32768, an OV ERROR will occur when the order is put on backorder status.

Solution:

In the "ORDER/BAS" program, change ALL occurrences of the variables FR and FB to FR! and FB!. These variables appear in lines 3050, 3140, 3190 and 3330.

26-4503 Payroll

Problem:

If, while preparing checks, you decide to edit the deductions, an NF ERROR can occur.

Solution:

This problem occurs when not all of the deduction categories are defined. There are two separate solutions.

First, you can define any remaining undefined deduction categories. To define them, return to the Main Menu and choose option 4. This will take you to Company Setup. At the Setup Menu, choose option 2 for Earnings and Deduc-

tion Categories. Follow the instructions given on page 11 of your users manual. We suggest making these unused categories, type 6 (Volunteer) and giving them a name consisting of all blanks, and a G/L # which also consists of all blanks.

The second solution requires that you modify the program.

Change line 910 of the INPUT program to read:

```

910 FORI=10T018:IFT%(I)
<1ORT%(I)>6 THENE#(I)=
0#:NEXT:GOTO930ELSE
PRINT@(21,33),E$:PRINT@(21,
34),EC$(I)," ";:FL=12:GOSUB
100:IF LEN(IN$)>0THENE#(I)=
VAL(IN$):GOSUB 970
:PRINT@(I-2,65),USINGFI$;
E#(I)
    
```

Problem:

Annual tax credits are not always handled correctly.

Solution:

Again, there are two solutions.

The first requires that you divide the annual tax credit by the number of pay periods and enter the credit as a pay period amount each pay period.

The second requires a program change. Change line 1810 of the STATETAX program to read:

```

1810 NEXT:PRINT#1,USINGL$;SN+
190,:IFTB$(I)="P"THENPRINT
#1,"E#(I)=E#(I)/KY#:"
GOTO4800"ELSEPRINT#1,
"E#(I)=E#(I)/KY#-CVD
(MID$(NM$,161,8))/KY#:"
GOTO4800"
    
```

Problem:

When you record hand-written checks, the system does no calculations for you, so if an error is made it throws the system off.

Solution:

You may use the system to calculate some of the figures for you, then prepare checks and run Update instead of using the Record Hand-written Checks. After preparing checks, you should not print checks but go straight through to Update.

Problem:

The Payroll program does not always round properly.

Solution:

Change line 820 of the INPUT program to read:

```

820 E#(I)=INT(H#(I)*R#(I)*100
#+.5#)/100#:GOTO840
    
```

Problem:

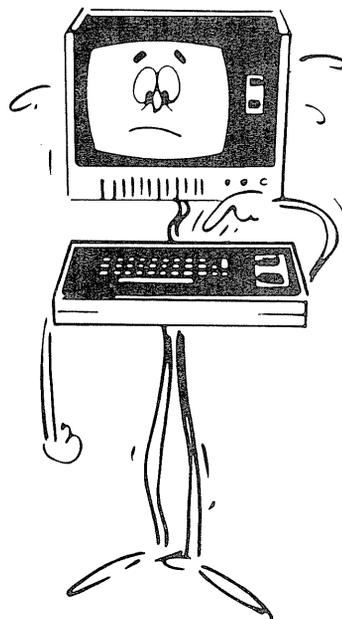
The Federal Unemployment Insurance Rate Factor is reported to three decimal places, and the Payroll program only allows two.

Solution:

Make the following changes to the CHNGCO program:

```

1620 CLEAR2000:GOSUB400
:CLS:PRINTCF$:
PRINT@(2,16),R$" OTHER
RATES AND LIMITS
"NS:DIMFT$(9),FT(11):F9$=
"###,###.##-"
:F8$="####"
:F7$=LEFT$(F9$,10)+"#-"
1670 FORI=1T08:PRINT@(I+6,0)
,R$;USING"###";I;
:PRINTN$;TAB(10);C6$(I);
FORK=1T02:J=VAL(MID$(C7$
(I),2)*K-1,2):IFJ>0
ANDI=5ANDK=1
THENPRINTTAB
(K*13+12);USING
F7$;FT$(J);ELSEIFJ>0
THENPRINTTAB(K*13+12);
USINGF9$;FT$(J);
1760 PRINT@(19,0),EL$:PRINT@
(19,8),P$;C6$(I);" ";
:FL=8:GOSUB300:IFCF=1
ORCF=2THENK=2:NEXT:
GOTO1710ELSEIF LEN(IN$)>0
THENFT$(J)=VAL(IN$):IF
I=5ANDK=1THENPRINT@(I+
6,K*13+12),
USINGF7$;FT$(J);ELSE
PRINT@(I+6,
K*13+12),USINGF9$;FT$(J);
    
```



TRS-80 ON SALE!

**32K
Level II**
With 2 Disk Drives
1895.00



**Save
381.00**

Radio Shack's 32K Two Disk Model I system gives you the power you need to solve many of today's business problems. A vast library of business, education and personal programs is available for the TRS-80 Model II! Now you can get the power and flexibility of the TRS-80 at a tremendous savings! Don't Wait! System includes 16K Level II Model I (26-1056), 16K Expansion Interface (26-1141), two 5 1/4" Disk Drives (26-1160 and 26-1161), Radio Shack's Disk Operating System (TRSDOS), Cables and Manuals. Sale ends Oct. 31, 1980.

ADD A PRINTER

Line Printer II



Line Printer II now has software selectable 80 or 132 column print capability! Line Printer II gives you 7x7 dot matrix upper and lower case characters. The fixed pin platen allows you to use either single sheets or roll paper for complete printing flexibility. Print speed is 100 characters per second to give you 31 lines a minute. 26-1154 \$799.00 plus cable

Line Printer IV



This high quality (Nx9) dot matrix printer is the solution for inexpensive near "letter quality" printing. Software control allows you to select 80 or 132 columns of fixed pitch printing, or high quality proportional spaced print. The fixed pin platen allows you to use roll paper, or single sheets with two carbons! U.L. Listed. 26-1159 \$999.00 plus cable

Radio Shack®

Retail prices in this Newsletter may vary at individual stores and dealers. The company cannot be liable for pictorial and typographical inaccuracies.

Most Accessory Items in Product News are Available Quickly on Special Order.

TRS-80TM POCKET COMPUTER

More power in your hand than you ever thought possible.

Programs in BASIC, the language of all TRS-80s. Pocket Computer BASIC includes arithmetic and relational operators, eleven mathematical functions including both natural and common logarithms, three angular modes (degrees, radians and gradians), multiple statement lines, audible beep, formatted print statements, DEBUG, cassette program and data storage and much much more! Program lines can be edited by inserting or deleting characters, or even duplicated by editing the line number! BASIC programs of up to 1424 steps (one step equals one character) can be entered from tape, or directly from the 57 key keyboard. Don't let that 1424 step limit fool you; memory space is used efficiently by storing each BASIC command in a single byte!

FOUR program modes give you a lot of flexibility!

Program Mode (PRO): This mode is used when you enter or edit a BASIC program. You can use the full 1424 program steps and have 26 fixed memory locations which you can use for either alphanumeric or numeric data storage, or you can use some of your program memory for additional (flexible) data storage (giving you a total of 204 possible memory locations).

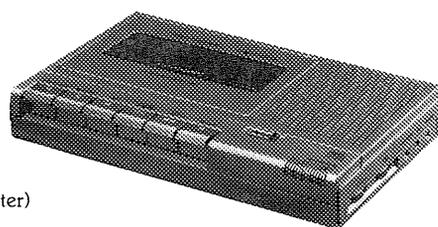
Reserve Key Mode (RESERVE): A "reserved" key allows you to access a short expression directly from the keyboard. Reserved keys can be used to enter 18 commonly used expressions (like: $A*A + B*B$) by pressing the shift key, then the reserved key.

Definable mode (DEF): The defined program mode is used to execute labeled programs or subroutines. These programs may be accessed from the keyboard by pressing shift, and then the program label. This feature allows you to quickly access any portion of a program. In the DEF mode you also have access to the direct execution capabilities of your computer.

Run Mode (RUN): This mode is used when defined program sections are not used. In this mode you also have access to direct execution and the Pocket Computer's DEBUG facility.

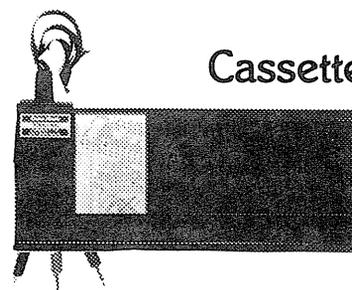
Technical Specifications:

Numerical accuracy:	10 digits (mantissa) + 2 digits (exponent)
Calculation system:	Mathematical formula using order of operations
Program System:	Stored programs
Program Language:	BASIC
Capacity:	Program Memory — 1424 steps maximum Data Memory — 26 Fixed memories 178 Flexible memories, (Shared with programs)
Stack:	Reserve Memory — 48 steps maximum (including reserve character) Input Buffer — 80 Characters For data — 8 steps For functions — 16 steps (15 levels of parentheses) For subroutines — 4 levels FOR-NEXT statements — 4 loop levels
Calculations:	Four arithmetic calculations, powers, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, angular conversions, square roots, signum function, absolute value, integer value and relational calculations.
Editing Function:	Cursor shifting (right and left) Insertion (INS), Deletion (DEL), Line up or down
External Memory:	Through optional TRS-80 Cassette Interface (26-3503), program, reserve program and data memory can be read to or from cassette tape.
Memory protection:	battery — Program, data and reserve memories are protected
Microprocessor:	Two 4-bit CMOS microprocessors (one for arithmetic operations, one for the BASIC interpreter and keyboard)
Display:	LCD 24 character 5x7 dot matrix plus 8 symbols.
Memory:	ROM — 11K Bytes (approx. 7K BASIC and 4K monitor) RAM — CMOS approx. 1.9K Bytes
Operating Time:	Approx. 300 hours on type 675 mercury batteries
Weight:	Approx. 170 grams (0.37 pounds)



Minisette
Recorder
79.9

Ultra-slim, compact design makes it perfect for use with Pocket Computer. Features end-of-tape Auto-Stop, 3 counter, LED record mode/battery condition indicator.



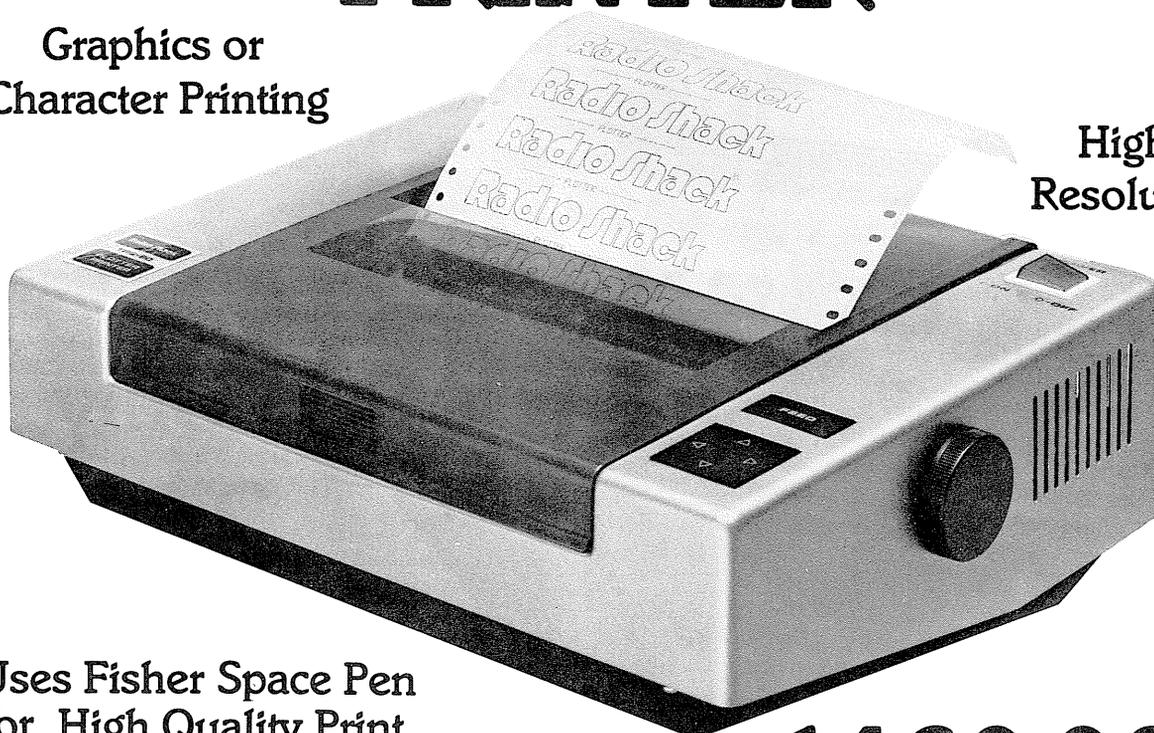
Cassette Interface
49.0

Connects your Pocket Computer to a cassette recorder. Includes cable and plugs to fit the Minisette-9TM and compatible recorders. The cassette interface enables you to store and reuse your programs. 26-3503

TRS-80 PLOTTER/ PRINTER

Graphics or
Character Printing

High
Resolution



Uses Fisher Space Pen
for High Quality Print

1460.00

Black and Colors available at most Office Supply Companies

The TRS-80 Plotter/Printer will AUTOMATICALLY draw Circles, Rectangles and Triangles with a SINGLE print statement!

The TRS-80 Plotter/Printer is a microprocessor controlled printer which takes simple commands from BASIC, interprets them, and then makes the needed pen movements. Three modes of addressing are available: absolute, relative and circle. The absolute coordinate system (X, Y) is fixed at a particular point set by you. The relative coordinate system (U, V) uses the current pen location as the origin. The circle coordinate system (I, J) is used with the other two systems to draw circles, and tells the printer where the pen is currently sitting, in relationship to the center of the circle or partial circle which is about to be drawn.

The Plotter/Printer is no slouch in its character mode either! In the character mode, you have software control of character size (normal, two, four and eight times normal) and printing rotations of zero, 90, 180 and 270 degrees. The ability to control print orientation means you can label drawings, create special forms and do many things not possible with a standard printer. Of course both character and graphics printing can be combined to produce exactly what you want.

Plotter/Printer	26-1190	\$1460.00
Model I Prt/Int Cab	26-1411	\$ 59.00
Model I/III Cable	26-1401	\$ 39.00
Model II Cable	26-4401	\$ 39.00
Paper	26-1407	\$ 4.95

Specifications:

Printing System:	Pressurized Ball Point Pen
Print Speed:	Average 10 Char/Sec
Step Speed:	667 Steps/Sec
Step Distance:	0.09525mm in either X or Y direction
(increment)	
No. Char/Line:	75 Chars. Max.
Normal Size Char. Pitch:	2.5 mm (9 Char/inch)
Char. Size:	2x3mm (20 by 30 steps)
No. Characters and Symbols:	64 (Upper case, digits and symbols. Lower case ignored)
Paper Width:	9 inches (7 1/3" effective width) 1964 Steps
Pen Life:	Approx. 500,000 characters (4500m)
Accuracy—	
Relative:	0.15% or less
Repeat:	0.1mm or less

VIDEOTEK Hardware

(From Page 1)

The VIDEOTEK terminal will LOOK very much like our Color Computer, will have an alpha-numeric keyboard and 4K of internal memory. The VIDEOTEK terminal is NOT a computer, it will NOT compute or do anything except act as a intelligent terminal. The 4K of internal memory may be used to store information for later viewing, thus minimizing "on-line" time. The VIDEOTEK terminal will provide fully interactive communication when connected to some system (such as CompuServe) which has the ability to carry on such communications. The VIDEOTEK software needed to access CompuServe is built into the VIDEOTEK hardware.

In addition, the purchase of the VIDEOTEK hardware will include one free hour of time on the CompuServe Information Service, an operators manual, identification number and password.

WHAT IS VIDEOTEK SOFTWARE?

Radio Shack will market software packages which will allow microcomputers to become terminals which will access any VIDEOTEK information supplier (such as CompuServe). The software packages will include programs, one free hour of access to the CompuServe Information Service, an operators manual, identification number and password.

The following VIDEOTEK software packages have been announced:

TRS-80 Color Computer	26-2222
TRS-80 Model I/III	26-2220
TRS-80 Model II	26-2221
Dumb Terminal (no software)	26-2224
Apple® II Pkg.	26-2223

The suggested retail price on all these packages is \$29.95, except 26-2224 which has a suggested retail price of \$19.95. Other packages will be announced as they become available.

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® Apple is a trademark of Apple Computer.

CompuServe Phone Numbers

The following is a list of the cities and telephone numbers which can access the CompuServe Information Service directly. The current charge is \$5.00 per hour.

Akron, OH	216/867-4063	Louisville, KY	502/585-9664
Arlington, VA	202/452-8930	Memphis, TN	901/454-7029
Atlanta, GA	404/262-3547	Mountain View, CA	415/961-5665
Baltimore, MD	301/837-3171	New York, NY	212/391-2034
Boston, MA	617/489-2960	Orange County, CA	714/530-6403
Canton, OH	216/452-6876	Palo Alto, CA	415/324-8200
Chicago, IL	312/372-3980	Philadelphia, PA	215/563-1210
Cincinnati, OH	513/241-5232	Pittsburgh, PA	412/232-3484
Columbus, OH	614/457-7606	Princeton, NJ	609/921-1849
Cleveland, OH	216/696-2304	San Francisco, CA	415/391-7445
Dallas, TX	214/745-1415	San Diego, CA	714/566-4874
Dayton, OH	513/228-0072	San Jose, CA	408/496-0622
Denver, CO	303/861-7748	San Mateo, CA	415/347-1008
Detroit, MI	313/962-3838	St. Louis, MO	314/872-8490
Fort Worth, TX	817/334-0406	Stamford, CT	203/324-6630
Houston, TX	713/236-1601	Toledo, OH	419/248-1431
Indianapolis, IN	317/632-1115	Tucson, AZ	602/790-3228
Kansas City, MO	816/474-9594	Van Nuys, CA	213/989-6047
Long Island, NY	516/433-3821	West Caldwell, NJ	201/575-9559
Los Angeles, CA	213/384-0057		

Tymnet Phone Numbers

Users in the following cities have access to the CompuServe Information Service via TYMNET facilities. There is an additional service charge of \$2.00/hr. (For total of \$7.00/hr):

Albany, NY	518/463-3111	Erie, PA	814/453-7161
Albuquerque, NM	505/842-6036	Evansville, IN	812/423-6885
Alhambra, CA	213/572-0999	Ft. Lauderdale, FL	305/467-7550
Allentown, PA	215/433-6131	Ft. Wayne, IN	219/424-5162
Ann Arbor, MI	313/665-2627	Ft. Worth, TX	214/263-4581
Antioch, CA	415/757-1016	Freeport, IL	815/233-5585
Appleton, WI	414/734-9940	Fresno, CA	209/445-0911
Austin, TX	512/444-3280	Grand Rapids, MI	616/459-5069
Baltimore, MD	301/547-8100	Greensboro, NC	919/379-0034
Baton Rouge, LA	504/292-4050	Greenville, SC	803/271-2418
Baytown, TX	713/427-5856	Harrisburg, PA	717/236-1190
Beaumont, TX	713/832-2589	Hartford, CT	203/568-2610
Birmingham, AL	205/942-4141	Hayward, CA	415/785-3431
Boise, ID	208/343-4851	Hempstead LI, NY	516/794-3390
Bridgeport, CT	203/579-7820	Huntsville, AL	205/533-5137
Bridgeton, MO	314/731-2304	Iowa City, IA	319/354-7371
Buffalo, NY	716/856-1400	Jackson, MI	517/787-9461
Burlingame, CA	415/348-4992	Jackson, MS	601/944-0860
Cedar Rapids, IA	319/363-2482	Jacksonville, FL	904/721-8100
Charleston, WV	304/345-2908	Kalamazoo, MI	616/385-3150
Charlotte, NC	704/372-9730	Kansas City, MO	913/677-2833
Chattanooga, TN	615/756-5856	Knoxville, TN	615/637-3118
Colorado Spgs., CO	303/475-2121	Lafayette, LA	318/235-3501
Columbia, MO	314/875-1150	Lansing, MI	517/487-2040
Columbia, SC	803/252-0840	Las Vegas, NV	702/386-1899
Corning, NY	607/962-5071	Lexington, KY	606/253-3463
Corpus Christi, TX	512/882-3641	Little Rock, AR	501/372-5780
Danbury, CT	203/743-1340	Long Island, NY	516/653-5780
Darien, CT	203/655-8931	Longview, TX	214/758-1756
Daytona Beach, FL	904/252-4481	Los Angeles, CA	213/683-0451
Des Moines, IA	515/280-9600	Los Angeles, CA	213/629-3451
Durham, NC	919/549-0441	Lubbock, TX	806/762-0136
Eau Claire, WI	715/834-7863	Lyndhurst, NJ	201/460-0100
El Paso, TX	915/544-9590	Madison, WI	608/221-4211
El Segundo, CA	213/640-1570	Manchester, NH	603/669-0493
Englewood Clf., NJ	201/894-8250	Manistee, MI	616/723-8760
Enumclaw, WA	206/825-6909	Marina Del Rey, CA	213/821-2257

(Continued on Page 8)

Definition Commands

	Level I	Level II	TRSDOS	TRSDOS	TAPE	TRSDOS	TRSDOS	8K COLOR	POCKET
DEF FN									
DEFDBL									
DEFINT									
DEFNSG									
DEFSTR									
DEFUSR									
DEGREE									
GRAD									
RADIAN									

Defines a user-created function.
 Defines variables as double precision type.
 Defines variables as integer type.
 Defines variables as single precision type.
 Defines variables as string type.
 Defines entry point for mach, lang, subroutines.
 Set angle mode to degree.
 Set angle mode to gradians.
 Set angle mode to radians.

Math Functions

	Level I	Level II	TRSDOS	TRSDOS	TAPE	TRSDOS	TRSDOS	8K COLOR	POCKET
ABS									
ACS									
ATN									
COS									
EXP									
FIX									
HEXS									
INT									
LN									
LOG									
OCT\$									
RND									
RND(0)									
RND(N)									
SGN									
SIN									
SQR									
SQR									
TAN									
VAL									

Computes absolute value of X.
 Computes Arc cosine.
 Computes arctangent; value returned in radians.
 Computes cosine; angle must be in radians.
 Computes the natural antilog.
 Truncates all digits to right of decimal point.
 Computes hexadecimal value and returns in string.
 Largest integer not greater than X.
 Natural logarithm in Pocket Computer.
 Natural Logarithm. *Common Logarithm in PC.
 Computes octal value and returns it as a string.
 RND(N) — Pseudorandom number between 1 and N.
 Generates a pseudorandom number between 0 and 1.
 Returns sign component of a number.
 Computes sine; angle must be in radians.
 Computes single-precision square root. *Keyboard
 Computes tangent; angle must be in radians.
 Evaluates a string as a number.

String Commands and Functions

	Level I	Level II	TRSDOS	TRSDOS	TAPE	TRSDOS	TRSDOS	8K COLOR	POCKET
ASC									
ASCII									
ASCII									
CHR\$									
CINT									
CSNG									
CVD									
CVL									
CVS									
INKEY\$									
INSTR									
LEFT\$									
LEN									
MIDS									
MKDS									
MKS\$									
MKS\$									
RIGHT\$									
SPACES									
STR\$									
STRING\$									

Returns ASCII code of first character in string.
 Converts to double precision.
 Returns character for ASCII or other code.
 Returns largest integer not greater than n.
 Converts to single precision.
 Converts to double-precision after GET.
 Converts to integer after GET.
 Converts to single-precision after GET.
 Gets keyboard character if available.
 Returns starting position of substring.
 Returns left portion of string.
 Returns the number of characters in a string.
 Returns a substring of a string.
 Makes double-precision number a string.
 Makes single-precision number a string.
 Returns right portion of string.
 Returns a string of n spaces.
 Converts a numeric expression to a string.
 Returns a string of n identical characters.

Assignment Statements

	Level I	Level II	TRSDOS	TRSDOS	TAPE	TRSDOS	TRSDOS	8K COLOR	POCKET
CLEAR									
CLEAR N									
DEG									
DIM									
DMS									
ERASE									
LET									
MIDS=									
SWAP									

Clears all data variables.
 Reserves N bytes string memory; reset variables.
 Converts to decimal notation.
 Dimension one or more arrays. * 1 dimension only.
 Converts to sexagesimal notation.
 Deletes an array.
 Optional. *DO NOT use with Color Computer.
 Replace old portion of string with new portion.
 Exchanges the values of two variables.

Other Commands, Functions and Operations

	Level I	Level II	TRSDOS	TRSDOS	TAPE	TRSDOS	TRSDOS	8K COLOR	POCKET
ELSE									
IF									
THEN									
AUDIO									
DEBUG									
MERGE									
MOTOR									
POKE									
RANDOM									
REM									
SKIPF									
DATE\$									
ERL									
ERR									
FRE\$(STR)									
FRE(X)									
INP									
MEM									
PEEK									
POS									
ROW									
TIMES\$									
USR									
USRn									
VARPTR									
EOF									
LOC									
LOF									
VARPTR(#b)									
AND									
CONCATENATION									
EQV									
EXPONENTIATION									
IMP									
MOD									
NOT									
OR									
XOR									

Secondary action clause in IF-THEN statement.
 Tests conditional expression in IF-THEN-ELSE.
 Primary action to be taken in IF-THEN statement.
 Connects cassette audio to television speaker.
 Direct program execution under the DEBUG mode.
 Merges ASCII disk program with resident program.
 Turns cassette motor on or off.
 Puts a value into a RAM memory location.
 Resets random number generator.
 REMark: instructs compiler to ignore rest of line.
 Positions cassette tape at end of next file.
 Gets current date as 18 character string.
 Returns the line number in which an error occurred.
 Returns a value related to most recent error.
 Returns amount of unused string space.
 Finds amount of free memory space.
 Gets a value from specified port.
 Finds the amount of free memory.
 Gets value in specified memory location.
 Returns column position of cursor.
 Gets row number where cursor is positioned.
 Returns time (24 hour format) as a string.
 Calls a machine language subroutine.
 Calls one of ten machine language routines.
 Gets address where variable contents are stored.
 End-of-file detector.
 Determines current record number of disk file.
 Determines highest numbered record in disk file.
 Returns address of data buffer b.
 * USE (*) IN LI BASIC
 JOIN STRINGS
 0 IF 1ST 1 AND 2ND 0
 RAISE TO POWER
 OPPOSITE OF XOR
 MODULUS CALCULATIONS
 NEGATE
 * USE (+) IN LI BASIC
 EXCLUSIVE OR

TRS-80 BASIC Command Comparison Chart

	Mod I			Mod III		
	Level I	Level II	TRSDOS	Level I	Level II	TRSDOS
System Commands						
AUTO	✓	✓	✓	✓	✓	✓
CHAIN	✓	✓	✓	✓	✓	✓
CMD "A"	✓	✓	✓	✓	✓	✓
CMD "C"	✓	✓	✓	✓	✓	✓
CMD "D"	✓	✓	✓	✓	✓	✓
CMD "D:d"	✓	✓	✓	✓	✓	✓
CMD "E"	✓	✓	✓	✓	✓	✓
CMD "T"	✓	✓	✓	✓	✓	✓
CMD "J"	✓	✓	✓	✓	✓	✓
CMD "L"	✓	✓	✓	✓	✓	✓
CMD "O"	✓	✓	✓	✓	✓	✓
CMD "P"	✓	✓	✓	✓	✓	✓
CMD "R"	✓	✓	✓	✓	✓	✓
CMD "S"	✓	✓	✓	✓	✓	✓
CMD "T"	✓	✓	✓	✓	✓	✓
CMD "X"	✓	✓	✓	✓	✓	✓
CMD "Z"	✓	✓	✓	✓	✓	✓
CONT	✓	✓	✓	✓	✓	✓
DELETE	✓	✓	✓	✓	✓	✓
EDIT	✓	✓	✓	✓	✓	✓
KILL	✓	✓	✓	✓	✓	✓
LIST	✓	✓	✓	✓	✓	✓
LIST ###	✓	✓	✓	✓	✓	✓
LOAD	✓	✓	✓	✓	✓	✓
NAME	✓	✓	✓	✓	✓	✓
NEW	✓	✓	✓	✓	✓	✓
RENUM	✓	✓	✓	✓	✓	✓
RUN	✓	✓	✓	✓	✓	✓
RUN "FILESPEC"	✓	✓	✓	✓	✓	✓
RUN ###	✓	✓	✓	✓	✓	✓
SAVE	✓	✓	✓	✓	✓	✓
SYSTEM	✓	✓	✓	✓	✓	✓
TROFF	✓	✓	✓	✓	✓	✓
TRON	✓	✓	✓	✓	✓	✓
END	✓	✓	✓	✓	✓	✓
ERROR(N)	✓	✓	✓	✓	✓	✓
EXEC	✓	✓	✓	✓	✓	✓
FOR-NEXT	✓	✓	✓	✓	✓	✓
GOSUB	✓	✓	✓	✓	✓	✓
GOTO	✓	✓	✓	✓	✓	✓
NEXT	✓	✓	✓	✓	✓	✓
ON	✓	✓	✓	✓	✓	✓
ON ERROR	✓	✓	✓	✓	✓	✓
GOTO	✓	✓	✓	✓	✓	✓
ON ERROR	✓	✓	✓	✓	✓	✓
GOTO 0	✓	✓	✓	✓	✓	✓
RESUME	✓	✓	✓	✓	✓	✓
RETURN	✓	✓	✓	✓	✓	✓
STEP	✓	✓	✓	✓	✓	✓
STOP	✓	✓	✓	✓	✓	✓
SYSTEM	✓	✓	✓	✓	✓	✓
TO	✓	✓	✓	✓	✓	✓
Numbers lines automatically.						
Load and execute specified program.						
Return to TRSDOS, printing message.						
Compress program by removing spaces and REMs.						
Loads and executes DEBUG.						
Display disk directory in BASIC.						
Display most recent disk error.						
Returns to TRSDOS, execute specified command.						
Performs Julian calendar calculations.						
Load specified disk file from BASIC.						
Sort specified number of strings in an array.						
Returns printer status as a string.						
MOD I: Start clock MOD III: Display clock.						
Returns control to TRSDOS						
MOD I: Stops clock/Mod III: Turn off clock display.						
BASIC cross-reference facility.						
Toggle "DUAL" routing.						
Continues execution of program after BREAK/STOP.						
Erases program lines from memory.						
Puts computer into edit mode for specified line.						
Deletes a disk file.						
LIST program lines to the Video Display.						
LIST from program line ###						
Loads program file from disk.						
Remembers resident program. *BASIC only.						
Erases program from memory, initialize variables.						
Remembers resident BASIC program.						
Execute resident program.						
Loads and executes specified disk program.						
RUN from line specified by ###						
Saves BASIC program on disk.						
Puts computer in monitor mode.						
Turns off the program trace function.						
Turns on the program trace function.						
ENDS program execution.						
Simulates the specified error.						
Transfers control to machine language program.						
Program loop.						
Transfers program control to specified subroutine.						
Transfers program control to the specified line.						
Ends FOR-NEXT loop.						
Multi-way branch used with GOTO and GOSUB.						
Sets up an error-handling routine.						
Disables an error handling-routine.						
Ends an error-handling routine.						
Returns from subroutine to statement after GOSUB.						
Increments or decrements FOR-NEXT loop index.						
Stops execution of a program.						
Executes TRSDOS command, returns to BASIC.						
Used to specify index range in FOR-NEXT statement.						
Content of display read into variable.						
Print beginning at specified screen location.						
Sound buzzer n times.						
Loads BASIC program file from cassette.						
Compares program on tape with resident program.						
Loads a machine language program from cassette.						
CLOSE all open file-buffers or specified buffer b.						
Stores resident program on tape.						
Stores data to be accessed by a READ statement.						
Organizes a random file buffer into fields.						
Gets specified record from random disk file.						
INPUT's data from the keyboard.						
INPUT's data from specified cassette unit.						
INPUT's the "PROMPT" and INPUT's data from keyboard.						
Get data from tape and place in memory.						
Inputs n characters from the keyboard.						
Inputs n characters from sequential disk file.						
Line inputs from keyboard; <ENTER> ends input.						
Line inputs from disk into buffer.						
List program to line printer. *MIII Level I only.						
Moves printer carriage to specified position.						
Prints formatted data to line printer.						
Left-justifies data into a random access field.						
Opens file; assigns mode and buffer.						
Sends value to specified port.						
Hold display 0.85 seconds and continue.						
PRINT's an item or list at current cursor position.						
Writes data to cassette. *# - 2 Outputs to printer.						
Begin printing at specified screen position.						
PRINT AT specified screen location in Level I.						
Moves cursor right to specified TAB position.						
Formats strings and numbers for display.						
Contents of data memory is recorded on tape.						
Formatted sequential write to disk.						
Writes data to sequential file-buffer.						
Moves data from file-buffer to random disk-file.						
READS a value from a DATA statement.						
Resets pointer to first item of first data line.						
Right-justifies data into random access field.						
Sounds the frequency and duration specified.						
Prints a line of n blanks.						
Moves cursor to specified TAB position.						
Defines format for PRINT and LPRINT.						
Clears the display.						
Clears display and sets background color.						
Returns value related to joystick positions.						
Test graphic block *Return color if SET.						
Turn off specified graphics block.						
Turn on graphic block. *SET(x,y,z) z = COLOR.						

Sequencing Commands and Functions

	Level I	Level II	TRSDOS	Level I	Level II	TRSDOS
END	✓	✓	✓	✓	✓	✓
ERROR(N)	✓	✓	✓	✓	✓	✓
EXEC	✓	✓	✓	✓	✓	✓
FOR-NEXT	✓	✓	✓	✓	✓	✓
GOSUB	✓	✓	✓	✓	✓	✓
GOTO	✓	✓	✓	✓	✓	✓
NEXT	✓	✓	✓	✓	✓	✓
ON	✓	✓	✓	✓	✓	✓
ON ERROR	✓	✓	✓	✓	✓	✓
GOTO	✓	✓	✓	✓	✓	✓
ON ERROR	✓	✓	✓	✓	✓	✓
GOTO 0	✓	✓	✓	✓	✓	✓
RESUME	✓	✓	✓	✓	✓	✓
RETURN	✓	✓	✓	✓	✓	✓
STEP	✓	✓	✓	✓	✓	✓
STOP	✓	✓	✓	✓	✓	✓
SYSTEM	✓	✓	✓	✓	✓	✓
TO	✓	✓	✓	✓	✓	✓

Input/Output Commands

	Level I	Level II	TRSDOS	Level I	Level II	TRSDOS
AREAD	✓	✓	✓	✓	✓	✓
AT	✓	✓	✓	✓	✓	✓
BEEP	✓	✓	✓	✓	✓	✓
CLOAD	✓	✓	✓	✓	✓	✓
CLOAD?	✓	✓	✓	✓	✓	✓
CLOADM	✓	✓	✓	✓	✓	✓
CLOSE	✓	✓	✓	✓	✓	✓
CSAVE	✓	✓	✓	✓	✓	✓
DATA	✓	✓	✓	✓	✓	✓
FIELD	✓	✓	✓	✓	✓	✓
GET b,r	✓	✓	✓	✓	✓	✓
INPUT	✓	✓	✓	✓	✓	✓
INPUT # - b	✓	✓	✓	✓	✓	✓
INPUT #b	✓	✓	✓	✓	✓	✓
INPUT	✓	✓	✓	✓	✓	✓
PROMPT	✓	✓	✓	✓	✓	✓
INPUT #	✓	✓	✓	✓	✓	✓
INPUT\$(N)	✓	✓	✓	✓	✓	✓
INPUT\$(N,b)	✓	✓	✓	✓	✓	✓
LINE INPUT	✓	✓	✓	✓	✓	✓
LINE INPUT #b	✓	✓	✓	✓	✓	✓
LIST	✓	✓	✓	✓	✓	✓
LPRINT	✓	✓	✓	✓	✓	✓
LPRINT TAB	✓	✓	✓	✓	✓	✓
LPRINT USING	✓	✓	✓	✓	✓	✓
LSET	✓	✓	✓	✓	✓	✓
OPEN	✓	✓	✓	✓	✓	✓
OUT	✓	✓	✓	✓	✓	✓
PAUSE	✓	✓	✓	✓	✓	✓
PRINT	✓	✓	✓	✓	✓	✓
PRINT # - b	✓	✓	✓	✓	✓	✓
PRINT (a)	✓	✓	✓	✓	✓	✓
PRINT AT	✓	✓	✓	✓	✓	✓
PRINT TAB	✓	✓	✓	✓	✓	✓
PRINT USING	✓	✓	✓	✓	✓	✓
PRINT #	✓	✓	✓	✓	✓	✓
PRINT # USING	✓	✓	✓	✓	✓	✓
PRINT #b	✓	✓	✓	✓	✓	✓
PUT	✓	✓	✓	✓	✓	✓
READ	✓	✓	✓	✓	✓	✓
RESTORE	✓	✓	✓	✓	✓	✓
RSET	✓	✓	✓	✓	✓	✓
SOUND	✓	✓	✓	✓	✓	✓
SPC	✓	✓	✓	✓	✓	✓
TAB	✓	✓	✓	✓	✓	✓
USING	✓	✓	✓	✓	✓	✓

Graphic Commands

	Level I	Level II	TRSDOS	Level I	Level II	TRSDOS
CLS	✓	✓	✓	✓	✓	✓

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IF UNDELIVERABLE DO NOT RETURN

Tymnet (From Page 5)

Marion, IN	317/662-0091	Rochester, NY	716/248-8000
Merrillville, IN	219/769-7254	Rockford, IL	815/398-6090
Miami, FL	305/374-7120	Sacramento, CA	916/441-6550
Midland, TX	915/683-5645	St. Joseph, MI	313/429-2568
Milwaukee, WI	414/257-3482	St. Petersburg, FL	813/536-7823
Minneapolis, MN	612/339-5200	Salt Lake City, UT	801/582-8972
Modesto, CA	209/578-4236	San Antonio, TX	512/696-4002
Morristown, NJ	609/235-3761	San Clemente, CA	714/498-3130
Mountain View, CA	415/961-7970	San Diego, CA	714/291-8700
Mountain View, CA	415/941-8450	San Jose/Cupertino, CA	408/446-1470
Nashua, NH	603/889-8618	San Pedro, CA	213/830-0775
Nashville, TN	615/244-5784	Santa Barbara, CA	805/687-6119
Nashville, TN	615/367-9382	Santa Rosa, CA	707/526-4260
Newark, NJ	201/483-5937	Savannah, GA	912/352-7259
New Haven, CT	203/789-0579	Seattle, WA	206/625-9900
New Orleans, LA	504/586-1071	Shawnee Mission, KS	913/677-2833
Newport Beach, CA	714/540-9560	South Bend, IN	219/233-4163
New York, NY	212/344-7445	Southfield, MI	313/569-8350
New York, NY	212/551-9322	Spokane, WA	509/448-9515
New York, NY	212/350-9100	Springfield, IL	217/753-7905
Niagara Falls, NY	716/285-6691	Springfield, MA	413/781-6830
Norfolk, VA	804/622-0435	Syracuse, NY	315/437-7111
Oakland, CA	415/836-8700	Tampa, FL	813/977-8032
Odessa, TX	915/563-3745	Toledo, OH	419/243-3144
Oklahoma City, OK	405/947-0561	Topeka, KS	913/233-1612
Omaha, NE	402/392-2970	Traverse City, MI	616/946-0020
Orlando, FL	305/851-3530	Tulsa, OK	918/663-2220
Oshkosh, WI	414/235-4594	Valley Forge, PA	215/666-9190
Palo Alto, CA	415/326-7015	Van Nuys, CA	213/986-9503
Pascagoula, MS	601/769-6711	Ventura/Oxnard, CA	805/487-0482
Pensacola, FL	904/434-0134	Vista, CA	714/727-6011
Peoria, IL	309/673-2156	Washington, DC	703/841-9560
Phoenix, AZ	602/249-9261	Washington, DC	703/841-0200
Piscataway, NJ	201/981-1900	Waterbury, CT	203/755-1153
Plymouth, MI	313/459-8900	Wayne, NJ	201/785-4480
Portland, OR	503/231-4050	W. Palm Beach, FL	305/622-2871
Princeton, NJ	609/452-8970	White Plains, NY	914/694-9361
Providence, RI	401/274-5783	Wichita, KS	316/265-1241
Reno, NV	702/882-7810	Wilmington, DE	302/658-5261
Richland, WA	509/375-1975	Winston-Salem, NC	919/725-1414
Richmond, VA	804/649-3050	Worcester, MA	617/754-9451
Riverside, CA	714/825-9372	York, PA	717/846-4802

Using the VAL Function

The VAL function is used to return (find) the numeric value of a string constant or variable. For example:

```
10 A$ = "100 DOLLARS"
20 PRINT VAL(A$)
```

If you RUN this program, the printed result will be the number 100.

If you change the value of A\$ in line 10 to "ONE HUNDRED DOLLARS," the printed result will be 0 (zero). The VAL function scans the variable A\$ from left to right. As soon as a non-blank, non-numeric character is found the function returns the current value. In the case of A\$, the first character encountered (The 0 in ONE) is not a blank and is also not a number, and the current value (zero since nothing was found) is returned.

Consider the following program:

```
10 A = 123:B = - 123
20 A$ = "123:B$ = " - 123":
   C$ = " 123":D$ = " - 123"
30 PRINT A,B,A$,VAL(A$)
40 PRINT B$,VAL(B$),C$,VAL(C$)
50 PRINT D$,VAL(D$)
```

When you RUN this program your result will be:

```
Models I, II, III:
   123  -123  123  123
   -123 -123  123  123
   -123  0
```

Color Computer:

```
   123          -123
   123          123
  -123          -123
   123          123
  -123          -123
```

Do you notice a difference? The Color Computer evaluated D\$ to be -123, while the other TRS-80s evaluated D\$ to be 0. If you change D\$ to read D\$ = " - 123", VAL will return -123 for D\$.