

TRS-80TM Microcomputer NEWS

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THE MICROCOMPUTER NEWSLETTER PUBLISHED FOR TRS-80 OWNERS

Volume 2 Issue 10

Fort Worth Scene



Season's Greetings! One year ago when I wrote this column for the Dec. 1979 Newsletter, I said that I was looking forward to 1980. My expectations, and many of my wildest dreams, have been realized.

In Dec. 1979, I had heard enough rumors to be certain that we would be offering a new computer. I never imagined that we would have three of them, or that they would fit as many of my personal wants as they do. Here at work I am surrounded by computers. Most of my work is done on a Model II using SCRIP-SIT to create and edit the Microcomputer News. I also have ready access to a 48K Model I with two disks, a Color Computer with Extended BASIC, a Pocket Computer and something called a TI-59 (which is mine and which I now use primarily as a four-function calculator). When I go home, I have no real need for a business computer.

The Pocket Computer is ideal for comparison shopping when we go to the grocery store, and it gives me all the computer power I have needed away from home. What the Pocket Computer won't do for me is graphics.

Enter a Color Computer. After a little experimenting, I was able to get 256 x 192 graphics with an 8K Color BASIC Computer and 16K. I thought I was in heaven. Compared to the graphics of the Model I, I now had the ability to draw diagonal lines that looked like lines, and not stair-steps. I am not a great artist, but I was happy. The 8K Color BASIC Computer and a set of joysticks let me draw and create to my heart's content, I could choose my resolution level, and all of this using BASIC!

About a week ago, I managed to get my Color Computer (I call it mine, even though it belongs to Radio Shack)



upgraded to the Extended BASIC. (Check the Product News section for a list of the new commands.) I quickly saw a few interesting commands (LINE, CIRCLE, DRAW) and started playing (excuse me boss, WORKING).

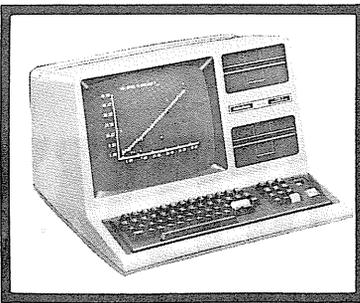
The 8K Color Computer is good, and I can do virtually anything with it I want, but the Extended BASIC is BETTER! Now instead of having to spend my time writing programs to keep track of where I am on the screen, all I have to do is say DRAW. The computer does the work and I have more time for "creative things."

The first project was to take the Radio Shack logo and see what Extended BASIC could do with it. Using the vectors from the Plotter/Printer program (see the November Newsletter after Mr. Shirley's View From the 7th Floor for the drawing). Using these vectors, and a scaling routine, I quickly had a very good Radio Shack logo. Granted, where there are arcs in the logo, mine has circles. But, that is my limitation and not the Color Computer's. The circle command gives me the ability to draw an arc; I just haven't taken the time to compute the starting and ending points.

The past year has been fantastic! There are still some new products which we have introduced during the year which have not been given due notice in the Newsletter. Why not? Simply because there have been so many new products that a few have slipped by almost unnoticed. With a new year just around the corner, I can truthfully repeat what I said last year... I can hardly wait...

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Model I/III

Product Line Manager's News



	A	B	C	D	E	F
1 MONTH	JAN	FEB	MAR	APR	MAY	JUN
2 SALES	2136.00	2236.50	2346.00	2456.74	2566.00	
3 COST OF	1276.00	1341.90	1405.00	1479.44	1553.42	
4 ADMINISTR	179.00	182.56	186.20	189.96	193.76	
5 INCOME BE	679.00	712.04	755.00	796.34	841.82	
6 INCOME TR	161.56	176.66	190.74	191.12	206.08	
7 NET INCOM	517.44	541.14	570.35	605.22	635.81	
8						
9						
10						
11						
12						

VisiCalc™ for the TRS-80 is one of those software products that was meant to be. There is finally an alternative to the long hours many of us spend working with numbers. Those of you who use columnar pads, calculator, and pencil to generate forecasts, plans, budgets and the like are going to get excited about VisiCalc. It's applicable to just about any task that involves a row and column approach to analyzing numbers. VisiCalc is great for applications like budgeting, tax planning, financial ratio calculation, cost estimation, sales forecasting, manufacturing build schedules, pro-formas, engineering calculations, and even personal budgeting. Since any planning activity is a series of revisions, corrections, and time consuming recalculations we don't usually have the time to examine all of the scenarios that can affect the results. VisiCalc's ability to instantly provide recalculation for a "what if" question is dramatic to see. Once a VisiCalc model is set up with data and formulas, you watch as VisiCalc immediately recalculates all values having a relationship to the item which you changed. The screen almost instantly totals across rows and down columns saving hours of work.

With VisiCalc an electronic worksheet is created which corresponds to the familiar columnar pad used to summarize rows and columns of numbers. Look at the example above. It is the leftmost portion of a large VisiCalc worksheet set up to produce a projected income statement for several accounting periods. Along the upper portion of the worksheet are vertical columns labeled A, B, C, etc. used here

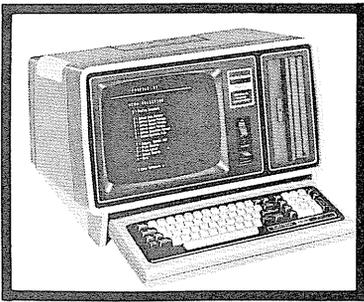
to describe months. The horizontal rows, labeled 1, 2, 3, etc. describe income and expense items. Down the left side and above the columns we have inserted descriptions of income and expense items and the months. The TRS-80's screen now becomes a "window" that can zoom along, under keyboard control, to examine any portion of this worksheet. The TRS-80's four arrow keys position VisiCalc's cursor, the set of brackets shown in the example, to any element of the row and column worksheet using VisiCalc's automatic repeat key feature. If your worksheet is larger than the TRS-80's screen, VisiCalc can let you examine the entire worksheet. For example, as VisiCalc's cursor moves to the right with the continuous depression of the right arrow key, the cursor will eventually "bump" into the right edge of the TRS-80's screen. When it does, the worksheet then starts scrolling to the left as your window continues moving along to the right. A similar thing happens in all four directions. In this way VisiCalc can scan as many as 63 columns by 254 rows for a total of 16,002 entry positions. As your model is developed VisiCalc dynamically sets and reconfigures memory requirements to fit the size of your worksheet. The VisiCalc program requires only 25K bytes, so the rest of RAM is available for your worksheet. Notice, in the example above, VisiCalc's memory indicator which is constantly updated with the amount of remaining free memory.

How does a VisiCalc model get set up in the first place? VisiCalc's power continues to be seen as it saves you time in

developing formulas and initial values along with titles and formats for every row and column in the worksheet. Let's assume that in row 3 of the worksheet below, which is cost of goods sold, that the calculated value of each row element — B3, C3, D3, etc. is always 60% of that month's sales as shown in B2, C2, D2, etc. Key in, at location B3, the formula: $.6*B2$. Actually VisiCalc allows you to position the cursor over elements of the worksheet and "create" a formula without having to remember element descriptions. In this example we want to maintain the same relationship across the row for each successive month's sales. VisiCalc will replicate across the row this relationship of cost of goods to sales. You will be able to watch as all of the future month's formulas are created and each cost of goods value is calculated instantly. This ability to replicate saves hours of work in creating a worksheet and in changing it if, for example, you wish to spread a constant value across all months or, as we have shown, you need to maintain the same relationship between elements. It works for both column and row replication.

VisiCalc also offers several formatting options for elements of the worksheet. These include dollars and cents, integer, left justification for values, right justification for descriptions, or simply as many significant digits as your specified column width will allow. Formats can be specified for individual locations or applied to all elements, or even specific rows or columns. VisiCalc maintains 11 digits of accuracy and even handles sci-

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Model II

Product Line Manager's News

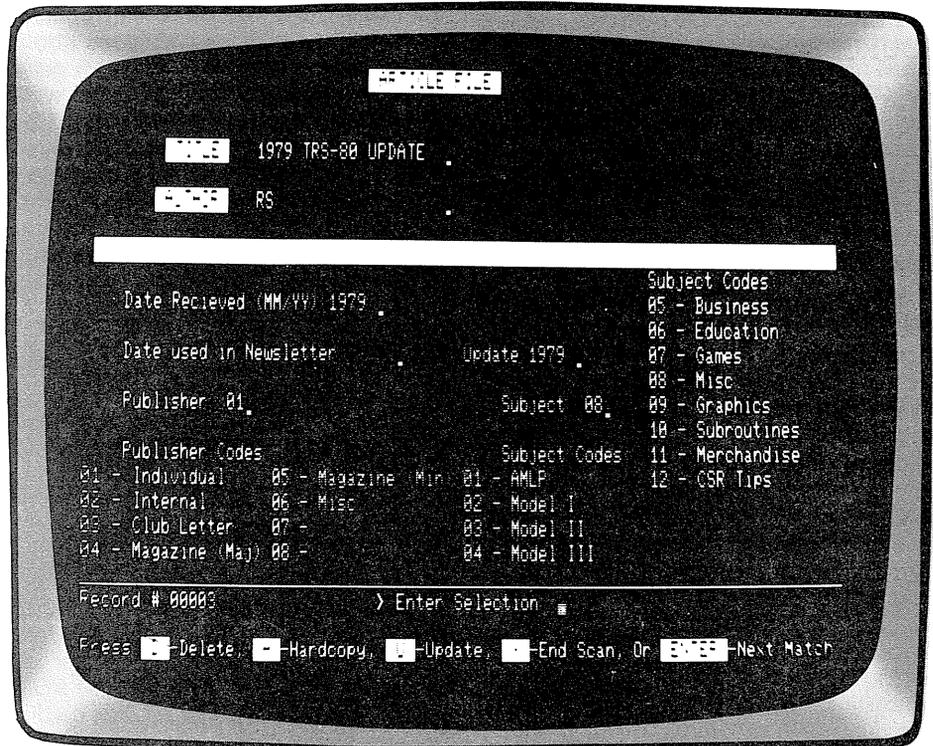
This month I would like to introduce you to some of the outstanding features of what I think is one of our most exciting Model II programs. "PROFILE II" is a filing system designed to make a large amount of information available to you at the touch of a key (word or number). It is a fast, accurate system that allows up to 20,000 individual records to be stored, reviewed or updated.

PROFILE II can keep track of names and addresses, accounts, bills owed and paid, personnel records and countless other files and records. Unlike a conventional file, which you can search in order only (such as alphabetically or by account number, but not both), PROFILE II files can be searched by up to 36 user-defined criteria. That means that you can select lists or reports based selectively on the contents of 36 different data "fields" within each record... and you can do it on the basis of each field being not equal to, equal to, less than, greater than, less than or equal, greater than or equal to a specified parameter or within a range of two parameters.

You can store your information in any of three formats (alphanumeric, numeric, or decimal), and use the information in six field types including alphanumeric, numeric, decimal, protected, add and subtract. The add and subtract fields are particularly nice if you need to add or subtract information from information you already have stored in PROFILE II.

You can have up to 99 data items in a single record, and you can display these items on any or all of the five custom screen formats which you can define for each file. While designing these screen formats, you might want a particular piece of information to be changeable on one screen and protected on all others. No problem. PROFILE II lets you do this with ease.

You can also define up to five different printed reports for each file. Imagine being able to get your information any way you want it! You can even have PROFILE II total a column of figures and print the total at the bottom of the report! Your reports can include automatic page numbering and use of the current date.



If you need labels of any kind, PROFILE II will let you define up to five labels for each file. Multiple search keys allow numerous label and report selections within each format. PROFILE II gives you a multi-parameter sort, multi-key search, which lets you see or print only the specific information you want (see Dr. Bell's education article for other ways PROFILE II data can be accessed and used).

Each file can store up to 3000 records on a single drive, or up to 20,000 records with extra drives.

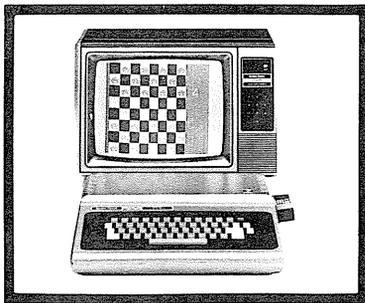
PROFILE II provides easy access to files by Model II SCRIPSIT for form letters and reports (requires more than one drive). You have full print formatting featuring a movable 132-column video "window" that lets you design the form you want for your print-outs.

If you need to restrict access to your file structure and data, a Limited Menu capability of PROFILE II gives access to your files without allowing file structure

manipulation, and any or all of your files may be password protected.

My space is used up, but I hope I've given you some idea of the power of this versatile and exciting Model II program. Until next month, Season's Greetings.





Color Computer

Product Line Manager's News

APPLICATIONS SOFTWARE SOURCEBOOK

The success of the Applications Software Sourcebook (26-2113) has been tremendous and we hope it will continue to be so. The first edition went to press back in May with over 400 programmers or distributors listing over 1000 programs in eight categories, all at a price of only \$.99.

Well, so much for history. Your local Radio Shack store or participating dealer should be receiving (or able to order) the latest edition of the Applications Sourcebook. At the time this column was being written, the programs for the new Sourcebook were being sorted and printed, tallying in at over 1400 listings. That's over 40% more new listings! Granted, we did have to raise the price, up to \$1.95, but it still remains an excellent buy. The same rules apply to the current version that applied to the first, namely that Radio Shack has not checked out any of the programs for accuracy, applicability, or even for existence. We're just trying to supply individuals with programs a vehicle with which to reach you, the TRS-80 owner. So before you send your money to people listed in the Sourcebook, be sure to check them out. Most of the suppliers we have talked to since the first edition hit the stores have been more than glad to answer customer inquiries directed to them about their company and/or their software listed.

A short word about changes to the Sourcebook format: The first edition listed an index by author/vendor with all of the Mr.'s and Dr.'s in alphabetical order. In the current version, however, all recognizably private individuals have been keyed in last name first, first name last while the business names have remained unchanged. Also, about filling out the application form, we have allowed for listing of software for the Color Computer, Model III, and for the Pocket Computer; just write it in on the form under minimum requirements. The retail price field was expanded to allow for software selling for up to \$9999.99 (on a TRS-80?) or on a "QUOTE" basis.

We are still taking applications for listings! Even if you send in your application the day after the next edition goes to print, your listing time (one year) does not start

until that listing actually shows up in print. We plan to release new editions about every quarter unless we run out or get a lot of new listings; in which case, we'll release a new edition sooner. This will be an ongoing product with Radio Shack, so if you have an applications program you wish to list, fill out an application (available from your local Shack, Form FO-155) and mail it with your listing fee (still only \$10.00 for one year) to:

Applications Software Sourcebook
Radio Shack P.O. Box 17400
Fort Worth, TX 76102

Thanks to all of you who have and all of you who will list software in our Sourcebook.

COLOR COMPUTER

Software for the Color Computer: Radio Shack has branched into another field for methods of distributing our software. The new Program Paks[™] that are offered for the Color Computer use ROM cartridges instead of tape or disk media. The advantages of this type of system will make life a lot easier for you, the consumer. No more time-weary trials at getting the correct volume on the tape (even though the Color Computer will use tape at a high 1500 BAUD transfer rate with a broad volume range tolerance), or needing the heads cleaned on the disk drive or making sure that the DOS you are working under is the current version. Just plug the cartridge in and it takes over control of the CPU. The ROM(s) are mounted on a PC (printed circuit) board which is housed in a plastic cartridge that even has a protective door which closes automatically over the connecting edge of the PC board when not in use. The cartridge is inserted in the right side (facing the computer) of the CPU. It is recommended that the computer be turned off when either inserting or removing the Program Pak. Currently available from your local Radio Shack are: Chess, Checkers, Quasar Commander, Personal Finance, and a Diagnostics Package. Soon to be available (if not already) are: Music, Pinball, Football, Math Bingo, Dino Wars, and many other games, personal, and educational programs.

A short word about some of the software: Chess (26-3050): This package

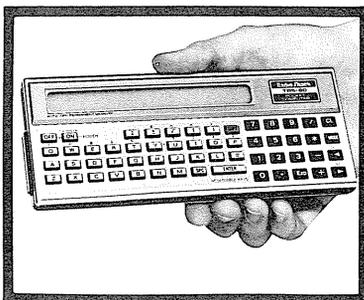
offers eight levels of difficulty. It gives you two sets of choices of colors for the men and board. The only snag that I could find was in using the alternate colors, the player needs to remember that green was white and yellow was black in regards to the board itself. The game can be played without using the optional Joysticks, but I found that they did speed up my moving of the men. Also, I noticed that the manual illustrates using the Queen in castling; however, the program does use the King when it castles which is the way it is supposed to be done. Speaking of Joysticks (26-3008), they make for an excellent addition to your Color Computer. Some of the games Radio Shack offers require them, while other games allow their use optionally. Even when writing your own programs they can be very useful. This short program, taken from the "Getting Started With Color Basic" manual (more about the manual later), will demo how to use the Joysticks in your own programs.

```
10 CLS
20 PRINT@0,JOYSTK(0);
30 PRINT@5,JOYSTK(1);
40 PRINT@10,JOYSTK(2);
50 PRINT@15,JOYSTK(3);
60 GOTO 20
```

The manual is a little vague on the idea of left and right Joystick position. When you try this program, you will find that the Joystick the manual wants you to place on the "left" side will actually be plugged into the "right" Joystick slot in the machine. Not to worry, the computer reads the "right" Joystick's location first, and all the software we have available refers to the "right" Joystick which is plugged into the "right" Joystick slot. (The same holds true about the left Joystick).

Now, on with the manual... For those of you who have already purchased a Color Computer (thank you) and for those of you who plan to purchase one (please), the "Getting Started With Color Basic" manual (26-3191) might leave you with some unanswered questions. By the time you are reading this, more information should be on its way to your mailbox. Namely, the information telling you how to access and store data on tape (for those whose trial and errors ended in frustra-

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Pocket Computer

Product Line Manager's News

This month it is my privilege to introduce you to an exciting new TRS-80 computer via this column which will be a regular monthly feature. That new computer I mentioned is the recently announced TRS-80 Pocket Computer... a portable, programmable computer that literally fits in your pocket.

Among the many features of this incredible machine:

- Programs in BASIC.
- Retains programs and data when power is off.
- 1424 step memory holds multiple programs.
- Standard typewriter keyboard with 15 key numeric pad.
- 24 character easy-to-read liquid crystal display.
- 10 digit numeric accuracy.
- 15 arithmetic functions.
- 300 hour nominal battery life on 4 calculator type mercury batteries.
- Automatic power-off after about 7 minutes of non-use.

The computer comes complete with a protective carrying case, a 116-page user's manual and long-life batteries. It measures $6\frac{7}{8} \times 2\frac{3}{4} \times 1\frac{1}{16}$ inches and weighs just 6 oz. All this for just \$249.00!

Now that I've piqued your interest, let's explore this little machine's capabilities further.

The BASIC interpreter in the machine is very similar to the TRS-80 Level I BASIC with the addition of 15 arithmetic functions, and is contained in about 7K of the 11K of ROM in the computer. The other 4K is used for the system monitor. In addition, there is 1.9K of CMOS RAM which holds the 1424 step program/data memory, 26 data (only) memories and 48 steps of reserve memory for the reserve keys (more about this later). The 1424 step memory is automatically partitioned for program and data storage and each BASIC statement in a program is compressed into a single step in order to make maximum use of available memory. Programs may be entered and edited in the program mode and then easily checked out in the RUN mode using the DEBUG

command. After you are satisfied that your program is working properly, you simply CSAVE it out to a cassette tape using the optional extra cassette interface and our Minisette-9 recorder or any good quality cassette recorder. Speaking of cassette commands, the pocket computer can also verify programs using the CLOAD? command as well as load and store data using the INPUT# and PRINT# commands. And, under program control, you can CHAIN another program from tape with execution to begin at a specified line number, label or at the beginning line number or you can CLOAD1 another program from tape which will load the program in addition to the one already in the computer.

Now let's look at some of the BASIC statements to get a real idea of the power and flexibility of this machine. For example, the INPUT statement. With this statement you can input one or more variables and at the same time display prompts to the user. If the user wishes to keep the same information in a variable as was previously input, he need only press the ENTER key and the information (either alpha or numeric) will be retained in the specified variable, he does not have to re-enter the information. When the user performs this sequence, the machine does something very unique, it skips all remaining instructions on the same line as the INPUT instruction and proceeds to the next higher line number. And here is where you can make use of another instruction, the PAUSE statement. This statement is similar to a PRINT command but will only display information on the LCD read-out for about .85 seconds.

Referring to Figure A you can see that by following the INPUT statement on line 10 with a PAUSE statement on line 20, you have a very efficient method of executing a program loop containing several variables.

Figure A

```
10 INPUT"LENGTH OF SIDE
   A?";A:GOTO 30
20 PAUSE"A=";A
30 INPUT"LENGTH OF SIDE
   B?";B:GOTO50
40 PAUSE"B=";B
50 C=(A*B)/2:PRINT"AREA
   OF TRIANGLE=";C
60 GOTO 10
```

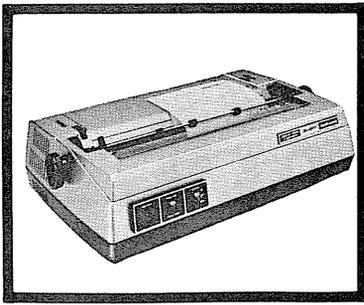
This allows the user to change only the desired variable while retaining the others and at the same time being able to verify, on the screen, what the values were. By-the-way, even though the LCD display shows only 24 characters, you can enter up to 80 characters on one BASIC line and the display will scroll left as you enter. For review, you can scroll back and forth using the cursor control buttons on the keyboard.

Next month, I will take a look at the reservable keys and how to use the reserve memory when writing programs. Also, I will begin a review of the software packages we have introduced to support the TRS-80 Pocket Computer. The first 8 packages are:

- Business Finance
- Business Statistics and Marketing
- Real Estate
- Personal Finance
- Aviation (Pilot navigation system)
- Civil Engineering
- Games Pack I
- Math Drill

If you haven't gotten your "Hands On" one of these pocket computers yet, why not stop by your nearest Radio Shack Computer Center, Store or Dealer and try one out for yourself. Until next month... more "Pocket" power to you.





Peripherals

Product Line Manager's News

What on earth is a peripheral? A peripheral, my friend, is one of those devices which can make your computer live up to the high hopes you had when you bit the bullet and plunked down the cash for that sometimes inscrutable TRS-80! Printers, plotters, telephone interfaces, voice synthesizers, voice input devices and a host of other devices and accessories, announced and yet to be announced, will be covered here.

Look to this page for in-depth articles describing each Radio Shack printer and other accessories. Features designed to help you understand various product specifications and functions will regularly appear here. We hope to bring you news of upcoming products as well as updates to current ones. We want you to get the most out of your investment.

Word processing is the thing these days. Radio Shack's impressive lineup of software and hardware brings the power of once expensive systems to within the reach of everyone. There are two printers currently billed as "word processing" devices. The "star" of the line is DW II (26-1158). It is a full performance "daisy-wheel" printer. The characters are produced "fully formed" by an interchangeable wheel carrying 124 letters and symbols. The carbon ribbon produces very dense, high quality letters equal to the best electric typewriter. You can compose a letter, a manuscript, or some other kind of text using SCRIPSIT.® Then with "touch of a finger" you can turn DW II loose and produce page after page of letter perfect copy. Your TRS-80 doesn't need a coffee break either!

This paragraph has been printed with the standard COURIER print wheel which comes with the printer. It produces 10 characters per inch and its type face, or "font", is most suitable for ordinary business correspondence.

This paragraph illustrates the optional PRESTIGE ELITE wheel (26-1421). Notice that the letters are smaller and closer together. This wheel most nearly resembles the fonts of many "personal" typewriters. When this wheel is installed the front panel "pitch control" must be set to "12". In BASIC, the command LPRINT CHR\$(27) CHR\$(14) will set the proper pitch automatically and will override the front panel switch.

Here is a sample of the MADELEINE proportionally spaced wheel (26-1422). Notice in this example the space occupied by each character varies according to its size. The microprocessor inside the printer computes the space needed by each character and advances the carriage accordingly. If the P.S. mode is not set when using this wheel (by using the front panel switch or LPRINT CHR\$(27) CHR\$(17)) then many of the letters will appear to be all crunched together.

LIKE THIS - MNOPQRSTUVWXYZ

Here is some interesting news. You read it here first, folks. Radio Shack will soon have available two more wheels, CUBIC (P.S.) and TITLE ITALIC (12). Watch this space for catalog number and delivery date.

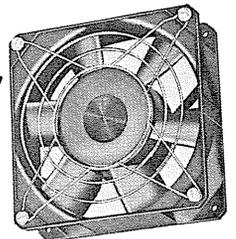
I am a sample of the new CUBIC P.S. print wheel. I get 40 million characters per wheel just like all other fonts. Please don't order me until you have my number. If you do, your order will be placed in the order bin without a bottom. It will probably not be seen again!

This is a sample of the TITLE ITALIC print wheel. It prints 12 characters per inch. It will soon be available on order from your Radio Shack store. Do not order it until we announce the stock number

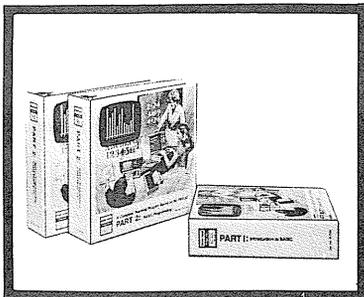
The DW II is a high quality, well built machine priced well below anything else in its class. It prints about 43 characters per second (that's 516 five letter words per minute!). The optional tractor mechanism (26-1446) is a must for printing on continuous fan-fold paper.

If \$1960.00 is too rich for your blood then the new Line Printer IV may be your
(Continued on Page 10)

SPECIAL PLM SALE



For sometime now there has been in the line a fan kit (26-1303) designed to be installed in the disk bay of the Model I desk to keep the drives cooler in the rather confined area. Well, we bought too many of 'em (or not enough of you guys did — it depends upon your viewpoint). Here's your chance. Mention my name and you can take one home for \$17.95. That is a savings of forty percent! This page is the only announcement of this special price. Help get our inventory in line and buy yourself an extra measure of reliability at a bargain.



Education

Educational Product's News

This month's education column is written by Dr. Norman T. Bell, Professor of Educational Psychology at Michigan State University. Dr. Bell has been involved in applications of computers in education since 1965, and is author of Parts I and II of Radio Shack's Computer Education Series. Because of a growing interest in the use of Microcomputers in administrative applications in schools, we asked Dr. Bell to comment on some projects he has been involved with in this area.

EDUCATIONAL APPLICATIONS OF PROFILE

In today's world, with the continuing explosion of information, there is the increasing need at every level for systematic retrieval of selected information. In every walk of life, individuals are constantly faced with the need of information to assist them in making intelligent decisions. For many individuals it appears that this need for an information system was the prime force in causing them to purchase a microcomputer. In fact, surveys of owners of micros have demonstrated that by far and away the most desired application of the micro by these owners is information storage and retrieval. In the home, some information retrieval applications have been names, addresses, and phone numbers, financial information, and special purpose applications such as 35mm slide information retrieval.

This need for information to facilitate decision-making is even more important in educational institutions today. On almost a daily basis reports are required which may cause endless hours of data collection and summarizing. Generally the production of these numerous, required reports is extremely time-consuming and not as error-free as would be desired. As with the private owners of micros, surveys of school administrators and teachers will show that a general information storage and retrieval system would be at the top of the priority listing of microcomputer applications.

This need for an easy-to-use, generalizable information system has been met to a large degree by Radio Shack's PROFILE (Cat. No. 26-1562) and PROFILE II (Cat. No. 26-4512). Both of

these systems, PROFILE for the Model I and Model III, and PROFILE II for the Model II, are systems that can immediately be put to use in the educational setting. In the College of Education, Michigan State University, PROFILE is currently being used to store and retrieve faculty data. Such data are then available for decisions concerning faculty assignments, budgeting, and the general reporting of activities required in most educational institutions. In the College of Osteopathic Medicine the faculty data system is being implemented with PROFILE II with data involving both the faculty and student's records systems.

Implementing these systems in these two colleges has been much easier than expected. No more than several hours were used in assisting the administrative personnel in defining their file structure and the format for reports to be output. Satisfaction by the users and the decision-makers receiving the requested information was immediately evident.

In both versions of PROFILE it is possible to access the files generated by PROFILE by developing programs in BASIC. Almost immediately it was noted that in both of the colleges more comprehensive retrieval and printing programs would be useful. As PROFILE now exists, the printing option allows a search and display to be done on any specified variable but does not allow searches based on more than one variable. In PROFILE II this capability has been expanded to allow searches on two variables, using the logical operators AND and OR. But in almost all applications in these two colleges there was a need for searches on multiple variables and the printing of the results of the searches with user-specified formatting.

As with many of us in the area of educational applications of computers, it was time for me to seek programming assistance. This time, as on many previous occasions, I turned for help to my son, John. To facilitate this desire by the users for expanded search capabilities, John developed a BASIC program with these characteristics. First, as previously indicated, the program allows searches on any number of variables, thus greatly expanding the capability to locate only those records desired. Secondly, the user with this program can specify which of the

data from the selected records will be output to the video display or printer. Also, the user is able to specify the format of the output report determining how it will appear on the video display or the printer, or both. Third, this program will allow both sums and averages of any columns containing numeric data, thus providing for the user some of the summary statistics often needed.

Concerning program operation, it is important to explain that the actual field names as specified by the user in the setup of PROFILE are used. Thus the program functions, without change, with any file developed using PROFILE. Also these same field names are used in prompting the user in specifying column headings for output reports, again maintaining the usefulness of this utility program with any files created by PROFILE. Consequently, because of the capability of PROFILE to generate files accessible by BASIC programs, a valuable addition to the already-powerful capabilities of PROFILE has been made for our needs at Michigan State University.

In demonstrating this system to school personnel it appears that the possible education-related applications are almost limitless. Each time the system has been demonstrated, additional applications are identified. Examples of several of the applications are as follows:

TEACHER INFORMATION SYSTEM.

In almost every educational institution it is necessary to keep on file for ready reference information related to the teaching staff. This information has been maintained in manual card-oriented systems in many school settings. However, it has been found that some valuable information concerning teachers is often overlooked because it is so difficult to search the files. For example, teachers are often employed and are requested to teach courses that may not be their first choice. These teachers are told that when there is an opening in the area of their first choice, they will have an opportunity to get their name in for the position. But in the rush of daily operations, these promises are often broken and new teachers hired into those desired positions merely because the request was forgotten. With almost no additional work PROFILE can maintain

(Continued on Page 16)

TRS-80 Color Computer

Exciting features at an
Incredibly Low Price!

FROM

\$399

4K TRS-80 Color Computer

Television Receiver, Recorder and
Joysticks Optional/Extra

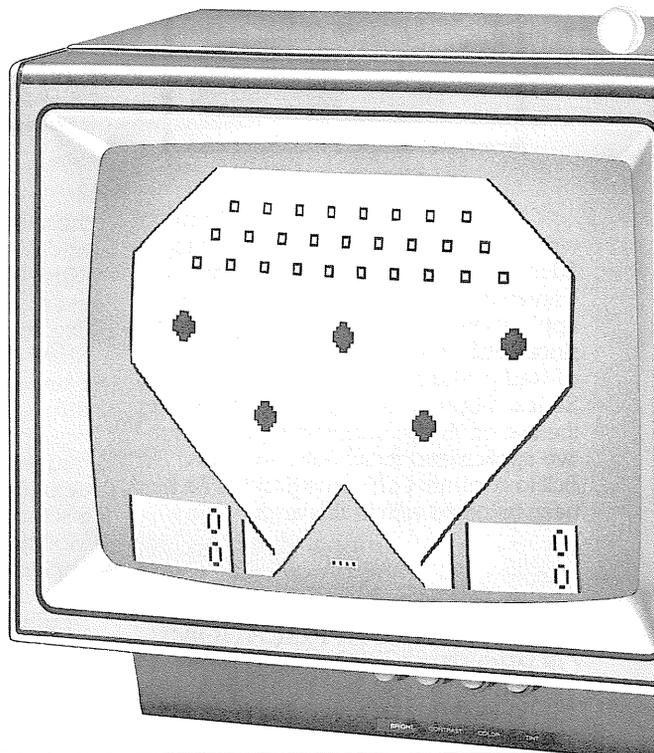
Radio Shack's TRS-80 Color Computer gives you most of the power of Level II BASIC for less than the price of Level I BASIC! The Color Computer comes complete with 53-key standard keyboard, 8K BASIC, 4K RAM, 8 beautiful colors and sound, all in a single attractively styled enclosure. It also includes a cable and a television switch box which allows you to connect to ANY standard television receiver, black and white or color.

Enter the exciting world of TRS-80 Program Paks[™]. Program Paks contain machine language programs (for fast execution) which are in Read Only Memory (ROM). Program Paks are ready to use INSTANTLY! Just plug one in, turn on the computer, and you are ready to go! It is that easy, and that quick! Many of these Program Paks will make use of the high resolution color graphics ability of your computer, some will require the optional/extra Joysticks.

These Program Paks are available NOW: Diagnostic ROM, Personal Finance, Checkers, Chess, Quasar Commander, Football, Pinball, Bingo Math and Music.

You can program it yourself! Just like all other TRS-80s, the Color Computer comes with Color BASIC. The 8K Color BASIC in the Color Computer includes arrays, advanced string handling commands, PEEK, POKE, USR, DATA statements and more! See our October Newsletter for a complete list of commands in Color BASIC. Extended BASIC adds DEF FN, DEFUSR, INSTR, MID\$= and other commands previously found only in our Disk BASICs!

Why wait? The world of sound and color is here today!



Specifications

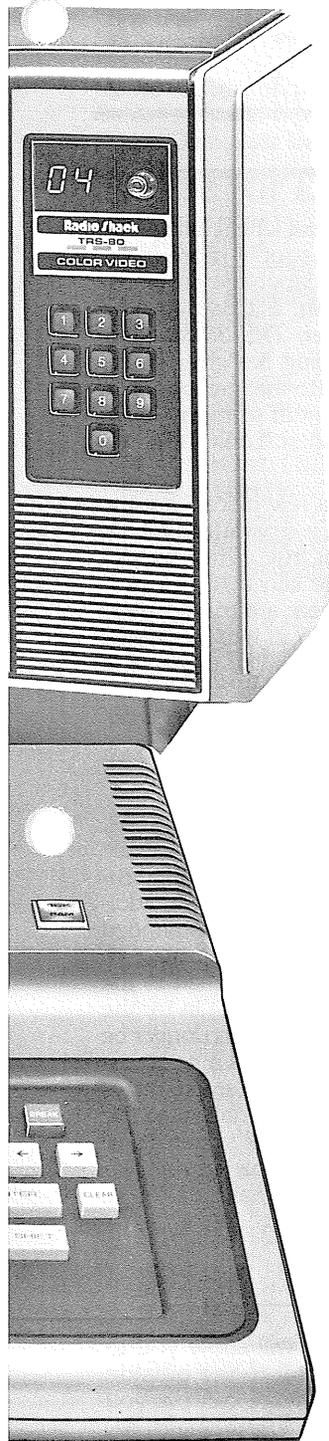
8K — 8K Color BASIC, EB — Extended Color BASIC

Numerical Accuracy: 9 digits (mantissa) + 2 Digits (Exponent)
Calculation System: Mathematical formula using order of operations
Program System: Stored programs

Program Language: Color BASIC
6809 Machine Language

Capacity: 4K or 16K RAM
Up to 32K ROM in Program Pak[™]

Calculations: 8K — Four arithmetic calculations, ABS, INT, RND, SGN, SIN
EB — All of the above plus: Exponentiation, LOG, TAN, ATN, COS, EXP, FIX and SQR.



- 4K Color Computer
- 26-3001 \$399.00
- 16K Memory Conversion
- 26-3015 \$119.00*
- Extended BASIC Add/On (Available 12/30/80)
- 26-3018 \$99.00*
- 16K Color Computer with Extended
- BASIC 26-3002 \$599.00

Extended Color BASIC requires 16K RAM.

*Required installation extra.

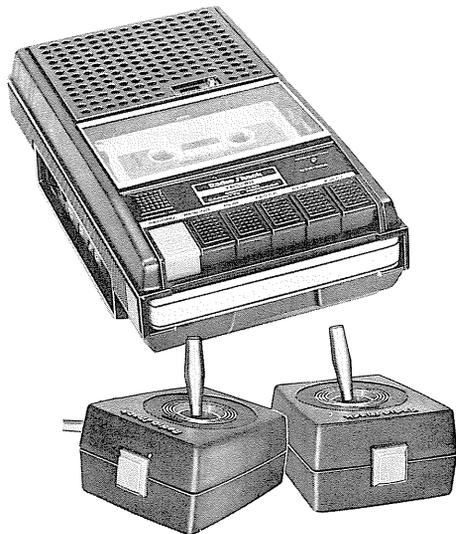
Joysticks — allow you to input directional information directly to your BASIC programs. Add excitement and fun! Great for games of skill and dexterity! Required by some Program Paks. 26-3008 \$24.95/pr.

CTR-80A Cassette Recorder — Comes complete with the computer/cassette interface cable. Gives you a fast, efficient method of storing programs and data.

26-1206 \$59.95

TRS-80 Color Video Receiver

This is a complete 13" diagonal VHF/UHF digitally tuned color receiver. You can even get those new "mid-band" TV frequencies! Use our TRS-80 Color Video with your computer, or as a personal television set. 26-3010 \$399.00



Editing Function

8K None

EB Full line editing capabilities

Interfaces for:

Cassette I/O at 1500 Baud

RS 232C

Two Joysticks (Optional/Extra)

Processor:

6809E with a clock speed of 0.895 MHz.

Display:

16 lines of 32 upper case characters (Lower case may be output to RS-232C and is displayed as upper case in reverse video). Color graphics range from 64x32, 8 colors to 256 x 192 single color with background. Some graphics resolutions require 16K RAM.

New commands and functions available in Extended Color BASIC

Very Important Note: Extended Color BASIC will not function without 16K RAM installed.

Graphic Functions

CIRCLE—Draws circle or arc with specified center, radius, aspect ratio, and color.

COLOR—Sets foreground and background colors.

DRAW—Draws line of specified direction, color and length. Several lines, angles, etc. can be included in one command.

GET—Reads graphics in specified rectangle and stores it in an array for later use.

LINE—Draws line from one point to another. Line can be set to fore- or background color or optionally, a box may be drawn and filled (colored) automatically.

PAINT—Paints graphic color beginning at specified point, with specified color. Painting continues until a border of a specified color is reached.

PCLEAR—Reserves specified number of 1.5K graphic pages.

PCLS—Clears graphic screen to specified color.

PCOPY—Copies contents of source memory page to destination memory page.

PMODE—Selects graphics resolution mode and memory page to start on.

PPOINT—Tests to see whether a specified graphics cell is on or off.

PRESET—Sets specified point to background color.

PSET—Sets specified point to foreground color. If another color is specified, the point is set to specified color.

PUT—Puts graphics from an array onto the screen.

SCREEN—Selects either text or graphics screen and selects color set to be used.

Sound Function

PLAY—Plays music or sounds of specified octave, volume, length, and tempo. More than one note may be PLAYed from the same string.

BASIC Commands

DEL—Allows deletion of lines from a program.

EDIT—Allows editing of a program line.

RENUM—Allows resident program lines to be renumbered.

Math Functions

ATN—Returns arctangent in radians.

COS—Returns cosine in radians.

EXP—Returns natural exponent of a number.

FIX—Returns truncated integer.

LOG—Returns natural logarithm.

SIN—Returns sine in radians.

SQR—Returns the square root of a number.

TAN—Returns tangent in radians.

EXPONENTIATION—Allows numbers to be raised to specified power.

BASIC Statements

CSAVEM—Writes a machine-language tape file.

DEF FN—Defines a user-created function.

DEFUSR—Define entry points for user's machine-language routines.

DLOAD—Loads a machine-language tape file. Includes Baud rate select for 300 or 1200 baud and optional load offset.

HEX\$—Converts decimal value to string hexadecimal value.

INSTR—Returns starting position of substring.

LET—Use of keyword 'LET' is allowed.

LINE INPUT—Line inputs from keyboard.

MID\$ = —Replace old portion of string with new portion.

POS—Returns column position of cursor.

PRINT USING—Formats strings and numbers for display.

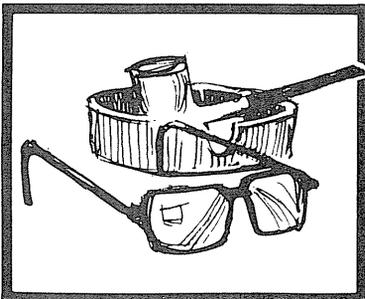
STRING\$—Returns a string of n identical characters.

TIMER—Returns contents of real-time timer.

TRON/TROFF—Turns trace feature on and off.

USRn—Calls one of user's machine language routines.

VARPTR—Gets address where variable contents are stored.



View From the 7th Floor

by Jon Shirley, Vice President Computer Division

Merry Christmas and a great New Year to you all. I just hope we get this issue to you early enough to not make that a belated greeting.

It does feel a little funny to wish Merry Christmas in October but that's how early we need to start to get the Newsletter out. I am writing this in Chicago and it was COLD yesterday but today it's back to normal, wet and hot. I am attending the Midwest Computer Show and Conference. If you have not been to a computer show I recommend that you look for one in your area and go to it. Of course I know you will see all sorts of non-Radio Shack hardware mods, brand X printers etc., but you will also see endless quantities of TRS-80 software. Some of it is good, some bad, a little is great and a little is terrible but it is nice to see that the TRS-80 is the most supported computer ever and that they seem to be providing a living for a lot of people.

If you do get this newsletter before Christmas don't forget our neat new items for Christmas giving. I have not met a teenager yet that has not fallen for a Color Computer. And the Pocket Computer must be this year's most unique and desirable gift. And we beat Neiman Marcus to it! Of course software makes a neat gift for the computer owner and if you want one software package that will delight the entire family try TRS-80 VIDEOTEX. You will have to have an RS-232C and a telephone modem to use it but if you are not so equipped VIDEOTEX provides a great reason to do it now.

The VIDEOTEX software (by now available for all TRS-80s that can communicate, I hope) costs \$29.95 but it includes software, a manual on the CompuServe network, your personal ID number and password and one free hour on CompuServe. No further connect charges are required. (The Source, on the other hand charges \$100 to sign up). After the one hour is up it only costs \$5.00 an hour in non-prime time to access CompuServe. What do you get? The first time I logged on at home with a Color Computer it was a Sunday evening, too late for the news and I wanted the NFC results. I was on for 40 minutes but when I signed off I had read not only the full stories carried the next day in our local paper on Dallas and Houston but also in-depth game coverage of other games that would only get a summary in our paper.

CompuServe is full of neat stuff. In addition to AP news and news from an ever increasing list of other newspapers there is weather, world wide sports coverage (interested in Australian kangaroo race results?), electronic mail to other CompuServe users, Better Homes and Gardens information, our newsletter (if Ed ever gets anything on it), games, stock market and commodities information and more to come including H and R Block tax tips. If you have never seen CompuServe call your local store, many will be able to demonstrate by now or will know which store can. While most will use a color computer for the demo, it also works just great on Models I/II/III. Its the most fun I have had on my computer since Eliza.

I have had several letters lately saying that we need to supply more information on machine language programming. I agree and Mr. Bill Barden who wrote our best seller, *TRS-80 Machine Language Programming*, has given us the draft of his follow up to that great book. It gets into advanced stuff of many kinds including disk operation. Look for it in a few months.

I have read in a few places that the new Model III is just a repackaged Model I. That is simply not true. While we did make the BASIC the same so our programs would run, there are many, many unique new features built into the Model III. Some are hardware like upper and lower case video, improved cassette circuits (1500 baud is super reliable and not very volume sensitive), real time clock, built in printer interface, switching power supply and high resolution monitor. Others are in software in 2K additional ROM. (All this applies to the 16K version, while only some applies to the 4K.) For example there are 96 special characters in addition to the Model I set, there are expanded built in printer functions, the ability to route input/output (like the screen to the printer), terminal software built in for the RS-232C and the system can no longer be "hung up" by a command to a non-existent printer. In addition there are 26 pages of ROM subroutine information in the manual. Of course the disk system is all new with a new TRSDOS loaded with features. I know you already have a TRS-80, but if you need another . . .

See you next year

Peripherals

(from Page 6)

cup of tea. In addition to printing normal "dot matrix" characters in 80 and 132 column format it can also be set to a "high density," proportionally spaced mode.

Here the dots are laid down closer together to form a font more nearly resembling a "formed character." LP IV is a low cost answer for word processing needs. It should be especially attractive to students or authors wanting to produce term papers or other manuscripts.

Watch this space for detailed articles about these products.

CHRISTMAS GIFT IDEAS

Computer accessories make excellent gift items. Go to your nearby store and get a copy of the excellent Computer Catalog RSC-4. It has a lot of good information about selecting computer systems and peripherals — there's that word again!. The Mini-Disk storage case (26-1452 — \$3.95) or the Cassette/Diskette storage box (26-1450 — \$19.95) are excellent gift items. There are also 3-ring diskette storage holders for both 5¼ and 8 inch media.

The TRS-80 Telephone Interface II

(26-1171 — \$199.00) will allow you to connect your computer to the outside world. VIDEOTEX software can put you in direct contact with an ever growing pool of information and bring to your home a variety of space-age services. Be the first on your block to join the new "AGE OF INFORMATION"! (RS-232 Required)

If you don't have a printer, treat yourself to MIGHTY MITE — Quick Printer II. The benefits of being able to produce a hard copy listing of a lengthy program as an aid to debugging make its low price (\$219.00) very worthwhile. It is available for order "off the shelf" at most stores.

A Holiday Forest

Model III Tree on page 14.
Color Computer Tree on page 14.
Pocket Computer Tree on page 15.

A Tree for Level I, Mod III

This Christmas Tree for Level I computers was provided by Mr. A. B. Liles of Vancouver, WA.

```

10 REM ** THIS PROGRAM
  PRINTS A CHRISTMAS
  TREE ON
20 REM ** THE SCREEN
  AND LIGHTS STARS AND
  LIGHTS
30 REM ** ON THE TREE
  AND PRINTS CHRISTMAS
  MESSAGES
40 CLS
50 REM ** PRINT A
  CHRISTMAS MESSAGE,
  MAX 25 CHARACTERS
60 PRINT AT 67, "PUT
  YOUR MESSAGE HERE"
70 PRINT AT 131, "YOU
  CAN PUT ONE HERE
  TOO"
80 REM ** PRINT TREE
  AND DECORATE
90 X=64
100 FOR K=0 TO 30
110 SET(X+K,4+K)
120 SET(X-K,4+K)
130 NEXT K
140 FOR S=34 TO 94
150 SET(S,34)
160 NEXT S
170 X=60
180 Y=34
190 K=8
200 FOR L=X TO X+K
210 SET(L,Y)
220 SET(L,Y+K)
230 NEXT L
240 FOR M=Y TO Y+K
250 SET(X,M)
260 SET(X+K,M)
270 NEXT M
280 SET(64,2)
290 SET(63,3)
300 SET(64,3)
310 SET(65,3)
320 Y=12
330 FOR X=58 TO 82
  STEP 2
340 SET(X,Y)
350 Y=Y+1
360 NEXT X
370 Y=32
380 FOR X=35 TO 72
  STEP 2
390 SET(X,Y)

```

```

400 Y=Y-1
410 NEXT X
420 REM ** PRINT
  PACKAGES UNDER TREE
430 X=35
440 Y=36
450 K=6
460 GOSUB 10000
470 X=42
480 Y=38
490 K=4
500 GOSUB 10000
510 X=75
520 Y=38
530 K=4
540 GOSUB 10000
550 X=80
560 Y=36
570 K=6
580 GOSUB 10000
590 REM ** FINISH
  DECORATIONS
600 SET(65,9):
  SET(63,11)
610 SET(57,14):
  SET(73,16)
620 SET(61,16):
  SET(51,21)
630 SET(40,31):
  SET(89,32)
640 SET(55,17)
650 Q=25
660 R=50
670 REM ** FLASH TREE
  LIGHTS
680 FOR D=1 TO 1000
690 X=RND(76)
700 IF X<52 GOTO 690
710 Y=RND(33)
720 IF Y<17 THEN 710
730 SET(X,Y)
740 FOR B=1 TO 15:NEXT B
750 RESET(X,Y)
760 GOSUB 20000
770 REM** PRINT
  CHRISTMAS MESSAGE,
  MAX 15 CHAR,
780 IF D=Q GOSUB 22000
790 IF D=R GOSUB 22500
800 NEXT D
810 GOTO 680
10000 FOR L=X TO X+K
10010 SET(L,Y)
10020 SET(L,Y+K)
10030 NEXT L
10040 FOR M=Y TO Y+K
10050 SET(X,M)
10060 SET(X+K,M)
10070 NEXT M
10080 RETURN
19990 REM ** SET OTHER
  FLASHING LIGHTS

```

```

20000 SET(80,28):
  RESET(80,28)
20010 SET(45,30):
  RESET(45,30)
20020 SET(65,12):
  RESET(65,12)
20030 SET(64,7):
  RESET(64,7)
20040 SET(77,24):
  RESET(77,24)
20050 SET(48,32):
  RESET(48,32)
20060 RETURN
22000 PRINT AT 110,
  "YOUR MESSAGE"
22010 PRINT AT 174,
  "MESSAGE # 2"
22020 PRINT AT 238,
  "MESSAGE # 3"
22030 Q=Q+50
22040 RETURN
22500 PRINT AT 110,
  "YOUR MESSAGE"
22510 PRINT AT 174,
  "MESSAGE # 2"
22520 PRINT AT 238,
  "MESSAGE # 3"
22530 R=R+50
22540 RETURN

```

Model VIII (from Page 2)

entific notation. VisiCalc's print ability allows for printing of your choice of rectangular portions of the VisiCalc worksheet on an optional TRS-80 Printer. In addition VisiCalc worksheets can be saved in a Data Interchange Format which allows access thru BASIC to develop special reporting requirements.

As your familiarity with VisiCalc grows the more advanced features become useful. VisiCalc allows insertion or deletion of additional rows and columns, lookup to scan and test a table of values for a match, movement of rows and columns within the worksheet, splitting of the screen into two independent windows, synchronized or unsynchronized scrolling of these windows, and the use of functions such as SUM, MIN, MAX, AVERAGE, NPV for Net Present Value, ABS, and transcendental functions like sine, cosine, etc. If you have a 16K TRS-80 Model I with Level II BASIC, a 16K Expansion Interface, and one Mini-Disk or a 32K Model III with Model III Basic and drives you are ready to get started with VisiCalc.

VisiCalc is \$99.95 (26-1566 for Model I, 26-1567 for Model III. Model III version available January 30.) and includes a VisiCalc manual with a tutorial and a command reference section, a quick reference card, and the program diskette.

Carrying Case Sale (26-500, \$39.95)
Ends Dec. 31, 1980

BASE CONVERSION PROGRAM

The following program is quite a bit fancier than the program we published in the March/April Newsletter. Using this program, you can input a value in any of four bases (Binary, Octal, Decimal, or Hexadecimal) and immediately see the same value in the other three bases. We have used this on Models I, II and III with no problems. Changes needed to make this work in an Extended BASIC Color Computer are shown after the program listing.

```

10 CLS
20 PRINT"BINARY * * DECIMAL * *
   HEXADECIMAL * * OCTAL"
30 PRINT"          * * CONVERSION * *"
40 PRINT"          BY"
50 PRINT"          JOHN R INGERSOLL"
60 FOR I=1 TO 500:NEXT I
70 CLEAR 100: CLS
80 PRINT"THIS PROGRAM CONVERTS THE
   INPUT NUMBER TO"
90 PRINT"BINARY, OCTAL, DECIMAL, AND
   HEXADECIMAL"
100 PRINT:PRINT"(ADD THE SUFFIX B, O, D,
   OR H TO THE"
110 PRINT"NUMBER YOU INPUT)"
120 PRINT
130 INPUT"ENTER NUMBER TO BE CONVERTED
   (IE - 123D)";NI$
140 IF RIGHT$(NI$,1)="B" THEN BI%=2:
   GOTO 210
150 IF RIGHT$(NI$,1)="O" THEN BI%=8:
   GOTO 210
160 IF RIGHT$(NI$,1)="D" THEN BI%=10:
   GOTO 210
170 IF RIGHT$(NI$,1)="H" THEN BI%=16:
   GOTO 210
180 CLS:PRINT"PLEASE USE THE INDICATED
   SUBSCRIPTS"
190 PRINT"SO I KNOW WHAT YOU WANT -"
200 GOTO 130
210 CLS
220 PRINT" HEX", "DECIMAL", "OCTAL",
   "BINARY"
230 PRINT STRING$(58,131)
240 L%=LEN(NI$)
250 NI$=LEFT$(NI$,L%-1)
260 PRINT
270 BO%=16: GOSUB 360: PRINT NO$,
280 BO%=10: GOSUB 360: PRINT NO$,
290 BO%=8: GOSUB 360: PRINT NO$,
300 BO%=2: GOSUB 360: PRINT NO$
310 PRINT
320 PRINT STRING$(58,131)
330 INPUT"NEXT NUMBER TO BE CONVERTED";
   NI$
340 CLS
350 GOTO 140
360 REM BASE CONVERSION SUBROUTINE
370 REM CONVERT TO DECIMAL
380 L%=LEN(NI$)
390 DEC=0
400 PWR%=0
410 FOR J=L% TO 1 STEP -1
420 K%=ASC(MID$(NI$,J,1))
430 IF K%>64 THEN K%=K%-7
440 K%=K%-48
450 IF K%<BI% AND K%>-1 THEN 490

```

```

460 PRINT"INVALID INPUT FOR BASE ";
470 PRINT BI%
480 RETURN
490 DEC=DEC+INT(K% * BI% ^ PWR% + .5)
500 PWR%=PWR% + 1
510 NEXT J
520 REM CONVERT DECIMAL TO BASE #
530 H$="0123456789ABCDEF"
540 NO$=" "
550 PWR%=LOG(DEC)/LOG(BO%)
560 FOR J=PWR% TO 0 STEP -1
570 XX=INT(BO% ^ J + .5)
580 CH%=DEC/XX
590 NO$=NO$+MID$(H$,CH%+1,1)
600 DEC=INT(DEC - CH% * XX + .5)
610 NEXT J
620 RETURN
630 END

```

To use this program, enter it save it on tape or diskette. When you need to make base conversions, enter the number to be converted immediately followed by "B," "O," "D" or "H" depending upon whether the number entered is binary, octal, decimal or hexadecimal. The program will convert the input value to decimal, then to each of the four bases. Response time is very rapid and you can input values for any of the bases, as long as you remember the base suffix.

If you run this program on Models I or III, it will run as printed. For Model II, you may wish to change the first value in the two STRING\$ commands to 79.

If you would like to use this program in Extended Color BASIC, leave out the "%" after variable names. Change the first value in the two STRING\$ commands to 31. Only two other changes are needed. Change lines 550 and 580 to read:

```

550 PWR=INT(LOG(DEC)/)/LOG(BO)+.00001)
580 CH=INT(DEC/XX)

```

Our thanks to John Ingersoll of Rapid City, SD for this "Rapid" base conversion program.

Some useful Printer Subroutines for Model I/III

Mr. Ron Merchant of Jackson Miss., provided these printer subroutines:

```

10000 'ROUTINE TO CENTER COPY ON A PAGE
10100 'A$= COPY TO BE PRINTED
10200 'NC= NUMBER OF CHARACTERS PER LINE
   YOUR PRINTER
10300 ' WILL PERMIT
10400 LPRINT STRING$( NC/2 -
   (LEN(A$)/2),32);
10500 RETURN
11000 'TO PRINT A COLUMN WITH A RIGHT
   JUSTIFIED MARGIN.
11100 'INSTEAD OF A LEFT JUSTIFIED
   MARGIN
11200 LPRINT STRING$( NC- LEN(A$),32);
11300 RETURN
12000 'ROUTINE TO MOVE PAPER TO
   TOP-OF-FORM
12100 'NL= NUMBER OF LINES IN YOUR FORM
12300 FOR I= PEEK(16425) TO NL
12400 LPRINT" "
12500 NEXT I
12600 RETURN

```

(Continued on Page 13)

```

13000 'ROUTINE TO COUNT LINES, PRINT A
      FOOTER, AND
13100 'EXECUTE TOP-OF-FORM
13200 A$="CONTINUED ON PAGE ** , PLEASE"
13300 L=L+1 'NUMBER OF LINES PRINTED ON
      THIS PAGE
13400 IF L< PL THEN RETURN 'PL=# OF
      LINES TO PRINT
13500 GOSUB 10000 'CENTER A$
13600 LPRINT USING A$;P
13700 GOSUB 12000 'MOVE TO TOP-OF-FORM
13800 P=P+1 'INCREMENT PAGE COUNTER
13900 L=0 'RESET LINE COUNTER
14000 RETURN
    
```

Paging on the Line Printer I for Models I and III

Richard Halloran of San Francisco, CA sent us this routine which, when used with a disk system, will let you print "pages" of information on the Line Printer I (26-1150 or 26-1152).

The program is:

```

10 CLEAR 500
20 OPEN "I",1,"BUDGER/BAS"
30 FOR I=1 TO N
40 IF PEEK(16425) = 50 THEN LPRINT
   CHR$(12)
50 LINEINPUT#1, R$
60 LPRINT R$
70 NEXT N
80 CLOSE
90 LPRINT CHR$(12)
    
```

Program Notes:

1. N is the total number of lines that will be printed.
2. The value 50 in line 40 can be changed to any number of lines you would like to have printed on a page.
3. The program name "BUDGER/BAS," should be changed to match the file name you gave the program or file you want listed.

How to use the program:

To use this program, first, save the text you want printed on disk. If you want to print a program listing, be sure that you save the program in ASCII format by using the ",A" option.

Second, load and RUN this program. This program will read your text file from disk one line at a time and print it. When 50 lines (or as many as you have specified) have been printed, the computer will move the paper to Top-of-Form and then continue printing. After all of the lines have been printed (controlled by the value you give N), the paper will again be moved to Top-of-Form.

The result of using this program should be neatly printed information paged just the way you want it!

This program will work with both Model I and Model III, and with printers other than the Line Printer I.

Tiny Pascal Line Printer Procedure

Recently, while working with our Tiny Pascal program (26-2009), I wanted to have a hardcopy of a program listing. Tiny Pascal does not provide printer output, so I decided to use a technique we published in the Dec. 1979 Newsletter. The idea is to redefine the Device Control Block (DCB) of the video to the printer DCB. This is accomplished in BASIC by POKEing appropriate values into memory locations 16414 and 16415.

In Tiny Pascal, the 'MEM(address):=' command is equivalent to BASIC's POKE. The program listing which follows is written in Tiny Pascal, and demonstrates Tiny Pascal's ability to change the DCBs. The first two PROCedures redefine the DCB. The first, called 'PRINTER' will send anything which would normally go to the video to a line printer (make sure yours is connected and ready!). The second routine, called 'VIDEO,' will put things back to normal.

The rest of this program is a demonstration of your new ability to output to your printer. The computer will constantly scan the keyboard. If the 'P' key is pressed, output will be sent to the printer. On the next scan, you will probably not be pressing the 'P' key so output will return to the video. To end the program, press 'Q'. In this program I could have left the output going to the printer, and then had you use the 'V' key to get back to the video; however, this uses a lot of paper in a hurry, so I made the return to the video automatic.

In your Tiny Pascal programs, all you need to duplicate is the two PROCedures, 'PRINTER' and 'VIDEO.' Then when you want output to be sent to the printer, simply use 'PRINTER.' To return things to normal, use 'VIDEO.'

```

(* LINE PRINTER DEMO PROGRAM *)
VAR TEMP:INTEGER; (* GLOBAL VARIABLE *)
PROC PRINTER; (* SET DCB TO LINE
PRINTER *)
BEGIN
  MEM(16414):=141;
  MEM(16415):=5;
  END;
PROC VIDEO; (* SET DCB FOR VIDEO *)
BEGIN
  MEM(16414):=88;
  MEM(16415):=4;
  END;
PROC ANSWER; (* GET KEYBOARD VALUE *)
VAR NUMBER:INTEGER;
BEGIN
  CASE INKEY OF
    'P': NUMBER:=1;
    'Q': NUMBER:=2;
    'V': NUMBER:=3
    ELSE NUMBER:=0
  END;
  TEMP:=NUMBER;
  END;
PROC COUNT; (* PRINT NUMBERS 1 - 10 *)
VAR NUMBER:INTEGER;
BEGIN
  NUMBER:=0;
  REPEAT
    WRITE(NUMBER#,13);
    NUMBER:=NUMBER+1;
  UNTIL NUMBER=11
  END;
(* MAIN PROGRAM *)
BEGIN
  REPEAT (* UNTIL 'Q' (TEMP=2) THEN END *)
  WRITE(28,31,'OUTPUT TO <P>PRINTER OR
<V>IDEO',13);
  ANSWER; (* USE PROCEDURE 'ANSWER' *)
  IF TEMP=1 THEN PRINTER ELSE VIDEO;
  COUNT; (* USE PROCEDURE 'COUNT' *)
  UNTIL TEMP=2; (* STOP ON 'Q' *)
  END;
    
```

A Tree for Models I and III

Program provided by Stefan Cemusca.

```

10 DIM A(50)
20 FOR N=1 TO 10
30 FOR X=1 TO 1022 STEP 7
40 PRINT@X," HAPPY NEW
YEAR 1981 TO ALL OF
YOU!"
50 NEXT X
60 FOR X=1 TO 1500:NEXT X
70 FOR X=1022 TO 0
STEP -5
80 PRINT@X," FROM TRS-80"
90 NEXT X
100 FOR X=1 TO 1000:NEXT X
110 CLS
120 PRINT CHR$(23)
130 PRINT@0,"MERRY";
140 PRINT@34,"SEASONS";
150 PRINT@66,"CHRISTMAS";
160 PRINT@100,
"GREETINGS!";
170 J=64
180 K=64
190 FOR S=1 TO 39 STEP 2
200 FOR Y=S TO 39
210 SET(J,Y)
220 SET(K,Y)
230 J=J-1
240 K=K+1
250 NEXT Y
260 J=64
270 K=64
280 NEXT S
290 FOR Y=40 TO 47
300 SET(63,Y)
310 SET(64,Y)
320 SET(65,Y)
330 NEXT Y
340 FOR X=50 TO 78
350 SET(X,47)
360 NEXT X
370 FOR X=53 TO 76
380 SET(X,46)
390 NEXT X
400 FOR X=54 TO 74
410 SET(X,45)
420 NEXT X
430 FOR D=1 TO 50
440 READ A(D)
450 NEXT D
460 DATA 55, 74, 49, 56,
83, 64, 75, 42, 66,
55, 74
470 DATA 51, 70, 47, 60,
48, 88, 73, 49, 36,
78, 82
480 DATA 47, 83, 88, 44,
71, 58, 72, 57, 83,
78, 54
490 DATA 62, 48, 35, 61,
73, 41, 62, 34, 78,
29, 76

```

```

500 DATA 81, 43, 73, 45,
87, 81
510 FOR F=1 TO 12
520 D=0
530 FOR Y=17 TO 39
540 D=D+1
550 K=A(D)
560 SET(K,Y)
570 IF D=50 THEN Y=39
580 NEXT Y
590 D=0
600 FOR Y=20 TO 39
610 D=D+1
620 K=A(D)
630 SET(K,Y)
640 NEXT Y
650 D=0
660 FOR Y=1 TO 20
670 D=D+1
680 K=A(D)
690 RESET(K,Y)
700 RESET(K,Y+10)
710 NEXT Y
720 FOR Y=20 TO 40
730 D=D+1
740 K=A(D)
750 RESET(K,Y)
760 IF D=20 THEN Y=40
770 NEXT Y
780 NEXT F
790 RESTORE
800 CLS
810 NEXT N

```



Color Computer

(from Page 4)

tion) and how to access the higher resolution graphics of which the machine is capable. (Information concerning video memory locations and an overall memory map is currently available from Customer Service). We are sorry that when the machines were ready to ship that the documentation was not complete; but rather than keep the Color Computer from you, we sent what we had available. The extra card along with the registration card which you filled out should have put you on the list to get the additional information as it comes available. In other words, when I get it, YOU'LL get it. OK?

A Tree for your Color Computer

This Christmas Tree was adapted for the Color Computer from the Model I/III Tree provided by Mr. Stefan Cemusca, of Susquehanna, PA. Stefan has been a constant supplier of program ideas throughout the year. Thank You, Stefan.

```

10 FOR X=3 TO 480 STEP 7
20 PRINT@X, " MERRY
CHRISTMAS FROM US
ALL! "
30 PRINT@X+32," HAPPY NEW
YEAR TO YOU ALL! "
40 FOR I=1 TO 20:NEXT I
50 NEXT X
60 FOR X=1 TO 1000:NEXT X
70 FOR X= 510 TO 0
STEP -5
80 PRINT@X, " FROM
TRS-80 "
90 FOR I=1 TO 20: NEXT I
100 NEXT X
110 FOR X=1 TO 1000:
NEXT X
120 CLS 0
130 PRINT@4," MERRY ";
140 PRINT@22," HAPPY ";
150 PRINT@34," CHRISTMAS ";
160 PRINT@53," NEW YEAR ";
170 J=32
180 K=32
190 FOR S=1 TO 25 STEP 2
200 FOR Y=S TO 25
210 SET(J,Y,1)
220 SET(K,Y,1)
230 J=J-1
240 K=K+1
250 NEXT Y
260 J=32
270 K=32
280 NEXT S
290 FOR Y=25 TO 31
300 SET(31,Y,8)
310 SET(32,Y,8)
320 SET(33,Y,8)
330 NEXT Y
340 FOR X=27 TO 37
350 SET(X,31,6)
360 NEXT X
370 FOR X=30 TO 34
380 SET(X,30,6)
390 NEXT X
400 FOR I=1 TO 50
410 Y=RND(25)
420 X=RND(Y)
430 SET(32-X,Y,RND(8))
440 SET(32+X,Y,RND(8))
450 FOR W=1 TO 100:NEXT W
460 NEXT I
470 RUN

```

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A Tree for the Pocket Computer

```

10 PAUSE "MERRY CHRISTMAS"
20 PAUSE " AND"
30 PAUSE "HAPPY NEW YEAR"
40 PAUSE " * (TREE)"
50 PAUSE " ***"
60 PAUSE " *****"
70 PAUSE " *****"
80 PAUSE " * (TRUNK)"
90 PAUSE " *** (STAND)"
100 GOTO 10
    
```

IF UNDELIVERABLE DO NOT RETURN

Education

(from Page 7)

this information on teacher requests, and as positions open the file can automatically be searched to give those who already are employees the first chance at the new opening.

SUBSTITUTE SELECTION SYSTEM.

Because of the very nature of the task, the job of selecting and calling substitute teachers must be done quickly. In periods of bad weather, or "flu" epidemics, those individuals who must locate and engage substitutes find themselves facing almost overwhelming difficulties. With the development of a "substitute" file using PROFILE this task can be made manageable. Using a program such as the auxiliary BASIC retrieval and display program described earlier, the individual looking for substitutes can specify the combination of subject-matter specialty desired, and if the file also contains some sort of substitute rating, a display of potential substitutes, together with address and phone number, can be displayed in descending order of desirability. Certainly such a use of PROFILE would be much appreciated by those charged with keeping the classrooms manned.

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

COMPUTER SERVICES ADDRESS AND PHONE NUMBERS

8 AM to 7 PM Central Time

Sat., Dec. 20 8 AM-12 NOON
 Fri., Dec. 26 8 AM-5 PM
 Fri., Jan. 2 8 AM-5 PM

Computer Services
 900 Two Tandy Center
 Fort Worth, Texas 76102

1-800-433-1679 (WATS except Texas)
 1-800-772-5914 (WATS inside Texas)
 1-817-390-3583 (Switchboard)

VEHICLE MAINTENANCE SYSTEM.

Operating a fleet of vehicles on a daily basis demands that the decision-makers have a large amount of maintenance information available for decisions concerning required upkeep and even when it is no longer appropriate to repair but time to sell. PROFILE can be programmed to provide the data collection system for such files, and the display system to allow decisions to be made, thus maximizing the efficiency of the entire operation. In such a system the periodic maintenance which is so important could be specified and then recorded. Thus each vehicle would have a history available when decisions concerning that vehicle are required. Again, this is a use of PROFILE that allows an increase in efficiency in a critical area.

These are but a few of the possible education-related applications of this powerful, yet easy-to-use, information storage and retrieval system. With the addition of a multiple variable search and display program designed to suit your particular application, this system is an especially valuable tool for today's educational decision-makers.

Plot Routine

Mr. John Corbani of Santa Barbara, CA sent us this plot routine for Christmas. The following is from Mr. Corbani's letter: The following variables are used:

XO = X Old , YO = Y Old
 XN = X New , YN = Y New
 XS = X Step , YS = Y Step
 XP = X Polarity , YP = Y Polar.
 XD = X Difference (XN - XO), YD = Y Diff.

The subroutine is entered by assigning values to XO, YO and XN, YN, the starting and finishing points of a vector. Note that XO, YO need only be furnished for the first set of contiguous vectors.

Lines 1000 to 1210 comprise the plotting subroutine itself. Lines 100 to

1000 demonstrate the calling sequence for a pair of triangles of different sizes.

```

100 REM FIRST TRIANGLE
110 DATA 10,40, 30,40
120 DATA 20,30, 10,40
130 REM SECOND TRIANGLE
140 DATA 40,40, 120,40
150 DATA 80,10, 40,40
160 CLS
170 READ XO, YO
180 FOR A=1 TO 3
190 READ XN,YN
200 GOSUB 1000
210 NEXT
220 READ XO, YO
230 FOR A=1 TO 3
240 READ XN,YN
250 GOSUB 1000
260 NEXT
270 GOTO 270
1000 XD=XN-XO
1010 XP=SGN(XD)
1020 XD=ABS(XD)
1030 YD=YN-YO
1040 YP=SGN(YD)
1050 YD=ABS(YD)
1060 IF XD<1 AND YD<1
    THEN RETURN
1070 IF XD<YD THEN XS=XD/
    YD*XP: GOTO 1150
    ELSE YS=YD/XD*YP
1080 ON ERROR GOTO 1140
1090 FOR XO=XO TO XN
    STEP XP
1100 SET(XO,YO)
1110 YO=YO+YS
1120 NEXT
1130 YO=YN: XO=XN: RETURN
1140 RESUME 1110
1150 ON ERROR GOTO 1210
1160 FOR YO=YO TO YN
    STEP YP
1170 SET(XO,YO)
1180 XO=XO+XS
1190 NEXT
1200 YO=YN: XO=XN: RETURN
1210 RESUME 1180
    
```

The error trap may be reset to another part of the program after plotting.