

TRS-80[®]

Volume 4, Issue 11

DECEMBER 1982

\$1.50

Microcomputer News

Outside Software Support

**Model III Business
Graphics**

1982 Annual Index



Fort Worth Scene



Here we are at the end of our first forty-eight page per issue year. Thumbing through the last year of Newsletters, brings to mind the many changes that have taken place. 1982 saw Bill Barden's series of articles on 6809 assembly language for the Color Computer begin in February as did our two for one media exchange program for user submitted material on tape or disk (not to mention CompuServe).

We have looked at the Pocket Computer II, SuperSCRIPSIT, the Model II Graphics board, the digitizer, hard disks, a whole new line of printers (including dot matrix, daisy wheel, and plotters) for all the computers, terminals, myriad software packages, a new operating system in LDOS, and much, much more. It all leaves us in a state of wonder and breathless anticipation—wonder at what has been accomplished in the Radio Shack line of computer products in this last short year and anticipation at the promise of the many exciting things yet to come.

RING OUT THE OLD, BRING ON THE NEW

While 1982 was a good year for TRS-80s (excellent in fact), 1983 promises to be even better. We cannot tell you everything that may be coming up in the computer line, but we thought you might be interested in the 1983 TRS-80 Microcomputer News topics.

- January—Getting Started
 - Where are you going to put it?
 - Getting it running
 - Selection and care of software
 - What if it doesn't work?
- February—Utilities
 - FORMAT, BACKUP, XFERSYS
 - PATCH, BUILD, DO
 - Personal utilities
 - BASIC utilities
- March—Peripherals
 - What is a peripheral?
 - Storage devices
 - Input devices
 - Output devices
- April—Communications/Databases
 - What is a database?
 - How do I talk to a database?
 - Commercial databases
 - Personal/Business databases
- May—Home
 - Education
 - Management
 - Environmental Control
 - Recreation
- June—Graphics
 - Low resolution
 - High resolution
 - Printers
 - Using graphics
- July—Games
- August—Word Processing
 - What is a word processor?
 - SCRIPSIT
 - Writing your own word processor
 - Getting the most out of your word processor
- September—Education
 - Computer literacy
 - Home education

- Business education
- Education resources
- October—What's New and System Integration
 - What's new for '84?
 - Getting programs to work together
 - Using Dow Jones/CompuServe with BASIC
 - Terminal/SCRIPSIT/BASIC
- November—Operating Systems
 - What is an operating system?
 - TRSDOS
 - LDOS
 - Multi-user
- December—Languages/Modeling/Christmas
 - Why are there different languages?
 - Machine language
 - High level languages
 - Modeling

If you have something related to one of these topics that you want to send us for possible publication, keep in mind that we work three to four months ahead of the month that the News actually goes into print. Don't let that be a limiting factor though, because if you send something we really like, we can run it any time.

Thank you for your contributions and interest in TRS-80 Microcomputer News. Best wishes for the holiday season and a very happy, prosperous 1983 to you and yours from all our staff. 📺



TRS-80[®] Microcomputer News

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TRS-80 Microcomputer News is published monthly by Radio Shack, a division of Tandy Corporation. A single six month subscription is available free to purchasers of new TRS-80 Microcomputer systems with addresses in the United States, Puerto Rico, Canada and APO or FPO addresses. Subscriptions to other addresses are not available.

The subscription rate for renewals and other interested persons with U.S., APO or FPO addresses is twelve dollars (\$12.00) per year, check or money order. Single copies of the Microcomputer News may be purchased from Radio Shack Computer Centers or Computer Departments for \$1.50 suggested retail each.

The subscription rate for renewals and other interested persons with Canadian addresses is Fifteen dollars (\$15.00) per year, check or money order in U.S. funds. All correspondence related to subscriptions should be sent to: Microcomputer News, P.O. Box 2910, Fort Worth, Texas 76113-2910.

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

Back issues of Microcomputer News prior to January, 1981 are available through your local Radio Shack store as stock number 26-2115 (Suggested Retail Price \$4.95 for the set). Back issues of 1981 copies are available as stock number 26-2240 (Suggested Retail Price \$9.95 for the set).

The TRS-80 Newsletter welcomes the receipt of computer programs, or other material which you would like to make available to users of TRS-80 Microcomputer systems. In order for us to reprint your submission, you must specifically request that your material be considered for reprinting in the newsletter and provide no notice that you retain copyrights or other exclusive rights in the material. This assures that our readers may be permitted to recopy and use your material without creating any legal hassles.

Material for publication should be submitted on magnetic media (tape, disk, or CompuServe). If you submit material on tape or disk, and it is accepted for publication, we will send you two cassettes or diskettes for each one you sent us. Cassettes will come from our box of mixed blank cassettes. If you submit material on CompuServe, and we think we may use the material, we will extend your Microcomputer News subscription by six months for each article accepted. If you are submitting material over CompuServe, please include your name and address or your subscription number so we can find you. If the material is very short, send it to us in E-Mail. If you have more than a few lines, you need to place the material in the ACCESS area of CompuServe and then let us know it is there by leaving a message on E-Mail.

Material may be submitted by mail to P.O. Box 2910, Fort Worth, Texas 76113-2910, or through CompuServe. The Microcomputer News' CompuServe user ID number is 70007,535.

Notes to Program Users:

Programs published in the Microcomputer News are provided as is, for your information. While we make reasonable efforts to ensure that the programs we publish here work as specified, Radio Shack can not assume any liability for the accuracy either of the programs themselves or of the results provided by the programs.

Further, while Microcomputer News is a product of Radio Shack, the programs and much of the information published here are not Radio Shack products, and as such can not be supported by our Computer Customer Service group. If you have questions about a program in the Microcomputer News, your first option is to write directly to the author of the program. When possible, we are now including author's addresses to facilitate communications. If the address is not published, or if you are not happy with the response you get, please write us here at Microcomputer News. We will try (given the limited size of our staff) to find an answer to your question and, in many cases, will publish the answer in an up-coming issue of Microcomputer News.

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Prices shown in TRS-80 Microcomputer News are in U.S. Funds.

View From the Seventh Floor

by Jon Shirley
Vice President
Radio Shack Computer Merchandising

It is hard to believe that it is Christmas time already and another year is almost gone. Back in September we had our fifth anniversary in the microcomputer business but we hardly had time to notice it, as we surged into our sixth year with a great many new ideas for new products. 1983 will be our most exciting year, yet 1982 was certainly not too bad.

Christmas, among its other connotations, does mean gifts, and we have numerous suggestions for the TRS-80 owner. Our number one family gift is the Color Computer, specially priced for giving. If you already have a CoCo check out all the new software like MegaBug, Microbes, Poltergeist, Clowns and Balloons, and Tennis. A Pocket Computer is a neat idea for the man who has everything. Videotext software and a modem are welcome additions to any TRS-80. I don't want to run an ad here, but if you are stuck for gifts, check out the local Shack; we have gifts for boys and girls from 8 to 80.

One gift any owner of a computer would like is a subscription to a magazine. Here are a few ideas for you, based on what we read. Please understand that we are not involved in these publications but merely want you to know they exist.

80-US is a rapidly growing publication that supports all our Models from the Pocket Computer to the Model 16. They review products and publish programs. They would like to increase their readership, so here is a special offer for Microcomputer News readers. Write to them and say you are interested, and they will send you one free issue to check out. No risk or obligation. If you like it, subscribe. If you don't like the publication, give it to the Boy Scouts paper drive. Write to them at: 80-US Journal, 3838 South Warner St., Tacoma, Washington 98409, and request a sample copy.

The Rainbow is exclusively for the Color Computer and it has been growing in size recently. They also publish and review software, and it is a good source for third party programs. They can be contacted at: The Rainbow, 5803 Timber Ridge Dr., Prospect, KY 40059.

Also for the Color Computer is an interesting publication, without ads, called the Color Computer Index. It is an index to articles, programs, reviews, and news releases about the Color Computer. The one I saw had 25 pages of items listed by title, author, and subject from 6 different magazines and the TRS-80 Microcomputer News. They do not publish the actual articles, just a bibliographic citation and brief annotation. Of course, most of the cited articles can be found at a local library. For more information write to: American Library and Information Services, 3705 Mary Ellen NE, Albuquerque, NM 87111.

Yet another new magazine is called two/sixteen and is obviously for Model II and 16 owners. It is published bi-monthly, but might go monthly if they get enough subscriptions. It is a nice looking magazine and the issue I saw had a

great deal of useful information. Write to: two/sixteen, 131 East Orange St., Lancaster, PA 17602.

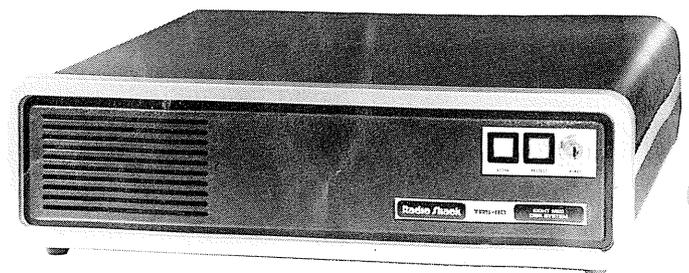
HARD DISK

Off the Christmas theme for a minute, I would like to talk about the hard disk. I use one, and I now have a lot of very valuable information on it. To insure the safety of that information, I do backups. Hard disks do fail, although not very often, and it is easy to forget the backups and assume it will run forever. Do that and it is certain to fail. Someone's law. Our manual leaves something to be desired and is being redone, but here is the procedure I follow and recommend that you follow, if you keep large amounts of data updated frequently on the disk. Once a month backup the entire disk. Do that by invoking `SAVE :4 TO 0 {SYS,ALL}`. This will save all user files and programs and system items like runtimes that are not on the INIT disk.

Each day (or even twice a day if the disk is used all day long) back up those files modified since the last backup. To do that: `SAVE !:4 TO 0 {DM>MMDDYY}` where MMDDYY is the date of your last full month end backup. This will SAVE only those files or programs that were changed since the last full backup. Should your disk fail, all you would need are two sets of diskettes to recapture everything up to the end of the previous day. The procedure would be `RESTORE 0 TO 4 {SYS}`, using the month end set, then `RESTORE 0 TO 4` again using the month end set. Then take the last day set and do `RESTORE 0 TO 4 {ABS}`. This last step will write over those files that have been modified and bring them up to date. If you are a very heavy user of the hard disk, you may want to do the big save more often, twice a month or even weekly, to make the daily saves faster.

And no matter which machine you have or what media you use, please make backups if you value your data. There is no such thing as a failsafe computer.

Thanks for reading the Microcomputer News this year and for your support of the TRS-80. Have a happy holiday and a great new year. Until next year. 📄



Outside Software Support

Radio Shack is launching an innovative new Outside Software Support Program. This new program offers a variety of support and assistance services to third-party software vendors who are developing software to run on any of Radio Shack's TRS-80 computers. Radio Shack Vice President for Computer Merchandising, Jon Shirley, acknowledges the program as "A major effort to aggressively support the needs of independent software developers who are themselves interested in supporting the needs of TRS-80 computer owners and users."

This new Outside Software Support Program is available to virtually all professional software developers with an interest in creating and marketing programs to run on Radio Shack TRS-80 computers. "This is most assuredly a third-party plan in every sense," comments Shirley. "Unlike our earlier policy, the software being developed with the support of our new program does not have to be intended for eventual sale through Radio Shack stores and dealers. We're putting this program in place specifically to help develop new options for people who own our hardware."

Technical assistance is one of the key services provided by the new Outside Software Support Program; others include customer referrals through a software review program and a directory of outside software, and product line consideration, if desired, by Radio Shack.

The Technical Assistance Program will provide information to aid the development of software for TRS-80 computers. Licensing of Radio Shack TRSDOS (disk operating systems) and BASIC, sale of TRSDOS source codes and bulk sale of RUNTIME packages will be made available. Information updates on new operating system releases, new patches and new hardware will also be offered.

SOFTWARE SUPPORT PROGRAM

The Radio Shack Software Support Program was established to assist third party software firms in the development and/or conversion of reliable, specialized software for our TRS-80 line of computers.

If you or your company wish to develop specialized software packages for the TRS-80 computer line under TRSDOS and are interested in a relationship with Radio Shack, write for an Application (or pick one up at your local Radio Shack Computer Center—Form # FC-3013), and mail it to Radio Shack.

If your application meets the criteria for the Radio Shack Software Support Program we will send you an information packet containing the information you requested and an application for the Radio Shack Software Review Program.

SOFTWARE SUPPORT BENEFITS

If Radio Shack accepts your application, you are eligible for many outstanding benefits. The list of these benefits include:

- 1 – TECHNICAL INFORMATION GUIDES pertaining to the piece of hardware on which you are developing systems. This information will include material not generally released. You may also request technical information (upon your acceptance in the support program) associated with the hardware you are working with, that is not contained in the Technical Information Guides. If you have experienced problems and have determined their solutions, we will incorporate any information from you in the Technical Information Guides.
- 2 – SOFTWARE DEVELOPMENT GUIDES that are used by Radio Shack in developing our packages. This guideline illustrates procedures used in creating thorough documentation and functional smooth-flowing programs. The Software Development Guide outlines concepts that will assist you in making your product ready to market.
- 3 – INTERNAL LIBRARY ROUTINES used by the Radio Shack Software Development Group for standardization and high productivity of packages. Included in this category are:
 - the INKEY routines for Interpreter BASIC & Compiler BASIC
 - an assembler input routine that allows the programmer full control of the keyboard and graphics in COBOL on the Model II & Model III
 - source copies that are copied by our COBOL source programs when developing software
 - more advanced joystick routine for the Color Computer
 - an artifacting example routine for more sophisticated graphics on the Color Computer
 - assembler routines that are callable on the Pocket Computer 2
- 4 – TRSDOS LICENSING will be available to approved Software Support Program participants. This will allow you to duplicate & distribute TRSDOS and BASIC Interpreter system software on diskettes with your application software.
- 5 – PURCHASE TRSDOS SOURCE code copy for customizing utilities and making changes for your specific requirements. Any modification to TRSDOS is the responsibility of the individual who changes TRSDOS and releases the responsibility of support from Radio Shack. Calls to TRSDOS are preferred to ensure compatibility with future releases of TRSDOS.
- 6 – COMMERCIAL QUANTITIES of Compiler BASIC and COBOL Runtime packages at reduced rates will be made available. Along with a TRSDOS Duplication license, RUNTIME quantity purchases will allow you to sell completed packages at a reduced rate.
- 7 – ROM PAK COMPONENT information listing the materials and their availability from Radio Shack for assembling your own cartridges.
- 8 – MISCELLANEOUS INFORMATION which includes price listings for quantity purchases of computer hardware,

software, and peripherals. Also, a listing of programming aids and software design books that are felt to be above average is available.

- 9 – INFORMATION DISTRIBUTION LIST which will make available to you any information on patches to Radio Shack software, including TRSDOS. Also, you will be one of the first to know about any new operating systems or new versions of the operating systems. Under certain circumstances you may receive information on new hardware, so you may begin developing software before the new hardware is available in stores.

SOFTWARE REVIEW PROGRAM

The Radio Shack Software Review Program is designed to allow third party software firms, who are members of the Software Support Program, an opportunity to receive product exposure through a reference guide for reviewed software and in Computer Center product brochures.

SOFTWARE REVIEW BENEFITS

If Radio Shack approves your software package, it will be listed in a reference guide for reviewed software.

The reference guide for reviewed software will contain our evaluation on your package and the location where the package may be purchased. Separated by Application Area specified by you, the evaluations will contain the information specified on the application form, our positive opinion of the package, and any positive reactions from your user group.

On selected software packages that are extremely well developed and address specialized vertical markets which we cannot or do not currently address, Radio Shack will, at its expense and subject to your approval, prepare and print software brochures which will be provided to Computer Centers for distribution to customers.

BASIC RULES

- 1 – We will only consider software currently running on any TRS-80 CPU including: Model I, Model II, Model III, Model 16, Color Computer, Pocket Computer, and Pocket Computer 2.
- 2 – No Games will be evaluated in the Software Review Program.
- 3 – You must be an accepted member of the Software Support Program.
- 4 – Software and documentation flow with program must be tested. You will be asked to sign a Confirmation Form.
- 5 – You must be able to support any user problems with the package. A report containing the names of the packages approved, along with your phone number will be distributed to the Radio Shack Customer Service Group so they can refer customers to you.
- 6 – We recommend (but do not require) that your company establish an "800" number for support purposes, if you have not already done so. This number would also serve as a direct line to you for potential customer inquiries.
- 7 – Follow all documentation and software guidelines when submitting packages.
- 8 – Try not to have too many calls to the operating system, so that your system will be more compatible with future DOS's.

- 9 – Do not contact Radio Shack about your application or evaluation, this will only slow the response process.
- 10 – DO NOT submit ANY software or documentation until you are requested to do so by Radio Shack.
- 11 – Only submit disk software running under TRSDOS, until further notice, or cassette tape software that can be loaded by the appropriate TRS-80 computers.
- 12 – Software or documentation will not be returned.
- 13 – We maintain the right to refuse to review any program. In particular, we are not interested in reviewing products that are directly competitive to Radio Shack's offerings. We are most interested in vertical market applications and personal productivity programs.

NOTICE

The Radio Shack Software Support and Review Programs are provided for the assistance and convenience of those developing software for use on TRS-80 computers. Radio Shack shall have the right, at its sole discretion, to determine those persons and companies it will accept in the Program and to eliminate any person or company from the Program at any time. Radio Shack shall also have the right to discontinue distribution of any information it so desires and to discontinue the Programs, in part or in their entirety at its discretion. Radio Shack's acceptance of any application shall not be regarded as creating any contracted relationship between Radio Shack and the Applicant.

Software authors and vendors who want further information on Radio Shack's new Outside Software Support program are urged to write:

Radio Shack
Software Support/Review Program
1300 One Tandy Center
Fort Worth, TX 76102.

Color Computer Bugs, Errors, and Fixes

COLOR DISK DRIVE KIT (26-3022)

The end of the cable that connects the disk drive(s) to the disk controller is stamped with the word TOP in white letters. The TOP end of the cable is connected to the disk controller with TOP up. The two connectors which connect to the disk drives may or may not be similarly marked. Some of these cables are keyed so that they cannot be inserted upside down while others are multi-striped and not keyed. For those that are not keyed, the pin numbers (from 1 to 34) are visible on the edge of each connector. When connecting the cable, place the lowest pin numbers closest to the bottom of the drive.

When the disk drive cable is connected and the power is turned on, the drives should not start running. If they do then the cable is connected incorrectly. Before hooking or unhooking disk drives, make sure that all diskettes have been removed. They should also be removed before powering down the system.

TRIS-80 Christmas Story—Billy and Santa

by Jacquie Farthing

Editor's Note: The CompuServe Information Service is one of the largest information and entertainment services available to owners of personal computers and computer terminals. With each issue of TRIS-80 Microcomputer News, various features of CompuServe will be discussed. The CompuServe Information Service is sold at Radio Shack stores nationwide and in Canada.

Little Billy laid out cookies and milk on the small table next to the towering Christmas tree, twinkling and reverent in its corner of the dark living room.

Eight-year-old Billy sank into the folds of the family easy chair, nearly burying himself, and snuggled up with the eider-down to observe his effect on the already cozy Christmas scene.

As Billy huddled in the warmth of the atmosphere, he gazed around the room lit only by the lights of the magnificent Christmas tree. The tree was positioned in the far corner and shone brightly of green, red, blue, and other flashes of light illuminating the vast array of ornaments dangling between branches and tinsel.

The presents were heaped one on top of the other and were strewn as far as the fireplace, whose ashes were still smoldering from the evening's fire. Billy glanced up at the silhouetted stockings lying in wait at the mantle.

Sitting back with a satisfied air, Billy's eyes rested on the familiar TRIS-80 Model III, now dark after a full night's use by various family members. As he stared at the blank screen Billy dreamed he was a top computer programmer, keying equations and computations for the space program and calculating major defense plans for the approval of the president and his defense committee.

As Billy imagined himself being congratulated by the president, he was interrupted by a sudden noise over near the tree. He raised his sleepy eyelids just enough to make out a figure by the fireplace, bent over with the cumbersome weight of an object resting on his back. The figure heaved the huge bundle onto the hearth and straightened himself out, dusting himself off and chuckling.

As Billy gazed across the dimly lit room, he rubbed his eyes and squinted to get a better look at what now occupied a large space in front of the fireplace. As Billy stared at the spot on the hearth, it turned just enough for him to see that it was a man engulfed in a long white beard and long white hair, pink cheeks and bright, glistening eyes. The man was dressed all in red with furry white trim on his collar, cuffs, and jacket front, which seemed to almost pop with his heaviness. He wore a stocking cap on his head with a little white ball on its end, and his pants were tucked into a high pair of jet black boots which

matched the massive black belt stretched tightly around his middle.

Billy leapt from his perch, no longer mildly observing the actions on the hearth, as Santa peered into his huge bundle and chuckled quietly to himself.

"Santa! What did you bring me, Santa?," Billy cried as he made his way across the room to get a closer look at Santa Claus.

"My, how you startled me, Billy. What are you doing up at this hour?"

"I'm waiting for you, Santa. I wanted to be here to help you with the gifts and give you milk and cookies. What did you bring me this year, Santa?"

As Billy eagerly awaited Santa's reply, Santa laughed and then pointed to the solemn computer and with a grin said, "Why Billy, I've brought you a world of information."

Billy gazed at Santa with puzzlement as he watched him rummage through the bulk of his huge bundle until he drew out a bright green light and set it in the palm of his hand.

"What's that?" Billy asked as he backed away from the light.

Billy could just catch a glimpse of Santa winking at him through the light as he turned toward the computer. As Billy moved closer he realized that the light was no longer coming from Santa but from the screen of the now bright computer.

"Sit down next to me, Billy, and I'll show you the growing world of videotex," Santa said.

As Billy gazed up at the terminal, Santa typed in his user ID number and secret password to the CompuServe Information Service.

"How would you like to talk to people all across the country on your TRIS-80 Model III?" Santa asked.

Billy continued to stare at the screen and slowly shook his head yes while Santa typed Go HOM-21 at the "!" CIS prompt.

"This is CompuServe's version of the CB, Billy. By using CompuServe you can talk through your computer to people all over the U. S. and Canada," Santa said.

"Once you enter with your ID number and password, you select "Communications." This automatically logs you on CB where you'll see many different conversations by people like Tootsie Roll, Cupcake or the Cookie Monster. These are their handles, just like those used by people on the radio version CB. Your terminal is your microphone and everything you type, followed by an <ENTER> is seen by other CBers on one of 40 channels," Santa said.

"But if I'm on channel 19 how do I change to another channel? Or how do I know if anyone's listening to me," Billy inquired.

"There are a few commands you give the computer to help you get around in CB," Santa said. "To change your channel, just type in the command /TUNE and you can send and receive messages on a different channel. /STATUS lets you see how many are "listening" to you, and the /MONITOR command lets you follow other conversations. You can even have your own private conversation with the /SCRAMBLE command," Santa told Billy.

"What else does CompuServe have, Santa? Can I play games on it?"

"CompuServe offers lots of games, Billy, plus shopping at home and Special Interest Groups."

"What's a Special Interest Group," Billy asked as he munched on a cookie from Santa's plate.

"A Special Interest Group is for people who share a common interest in something and want to swap information. CompuServe has groups for photography and music (Photo-80/Orch-80), groups for people who like ham radios (HAMNETS), groups for people who like to cook (the Cook's Underground) and even a group for the people who like to talk on CB. It's called CBIG. These groups share their information through an electronic bulletin board and some have a Feedback section where you can converse with hardware manufacturers about equipment, problems, or suggestions."

"Could I become a member of a special interest group?" Billy wondered.

"Of course you can. Most SIGs add you as a member when you log on and access them. Some have a fee, while others have certain equipment requirements."

"What kinds of things would be there for people like my Mom and Dad and brothers and sisters?"

"How about the ability to shop from your own home without getting up out of your chair? You can do that with Comp-U-Store, the electronic shop-at-home service. They have prices 10 to 40 percent lower than other places and can be accessed at CIS rates of \$5 for standard service and \$22.50 for prime service. Just access the main menu of Home Service and then the shop-at-home section on the subsequent menu. You can read information on products and prices and can order from a selection of over 30,000 brand name products including cameras, musical instruments, and stereo equipment."

"How do you do that?" Billy asked from the side of the now empty milk glass.

"With Comp-U-Store you can comparison shop among all the items. When you've decided on what you're going to buy, you go to the ordering section where you give information like your address, name, and method of payment."

"But how do they get the money to them if they're not in a store?" asked Billy.

"They can pay by credit card including the new no fee VISA which Comp-U-Store is offering to its members. With this feature, members don't have to pay a fee to use their VISA card. Comp-U-Store also has a Databasement where other specific items are further discounted, plus a weekly auction where items are bid on by members. As in any other auction, whoever gives the highest price gets the item."

"What kinds of games can I play," Billy asked, through a large yawn and bleary eyes.

"Oh, there are lots of games on CompuServe," Santa told Billy. "There are games like football and strategic games like chess. There're games of chance like roulette, blackjack, and craps, and popular games like golf. There's the Adven-

ture game where you battle snakes and dwarves in Colossal Cave in search of lost treasure. There's a series of adventure-type games such as Adventureland, Pirates Adventure, Mission Impossible, Voodoo Castle, Ghost Town, Pyramid o. Doom, and Strange Odyssey. There's Megawars which is a real-time space battle where up to 10 people can play at a time. You're either a Colonist or a Kryon, and the object of the game is to attack your opponents' space ships and capture planets."

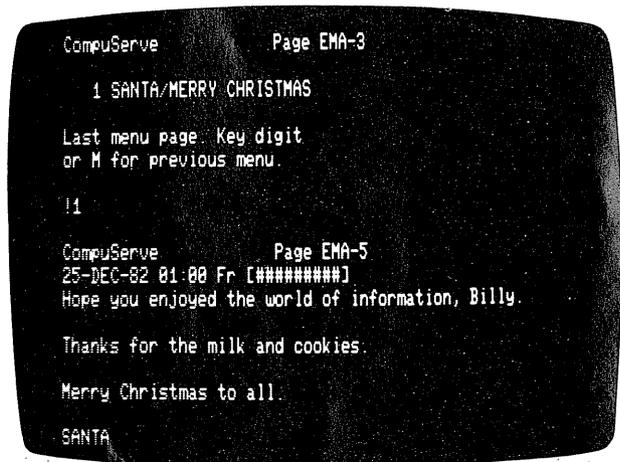
Santa chuckled and looked down to find Billy fast asleep by his lap with a large smile and a dried "milk mustache." He gently lifted Billy up into the chair in front of the computer and removed the empty plate of cookies and glass of milk. Santa quietly typed in a short message on the computer, gathered his huge bundle, and stepped onto the hearth. With the smoke still swirling around his windburned cheeks, he bade Billy a Merry Christmas and good night and disappeared up the chimney without a sound.

In the morning, Billy's family found him fast asleep in front of a black screen. Billy awakened and excitedly told them about his visit from Santa and about all the things he had shown him on the computer. Billy's mother wiped the dried mustache from Billy's lip and directed Billy to the pile of presents in front of the tree. Billy's brothers and sisters remarked how they used to sit and wait for Santa on Christmas Eve and told Billy that they used to dream that they actually saw Santa, too.

"But I did see Santa," Billy protested. "He showed me all the games, and shopping at home, and special interest groups, and . . ."

But everyone just continued to open their presents amidst Billy's indignant protests. After they opened all their presents, Billy wandered over to the computer and switched it on. To everyone's surprise there was a "main menu" displayed on the screen and a little message at the bottom which read, "You have EMAIL waiting."

Remembering the instructions Santa had given him, Billy pushed the keys to read "Go EMA," and a short message distinctly appeared on the screen as Billy's family gathered around. The message read . . .



Questions and comments about the CompuServe Information Service can be sent to Richard A. Baker, Editorial Director, or Jacqueline A. Farthing, Assistant Editor, CompuServe Information Service, 5000 Arlington Centre Blvd., P. O. Box 20212, Columbus, Ohio 43220, or through Feedback, main menu item 5, CompuServe User Information.

Now You Too Can Be a "Wall Street Wizard" . . .

George Maniscalco
Vice President, Standard & Poor's Corporation

I know a lot of people who dream about making their fortune in the stock market. After all, history shows that many people have already done so, and the opportunities for future success certainly seem to be plentiful enough. In fact, the only thing one really needs to know are the names of some stocks that will be going up (or down) in price. Then one could invest accordingly.

Obviously, and unfortunately, this knowledge is hard to come by. So, a great deal of effort and energy is expended in the fascinating arena of investment analysis. The basic idea, of course, is to find a way to forecast what is likely to happen to the price of a company's stock. At present there are a great many systems which are designed to help investors make decisions about whether and what to buy, sell, or hold. Essentially, these systems fall into one of two basic approaches: Fundamental or Technical analysis. Let us briefly look at these two approaches.

FUNDAMENTAL ANALYSIS . . .

In the area of fundamental analysis, the investor is typically looking for a situation which reflects a good buying (or selling) opportunity, usually based on some computation of current data in the context of a historical perspective or comparison. The information used here almost always contains some combination of fundamental financial data; that is, basic earnings data, dividend data, growth rates, sales or revenue data, balance sheet data such as assets or debt, and so on. The idea behind this approach is that, in the long run, the shares of companies with superior performance will outperform the shares of companies with less than superior performance.

Therefore, if one can find a company whose data shows movement towards superior performance, an increase in the price of that company's stock probably is not far behind. (Of course, there are other considerations that may affect how long a period one will have to wait. These include the overall economic situation, competitive considerations, and so forth.) The source for this fundamental information is often the company itself, frequently through the data it presents in its annual report. In addition, there are a number of financial publishing companies (e.g. Standard and Poor's) which collect, process, and re-distribute information about these companies. This information is made available to individual investors, and to the "professionals" at brokerage houses, investment banking firms, investment-advisory companies, and the investment departments of a large number of other companies.

TECHNICAL ANALYSIS . . .

On the other hand, technical analysis systems typically disregard all fundamental information. The concept behind these systems is that the rise or fall in the price of a company's stock is most simply expressed by the balance (or lack of it) between willing buyers and sellers of the stock. Further, this balance is considered to be best reflected in the "picture" (usually expressed as a chart or graph) of the stock's trading activity. A wide variety of displays exist for these technical systems. For example, there are bar charts, line charts, point and figure charts, ratio charts, moving average and volume indicators, logarithmic charts, etc., etc. Some of the buzzwords used to describe these pictures or formations may sound familiar: "head and shoulders", "flag", "pennant", "upside breakout", and so forth. In most cases, the incredible array of displays and visualizations comes from only four pieces of daily information: the high, low, and last price, and the trading volume.

Very often, the type of system that an investor uses will provide insights into his investment objectives and his investment time-frame as well. Patient investors will tend to use fundamental approaches. They'll focus more on long-term growth opportunities and avoid the temptation to try for a quick profit. Less patient investors are perhaps better described as "traders". Typically, they'll look for short-term situations and are usually less interested in long-range opportunities. Technical approaches tend to serve their needs better than fundamental approaches.

Actually, neither approach is inherently good or bad, right or wrong; and sometimes they can even work very well together. What is most important to the individual investor is to select the approach that makes him, or her, most comfortable. After all, the challenge itself is difficult enough: no need to make it worse by using an approach that does not match your style. Of course, some people use a third approach, sometimes referred to as the "dart-board" system. Since this approach is totally without discipline, we will not deal with it here.

Given all the different systems and approaches and types of data, it is easy to understand why many investors feel confused about the investment approach they should follow. To make matters worse, increasing amounts of basic data have become available to feed into this growing number of investment systems. For the average investor, dealing with all of this can often be a complex, time-consuming, and sometimes even frustrating job.

ENTER, AN APPROACH DESIGNED TO OFFER SOME HELP . . .

The advent of the microcomputer has made the task of investment analysis much easier to deal with. Although micros can be useful for a wide variety of applications, their use in this area is a particularly good fit. The main reason for this has to do with the fact that investment analysis systems usually require a lot of computational processing, and the process gets repeated on a regular basis as new data becomes available.

Two years ago, Standard & Poor's and Tandy combined forces to introduce a powerful, yet easy-to-use, investment software system. We called it Stockpak. This system was designed to help investors in two distinct and important ways. First, the Stockpak System includes a Portfolio Management capability to help you manage your investments. Second, Stockpak contains a unique and powerful Screening feature that helps you locate companies that meet your own personal investment criteria. Interestingly, both parts of the Stockpak System work against a disk-database which is updated each month.

Each of these capabilities is basic enough and important enough to be worthy of "stand-alone" status. Taken together, the combination of their features makes the Stockpak System extremely powerful, versatile, and useful. Let's take a closer look . . .

STOCKPAK'S PORTFOLIO MANAGEMENT CAPABILITY

For starters, we will make the assumption that anyone with investments (in anything) has a basic need for some way to keep track of those investments. After all, if for no other reason, you must at least have accurate records of your investment transactions for the Internal Revenue Service. A true portfolio management system is a well-defined database management system.

The Stockpak System includes a Portfolio Management capability that keeps track of stock, bond, and option purchases and sales. These functions are a minimum requirement for any portfolio management capability. In addition to these record-keeping functions, Stockpak handles the calculations to determine such items as Net Present Position, and Realized/Unrealized Gains or Losses. Stockpak also calculates the Rates of Return of each item in the portfolio against the S & P 500 Index and tells you when an issue will go from 'short-term' to 'long-term' status for income tax purposes, a feature which can be quite valuable. In addition, Stockpak sorts the data and delivers a report to either the screen or a printer. A very convenient feature allows the Portfolio diskette to accept information from the monthly database diskettes, about which we will have more to say later. As impressive as these features may be, they are only a small part of Stockpak's real power . . .

STOCKPAK'S SCREEN AND SELECT SYSTEM

By far, Stockpak's most impressive feature lies in its Screen & Select capability. This function permits users to create their own investment screens, then apply those screens to a database of companies. This part of the system works in conjunction with a database diskette (updated each month) which contains 30 financial facts on 900 actively traded companies. The 900 companies in the database include the 500 companies in the S & P 500 Stock Index, plus

400 other New York, American, and Over-the-Counter companies. Through the use of a unique Data Dictionary feature, users can create and maintain an additional 200 financial facts about these companies. Therefore, well over 200 items can be accessed in the process of creating a screen.

For example, you might tell the system to "find" only large companies, or only small ones . . . only companies with high earnings growth, or low P/E's, or high yields . . . only companies in specific industries or on certain exchanges . . . only companies with high sales or low debt or a high S&P Earnings and Dividend ranking. In fact, you can draw from over 200 information items to create a single screen and there is no limit to the number of screens you can apply. The system then goes to work to sort through all of the data on the database disk to find only those companies that exactly meet the criteria you specified. If you need to, you can easily re-define a screen if the previous criteria were either too loose or too tight. It is not hard to imagine how difficult, if not impossible, performing a task like this would be for someone without a computer.



Photo 1. Database Updates

Once you have reduced the 900 companies to a smaller group of your prime candidates, you can create a separate Spin-Off file to follow them more closely in the future. To round out the functions, the system also provides extensive report-writing facilities (both customized and pre-defined) for temporary or permanent retention of the results.

Until recently, these capabilities were only available to professional investors using time-sharing or large in-house computer facilities. Now, with Stockpak's software and data, individual investors stand a much better chance of finding those companies of special interest, based solely on the factors that they consider to be most important.

TOWARDS BETTER INVESTMENTS

The Stockpak System is currently available for both the Model III and the Model I TRS-80's, and it comes in two parts. The first part includes all of the software described above (Portfolio Management, Screen & Select, and Report Writer), a sample database diskette, and complete documentation. The second part of the system is an annual subscription to updates of the database. These updates are produced once each month and mailed after the last trading day of the month. Also, included in part two is a subscription to the Stockpak Strategist, a monthly newsletter that helps subscribers get even more value from using the system.

Part one is available from all Radio Shack stores and sells for \$49.95 (26-1507). Part two is available from Standard and Poor's and sells for \$200 per year. For more information, see your local Radio Shack dealer or write to Standard and Poor's, c/o Stockpak, 25 Broadway, New York, N.Y. 10004.

Business Graphics—Analysis Pak

Effective business graphics made easy—that's the promise of a new software package called the Business Graphics-Analysis Pak. We have obtained this package from TimeWare Corporation, a Palo Alto software firm with many years experience in the field of business graphics. The package is a real bargain, offering functions similar to those of mainframe products costing thousands of dollars.

With the Business Graphics-Analysis Pak, you can display your data pictorially—in the form of line charts, bar charts, and scatter charts. The package is designed to run on the TRS-80 Model III microcomputer and requires two disk drives and 48K RAM. There is no expensive hardware to buy—charts can be produced on the printer you probably are using right now (dot matrix line printer V, VI, or VIII, or the daisy-wheel printer II) or on the TRS-80 multi-pen plotter.

Designed for business users at all levels, the Business Graphics-Analysis Pak is completely menu-driven—you can put it to work for you right away, without having to learn complicated operating procedures.

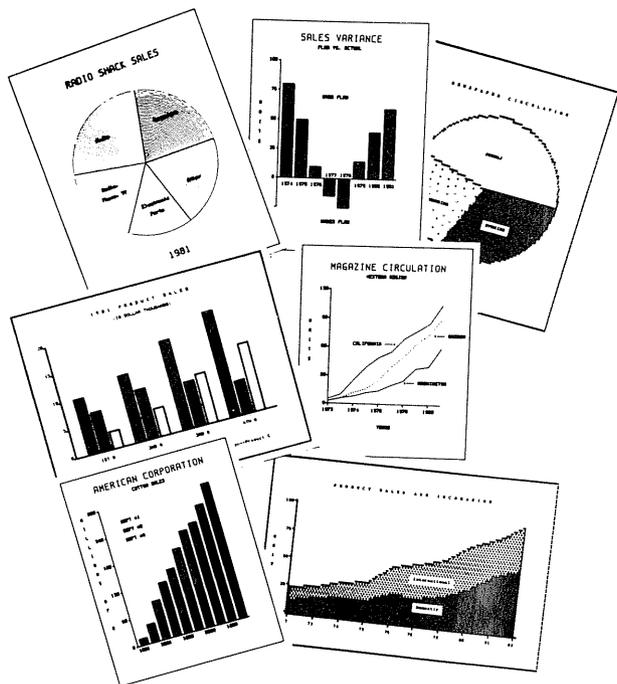


Photo 1

The Business Graphics-Analysis Pak sets up an attractive chart for you—automatically scaled, labeled, and laid out to suit your particular output device. Just select a chart type, supply your data, provide a title or two, and ask to see your chart displayed on the screen. After previewing the chart, direct it to your printer or pen plotter. It's as simple as that!

While the chart is displayed on the screen, you can edit the text by inserting, changing, deleting, or moving labels or captions. You can actually move text freely about the screen with the arrow keys—placing the text exactly where you want it, in or around the chart.

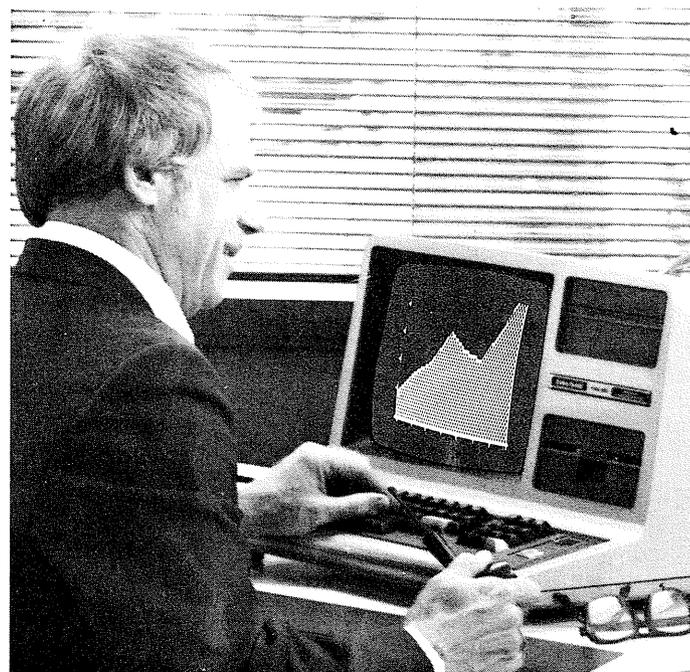


Photo 2

When you are satisfied with the chart on the screen, you can then produce a hard copy on the printer or pen plotter or save the chart in a file for future use.

If you want, you can assume more control over the chart format:

- Modify the size and shape of the chart—up to 11 inches square
- Adjust the range of the numeric scale and the format of the scale labels
- Provide a starting time label (such as a month or a quarter) that will be incremented automatically for each plot point or bar
- Modify the format of the curves, plot points, bars, or slices
- Request shading under curves or within bars, bar segments, or pie slices
- Add a frame to the chart

You can even design and save a customized chart format—this is handy for charts that are produced on a regular basis.

CHART DATA

Data for the chart can be entered at the terminal, brought in from a disk file, or generated by the program. Virtually any type of file can be used, including VisiCalc, SCRIPSIT, BASIC, and FORTRAN files. (Some types of files must first be converted to another format, using a utility that comes with the package.)

The Business Graphics-Analysis Pak provides extensive data handling capabilities. You can generate an arithmetic or geometric series of values. You can edit data, or manipulate it with various mathematical functions. You can project trends, compute moving averages, consolidate data, etc. You can display the data on the screen, print it on the printer, or save it in a file.

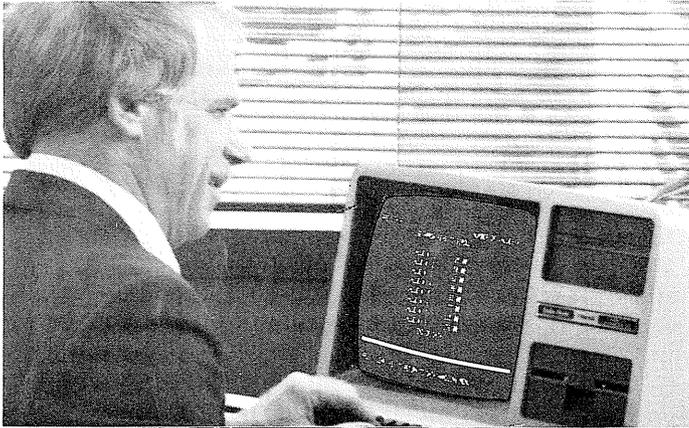


Photo 3

OUTPUT DEVICES

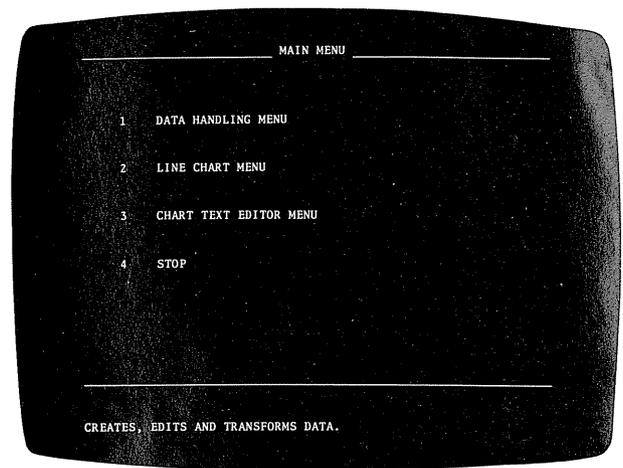
Charts can be produced on a line printer or a pen plotter. You can draw multi-color pictures on the pen plotter, and can even draw pictures directly on transparency film for use with overhead projectors. Charts produced on a printer can be transferred to transparency film with many office photocopiers.

By increasing the density at which characters are printed, the program improves both the appearance and the accuracy of the charts. Circles are rounder, shading is more dense, and data points are placed more accurately. Characters normally print at a density of 10 per inch horizontally and 6 per inch vertically. For plot and fill characters on the line printers, this density is increased—up to 20 per inch horizontally, and up to 12 per inch vertically on the daisy-wheel printer and 24 per inch vertically on the matrix printers. The highest resolution—200 characters per inch—is obtained on the pen plotter.

The picture's aspect ratio is always maintained—there is no distortion of the picture when moving from the screen to the printer or plotter. (Pie charts, for example, are always round, not egg-shaped!)

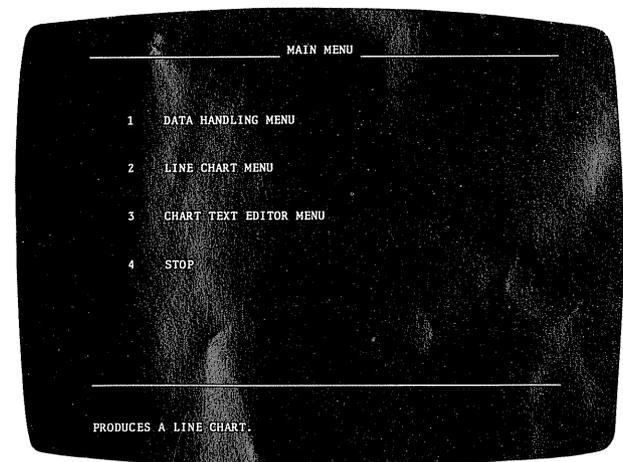
LEARN-AS-YOU-GO OPERATION

Because the Business Graphics-Analysis Pak is completely menu-driven, you can learn as you use it. Each time a menu appears on the screen, one menu item is blinking off and on; an explanatory message about that item appears at the bottom of the screen. If you press the `<ENTER>` key, the flashing item is selected.



Screen 1

If you point to another menu item (either by pressing the corresponding number key or by moving to the item with the arrow keys), that item starts to blink, and a new explanatory message appears at the bottom of the screen. You can select the menu item, if you wish, by pressing the `<ENTER>` key.



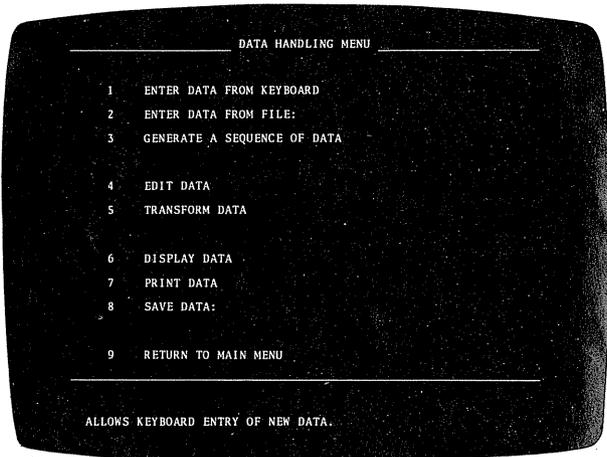
Screen 2

When you first start using Business Graphics-Analysis Pak, you can browse through the menus, reading all the explanatory comments before deciding on your selection. As you get more familiar with the program, you can make your selections immediately by pressing the number key and `<ENTER>`, pausing to read the explanatory message only when you need to refresh your memory.

STEP-BY-STEP EXAMPLE

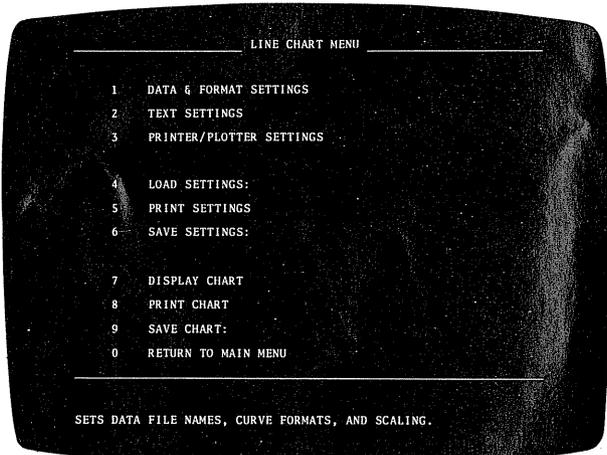
The following example—creation of a time plot—shows just how easy it is to use Business Graphics.

After loading the TRSDOS system disk and the line chart disk, you type in "TRSCHART" and press the `<ENTER>` key to access the Main Menu. Pressing `<ENTER>` a second time transfers you to the Data Handling Menu.



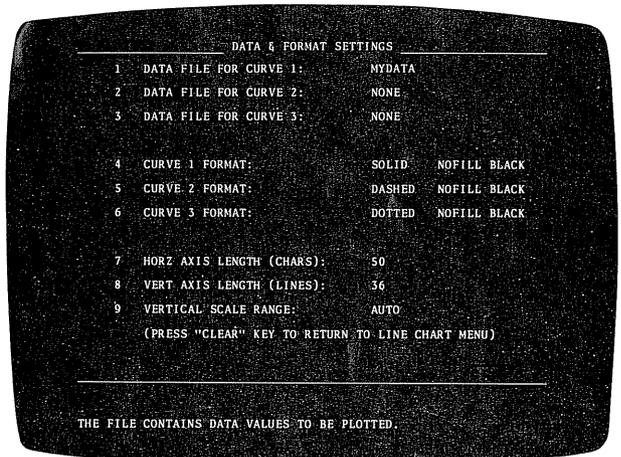
Screen 3

Since menu item 1 (ENTER DATA FROM KEYBOARD) is flashing, pressing the <ENTER> key brings up a new screen; you are then prompted to enter your data, one value at a time. Each value you enter is displayed on the screen. Data entry is terminated with the <CLEAR> key, which returns you to the Data Handling Menu. You select item 8 (SAVE DATA) and enter a file name; the program writes your data values to disk under that name. You then return to the Main Menu and select menu item 2, the Line Chart Menu.



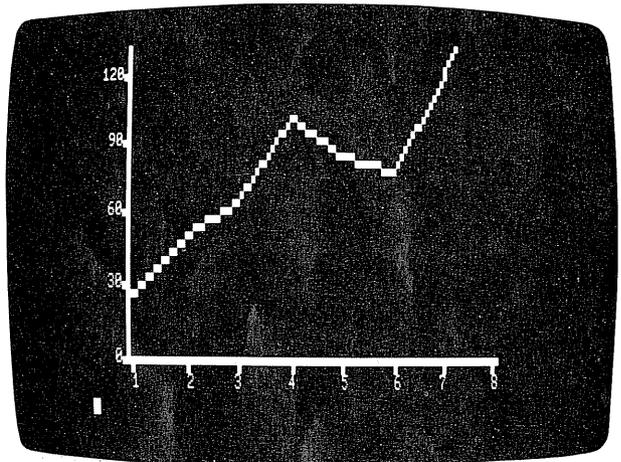
Screen 4

Since menu item 1 (DATA & FORMAT SETTINGS) is flashing, you need only press the <ENTER> key to be transferred to the Data and Format Settings Menu, where you enter the name of your data file for curve 1.



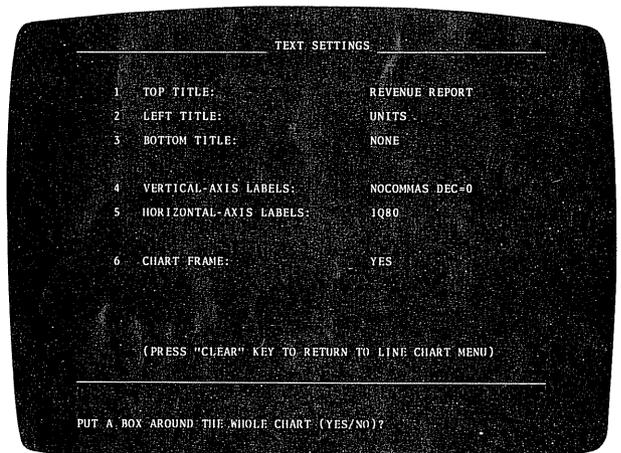
Screen 5

Press <CLEAR> to return to the Line Chart menu and select menu item 7 (DISPLAY CHART) to display your chart on the screen.



Screen 6

Pressing the <CLEAR> key restores the Line Chart Menu, and you select menu item 2 (TEXT SETTINGS). The Text Settings Menu is then displayed.



Screen 7

Here you enter a top title, a left title, and labels starting with 1Q80 (the first quarter of 1980) for the horizontal axis. You also request a frame for the chart.

The **<CLEAR>** key returns you to the Line Chart Menu. If you want, you can preview the chart on the screen. Selecting menu item 8 (PRINT CHART) causes the chart to be produced on the printer as shown below. (A daisy-wheel printer was used in this example.)

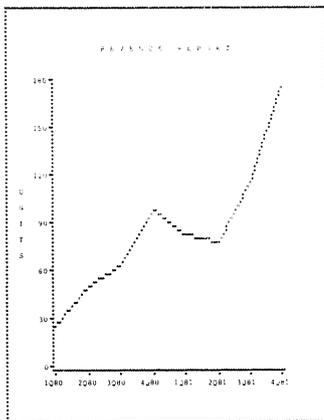


Photo 4

You can save the chart in a disk file (using menu item 9, SAVE CHART) for future use. Or you can save the chart settings (using menu item 6, SAVE SETTINGS) to be used with new data for another chart.

SYSTEM CAPABILITIES

Chart Types. Line charts, bar charts, pie charts, and scatter charts are available.

- Line charts may contain up to 3 curves, each based on up to 100 data points. Curves can be shaded from the curve line down to the bottom grid.
- Bar charts may contain up to 100 bars. Bars can be grouped in clusters of up to 3 bars or stacked (cumulated) with up to 3 segments. (Stacking or grouping reduces the maximum number of bars.) Bars or bar segments can be shaded.
- Pie charts may contain up to 12 slices, any of which can be shaded.
- Scatter charts (X-Y plots) can be based on up to 100 pairs of data values. By default, the data points are unconnected; you can request a connecting line, if desired.

Chart Style. You can let the program format the chart, or you can control any part of it directly.

- Chart width can range from 2 to 11 inches, chart height from 3¹/₃ to 11 inches.
- Charts can be framed.
- Solid, dashed, or dotted lines can be used for curves, and any character can be specified for the data points.
- On a pen plotter, color can be specified for curves, plot points, bar or slice outlines, shading, and text entries.
- Automatic scaling is based on the data; alternatively, you can specify the range to be used.

Text. Screen editing is available for all text entries.

- The program provides for three titles, one each cen-

tered at the top, bottom, and left of the chart. Top and bottom titles can be enlarged.

- Automatic labeling is provided by default for line charts, bar charts, and scatter charts. Scale labels are based on the data; time periods are numbered from 1. You can control the format of the scale labels, and you can specify a starting time label (week, month, quarter, or year) for the time periods or bars, or suppress those labels altogether.
- In chart edit mode, the chart is displayed on the screen. You can then add, change, delete, or move any text, supply special labels, etc. You can place text anywhere in or around the chart and see exactly how it will look before you produce the picture.

Data Handling. Extensive data handling capabilities are provided.

- Data can be entered at the keyboard or retrieved from a disk file.
- An arithmetic or geometric series can be generated from a starting value and an increment or factor.
- Any set of data can be transformed by adding or subtracting a constant or multiplying or dividing each value by a constant; by consolidating the data (such as months into quarters); smoothing the data with a moving average; or computing the logarithm of each value.
- Growth projections, either arithmetic or geometric, can be computed or a linear, quadratic, or exponential trend curve can be fitted to the data and projected for a number of periods.
- Data can be edited on the screen—values can be changed, inserted, or deleted, and the results displayed immediately.

Program Output. Output can be handled several ways.

- Charts can be displayed on the screen, printed on a matrix or daisy-wheel printer, or drawn on the multi-pen plotter. Charts can also be stored in a disk file for later use.
- Data values and chart settings can be displayed on the screen, printed on the printer, or stored in a disk file.

Program Documentation. Documentation is provided within the program itself and in a separate manual.

- Menus printed on the screen list the available choices at each stage of operation.
- For the current item, some additional information is displayed at the bottom of the screen.
- Diagnostic messages are provided when an error occurs. Error and warning messages appear at the bottom of the screen and flash off and on; the message must be acknowledged before the program will continue.
- The Business Graphics Reference Manual provides an overview of the program, a tutorial for the new user, and detailed reference materials. A comprehensive index is included.

SEE IT IN ACTION!

Stop by your local Radio Shack and ask to see the automated demonstration of the Business Graphics—Analysis Pak. This will give you a better idea of how the system actually works. See how easy it is to design a chart, to preview and edit it right on the screen, and to produce the final chart on the printer or plotter. 

Model III Port Assignments

Robert E. Brown
2 Christina Drive East
Schenectady, NY 12303

(Text on Page 17)

MOD 3 PORT	FUNCTION	MOD 1 EQUIVALENT
E0H (224)	Maskable Interrupt Latch Bit reset = interrupt request (directs jumps to interrupt routines) Bit 0,1 - cassette interrupts Bit 2 - clock interrupt Bit 3 - I/O bus interrupt Bit 4 - RS232 transmit inter. Bit 5 - RS232 receive inter. Bit 6 - RS232 error interrupt Bit 7 - unused interrupt #7	37E0H (14304) Bit 0,1 - unused Bit 2 - communications interrupt Bit 3 - unused Bit 4 - unused Bit 5 - unused Bit 6 - disk controller interrupt Bit 7 - clock interrupt
E4H (228)	Non-Maskable Interrupt Latch Bit reset = interrupt request Bit 5 - front panel reset inter. Bit 6 - motor time-out interrupt Bit 7 - disk controller interrupt	—No Direct Equivalent—
E8H (232)	RS232/Modem Status Register OUT: any byte resets the interface IN: Bits 0,1,2,3 - unused Bit 4 - RI (ring indicator) Bit 5 - CD (carrier detect) Bit 6 - DSR (data set ready) Bit 7 - CTS (clear to send)	—Same as Mod 3 (port E8H)—
E9H (233)	RS232 Baud Rate Select and Switch Sensor OUT: Bits 0-3 - select receiver baud rate Bits 4-7 - select transmit baud rate IN: Bits 0,1,2 - ignore Bit 3 - parity (set = enabled) Bit 4 - stop bits (set = 2, reset = 1 bit) Bits 5,6 - word length (00 = 5, 01 = 6, 10 = 7, 11 = 8) Bit 7 - parity (set = even, reset = odd)	—Same as Mod 3 (port E9H)—
EAH (234)	UART Control/Status Register OUT: Bit 0 - DTR (data terminal ready)* Bit 1 - RTS (request to send)* Bit 2 - Break (disable transmit data) Bits 3-7 - see IN assignments, port E9H IN: Bits 0-2 - unused Bit 3 - set = parity error Bit 4 - set = framing error Bit 5 - set = overrun Bit 6 - set = data sent (register empty) Bit 7 - set = data received (register full) *The Radio Shack Mod 3 service manual lists these two-bit assignments reversed from the arrangement shown here.	—Same as Mod 3 (port EAH)—
EBH (235)	RS232 Data Register OUT: 8-bit parallel transmit data IN: 8-bit parallel receive data	—same as Mod 3 (port EBH)—
ECH (236)	Miscellaneous Controls Bit 1 - cassette motor (set = on) Bit 2 - 32 CPL mode (set = 32 CPL) Bit 3 - Kana characters (reset = Kana) Bit 4 - Enable I/O bus (set = enabled) Bit 5 - Enable video waits (set = enabled) Bits 0,6,7 - Unused	No direct equivalent, See FFH (255) described later . . .
MOD 3 PORT FOH (240)	FUNCTION FDC Command/Status Register OUT: see Western Digital FD1771/3 manual - various bit patterns handle all disk commands including: Restore, seek, step, step in, step out, read data, write data, read track, read address, write track, force interrupt IN: Bit 0 - set = busy Bit 1 - DRQ (set = data register full)* Bit 2 - lost data/missing address* Bit 3 - set = CRC error* Bit 4 - set = seek error/record not found* Bit 5 - set = head engaged* Bit 6 - set = write protected disk* Bit 7 - not ready *various status conditions are provided, depending upon the disk operation in progress	MOD 1 EQUIVALENT 37ECH (14316)
F1H (241)	Disk Track Update Register IN: current track NOTE: track selection is done by loading the data register (F3H) with the desired track and then issuing a SEEK command through port FOH	37EDH (14317) treated exactly as per the F1H Model 3 port
F2H (242)	Disk Sector Select Register IN or OUT: 8-bit parallel register for storing/reading desired sector	37EEH (14318) treated exactly as per the F2H Model 3 port
F3H (243)	Disk Data IN and OUT: 8-bit parallel port	37EFH (14319) treated exactly as per the F3H Model 3 port
F4H (244)	Disk Drive Select OUT: Bit 0 - set = drive #0 Bit 1 - set = drive #1 Bit 2 - set = drive #2 Bit 3 - set = drive #3 Bit 7 - set = double density IN: Bits 0-3,7 - ignore Bit 4 - reset = side 0, set = side 1 Bit 5 - set = write precompensation engaged Bit 6 - set = generate waits	37E1H (14305) treated exactly as per the F4H Model 3 port IF in Double-Density operation (using write precompensation)
F8H (248) or 37E8H (14312)	Line Printer Status/Data Register OUT: 8-bit parallel data port IN: Bits 0-3 unused Bit 4 - set = printer fault Bit 5 - set = device selected Bit 6 - set = out of paper Bit 7 - set = busy	37E8H (14312) treated exactly as per the F8H Model 3 port
FFH (255)	Cassette Status/Command Register OUT: Bits 0,1 - output signal 00 = .85v, 01 = .46v, 10 = 0.0v Bits 2-7 unused IN: Bit 0 - set = 1500 baud Bit 1 - set = motor on Bits 2-5 - see same bits port 0ECH Bit 6 - unused Bit 7 - set = 500 baud —No Direct Equivalent—	Port FFH (255) OUT: Bits 0,1 - output signal Bit 2 - set = motor on Bit 3 - set = 32 CPL display Bits 4-7 - ignore IN: Bit 0 - ignore Bit 1 - ignore Bits 2-5 - ignore Bit 6 - video display status Bit 7 - cassette input 37E4H (14308) OUT: 01 = Select Cassette #1 02 = Select Cassette #2

(Continued on Page 17)

Holiday Fun with Your TRS-80

Well, they tell me that it's time for Christmas once again. It's a bit hard to get into the Holiday Spirit when it's still 102 degrees outside. (In case you haven't picked up on it yet, these articles must be written several months in advance. This one is being written in late August/early September.) Anyway, we're going to try to give you a few new ideas for having fun with your equipment during the Holiday Season.

The first program we'd like to share with you is for the PC2. It includes a printer routine which may be omitted if you haven't gotten your printer yet. I'm not going to tell you what will happen; I'll just let you type it in.

```

2 GOSUB 100
6 WAIT 100
7 PRINT "SEASONS GREETINGS !!!"
8 CLS
9 WAIT 0
10 GCURSOR 1
20 GPRINT 32; 48; 120; 48; 32; 0; 0;
21 GPRINT 16; 24; 28; 30; 127; 30; 28; 24; 16; 0;
0
22 GPRINT 32; 48; 120; 48; 32; 0; 0; 0; 0; 0;
0; 0; 0; 0;
30 GPRINT 63; 127; 127; 112; 48; 0; 0; 0; 0; 0;
0; 0; 0; 0;
40 GPRINT 124; 124; 124; 125; 126; 125; 124; 124; 0;
0; 0; 0; 0; 0; 0; 0; 0;
50 GPRINT 95; 81; 113; 82; 84; 84; 116; 88; 80;
88; 0; 0; 0; 0;
60 GPRINT 68; 56; 88; 24; 88; 61; 70; 1; 0; 0; 0;
0; 0; 0; 0; 0; 0;
70 GPRINT 124; 126; 6; 6; 12; 60; 0; 0; 0; 0; 0;
0; 0; 0;
80 GPRINT 64; 96; 127; 127; 96; 68; 36; 24; 0; 0;
0; 0; 0; 0; 0; 0;
90 GPRINT 32; 48; 120; 48; 32; 0; 0;
91 GPRINT 16; 24; 28; 30; 127; 30; 28; 24; 16; 0;
0;
92 WAIT 100
93 GPRINT 32; 48; 120; 48; 32
94 WAIT
95 GOTO 500
100 GRAPH
105 COLOR 2
110 GLCURSOR (108,-500)
: SORGN
120 LINE (0,500) - (-70,450) - (-20,460) -
(-80,410) - (-25, 420) - (-90,370) -
(-30,380)
130 LINE - (-100,330) - (-15,340) - (-15,300) -
(15,300) - (15,340) - (100,330)
140 LINE - (30,380) - (90,370) - (25,420) -
(80,410) - (20, 460)
150 LINE - (70,450) - (0,500)
180 FOR Z = 1 TO 9
185 COLOR RND(3)
190 READ A, B, C, D, E, F, G, H, I, J, K, L, M,
N, O, P, Q, R
200 LINE (A,B) - (C,D) - (E,F) - (G,H) - (I,J)
210 LINE - (K,L) - (M,N) - (O,P) - (Q,R)
220 NEXT Z

```

```

230 DATA -34, 460, -36, 458, -38, 456, -36, 454,
-34, 452, -32, 454, -30, 456, -32, 458,
-34, 460
240 DATA 20, 360, 18, 358, 16, 356, 18, 354, 20,
352, 22, 354, 24, 356, 22, 358, 20, 360
250 DATA 0, 480, -2, 478, -4, 476, -2, 474, 0,
472, 2, 474, 4, 476, 2, 478, 0, 480
260 DATA -50, 420, -52, 418, -54, 416, -52, 414,
-50, 412, -48, 414, -46, 416, -48, 418,
-50, 420
270 DATA 24, 440, 22, 438, 20, 436, 22, 434, 24,
432, 26, 434, 28, 436, 26, 438, 24, 440
280 DATA -20, 400, -22, 398, -24, 396, -22, 394,
-20, 392, -18, 394, -16, 396, -18, 398,
-20, 400
290 DATA 64, 412, 62, 410, 60, 408, 62, 406, 64,
404, 66, 406, 68, 408, 66, 410, 64, 412
300 DATA -70, 344, -72, 342, -74, 340, -72, 338,
-70, 336, -68, 338, -66, 340, -68, 342, -70,
344
310 DATA 36, 400, 34, 398, 32, 396, 34, 394, 36,
392, 38, 394, 40, 396, 38, 398, 36, 400
320 GLCURSOR (-108,200)
: SORGN
330 TEXT
335 CSIZE 3
340 LPRINT "MERRY CHRISTMAS!"
345 LF +3
346 LPRINT "SEE DISPLAY . . ."
347 LF +4
350 RETURN
500 READ A, B
510 IF A = 0 THEN FOR D = 1 TO 6
: NEXT D
520 IF A = 255 THEN END
530 BEEP 1, A, B
540 GOTO 500
550 DATA 70, 450, 50, 300, 50, 300, 50, 660, 45,
600, 38, 400, 38, 400, 38, 1100, 0, 0, 38,
400
560 DATA 44, 375, 38, 400, 36, 750, 53, 450, 44,
400, 50, 300, 50, 700, 0, 0, 70, 450, 50,
300, 50, 300
570 DATA 50, 550, 45, 650, 38, 400, 38, 400, 38,
1100, 0, 0, 38, 400, 44, 375, 38, 400, 36,
750
580 DATA 53, 450, 44, 400, 50, 300, 50, 700, 0,
0, 31, 500, 31, 450, 38, 400, 27, 900, 31,
500, 31, 400
590 DATA 36,-450, 36, 800, 0, 0, 36, 500, 36,
400, 44, 400, 31, 800, 36, 500, 36, 400, 38,
500, 38, 900
600 DATA 0, 0, 70, 450, 50, 300, 50, 300, 50,
660, 45, 600, 38, 400, 38, 400, 38, 1100, 0,
0, 38, 400
610 DATA 44, 375, 38, 400, 36, 750, 53, 450, 44,
400, 50, 300, 50, 1000, 255, 0

```

If you do not have the Plotter/Printer-Cassette Interface, you should omit lines 2, 95, and 100-350. Now I hear you cry, "But I have a Plotter/Printer for my Model I/II/III/16/Color Computer. What do you have for me?" To that I give you the following program for the CGP-115 Color Graphics Printer.

```

10 CLS
20 LPRINT CHR$(18)
30 LPRINT "M240,-700"
   : LPRINT "I"
40 LPRINT "C3"
   : LPRINT "M-8,498"
50 LPRINT "D0,519,8,498,-10,510,10,510,-8,498"
60 LPRINT "M0,500"
70 LPRINT "C2"
80 LPRINT "D-140,400,-40,420,-160,320,-50,
   340,-180,240,-60,260"
90 LPRINT "D-200,160,-30,150,-30,40,30,40,30,
   150,200,160"
100 LPRINT "D60,260,180,240,50,340,160,320,
   40,420"
110 LPRINT "D140,400,0,500"
120 C=RND(4)-1
   : IF C = 0 THEN GOTO 120 'NO BLACK
130 LPRINT "C"; C
140 READ A, B
   : IF A = 0 THEN GOTO 220
150 LPRINT "M"; A; ", "; B
160 LPRINT "D"; A; ", "; B; ", "; A - 4; ", "; B -
   4; ", "; A; ", "; B - 8
170 LPRINT "D"; A + 4; ", "; B - 4; ", "; A; ", "; B
180 LPRINT "D"; A - 3; ", "; B - 5; ", "; A + 3;
   ", "; B - 1; ", "; A - 3; ", "; B - 1
190 LPRINT "D"; A + 3; ", "; B - 5; ", "; A - 3;
   ", "; B - 5
200 GOTO 120
210 DATA -40, 460, 1, 350, -100, 280, 100, 270,
   -50, 240, -150, 180, 80, 190, 170, 0,
   0
220 READ C
   : LPRINT "C"; C
230 READ A, B
   : IF A = 0 THEN GOTO 290
240 LPRINT "M"; A; ", "; B
250 LPRINT "D"; A; ", "; B; ", "; A + 80; ", "; B;
   ", "; A + 80; ", "; B - 50
260 LPRINT "D"; A; ", "; B - 50; ", "; A; ", "; B
270 GOTO 220
280 DATA 2, -190, 100, 3, 140, 100, 0, 0, 0
290 LPRINT "M-190,75"
   : LPRINT "C3"
300 LPRINT "D-190,75,-110,75"
310 LPRINT "M-150,50"
   : LPRINT "D-150,50,-150,100"
320 LPRINT "C2"
   : LPRINT "M160,50"
330 LPRINT "D160,50,160,100"
340 LPRINT "M140,60"
   : LPRINT "D140,60,220,60"
350 LPRINT "M-240,-10"
360 LPRINT "S4"
   : LPRINT "Merry Christmas!"
370 LPRINT "A"
380 LPRINT " "

```

For users of the Color Computer, change all occurrences of LPRINT to PRINT #-2. No further changes should be required. If you use a Model II, you should use the error trapping routine given in the printer manual.



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Model III Ports (From Page 15)

My disk head cleaner program, which appeared here a few issues ago, resulted in a flood of correspondence from some very nice people who wanted to know more about Model III ports and their use. To answer the questions and to improve my own understanding, I decided to do some research, and the results are presented in the following charts.

One common misconception, evident in the letters, was a tendency to equate INP with PEEK and OUT with POKE. Ports are not memory locations and are massaged and reset by the central processor at very high speeds. It is very unlikely that one could OUT a value to a port and find the same value with INP. In fact, with only a very slight delay, a port can be loaded with data via the OUT command and then read immediately using INP, providing entirely different information having to do with a device's status. Perhaps the confusion arises because the Model I was "memory-mapped" and communication was with what seemed like memory addresses (actually, they were not RAM addresses but 'addressed devices'). Early Model I computers used only one port—FFH (255) for the cassette. Later, additional ports were claimed by the RS-232 interface, and these same ports are used in the Model III. In fact, the Model III did away with memory-mapping altogether except for the display which is truly memory-mapped in RAM.

The Z-80 processor is capable of communicating with 256 'ports' which are usually assigned to peripheral devices. It establishes the link by using the address bus and the data bus, sending out 8-bits of a port address and a signal saying, "I have an I/O address here." It is the responsibility of the peripheral device to recognize its unique I/O address and to receive or transmit data. The charts which follow list the ports known (by me) to be assigned in the Model III and their approximate memory-mapped counterparts in the Model I.

The ports assigned to disk operations must be carefully addressed as regards timing and sequence. So, with the exception of simple select, restore, and seek operations (as were used in my head cleaning program), they are not of much use to the BASIC programmer. The ports assigned to the RS232, line printer, and cassette recorder, on the other hand, are very amenable to use from within BASIC.

Profile III + : Setting Up a User Menu

Profile
The small Computer Company

Written for the users of PROFILE II, PROFILE + and PROFILE III +

PROFILE Editor
P.O. Box 2910
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Once you've set up your PROFILE III + data base, your last step is to define your user menu. Creating a user menu is optional but well worth the effort because of the increased speed and ease with which you can manipulate your files. The manual which came with your copy of the program tells you how to set up the user menu, and you should refer to the manual for general instructions. In this column, we'll explain some of the finer points of menu creation, especially substituting the user menu for the regular Runtime menu.

MENU NAMES

Setting up a menu is easier than it looks at first. The trickiest part is the menu itself. Some of the confusion over names stems from the fact that there are three independent entities that can be construed as menu names: 1) the heading for your menu, which is actually only the text that serves as a title at the top of the menu screen, 2) the six-character entry you can use to code or identify the menu, which appears only during menu creation, never to be seen or used by the program again, and 3) the real menu name, which is listed in the DIRectory and which is the file called by PROFILE III + when you ask for the user menu.

More confusion stems from the name changes you must make to substitute the user menu for the Runtime menu supplied by Radio Shack. (Why substitute? If you do, your user menu, rather than the regular Runtime menu, appears whenever you reset the computer or finish an operation.) The original Runtime menu is RM/CMD (CM/CMD is the Creation menu). The reason menu names have to be juggled is that PROFILE III + knows only how to call for something named RM/CMD when it wants a menu. Consequently, to substitute a user menu for the Runtime menu, you must take these steps:

- 1) At definition time, the user menu-to-be must originally be called anything but RM/CMD. We suggest MI/CMD, although any permissible TRSDOS file name will do.
- 2) When the user menu has been completed and checked, the Runtime menu (RM/CMD) must be re-named (with the RENAME command). Again, any name but RM/CMD is appropriate. The manual's suggestion, HOLD/CMD, is as good as any other and easy to remember.
- 3) Finally, since there must be something called RM/

CMD for PROFILE III + to call, RENAME your user menu RM/CMD.

IF ONE IS GOOD, MORE IS BETTER

You'll appreciate the ease with which your user menu takes you right into your data base. You'll also soon realize, especially if you have formatted a variety of screens, reports, and labels, that the eight user menu choices allowed may not be enough. Indeed, you will probably have only seven choices, since it's a good idea to use one of the eight for calling the PROFILE III + Runtime menu (now called HOLD/CMD, remember?).

The solution is simple: make a multi-page user menu! The first page (or screen) of your menu is the new RM/CMD. Define another user menu—select "Define User Menus" from the Creation menu—giving it the file name "M2/CMD" or something similar. Then add M2/CMD to RM/CMD as a menu entry. You should also add an entry on the page 2 menu, M2/CMD, for the page 1 menu, RM/CMD.

Another option is creating a three (or more) page menu, each page called from another menu or even from a menu of menus. You could have one page for inquiry options, one for report options, and one for label options. This would give you enough room to have separate choices, for instance, for "Report 1, Normal Selection" and "Report 1, Extended Selection."

Each user menu occupies six granules of disk space but can be placed on any available drive.

DON'T PASS OUT: PASS PARAMETERS

The PROFILE III + manual discusses ways to have the computer enter keystrokes automatically when a certain menu selection is made. For instance, something like "EFC8 A (YOURFILE, 1, PRINT REPORT FROM FORMAT ONE)" will take you all the way to the sorting prompts.

It's possible to get even further into your program by using a DO file to pass additional keystrokes to PROFILE III +. To continue with the example above, if you consistently use report format 1 to make zip-coded sorts, you could construct the following "DO" file using the TRSDOS "BUILD" command:

Instructions:	Comments:
BUILD ZIPSORT	"ZIPSORT" is the name of the DO file.
<ENTER>	
EFC8 A(YOURFILE,	This passes the file name, format and

1,PRINT REPORT heading to the DO file.
 FROM FORMAT ONE)
 <ENTER>
 3 <ENTER> Your zip code field number is 3; press
 <ENTER> to record it.
 <ENTER> To use the entire field length for
 sorting.
 <ENTER> To select all records.
 <BREAK> To record the DO file; "TRSDOS
 Ready" returns.

Then replace "EFC8 A (YOURFILE,1, PRINT REPORT
 FROM FORMAT ONE)" with "DO ZIPSORT" on your user
 menu:

1 Print Report 1 in Zip Code Order DO ZIPSORT
 Pressing "1" on the menu now prints the entire report
 without any user intervention.

BUILD A STAIRWAY TO THE STARS

There is almost no limit to the operations you can run
 automatically with such a DO file. Suppose the above report
 format were a 132-character format, but your dot matrix
 printer has a default setting of 80 characters. Your printer can
 be initialized automatically for 132-character reports (assuming
 it is capable of 132 column operations) by adding the
 following commands to the beginning of the ZIPSORT file
 (Please note that this program applies to a Radio Shack Line
 Printer IV. Consult your own printer's user manual for equivalent
 commands.)

Instructions:	Comments:
BUILD ZIPSORT	You can rewrite the DO file to include
<ENTER>	the new instructions.
PAUSE Printer Ready, on Line? <ENTER>	This prompts the operator to check the printer; the message "Press <ENTER> to continue" will follow "Printer Ready . . .".
BASIC <ENTER>	Go into BASIC.
<ENTER>	Press <ENTER>—you don't need to open files.
<ENTER>	Press <ENTER> again to skip the memory size prompt.
LPRINT	
CHR\$(27);CHR\$(20)	
<ENTER>	This is the code to change the default to 132 characters.
<ENTER>	Press <ENTER> so that BASIC knows to continue.
CMD"S" <ENTER>	This command returns you to TRSDOS.
EFC8	
A(YOUR FILE . . .	Continue as before.

The final step in automating your menu is to add an "AUTO
 RM" command to your Runtime diskette. When you boot up,
 page 1 of your user menu will automatically appear on your
 screen after the data and time prompts are answered. It is
 then possible to print an entire 30-page report with only two
 keystrokes—the "1" to start the operation from the menu,
 and <ENTER> when the printer is ready.

MAKE YOUR DATA BASE USER-FRIENDLY

You'll soon become adept at making PROFILE III+ do
 what you want it to do. The next level of sophistication is
 getting the people in your office who use your program to use

it the way you had in mind. A well-thought-out user menu
 system will make the program more transparent to your
 colleagues, which in turn will increase efficiency. Here are a
 couple of pointers and ideas.

Group functions logically, in chronological order or ac-
 cording to priority. For instance, don't place "Add Records"
 between "Print Report 1" and "Prepare Mailing Labels".

If different operators perform different functions, give
 each one his or her own menu page, even at the cost of
 duplicating selections.

PROFILE III+ is all about improving work flow. Keep
 this foremost in mind as you design your user menus.

*Profile Editor's Note: This is Mr. Sygoda's third selection
 in a series of 'how-to' PROFILE III+ articles. Other articles in
 the series will be published over the next few issues in this
 column. We hope that you enjoy this new feature, and we look
 forward to your comments and questions on PROFILE III+.*

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PROFILE PLUS: WHAT TO DO WHEN YOU GET AN ERROR

PROFILE PLUS is a nearly fool-proof program. Nonethe-
 less, our readers tell us that sometimes they do get error
 messages and would like help in figuring them out. So, in
 response to your queries, part two of this PROFILE column
 will be our suggested PROFILE PLUS troubleshooting
 procedures.

We recommend, first of all, that you keep a log with a
 section on problems and troubleshooting. A troubleshooting
 log is very helpful reference material for anyone using your
 PROFILE PLUS system.

This log should have five columns of entries: "What
 Program Were You Using?" when you saw the error; "Name
 of File and Extension"; "Error Number"; "Any Special Cir-
 cumstances?"; and "Date."

ERROR TYPES

In general, there are two kinds of errors: operating errors
 and system errors.

When the program doesn't do what you expected it to
 do, that's an "operating" error. For example, you thought you
 indexed a data base on field 1, "Last Name." When you go to
 update records, however, you find that the field shown on the
 index screen is field 2, "First Name." You've made a mis-
 take—what is it?

A "system" error gives you an error message and drops
 you into system mode—the line "TRSDOS READY" appears
 beneath the message. For help with these errors, look in the
 following section, "System Errors and Solutions."

HOW TO HANDLE ERRORS

Your first response to an error message should be to
 decide if you understand why you got it and if you can fix it
 without help.

If not, you should write the error message down in your
 troubleshooting log noting:

- 1) the PROFILE PLUS operation,
- 2) the name and extension of the file you were using,
- 3) the error number, and
- 4) any unusual circumstances surrounding the error
 condition—a brown-out, for instance.

Then look for the reason you got the error. Once you get an explanation, you should put it in the log also.

OPERATING ERRORS AND SOLUTIONS

To find out why you're seeing operating errors, turn to the part of the PROFILE PLUS manual that describes the operation you're in, and look through the instructions. Watch especially for notes—your problem may be explained there. If not, check that you did each step of the operation correctly and used the proper syntax.

SYSTEM ERRORS AND SOLUTIONS

There are two ways to find explanations for system errors. One is through the computer itself. The other is through reference materials like your manual or this column.

COMPUTER

If the program only shows you the number of the error, type in the word error and the error number when you see the message "TRSDOS READY" and press <ENTER>. For instance, type:

ERROR 4

Press <ENTER>. The computer responds:
CRC ERROR DURING DISK I/O OPERATION
(See below for an explanation.)

The error messages in PROFILE PLUS programs always include descriptions of the problem and the name of the file in which the error occurred. For instance, in the PROFILE PLUS Inquire, Update, Add program you might see this error:
DISK ERROR CODE 28 OCCURRED ON FILE INVOICEX/
IY1 ATTEMPT TO READ PAST EOF

You probably tried to use an index with no records in it. This would happen if you had started to index the INVOICEX data base earlier, then changed your mind and broke out of the index operation before the computer could write any records into the index file.

REFERENCE

A list of operating system error messages is available in the Disk Operating System Reference section of your TRS-80 Model II Owner's Manual, under "Technical Information".

Some system errors are more common than others. Following is a list of errors, possible reasons for their occurrence, and what you can do about them.

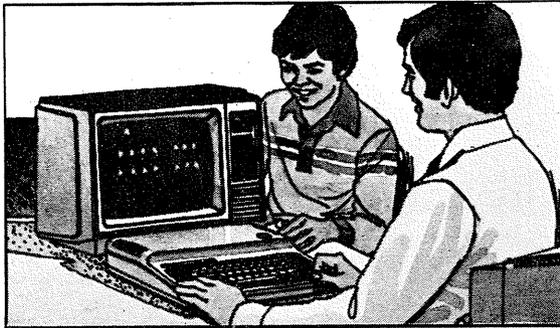
- 4 CRC ERROR DURING DISK I/O OPERATION
The computer, in attempting to read data off a diskette, discovers that it cannot verify the data. An error 4 may indicate a magnetically—damaged diskette.
Error 4s are sometimes transient. Try the question a few times. If you continue to get the error, go into TRSDOS, open the drive door, take the diskette out, and put it back in to reseal it. You might also try moving the diskette to another drive.
If any of these procedures work, immediately back up the problem diskette onto a fresh diskette. Watch for error messages—if there are no errors, then the information was recovered and your new backup diskette can be used. Do not use the original diskette. Label this diskette as damaged and remove it from use.
If errors **do** appear during the backup operation, neither the original diskette nor the new backup diskette is usable. You will have to go to an earlier set of backups—from this point on, use these diskettes.

- 5 DISK SECTOR NOT FOUND
The computer tried to read a specific sector on a diskette and could not. Possibly a mechanical problem; more likely, the sector was magnetically damaged or erased. Follow the error 4 instructions.
- 6 ATTEMPT TO OPEN A FILE WHICH HAS NOT BEEN CLOSED
This probably means that the diskettes were removed from the system or the computer was reset without exiting PROFILE PLUS first. Simply try the operation again—in the process of giving you the error message, PROFILE PLUS closes the files.
- 8 DISK DRIVE NOT READY
Check to see if the drive door is open, if the specified drive has a diskette in it, or if the diskette is in backwards.
- 15 DISK IS WRITE PROTECTED
The silver tab over the notch on the diskette has come off. Also check that you have the right diskette in the drive—a CREATION or master diskette is write-protected for a reason.
- 19 IMPROPER FILE NAME (FILESPEC)
You may have mis-typed a file name or its extension, or some other specification—drive number, password, etc.
- 24 FILE NOT FOUND
You have misspelled the file name, have the wrong diskettes in the system, or the data base or parts of the data base (MAP, KEY, DAT, DA2, DA3, etc.) have been erased. PROFILE PLUS tells you the name of the missing data base. Also check that you typed the file name in all upper-case letters, or upper-and lower-case letters, as you defined it.
- 25 FILE ACCESS DENIED DUE TO PASSWORD PROTECTION
The file, format, or screen you asked for is protected by a password, or you have misspelled the password.
- 28 ATTEMPT TO READ PAST EOF
EOF is End Of File. This error usually occurs if a format or index was started but not finished—there are no records in the file. For instance, you opened the "Define Math Formulas" operation, but defined no formulas. You must either return and finish the operation or format, or kill the incomplete file.
- 31 PROGRAM NOT FOUND
You have the wrong diskettes in the system, or the program has been erased.
- 40 SEEK ERROR
Errors 4, 5 and 40 may all mean that the diskette has been magnetically damaged. Error 4 means an error on a sector; error 5 means the computer couldn't find the sector; error 40 means it couldn't find the track. To correct or to find the nature of the error, try your operation again, try a different drive, and if worse comes to worst, use your backups. Notice if any of these errors occur during backup. If you try to use the diskettes with these errors, you'll have unreliable results.
- 42 PRINTER NOT READY
Check to see if the printer is turned off, off-line, disconnected, if there is no paper in the printer, or if the ribbon or ink has run out.

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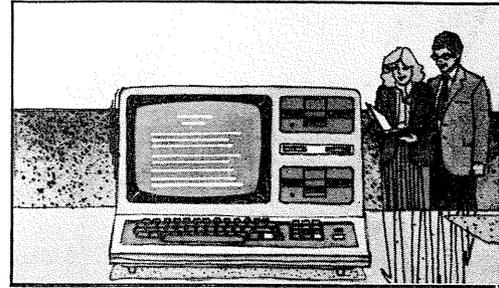
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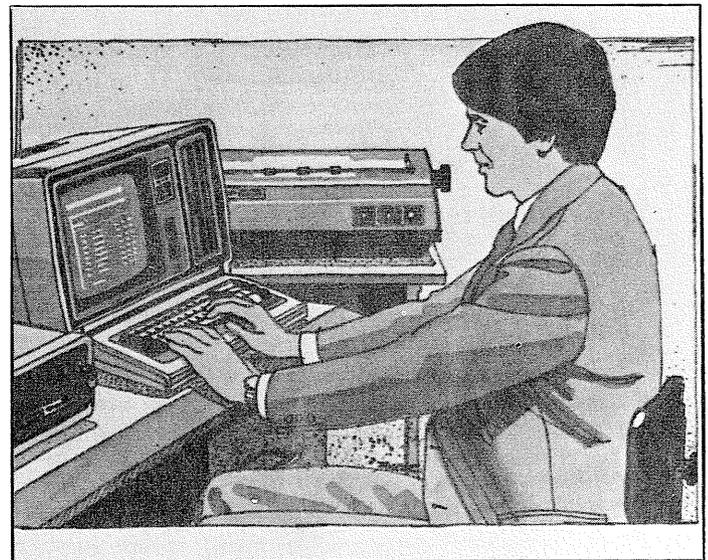
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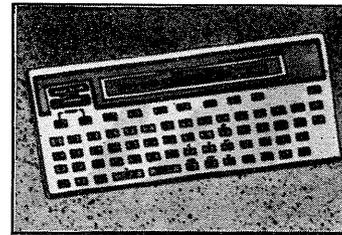
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NOVEMBER 1981

Model III Directory Menu

Richard Ellers
426 Central Parkway SE
Warren, OH 44483

Here is what may be the world's shortest, practical BASIC program:

```
1 NEW
SAVE "NEW"
```

I devised it to use with James Ditucci's terrific auto loading Model III directory menu from the November 1981 TRS-80 Microcomputer News.

Ditucci devised his auto-loaded directory so a user would not have to know about and go through booting.

"NEW" adds convenience for the programmer by providing direct entry into program-writing BASIC mode without having to suppress the auto load on BOOT or having to load a program from the menu, breaking it, and starting NEW.

In the same fashion, another short program gets you to TRSDOS directly from Ditucci's menu.

```
1 CMD"S"
SAVE "CMD/S"
```

FEBRUARY 1982

BASICally Speaking

Bruce Lewis
Box 395
Osceola, MO 64776

In the February 1982 issue on the product line manager's page, there was a program that used RND(TIMER) to scramble the Color Computer's random sequence. This doesn't seem to work on my Extended BASIC version. The assembly language listing below is the ultimate way to scramble the sequence. It uses the timer to scramble the memory holding the position of the random sequence.

To use the code below, you may have to refer to the article on assembly language programming in the February 1982 issue of Microcomputer News.

This may be used as a subroutine in your BASIC program. Pressing <BREAK> while this subroutine is working will not stop your BASIC program. The computer will strobe the keyboard again to see if <BREAK> is pressed, and since it doesn't use auto repeat, it will recognize no keys.

I hope to see other assembly language programs in future issues of this magazine. It should save other programmers from insomnia.

0FE2			00100	ORG	\$FE2	
0FE2	FC	0FE2	00110	START	LDD	\$FE2
0FE5	F3	0116	00120		ADD D	\$116
0FE8	FD	0116	00130		STD	\$116
0FEB	F3	0117	00140		ADD D	\$117
0FEE	FD	0117	00150		STD	\$117
0FF1	F3	0118	00160		ADD D	\$118
0FF4	FD	0118	00170		STD	\$118
0FF7	AD	9F A000	00180		JSR	[\$A000]
0FFB	81	03	00190		CMP A	#03
0FFD	26	E3	00200		BNE	START
0FFF	39		00210	END	RTS	
			00220		END	
00000	TOTAL ERRORS					
END	0FFF					
START	0FE2					

MARCH 1982

Relocating Machine Language Programs

David D. Bailey
3962 Petite Dr. W.
Jacksonville Beach, FL 32250

In regards to the March article about Relocating Machine Language Programs, there is another problem that can occur with any program that requires information to be stored from the program. Although you point out that the "SAVE" command will still store data on cassette tape, you failed to tell the Model III user that they must make one more change to allow this to occur.

The original programs, such as "Cassette Scripsit", were designed to operate at Low Baud. When they were transferred to disk, the computer operated in High Baud. This will not allow programs already stored to be LOADED, nor will the program "SAVE" or "LOAD."

This can be corrected using the following sequence.

(1) Patch to prompt for the Baud Rate:

```
PATCH BASIC/CMD (ADD=5202, FIND=00, CHG=FF) <ENTER>
```

You must follow the sequence below each time you re-boot.

- (2) a. Start TRSDOS
- b. Answer Date Prompt
- c. Answer Time Prompt
- d. BASIC <ENTER> ' Go to Disk BASIC
- e. CASS? L
- f. <ENTER>
- g. <ENTER>
- h. CMD"S" ' Returns to TRSDOS
- i. SCRIPS/CMD ' Loads Program

I realize this is an involved start-up sequence, but by using this method you can "SAVE" your programs to tape.

APRIL 1982

Linefeed with a Carriage Return

David E. Pitts
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I am currently using a Dot Matrix printer with my 32K Color Computer. Since this printer has had the automatic linefeed circuit disenabled, I was very interested in Ed Hamilton's article "Linefeed with a Carriage Return." Since I write many of my BASIC programs with maximum packing (up to 255 characters per line), I needed Hamilton's routine to give a carriage return and linefeed after each N characters have been printed. The program is currently set up for N=78 characters (change line 165 to have other line widths). This not only allowed me to print my long lines with abandon, but also to print narrow columns if I should so desire. Below is the BASIC program. My compliments to Mr. Hamilton for an excellent program.

```
10 REM O/S PATCH FOR LF ON CR
20 REM MODIFIED BY DAVID PITTS FROM ED HAMILTON
   TRS-80 MICROCOMPUTER NEWS APRIL 1982 PAGE 45
30 REM MODIFIED TO GIVE LF AND CR AFTER 78
   CHARACTERS
100 REM PUT CODE AT MEMTOP -41 (CODE IS AT 32726,
   32725=WORKING)
110 MT=PEEK(116) * 256 + PEEK(117)
112 MT=MT-40
120 FOR I = 0 TO 39
122 READ T
124 POKE MT + I, T
126 NEXT
```

```

130 REM SAVE O/S CODE
140 REM PUT JMP ON O/S HANDLER
142 AH = INT(MT/256)
144 AL = MT - AH * 256
146 POKE 359, 126
148 POKE 360, AH
    : POKE 361, AL
150 REM MACHINE - LANGUAGE CODE
151 DATA 52, 4, 214, 111, 193, 254
155 DATA 38, 27, 124, 127, 213, 129
160 DATA 13, 39, 10, 246, 127, 213
165 DATA 193, 78, 38, 13, 189, 162
166 REM CHANGE 78 IN ABOVE LINE TO BE LINE WIDTH
    DESIRED.
170 DATA 133, 127, 127, 213, 134, 10
175 DATA 189, 162, 133, 134, 13, 53, 4
180 DATA 126, 203, 74
200 REM RESERVE MEMORY
210 CLEAR 200, MT-1
220 CLS
230 NEW
999 END

```

JUNE 1982

Concentric Circles

Donan C. McGinley
Keystone Engineering Corp.
845 N. 19th Street
Philadelphia, PA 19130

I just wanted to make a few additions to Stephen Haven's Concentric Circles program. To begin with, an LPRINT inserted at line 85 gives the program a little animation. All sorts of variations are possible. Making the value of the resolution greater slows the animation while making it smaller speeds it up. The value for the number of spaces determines how quickly the spaces on the screen vary. Changing the constant in line 70 (2.6667) to a smaller value also causes interesting changes.

The program is even better when an extra line or circle is plotted. Below are two additions that can be made:

```

71 G = 63 + Y * (2.6667 * SIN(A)): H = 23 - Y *
    COS(A)
81 SET (G,H)
85 LPRINT
OR
81 SET (N,N)
85 LPRINT

```

By experimenting with various sizes, resolutions, and spaces, all sorts of amusing things appear. The possibilities are endless.

Andrew Pensky
105-25 67 Ave.
Forrest Hills, NY 11373

On page 32 of the June 1982 edition, you printed a program called "Concentric Circles." While running the program through the computer, I noticed two mistakes in line 90.

Line 90 read:

```

90 NEXT A
  : Y = Y - 1 - Z
  : IF Y < 0 THEN 160 ELSE 90

```

Line 90 should read:

```

90 NEXT A
  : Y = Y - 1 - Z
  : IF Y < 0 THEN 120 ELSE 60

```

The first mistake was that there was no line 160 for the computer to go to. And the ELSE function in that line sends you back to a NEXT A statement which causes a NEXT without FOR error. To see the program work as stated, input Y=23:X=23:Z=6 when prompted by the program.

Graphs for the PC-2

The following are known errors in the Graphs for the PC-2 program which appeared in the June 1982 issue.

Line 944 should be entered as line 955. There is no line 944.

In line 1045 the semicolon (;) preceding the final USING statement in the line should be changed to a colon (:).

In line 1115 where the statement ... LET L=I ... appears, the letter I should be changed to the number 1.

Our thanks to Mack R. Rhea of Nashville, Tennessee and Robert C. Taylor of Montreal for these changes. Mr. Taylor also sent the the following changes.

Line 1225 becomes:

```
IF L>3 LET L=1
```

Line 1226 becomes:

```
LINE (V,P) - (S,P),0,L
```

Line 1260 becomes:

```
IF L>3 LET L=1
```

Line 1261 becomes:

```
LINE (P,W) - (P,T),0,L
```

JULY/AUGUST 1982

Asteroids

Joseph Prisco
RD #7 Box 80
Oswego, NY 13126

I have just reached a score of 3998 in Richard Zepp's "Asteroids" with screen number 118. This tops the shown high score to date. Also, I changed the color of the "Ship" so it is easier to see in black and white and added two lines to make the high score tally along with the player's score (if it's the high). They are as follows:

```

295 IF S > HS THEN HS = S
311 IF S > HS THEN HS = S

```

SCRIPSIT and the LP VIII

H.U. Kohler, CDP
P.O. Box 628
Proctor, VT 05765

The July/August 1982 issue addresses SCRIPSIT and the LP VIII by Gilbert Keith. To add to the list of many possibilities, my SCRIPSIT disk, when RESET, goes automatically to the BASIC program "PRINTER" which displays the appropriate menu. After the desired typestyle is entered the program automatically goes back to TRSDOS with the CMD"S" statement.

Needless to say, the printer should always be reset prior to running "PRINTER."

```

2 '*****
3 '
4 ' PROGRAM TO SET UP PRINTER TYPE AND SPACING
5 '
6 ' BY: H.U. KOHLER, CDP
7 ' P.O. BOX 628
8 ' PROCTOR, VT 05765
9 '
10 '*****
11 CLS
    : PRINT@202,"-----"
    : PRINT@202,"-----MENU-----"
12 PRINT@266,"1 - PRINT EXPANDED REGULAR
    CHARACTERS"
13 PRINT@330,"2 - PRINT PROPORTIONATE CHARACTERS"
14 PRINT@394,"3 - PRINT PROPORTIONATE EXPANDED
    CHARACTERS":
15 PRINT@458,"4 - PRINT CONDENSED CHARACTERS, 6
    LINES PER INCH
16 PRINT@522,"5 - PRINT CONDENSED EXPANDED
    CHARACTERS, 6 LPI"

```

```

17 PRINT@586,"6 - PRINT CONDENSED CHARACTERS, 3/4
    VERTICAL SPACING"
18 PRINT@714,"ENTER FUNCTION CODE:";
19 INPUT I
20 ON I GOTO 22, 24, 26, 28, 30, 32
21 GOTO 12
22 LPRINT CHR$(27);CHR$(14)
23 CMD"S"
24 LPRINT CHR$(27);CHR$(17)
25 CMD"S"
26 LPRINT CHR$(27);CHR$(14);CHR$(27);CHR$(17)
27 CMD"S"
28 LPRINT CHR$(27);CHR$(20)
29 CMD"S"
30 LPRINT CHR$(27);CHR$(20);CHR$(27);CHR$(14)
31 CMD"S"
32 LPRINT CHR$(27);CHR$(20);CHR$(27);CHR$(56)
33 CMD"S"

```

More about SCRIPSIT

Carol V. English, Ph.D.
 9920 West 34th Drive
 Wheat Ridge, CO 80033

Since our office acquired the Model II, my secretary complains that I leave her only the routine things to type up! I'm enjoying so much of the software myself.

In the July/August issue on page 13 of "More about SCRIPSIT," there is a suggestion on how to address an envelope. I think my method is a bit less cumbersome. Possibly, it just seems that way to me because I created the method.

After I type the letter, I define the addressee information from the letter and duplicate it on the page I create for this purpose which follows the last page of the letter. <CTRL> <R> sets up the address. After I print the letter (set up on the print menu to stop after the last page of the letter), I go back to the print menu for the document and program it to print only the address page. Since the company stationery envelopes have our return address on them, I need only to program the print menu for the column position that fits the size of the regular envelope. (In our case, 40)

For a large manila envelope, I execute a user key defined for my company's return address, press <ENTER> eighteen times, change the format line to conform to the larger envelope (TABS here would require a line-by-line entry or rearrangement for the block form), and do a <CTRL> <R> to bring up the duplicated address from the letter.

I hope Model II users find this as easy a method as I do.

Andrew J. Wheeler, Ph.D.
 Department of Human Resources
 State of North Carolina
 Murdoch Center
 Butner, NC 27509

I enjoyed your July/August issue featuring word processing and thought that you might be interested in our adaptation of your method for addressing envelopes described on page 13. Our office has a 48K, two disk Model III with Daisy Wheel II Printer and Scripsit. We have put the letter and envelope on separate pages of a single document. Since Scripsit does not have user-defined keys, the addressee block at the beginning of the letter is defined as Block A. Then on the second page (the envelope) of the document, the return address is typed to appear on the upper left corner of the envelope, the margins are reset for the address (LM = 40 works for a standard business envelope), and a number of line feeds are entered for centering the address. At the place where the address should go, a comment line is entered, "Insert Block A Here." When typing form letters, simply type in the name and address at the beginning

of the letter, and then move the cursor down to the beginning of the comment line. Insert Block A, then insert stationery into the printer and give the print-with-pause-between-pages command. Insert envelope for second page, and you get the letter and envelope after having typed name and address only once.

I hope this adaptation will be helpful for Model III and Scripsit users.

Sieve of Eratosthenes

Joel M. Jacobson
 5 Sudbrook Court
 Pikesville, MD 21208

The article by Wm. Barden, Jr., "Sieve of Eratosthenes" was especially interesting to me since I have been using the simple BASIC program below to determine prime numbers. While this should work between any limits, the time becomes excessive for very large numbers.

```

10 PRINT "ENTER RANGE IN WHICH PRIME NUMBERS ARE
    DESIRED."
20 INPUT "LOWER LIMIT, UPPER LIMIT"; L,U
30 N = L
40 FOR M = 2 TO N - 1
50 X = N/M
60 IF X-INT(X)=0 THEN 100
70 NEXT N
80 PRINT N;
100 N = N + 1: IF N > U THEN END
110 GOTO 40

```

Color Scripsit Bug

David Bressan
 2815 Ritchie Rd.
 Forestville, MD 20747

I read your July/August issue and found others have encountered the bug in Color Scripsit concerning TAB (<SHIFT> <RIGHT ARROW>) when in the Insert Mode. To avoid this, set a tab stop at the right end of the line when you start up or load from tape. You will then only insert spaces to the line end and not to memory end.

Graphic Keys

Robby Bennett
 2702 S. Banker
 Effingham, IL 62401

On page 17 of the newsletter the program Graphic Keys contains an error. Change 7 LPRINT CHR\$(21); to 7 PRINT CHR\$(21);



A Clock/Scheduler for the Busy Executive

John Titus
 P. O. Box 153
 Descanso, CA 92016

Our hypothetical Mr. X is a busy executive with many demands on his time. Unfortunately, he also has many interruptions and is somewhat absentminded, so he needs frequent reminders of what he has to do next. For this he doesn't particularly want the time. What he wants is to know how long it will be until the next thing he has to do.

Mr. X also has a number of clients throughout the world (New York, London, Pago-Pago) and sometimes needs to call them.

Because of its flexibility and special features such as TIME, the PC-2 is an ideal way to handle these functions. (Remember how to set the TIME? According to your PC-2 manual, TIME can be set or reset by typing: TIME = MMDDHR.MMSS<ENTER>. That's two digits each for month, day, hour, a decimal point, and two digits each for minutes and seconds.)

The program operates in 4 modes:

1. F3:GOTO 75@

This entry clears the previous schedule and sets up a new one. The time for each appointment is entered as HR.MN(P), using Hours (2 digits), Minutes (2 digits), with a decimal point in between. For times after Noon, P must be added. (A for AM is optional.) EVENT is a short note which may be added as a reminder of why the time is being set aside. A printed record is produced.

Note: This entry must be entered first, since it sets up the DIM Statements for the variables. Here is a sample:

SCHEDULE

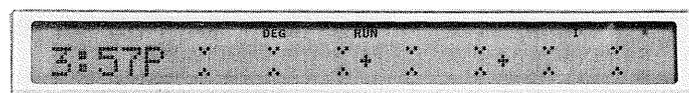
```
# 1 10.25 CALL J
# 2 12.10P LUNCH W
ITH M
# 3 4.20P MEET WIT
H A&C
# 4 4.40P HENRY G
```

2. F4:GOTO 80@

This entry adds items to the schedule without disturbing existing items.

3. F1:GOTO 10@

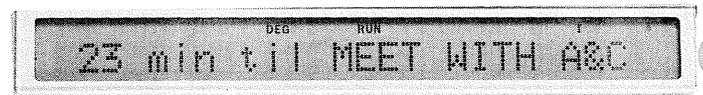
This item presents the local time and a graphic display (with 10-minute interval markers) plus a small cross for each item on the schedule occurring within the next 60 minutes.



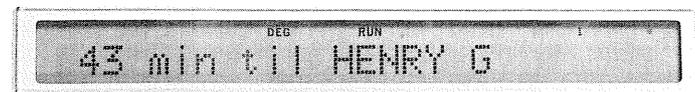
In the above example, the time is 3:57P, and the items displayed are the two between 3:57 and 4:47P (the items at 4:20P and 4:40P).

We should add a detail here about the program's sorting capabilities. All events which are scheduled to occur within a given hour will be displayed. However, their order of display will depend on how they were originally input. The two displays which follow were input in chronological order (see display screens, #3 and #4). If their input had been switched, their order of appearance, within that given hour, would also have been switched.

Push <ENTER> after the BUSY signal goes out, and the time before the first item will be displayed.

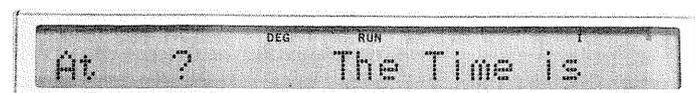


Push <ENTER> again and the next one will be displayed.

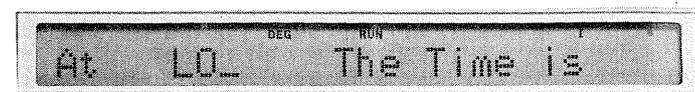


4. F2:GOTO 200@

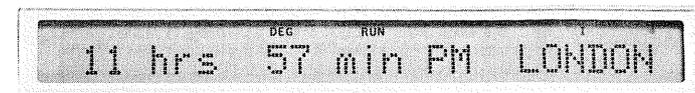
This entry gives times in various cities. City names and time differences are stored in DATA. The display will show:



The first two digits entered must correspond to the first two digits stored in the city's name in DATA. Thus for London time, these could be LO, LON, etc.



Push <ENTER> and the time in London is displayed:



And with all this, Mr. X still manages to miss an appointment now and then. But everybody admits he is a lot better than he used to be!

If no printer is available, the LP and LF instructions in Statements 75 and 95 should be removed.

```

10 REM DISPLAY SCHEDULE
15 GOSUB 100
   :D$=STR$ D
   :C$=STR$C
   :B$=""
   :IF D<10 LET D$=B$+D$
20 CLS
   :WAIT 0
   :FOR I=39 TO 147 STEP 18
25 GCURSOR I=1
   :GPRINT 65
   :GCURSOR I
   :GPRINT 34
   :GCURSOR I+1
   :GPRINT 65
   :NEXT I
30 CURSOR 0
   :PRINT C$;" ";D$;A$
35 FOR I=1 TO 10
   :GOSUB 180
   :GOTO 35+X
40 V=108*U+40
   :GCURSOR V-1
   :GPRINT 8
   :GCURSOR V
   :GPRINT 28
   :GCURSOR V+1
   :GPRINT 8
45 NEXT I
50 WAIT
   :CURSOR 0
   :PRINT ""
55 FOR I=1 TO 10
   :GOSUB 180
   :GOTO 55+X
60 PRINT INT (U*60+1);" min til ";E$(I)
65 NEXT I
   :PRINT "THATS ALL FOR NOW!"
   :STOP
70 REM SET UP SCHEDULE
75 CLEAR
   :DIM H(10),E$(10)
   :K=1
   :LPRINT "SCHEDULE"
   :LF 1
80 INPUT "HR.MN(P) ";U$
   :H(K)=DEG VAL U$
85 IF RIGHT$(U$,1)="P"AND H(K)<12 LET
   H(K)=H(K)+12
90 INPUT "EVENT?";E$(K)
95 LPRINT "#";K;" ";U$;" ";E$(K)
   :K=K+1
   :GOTO 80
100 REM LOOK UP TIME
105 E=TIME /100
   :FOR I=2 TO 4
110 @(I)=INT E
   :E=(E-@(I))*100
   :NEXT I
115 H=C+D/60+E/3600
   :GOSUB 150
   :RETURN
150 REM H<24, C<13, AM/PM
155 IF H>24 LET H=H-24
160 A$="P"
   :IF H<12 LET A$="A"
165 IF C>=13 LET C=C-12
   :GOTO 165
170 RETURN

```

```

180 U=H(I)-H
   :X=5
   :IF U>1 OR U<0 LET X=10
185 RETURN
200 REM TIME IN OTHER CITIES
205 GOSUB 100
   :WAIT 0
   :PRINT "At "
210 CURSOR 12
   :PRINT "The Time is"
   :CURSOR 5
   :INPUT L$
220 RESTORE
   :FOR I+1 TO 6
   :READ J$,DL
   :IF LEFT$(L$,2)=LEFT$(J$,2) LET H=H+DL
   :C=C+DL
   :GOSUB 150
   :GOTO 230
225 NEXT I
230 CLS
   :WAIT
   :PRINT C;" hrs ";D;" min ";A$;"M ";J$
   :GOTO 200
300 DATA "LONDON",8,"BONN",9,"NY",3,"CHICAGO",
   2,"LA",0,"PAGO-PAGO",21
320 END

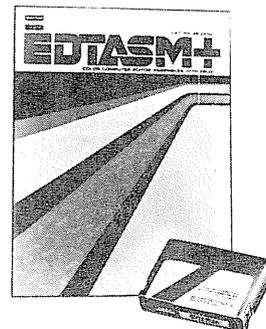
```

Color Computer EDTASM + Tips

George Yefchak
4112 Silver Oak St.
Dayton, OH 45424

I have been very happy with EDTASM+, the Color Computer Editor-Assembler (Stock Number 26-3250). I bought one of the first ones available in my area. There is an error in the manual on page 26. In the section on passing parameters to and from assembly routines, the method shown for calling the floating-point routines INTCNV and GIVABF is wrong. The starting addresses of these routines are not STORED IN \$B3ED and \$B4F4; they ARE \$B3ED and \$B4F4, respectively. In other words, these two routines should be called with direct addressing, not indirect addressing. Note that the other ROM routines listed in the manual (JOYIN, CHROUT, etc.) are to be called indirectly, as the manual indicates.

One more note. Although INTCNV must be called with either the JSR or LBSR instructions, as the manual says, GIVABF can be called with the simpler JMP or LBRA instructions. It will then return directly to BASIC. I suspect that JMP would be the most efficient.



LDOS Hints and Tips

The following information was excerpted from THE LDOS QUARTERLY Volume 1, Number 2, October 1, 1981 with permission from Logical Systems, Incorporated.

BACKUP-BY-CLASS

The Backup-by-class feature of LDOS is a very powerful feature, but it is also very complex internally. There are a couple of things that are done when SYS0 is moved to the destination disk by a Backup-by-class that are not readily apparent.

SYS0 is the heart of LDOS. It can also be referred to as the resident system. It is like a traffic control system for the entire operation of LDOS. When it is moved, certain other sectors of the source disk are also placed on the destination disk. These are sectors 2, 3, and 4 of track 0.

One reason these sectors are moved is that they contain special information storage used by the system, sectors 0 and 1 are not moved to assure that the proper type of boot will be on the destination disk. Another reason to move these (sectors 2 - 4) is that the state of the SYSTEM (SYSGEN), On or Off, is stored within them. So, if the source disk is sysgened then the destination will also be, and if the source disk is not sysgened, the destination disk will NOT be sysgened, even if it was before the backup began.

This is a good time to mention the use of JCL to configure your system. Because you have to type in all the setup you desire for your system, why not type it into a JCL file so that it can be reused!! To do this, refer to BUILD in your LDOS manual (a suggested name for the file would be SYSGEN/JCL). After you have entered the statement to turn on or set up the features and options you want, simply execute the JCL file with the LDOS DO command. This will execute all the statements you typed in as though you were entering them as commands from the keyboard. When the DO is completed, type SYSTEM (SYSGEN) and the present setup will be saved on drive 0 as that system disk's configuration. Do not place "SYSTEM (SYSGEN)" in the JCL file!

CREATING A MINIMUM CONFIGURATION DISK

All files except certain /SYS files may be removed from your run time drive 0 disk.

For operation, SYS files 1, 2, 3, 4, 8, and 10 should remain on drive 0. SYS 11 must be present only if any JCL files will be used. Both libraries (SYS 6 and SYS 7) may be removed if no library command will be used. SYS 5 and SYS 9 may be removed if the system DEBUGger is not used. SYS 0 may be removed from any disk not used for BOOTing.

When using LBASIC, BASIC/OVN and /OVX may be removed if no renumbering or cross-referencing will be done.

The presence of any Utility, Driver, or Filter program is totally dependent upon the user's individual needs. Most of the LDOS features can be saved in a configuration file with the SYSTEM (SYSGEN) command, so the Driver and Filter programs won't be needed in run time applications.

The passwords for LDOS files are as follows:

System files (/SYS)	Update Password = WOLVES
Filter files (/FLT)	Update Password = GSLTD
Driver files (/DVR)	Update Password = GSLTD
Utility files (/FLT)	Update Password = RRW3
LBASIC	Update Password = BASIC
BASIC overlays(/OV\$)	Update Password = BASIC
CONFIG/SYS	Update Password = CCC
MASTER PASSWORD	= RS0LTOFF

ITEMS OF GENERAL INTEREST

Model III owners wishing to move programs from LDOS to Model III TRSDOS should put the files on a 35 track, single density diskette and then use the Model III TRSDOS Convert command to move the files. Be sure the disk is formatted for 35 tracks, as the TRSDOS Convert expects the directory to be on track 17.

We have found that many direct connect modems need to have the DTR (Data Terminal Ready) line high before the modem will remain off hook. Therefore, when using one of the LDOS RS-232 driver programs, it may be necessary to specify (DTR) as a parameter when setting the RS-232 driver.

FEATURES OF LDOS 5.1

- Any LDOS command which requires parentheses around the parameters may be entered without the closing parenthesis.
- The ATTRIB command includes the functions of PROT.
- The COPY command contains an (X) parameter to allow the transferring of files when dealing with non-system diskettes. COPY also contains the ECHO parameter to echo characters to the screen during the copy.
- The CONV command will allow you to transfer files created on the Model III under TRSDOS 1.2 or 1.3 to an LDOS diskette. Note that Model I owners who wish to utilize CONV must have two drives and be capable of reading double density with their system.
- The Job Log (*JL) is established via the SET command.
- The Keyboard driver (*KI) activates the use of the <CLEAR> key and must be established if advanced keyboard features are to be utilized (KSM, MiniDOS, etc.). In addition, the type-ahead and screen print functions are enabled using the Keyboard driver.
- A SuperVisory Call (SVC) table can be loaded into high memory for use by assembly language programmers. It contains most documented system entry points and routines.
- The MiniDOS filter allows the keyboard driver to intercept certain keyboard inputs and immediately act on them. MiniDOS commands are issued by depressing <CLEAR> <SHIFT> and an alphabetic key.

Model II Twinkling Christmas Tree

by Robert Graham

This program is a modification of the Twinkling Christmas Tree program listed in the December 1981 Microcomputer News. Now everyone with a Model II can enjoy the fun. The size of the tree has been expanded from 10 lines to 15 lines.

Instead of PEEK-ing into memory to see what was displayed at a given location, it uses the variable T(Y) to keep track of what was last printed there. And instead of POKE-ing something into display memory, the program uses the PRINT@ command in the graphics mode. Also pressing "Q" during the operation returns you to TRSDOS READY.

```

10 DIM S(225)
   :DIM T(225)
   :CLS
   :X=-3
20 FOR L=1 TO 15
   :X=X+2
30 FOR W=40+(80*L)-((X/2)+.5) TO 40+(80*L)+((X/2)+.5)
40 PRINT@W,CHR$(42)
   :Y=Y+1
   :S(Y)=W
   :T(Y)=1
50 NEXT W
   :NEXT L
60 X=-1
   :FOR Y = 1318 TO 1322
70 PRINT@Y,CHR$(158)
   :NEXT Y
80 PRINT@1466, "M E R R Y   C H R I S T M A S"
90 Y=RND(224)+1
   :PRINTCHR$(02)
100 IF T(Y)=1 THEN PRINT@ S(Y),CHR$(43)
   :T(Y)=-1
   :GOTO110
105 PRINT@S(Y),CHR(42)
   :T(Y)=1
110 X=X*-1
   :IF X=1 THEN PRINT@S(1),CHR$(42)ELSE PRINT@
   S(1),CHR$(43)
120 B$=INKEY$
   :IF B$="Q" THEN SYSTEM ELSE 90

```

Model II Bugs, Errors, and Fixes

NOTE TO USERS:

The following program changes and corrections are provided for your information. If you have an applications program which is working correctly, you should probably NOT make any changes to it. If you feel that the changes should be made, but you do not feel qualified to make the changes yourself, please contact your local Radio Shack Computer Center or Expanded Computer Department for assistance. If you do not have access to one of these stores,

then you may want to call Computer Customer Services in Fort Worth for assistance.

PATCHES

PATCHes are entered from TRSDOS READY and are used to make corrections to files stored on the disk.

1. Before making a PATCH, back up the diskette that requires modification and make the PATCHES to the backup copy of the diskette.
2. Apply PATCHES according to the information given in your TRSDOS manual.

MODEL II/16 TRSDOS (26-4150) Version 4.1

These patches are used to permanently change the operation of the TERMINAL program to use channel B in place of channel A. Do not apply these patches unless you have a special situation which requires the use of channel B only. Please note that a serial printer (which also uses channel B) may not be used concurrently with TERMINAL once these patches are applied.

```

PATCH TERMINAL {R=5 B=172 F=3E61 C=3E63}
PATCH TERMINAL {R=5 B=248 F=3E60 C=3E62}
PATCH TERMINAL {R=6 B=164 F=3E64 C=3E65}
PATCH TERMINAL {R=6 B=173 F=3E64 C=3E65}
PATCH TERMINAL {R=6 B=183 F=3E64 C=3E65}
PATCH TERMINAL {R=6 B=193 F=3E61 C=3E63}
PATCH TERMINAL {R=6 B=251 F=3E60 C=3E62}
PATCH TERMINAL {R=8 B=37 F=3E60 C=3E62}
PATCH TERMINAL {R=8 B=86 F=3E60 C=3E62}

```

When an "INIT dr#" is performed on a floppy disk drive, not all records from the previously inserted diskette are cleared from the system. This problem will manifest itself when a "DIR" is done on one diskette containing two to eight files and then an "INIT" is done followed by the insertion of another diskette into the drive. A "DIR" on the new diskette will now show not only its files, but also some files from the first diskette.

The following "PATCH" sequence will remedy this situation.

```

PATCH SYSRES/SYS {R=15 B=88 F=203BC5 C=C52039}
PATCH SYSRES/SYS {R=15 B=99 F=29 C=2A}
PATCH SYSRES/SYS {R=15 B=108 F=0911980E
C=03C3981D}
PATCH SYSRES/SYS {R=30 B=37 F=0000000000000000
C=D511980EEDA0EDA8}
PATCH SYSRES/SYS {R=30 B=45 F=0000000000000000
C=4E23462BC37A0E}
PATCH SYSRES/SYS {R=15 B=116 F=1814EDA0EDA8
C=4E23462BD500}
PATCH SYSRES/SYS {R=15 B=141 F=E5 C=D1}
PATCH SYSRES/SYS {R=15 B=145 F=36FFE1 C=C3A71D}
PATCH SYSRES/SYS {R=30 B=52 F=0000000000000000
C=36FF6069C38A0E}
PATCH SYSRES/SYS {R=15 B=148 F=C1545D7E23666F
C=545D7E23666FC1}

```

PAYROLL (26-4503)

The following is a new ADDENDUM FOR PAYROLL 26-4503 — CONVERTING PAYROLL TO 2.0a

Conversion of prior versions of Payroll to the 2.0a operating system requires a Multi-drive system. Make a Backup of this disk prior to converting.

Follow this procedure for converting your older version diskette only after completing your accounting cycle.

1. Reset the computer and insert the old version of Payroll. Use this version to make at least one Backup of the disk. Keep this Backup in a safe place until the conversion is complete and confirmed by use. This is very important!

2. Reset the computer and insert a Backup of the new 2.0a Payroll disk in Drive 0. Insert the old Payroll disk in Drive 1.

3. Type in the command:
XFERSYS :1 DATA <ENTER>

The screen will show:

TRS-80 Model II XFERSYS Utility Ver 2.0

Mount DESTINATION diskette in Drive 1

Press ANY key to continue

Now press any key.

The screen will then show:

Phase 1 now starting

XFERSYS will purge the disk in Drive 1 of all system files, leaving only the Payroll programs and data.

4. At TRSDOS READY, type in the command:
COPY PR4X:1 TO PR4X:0 <ENTER>

You will see the message:

Existing file. Copy over it (Y/Q)

Press <Y> <ENTER> in response.

5. AT TRSDOS READY, type in the command:
MOVE */DAT:1 TO :0 <ENTER>

This will move the data files from your old diskette to the new diskette.

The screen will show:

SOURCE disk ready?

Press <Y> <ENTER>

To the right of the data file names displayed on the screen, you will see the message:

Existing file. Copy over it? (Y/Q)

Answer <Y> to PR4CO/DAT

<N> to PR4COID/DAT This is VERY IMPORTANT

<Y> to PR4EMPLE/DAT

<Y> to PR4EARN/DAT

6. If there have been no error warning messages displayed during the conversion, you can now enter the following data as necessary:

—Choose option 1 from the Company Setup menu; then choose number 1, Company Name; enter your company information and the State U.C. code (if applicable).

—From the Company Setup menu, choose option 6, Other Rates and Limits, and enter the basis of supplemental benefits.

—Reenter the State Tax Tables (if applicable).

It is recommended that you make a Backup of the new Payroll disk and store your original converted version in a safe place.

Your Payroll on TRSDOS 2.0a is now ready to be used.

PROFILE II (26-4512) Version 1.0

This program requires modifications as described below before it can be FCOPYed for hard disk use.

At TRSDOS READY, apply the following patches to correct the above problem.

```
PATCH CREATE/EFC A=51AE F=34 C=38
```

BEDIT (26-4705) with TRSDOS 4.1

BEDIT does not properly store source files when running under Model II TRSDOS 4.1. The result is garbled source files.

Make the following PATCH to BEDIT:

```
PATCH BEDIT {A=4184 F=3E30CF C=000000}
```

This patch is required for running under TRSDOS 4.1. It is not required for TRSDOS 2.0 or 4.0. It should not be done on TRSDOS 1.2.

BISYNC (26-4715)

The PATCH printed in the September 1982 Microcomputer News on page 38 is not valid. Version 3.4 of the BISYNC 3270 package solved the problem. The 3.4 version is now in the process of being released and will be available as an upgrade, at no extra cost. 

Microcomputers in Education

Forward to the 3 C's Communicating, Calculating, and Computing

The College of Education at Arizona State University is hosting the 3rd Annual Microcomputers in Education Conference emphasizing the potential of computers to revolutionize the learning process; computers are changing the nature of content in all subject areas, the nature of teaching, and the nature of what it means to be well-educated. A variety of workshops, demonstrations and presentations are designed for anyone interested in creative, innovative microcomputer applications in education.

This two and a half day conference will be held on the Arizona State University campus on March 17-19, 1983. University credit will be available.

A call for conference presenters is extended. Individuals who wish to make a presentation at the 1983 conference should write or call for a proposal form as soon as possible.

Vendors interested in securing a booth are invited to contact the Conference Co-Director. Since exhibit space is limited, reservations will be made on a first come first served basis.

For further information or registration materials write or phone:

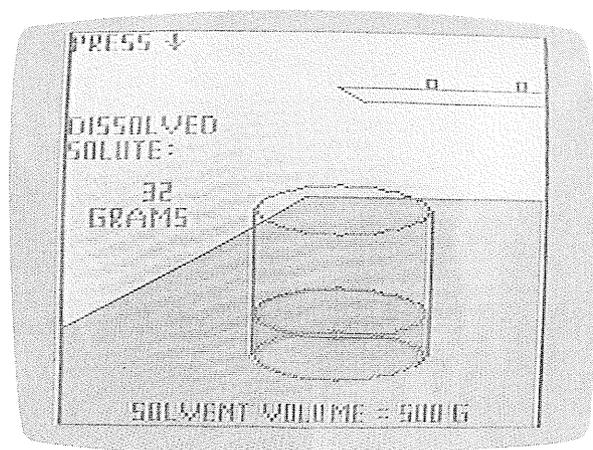
Marilyn Sue Ford
B-47 Payne Hall, College of Education
Arizona State University
Tempe, Arizona 85287
(602) 965-7363 or 965-3322 

Chemistry Simulations for Secondary Students

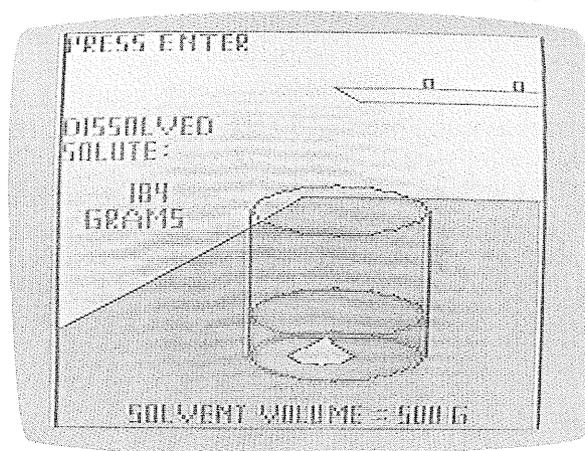
A new Radio Shack courseware program lets secondary students use the TRS-80 computer to simulate chemistry experiments. TRS-80 Chemistry Lab, Volume I is now available for the Model III or Model I 32K disk system or 16K tape system, or for the 16K Color Computer tape system. TRS-80 Chemistry Lab, Volume I supplements classroom instruction for secondary and college chemistry classes. Six different computer programs are included to allow for simulations in six different topics: Kinetic Theory, Charles' Law, Boyle's Law, Conductivity, Solubility, and Titration.

The program design allows students to repeat and vary the simulations many different times, collecting different data each time. For example, the Kinetic Theory, Charles' Law, and Boyle's Law programs let the student choose the volume, and the pressure(s) or temperature(s) of gas for which data will be collected. Thus, numerous different experiments can be performed. Programs are based on equations derived from actual laboratory experiments.

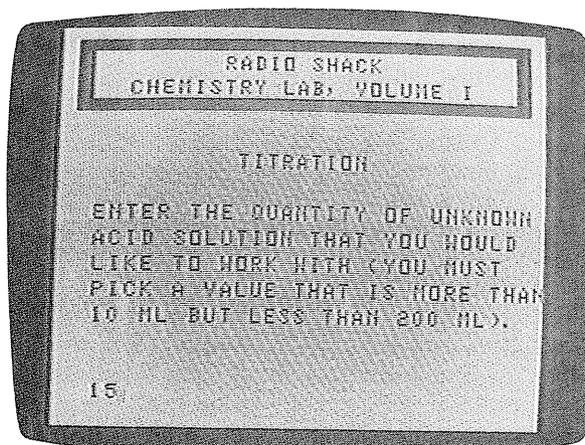
Both the Model III/I version and the Color Computer version of TRS-80 Chemistry Lab, Volume I, lead the student through simulations with helpful on-screen explanations. Not only experimental results, but also correct experimental procedures are realistically simulated. Extensive use of graphics provides a realistic representation of each experiment. For example, the Solubility program shows the student what occurs when you add solute to a solution before the solution has become saturated:



on the bottom of the beaker rather than dissolving:

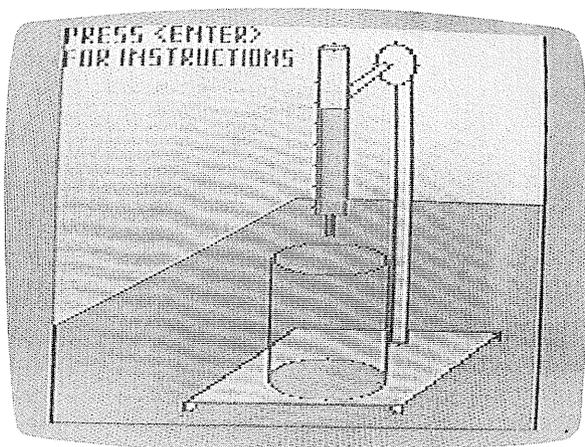


These simulations are not intended to replace experience in a real laboratory, but they do provide an easy, safe way for students to see the results of an experiment again and again, and to collect, graph, and analyze the data produced by these experiments, with the aid of the computer. The Titration program provides a good example of how the simulations reinforce correct experimental procedures. The Titration simulation leads the student through several steps to collect and refine the data that he or she needs. First, the student chooses a base solution and then chooses the quantity of unknown acid solution to work with:

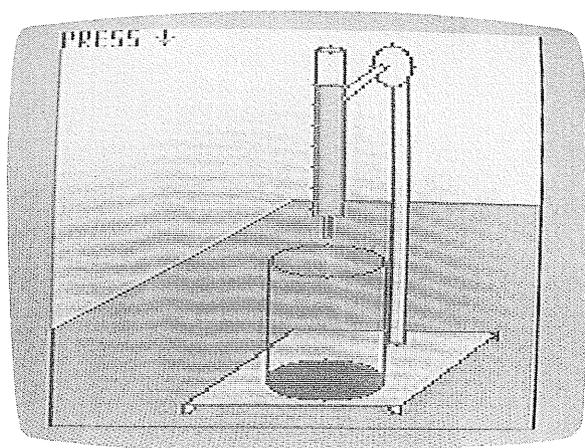


If the student continues to add solute once the solution has become saturated, the screen shows the solute piling up

Then the beaker is filled, and the student fills the beaker:



Then the student uses the down-arrow key to add drops of the base to the acid. When the solution has been titrated, it changes colors—just as it would in a real experiment if litmus dye were used:



The computer has kept track of the data for the titration. The student then records data from the computer screen onto a worksheet (provided in the student experiment book that accompanies the program), and then presses <ENTER> to continue. The next screen presents the student with the equation used to calculate the molarity of acid for this titration. The student fills in the appropriate amounts from the data worksheet and solves for the molarity of the acid.

TRS-80 Chemistry Lab, Volume I includes an instructor manual and twenty-five student experiment books. The student experiment books include background information and experimental procedures for each topic, a short summary quiz over the background information, data worksheets for recording the results of the experiments, and a set of questions over the data acquired in each topic. Step-by-step instructions for using the program on the TRS-80 computer are also included. The teacher's manual includes all of this information, plus instructional objectives for each topic, answers to the summary quizzes and final questions, and suggestions for areas of emphasis and methods of presentation.

Radio Shack's TRS-80 Chemistry Lab, Volume I, is available at Radio Shack stores and Computer Centers. The Color Computer version of the program (Cat. No. 26-2626) can be used with a 16K Color Computer tape system with Extended Color BASIC. The Model III/I version (Cat. No. 26-2609) is designed for use with the Model III or Model I 32K disk system or 16K tape system. This Model III/I version includes a Model III diskette and a 1500 Baud cassette tape for use with the Model III tape system. Replacement software for Model I users can be obtained FREE from Radio Shack. (The teacher's manual for the package tells you how.) The suggested retail price of either package (26-2609 or 26-2626) is \$199.00. (Prices may vary at individual stores and dealers.)

TRS-80 Chemistry Lab, Volume I, is the first of several simulation programs to be released by Radio Shack. A second volume of chemistry simulations and two volumes of physics simulations are to follow.

Reprints Are Now Available

The 1981 reprint set (Catalog No. 26-2240, \$9.95) is now available. This second set includes all 1981 issues of the TRS-80 Microcomputer News plus the 1981 index. "Stop That Out-of-Sorts Feeling", a two dimensional machine language sort for the Models I/II, and "Printer Codes—the Inside Story" are only two of the many useful and informative articles in the 1981 Reprints.

The response to the first TRS-80 Microcomputer News Reprints (Catalog No. 26-2115, \$4.95) has been even better than expected. For those who may not be familiar with it, this set of reprints includes all issues of TRS-80 Microcomputer News from the first-ever-issue through December 1980.

While a reprint of the 1982 TRS-80 Microcomputer News is planned, it will not be available until late summer or early fall of 1983.



Personal Time Savers Revisited

OOPS!!!

Calls from frustrated readers regarding the September VisiCalc Personal Time Savers column have resulted in this follow up article. The ideas presented are in fact valid, but there is additional information which was not included in the previous article. We apologize for any time loss or confusion that may have resulted from this oversight.

THE GENERAL IDEA IS . . .

Keyboard commands like /IR, >A5, /F\$, and formulas like +A5+A6 can be entered into a VisiCalc sheet as labels by using the preceding " (quote mark), stored in Print File format, and read back into another VisiCalc sheet as a command file. While immediate applications for this capability may not spring to mind, playing around with the examples a little may give you additional insight into several practical applications of this capability.

STORING COMMANDS AND FORMULAS IN A VISICALC PRF FILE

The coordinates, which are entered into the VisiCalc sheet as labels by using a quotation mark ("), indicate the coordinate where the values (10) or formula (+A5+A6) will actually be stored when the file is loaded back into another VisiCalc screen. The first example is a sample command file which stores the value 10 at coordinates A5 and A6 and the formula +A5+A6 at coordinate A7. The following key-strokes setup A5, the first screen coordinate of the file, and the value to be stored at that position.

```
">A5:10 <ENTER>
```

The " is for a label; >A5 indicates that the formula or value will be stored at coordinate A5; the : must follow the coordi-

nate in this format or this procedure will not work; and 10, in this example, is the value that is stored at A5.

A value or command may be stored at the coordinate by entering it:

1. Right after the colon (A5:10)
2. In the next coordinate position.

For example, the format /F\$ can be stored at coordinate A1 by typing ">A1:/F\$ or by typing ">A1: at coordinate A1 and "/F\$ at coordinate A2.

To create the first file, enter the information shown in Screen 1. Be sure that all commands, labels, or formulas are entered as labels. Numeric items entered in a cell by themselves are entered as numbers, not labels.

SAVING THE FILE TO DISK

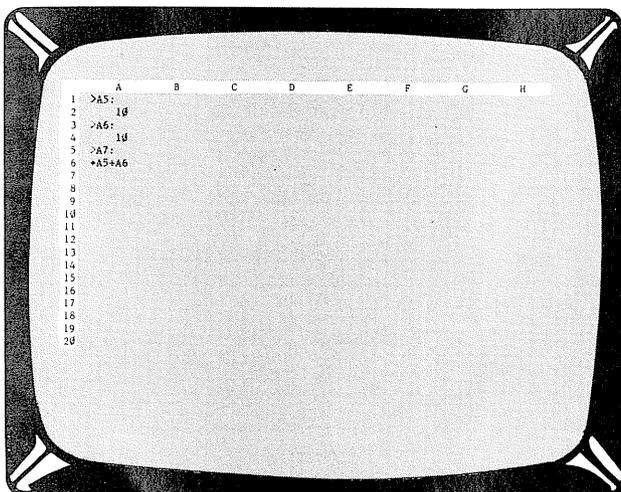
When all the information is entered, move the cursor to coordinate A1 and then save the file to disk by typing:

```
/PF filename/ext <ENTER>
```

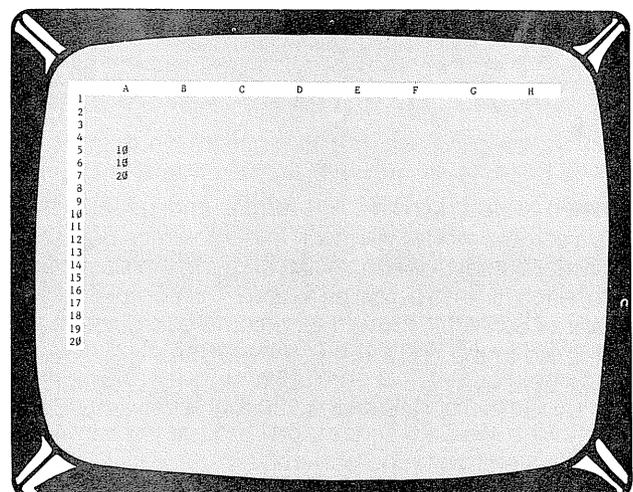
Notice that the file is not being saved by the standard /SS procedure. /PF saves the file in a special format that enables it to be read back as a command file. "filename" is the name you assign to the file. For demonstration purposes, the filename will be ADD. The extension (/ext) is optional, but if an extension is not used, VisiCalc will add a /PRF extension to the filename. When the file is reloaded into VisiCalc, the extension will have to be included in the filename. Instructions for saving and reloading the ADD file are:

1. Save it to disk by /PF ADD <ENTER>
2. Clear the screen - /CY
3. Reload ADD with /SL ADD/PRF <ENTER>

The result is Screen 2.



Screen 1



Screen 2

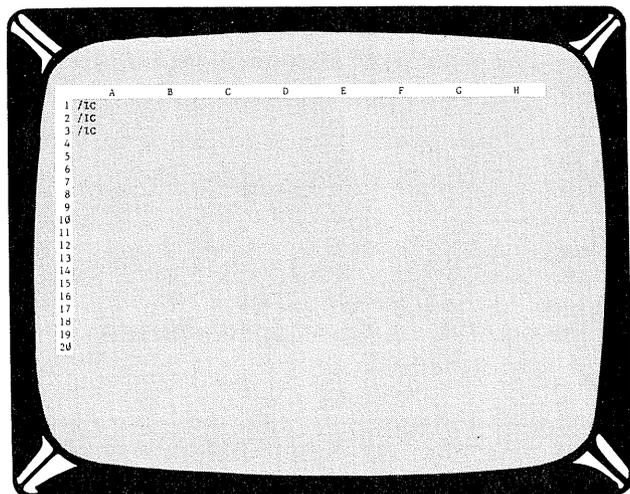
You should also be aware that /PF stores only what appears on the VisiCalc screen. Therefore, the column should be wide enough to display the entire formula.

A NOTE ON COMMAND FILE SEQUENCING

VisiCalc reads commands from left to right just as you are reading this text. So you could write the commands at A1, B1, C1, . . . , and then the next set of commands could start at A2, B2, C2, It is also possible to write the commands vertically—the first command at A1, the second command at A2, the third at A3 and so on, but a word of caution is needed. Since VisiCalc reads the file from left to right, there would be problems if the command file were written beginning at A1 for the first command, A2 for the second command, A3 for the third command, and then B1 for the fourth command, B2 for the fifth command, B3 for the sixth command, because VisiCalc would read them A1, B1, A2, B2, A3, B3 which would not be the intended order. While it is possible to have multiple rows of commands read in a left to right direction, it is not possible to write them in multiple columns.

MULTIPLE ROW AND COLUMN INSERTS

The September command file which inserted multiple rows worked just as it was given. This example will discuss inserting multiple columns. Try creating a command file like the one shown in Screen 3.

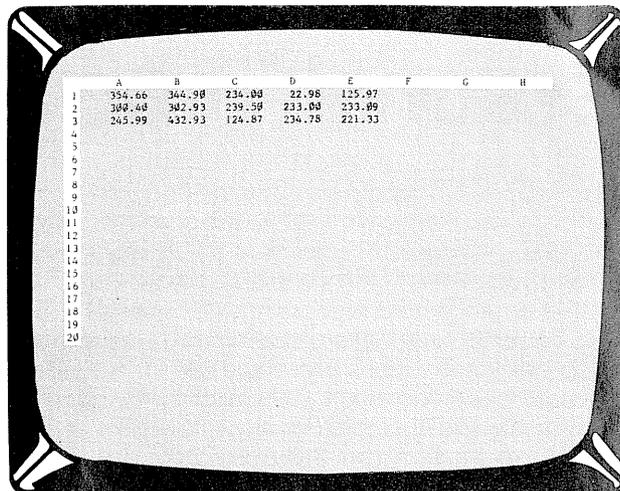


Screen 3

When stored with the /PF format and reloaded into a VisiCalc screen, this file will insert three columns beginning at the present cursor position. When creating the file remember to enter each /IC instruction as a label. The completed screen appears as Screen 3. Move the cursor to coordinate A1, and save the file in the /PF format as INS3COL.

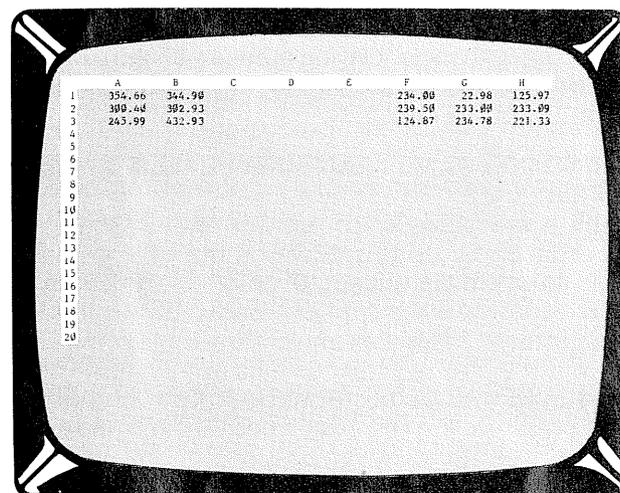
For a demonstration of the effect of INS3COL when it is loaded into a VisiCalc screen, first look at Screen 4 which contains several columns of numbers.

Three columns between the B and C columns are inserted by placing the cursor on column C and loading



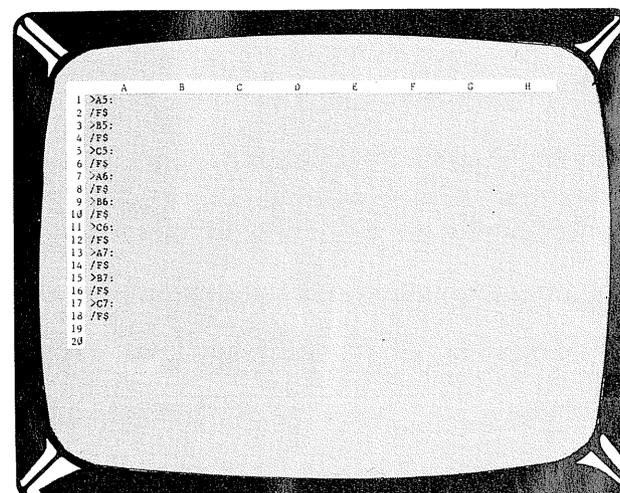
Screen 4

INS3COL/PF. The result is Screen 5.



Screen 5

A DECIMAL NUMBER MATRIX COMMAND FILE



Screen 6

(Continued on Page 38)

Modem II Programming Techniques

To correctly program the Modem II, you must follow certain conventions. First, initialize the RS-232C port. The Modem II/RS-232C protocol is 300 baud, 8 bit words, no parity, and 1 stop bit. Set these prior to programming the Modem. For example, on the Model II, you might initialize by typing (from TRSDOS READY):

```
SETCOM A=(300,8,N,1) <ENTER>
```

Set the Modem II switches to AUTO, ORIG, and TEST OFF. Now turn the Modem II POWER switch to ON. Notice that the RD indicator light is on, and remains on for about six seconds. When the RD light goes off, the TR indicator light should turn on. You MUST wait until the TR light is on before trying to program the Modem II! Once the TR light comes on, send an "*" to the modem. The TR light should turn off. If it doesn't, keep sending "*"s.

If the TR light fails to turn on, you might have a problem in the connections or have the protocol set incorrectly.

Once the TR light is off, you may begin programming the modem. Programming normally involves the following:

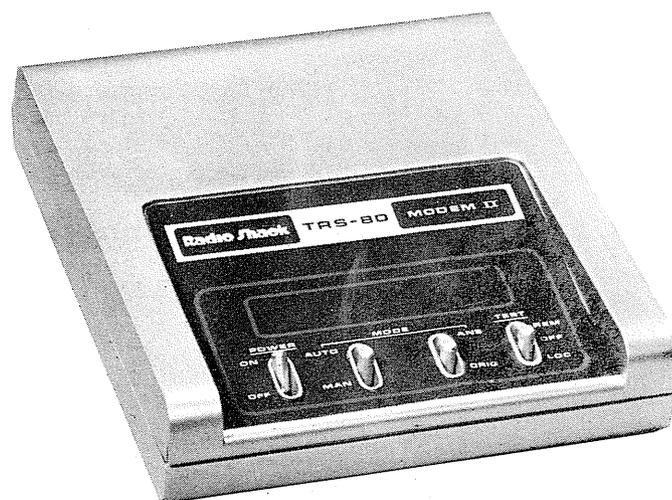
1. Send a "D" to clear the modem's program memory. This only clears the number—dialing speed and style remain at their default values of Slow Rotary.
2. If you are using rotary dialing, next send out the dialing speed, either "F" for fast, or a "S" for slow. Follow this by a "D", so that you can enter the phone number.
3. Now send the dialing style, either an "R" for rotary or a "T" for tone.
4. Enter the phone number. Valid characters include numbers and the letter "P" (for pause). Note: Do NOT enter hyphens, spaces, or parentheses! If you make a mistake, send a "D" to erase the old number and start over at Step 3.
5. When you are ready to place the call, send an "X". Once the modem has dialed the number, it waits on the other party to answer. If there is no answer after three rings, the modem disconnects, and the TR light comes on. To re-try the number, send an "*" and an "X".

Note: While entering the data into the modem, you must wait for the modem to correctly echo the last character sent BEFORE sending the next character. If the modem's echo doesn't match the character you sent, then a problem exists. Check your connections, the protocol, etc.

SAMPLE MODEM II PROGRAMS

Here are some examples of programs for the Modem II along with their interpretations. We'll assume that you are using a "terminal" program to send these to the modem.

Program	Interpretation
*DFDR5552234X	Select fast rotary dialing, then dial the number 555-2234.
*DT9P5551231X	Select tone dialing, dial 9 then pause for two seconds, and then dial 555-1231.
*DT9PPP1P8175559876X	Select tone dialing, dial 9 and pause for six seconds, dial one and pause for two seconds, then dial the number (817) 555-9876.
*DSDR2851X	Select slow rotary dialing and dial the number 2851.
*D2851X	Select slow rotary (as the default on Power up) and dial the number 2851.



SAMPLE DRIVER FOR AUTOMATIC DIALING

Here is an example of a driver program which sends a program to a modem. It is written for a Model II. To modify it for use on a Model III, simply remove the DEFUSR statements and replace the USR0 statements with OUT &HEB, SND% and the USR1 statements with ECHO% = INP(&HEB).

(Note: Naturally, you would want to use this in conjunction with a communications package. The following shows merely how to program the modem, and nothing about what to do once the communications are set up.)

```
10 'Sample Modem II Auto Dial Program written in
   ' Model II BASIC
20 '
30 ' Note: Use Channel A to run the program.
   ' First initialize this channel with the
```

```

40 ' TRSDOS command SEICOM A=(30,8,N,1). Load the
50 ' OUTP and INP routines, and then load BASIC
60 ' with the command BASIC -M:HEF50
70 '
80 DEFUSR0 = &HEF50      'OUTP Routine
90 DEFUSR1 = &HEF54      'INP Routine
100 '
110 ' Get the phone number data
120 '
130 LINE INPUT "Enter Phone Number: ";PH$
140 INPUT "Enter Dialing Style (<R>otary or
    <T>one): ";STYLE$
150 IF STYLE$ = "R" THEN INPUT "Enter Dialing
    Speed (<F>ast or <S>low): ";SPEED$ ELSE
    SPEED$=""
160 PGM$ = "D" + SPEED$ + "D" + STYLE$ + PH$
170 '
180 'Enter the program mode of the Model II by
    sending an "*"
190 '
200 TRIES = 0
210 SND% = CINT(ASC("*"))
220 X% = USR0(SND%)
230 FOR I = 1 TO 50
    : NEXT I
240 ECHO% = USR1(0)
250 TRIES = TRIES + 1
260 IF ECHO% <> SND% AND TRIES < 3 THEN 210
270 IF TRIES = 3 THEN PRINT "Can't program the
    Modem!"
    : STOP
280 '
290 ' Send the phone number data string (i.e.,
    the Modem II program)
300 '
310 FOR I = 1 TO LEN(PGM$)
320 SND% = CINT(ASC(MID$(PGM$,I,1)))
330 X% = USR0(SND%)
340 FOR N = 1 TO 50
    : NEXT N
350 ECHO% = USR1(0)
360 IF SND% <> ECHO% THEN PRINT "Can't program
    the Modem!"
    : STOP
370 NEXT I
380 '
390 ' Get the time for the number to be dialed
    and wait for the dialing time
400 ' (DT$) to equal the system time (TIME$).
    When equal, send a "X" to instruct the
410 ' Modem II to dial the number.
420 '
430 INPUT"Modem Programmed. Enter Time to Dial
    Number (HH.MM.SS)"; DT$
440 IF DT$ <> TIME$ THEN 440
450 SND% = CINT(ASC("X"))
460 X% = USR0(SND%)
470 FOR I = 1 TO 50
    : NEXT I
480 ECHO% = USR1(0)
490 IF SND% = ECHO% THEN PRINT "Number Dialed!"
    ELSE PRINT "Number NOT Dialed!"
500 PRINT "Number Dialed!"

```

OUT/INP SUBROUTINES

Use these routines to input and output characters via the RS232-C Channel A port. On entry to OUTP, HL points to the character to be sent. On entry to INP, HL points to the address that is to receive the character. This is consistent with Model II BASIC's method of parameter passing.

```

PORTA EQU 0F4H      ;Channel A Data Port=0F4H
PSECT 0EF50H      ;Routines must reside in
                  high memory

```

```

OUTP: LD A,(HL)      ;Get character from BASIC
        ; program
        OUT (PORTA),A ;Send character out Channel
        ; A
        RET          ;Return to BASIC
;
INP: IN A,(PORTA)    ;Send character from Channel
        ; A port
        LD (HL),A    ;Return character to BASIC
        ; (HL -> character)
        RET          ;Return to BASIC
;
END OUTP

```

Personal Time Savers (From Page 36)

This command file presets the value format to a dollar format for all numbers that will be entered in the following matrix positions: A5, B5, C5, A6, B6, C6, A7, B7, C7. The setup of this file would appear as Screen 6.

After saving this file in the /PF format, clearing the screen, and loading it back in, numbers entered in the matrix bounded by A5 - A7 and C5 - C7 will be displayed as decimal numbers as in Screen 7.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5	33.02	29.12	27.11					
6	21.05	26.78	24.17					
7	27.51	28.93	31.90					
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Screen 7

TIME SAVERS

These procedures can be true time savers by allowing you to eliminate repetitive entries by entering them once, saving the file, and reloading them into another file when needed.

Christmas Eve

Todd Day
6702 Mt. Pakron Dr.
San Jose, CA 95120

Here is a program that I thought you might enjoy for the holidays. It draws a nice Christmas Eve scene complete with a Christmas tree with a blinking star, lights, and a warm, cozy fire. This program requires 16K and Extended BASIC. Since this program uses up almost all of the available memory, it cannot be run while a disk system is connected.

One programming technique I have found useful in making graphics programs is to stick this line in the last part of your program:

```
90000 H = JOYSTK(0) * 4
      : V = JOYSTK(1) * 3
      : PSET(H,V)
      : GOTO 90000
```

This allows you to see all of your graphics and move the dot from the joystick around. When you find the spot you need, you can "break" the program, and by printing the values of H and V you can find the required coordinates.

CHRISTMAS EVE PROGRAM

Line 10 Reserves space for graphics and sets up the screen. L and L1 are the coordinates for the lights on the tree.

Line 15 Draws the walls.

Line 20 Paints the floor and starts drawing the fireplace mantle.

Line 25 Finishes the bricks and makes the fireplace hole.

Line 30 Draws the rug.

Line 35 Paints the right wall blue and draws the window.

Line 40 Paints the left wall blue, makes the picture frame and draws the Christmas tree.

Line 45 Draws the wreath and tree base.

Line 50 Draws the vases.

Line 55 Draws the presents and stockings.

Line 60 Draws the log and star.

Line 65 Draws "Merry Christmas."

Line 70 - 90 Blinks the star and lights, flickers the fire, and plays "We Wish You a Merry Christmas."

```
10 CLEAR 0
   : PCLEAR 8
   : PMODE 3,1
   : PCLS 2
   : SCREEN1,0
   : COLOR7
   : DIM L(16), L1(16)
   : FOR T = 0 TO 16
   : READ L(T), L1(T)
   : NEXT
15 LINE(0,20)-(30,30),PSET
   : LINE-(255,181),PSET,B
   : LINE -(255,191), PSET
```

```
   : LINE(0,255) - (30,181), PSET
   : LINE(255,20) - (225,30), PSET
   : LINE -(30,110), PSET, BF
   : LINE(0,20) - (255,19), PSET, B
   : PAINT(0,0), 1, 3
20 PAINT(245,189),1,3
   : PAINT(33,120), 8, 7
   : COLOR 2
   : FOR T = 174 TO 117 STEP - 7
   : LINE(33,T) - (222,T), PSET
   : NEXT
21 COLOR 7
22 LINE (30,30) - (225,181), PSET, B
25 COLOR 2
   : FOR T = 111 TO 180 STEP 14
   : FOR TT = 40 TO 218 STEP 20
   : LINE (TT,T) - (TT,T+7), PSET
   : LINE (TT + 10, T + 7) - (TT + 10, T + 14),
   PSET
   : NEXT
   : NEXT
   : COLOR 7
   : LINE (100,125) - (160,174), PSET, BF
30 CIRCLE (132,191), 30, 3, .3, .5, 0
   : PAINT(132,189), 3, 3
   : CIRCLE(132,191), 15, 4, .3, .5, 0
   : PAINT (132,191), 4, 4
35 LINE (255,64) - (230,68), PSET
   : LINE - (230,116), PSET
   : LINE -(255,120), PSET
   : PAINT (252,24), 7, 7
   : LINE(230,92) - (255,92), PSET
   : LINE(243,64) - (243,120), PSET
40 PAINT (2,27), 3, 3
   : COLOR 4
   : LINE (30,30) - (30,100), PSET
   : COLOR 4
   : LINE (96,45) - (164,99), PSET, BF
   : COLOR 2
   : LINE (99,48) - (162,97), PSET, BF
   : COLOR 1
   : LINE (44,57) - (0,174), PSET
   : LINE - (88,174), PSET
   : LINE - (44,57), PSET
   : PAINT (45,60), 1, 1
45 CIRCLE (130,73), 22, 1
   : PAINT (130,73), 1, 1
   : CIRCLE (130,73), 13, 2
   : PAINT (130,73), 2, 2
   : COLOR 4
   : LINE (126,87) - (137,90), PSET, BF
   : CIRCLE (44,191), 30, 4, .3
   : PAINT (44,188), 4, 4
   : COLOR 2
   : LINE (40,174) - (48,187), PSET, BF
50 COLOR 5
   : LINE (80,93) - (82,110), PSET
   : LINE - (86,110), PSET
   : LINE - (88,93), PSET
   : LINE - (80,93), PSET
   : PAINT (82,95), 5, 5
```

```

: LINE (172,93) - (174,110), PSET
: LINE -(178,110), PSET
: LINE -(180,93), PSET
: LINE -(172,93), PSET
: PAINT (174,95), 5, 5
: COLOR 8
: LINE(222,30) - (222,112), PSET
55 PAINT (240,87), 6, 7
: COLOR 2
: LINE (16,179) - (30,189), PSET, BF
: COLOR 3
: LINE (56,177) - (76,189), PSET, BF
: DRAW "BM114,123C2D11G2L4G2D2F2R10E4U15L6"
: PAINT (118,126), 2, 2
: DRAW "BM138,123D11G2L4G2D2F2R10E4U15L6"
: PAINT (142,126), 2, 2
60 LINE (112,165) - (148,174), PSET, BF
: COLOR 4
: LINE (45,56) - (52,60), PSET
: LINE -(46,52), PSET
: LINE -(54,49), PSET
: LINE -(46,49), PSET
: LINE -(44,43), PSET
: LINE -(42,49), PSET
: LINE -(35,49), PSET
: LINE -(42,52), PSET
: LINE -(36,60), PSET
: LINE -(45,56), PSET
65 DRAW "BM62,15U8F2E2D8BR6NR4U4NR2U4R4BR6N
D8R2F2G2L2F4BR6U8R2F2G2L2F4BR8U4NH4NE4D4BR14U
8NR4D8R4BR6U4NU4R4NU4D4BR6U8R2F2G2L2F4BR6R2NR
2U8L2R4BR6NR4D4R4D4NL4BR8U8L2R4BR6ND8F2E2D8BR
6U4NR4U4R4D8BR6R4U4L4U4R4
70 FOR I = 1 TO 4
: PCOPY T TO I + 4
: NEXT
75 PMODE 3,5
: X = X + 1
: IF X > 2 THEN X = 0
: GOTO 75
: ELSE PAINT (44,51), X + 1, 4
77 Y = Y + 2
: IF Y > 21 THEN Y = 0
: PLAY "T302L4G03CL8C0C02BL4AAP32A03DL8DE
DC02L4BGP32G03EL8EFEDL4C02AP32L8GGL4A03C02B0
3C
80 R = RND(17) - 1
: CIRCLE (L(R),L1(R)), 3, RND(3) + 1
: COLOR 3
: LINE(148,164) - (112,148), PSET, BF
: ON RND(2) GOSUB 85, 90
: FOR T = 5 TO 8
: PCOPY T TO T - 4
: NEXT
: GOTO 75
85 COLOR 2
: LINE (148,164) - (139,152), PSET
: LINE -(130,162), PSET
: LINE -(121,148), PSET
: LINE -(112,164), PSET
: PAINT (120,156), 4, 2
: RETURN
90 COLOR 2
: LINE (148,164) - (139,149), PSET
: LINE -(127,162), PSET
: LINE -(121,153), PSET
: LINE -(112,164), PSET
: PAINT (120,156), 4, 2
: RETURN
95 DATA 44, 66, 48, 83, 36, 87, 33, 102, 44, 102,
56, 105, 56, 120, 44, 120, 24, 120, 20, 138,
44, 138, 64, 142, 72, 162, 52, 162, 36, 168,
12, 162, 31, 153

```



Computer Clubs

Northern Illinois Color Computer Club
c/o John Bowman, President
9346 Landings
Des Plaines, IL 60016

St. Ignatius Computer Club
St. Ignatius High School
c/o Stephan Kinholt
P. O. Box 400
St. Ignatius, MT 59865

We apologize for the error in the September 1982 Microcomputer News. The listing for the Silicon Valley Computer Club should have read:

Silicon Valley Color Computer Club
P.O. Box 61593
Sunnyvale, Ca 94088

There is also a color computer bulletin board for the area called:

Silicon Rainbow Bulletin Board
408-733-6809

TRS-80 Users Group of North Utah
c/o Marcel Kinard
3106 East 125th North
Layton, UT 84041
1-801-544-8970

Text Editor Revisited

Ashok Basargekar
1423 N. Cleveland St.
Orange, CA 92667

The Text Editor 2.2 program published in the July/August 1982 issue of TRS-80 Microcomputer News is really a great one. The program of course works fine when a Color Computer with Extended BASIC is used. It requires quite a bit of modification when using Disk Extended Color BASIC.

Since additional system RAM from address 1536 to 2440 is reserved for the Disk BASIC, it is necessary to change the Assembly Language code and the BASIC program so that the Text Editor starts after the reserved RAM for the Disk BASIC.

I feel that the readers having Disk BASIC and a 32K Color Computer will find the following modifications to the Text Editor very useful while using the program. I have only listed the lines that need to be changed and the new lines that are required to be added.

I have deleted the lines from 5000 to 5050 to my program and have used the Assembly Language code as a separate Machine Language program called TEXT ML. My modifications are as follows:

```
10 CLEAR 200, 32500
   : LOADM "TEXT ML"
20 CLS
   : INPUT "LINE WIDTH"; LW
30 INPUT "MARGIN"; TB
30 DEFUSR0 = &H7FEB
   : DEFUSR1 = 32719
   : DEFUSR2 = &H7FB2
40 CLS
   : PRINT "1: COMPOSE"
   : PRINT "2: EDIT"
   : PRINT "3: COPY ON PRINTER"
   : PRINT "4: SAVE TEXT ON DISK"
   : PRINT "5: LOAD TEXT FROM DISK"
   : PRINT
   : PRINT
   : PRINT "SELECT 1 TO 5"
41 KY$ = INKEY$
   : IF KY$="" THEN 41 ELSE IF VAL(KY$) < 0 OR
   VAL(KY$) > 5 THEN 41
42 ON VAL(KY$) GOTO 100, 210, 550, 4050, 4100
   : GOTO 20
120 A = 2560
170 IF A$ = "~" THEN POKE A, 255
   : LIMIT = A
   : GOTO 20 ELSE IF A$ = CHR$(8) THEN A = A -
   1
   : GOTO 140
```

Delete line 180

```
210 POKE 65479, 0
   : POKE 65480, 0
   : POKE 65483, 0
220 A = 2560
270 IF A$ = CHR$(8) THEN A = A - 1
   : IF A = 2559 THEN A = 2560
290 IF A$ = "~" THEN A = A - 32
   : IF A < 2560 THEN A = 2560
530 IF A$ = "~" THEN POKE A, 255
   : LIMIT = A
   : GOTO 230
550 CLS
   : PRINT "TEXT PRINTING ON PRINTER. TURN
   PRINTER ON AND PRESS ENTER."
   : INPUT RS
```

```
   : FOR A = 2560 TO 9215
620 IF LEN(B$) = LW THEN 3050
640 PRINT# - 2, TAB(TB); B$
   : B$ = ""
650 IF A1 = 255 THEN LIMIT = A
   : GOTO 20 ELSE IF A = 9215 THEN LIMIT = 9215
   : GOTO 20
3000 IF A > 7679 THEN POKE 65479, 0
   : POKE 65481, 0
   : POKE 65483, 0
   : POKE 65485, 0
   : RETURN
3001 IF A > 7167 THEN POKE 65478, 0
   : POKE 65481, 0
   : POKE 65483, 0
   : POKE 65485, 0
   : RETURN
3002 IF A > 6655 THEN POKE 65479, 0
   : POKE 65480, 0
   : POKE 65483, 0
   : POKE 65485, 0
   : RETURN
3003 IF A > 6143 THEN POKE 65478, 0
   : POKE 65480, 0
   : POKE 65483, 0
   : POKE 65485, 0
   : RETURN
3004 IF A > 5631 THEN POKE 65479, 0
   : POKE 65481, 0
   : POKE 65482, 0
   : POKE 65485, 0
   : RETURN
3005 IF A > 5120 THEN POKE 65478, 0
   : POKE 65481, 0
   : POKE 65482, 0
   : POKE 65485, 0
   : RETURN
3006 IF A > 4607 THEN POKE 65479, 0
   : POKE 65480, 0
   : POKE 65482, 0
   : POKE 65485, 0
   : RETURN
3007 IF A > 4095 THEN POKE 65478, 0
   : POKE 65480, 0
   : POKE 65482, 0
   : POKE 65485, 0
   : RETURN
3010 IF A > 3583 THEN POKE 65479, 0
   : POKE 65481, 0
   : POKE 65483, 0
   : POKE 65484, 0
   : RETURN
3020 IF A > 3071 THEN POKE 65478, 0
   : POKE 65481, 0
   : POKE 65483, 0
   : POKE 65484, 0
   : RETURN
3030 POKE 65479, 0
   : POKE 65480, 0
   : POKE 65483, 0
   : RETURN
3050 IF PEEK(A+1) = 143 THEN 640
3055 IF PEEK(A+1) = 32 THEN 640
3060 IF A1 >= 32 AND A1 < 48 THEN 640
3070 IF A1 > 57 AND A1 < 64 THEN 640
3080 A = A - 1
   : B$ = LEFT$(B$, LEN(B$)-1)
   : A1 = PEEK(A)
3090 IF A1 > 0 AND A1 < 27 THEN A1 = A1 + 96
4000 IF A1 = 143 THEN A1 = 32
4010 IF A1 = 255 THEN 640
4020 IF A1 = 191 THEN 640
4030 GOTO 3050
4050 CLS
   : INPUT "FILE NAME"; F$
   : SAVEM F$, 2560, LIMIT, 2560
```

```

: GOTO 20
4100 CLS
: INPUT "FILE NAME"; FS
: LOADM FS
: GOTO 20

```

TEXT ML ASSEMBLY LANGUAGE PROGRAM

```
SAVEM 'TEXT ML', 32501, 32767, 32690
```

```

7FB2 8E0A00 LDX #A00
7FB5 A680 LDA X+
7FB7 E684 LDB X+0
7FB9 A780 STA X+
7FBB 1E89 EXC A, B
7FBD 81FF CMPA #FF
7FBF 2707 BEQ 7FC8
7FC1 8C11FF CMPX #11FF
7FC4 2702 BEQ 7FC8
7FC6 20EF BRA 7FB7
7FC8 E784 STB X+0
7FCA 86FF LDA #FF
7FCC A784 STA X+0
7FCE 39 RTS
7FCF 8E0000 LDX #0
7FD2 E684 LDB X+0
7FD4 E782 STB -X
7FD6 A681 LDA X++
7FD8 E684 LDB X+0
7FDA C1FF CMPB #FF
7FDC 270A BEQ 7FE8
7FDE 8C11FF CMPX #11FF
7FE1 2705 BEQ 7FE8
7FE3 E782 STB-X
7FE5 7E7FD6 JMP 7FD6
7FE8 E782 STB -X
7FEA 39 RTS
7FEB C68F LDB #8F
7FED 8E0A00 LDX #A00
7FF0 E780 STB X+
7FF2 8C0BFF CMPX #BFF
7FF5 26F9 BNE 7FF0
7FF7 39 RTS

```

```
13 IF Z=11 LET Y$="ELEVNTH"
```

The program is interesting from a technical standpoint because it uses IF statements to control PRINT or PAUSE commands. If the conditions specified in the IF statement are not met, then the PRINT or PAUSE is not executed. This is a useful programming trick because it allows you to format "error messages" and special messages that will appear only under certain conditions.

```

1 "XMAS"
2 " "CLEAR
:PAUSE "TWELVE DAYS OF CHRISTMAS"
3 FOR Z=1 TO 12
:IF Z=1 LET Y$="FIRST"
4 IF Z=2 LET Y$="SECOND"
5 IF Z=3 LET Y$="THIRD"
6 IF Z=4 LET Y$="FOURTH"
7 IF Z=5 LET Y$="FIFTH"
8 IF Z=6 LET Y$="SIXTH"
9 IF Z=7 LET Y$="SEVENTH"
10 IF Z=8 LET Y$="EIGHTH"
11 IF Z=9 LET Y$="NINTH"
12 IF Z=10 LET Y$="TENTH"
13 IF Z=11 LET Y$="ELEVNTH"
14 IF Z=12 LET Y$="TWELFTH"
15 PAUSE "ON THE ";Y$;" DAY"
:PAUSE "OF CHRISTMAS, MY TRUE"
:PAUSE "LOVE GAVE TO ME"
16 IF Z>11 PAUSE "TWELVE LORDS A LEAPING"
17 IF Z>10 PAUSE "ELEVEN LADIES DANCING"
18 IF Z>9 PAUSE "TEN PIPERS PIPING"
19 IF Z>8 PAUSE "NINE DRUMMERS DRUMMING"
20 IF Z>7 PAUSE "EIGHT MAIDS A MILKING"
21 IF Z>6 PAUSE "SEVEN SWANS A SWIMMING"
22 IF Z>5 PAUSE "SIX GEESE A LAYING"
23 IF Z>4 PAUSE "FIVE GOLDEN RINGS"
24 IF Z>3 PAUSE "FOUR CALLING BIRDS"
25 IF Z>2 PAUSE "THREE FRENCH HENS"
26 IF Z>1 PAUSE "TWO TURTLEDOVES AND"
27 PAUSE "A PARTRIDGE IN A"
:PAUSE "PEAR TREE"
:NEXT Z
28 PAUSE "MERRY CHRISTMAS TO YOU!"
:END

```

PC-1 Twelve Days of Christmas

Robert K. Phelps
143 Forest Park
7800 Tayloe Drive
Manassas, VA 22111

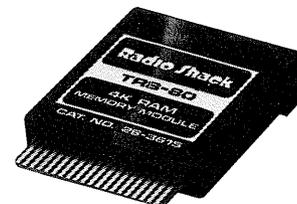
This program is based on the song "The Twelve Days of Christmas." It can be run on a PC-1 as a "fun" program. It can also be adapted to other computers. The program takes only 28 program lines so it is easy to key into memory. After the program is loaded, you switch to the DEF mode and press <SHIFT> <SPACE> to start the run. The program can be converted to use the printer, but it is mainly designed to use the computer as a stand-alone unit.

There is a program bug that was left in deliberately. This is on line 13. The computer will print ON THE ELEVENT DAY. The final H is dropped because it exceeds the 7-letter limit for string values. This is such a minor problem that it is not worth the time and effort to correct the bug. It does not affect the running of the program. If you want a program correction, then you can drop the E between the V and N on line 13. This will change line 13 as follows.

Availability of 16K RAM Modules for the Pocket Computer II

There have been many inquiries regarding availability dates for the 16K RAM module for the Pocket Computer II. There simply is not an availability date in existence at this time. Presently it is not possible to manufacture CMOS memory chips in the density necessary to produce a 16K module.

Radio Shack will have 16K modules as soon as it is feasible to produce them, but, for the present, a 16K RAM module looks to be a minimum of one to two years away.

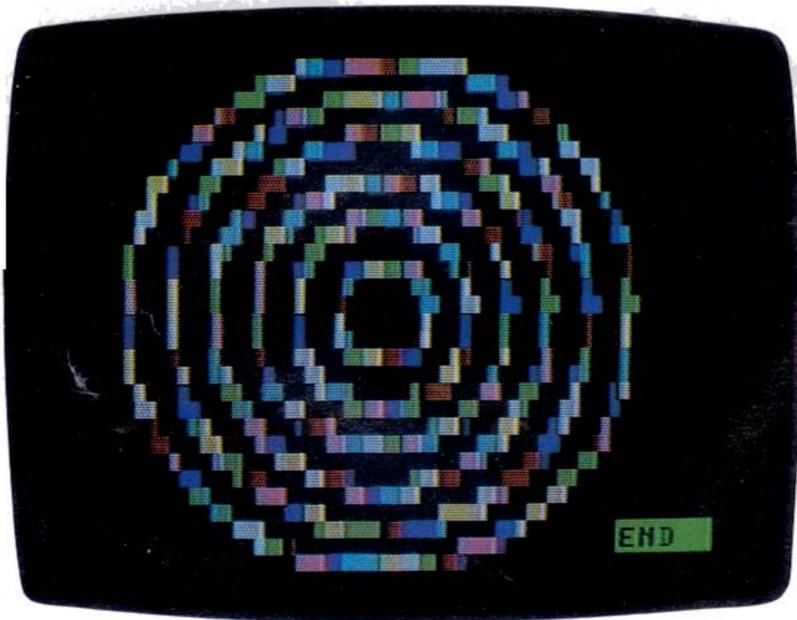


Concentric Circles on the CoCo

Donald E. Whitelock
402 Ganttown Road
Turnersville, NJ 08012

In your June 1982 issue I was particularly interested in a program by Stephen Havens entitled "Concentric Circles." I was disappointed when it would not run on my Color Computer so I updated the program to run on the Color Computer and discovered the best I could come up with was concentric ellipses.

Also, in your June issue I found an article by R.A. Esquivel concerning a height correction factor for Color Computer graphics. I found his .9 correction factor to be valid when operating within the guidelines of PMODE. If you were using the SET command for graphic operation, as Mr. Havens and I did in the above mentioned "Concentric Circles" program, the .9 correction factor no longer remained valid. Under this set of circumstances the correction factor for height is .6. I believe that .6 does not deliver an exact one to one ratio, but even if it is not mathematically close, it is certainly visually close.



```

10 REM CONCENTRIC CIRCLES II
20 REM DONALD E. WHITELOCK 1982
30 F = 0
40 CLS(0)
50 PRINT "ENTER THE RADIUS OF THE CIRCLE."
60 INPUT "----(2 TO 25)---";A
70 IF A < 2 OR A > 25 THEN 50
80 CLS(0)
90 PRINT "ENTER ANY NUMBER GREATER THAN "
100 INPUT "20 FOR THE RESOLUTION";B
110 IF B < 20 THEN 90
120 CLS(0)
130 PRINT "ENTER THE NUMBER OF SPACES"
140 PRINT "BETWEEN EACH CIRCLE";C
150 CLS(0)
160 FOR D = 1 TO B STEP .5
170 F = F + 1
180 IF F = 8 THEN LET F = 1
190 I = 30 + (A * SIN(D))
200 J = 16 + (.60 * (A * COS(D)))
210 SET (I,J,F)
220 NEXT D
230 A = A - 1 - C

```

```

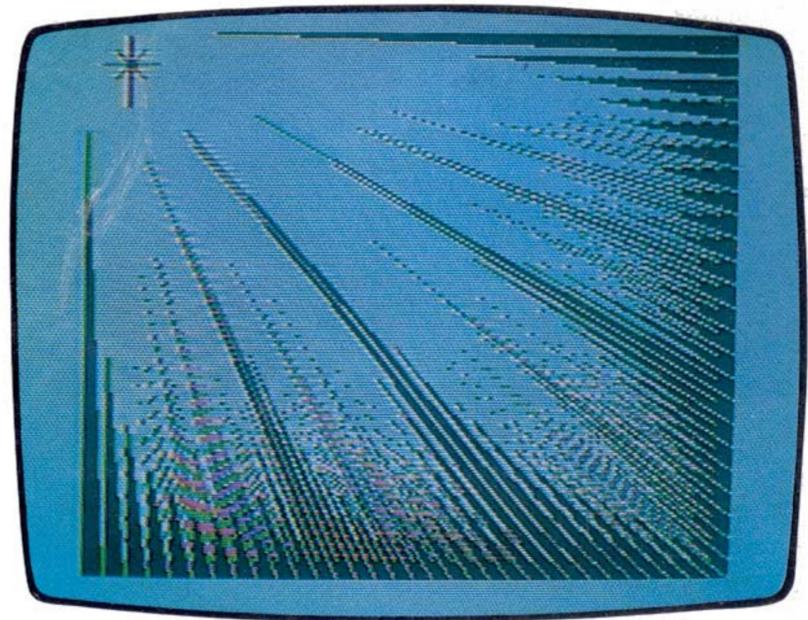
240 IF A < 2 THEN 250 ELSE 160
250 PRINT @ 475, "END"
260 GOTO 260

```

Christmas Card

G. Pigounias
2226 Texas Avenue
Savannah, GA 31404

This program can be used with the Line Printer VII to make a nice Christmas letter to send to friends. After saving the BASIC program on tape, CLOADM the Screen Print Routine (26-3012) using normal procedures, and type POKE 16303,255. Run the BASIC program and break execution when the screen is completed. Then press the <SHIFT> <↑> to begin the screen dump to the printer.



```

10 '*****
20 '***** XMAS CARD *****
30 '*****
40 PMODE 4,1
   : PCLS
   : SCREEN 1,1
50 FOR X = 0 TO 256 STEP 8
60 FOR Y = 0 TO 192 STEP 8
70 LINE (0,0) - (X,Y), PSET
80 NEXT Y
90 NEXT X
100 DRAW "M16,12; C0; N; V10; N; R10; N; D15; N;
      L10; N; E5; N; G5; N; H5; N; F5;"
110 GOTO 110

```



Radio Shack Computer Center Addresses and Telephone Numbers

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MOBILE 405 Bel-Air Blvd., (205) 471-1617
MONTGOMERY #24 Union Square S/C, (205) 271-1500

ARIZONA
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TUCSON 5622 E. Broadway, (602) 748-0101; Campbell Plaza, 2830 N. Campbell Ave., (602) 881-8003

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HOMEWOOD/GLENWOOD 329 Glenwood Lansing, (312) 758-0440
LaGRANGE One S. LaGrange Rd., (312) 482-3484
LIBERTYVILLE 1350 S. Milwaukee Ave., (312) 367-8230
LOMBARD 4 Yorktown Center, (312) 629-5350
NILES 8349 Golf Rd., (312) 470-0670
OAK LAWN 4815 W. 95th St., (312) 425-9130
PEORIA 4125 N. Sheridan Rd., (309) 685-7056
ROCKFORD North Town S/C, 3600 N. Main St., (815) 282-1001
SCHAUMBURG 651 Mall Dr., (312) 884-8600
SPRINGFIELD Sherwood Plaza, 2478 Wabash, (217) 787-3066

INDIANA
EVANSVILLE 431 Diamond Ave., (812) 426-1715
FT. WAYNE 747 Northcrest S/C, (219) 482-9547
GRIFFITH 208 W. Ridge Rd., (219) 838-3000
INDIANAPOLIS 6242 E. 82nd St., Castleton Pl., (317) 849-6896; Speedway Plaza, 6129 B Crawfordsville, (317) 244-2221; 10013 E. Washington St., (317) 898-4887
TERRE HAUTE 3460 U.S. Hwy. 41 S., (812) 234-3212

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CEDAR RAPIDS 111 First Ave., S.E. (Downtown), (319) 362-7399
DAVENPORT 616 E. Kimberly Rd., (319) 386-3457
DES MOINES 7660 Hickman Rd., Sherwood Forest S/M, (515) 270-0193

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OVERLAND PARK 8619 W. 95th, (913) 642-1301
TOPEKA White Lakes Plaza, West Tower, 3715 Plaza Dr., (913) 267-6420
WICHITA 2732 Blvd. Plaza S/C, (316) 681-1212

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LEXINGTON 2900 Richmond Rd., (606) 269-7321
LOUISVILLE 2900 Taylorsville Rd., (502) 459-9901; Louisville Galleria, (502) 589-1013

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BATON ROUGE 7007 Florida Blvd., (504) 928-5260
HOUMA 2348 W. Park Ave. (Hwy. 24), (504) 873-7713
LAFAYETTE University Square at Congress Blvd., (337) 235-6177
METAIRIE 3750 Veterans Hwy., (504) 454-3631
NEW ORLEANS 327 St. Charles Ave., (504) 523-6408
SHREVEPORT 1545 Line Ave., (318) 221-5125

MAINE
BANGOR Maine Square, (207) 945-6491

MARYLAND
BALTIMORE 7942 Belair Rd., Putty Hill Plaza, (301) 882-9583; 115 N. Charles St. at Lexington, (301) 539-7251
BETHESDA 7900 Wisconsin Ave., (301) 656-0892
CATONSVILLE One Mile West S/C, 6600 B Balt. Nat'l. Pike, (301) 788-3277
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NEW CARROLLTON-LANHAM 7949 Annapolis Rd., (301) 459-8030
PASADENA 8120 Ritchie Hwy., (301) 544-2352
ROCKVILLE Congressional Plaza, 1673 Rockville Pike, (301) 984-0424
SALISBURY Shoppers World S/C, Rt. 50, (301) 546-9223
TEMPLE HILLS 4520 St. Barnabas Rd., (301) 899-0740
TOWSON-LUTHERVILLE Yorktown S/C York Rd. at Ridgely Rd., (301) 561-2001

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BOSTON 730 Commonwealth Ave., (617) 739-1704, 111 Summer St., (617) 542-0361
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BROCKTON 675 Belmont, (617) 583-2270
BURLINGTON Crossroads Plaza, Rt. 3 S., (617) 229-2850
CAMBRIDGE Harvard Square, 28 Boylston St., (617) 354-7694
CHESTNUT HILL 200 Boylston St., (617) 969-2031
NATICK 1400 Worcester Rd., (617) 875-8721
SAUGUS 343 Broadway, (617) 233-4985
SPRINGFIELD 1985 Main St. Northgate Plz., (413) 732-4745
WORCESTER Lincoln Plaza, (617) 852-8844

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ANN ARBOR 2515 Jackson Rd., (313) 761-6266
BIRMINGHAM 3620 W. Maple Rd., (313) 647-2151
DETROIT DWNTN 1559 Woodward Ave., (313) 961-6855
FLINT G3298 Miller Rd., (313) 732-2530
GRAND RAPIDS 3142 28th St. SE., (616) 957-2040
KALAMAZOO 25 Kalamazoo Center, (616) 343-0780
LANSING 2519 S. Cedar St., (517) 372-1120
PLAINFIELD North Kent Mall, (616) 364-7558
LIVONIA 33470 W. 7 Mile Rd., (313) 476-6800
ROSELVILLE 31873 Gratiot Ave., (313) 296-6210
SOUTHFIELD 17651 West 12 Mile Rd., (313) 569-1027
TROY Oakland Plaza, 322 John R. Rd., (313) 585-3900

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BLOOMINGTON 10566 France Ave. S., (612) 884-1641
GOLDEN VALLEY Golden Valley S/C, 8016 Olson Memorial Hwy., (612) 542-8471
ST. PAUL 6th & Wabasha, (612) 291-7230

MISSISSIPPI
JACKSON 979 Ellis Ave., (601) 352-5001

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KANSAS CITY 4025 N. Oak Trafficway, (816) 455-3381
ST. ANN 10472 St. Charles Rock Rd., (314) 428-1400
SPRINGFIELD 2684 S. Glenstone, (417) 883-4320

NEBRASKA
OMAHA 3006 Dodge St., (402) 346-4003

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LAS VEGAS Commercial Center, 953 E. Sahara #31-B, (702) 731-3956
RENO 3328 Kietzke Lane, (702) 326-6327

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BALA CYNWYD 67 E. City Line Ave., (215) 668-9950
ERIE 5755 Peach St., (814) 868-5541
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LANCASTER Park City Plaza, US 30, (717) 393-5817
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