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MOD-II/16

THE NEWSLETTER FOR OWNERS OF THE TRS-80™
MODEL II/16 MICROCOMPUTERS

The purpose of the **MOD-II/16 NEWSLETTER** is to provide and exchange information related to the care, use and application of the **TRS-80 MOD-II** and 16 microcomputer systems (TRS-80 is a Trademark of the Tandy Corporation). The **MOD-II/16 NEWSLETTER** is a user-oriented publication and will greatly depend on **MOD-II/16** owners as sources of information. Please send any questions, comments, ideas, programming hints, stories, etc., to The Editor, MOD-II NEWSLETTER, 50 North Pascack Road, Spring Valley, NY 10977.

*** THE MOD-II/16 NEWSLETTER ***

As you can see, we have changed our name a little to reflect the fact that, as more people start using the Mod-II's big brother--the Mod-16--we plan to introduce items will be of interest to both Mod-II and Mod-16 owners. Although some people have now actually taken delivery of Mod-16 computers, they are still running the computer as if it were a Mod-II, by using a slightly modified Mod-II TRSDOS 2.0 operating system. Remember, the Mod-16 is a dual microprocessor machine, so it can run any software that runs on a Mod-II by using its 8-bit microprocessor. For a while, at least, the owners of Mod-16's who want to buy finished programs will have to use programs written for the Model II computer. The Mod-16's own operating system and its own expanded version of BASIC have finally been released, but so recently that there has been no time for anyone to develop software for it yet. So, unless you want to write all of your own programs, you'll have to wait a few months for programs that fully utilize the capabilities of the Mod-16.

Why are we telling all of you Mod-II owners about the Mod-16? Because you are the best candidates to buy Mod-16's in the

near future--a present Mod-II owner can easily upgrade to the Mod-16 with a hardware modification from Radio Shack. But very little has yet been said about the Mod-16, so the greater power and sophistication that it is supposed to provide is not very apparent yet. Until the advantages of the Mod-16 over the Mod-II become very obvious, you won't even be tempted to upgrade your Mod-II. So, as these advantages start to appear, you'll read about them here.

*** DISSENSION IN THE RANKS ***

A letter from Dan Heinze, 1007 SE Marion, Portland OR 97202.

"To the Editor:

I just received your April issue, and I feel somewhat like the reader from Berkeley, CA, who feels he is paying for a 'monthly' advertisement. You have basically three kinds of articles: Advertisements, letters from readers, and suggestions from you.

The advertisements may or may not have benefit to readers. I do, however, feel you should keep them down to 20% or less of the Newsletter. Letters from readers are usually the best thing in the magazine, and it was the two letters in the April issue which sparked me to write this letter. The suggestions from you I do not usually agree with.

However, if between the three of these items you can give us--the readers--\$18 of information, then, I guess no one will ask for their money back. If you gave them more than \$18 worth of info, they might even renew their subscriptions.

First, I would like to comment about your reasons for having more than one disk drive. I have written to you disagreeing with you on this subject before. NO ONE

ever buys a third disk drive to make backups easier. They are already easier with two drives. The reason a person might need more than two disk drives is because the data and progrms will not all fit on the drives they already had.

As far as spanning drives with data, if the program is designed right, you don't need to. Let me give you an example. Let's say you have a mailing list type program that can store 3000 records on one disk. This can be written to fit on two data disk drives by splitting the data up into two pieces. But not like your example. Split the data the other way. Put all names and zips in one file on drive one. Then put all street addresses, cities, and states on drive two. In this way (in our example), 6000 items can be stored. If 9000 are required, split the data up further. Of course, this had to be designed into the program when it was written!

Now, I would like to answer the letter written by Mr. Cohoon about TRSDOS 2.0's slow speed. **The information I am about to reveal here is worth much more than \$18.00 to anyone who uses TRSDOS 2.0** (who didn't already know this). The reason TRSDOS 2.0 (or 2.0a) is slower than TRSDOS 1.2 is that it adds an extra safety feature. In TRSDOS 1.2, whenever you swapped disks you had to issue an "I" command to TRSDOS so it would know you had changed disks. In TRSDOS 2.0, a check is included for every disk read and write, so the "I" command is not necessary. However, most of us would rather have the speed and just type "I" at every disk swap. To speed all disk accesses up, in TRSDOS READY, type in

VERIFY DETECT OFF

This tells TRSDOS not to check the disk ID every time. In benchmark tests I have conducted on Profile II with searches through 500 data items, I measured a 430% increase in speed. To make this execute every time the computer is powered up (for each disk), type AUTO VERIFY DETECT OFF at TRSDOS.

Mr. Cohoon says he is having all kinds of problems doing simple things like backups. Either your computer is broken, you have a lot of static electricity, you have a lot of dirt in the air, your disk heads are dirty, or your disks are worn out. I have been running my Model II daily, and have experienced no unexpected failures since I have started using TRSDOS 2.0a. (I define an expected failure as one you get when you are experimenting with things, especially machine language programs and patches). When the Mod II had just come out on the market, it had problems, and the software wasn't very good. But they have come a long way. Today, the software they sell will cover 95% of all applications, in a professional manner, virtually error free.

I hope I have been of help.

PS--If you would pay for articles, I'm sure it would be of more incentive to write \$18 worth of information letters. PPS--You should put your mailing address on every issue of the Newsletter so that people will know where to write to."

Editors Reply:

Thank you, Mr. Heinze. Your letter certainly does make our Newsletter worth \$18 a year and does stimulate my brains.

What is the MOD-II/16 Newsletter? As the editor-in-chief of the MOD-II/16 Newsletter and as President of H & E Computronics, Inc., I can tell you that the Newsletter is not a profitable operation. H & E Computronics, Inc. has grown by leaps and bounds. We now sell software for all microcomputers. The Mod-II Newsletter adds far less than 1% revenues to H & E Computronics, Inc. The Mod-II is my favorite computer. I have personally developed all of our in house software which monitors H & E Computronics, Inc. All of our business records are kept on our five Mod-II's. The Mod-II is my pride and joy. The Mod-II Newsletter is my personal contact with other owners of my favorite computer. The \$18 subscription rate (which will soon be going up to \$24) just barely pays for printing, advertising and distribution of the Newsletter.

My stated goal within the Newsletter is provide every reader who pays \$18, a minimum of \$18 worth of information. Most of the comments I have received from readers indicates that I have met my goal. H & E Computronics, Inc. does charge \$18 for the Newsletter. It will continue to stay in existence as long as we can provide our readers with \$18 worth of information. In my opinion, our readers have received \$18 worth of information in every issue (and just the information in your letter alone is worth \$18 all by itself). As you know, this is a very informal publication. The information in the Newsletter is unbiased by outside sources (such as Radio Shack). It does contain the truth about the Mod-II (through the eyes of the editor).

I disagree with your comment, "no one ever buys a third disk drive to make backups easier." We do (but then again we make many, many backups every day). I do agree (and it is certainly worth the \$18 subscription price) that your method of using the additional disk drives is fantastic. Most programs do not work that way...but the concept is ideal. I never wrote our in-house programs that way because I didn't like to mix records on several disk drives...but I do agree that it is a good idea.

Your comments about VERIFY DETECT OFF are 100% correct.

What you say about the Mod-II working properly is also 100% correct. Unfortunately, most people do not know when their Mod-II is not working correctly. I strongly urge Radio Shack to come out with a foolproof test that all Mod-II owners can use to verify the proper operation of every part of their computer system. At the current time, only their technicians have these tests.

I do thank you for writing and do urge all of our subscribers to write their ideas and comments to the Mod-II Newsletter (our address now appears on page 1). At the present time, our circulation is about 2,300. I do urge all Mod-II subscribers to recommend the Mod-II Newsletter to others. My personal plans are to keep the Newsletter growing (and I do have some secret plans in the works to meet that goal).

***** LEARNING TRS-80 BASIC FOR THE MODEL I, II/16 AND III *****

This is our plug for the month. Everyone needs this book and should buy it now.

LEARNING TRS-80 BASIC FOR THE MODEL I, II/16 AND III is a revised edition of the book originally called LEARNING LEVEL II BASIC. David A. Lien, the author, is the best computer book writer anywhere ever. As a matter of fact, I believe that Dr. Lien is the major factor that made the TRS-80 a successful computer. Many years back, in the beginning, RADIO SHACK released their first computer. Their original computer contained a watered down version of the present BASIC in use. At that time, no novice understood or would dare to purchase a computer. Radio Shack had the luck to hire David Lien to write the manual for their first computer. The results were a huge success. Dr. Lien wrote a step by step, well-illustrated learners manual for the TRS-80. Anyone visiting a Radio Shack store (including myself) was very impressed with the manual that accompanies the computer--this manual was destined to go down in history as the best tutorial manual ever written for beginners. The step by step approach looked so simple that you couldn't go wrong. Of course, the computer with the manual became an instant success and Radio Shack soon released their Level II BASIC. Unfortunately, Radio Shack and Dr. Lien were unable to agree on financial terms so Radio Shack had someone else write the manual for the more advanced BASIC (but Radio Shack did continue to include Dr. Lien's manual with every computer since all the commands and approaches in it also apply to Level II BASIC). Radio Shack never did come out with a good training manual for Level II BASIC--their manual is strictly a reference work. So, Dr. Lien went on to form his own company and fill the gap by selling his own book, LEARNING LEVEL II BASIC, without the help of Radio Shack. It worked. Well over 300,000 copies of LEARNING LEVEL II BASIC have been sold (that means that almost every TRS-80 owner has purchased a copy at \$16.95 each).

That's the story of David Lien. Now, Dr. Lien has published a greatly expanded and update version of his book called LEARNING TRS-80 BASIC FOR THE MODEL I, II, III AND 16. This is the ultimate tutorial work for anyone wishing to learn TRS-80 BASIC...and it also includes plenty of aids, hints and ideas for experienced

programmers at any level. Written in a relaxed and amusing style, this book leads the beginning user step-by-step through the many aspects of BASIC programming. Sample programs and ideas for writing custom software abound.

Easy-to-understand directions guide the reader confidently to programming proficiency. Question and answer sections in most chapters reinforce learning of the material covered.

LEARNING TRS-80 BASIC FOR THE MODELS I, II/16 AND III (written by David A. Lien and published by COMPUSOFT PUBLISHING) is available from H & E COMPUTRONICS, INC. for \$19.95 (plus appropriate postage...\$3 within the U.S.).

*** THE MOD-II UTILITY PAC REVISITED ***

Racet Computes (a software firm in California) is the king of utility software creators for the TRS-80. Racet is the company that developed FASTBACK.

One of the most outstanding packages available from Racet is their Mod-II Utility Package. The main function of this \$150 package is to recover lost data...and if you have a Mod-II, you probably do lose data from time to time. Although written for the experience program, the Mod-II Utility program offers several features of interest to non-programmers.

XCOPY is Racet's version of the TRS-80 COPY command. XCOPY does several things that COPY does not do. For example, let's say that you have a bad diskette with a directory that cannot be read by your computer. You do know that there is an important file on your diskette called DATA. Since TRSDOS can't read the directory on the diskette, the file called DATA is lost forever!! However, You may be able to use the XCOPY function to recover the file. All you have to do is type in XCOPY DATA:1 TO DATA:2. The Mod-II Utility Pac should now move the whole file from disk drive #1 to disk drive #2, even though you were unable to read the directory. (This will work about half the time, depending on what part of your diskette has been zapped.) XCOPY can also be used to copy bad data files. For example, let's say you try to use the COPY command on TRSDOS to copy a file called DATA, but part of the file has been damaged--TRSDOS will not copy partial files. Let's say your DATA file contains 3,000 names and addresses. Due to some malfunction on your disk drive, one of those addresses becomes zapped (let's say address number 453). With TRSDOS, your diskette is just about worthless. You can no longer use TRSDOS to backup your diskette with the bad file in it, and you can no longer use TRSDOS to copy the file onto another diskette. The XCOPY command on the Mod-II Utility Package will copy the entire file. When it reaches the section of the bad record, the Utility package will show an error on the screen in that section, but will continue to copy the file as best as it can. The XCOPY command that you enter into your computer is identical to the TRSDOS COPY command (XCOPY DATA:1 TO DATA:2 in this example). A third function of XCOPY is to more efficiently copy data files. When you use TRSDOS to copy a file containing 3,000 names and addresses (for example), you will hear your disk drives click on and off 6,000 times (3,000 per drive). The XCOPY function is far more efficient and much easier on your disk drives. XCOPY stores as much information in memory as possible (about 1,000 names and addresses in our example)...then it puts the 1,000 names and addresses onto the second drive. As a result, you will only hear about 6 disk drive "clicks" to copy the entire file. XCOPY will also allow the user to copy more than one file at a time.

The XCOPY function is only one tiny part of the Mod-II Utility Package. Another major function of the package is SUPERZAP. SUPERZAP will allow the user to see any information on your diskette. Can a beginning non-programmer use SUPERZAP? Yes and no. A beginner can't use SUPERZAP to repair a bad directory or recover lost data. A good BASIC programmer can. With a little experience, a good BASIC programmer to learn to repair disk directories and move data from one disk drive to another. We have successfully used SUPERZAP to recover many important lost files.

SUPERZAP has some functions that can be used by the inexperienced "know-nothing" user. Let's say that you have a very important file on your diskette. Due to insanity, you have lost your two backup copies of the diskette. Now you insert your

one copy of your diskette into your computer and ZAP, a power surge or a disk drive error causes you to lose your file of CIA agents in Cuba. Now, remember, you know almost nothing about computers or programming. You can easily use SUPERZAP to print out almost every piece of missing data. Even though your computer can't read your diskette, almost all of the information is still on the diskette. All you have to do is type in SUPERZAP and enable the print function. SUPERZAP can print the entire contents of your diskette onto your line printer. Of course, the inexperienced Mod-II user will probably have to re-enter information into the computer from the printout, but at least the data hasn't been completely lost.

If you know just a little bit more about programming, SUPERZAP can be used to save the file lost in the above paragraph. Every TRSDOS 2.0 diskette contains two directories. The most likely cause of a loss of data is the loss of the directory track. In most cases, diskettes that seem to be useless and can't be read by your computer are in perfect shape--except for the directory track, which gets worn out much faster than the rest of the disk because it gets read every time a file is accessed. Using SUPERZAP, all you would have is selectively copy all of the information on your bad diskette (except the primary directory) onto a formatted diskette in a second drive. Now copy the secondary directory (the alternate directory) onto the area on the new diskette that should contain the primary directory. The task is complete, and you have created a perfectly usable new diskette.

The Mod-II Utility Package is available from H & E Computronics, Inc. for \$150 or directly from Racet Computes. The description only tells the reader about 10% of the functions of the package. The documentation is excellent if you are an experienced BASIC programmer. Inexperienced readers will have problems understanding the documentation (but will be able to use the XCOPY command and will be able to use SUPERZAP to print out data stored on your diskettes). In addition to what has already been described, the Utility Pac offers many other methods (with examples) to recover lost directories and data. An enhanced DEBUG Utility has been added to the package. A thorough reading the manual will allow the user to create his own directories, change passwords and do all sorts of other good tricks. The CATALOG routine within the utility package allows the user (both experienced and inexperienced) to make a catalog of the directories from all of their diskettes.

*** NEW MODEL-II SPEEDUP ***

Racet Computes has just released a brand new product called MODEL-II SPEEDUP. This new software increases the speed of disk input/output by 50% (or more). It also LOADs and SAVEs programs three times as fast and greatly reduces the chances of blowing diskettes. The product sells for \$99.95 and is available through H & E Computronics, Inc. or directly from Racet Computes.

*** NEW TRS-80 MOD II'S CAUSE SOME PROBLEMS ***

Do you have a new TRS-80 MOD-II? You can tell very easily. The main unit's large power and reset switches have been chopped down so they are short and stubby--they now make it impossible to trip the reset switch or turn off the machine accidentally. The old MOD-II expansion disk drive unit only has a single light (the power light), while the new expansion units contain a power light and one disk-access indicator light on each of its disk drives. In addition, the disk drives themselves are made by a different manufacturer.

If you own a new MOD-II, then you can use your main unit without having to connect or turn on the expansion drives. If you own an old MOD-II, you must plug in a terminating resistor into the back of your computer. Also, if you have an old MOD-II and decide to add on an expansion unit, you have to buy the old expansion unit. The new expansion units are not compatible with the old MOD-II's.

It seems that the new MOD-II's do work better, are more quiet and efficient. The expansion disk drive units seem to be more reliable and require less maintenance.

Now here is the biggest problem with the new MOD-II's, a problem that we discovered when we had the opportunity to use the new disk expansion unit with its new brand of disk drives. We found that the new disk drives (manufactured by Texas Peripherals, Inc.) will operate under Pickles & Trout's version of CP/M, but will not function at all with the more popular version of CP/M from Lifeboat Associates. So we placed a call to the technical department at Lifeboat. They confirmed that CP/M 2.25C is not compatible with the new disk drives, and they said that although they have tried a number of patches to CP/M to fix the problem, none of them have worked yet. Lifeboat hopes to get the problem solved quickly, and the fixed system will be offered as a new numbered release of CP/M for the Mod-II. But, until this new version is actually made available, owners of the new expansion drive unit will not be able to use it under Lifeboat CP/M.

***** PICKLES & TROUT NOW SUPPORTS THE CAMEO MULTIPLEXER *****

PICKLES & TROUT now fully supports the Cameo Electronics hard disk drive system with multiplexer for the TRS-80 Model II Microcomputer. The Cameo multiplexer allows the highly reliable Cameo hard disk system to be connected to up to 4 separate computers, allowing the expense of the hard disk unit to be shared by several users. For more information, contact PICKLES & TROUT, P.O. Box 1206, Goleta CA 93116.

***** LOST DATA ERROR USING CP/M *****

According to PICKLES AND TROUT (who sells one version of CP/M), several users have reported that CP/M will not boot correctly on some recently purchased MOD-II's (lost data error). If the computer is first booted with TRSDOS and then with CP/M, the problem vanishes. The problem has been traced to a batch of defective DMA (Direct Memory Access) controller circuits. It seems that Radio Shack produced a number of MODEL-II's with the defective circuit before the problem was discovered.

***** CP/M AND THE MODEL 16 *****

At the current time we are not sure if CP/M is working on the MODEL-16. We do know that both LIFEBOAT ASSOCIATES and PICKLES & TROUT are sure that CP/M will be working on the MODEL-16 within the next 30-days (probably by the time you receive this Newsletter).

***** FOR DENTISTS ONLY *****

Charles Mann & Associates (an old and well established software house) has announced the release of a new Dental Office Management system for the Model-II. The software is designed to handle the appointment scheduling, claims form management and accounts receivable of a small to medium sized dental office. The system will handle either single practitioners or small group clinics. Any dentist (or doctor) interested in using the Mod-II to handle a practice should contact and obtain the latest catalog for more information on both medical and dental practice software. Write to Charles Mann & Associates, 55722 Santa Fe Trail, Yucca Valley CA 92284 or call (714) 365-9718. By the way, this dental package sells for \$1,295.95 (documentation available for \$50). This product is not available through H & E Computronics, Inc.

***** IS OUR INFORMATION CORRECT? *****

A letter from Dennis E. Nolen, Data Automation Services, Inc., 4 E. Germantown Pike, Plymouth Meeting PA 19462 (215) 825-3435:

"In the last issue (April 1982) of your MOD II Newsletter, you stated some very interesting facts:

1. ...about 3/4 of our readers are computer users only and do not know how to program the Model II.

2. Everyone has a special application software package that they would like to see for the Model II...

I was very surprised that such a large percentage (75%) of Model II owners do not program (or have the capability to program) their machines. I would have thought the percentage to be much lower.

Our firm specializes in Customer Application Software for the TRS-80 Model II and we would be delighted to discuss the development of specialized packages with your readers who do not have the capability or the time to develop their own."

Editor's reply:

We stick to our guns. We do believe that most TRS-80 owners (75%) are users only and do not know how to program (therefore, most TRS-80 owners are not getting the full value of their machines). We have no hard statistics to back up this claim (other than our experiences speaking to Mod-II owners on the telephone and reading many letters). If you do need an application program not currently available, perhaps you should try contacting Data Automation Services (This is not a plug or ad. We know little about the company. We are offering this information for your evaluation, since we do have many callers asking about custom software.)

*** RESTAURANT INVENTORY CONTROL AND COST ANALYSIS PROGRAMS ***

Advanced Analytical Computer Systems has a complete inventory and cost management system for both the Mod-II, III and 16. The program is designed for fine food and liquor, fast food, and single or chain locations. For more information, contact Daniel Alan Gimpel, Advanced Analytical Computer Systems, 330 S. Barrington Avenue, Suite 109, Los Angeles CA 90049 or call (213) 471-1134. This product is not sold through H & E Computronics, Inc.

*** I DON'T WANT TO HEAR IT ***

After our article about FASTBACK in the last Newsletter, FASTBACK quickly became our #1 best selling product for the Model-II ever. As a matter of fact, over 50% of our current subscription list purchased FASTBACK.

The reaction to FASTBACK has been outstanding. The large majority of FASTBACK buyers are completely satisfied with FASTBACK. We do want to address ourselves here to some of the negative feedback that has come in.

Just to recap (for those of you who didn't read the last Newsletter), FASTBACK is a product created by RACET COMPUTES (California) that sells for \$75. The purpose of FASTBACK is to make a quick backup of a diskette. FASTBACK will copy a TRSDOS diskette in under 55 seconds (compared to about 12 minutes by TRSDOS). FASTBACK makes a perfect copy every time--as long as your system is working perfectly.

Several people who own FASTBACK have not been able to use it. They state that they keep getting disk errors. There are several computer- or diskette-related factors that can be causing the problem. I can unequivocally state that if your computer and diskettes are all in good shape, FASTBACK works every time.

If FASTBACK is not working for you, it is probably due to one of the problems listed below.

1. Your diskettes need replacement. Because it is so much slower, TRSDOS's BACKUP program is not as choosy about diskettes as FASTBACK is. If you try to use FASTBACK and it won't copy your diskette, it's very likely that BACKUP will. The fact that FASTBACK won't copy the diskette is an early warning that your diskette may be getting worn down. FASTBACK will notice that a diskette is going bad before TRSDOS does. The prudent user will replace the diskette that FASTBACK won't copy with a brand new one (use the TRSDOS BACKUP utility to copy your diskette onto a brand new diskette). If you choose to wait for TRSDOS to notice the defective diskette, it

will probably be too late to save it.

2. FASTBACK will only work on good diskettes. If you try using a box of 10-for-\$19.95 diskettes, FASTBACK may have problems.

3. FASTBACK has problems copying diskettes when your computer is not properly adjusted. If your disk drives are out of alignment or not working at the proper speed, FASTBACK will know it and not properly copy your diskettes.

4. FASTBACK has problems copying diskettes when your FDC board (floppy disk controller board) within your CPU is defective (and this is a common problem).

FASTBACK is an excellent diagnostic tool for your computer. If you are able to copy diskettes using FASTBACK, then you are assured that your computer is working properly. If FASTBACK doesn't work on your computer, then you can be sure that your computer is not working 100%. FASTBACK does work on all five of our Mod-II computers.

*** WHEN IS A BACKUP COMPLETED? ***

What follows is fact, so you'd better believe it. Whenever you have a completed backup, TRSDOS will say "BACKUP COMPLETE" on your screen. The fact that the screen says BACKUP COMPLETE and all files have been copied without errors does not mean that the computer is actually telling the truth. We have found that on occasion the Mod-II user may copy a diskette and get an ERROR 4 (or other error message) during a disk backup. However, TRSDOS goes on to complete the backup as if nothing had gone wrong. At the end of the backup, TRSDOS tells the user that the backup is complete, all files have been copied and no files have been deleted. This is probably not the case--the files copied may very well not be usable. If an ERROR 4 or ERROR 5 appeared during the backup, you had better try the backup again--TRSDOS probably did not make a successful backup. We know that this is true since we tried verifying the backup (by comparing the files on the backup diskette to the original files) and discovered that files which had supposedly been copied correctly were scrambled or unreadable. In all cases, we found that one or more records were destroyed. So, don't trust a backup if you see any error messages appear on the screen during the backup process.

*** CP/M'S SOFTWARE PORTABILITY ***

One of the often mentioned advantages of the CP/M operating system is "software portability" between different brands of computers. What does this mean and why is it relevant to the owner of a microcomputer?

"Software Portability" in the sense we are talking about simply means that a program written for one type of computer will run without change (or very little change) on a different computer. When a program is written in a so-called higher level language (e.g., BASIC, COBOL, FORTRAN, PASCAL) then there is software compatibility, to some extent, with any other machine running the same language. Taking BASIC as an example:

```
10 LET A = 5
20 LET B = 7
30 PRINT A + B
```

The above program will run the same way on virtually any computer implementing any version of BASIC. All we need to do is key the program into the computer and RUN it. Internally the different computers probably store the above program in entirely different "machine language" formats, but if we have the above "source code," then it really doesn't matter what the machine does internally. We are only interested in getting the above program to work.

There is, however, a catch to all this. First, outside of a simple program like

the above, there are significant differences between the many different versions (or dialects) of BASIC. For example, BASIC as implemented by APPLE and ATARI lacks PRINT USING statements for formatted output to screen and printer. BASIC on the TRS-80 and Microsoft BASIC for CP/M have the PRINT USING statement. Various BASICs seem to have many different file-handling procedures.

The upshot of the above is that it may not be that easy to convert programs written in one dialect of BASIC into another dialect. For example, it took H & E Computronics three months to convert the hundred programs of the BUSINESS PAC 100 from TRS-80 Level II BASIC to Applesoft BASIC. Conversions between machines that are more closely related may be somewhat easier, as when converting programs between the three different TRS-80s.

The second problem has to do with the fact that many authors wish to protect the source code of their programs. If a purchaser wishes to make a program modification, and does not have the source code, then the original author will have to be contacted. So, instead of selling a BASIC program, the author sells a machine language program produced either by compiling a BASIC source program, compiling a program from some other high-level language, or writing an assembly language program. The catch here is that, although they are generally more sophisticated and much faster than BASIC programs, machine language programs have the portability of a dry-docked battleship when we consider different types of computers. A machine language program written for an IBM mainframe (big computer) will not even remotely resemble a comparable machine language program written for a microcomputer.

There is nothing a software author would like better than to both protect his program and have it run on several different brands of computer. This is especially true if it will run on these other computers without any extra work on the author's part. This is what CP/M makes possible. CP/M runs on microcomputers using either the 8080, 8085, or Z-80 microprocessor chip. The design of the system makes it possible for a vendor to write some code which will permit CP/M to run on a target machine. Once the CP/M system is up and running on your computer, then any code written on any CP/M-based computer, no matter which one, can simply be copied over to your machine (generally without any changes) and RUN. This holds true even for machine language programs. The only exceptions come when the program uses characteristics of a particular piece of peripheral equipment, say a special printer, or if the program takes advantage of an 80-column screen width while your computer has a 40 or 64 column screen. These problems can generally be solved by simple program editing, or the author can write a special INSTALL routine to customize the program for your machine.

The biggest headache when converting a program from one CP/M system to another is transferring the code from a diskette which works on one computer's disk drive to a diskette which will work on a different computer's drive. With computers having 5.25" drives, although the programs may be interchangeable, the diskettes are not. Transferring a program involves having access to both computers, a serial communications port on each, and communications software. The only problem here is owning or gaining access to several different machines. The same problem occurs when transferring a program between a machine with an 8" drive and one with a 5.25" drive. However, if both machines have 8" drives, the conversion is far simpler--you just copy the program onto a diskette formatted in the so-called IBM single-density format, place this disk in the target machine, and the conversion is complete. For this to work, both machines must be able to read single-density 8" diskettes. This will generally be true, as virtually all implementations of CP/M on computers with 8" drives will read and write single-density (as well as non-compatible double and extended densities). In fact, we may think of the single density 8" diskette as the medium of exchange between 8" CP/M-based systems. Unfortunately, there seems to be no standard yet for 5.25" CP/M-based systems.

As an example of the above in action, we take the following real-life case. H & E Computronics converted the BUSINESS PAC 100 to CP/M format using the Radio Shack Model II implementing CP/M. The conversion was made from Radio Shack's Model II

TRSDOS and BASIC to MBASIC running under Model II CP/M. The conversion (of all 100 programs) took only two weeks, because Microsoft's MBASIC is very similar to BASIC as implemented by Radio Shack. A small startup program was added to the package, which sets up the code for clearing the screen on whatever terminal is used with the target CP/M system. The owner of a Digital Microsystems computer running CP/M called to order the BUSINESS PAC 100. Computronics personnel copied the BUSINESS PAC diskettes onto single density disks and mailed the disks. The conversion took 4 minutes, i.e., the time needed to copy the diskettes. It was not necessary to have access to the Digital Microsystems computer.

At the same time, the owner of a Superbrain computer called to order the BUSINESS PAC. This computer uses 5.25" drives, so Computronics could not do the conversion without access to the Superbrain. With this access, the Superbrain could have been attached to a Model II with a cable to the serial port, and then the conversions made, again with no changes needed to the programs.

Because of the portability of CP/M software, a lot of very good software is available to run on CP/M systems. This is because if the owner of, for instance, a Vector Graphic computer writes a good accounts receivable package, then it is immediately available on all other CP/M systems, including Radio Shack Model II's that use CP/M. In short, program written on the Model II under TRSDOS will only run under TRSDOS, and the Model II using TRSDOS can only use such programs. On the other hand, the Model II using CP/M can run any program written on virtually any system that uses CP/M, no matter who the manufacturer. Hence, more CP/M software is available for the Model II than TRSDOS software.

*** THE AUTOGRAMMER PROGRAM GENERATOR ***

Very frequently a computer user finds it necessary to quickly develop a computer program which will permit the rapid collection, printing, searching and sorting of data entered into a list. For a programmer, even a good programmer, a simple application like the above, properly debugged, might take several days. Among the needed operations the program must perform are data entry, rapid recall for editing and display, and the ability to delete individual records. In addition, for most applications some type of validity checking for entry into individual fields is very useful. Once the data is stored there should be some means of printing it out on a line printer and/or on the CRT screen in some report format. To handle situations such as the above, so-called "data management" or "file management" systems have been developed for most microcomputer operating systems. There are several excellent CP/M-based data management systems. Among these are SELECTOR V, DBASE II, and FMS-80. For any of these systems the program developer just enters the specifications for the individual records while following an easy-to-understand recipe, which includes prompts on the screen. The above data management programs themselves are just very general programs which can handle a lot of different applications if fed the correct parameters. On the Model II/16, Radio Shack's PROFILE II+ is a data management program which runs under the TRSDOS operating system.

The program under review here effectively does the same thing as those described above. This program, called AUTOGRAMMER (Roklan Systems, Rosemont, Illinois), is a program generator. It is written for the TRS-80 Model II with the TRSDOS 2.0 operating system, and works similarly to a data management system, except that when the specifications for the individual records are entered, AUTOGRAMMER actually writes the code for a customized machine language program. The finished machine language code cannot be modified by the user after it is generated, but new programs can be generated at any time by using the original AUTOGRAMMER disk.

Using AUTOGRAMMER is quite simple. The manual contains a short tutorial that will teach you how to design, generate, and run your first finished program in under 15 minutes! The AUTOGRAMMER program will prompt you to input all of the specifications

for the file's structure, then translate your instructions into machine code and write the finished machine language program to a separate disk that will boot up automatically. The example program is a telephone/address file, which many people will be able to put to use immediately.

We will now go through the steps needed to set up the example program using AUTOGRAMMER on a one disk system:

- 1) Format a diskette and put the TRSDOS 2.0 operating system on it. Boot up the system and wait for the TRSDOS READY prompt.

- 2) Take the TRSDOS disk out of the drive and place the AUTOGRAMMER disk in the drive.

- 3) Type AUTOGRAM <ENTER>. The program will load and start.

- 4) The program now asks for an INPUT application filename and an OUTPUT application filename. The first time through, you ignore the INPUT filename question by simply pressing <ENTER>. In response to the OUTPUT filename question you answer "PDF" <ENTER>, which stands for "Personal Directory File." Any other legitimate TRSDOS filename could be used.

- 5) Remove the AUTOGRAMMER disk from the drive and replace it with the TRSDOS disk.

- 6) Now comes a very nice aspect of this program. The computer will now act as a full-screen text editor, which allows you to create a "data input screen" for your program. What is a "data input screen"? Well, many programs request data by asking a long series of questions. If the program asks many questions for items of data that are optional inputs, then the operator may have to ignore many irrelevant questions from the computer, wasting time and adding to the tedium of the job. A data input screen is a good alternative method of fast data entry, and its operation is reminiscent of word processing programs. The operator sees a form on screen, with descriptive labels for many different data items, and blanks that can be filled as needed. All the operator has to do is move the cursor around the screen with the arrow keys, fill in the blanks with data, then press <ENTER>, and the entire screenfull of data is entered into memory at once. The AUTOGRAMMER program actually lets you design your own data input screen for your finished program. For example, in the PDF file we generated the following screen using the simple and well-documented commands described in the manual:

```
                LAST NAME: [                ]
                FIRST NAME: [                ]
    STREET ADDRESS: [                ]
                  CITY: [                ]
                  STATE: [  ]
                ZIP CODE: [    ]

    PHONE NUMBER: [{ }]-[{ }]-[{ }]
```

Even for a beginner, the time needed to generate the above screen is only about five minutes. If you get into trouble, you just press the F1 key to get a "Help Screen" full of instructions. Another push of F1 gets you back to your input screen. The brackets and braces are field delimiters, and they will show the number of characters that may be entered in each field. The brackets and braces are essentially identical in function, except that the brackets will be visible in the final program's input screen, while the braces remain invisible. When you are satisfied that the input screen is complete and correct, you just press <CTRL> <E>, and the AUTOGRAM program begins to evaluate your input screen.

- 7) After a few seconds, the computer will give a prompt: INPUT VALIDATION; and the first field (the area between the brackets next to LAST NAME) is displayed in reverse video. What the computer is asking is whether you wish to restrict the type of data that may be entered into the LAST NAME field. For instance, if you answer AL, the computer will only allow alphabetic characters to be entered into the LAST NAME field. Any attempt to key in numeric characters will simply be ignored. Several

types of validation are possible: you can restrict the STATE field so that the only accepted entry would be two capital letters; you can specify that only numeric characters are entered into the PHONE NUMBER and ZIP CODE fields. Other limitations include requiring dollars and cents entry to a field, specifying that any blank spaces in a field be placed to the right or left of the data item (right or left justification); and specifying that the contents of a field be calculated from two or more other numeric data items (similar to VISICALC-type programs). The program goes through all of your fields, and requests your specifications for each. After the last question involving validations, the AUTOGRAMMER program automatically creates a data entry program and places it on your disk--in this case it creates the program file PDF and several auxilliary files. Now your new program is finished and ready to run.

When you wish to run your new program, you simply boot up the system using your newly created disk, and when TRSDOS READY appears, type PDF <ENTER>. You will then see the following menu on screen:

MENU

1. Add a Record
2. Delete a Record
3. Modify a Record
4. Display a Record
5. Close Files and End Program

You just press one of the numbers and the desired function is run. In all options except number 5, the data is displayed in the screen format that you previously designed.

The programs which AUTOGRAMMER writes seem to be efficient. The first field defined on the user screen is a key field. Using this field, the user may search for any record in even a very large data base and find the record almost immediately.

A utility disk comes with the package. This disk contains several programs that will be very useful in maintaining the data base. One of the programs will consolidate the file, eliminating the space allocated for deleted records, and packing the file into the smallest possible space on the disk. Another permits you to create a program in BASIC that can access the data base for any special purpose you can think of. Still another program will allow you to generate new keys for the data base.

The computed fields feature is very useful. Suppose you create a field called TOTAL, which is to be the product of a field called QUANTITY and a field called UNIT PRICE. This can be set up in the validations section of the program. Now, during data entry, as soon as QUANTITY and UNIT PRICE are filled in, the TOTAL is automatically filled in by the computer.

During screen setup, the user has full access to the Model II's graphic character set. Thus it is possible to design really intricate forms for the data entry screen. Think of an invoice on the screen--AUTOGRAMMER can do it.

AUTOGRAMMER programs and data files are quite useful for several reasons. First, they are easy to design and quick to put into operation. Second, the files generated seem to be efficient, with almost instant recall for any record. Third, the files generated can be accessed by BASIC programs. Forth, Roklan Software sells an "in-depth" report generator which can output the data in almost any way the user wishes. This report generator can even operate on non-AUTOGRAMMER files.

This program seems like a very worthwhile purchase for any user who wishes to use the TRSDOS operating system, and wants to be able to create customized data entry/retrieval programs at a moment's notice. A freelance computer owner who wants to run and maintain many different customized data bases for many different clients will find this program ideal. It will create an unlimited number of different applications, but the basic operation of all the applications will remain the same, making it very easy to train new operators.