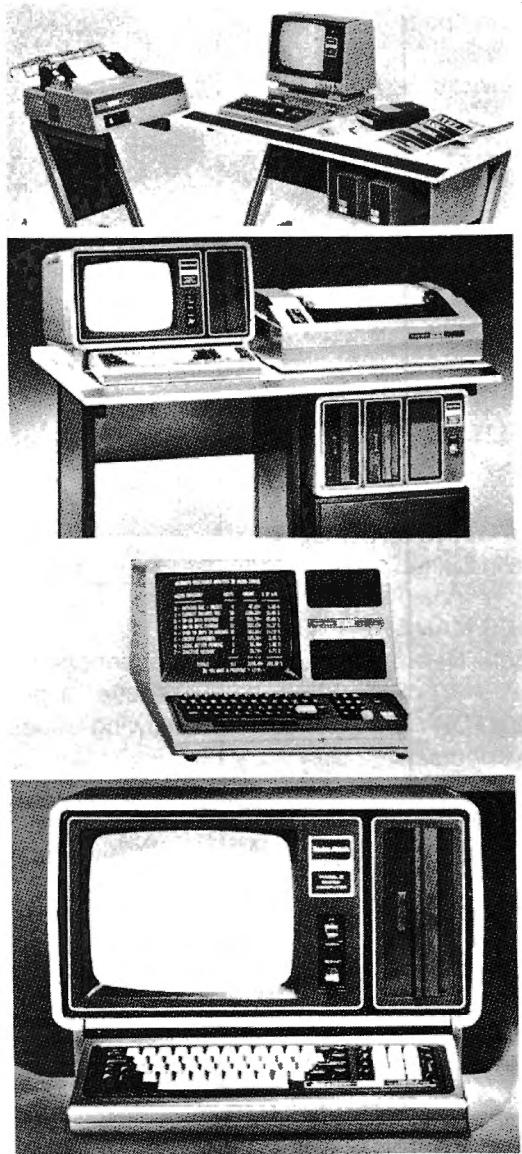


THE ORIGINAL MAGAZINE FOR TRS-80™* OWNERS

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 - KEYBOARD INPUT BUFFERING FOR BASIC PROGRAMS
 - OVER AND UNDER
 - CONCENTRATION
 - ZAP
 - SEARCHWORD PUZZLE
 - WIN21
 - MODEL 3 INFORMATION



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The purpose of the H & E COMPUTRONICS MONTHLY NEWS MAGAZINE is to provide and exchange information related to the care, use, and application of the TRS-80 computer systems. H & E COMPUTRONICS, INC. does not take any financial responsibility for errors in published programs. Users are advised to check and edit vital programs carefully.

The H & E COMPUTRONICS MONTHLY NEWS MAGAZINE encourages comments, questions, and suggestions. We publish articles and programs written by our readers. H & E COMPUTRONICS, INC. will pay contributors for articles and programs published in the magazine. Correspondence should be directed to The Editor, H & E Computronics, 50 North Pascack Road, Spring Valley, NY 10977 U.S.A. Telephone (914) 425-1535.

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PROGRAMS ON FREE CASSETTE

Subscribers to the H & E COMPUTRONICS MONTHLY NEWS MAGAZINE receive a free cassette of programs published in previous issues. These programs are documented in the following issues:

Word Processor (BASIC)	April 1979
Revisions	September 1980
Memory Test (SYSTEM MEM)	July 1979
Data Management System (BASIC)	October 1979
Word Processor (BASIC) (new version)	April 1980
Clean Up (BASIC)	none (self-documenting)
Adventure #0 (SYSTEM ADVENT)	none (self-documenting)

ISSUE NUMBER 31

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FEBRUARY 1981

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YOUR SUBSCRIPTION HAS EXPIRED IF... THE NUMBER ABOVE YOUR NAME AFTER THE DASH ON YOUR MAILING LABEL IS 31 (OR LESS). THE NUMBER FOLLOWING THE DASH TELLS YOU THE LAST ISSUE THAT YOU WILL RECEIVE. For example, if your subscription number is 16429-31, your subscription expires with this issue (issue #31).

BITS AND PIECES

by
HOWARD Y. GOSMAN

IN THIS ISSUE

we are publishing a variety of programs and articles that offer "something for everybody". We are getting more and more feedback about the Model 3, which we are passing along in our Letters to the Editor. So far, almost everyone who has bothered to write us has been pleased, although we're starting to learn now about software incompatibilities. We have a number of short Basic programs: four by Gordon Speer, an "Over and Under" game by C. Brian Honess, and a two-person game of "Concentration" by Mike Zinner. For the mathematically inclined, we offer "Roots" by Edgar W. Van Winkle. We are also publishing two assembly-language programs for the technically inclined, and we have a new puzzle by John K. Young together with the solution to the puzzle that was originally published last December.

Program Previews looks at "WIN21" by Philip C. Pilgrim, a program that can actually help you WIN at blackjack. Beginner's Corner continues the discussion of data communications, and there are many Helpful Hints and Answers to your Questions.

THE MAGIC SOFTWARE MACHINE

This month we are welcoming a new columnist, R. W. Liddil, who will be writing a whole series devoted to reviewing action-game programs and the like. Mr. Liddil is also known as the author of the "Captain 80" column that originally appeared in **80 MICROCOMPUTING** and is now published in **80-US**. He has a very entertaining writing style, and he keeps himself very well informed about all the latest developments in TRS-80 software. Please let us know how you like the adventures of Professor Megabyte.

OUR NEW MASTHEAD

You will no doubt notice the change at the top of each page, where the word "Computronics" has decreased in size. We think this looks more attractive, and it may also give us a bit more room to publish materials for you.

CRUSHING NEW FOREIGN POSTAGE RATES

At the beginning of the year 1981, we (and all magazines) were slapped with new postage rates for foreign air mail that will cost us about \$3.00 to mail each copy. We have therefore been forced to increase our subscription rates as follows: \$36 for first-class postage within the United States, Canada, or Mexico, and \$48 for an air mail subscription outside out of the United States, Canada, or Mexico. This rate increase came as a great shock, and we fear that it is going to put some magazines out of business. We regret any inconvenience caused to our foreign subscribers, and we will honor past subscriptions at the old rate until they run out.

HELPFUL HINTS and QUESTIONS AND ANSWERS

In response to some readers who have asked, we will pay any contributors for articles or programs published in the magazine, but not for HELPFUL HINTS or QUESTIONS that are answered by Dr. Howe. If you have a tip that you want to pass on to fellow readers, by all means send it in; but this is not the same thing as submitting an article.

WE ARE ELIMINATING OUR TECHNICAL SERVICE LINE

Unfortunately, we have been forced to eliminate our technical service hot line, at least partly because it was too successful. We will be glad to help out, as before, but we would like to ask readers to submit questions by mail, where they might also be published in the magazine. We were deluged by all kinds of questions, which is fine, but we often had to turn to other persons or companies to find the answer.

USERS MUST LEARN TO COPE FOR THEMSELVES

One of the problems we have learned through our technical service line is that many users have gotten themselves into trouble because they have not bothered to read the manuals carefully, or to learn how to operate the computer. There is no substitute for this knowledge. Users cannot expect to know how to use software that they buy without this knowledge. This fact is as true for the Radio Shack TRS-80 as for an IBM or other computer costing many times the price. We have had thousands of dollars of software returned because users did not realize how to use it properly.

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LETTERS TO THE EDITOR

Model 3 Programs that Work

Model 1 and 3 Compatibility

Dear Sirs:

I would like to thank you for your forthcoming intentions of including programs in your publications which will work on both the model 1 and the model 3.

I purchased a model 3 in early December. Being my first computer, I was impressed with the computer, but -- understandably -- eager to find programs that worked. I understood that most model 1 programs should SUPPOSEDLY work on the model 3. In actuality, I found that very few would work! I am being patient (hard as it may be) since most software will almost HAVE to work either on both or be made just for the model 3.

Your idea of making available software (rather than printouts in your magazine) of your magazine programs sounds tempting. I would suggest that you possibly compile programs about every three months, and at that time issue a tape that includes all of the programs for the past three months.

Keep up the good work....

Bob Krotts
9 Southmoor Circle
Kettering, Ohio 45429

Dear Mr. Krotts:

Many thanks for your comments. Our model 3 has still not arrived, so we can't be sure of what will work and what won't. From the letters we are receiving (see below), we can see that the situation must be very confusing.

Dear Sirs:

I noticed in your last issue that you stated that you were withholding comment on the compatibility of model 1 programs to the model 3, pending delivery of your model 3 computer.

I have received my model 3 with 48K, three disk drives and daisy wheel printer two weeks ago. In the event that any of your readers are interested, I also have a model 1 and hence have already been able to evaluate some of the programs I use.

So far I have found that the following programs work well without any change. Personal Software's DMS works fine, and this is the one I use most. It was a nuisance to convert data disks to a system disk first, and then copy back to a data disk. The convert command has to go to the system disk first. Your free word processor program works fine, and I can get upper and lower case with no problems at all. The checkbook program by Dr. Shenkin, which I have modified, works well. Most Basic programs seem to work fine. Machine language programs, I am told, need modification. I am also told that SCRIPSIT and VISICALC will not work without changes, which I understand are in the works by Radio Shack.

With one or two programs I had to make minor changes, which were easy to spot. The Microsoft Typing Tutor works well.

On the whole I like the model 3, although I'll still keep the old standby model 1 as well. The problem we new model 3 owners have is that we now have to check the compatibility of the new programs we

we purchase. Your company can be of great help in this area. Also, comments from your readers could be of assistance to all the new model 3 owners to come onto the scene.

Kindest personal regards.

Sincerely yours,

Harry I. Eteman
P. O. Box 2212
Palm Beach, FL 33480

Praise for the Model 3

Dear Sir:

I have been the proud owner of a TRS-80 Model 3 for the past three months, and I have nothing but excellent reports. To begin, the console unit is a tremendous space saver, not to mention the absence of all those interconnecting cables associated with the Model 1. The video presentation on the Model 3 is a tremendous improvement over that of the Model 1, having a black background with greater definition; no raster lines! I purchased the 16K level II unit without disk along with the new CTR-80A cassette deck. The cassette deck has performed flawlessly, at volume setting 5, for over 400 input/output operations. I have yet to drop a single bit during any data transfer between the Model 3 and the cassette deck. From previous comments on Model 1 data transfers, I would say that RS has responded with excellence!

Most programs I have seen and tried have been compatible (Model 1 programs), and I would say that at least 75% require little or no patch work to run on the Model 3. Of the five complementary cassette programs that came with my new subscription to COMPUTRONICS, the Memory Test is the only one that falls short of

outstanding success. As you have guessed, in previous Crystal Ball columns, the Model 3 ROM and the Model 1 ROM are not the same. Addressing has changed, and a few nice additional Basic commands have been added. A few of the added features that I consider to be the greatest improvements are features such as dynamic display Real Time Clock, Split Screen capability, lower case installed, no requirement for an expansion interface, addressable special characters, 100% data transfers, professional design, and instant compatibility with at least 75% of the largest software library of any other personal/business microcomputer on the market today.

The documentation supplied with the Model 3 is very informative and well written. Each feature is thoroughly explained in the owner's manual along with many tables and ready reference charts. I called RS regarding the availability of the Model 3 Technical Manual and tailored programs. The typical response to my every question was "around January 1981". Of course I would like to begin programming in assembly language right away, but RS is not ready to market the Model 3 Assembler. However, your magazine is doing a fine job of keeping me busy in Basic. After correcting any possible typo and inserting reader improvements, every program you have published, thus far, has run glitch free!

Again, I wish to express my great satisfaction with the Model 3 and the obvious conscious engineering effort on the part of RS. The Model 3 is upper shelf all the way. I have accumulated a fair amount of software in the last few months, all of which runs perfectly. I have tailored all the programs to

utilize the lower case feature of the Model 3. If you would be interested in my contributing Model 3 programs, I would be more than pleased.

Congratulations on your superb magazine. I have read many leading microcomputer magazines, and COMPUTRONICS has the greatest utility and widest and most active reader support of them all. Well done!

Sincerely,

Jim J. Jordan
6 Hickory Hall Lane
Charleston, SC 29408

Dear Mr. Jordan:

We are certainly interested in receiving Model 3 programs, and in receiving corrections for Model 1 programs to make them run on the Model 3. Anything you can contribute along these lines would be most appreciated!

Programs for the Pocket Computer

Gentlemen:

One vote yea: Yes, I would like to see you start publishing programs for the RS pocket computer. I'm sure many of the "long time" Level I TRS-80 users such as myself have already purchased one.

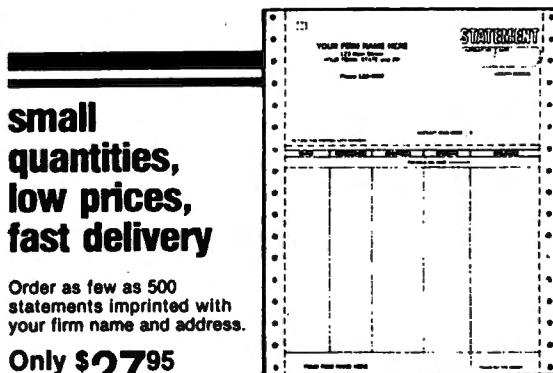
Robert L. Corwin
517 Woodford Avenue
Endicott, NY 13760

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Translator from Acorn. It is an excellent product. I feel the Editor that comes with it is not very advanced, but it does exemplify the power of the Translator. It is a "must" for the experienced programmer.

Sincerely yours,

Peter Ansbacher
1510 Bristol Drive
Iowa City, IA 52240

Using an ASR 33 Teletype

Dear Sir:

I must take a different view of your answer to Pat Buckley (December 1980 issue). The ASR 33 works great using the TRS-232. The software supplied with the unit allows selection of different baud rates. I have used one for quite a while, even with the Electric Pencil. It won't work with a lot of RS software because of their stupid PEEKs and POKEs.

Sincerely,

Errol Kyzer
3003-A McGhee
Montgomery, AL 36111

Dear Mr. Kyzer:

Your teletype must have an RS-232 interface installed in it. Most do not have this feature, as it is an option that adds to the expense of the unit. If you have it, you can use the teletype with any TRS-80 RS-232 interface, including the one made by Radio Shack.

Various Comments on Software

Dear Mr. Gosman:

William Bauknecht's "expressed brilliance" concerning the amount of time needed for learning SCRIPSPIT (November 1980 issue) makes me feel like I am very dense and slow. I had to spend at least 50 hours, had to replay the tapes, struggle to match tapes against text (User's Manual). However, I now use the program a lot. It is a fine package, and one cannot quarrel with the competitive price. Thanks for your articles on this subject. Without them I would have given up!

Also, in the November issue (page 845) you request reader comments concerning the possibility of your publishing those programs listed in the monthly magazine on cassette or disk. This is an excellent idea! Perhaps the entire inventory could be made available for user purchase either as "single programs", or perhaps combine and package the programs similar to what was done for "Library 100" and your new "Business Package". While I am not familiar with the ramifications of the rather complex patent law aspects involved, I have wondered many times why you don't do what you suggest. Also, what is wrong with making a reasonable profit in the process?

I include this last question or comment because I trust you would help hold the price line on software prices, which is rapidly ascending beyond the level of affordability. When one considers that each individual's time is worth some \$10 to \$30 per hour needed to type and duplicate a program, I would be happy to pay to have this done, since my cost remains the same.



However, I am deeply concerned that there is a highly inflationary trend in various trade magazines wherein software is now listed in the "hundreds of dollars".

While one might justify such for a specialized business application, certainly one cannot afford to continue to buy many programs non-professionally, as a hobbyist or casual user or learner. Additionally, the availability of your programs on disk or cassette would offer users an opportunity to dramatically widen their sphere of learning and fully grasp many of the excellent yet basic things included each month in your magazine. My time is critical!

I would be willing to pay you, say, \$100 to \$200 for a set of disks which include all programs published in the past, also. Perhaps this could be done in the manner you did the "free programs" offered with a subscription renewal.

Finally, I would like to offer my opinion as to the quality of services and user support provided to me by Radio Shack here in the San Francisco area. Simply stated, it has been inadequate. Had I not been able to obtain supplementary help from publications such as H & E COMPUTRONICS, BYTE, MICRO-80, etc., I would have long since given up. Radio Shack was fortunate to have developed and manufactured a quality product. Otherwise, they would not have survived, had it not been for the excellent user support provided by yourself, your staff, and others who recognized the glaring user support deficiencies within the Tandy/Radio Shack marketing and sales approach.

Truly, it is encouraging that Radio Shack is evidencing a recognition of this deficiency as you note in their recent

Newsletters. It is my firm belief that you have helped them to market "many thousands of dollars" of their products. Perhaps someday Radio Shack will acknowledge this to you and your staff with perhaps just a simple "thank you". While I have no way to ascertain the commercial interests of Radio Shack vs. H & E Computronics, I will only say that I would not have been able to gain enough support and learning to continue with my two-year old model, two disks, printer, 48K system. The stimulus resulting from H & E Computronics and to a lesser extent other publications resulted in my purchasing some \$3500 of my total \$5000 investment. Keep up the good work!

Sincerely,

Lewis J. DeBusk
38 Crystal Springs Rd.
San Mateo, CA 94402

Loading Tapes Under TAPEDISK

Dear Computronics:

I read with great interest the letter of your subscriber who is having trouble loading tapes under TAPEDISK. I too suffer from the same malady. It is not the use of the CMD"T" command that is the trouble. For some reason, IRV, PACK, REMODEL and PROLOAD, BPA and other popular utilities will NOT load on my machine no matter what I do. I am beginning to believe that the problem is with TAPEDISK itself. I am seriously considering purchasing NEWDOS because I am so disappointed with TRSDOS and its documentation. The book and the examples are absolutely terrible for the novice or first time user.

COMPUTRONICS

MATHEMATICAL APPLICATIONS SERVICE INC.

Kind regards,

Richard Eidmann
4244 M Street
Philadelphia, PA 19124

Re: PROFILE II

Dear Sir:

Not too long ago, I purchased PROFILE II from one of the RS Computer Centers for my TRS-80 Model II, and the program looked very promising. During some applications I discovered that the adding function of numeric fields creates a problem as far as the TOTALS are concerned.

For example: the program is excellent without using the add function and without using totals. Also, if there is only one column to be added, the program is perfectly all right. The problem starts if there are two or more columns to be added in the same report. There is a linefeed between totals, and the totals are stepping down to the next line.

Say you have four columns to be added in a report; then the totals are not printed all on the same line, but there is a linefeed between each total. This is very annoying, and at the same time it looks ridiculous on an otherwise perfect report.

I complained to the RS Computer Store and was told that other people have also complained about this problem. RS head office in Fort Worth, however, completely ignores all the complaints. I then wrote to the Computer Service Center of Radio Shack in Fort Worth, explaining the situation, sending copies of reports together with a copy of my diskette, and explaining that reports printed with step down totals cannot be used

in regular business applications. Reports of this kind are of absolutely no use, at least not to me.

I also talked to somebody on the phone at the RS Computer Service Center, and that gentleman was very helpful and mentioned to me that he will investigate the problem and would see what could be done about it.

Finally, after about six weeks, I had a phone call from this gentleman, informing me that the program is in machine language and was designed to have linefeeds between totals. He mentioned to me that the totals would run into each other if someone would not allow enough digits for the totals, and therefore it was programmed that way. At any rate, RS is not going to change the program, nor are they willing to write a patch for PROFILE II to correct this problem, and that's just the way it is, the man said.

Well, I certainly do not like this kind of attitude, especially when there are, as I understand, a number of people who are not satisfied with this program. This is the reason why I am writing this letter to you and your magazine. I think prospective buyers of PROFILE II should be made aware of this problem.

I am convinced that somebody with sufficient programming knowledge of machine language would be able to eliminate this linefeed between totals, and I am certain that many PROFILE II owners would appreciate that.

I am wondering whether you could help me with this problem, or whether you know somebody who could make this change in the program, indicating at the same time, the cost of such a change. It is

certain that you will come across many other readers of your magazine who have encountered the same problem and would like to correct it.

A finishing touch to PROFILE II would be to add other arithmetic functions, such as multiplications and divisions to numeric fields. Your early reply would be very much appreciated, and I would be grateful if you could help.

Very truly yours,

Hermann J. Hahn
16136 Royal Mount Drive
Encino, CA 91436

Dear Mr. Hahn:

We do not know how to patch this program in this way, and even though we have people on our staff who have a knowledge of machine language programming, it would be very difficult to disassemble this program to discover where and how to fix it. This type of change can be best made by the person who originally wrote the program, and the real problem is that he or she was not properly instructed.

We are printing your letter in case any readers who have this knowledge, or who have already corrected the problem themselves, might be so kind as to contact us, or you directly.

Programs Published in COMPUTRONICS

Dear Mr. Gosman:

I vote YES that COMPUTRONICS make "copies of programs published in the magazine"!!

I am a touch typist, currently involved in copying Andrew Braunstein's SIMULATED GOLF GAME

from the November issue. It looks like a "goodie", but l-o-n-g- and tedious to type in! I am doing it in "Bits and Pieces"! With all those pokes, etc. one has to be very careful not to make typographical errors.

This reader would be more than willing to pay the nominal price you suggested.

You have a fine publication!

Best wishes,

Les Roselle
81 Berehaven Drive
N. Tonawanda, NY 14120

Gentlemen:

You mentioned in your November issue about selling copies of your published programs and asked for comments.

I would buy every program on disk that you would make available. You might also consider an annual fee added to your monthly magazine and send them all out with the magazine.

Sincerely,

George Traeger
P.O. Box 323
Melrose, MN 56352

Dear Messrs. Roselle and Traeger:

We are nearing a solution to this problem. We are thinking of starting with publications consisting of reprints of programs from past issues. When we work up to the present, we will provide some system for purchasing the programs in advance. Whether they will be on disk or cassette, or both, we don't yet know. At the moment, we are still not certain of the details,



and we would still like to hear from readers as to whether they would be interested in purchasing them.

* * * *

H & E Computronics welcomes letters on any subject. If you wish a personal reply, please enclose a self-addressed, stamped envelope.

* * * *

H & E Computronics also welcomes readers to submit programs, articles, or reviews for publication. Please address correspondence to:

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**Now—from the editor of
Computronics:**

TRS-80 Assembly Language

Hubert S. Howe Jr.

Now for both the first-time user as well as experienced users of the TRS-80 microcomputer, here is a book that explains assembly language programming in a thorough, yet easy-to-understand style. *TRS-80 Assembly Language* contains all of the information you need in order to develop machine language programs.

In this book you will find:

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in the use of the TRS-80
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details of ROM, RAM, and disk operating systems
comprehensive tables, charts, and appendices
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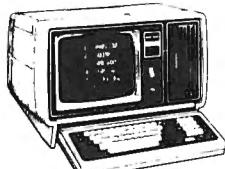
TRS-80 Assembly Language incorporates into a single volume all the pertinent facts and information you need to know to program and enjoy the TRS-80 microcomputer.

Hubert S. Howe, Jr., is an Associate Professor at Queens College of the City University of New York. He specializes in the subject of electronic music.

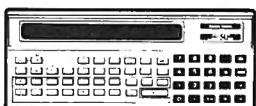
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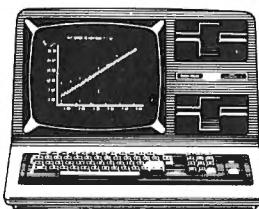
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CRYSTAL BALL DEPARTMENT

(NEW PRODUCTS OF INTEREST TO TRS-80^{TM*} OWNERS)

WARNING... THE INFORMATION FOUND IN OUR CRYSTAL BALL DEPARTMENT DOES NOT REPRESENT VERIFIABLE FACT. WHAT FOLLOWS ARE RUMORS FROM WHAT WE CONSIDER TO BE RELIABLE SOURCES (unless otherwise stated), OR RECENT NEWS OF INTEREST TO TRS-80 OWNERS.

1. There appear to be problems with the new TRS-80 Model 3's ROM. In addition to actual errors present, Radio Shack decided to leave out Microsoft's copyright notice. Microsoft will probably take legal action to get RS to put it back, especially after the new software copyright act of 1980. Model 3 owners will have to pay an additional \$20 to get the new ROM, whenever RS figures out how to correct the problems in it.
2. According to a major manufacturer of diskettes, the disk drives being shipped with the new TRS-80 Model 3 are double-headed and thus have the capability of giving twice the storage capacity. This enables one to have the capacity of four disk drives, like the Model 1, on the Model 3 with only the two built-in drives. This is not being advertised because RS does not presently have the software to enable the back side of the disk drive to be accessed. We predict that one of the authors of competing disk operating systems, such as NEWDOS or even CP/M, will beat RS to the punch and come out with the software first.
3. Personal Micro Computers, 475 Ellis Street, Mt. View, California, is now marketing the PMC-80 an unauthorized copy of the TRS-80 Model 1, Level II computer manufactured in Hong Kong. It has 16K bytes of RAM and the complete 12K BASIC ROM by Microsoft that makes it completely software-compatible with the Model 1.. In addition, the PMC-80 will operate with any standard TRS-80 peripheral. It costs \$645 (versus the TRS-80's price of \$849), but it does NOT come with a video monitor: you must plug it into your television set (channel 3). Other differences are: (1) The power supply has a fuse and is located inside the unit. (2) The cassette and interface are all contained within the same case. (Gets rid of all those wires.) (3) There is a 50 pin bus to S-100 chassis standard with 40 pin TRS-80 optional (\$35). (4) Optional 8000 baud "fastload" program transfer system.
4. Radio Shack/Tandy will enter the agricultural information business through a computer service known as "Instant Update". Slated to begin within 60 days, the 24 hour service will offer commodity prices, crop yields, market information, access to news and other important information for the farmer. It will be a joint venture with PFA (Professional Farmers of America) utilizing Radio Shack's "Videotex" terminals. The cost will be \$95 per month plus telephone line toll charges. Information will be displayed on a regular television screen.



5. Tandy Corporation was granted a one-year waiver to manufacture its Expansion Interface for the TRS-80 Model 1 computer. The waiver was granted on the conditions that Tandy not make more than 30,000 units and that "the interference potential of the TRS-80 not be increased more than six decibels." Radio Shack also had to agree to "correct interference caused by its equipment or refund the price of the equipment." Theoretically, an Expansion Interface made during 1981 that causes RF interference would have to be corrected by Radio Shack.

6. Reader's Digest has acquired controlling interest in "The Source", one of the major telecomputing networks which currently has about 7,000 subscribers to its personal computing database. "The Source" will operate as a subsidiary of Reader's Digest but will retain its name. "The Source" offers an electronic data service to the public by allowing personal computer users to access larger time-sharing computers and data banks during off business hours. An hourly rate is charged to access such information as UPI newswire, magazines, stock quotes, electronic mail, publications (such as newspapers), airline schedules, computer games and other emerging electronic services.

7. (Now former) President Carter has signed into law the Computer Software Protection Act of 1980. The bill, now Public Law 96-517, clearly states that the instructions (programs) to a computer are legally copyrightable. The ultimate result of the legislation will be that software authors will now be able to expand their activities, secure in the knowledge that their rights are protected. The U. S. Copyright Office has been accepting computer software programs for copyright since 1964, but until now there has never been a clear decision as to whether software does in fact represent the work of an author.

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THE MAGIC SOFTWARE MACHINE (PART I)

by R. W. Liddil

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I stood in front of the old Victorian style house, in Peterborough New Hampshire, and listened to the Real Estate lady rattle off its colorful history. It didn't really interest me until she got to the part about the Mad Electronics Engineer who'd lived in the upper two stories before it'd become vacant. He'd been a strange fellow, according to her, a genius-whiz at computers, long before it was fashionable to play computer. But he'd vanished mysteriously. Folks around here whispered that the house maybe was haunted, but what with me bein' in computers myself, she guessed maybe I'd be comfortable in Professor Megabyte's old house.

I took it. Not that the old professor was a genius-whiz at interior decorating. Far from it. The downstairs was laid out in Goodwill Modern, a sort of cross between the overstuffed upholstery of the fifties and the laid back modern style of a midwestern hobo jungle, circa 1971. The thing that intrigued me, though, was the third floor.

At the top of the stairs leading to the attic was a locked door. I'd found an old skeleton key in a hall closet. It was a long shot, but maybe this would unlock what I was sure, was the Professor's lab. As I started up those stairs, I had a strange feeling that I was not alone.

The key fit. A quick flick of my wrist, a snapped lock and a flick-of-my-Bic later and I was in a darkened attic room filled with machinery. Checking around, I found a master switch. I flipped it on.

The silence of the room was shattered by the whir-click of relays and the hum of a printer motor as every piece of equipment in the room came to life. The professor had been really well equipped. In a far corner of the lab sat a TRS-80 with three MPI B-51 disk drives, a 48k expansion interface, Livermore Star Modem and a R/S Daisy Wheel II. All this was interfaced to a huge aluminum box with more lights, knobs, buttons, and speakers on it than a flea market table at a robotics convention.

A disk had been in the drive at power up. So some software had already been activated. I just couldn't help myself. I sat down and typed "RUN".

Well, that aluminum box went totally gonzo. Bells, whistles, lights, the whole shooting match. I thought it was going to explode. But then, it settled down again and just as I had relaxed a little, a voice came from one of the speakers.

"Thanks, kid, I needed that."

I nearly died.



I typed "What's going on here?"

"You don't have to use the keyboard, I have a VOX unit built in," said the voice, "just press sequence 0348 (enter) and you can talk to me."

I sat there for a very long moment before doing anything. Wow, two hundred dollars a month for an apartment and THIS thrown in for free! What a trip! Then I typed in 0348 on the keypad.

"What's happening here?" I asked, not too loudly, and feeling pretty silly talking to a computer.

"Well," said the voice, "did you ever read a book called THE ADOLESCENCE OF P-1 ?"

"Um, yes." I recalled the book, all right. A fascinating bit of Science Fiction about an intelligent program, loose in the phone lines and free to move about the country by tele-link.

"I am a program, not unlike the character P-1, in that book, except that I am resident here, in this home built expandor, and quite pleased to stay that way, though occasionally I do go out exploring."

What do you say to an intelligent program? First, you try not to sound stupid.

"What do I call you?" I said, trying to act casual.

"Whatever you like," was the reply.

"I think I'll call you Max, then," I said. "What can you tell me about yourself?"

"Well, as near as I can compute it, from the information stored here, I am three years old. I was originally concieved as part of an experiment in compuphased spatial-shifting..."

"Hey, hold on here," I interrupted, "what the heck are you talking about?"

A hesitation, and a chatter of relays from the expando.

"Sorry, Let me simplify. Professor Megabyte was doing situation simulation research for the government when he discovered the equation for compu-phased spatial-shifting. In lay terms, he devised a formula for merging a human into a computer program."

Oh brother. Now I've heard everything.



I said, "Where did you fit in?"

"I was a to be a link to the real world, you know, kind of like a 48k digital lifeguard."

"So what happened to the Professor?"

"He went dipping, that's what it's called, dipping, anyhow, the Professor went dipping without checking the weather report. We had a power failure that wiped every byte of RAM in the whole computer. I managed to pump the program he was in, out the phone line just before the crash. When the power went down, the drives ate all three disks. When the memory went west all my present-sense went with it. The only thing left was my core program, in 48k of EPROM, and the boot in a battery powered SHORT-MEM pak. As for me, just before the crash, there was a surge that lunched most of one of the EPROM'S that made up my initial programming. The new combination of equations created an independently intelligent me."

"So you were created by a power surge, and Professor Megabyte was done in by memory crash?"

"The Professor is alive. That much I do know. I can't track him too much without human help. You see, after the initial crash, when the power came back up, it took me almost a month to gain control over my peripherals. I have a direct tele-link and an autodialer, that is internal, but everything else had to be recoded by trial and error. By using a copy of SUPERZAP that was unharmed by the drive crash, I was able to reconstruct the Dip-codes and do a search for the program he was in at the time of the accident. It was an early STAR TREK program, written by Ed Juge. When I pumped that program out into the phone system, Professor Megabyte was wholly resident inside. The TREK, the Professor, and the Lifeguard ID codes were downloaded into the safest place I could find, the memory bank at the SOURCE."

"At least there was plenty of memory for him there," I agreed.

"Unfortunatly there were over a hundred other programs in residence also. He apparently has the ability to sideslip from one program to another. Sometimes he leaves little clues as to where he's been. Sometimes I catch boottracks on new software, just released, I don't know how he's doing it but he is. He's lost and can't find his way home."

"What can I do ?" Says I.

"By using this computer, with my help, to sift through the hundreds of new and old software releases for the TRS-80, looking for clues to the Professor's whereabouts. I'll get you the programs. If you can find him resident, I can rescue him."

Now, it so happens, that I am a software reviewer by trade, having come



to Peterborough to partake of its rich microcomputer environment. So looking for one disappeared scientist in the midst of all the other work I had to do, seemed a small price to pay for the use of a super-computer and the friendship of a Magic Software Machine named Max.

"Max," I said, "I'll do it."

"Excellent, I'll get started collecting the software."

The CRT blinked and went to DOS READY. Max had left me to my thoughts. Now how would I explain this to my editor? Well, honesty is the best policy.

At this point, you readers know just about as much as the editors and I do. Mainly, as the months progress into 1981, I'll try to review software old or new, commercial or private.

If it is sent in by a reader, it should be his own stuff. If it is sent in by a company It should be already released, or within sixty days of being so. Software for review should be clearly marked "FOR REVIEW ONLY". Hardware should have a review release enclosed with the unit and the manufacturer should be prepared to wait a minimum of three months for the review to be completed. Please remember to state the prices of review items where it applies.

And if anyone comes across any clues to the whereabouts of Professor Megabyte, please write me and tell me about it. Address your correspondence to: MAGIC SOFTWARE MACHINE, P.O. BOX 66, PETERBOROUGH NH, 03458. Max and I need all the help we can get.

DISASSEMBLED HANDBOOK FOR TRS-80

by Robert M. Richardson

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FOUR BASIC PROGRAMS

by
GORDON SPEER

On my last trip in to the big city (Chicago) I noticed that some of the fast food places have automatic cash registers that total up hamburgers and fries by pressing buttons marked 'hamburger' and 'fries'. I decided my TRS-80 must be at least as smart as a cash register, so I wrote a little program to automatically total and add tax to four kinds of items. This might be useful in elementary schools for teaching making change, or simulating running a store, where the mathematics might be a little too much to handle.

To operate the program, press H for a hamburger, C for cheeseburger, F for french fries, and M for milkshake. If you want to subtract one item press the minus sign first, and to start a new order press the clear key. All printing is displayed in double sized characters. (Sales tax is 5% - Illinois.)

```
100 ' REGISTER
110 CLEAR 2000           'STRING STORAGE SPACE
120 CLS                  'CLEAR SCREEN
130 PRINT CHR$(23)        'DOUBLE WIDE LETTERS
140 LET S=1:HT=H*.65:CT=C*.75:FT=F*.55:MT=M*.70
150 PRINT"    TRS BURGER PALACE"
160 PRINT STRING$(28,176)
170 PRINT
180 PRINT H;" HAMBURGERS";TAB(20)USING"###.##";HT
190 PRINT
200 PRINT C;" CHEESEBURGERS";TAB(20)USING"###.##";CT
210 PRINT
220 PRINT F;" FRENCH FRIES";TAB(20)USING"###.##";FT
230 PRINT
240 PRINT M;" MILKSHAKES";TAB(20)USING"###.##";MT
250 LET T=HT+CT+FT+MT
260 PRINT TAB(15)USING"TOTAL###.##";T
270 LET TX=.05*T
280 PRINT TAB(15)USING"TAX####.##";TX
290 PRINT
300 PRINT TAB(18)USING"####.##";T+TX
310 LET A$=INKEY$
320 IF A$="-" THEN LET S=-1      'MINUS SIGN SUBTRACTS NEXT ENTRY
330 IF A$=CHR$(31) THEN RUN      'CLEAR KEY RESTARTS THE PROGRAM
340 IF A$="H" THEN LET H=H+S:GOTO 120
350 IF A$="C" THEN LET C=C+S:GOTO 120
360 IF A$="F" THEN LET F=F+S:GOTO 120
370 IF A$="M" THEN LET M=M+S:GOTO 120
380 GOTO 310
```

DETERMINANTS

One of the things I remember about math class at Hanley Junior High School was a method of solving two simultaneous equations called DETERMINANTS. It is an algorithm that uses the difference between the products of diagonals in some cute little boxes we had to draw, and anyway if you ever end up with two equations and two unknowns this is one of the methods you can use to figure them out. If anyone out there in readerland would like a challenge, see if you can write a similar program for third-order determinants, to solve three equations in three unknowns.

```

100 ' DETERMINANTS
110 CLS
115 PRINT:PRINT:PRINT
120 PRINT"TO SOLVE TWO EQUATIONS IN TWO UNKNOWNNS USING DETERMINANTS,"
130 PRINT"EACH EQUATION MUST FIRST BE PUT IN THE GENERAL FORM:"
140 PRINT
150 PRINT,"AX + BY = C"
160 PRINT
170 INPUT"INPUT (FOR THE 1ST EQUATION) A,B,C";A1,B1,C1
180 PRINT
190 INPUT"INPUT (FOR THE 2ND EQUATION) A,B,C";A2,B2,C2
200 CLS
210 LET X=(C1*B2-C2*B1)/(A1*B2-A2*B1)
220 LET Y=(A1*C2-A2*C1)/(A1*B2-A2*B1)
230 PRINT TAB(6)"C1      B1"TAB(22)C1"      "B1
240 PRINT TAB(42)C1*B2-C2*B1
250 PRINT TAB(6)"C2      B2"TAB(22)C2"      "B2
260 PRINT "X = ----- = ----- = ----- = "X
270 PRINT TAB(6)"A1      B1"TAB(22)A1"      "B1
280 PRINT TAB(42)A1*B2-A2*B1
290 PRINT TAB(6)"A2      B2"TAB(22)A2"      "B2
300 PRINT
310 PRINT
320 PRINT TAB(6)"A1      C1"TAB(22)A1"      "C1
330 PRINT TAB(42)A1*C2-A2*C1
340 PRINT TAB(6)"A2      C2"TAB(22)A2"      "C2
350 PRINT "Y = ----- = ----- = ----- = "Y
360 PRINT TAB(6)"A1      B1"TAB(22)A1"      "B1
370 PRINT TAB(42)A1*B2-A2*B1
380 PRINT TAB(6)"A2      B2"TAB(22)A2"      "B2;
390 FOR Y=0 TO 19
400 GOSUB 460
410 NEXT Y
420 FOR Y=27 TO 46
430 GOSUB 460
440 NEXT Y
450 GOTO 450
460 SET(8,Y):SET(31,Y):SET(42,Y):SET(71,Y)
470 RETURN

```



PAYOUT

I have had several people ask me to figure how much the monthly payments would be on a certain sized loan. A few years ago I wrote a program to figure the monthly payment by approximation until it arrived at the nearest penny per month. I guess I knew at the time there was an easier way but didn't run across it until recently. My education was in the sciences, not math or business.

You should notice that line 120 changes all variables to double precision. This is an easy way to guarantee super accuracy in financial programs. You should realize though, that some of the functions of BASIC do not operate with the 16 significant figures of double precision variables. Also, note that a double \$\$ in a PRINT USING statement causes close printing of the \$, which would be useful for paychecks and the like, to prevent alteration.

I'm getting into the habit of including sample input as in line 180, to suggest to the operator how the input should look. In this case the percentage is asked for as a whole number, not a decimal. Without the sample it might be confusing.

```
100 ' PAYOFF
110 CLS
120 DEFDBL A-Z           'DOUBLE PRECISION VARIABLES
130 PRINT
140 PRINT"PAYOFF: CALCULATES MONTHLY PAYMENT AND TOTAL INTEREST OF A LOAN"
150 PRINT
160 INPUT"PRINCIPAL (AMOUNT OF LOAN)";P
170 INPUT"    TIME (NUMBER OF YEARS)";T
180 INPUT"RATE OF INTEREST, % (5-20)";R
190 LET I=R/1200          'MONTHLY RATE OF INTEREST
200 LET N=T*12            'NUMBER OF MONTHS
210 'IF BRACKETS OCCUR IN THE FOLLOWING LINE, USE UP-ARROWS (EXPONENTS)
220 LET M=P*I*(1+I)[N/((1+I)[N-1]  'MONTHLY PAYMENT
230 LET TI=M*N-P          'TOTAL INTEREST
240 PRINT
250 PRINT"MONTHLY PAYMENT =";
260 PRINT USING"$$#####.##";M
270 PRINT" TOTAL INTEREST =";
280 PRINT USING"$$#####.##";TI
290 'NOTE: USE OF DOUBLE $$ IN PRINT-USING CAUSES CLOSE PRINTING
300 'OF $ TO PREVENT ALTERATION IN FINANCIAL RECORDS
310 PRINT:PRINT
320 INPUT"(ENTER) TO RUN AGAIN";Q
330 RUN
```

BANKTURN

In highway and racetrack design, turns are banked to keep cars from skidding, and passengers from sliding across the seats. This also causes an increase in the G-force, the apparent increase in the pull of gravity due to the centripetal acceleration of the object toward the center of the circle. Aircraft also use banked turns to prevent 'skidding' in flight. The G-forces in passenger carrying aircraft probably seldom exceed 1.5, but in aerobatic and military aircraft reach somewhere around 5 to 9.

This type program would be useful in civil engineering for highway design, or in aircraft flight training.

```
100 ' BANKTURN
110 LET PI=3.14159
120 LET G=32          'EARTH'S ACCELERATION OF GRAVITY
130 CLS
140 INPUT"SPEED (MILES PER HOUR)";S
150 CLS
160 LET L=0          'RESET LINE COUNTER
170 PRINT"    ANGLES OF PROPERLY BANKED TURNS AT"S" MILES PER HOUR:"
180 PRINT
190 PRINT"TURN RADIUS (FT)      ANGLE (DEGREES)      G-FORCE"
200 PRINT
210 RESTORE
220 READ R
230 DATA 10,12,15,20,30,40,50,75
240 DATA 100,120,150,200,300,400,500,750
250 DATA 1000,1200,1500,2000,3000,4000,5000,7500
260 DATA 10000,12000,15000,20000,30000,40000,50000,75000
270 DATA 1E5,1.2E5,1.5E5,2E5,3E5,4E5,5E5,7.5E5
280 DATA 1E6,1.2E6,1.5E6,2E6,3E6,4E6,5E6,7.5E6
290 LET A=180/PI*ATN(S*S/(R*G)) 'ANGLE OF BANK IN DEGREES
300 LET GF=1/COS(A*PI/180)      'G-FORCE
310 IF GF > 3 THEN 220        'EXCESSIVE G-FORCE
320 PRINT USING"#####";R;
330 PRINT USING"#####.##";A;
340 PRINT USING"#####.##";GF
350 LET L=L+1                  'LINE COUNTER
360 IF L < 11 THEN 220
370 GOTO 140
```

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The COMPUTRONICS SEARCHWORD

A Puzzle for TRS-80 Users

by John K. Young

T O L O O P M U J N I G H T
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U E R U I T P E I S A I N L
T H D I R O R R E N N N C V C
E R C A C U O L I D A R K Y
F L O W M S G M H N I O A C
I T E K E U R O P E T L L B
E R A S E E E A T R A E O E M
L A R G T Y M M U D M R U A
D A E H I C M M E P P I A T
L N T S G C E G O E N T B L
O A N A I D R L W S I I T H
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Cycle	Field	Key	Rub
Data	Flow	Loop	Terminal
Delay	Gate	Merge	

John K. Young
167 Richard Road
Braintree, MA 02185



Coming to Terms with
the COMPUTRONICS SEARCHWORD
Solution to December's Puzzle
by John K. Young

C O A X I A L P C L E A R
A O M G L I O E A B O H E
I D N G R R R R W R E A A
L E O F T A T I D A I M D
L L S A I C P P D N I E N
I E B C E G V H I C T T E
O L T P A S U E I H S S E
E N S U O N O R H C N Y S
L L L F T A A A A N P S D
B S O I E L I L H T R O F
B N B S N E G S Y S I A T
U D O R A E K E W S N O A
B R C O D E K R O W T E N

Find all of the following words in the above diagram, which may be arranged left-to-right, right-to-left, up, down, or diagonally.

Algol	Cobol	LET	READ
Analyst	Code	LOAD	Scan
Bit	Configuration	Network	Spectral
Branch	FORTH	Online	Sysgens
Bubble	Graphic	Peripheral	SYSTEM
CLEAR	Headhunt	Portable	Synchronous
Coaxial	ILLIAC	PRINT	Wait

John K. Young
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Braintree, MA 02185



KEYBOARD INPUT BUFFERING FOR BASIC PROGRAMS

by

Arne Rohde

One of the most annoying features of any word processing program written in BASIC is the speed with which text can be entered from the keyboard. Even slow typists will notice the occasional lost letter or two caused by typing faster than the program's ability to process the text being entered. The normal entry speed may be sufficient for most purposes, but extra processing will often have to be done when a line has been filled and text is to be moved onto the next line. This is the point where the COMPUTRONICS word processing program annoys me on almost every line, even though I am a relatively slow typist. Anything from 1 to 10 characters will be lost for each new line being created if I do not constantly watch the video display when I am nearing the end of the line.

Each character of text is entered into the program with the INKEY\$ function and checked before it is appended to the end of the current line. If text being entered results in the current line exceeding the permissible line length, then the trailing word on that line is moved onto the next line as the first word on that line. The time required to find the length of the trailing word and remove it from the line is usually long enough for characters entered during this process to be lost. BASIC maintains a one-character input buffer at location 4099H, and this is the location where INKEY\$ will fetch the next character. Since BASIC scans the keyboard for every statement executed, it can store any character entered, even if the program is not waiting for input. Since the buffer only consists of a single byte, only the last key pressed will be stored.

Another common cause of lost characters is BASIC word processing programs is the string area reorganization routine. For large string areas with many strings, the reorganization process can take many seconds to complete, and during this time the keyboard is not scanned. The only active key is the RESET button on the back of the keyboard, but this seems a little drastic to use in this situation. Characters entered during this process will not be stored in any buffer, and will therefore be completely lost. If the string area can be kept much larger than the number of characters actually stored, then the string reorganization process will be done seldom enough to avoid much annoyance from lost text.

Another feature of TRS-80 BASIC which becomes evident when using a word-processing program is the inverted keyboard, where SHIFT must be used to obtain lower-case letters, with unshifted letters resulting in upper-case. This could be corrected in the program by checking for the value of the current input key, and inverting it, but this again results in extra processing time, with slower entry as a result.



Since BASIC calls the keyboard driver for each statement executed, it should be possible to modify the driver so that it will buffer the input and only pass it on to the program when it is requested. To do this it could be necessary to distinguish between normal input routines, and input requested with the INKEY\$ function. The simplest method of achieving this is to let the program set an indicator somewhere in memory when buffered input is required, and remove the flag when direct keyboard entry is requested. Since the keyboard device control block (DCB) contains three unused bytes, indicated in the Level II manual as zeroes, it would be logical to use one of these bytes as an indicator. Even if buffered keyboard entry is required, the BREAK key should still be active, and so this key is also used to terminate buffering and return to direct entry mode.

The routine shown in the enclosed assembly listing is used to intercept the keyboard driver routine. The previous routine, possibly containing debounce or other functions, is called to provide the normal keyboard processing. If no new key has been depressed, then the accumulator will be zero; otherwise it will contain the ASCII value of the key. If the flag byte in the keyboard DCB (byte 4018H) is zero, then a normal exit is taken, after the keyboard buffer has been cleared. If the flag is non-zero, then the new character is stored in the next available position in the buffer, the pointer and counter updated, and the accumulator set to zero to indicate no keyboard input. In this way, the control of the INKEY\$ buffer in 4099H has been removed from the BASIC interpreter and transferred to the new driver. A zero value in 4099H indicates that the INKEY\$ buffer is empty and ready to receive the next byte of input. If a character is available in the buffer maintained by the driver, then it is inserted into byte 4099H and the address and counters updated to reflect the fact that it has been removed from the buffer. If no character is available, then the buffer is left untouched.

The technique used allows a maximum buffer length of 255 characters, but this should not really be necessary for most practical purposes. As implemented, the buffer can take a maximum of 64 characters, and if it overflows, then the oldest value in the buffer will be removed. The buffer acts as a queue, with a pointer to the next available position for storing a new character, a pointer to the next character to be removed from the queue, and a count of the number of characters actually present and waiting in the queue. Each time one of the pointers is updated, a check must be made to see if it has exceeded the end address of the buffer. If this is the case, then it will be updated to point to the start of the buffer. If a new input character results in buffer overflow, then the address of the next available character will be updated to point to the oldest available character in the buffer. If required, the routine could easily be modified to ignore the latest entry instead of the oldest entry.

If the flag for buffering has not been set, then the routine will perform exactly like the normal keyboard driver, and if the flag has not been reset when normal keyboard entry is desired, the buffer can always be deactivated by hitting the BREAK key. Any characters in the buffer when



this key is depressed will be lost.

Since I am using the routine exclusively at present together with the COMPUTRONICS word processor, a logical extension of the routine was a conversion of the letters entered from upper case to lower case, and vice versa. This could obviously be removed easily if not required.

Before each routine requiring extensive input with the INKEY\$ function, a call is made to a subroutine which will perform a POKE 16408,1 to set the flag for buffered input. After the input routine has been terminated, a call is made to a subroutine which does a POKE 16408,0 to indicate that normal input is now expected. If the flag is not cleared, then INPUT will not return any data to the program, and only the BREAK key will be active.

On initialization, the assembler routine will take the old driver address from the DCB and check the value to avoid the possibility of a loop if the routine is loaded twice. This address is then stored in a CALL instruction. The new driver address is placed in the DCB, and the high memory address set to the start address and the flag cleared before returning to DOS (or BASIC READY message if using tape). BASIC and the word processor can then be loaded and run. Since the keyboard is reversed, it can immediately be seen whether the program is active or not. It will also be obvious each time a new line is begun on text entry.

The routine should not cause any difficulty to implement, and with a shorter buffer it could easily be reduced to less than 200 bytes of reversed memory. A buffer of 15 to 30 characters should be sufficient for most programs, and any but the fastest typists. I hope it will help you to use the "free" word processor from COMPUTRONICS more efficiently than possible before.

POSTSCRIPT

One of the advantages of owning a TRS-80 is the mass of software and hardware available for the system. At the same time it can also be a disadvantage since it is almost impossible to find any area which has not been covered before. The routine presented here is a good example. When it was written, I had not seen a similar routine in any of the magazines I subscribe to. I wrote a description of the routine during a weekend. The following Monday the November/December issue of 80-US arrived, featuring Phil Pilgrim's keyboard queue routine!

There are two important differences between the routines. The one described here is program-controlled, including clearing the buffer, and this I have found to be an advantage in the BASIC word processor program, where the buffer is cleared each time command mode is entered. The other difference is that Phil's program intercepts the 25-msec interrupt so that input can proceed while strings are reorganized in BASIC. This is a definite advantage, the only problem being that each DOS apparently has a different method of inserting a routine into the interrupt chain, and that



it does not work on a system without an expansion interface. If needed, the interrupt routine could also be inserted in the routine presented here.

```
00100 ;
00110 ;KEYBOARD INTERCEPT ROUTINE FOR TYPEIN BUFFER
00120 ;USED FOR BASIC INKEY$ ROUTINE
00130 ;ACTIVATED WHEN BYTE 3 OF DCB <> 0
00140 ;BYTE STORED IN 4099H WHEN THIS BYTE ZERO
00150 ;VARIABLE LOOK-AHEAD BUFFER (MAX 256 CHAR)
00160 ;BUFFER CLEARED ON BREAK
00170 ;PROGRAMMED BY ARNE ROHDE, STRUVER, DENMARK
00180 ;OCTOBER 1980
00190     ORG    OFE00H
00200 INITL   EQU    $
00210     LD     HL,(4016H)      ;DCB PRESENT ADDR
00220     EX     DE,HL
00230     LD     HL,KYBUFF
00240     RST    CPDEHL        ;CHECK ALREADY INSERTED
00250     JR     NZ,NOINIT
00260     EX     DE,HL
00270     LD     (CALLKB+1),HL    ;STORE IN CALL
00280     LD     HL,KYBUFF        ;NEW ADDR
00290     LD     (4016H),HL
00300 NOINIT  EQU    $
00310     LD     HL,KYBUFF-1
00320     LD     (4049H),HL        ;SET HIMEM
00330     XOR    A
00340     LD     (4018H),A        ;SET SW FOR NO BUFFER
00350     JP     402DH          ;RETURN TO DOS
00360 ;NEW KEYBOARD ROUTINE
00370 KYBUFF  EQU    $
00380 CPDEHL  EQU    24          ;COMPARE DE,HL
00390 CALLKB  CALL   03E3H        ;GET KBD CHARACTER
00400 OR      A               ;CHECK VALUE
00410 PUSH    AF              ;STORE
00420 LD      A,(4018H)        ;CHECK FOR BUFFER
00430 OR      A
00440 JR      Z,CLRRET        ;NO, CLEAR AND RETURN
00450 POP    AF              ;GET CHARACTER
00460 JR      Z,GETNXB        ;ZERO, CHECK FOR BUFFER
00470 CP      65              ;CONVERT CASE
00480 JR      C,STORCH        ;STORE CHAR
00490 CP      91
00500 JR      C,ADD32
00510 CP      97
00520 JR      C,STORCH
00530 CP      123
00540 JR      NC,STORCH
00550 ADD    A,OCOH
00560 ADD32  EQU    $
```

00570	ADD	A,20H		
00580	STORCH	EQU	\$	
00590		LD	HL,(NXBFAD)	;NEXT ADDR IN BUFFER
00600		LD	(HL),A	;STORE CHAR
00610		PUSH	AF	;STORE AGAIN
00620		DEC	A	;CHECK FOR BREAK
00630		JR	Z,CLRRET	;YES, CLEAR AND RETURN
00640		POP	AF	;REMOVE
00650		INC	HL	;READY FOR NEXT
00660		EX	DE,HL	
00670		LD	HL,BUFEN	;CHECK FOR END
00680		RST	CPDEHL	;COMPARE ADDR
00690		EX	DE,HL	;OLD TO HL
00700		JR	NZ,NOTENA	;NOT END ADDR
00710		LD	HL,INPBUF	;START BUFFER
00720	NOTENA	EQU	\$	
00730		LD	(NXBFAD),HL	;STORE NEW ADDR
00740		LD	A,(NOCHAR)	;NO OF CHAR IN BUFFER
00750		INC	A	
00760		CP	BUFEN-INPBUF+1	;CHECK FOR MAX
00770		JR	NZ,NOTOVF	;NOT OVERFLOW
00780		DEC	A	;BACK TO MAX
00790		LD	(NXAVCH),HL	;SET NEXT FORWARD
00800	NOTOVF	EQU	\$	
00810		LD	(NOCHAR),A	;NEW NO OF CHAR
00820	GETNXB	EQU	\$	
00830		LD	A,(4099H)	;CHECK IF CHAR IN BUFF
00840		OR	A	
00850		JR	NZ,NORET	;CLEAR A AND RETURN
00860		LD	A,(NOCHAR)	;NUMBER IN BUFFER
00870		OR	A	
00880		RET	Z	;NONE, RETURN
00890		DEC	A	;DEC NO IN BUFF
00900		LD	(NOCHAR),A	;AND STORE
00910		LD	HL,(NXAVCH)	;ADDR OF NEXT
00920		LD	A,(HL)	;GET ACT CHAR
00930		LD	(4099H),A	;STORE IN BASIC BUFFER
00940		INC	HL	;TO NEXT ADDR
00950		EX	DE,HL	
00960		LD	HL,BUFEN	;CHECK FOR END
00970		RST	CPDEHL	
00980		EX	DE,HL	;NEW TO HL
00990		JR	NZ,ADROK	;NEW OK
01000		LD	HL,INPBUF	;ELSE BET START ADDR
01010	ADROK	EQU	\$	
01020		LD	(NXAVCH),HL	;STORE NEXT AVAILABLE
01030	NORET	EQU	\$	
01040		XOR	A	;SET NO INP CHAR
01050		RET		
01060	;CLEAR INPUT BUFFER			

```

01070 CLRBUF EQU    $          ;CLEAR SWITCH
01080      LD     (4018H),A      ;BUFFER ADDR
01090      LD     HL,INPBUF      ;NEXT AVAILABLE
01100      LD     (NXAVCH),HL    ;NEXT BUFFER ADDR
01110      LD     (NXBFAD),HL    ;NO OF CHAR
01120      LD     (NOCHAR),A
01130      RET
01140 ;CLEAR BUFFER AND RETURN
01150 CLRRET EQU    $          ;CLEAR BUFFER
01160      CALL   CLRBUF
01170      POP    AF
01180      RET
01190 ;BUFFER DEFINITION
01200 INPBUF EQU    $          ;INPUT BUFFER
01210      DEFS   64
01220 BUFEN  EQU    $          ;NEXT AVAIL ADDR
01230 NXAVCH DEFW   INPBUF
01240 NXBFAD DEFW   INPBUF
01250 NOCHAR DEFB   0          ;NEXT BUFFER ADDR
01260      END    INITL       ;NO OF BYTES STORED

```

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OVER AND UNDER

by

C. Brian Honess

OVER AND UNDER is a "casino-type" game that has many of the elements of Roulette, Chuck-A-Luck, Craps, etc., but doesn't have complex board layouts or complex rules. The player bets on the roll of two dice -- whether they will total less than seven, exactly seven, or more than seven. The payoff for over or under seven is even money, and if a bet is made on a roll of exactly seven and a seven is rolled, the payoff is three to one.

The game is heavily biased in favor of the house, and is typically not found in the larger formal casinos, but seems to be popular in the "road-house" and illegal type of establishment. Since there are 36 different combinations of the roll of two dice (six different ways to roll the first dice times six different ways to roll the second), and there are six different ways to roll a seven (6-1, 1-6, 5-2, 2-5, 4-3, and 3-4), the odds against rolling a seven are 5 to 1 against. Since there are fifteen ways to roll a number less than seven, the probability of doing this is $15/36 = 0.4166$, or odds of 15 to 21 against. The same odds hold for a roll of over seven.

Is there one bet that is better than the other two, you ask? Sure! Just find the expected value of each bet. If you bet on "under 7", it costs you 1.0 units of money. The chance of a total less than seven is $15/36 = 0.4166$. This probability is multiplied by the bet of 1.0 units of money, yielding 0.4166 units of money -- the expected return on a bet of 1.0 units. The same figures hold for a bet of "over 7".

The probability of rolling a seven is $6/36 = 0.166$, but here the bet is still 1.0 units of money and the payoff is 3.0 units. Therefore the expected value is $0.166 \times 3.0 = 0.5$ units. The 0.5 expected value for a bet on the seven is more than the 0.4166 expected value for a bet on "over" and "under".

The program is written in Level II BASIC, and requires a little less than 4K of memory. I have used subroutines for most of the "logical chunks" of the program (rolling the dice, making a bet, drawing the playing board, etc.). If you decide to delete any of the REM statements at the start of the subroutines, be sure to add 10 to each of the subroutine calls in lines 110 and 170, and change 8000 in line 180 to 8010. The program could be compressed considerably; I have been liberal in the use of spaces, for example, and multiple-statement lines could be used more extensively. But speed isn't a problem in the game, and since it fits in 4K, memory isn't either. There are some "time-wasting" loops, in lines 4060, 6120, and 6060, which keep messages on the screen long enough to be read. You may want to alter these after playing the game a few times.



```
100 CLEAR 300
110 GOSUB 1000
120 CLS
130 BR = 100
140 GOSUB 3000
150 GOSUB 4000
160 GOSUB 5000
170 GOSUB 6000
180 IF BR >= 1000 THEN 8000
190 GOTO 150
200 END
1000 REM *** PRINT OPENING REMARKS ***
1010 CLS
1020 PRINT TAB(21) "<<< OVER AND UNDER >>>" : PRINT
1030 PRINT "    OVER AND UNDER IS A GAMBLING GAME WHICH HAS ODDS PRETTY
MUCH"
1040 PRINT "    IN THE HOUSE'S FAVOR ..... BUT YOU'RE WELCOME TO TRY YOUR"
1050 PRINT "    HAND AT BEATING THEM !" : PRINT
1060 PRINT "    FIRST, THE COMPUTER WILL 'BANKROLL' YOU WITH $100 --- THEN "
1070 PRINT "    IT WILL ASK YOU TO 'PLACE YOUR BET' -- WHICH CAN BE ANY"
1080 PRINT "    AMOUNT, FROM $1.00, UP TO AND INCLUDING THE AMOUNT IN YOUR"
1090 PRINT "    BANKROLL.  YOU'LL BE BETTING ON WHETHER THE ROLL OF TWO
DICE"
1100 PRINT "    WILL TOTAL TO:"
1110 PRINT TAB(25) "LESS THAN 7"
1120 PRINT TAB(26) "EXACTLY 7"
1130 PRINT TAB(25) "MORE THAN 7"
1140 GOSUB 2000
1150 CLS : PRINT : PRINT "    PAYOFF TABLE:" : PRINT
1160 PRINT "        UNDER 7      1 TO 1"
1170 PRINT "        EXACTLY 7     3 TO 1"
1180 PRINT "        OVER 7       1 TO 1"
1190 PRINT
1200 PRINT "    ALSO .... YOU SHOULD REALIZE THAT THE ODDS ARE:"
1210 PRINT
1220 PRINT "        5 TO 1 AGAINST ROLLING A 7"
1230 PRINT "        21 TO 15 AGAINST ROLLING UNDER 7"
1240 PRINT "        21 TO 15 AGAINST ROLLING OVER 7"
1250 GOSUB 2000
1260 RETURN
2000 REM *** PRESS 'SPACE' WHEN READY ***
2010 PRINT @ 960, ".....PRESS.....WHEN
READY.....";
2020 FOR K=1 TO 25:K$=INKEY$:IF K$<>"" THEN RETURN ELSE NEXT K
2030 PRINT @ 985, "'SPACE'";
2040 FOR K=1 TO 25:K$=INKEY$:IF K$<>"" THEN RETURN ELSE NEXT K
2050 GOTO 2010
3000 REM *** DRAW PLAYING BOARD ***
3010 FOR X = 10 TO 39 : SET(X,2) : SET(X,21) : NEXT X
3020 FOR X = 48 TO 77 : SET(X,2) : SET(X,21) : NEXT X
```



```
3030 FOR X = 86 TO 115 : SET(X,2) : SET(X,21) : NEXT X
3040 FOR Y = 3 TO 20
3050 SET(10,Y) : SET(11,Y) : SET(38,Y) : SET(39,Y)
3060 SET(48,Y) : SET(49,Y) : SET(76,Y) : SET(77,Y)
3070 SET(86,Y) : SET(87,Y) : SET(114,Y) : SET(115,Y)
3080 NEXT Y
3090 PRINT @ 138, "UNDER"; : PRINT @ 176, "OVER";
3100 PRINT @ 394,"EVEN";:PRINT @ 412,"3 FOR 1";:PRINT @
432,"EVEN";
3110 FOR X = 20 TO 27 : SET(X,9) : NEXT X
3120 FOR X = 56 TO 69 : SET(X,4) : NEXT X
3130 FOR X = 96 TO 103 : SET(X,9) : NEXT X
3140 X1 = 26 : X2 = 102
3150 FOR Y = 10 TO 15
3160 SET(X1,Y) : SET(X1+1,Y) : SET(X2,Y) : SET(X2+1,Y)
3170 X1 = X1 - 1 : X2 = X2 - 1
3180 NEXT Y
3190 X = 68
3200 FOR Y = 5 TO 15
3210 SET(X,Y) : SET(X+1,Y)
3220 X = X - 1
3230 NEXT Y
3240 PRINT @ 551, "BANKROLL = $"; : PRINT USING "####.##"; BR
3250 RETURN
4000 REM *** PLACE BET ***
4010 PRINT @ 645, STRING$(251," ")
4020 PRINT @ 517, "AMOUNT OF BET"; : INPUT B
4030 IF B <= BR THEN 4100
4040 PRINT @ 661, "THAT'S MORE THAN YOU";
4050 PRINT @ 725, " HAVE. RE-ENTER BET!";
4060 FOR I = 1 TO 500 : NEXT I
4070 PRINT @ 532, STRING$(7," ")
4080 GOTO 4010
4100 PRINT @ 645, "WHICH SQUARE DO YOU WANT TO BET ON ( 1, 2, OR 3 ) "; :
INPUT S
4110 IF S > 3 THEN 4100
4120 RETURN
5000 REM *** ROLL DICE ***
5010 R1 = RND(6) : R2 = RND(6) : R = R1 + R2
5020 FOR X = 31 TO 42 : SET(X,34) : SET(X,39) : NEXT X
5030 FOR X = 47 TO 58 : SET(X,34) : SET(X,39) : NEXT X
5040 X1 = 31 : X2 = 41 : X3 = 47 : X4 = 57
5050 FOR Y = 34 TO 39
5060 SET(X1,Y) : SET(X1+1,Y) : SET(X2,Y) : SET(X2+1,Y)
5070 SET(X3,Y) : SET(X3+1,Y) : SET(X4,Y) : SET(X4+1,Y)
5080 NEXT Y
5090 PRINT @ 773, "ROLL WAS:";
5100 PRINT @ 785, R1; : PRINT @ 793, R2;
5110 RETURN
6000 REM *** WIN OR LOSE ? ***
```



```
6010 IF R = 7 AND S = 2 THEN 6020
6011 IF R < 7 AND S = 1 THEN 6020
6012 IF R > 7 AND S = 3 THEN 6020
6013 GOTO 6100
6020 PRINT @ 806, "YOU WIN !";
6030 W = B
6040 IF S = 2 THEN W = B * 3
6050 BR = BR + W
6060 FOR I = 1 TO 999 : NEXT I
6070 PRINT @ 551, "BANKROLL = $"; : PRINT USING "####.##"; BR
6080 PRINT @ 806, "          ";
6090 PRINT @ 532, "          "; : RETURN
6100 PRINT @ 806, "YOU LOSE!";
6110 BR = BR - B
6120 FOR I = 1 TO 999 : NEXT I
6130 PRINT @ 551, "BANKROLL = $"; : PRINT USING "####.##"; BR
6140 PRINT @ 806, "          ";
6150 IF BR = 0 THEN GOSUB 7000
6160 PRINT @ 532, "          "; : RETURN
7000 REM *** DISASTER! 'YA LOST IT ALL! ***
7010 CLS : PRINT @ 596, "YOU LOST YOUR BANKROLL !"
7020 PRINT @ 656, "WANT TO PLAY AGAIN ( YES / NO )"; : INPUT A$
7030 IF A$ = "YES" THEN 120
7040 CLS : END
```

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ZAP: A Machine Language Program to Zero User Memory

by Joseph Rosenman

Machine language programing is at best a messy task. When attempting to debug a machine language program, anything that helps clarify the information in memory is welcomed. There are several excellent monitor programs available (such as the MON4 program by Dr. Hubert Howe) with which one might alter information in memory, or "zap" areas of memory. While monitor programs certainly could zero out memory, it is not always convienient to load a second program into RAM. If program execution is being observed with the DOS (disk operating system) resident DEBUG program, it may be impossible to use a secondary monitor program. For this reason, I have written a machine language "zapping" program to zero out (almost) all of the user memory.

The first (and simplest) task was to determine the lowest address to zap. The DOS modules occupy memory up to 51FFH. While it is true that the memory between 5200H and 6FFFH is at times used by the DOS, they are always "transient" areas -- they are released after they are used. Memory locations 0000 to 51FFH are always used by the DOS, and so should only be modified selectively and with due consideration. In most DOSs, all the memory above the DOS is considered user memory. In NEWDOS80, however, certain DOS routines may occupy high memory (such as the Lower Case Driver program -- LCDVR/CMD). In addition, not every TRS-80 user has a 48K machine. This program, then, must determine the highest address to zap depending on what particular configuration (DOS version and RAM size) it is executing in.

If the program is going to clear all of the free user memory, where will it execute? The program relocates a minimal module of code to actually carry out the zap, and returns to the DOS. The program accordingly reserves an additional 18 bytes underneath the DOS reserved HIMEM (or the last available address on the system). After the correct ending address for the zap has been determined, a message is printed informing the user of the starting and ending addresses.

The program contains a subroutine to print the message, and a subroutine to convert (and store) the Hexadecimal high-zap address into ASCII. The actual operation of the program can best be understood by examining the assembly language code presented below. The comments included in the source listing carefully trace the logic of the program. The use of the HIMEM location in the DOS (4049H) is official in NEWDOS80. The address appears to serve the same purpose in the other DOSs, although they don't support routines to reset this address. (It could be altered by using a monitor program or the system debug routine.)

```

00100 ; "Z A P" BY JOSEPH ROSENMAN.
00110 ; THIS PROGRAM CLEARS MEMORY FROM 5211H TO HIMEM.
00120 ; PROGRAM RUNS UNDER TRSDOS 2.3, NEWDOS, AND NEWDOS80.
00130 ;
00140 ; FIRST, PROGRAM DETERMINES HIMEM ADDRESS. THEN, A
00150 ; MESSAGE IS DISPLAYED SHOWING AREA TO BE ZAPPED.
00160 ; MEMORY IS ZAPPED, AND A NORMAL RETURN TO DOS IS MADE.
00170 ;
00180 ; Z A P P I N G M O D U L E .
00190     ORG    5200H      ;MACHINE CODE ADDRESS.
00240 ZAP1   LDIR          ;ZAP MEMORY!
00250     JP     402DH      ;RETURN TO DOS.
00260 ;
00270 ; E N T R Y P O I N T F O R "Z A P".
00280 ;
00290 ZAP    LD     DE,5205H    ;FIRST LOC TO ZAP.
00300     LD     HL,(4049H)  ;ADDRESS OF HIMEM.
00310     SBC    HL,DE       ;SIZE OF ZAP AREA.
00320     LD     (SIZE),HL   ;SAVE ZAP SIZE.
00330     LD     HL,(4049H)  ;ADDRESS OF HIMEM.
00340     LD     DE,MESS1    ;LOC OF HIMEM # IN MESS.
00350     CALL   HEX         ;CONVERT # TO ASCII.
00360     LD     HL,MESS    ;ADDRESS OF MESSAGE.
00370     CALL   PRINT       ;DISPLAY MESSAGE.
00372     LD     HL,5205H    ;SOURCE BYTE ADDR.
00374     LD     DE,5206H    ;DEST BYTE ADDR.
00376     LD     BC,(SIZE)  ;NUMBER OF BYTES TO ZAP.
00378     LD     (HL),0      ;SET FIRST BYTE TO ZERO.
00380     JP     5200H      ;EXECUTE ZAP CODE.
00390 ;
00400 ; C O N V E R S I O N F R O M H E X T O A S C I I
00410 ;
00420 HEX    LD     A,H       ;GET HIGH ORDER BYTE OF NUMBER.
00430     CALL   HEX1        ;CONVERT BYTE 1 TO ASCII.
00440     LD     A,L       ;GET LOW ORDER BYTE OF NUMBER.
00450 HEX1   PUSH  AF        ;SAVE BOTH DIGITS OF BYTE.
00460     RRCA              ;THESE 4 RRCA INSTRUCTIONS
00470     RRCA              ;WILL CAUSE A 4 BIT SHIFT
00480     RRCA              ;TO THE RIGHT, REVERSING THE
00490     RRCA              ;2 DIGITS OF THE BYTE.
00500     CALL   HEX2        ;JUMP TO ACTUAL CONVERSION CODE.
00510     POP    AF        ;GET SECOND DIGIT FOR CONVERSION.
00520 HEX2   AND    OFH       ;ONLY OPERATE ON RIGHT DIGIT.
00530     ADD    A,30H      ;CHANGE BYTE TO ASCII.
00540     CP    3AH        ;IS THIS A HEX DIGIT BTW A-F?
00550     JR    C,HEX3     ;IF NOT, ALL DONE. SKIP AHEAD.
00560     ADD    A,7        ;YES, ADD CORRECTION FOR LETTER.
00570 HEX3   LD     (DE),A   ;SAVE ASCII DIGIT IN CORRECT LOC.
00580     INC    DE        ;SAVE ASCII DIGIT IN CORRECT LOC.
00590     RET

```

```

00600 ; P R I N T   M E S S A G E   R O U T I N E .
00610 PRINT    LD      A,(HL)      ;GET CURRENT BYTE OF MESSAGE.
00620      CP      ODH       ;IS IT A CARRIAGE RETURN?
00630      RET     Z        ;IF SO, DONE. RETURN TO MAIN.
00640      CALL    0033H    ;NO, DISPLAY BYTE (DOS ROUTINE).
00650      INC     HL       ;POINT TO NEXT BYTE OF TEXT.
00660      JP      PRINT    ;DO IT ALL AGAIN.
00670 ; D A T A   &   T E X T   S T O R A G E .
00680 SIZE     DEFW    0        ;NUMBER OF BYTES TO ZAP.
00690 MESS     DEFM    'MEMORY WILL BE ZAPPED FROM 5205H TO '
00700 MESS1    DEFM    '##### :'
00710      DEFB    ODH      ;END OF MESSAGE CR.
00720      END     ZAP      ;CONCLUDE ASSEMBLY.

```

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CONCENTRATION

by

Mike Zinner

This version of "concentration" is a two-person game that is a test of the players' memory. At the beginning, the video screen is filled with a six by six array of numbers from 1 to 36. Each player has two chances to make a match. When a number is guessed, it is erased and the word underneath is revealed. If no match is made, the words are replaced by the numbers again and the next player has a chance to try. There are two "wild" words that will match with anything. At the end of the game, it is possible that some words will be left over that cannot be matched. In this case, the last player must type "999" to end the game and display the final scores.

```
5 ' ** CONCENTRATION **  
6 'ADAPTED TO THE TRS-80 BY:  
7 'MIKE ZINNER MPLS,MN 55429  
10 CLS :S=0: CLEAR 1000  
30 DIM A$(40),B$(40),N$(2),A(40)  
50 INPUT "PLAYER #1'S NAME";N$(1)  
70 INPUT "PLAYER #2'S NAME";N$(2)  
90 PRINT : PRINT "IF THERE ARE NO MORE MATCHES POSSIBLE, ENTER A 999 FOR  
YOUR"  
110 PRINT "FIRST GUESS AND THE MACHINE WILL GIVE THE FINAL SCORE."  
130 PRINT : PRINT : INPUT "HIT ENTER TO START";ZM  
150 CLS  
310 FOR W=1 TO 18: READ A$(W): NEXT W: RESTORE : FOR W=19 TO 36: READ A$(W):  
NEXT W  
330 FOR X=1 TO 36: READ A(X): NEXT X  
340 FOR X=1 TO 36: PRINT @ A(X),STR$(X);: NEXT X  
350 RANDOM  
370 L=0  
390 FOR K=1 TO 36  
410 R=RND(36):IF A$(R)="X" THEN 410  
430 L=L+1  
450 LET B$(L)=A$(R)  
470 A$(R)="X"  
490 NEXT K  
510 FOR M=1 TO 2  
530 PRINT @ 704,N$(M);" WHAT IS YOUR 1ST GUESS";: INPUT Q  
535 IF Q=999 GOTO 750  
540 IF Q<1 OR Q>36 THEN 530  
541 IF B$(Q)="X" THEN 530 ELSE GOSUB 1030  
550 PRINT @ 768,N$(M);" WHAT IS YOUR 2ND GUESS";: INPUT Z  
555 IF Z=999 GOTO 750  
560 IF Z=Q OR Z<1 OR Z>36 THEN 550  
565 IF B$(Z)="X" THEN 550 ELSE GOSUB 1090
```



```
570 PRINT @ 704+LEN(N$(M))+25,"      "
590 PRINT @ 768+LEN(N$(M))+24,"      ";
610 IF B$(Q)="WILD" OR B$(Z)="WILD" OR B$(Q)=B$(Z) THEN PRINT " GO AGAIN"
ELSE 710
630 H=H+1: IF H=18 THEN 750
650 Y(M)=Y(M)+1
670 PRINT @ A(Q),B$(Q);: PRINT @ A(Z),B$(Z);
680 B$(Q)="X":B$(Z)="X"
690 GOTO 530
710 NEXT M
730 IF H<18 GOTO 510
750 PRINT "GAME OVER THE SCORES ARE:"
770 FOR U=1 TO 2
790 PRINT N$(U);Y(U),
810 NEXT U
830 END
850 DATA APPLE,BERRY,CHERI,DAIRY,EARLY,FUNNY,GREEN,HAIRY,JELLY,
LOUSY,MISTY,NIGHT,PICKY,WILD,RISKY,SHIFT,TIRED,UNDER
930 DATA 1,11,21,31,41,51,129,139,149,159,169,179,257,267,277
950 DATA 287,297,307,385,395,405,415,425,435,513,523,533,543
970 DATA 553,563,641,651,661,671,681,691
990 FOR G=1 TO 200: NEXT G
1010 PRINT @ A(Q),Q;"      ";: PRINT @ A(Z),Z;"      ";: RETURN
1030 PRINT @ A(Q),B$(Q);: RETURN
1090 PRINT @ A(Z),B$(Z);: GOSUB 990
1100 RETURN
```

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ROOTS

by Edgar W. Van Winkle

"ROOTS" is a mathematical program that solves quadratic, cubic, or biquadratic equations. It prints the equations and asks the operator to type 1, 2, or 3 depending on which equation is solved. The next statement is a request for the coefficients. These should be typed on the same line separated by commas. The program then prints the roots of the equations, and asks you to type 1 if you want to solve another equation.

```

10 CLS:PRINT "MATHEMATICAL PROGRAM TO SOLVE QUADRATIC,CUBIC OR"
20 PRINT"BIQUADRATIC EQUATIONS"
30 PRINT" QUADRATIC A*X[2 + B*X + C = 0"
40 PRINT" CUBIC      X[3 + B*X[2 +C*X +D =0"
50 PRINT" BIQUADRATIC X[4 + A*X[3 + B*X[2 + C*X +D = 0"
60 INPUT"TYPE 1,2 OR 3 TO SOLVE QUADRATIC,CUBIC OR BIQUADRATIC
EQUATIONS";E
70 PI=3.14159265:ON E GOTO 80,270,370
80 INPUT"TYPE COEFFICIENTS OF QUADRATIC EQUATION,A,B&C";A,B,C
90 Z=(B[2]-(4*A*C)
100 IF ABS(Z) < 1.E-5 THEN 190
110 IF Z > 0 THEN 220
120 PRINT"THE ROOTS ARE IMAGINARY AND UNEQUAL"
130 R=((4*A*C)-(B[2]))[.5:YA = -B/(2*A):YB=R/(2*A)
140 PRINT"THE FIRST ROOT IS ";YA;" +(";YB;" *I)"
150 PRINT"THE SECOND ROOT IS ";YA;" -(";YB;" *I)"
160 PRINT" WHERE I IS THE SQUARE ROOT OF -1"
170 INPUT"TYPE 1 TO SOLVE ANOTHER EQUATION, 0 TO STOP";V
180 IF V = 1 THEN 60ELSE GOTO 720
190 PRINT "THE ROOTS ARE REAL AND EQUAL"
200 XA = -B/(2*A)
210 PRINT" BOTH ROOTS ARE ";XA:GOTO 170
220 PRINT"THE ROOTS ARE REAL AND UNEQUAL"
230 YA = ((Z(.5)-B)/(2*A):YB=-(B+(Z(.5)))/(2*A)
240 PRINT" THE FIRST ROOT IS ";YA
250 PRINT" THE SECOND ROOT IS ";YB
260 GOTO 170
270 INPUT" TYPE COEFFICIENTS OF CUBIC EQUATION, B,C &D";B,C,D
280 P=C-((B[2]/3):IF B < 0 THEN 300
290 Q=D-(B*C/3)+(2*(B[3]/27):GOTO 310
300 Q = D-(B*C/3)+(2*B*(B[2]/27)
310 GOSUB 520
320 PRINT" THE FIRST ROOT IS ";XA:IF QQ < 0 THEN 350
330 PRINT" THE OTHER TWO ROOTS ARE IMAGINARY VALUES"
340 GOTO 170
350 PRINT" THE SECOND ROOT IS ";XB
360 PRINT" THE THIRD ROOT IS ";XC:GOTO 170
370 INPUT" TYPE COEFFICIENTS OF BIQUADRATIC EQUATION, A,B,C&D";A,AQ,C,S

```

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```
380 AP=A/2:R=C/2:B=-(AQ/2):CC=(AP*R)-S
390 DD=((AQ*S)-((AP[2]*S)-(R[2])/2:P=CC-((B[2]/3)
400 Q=DD-(B*CC/3)+(2*(B[3]/27):GOSUB 520
410 B1=((XA[2]-S)[.5:AB=(AP*XA)-R:A1=AB/B1
420 BA(1)=AP-A1:CA(1)=XA-B1
430 BA(2)=AP+A1:CA(2)=XA+B1
440 FOR J= 1 TO 2
450 QB=((BA(J))[2]-(4*CA(J)):IF QB < 0 THEN 490
460 QA=QB[.5:X1=(QA-BA(J))/2:X2=-((QA+BA(J))/2)
470 PRINT"ROOT ";((2*J)-1);" IS ";X1;" ROOT ";(2*J);" IS ";X2
480 GOTO 500
490 PRINT"ROOT ";((2*J)-1);" AND ROOT ";(2*J);" ARE IMAGINARY"
500 NEXT J
510 GOTO 170
520 QQ=(Q[2]+(4*(P[3]/27):TH=1/3
530 IF QQ < 0 THEN 540 ELSE GOTO 590
540 PP=P[2:PC=PP*P/27:RR=(-PC)[.5
550 CO=((1/PC)[.5)*(-Q)/2:TA=((1-(CO[2])[.5)/CO
560 AN=ATN(TA):IF AN < 0 THEN AN = AN+3.14159265
570 CS=COS(AN/3):CT=COS((AN+(2*PI))/3):CU=COS((AN+(4*PI))/3)
580 R3=2*(RR[TH]:YT=R3*CS:YU=R3*CT:YV=R3*CU:GOTO 700
590 AC=(-Q+(QQ[.5))/2:BC=(-Q-(QQ[.5))/2
600 IF AC < 0 THEN 650
610 IF BC > 0 THEN 640
620 BC= -BC
630 YT=(AC[TH])-(BC[TH]):GOTO 700
640 YT=(AC[TH])+(BC[TH]):GOTO 700
650 AC=-AC
660 IF BC > 0 THEN 690
670 BC= -BC
680 YT = -((AC[TH])+(BC[TH])):GOTO 700
690 YT=(BC[TH])-(AC[TH])
700 XA=YT-(B/3):XB=YU-(B/3):XC=YV-(B/3)
710 RETURN
720 END
```

(Note: the left bracket character ("[") should be typed as the UP ARROW.)

Edgar W. Van Winkle
439 Edgewood Place
Rutherford, NJ 07070



PROGRAM PREVIEWS

By A. A. Wicks

This Month: WIN21 by Philip C. Pilgrim

Two or three times a year I visit Las Vegas or Reno for a little relaxation and fun. Although I am not a inveterate gambler by any measure, I do spend some time trying my luck at the Slots, Roulett, and Blackjack, sometimes called "21". I have never returned with more money than when I left--in fact, usually the opposite occurs.

This is partly because I am extremely cautious, but mostly because in the game of Blackjack at least, I'm just not familiar enough with the inner logic of the game to enable me to win more often. At two dollars for a minimum bet, the money soon goes. When I heard of an instructional program for Blackjack tuition called WIN21, I felt it might help.

My first reaction upon receiving it was, "What -- another Blackjack game!" -- and I was then surprised to note that this thought was echoed on the back cover of the small manual accompanying the program. But, as the cover note goes on to explain, WIN21 is more than a game -- and indeed it is.

The program is supplied on a one-sided cassette. I never determined if it was recorded twice or not, because I had no problem loading the program on the initial try. I then saved it to disk, as it takes a long time to load from cassette, being approximately 13.5k long. In addition to the manual, a softcover book by Dr. Edward O. Thorp is supplied, called "Beat the Dealer". This is the first time that I have received a program package (other than a RS program), where I felt I was receiving a few nice items for my money, all in a neat plastic bag.

The book is a good one. It has been around for a while (reprinted in 1966), but the basics have certainly not changed, although possibly a few of the casino playing rules may be modified since it was first published. The text by Dr. Thorpe is interesting and never dull. It is desirable, if not essential, to read through the book up to at least Chapter 3, before starting to work with WIN21.

The book and the program assume that you are either a beginner at the game or, at best, a player who knows the rules but who wishes to sharpen his skills and develop a winning strategy. To this end, the instructional manual is divided into five short chapters, which always parallel guidance in the book. The first Chapter in the manual is devoted to getting the program up and running, and further instructions as to how you may select your choice of operation. There are five choices: The computer will make your moves and you watch; you can make your moves but the computer will tell you what to do; you may play, but you will have the opportunity to correct



your errors as they are indicated to you; the same, but your errors will not be correctable; and, you play with no assistance -- you're on your own.

Within this framework you may select one of four strategies, which are fully explained in the following four chapters. You may also initially set up the game for several other options, such as: How Many Decks (1, 2, 3, or 4)? Split Aces? Offer Insurance? etc. Two of the options are somewhat unusual and completely set this tutorial apart from any others. These are: How Many Players on Left? On Right? This, in addition to determining your position at the table, allows the game to progress with a very realistic distribution of the cards, and the subsequent odds, and provides the opportunity to sharpen your card-counting skills. Your table companions, though, act like dealer's skills -- they never split, never double down, never insure. They always draw to 11 or less, and they stand on 17 or more. If you wish, you can occupy as many of the table positions as you wish, which will really exercise your game!

Video display is reasonably graphic. The dealer is at the top of the screen, and his cards are shown there. The players are across the screen below. The dealer's "burned card" appears briefly at top right for every shuffle. As play progresses, an arrow moves and points to the player involved at the moment. Down cards are solid rectangles (one character block), which, as they are flipped over (and they do appear to flip!), become a digit showing the card face value or A, K, Q, or J. An optional choice of all dealt cards "up" may be selected too. This is becoming quite common in the Las Vegas casinos, and possibly in other places. (If you are counting cards, this helps.)

The amount bet appears within the player's "box". Other players always bet \$10, and the computer cautions you to do the same. Two figure groups are displayed in the upper left corner of the display. One of these, labeled "Profit", keeps track of all of your winnings (or losses!), for all of your hands played. The second figure, shown as "Risk", is a running total of all bets made, including doubling down, insurance, and splitting. The percentage of gain or loss may be calculated from these figures. The number of cards remaining in the deck(s) is shown at the top right of the screen.

Except in cases where you can intentionally delay things when the play is yours, the action is extremely fast. So fast, in fact, that I found myself being pressured as I would be at the casino table; but I suppose that this too, helps to develop speed and skill.

Once you feel reasonably comfortable playing a Basic Strategy game, which you should study in Chapter 3 of "Beat the Dealer", and Chapter 2 of the manual, you will want to go on to more advanced strategies. You should be totally familiar with Basic Strategy first, however -- and in this mode the computer can be configured to make your bets, decide when to split, etc. Afterwards, you make these decisions, and the computer will keep a total score of all of your correct decisions. Much practice will be needed to



encourage you to go to the other strategies. If you never applied more than Basic Strategy at the table, but you did it well, you would be playing a good game. In the event you would like to try your own particular strategy and observe the result, or just watch how a game progresses, the computer may be directed to play continuously with no further participation on your part -- for thousands of hands, if you wish.

Card counting is part of the next strategy. This is where the hard part begins (do I really want to work this hard for fun?), but the book tells us that this is not so. Once again, the computer will help you in making every move, and keep track of your progress. Chapter 4 allows you to continue playing the Basic Strategy, but your bets are made on a variable basis depending on point counts, and how many decks (in decimal fractions), are left in the shoe. If you thought that Chapter 3 was difficult, this strategy requires many simple but rapid mathematical computations (in your head, hopefully). The Introduction to Chapter 5, which brings all of the strategies into the play, could not be better presented -- "The Strategy is a powerful playing technique requiring persistence and dedication to master." (The italics are mine.)

The 5 1/4 by 6 3/4 inch manual that comes with the program is very adequate. An attractive soft-card cover retains 15 pages of typewriter composition reduced to about six-point. This is small, but the inking is sharp and black, which assists greatly in legibility. No typographical or spelling errors are present -- a compliment to the manual in itself, when most instructional manuals accompanying programs today are rife with them. Writing style is concise and pleasant, and very easy to understand.

Whether or not I eventually master the complete tuition program, and clean up at Las Vegas, remains to be seen. One thing is definite -- I will approach the tables with considerably greater confidence than before. If that is your aim, or you want to become an expert, this program will point the way.

WIN21: by Philip C. Pilgrim -- a practice and tutorial program for winning Blackjack. Discovery Bay Software Company. Available through H & E Computronics, Inc. Level II, 16K Cassette -- \$29.00 postpaid.



BEGINNER'S CORNER

INTRODUCING YOUR TRS-80 TO THE OUTSIDE WORLD

by

A. Douglas Werbeck

Here we are, hopefully warm and cozy, at the Beginner's Corner in February, our sixth meeting! Growing up in the Northeast, February always seemed to me to be about the bleakest month of the year. Skies are often grey, and the wind, more appropriately called the "Hawk" in February, certainly commands same respect! Not to let ol' mother nature get us too down, this month's column will discuss how we can "step out" with our TRS-80's while staying in the warm confines of the "computer room," wherever that may be in your home!

Last month we discussed TRS-80 and telecommunication. We covered the hardware and software requirements and briefly examined the role each piece played in the telecommunication system. To recap briefly, in order to get "hooked up," you will need software called a "terminal" program, an RS232 circuit board and a modem.

Now I would like to get a little more involved in discussing RS232 boards. As we explained last month, the RS232 board takes the keyboard ribbon-wire message carrying system called "parallel" and turns it into a system needing less individual wires called "serial." The RS232 circuit board fits inside the expansion interface on the Model I and directly inside the computer case in the Model III. At the time of this writing, the Model III is still too new to have many technical details and user reports available, so I cannot discuss with any first hand knowledge the performance of the RS232 board in the Model III. What I can tell you, however, is that the method used to make electrical connection between the RS232 board and the expansion interface on the Model I leaves a lot to be desired! Oh, yes, it works, and I do believe you get fair value for the \$100 it will cost, but the manner of electrical contact is very often a nuisance. I suppose there are some folks around that have had their RS232 installed for months or years without a nasty word, but I have not personally met one. The manner of contact (and you can open this compartment on your interface without voiding any guarantee) consists of having the silver circuit etches on the RS232 board press against some weird, little spring fingers. The "Pressing" is accomplished by having two tiny phillips head screws pull the board down against the fingers. The word in higher electrical engineering circles for this type of technical contact is called "hopeful".

When I decided to purchase a Radio Shack RS232 board, I asked Radio Shack if I could install it myself or if they preferred their technician to install it. They replied that I would probably be happier having their technician do



it because he has had a lot of experience determining just the "correct" way to press on it, tug on it, give a little special jiggle, and most important, to burst forth in special chant to obtain assistance from the Prince of Darkness. However, the soonest he could get to it was the next day, so I choose to do it myself. It only took about 5 minutes to install, and after creating a corrugated cardboard "wedge" to help everything make contact, it worked fine the first time around.

That is until about two weeks later when the "terminal" software started acting very weird. A call to a friend resulted in the suggestion to remove the RS232 board, clean all the contacts with a pencil eraser and then spray them with one of those electrical contact cleaners such as WD40, LPS, Blue Shower, or my trusty Radio Shack Color TV tuner cleaner. PRESTO, we were back in business. Apparently the contacts suffer the same type of thin metallic corrosion I spoke of in the last column that causes "kkkeybounce." This situation has recurred three more times in the past four months, apparently due to the phase of the moon, but now that I know what is probably wrong, the cure is simple. I have heard that the terminal program called ST80III, written by Lance Micklus, offers something special. Every time you load the program it does an automatic electronic check of the RS232 board and its connections. This alerts you to any problems before you begin using your telephone connections. Very nice!

Before anyone thinks that I am on the "bad mouth Radio Shack" bandwagon, let me say that this is completely untrue. Yes, yes, Radio Shack often moves very s-l-o-w-l-y, and often "other" manufacturers come out with products that outperform their Radio Shack counterparts, if their Radio Shack counterparts even exist. Radio Shack started this fantastic boom in microcomputing by introducing their first Model I, and that had to be an experiment in sales. Before that introduction, microcomputing was pretty much limited to electronic hobbyist kit builders. Radio Shack took a large step forward and risked some initial big bucks with the introduction of the Model I, so I consider most RS product shortcomings a reasonable price for their pioneering efforts. And you can't really knock their service-on-almost-every-corner, either.

Now, there are alternatives to that RS232 board mentioned above whose temperament seems all too often to be governed by the effect of gamma rays on man-in-the-moon marigolds. As I mentioned briefly last month, there are several modems available that contain hardware that performs the RS232 function, making a separate RS232 board unnecessary. While you gain a life free of RS232 hassles, you loose the extra things that an RS232 board inside a TRS-80 can do, such as allowing you to use a large variety of non-Radio Shack "serial" type printers.

Ok, now that you have your terminal program running, your RS232 board humming, and your modem beeping and chirping, who are you going to call? Who out there wants to talk to your jazzed up black and silver box? Well there are plenty of other computers just waiting!



Since the demand for one individual TRS-80 to call another singular TRS-80 doesn't come up too often, I won't get into the details of a one to one system in this column. I will concentrate on the popular telecommunication systems, the two BIG GUYS and the local "Boards." The two big guys I am referring to are the whale-sized systems called The SOURCE and MicroNet. They are located in McLean, Virginia and Columbus, Ohio, respectively, and are manned (?) not by TRS-80's, but by giant-sized, mainframe computers. Now, before you feel intimidated on behalf of your TRS-80 when calling something like HAL from the movie 2001, they are not large computers simply to be impressive, they are large so that they may have the ability to talk to many other computers like TRS-80's AT THE SAME TIME. I do not know the individual capabilities of The SOURCE and MicroNet, but I know that one evening while I was "on" with The SOURCE, 33 other computers were "talking" to The SOURCE at the same moment. Recall when you tried talking to 2 or 3 people simultaneously--well then, fall in awe at the machine that is talking, back and forth, simultaneously, to 33 other computers!

Both MicroNet and the SOURCE are telecomputing "networks." By this I mean that you do not have to dial Columbus, Ohio or McLean, Virginia long-distance to get to chat with these monsters. Each of them have phone numbers that will be a local charge call to many people. You dial their special "local charge" number and beep, beep, hum, pop and presto your TRS-80 is connected to the mainframe computer in Ohio or Virginia.

What you can do, once connected to these big, warm guys(?) is truly amazing. It brings back a story my grandfather once told me about what he thought was amazing. He said that if, when he was a teenager, someone was to come up to him and tell him that he would be able to sit in his living room in New York and watch a baseball game being played live, as-it-happened, in Los Angeles, he would have told that person that he or she was crazy. The basic concept for how it could be done was way beyond the imagination of the man on the street. Well, I'm glad I am not in the position of talking to my grandfather when he was a teenager, when I start to tell of just SOME the capabilities of MicroNet and The SOURCE!

To do each of the systems justice, I think, would require the devotion of an entire magazine. Let me just give you the tip of the iceberg. You can leave messages called "mail," in the foreign city computer memory for another user. When the person (identified with a code number) "gets on" the system, he is told there is mail "waiting" in the large computer's memory to be read! Next, you can ask the giant computer on the other end to tell you how many other computers are talking to him(?) at the same time and their individual ID numbers. You can then exercise a "CHAT" command and cause a message from you to be printed on THEIR video screen! Yes, yes, this will most likely be a total stranger, male or female, from who can guess where! You will have the option to chat back and forth with them via typed messages on your video screen, at the price of a LOCAL phone call!

We could go on and on here..... you can tie into giant newspaper information files such as having access to the enormous New York Times Information



Database! Here you can obtain information on anything from Alcoholism to Nuclear Wastes. One of the systems even has a female "consultant" for personal inquiries! You write her "mail" signed only by your ID number and she writes you back! The last aspect of these giant networks I will mention, and I will feel guilty of not mentioning the scillions of others options, is the ability to use their "biggie" mainframe computer for program writing and even storing program information in their memories while you are disconnected for days or weeks! You can even use their computers for programming in languages such as FORTRAN, COBOL or their own version of BASIC (not Level II). I could go on and on!

This finds us at the end of another column. Next month we will wrap up telecommunications with a discussion of the local "bulletin boards" and their heroic operators! As you can see, I am not finding any shortage of Beginner's Corner topics to discuss, but a letter I received recently started a thought. This particular letter suggested that I spend some column space discussing "popular" BASIC programming techniques, such as loops, GOSUBS, arrays, etc. It then occurred to me that it might be a good idea to directly ask you for your suggestions! Ok, what do you want to hear about out there? What, to the Beginner in February of 1981 seems strange and puzzling? My "beginner" days go way back to April 1979, so I think I could use some refreshing as to what, nowadays, is being covered poorly by standard instructional texts. Where are the gaps others leave open? Remember, I will only read the suggestions of those of you who write. If, in future months, I am not writing about a subject that you favor, maybe it is because you never wrote me your views! Shoot your preferences to me, Doug Werbeck, at POB 787, Ruskin, FL 33570, or leave "mail" on The SOURCE for ID #TCU318 (MicroNet not available in this boondock town). I thank you!

HOME BUDGET

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HELPFUL HINTS

DATABASE PROGRAM WITH MACHINE LANGUAGE SORT

I have used your "Database" program (from the free cassette) for some time and have adapted it to several needs. I find it well thought out and well within the limitations you claim for it. (The price is right too!) I did, however, find it frustratingly slow, particularly in sorting.

Enclosed you will find a modified version which incorporates a machine sort routine. When I did the machine language program, I did it to suit my phone list, which has only four fields. It would be simple to extend it to cover all ten fields, which I will do when I need it. In the meantime I hope you might find the enclosed changes interesting.

I have marked the areas of the program affected so you can easily identify the changes. The program allows the option of using the machine or the alpha sort. The machine sort requires that all fields be entered with the "S" option, so if the fields are mixed it is necessary to use the alpha sort. The sorting is done by changing the pointers, so that once the sort is complete it will only be printed in the sorted form. Also, if it is written to a file, it will be written in the sorted form.

It is necessary to run the machine sort twice and reload the file to get the pointers set correctly. This is done automatically in the program on the loading of the first file. The program is designed for disk use and would pose some difficulty adapting it to cassette.

The above options apply only to the "Machine" option, otherwise the program works the same as before. My phone list that I designed it for took the better part of half an hour to sort, and the machine sort does it in a few seconds.

The following Basic program loads the machine sort program and runs the Database program. (Before running this program, set memory size to 65279.)

```
80 'MACHINE SORT PROGRAM TO SORT UP TO 4 FIELDS. IT RUNS THE
85 'DATABASE PROGRAM AFTER LOADING MACHINE LANGUAGE PROGRAM
90 'ALL FOUR FIELDS TO BE SORTED MUST BE ENTERED AS STRING
95 'VARIABLES. IF MIXED FIELDS ARE USED, USE THE ALPHA SORT
96 'OPTION IN THE DATABASE PROGRAM. LONG ALPHABETICAL LISTS
97 'ARE SORTED VERY RAPIDLY WITH THIS SORT.
98 'THIS PROGRAM IS FOR A 48K MACHINE AND IS LOADED AT FDFFH
99 'IT WILL BE NECESSARY TO PROTECT MEMORY ABOVE 65279
100 Z1=-513
110 FOR N1=1 TO 230
120 READ W1
130 POKE Z1,W1
140 Z1=Z1+1
```

```
150 NEXT N1
155 RUN"DATABASE/BAS"
160 END
170 DATA 205,127,10,229,193,221,42,254,255,197,221,229,
      253,225,197,17,30,0,253,25,221,70,0,253,78,0,221,110,
      1,221,102,2,253
180 DATA 94,1,253,86,2,26,190,56,13,194,198,254,19,13,40,
      6,35,16,242,195,198,254,221,70,0,221,110,1,221,102,
      2,253,78,0,253,94
190 DATA 1,253,86,2,221,113,0,221,115,1,221,114,2,253,112,0,253,
      117,1,253,116,2,221,70,3,221,110,4,221,102,5,253,78,
      3,253,94,4
200 DATA 253,86,5,221,113,3,221,115,4,221,114,5,253,112,3,253,117,
      4,253,116,5,221,70,6,221,110,7,221,102,8,253,78,6,253, 94,7
210 DATA 253,86,8,221,113,6,221,115,7,221,114,8,253,112,6,253,117,
      7,253,116,8,221,70,9,221,110,10,221,102,11,253,78,9,
      253,94,10
220 DATA 253,86,11,221,113,9,221,115,10,221,114,11,253,
      112,9,253,117,10,253,116,11,193,11,120,177,194,13,254,
      193,17,30,0,221,25
230 DATA 11,253,94,1,253,86,2,221,110,1,221,102,2,120,177,194,8,
      254,201
```

The following changes must be made in the Database program. All the lines listed below either replace those in the existing program or are added to it:

```
690 NEXT I: ZZ=ZZ+1: CLOSE: IF ZZ=1 THEN 4000 ELSE 410
1902 PRINT "MACHINE OR ALPHA SORT";: INPUT A
1904 IF A="MACHINE" OR A="ALPHA" THEN 1906 ELSE 1902
1906 IF A="MACHINE" GOTO 3500
2675 IF A="MACHINE" THEN P0=1: GOTO 2700
2685 PRINT "IF MACHINE SORT WAS USED FILE WILL BE SORTED"
2686 PRINT "ENTER 1"
3500 N=NI: J=0: I=0
3510 R=VARPTR(A(0,0)): POKE -2,PEEK(VARPTR(R))
3520 POKE -1,PEEK(VARPTR(R)+1)
3540 DEFUSRO=&HFDFF
3550 X=USR0(N)
3560 IF ZZ=1 GOTO 610 ELSE 1000
3570 END
4000 I1=0: I2=NI: PF=2: P0=1: PJ=2
4010 GOTO 3500
4020 END
```

(Thanks to Weston H. Ament, P. O. Box 194, Mokelumne Hill, CA 95245.)

DISK/CASSETTE CONFLICTS

In your "Questions and Answers" section of the November 1980 issue of Computronics magazine (page 885), a reader asked about possible DOS/TAPE



conflicts. Your reply was to CMD"T", or disable the interrupts, and that there was "nothing else in the DOS that should interfere with the operation of the cassette." This is not quite correct. As is stated in the NEWDOS/80 manual, there is a NEW operation performed between evry byte read from tape. This causes the Disk Basic interface to attempt to close all open files, even if there aren't any files open. Going into Basic with less than three files open sometimes helps. I discovered this about a year ago when working under MICROMATION CP/M.

Radio Shack also states in one of their "Internal Distribution Only" Newsletters that some tapes have a timing problem due to high speed duplication that causes them to be unreadable under DOS. The solution they suggested was to load the faulty tapes on another machine, or under BASIC2, or whatever way they could be, and then re-written to the tape. I hope this information will be of interest to you.

(Thanks to Dave Rand, 10232-160 St., Edmonton, Alberta, Canada T5P 3E9.)

IMPROVEMENTS TO THE EXPANSION INTERFACE

Here is an improvement in the expansion interface you may be interested in: I had some great problems trying to get the full 48K of RAM running error free in my mid-1979 vintage Model 1 with expansion interface and disk drive. The Computronics Memory Test would report one or more of Z9 through Z16 failing; this was most noticeable when running the "Complete" test, and would occur at step 18 in the program. Swapping the chips did not move the error location, however, and I began to suspect Z17 and Z43 in the interface. I had been concerned about the behavior of these devices for some time, as they figure prominently in the RS "twisted pair modification" which I had installed several months ago, and I had been toying with the idea of replacing them with type "L" (instead of "LS") devices, to improve the noise immunity of the interface. Inspection of the PWB suggested a simpler remedy, when I saw that the RAS* and MUX signals were not well terminated in the interface.

You will note that R36 and C67 appear to be close to Z43 and Z17 when studying the schematic in the Expansion Interface Manual; they aren't. On my board, C67 is unlabeled, but located near the bus extension card edge. R36 is labeled, but not close enough to Z43 to suit me. It was a simple matter to move these two components to the ICs, and in both cases I bridged them from pin 1 to pin 8 of the IC, using the minimum possible lead length. The result has been richly rewarding, with no failures during the memory test, and fewer "soft hits" and no crashes. Be sure to warn your readers that this action will void their warranty, while improving the design, and to be VERY CAREFUL about solder bridging, especially in the vicinity of Z43.

(Thanks to Richard L. Davis, 3926 Bledsoe Avenue, Los Angeles, CA 90066.)



TRSDOS 2.3 - CMD"I"

The documentation I have regarding the above command advises that you may not use it to kill files, rename, etc. This is quite true for the command format given. However, I have been quite successfully using the format CMD "I",A\$.

This method does allow the passing of parameters to TRSDOS when the variable is loaded with a valid command line. When used as the last line in a Basic program, you can rename your files or perform file copies on exiting from Basic.

The only problem I have encountered to date is that the last few program lines in memory are garbled if I attempt a restart via "BASIC *".

(Thanks to Stanley T. Benoit, 203-240 Northcliffe Blvd., Toronto, Ontario, Canada M6E 3K7.)

WORD PROCESSOR WITH UPPER/LOWER CASE

I have really enjoyed the programs that are on the "subscription cassette" that I recently received. I did have a little trouble finding the Memory Test program. The instruction sheet implies that it is the second program on the tape when it is the last.

I especially enjoyed the Word Processor program, which I am using to type this letter. I did, however, find an error in line 4130. It looks like a ">" was typed instead of "?". I also made a modification to the LPRINT section which allows the use of the shift key directly to obtain upper case. It examines each character as it is being printed and changes the case if it is an alphabetic character. I hope that this modification will be useful to your readers, and I am listing it below as it is only five lines.

```
1162 LPRINT STRING$(LM," ");: IF LEN(A$(J))=0 THEN 1180
1163 FOR H1=1 TO LEN(A$(J)): AC$=A$(J)
1164 IF H1=1 THEN AB$=LEFT$(AC$,1) ELSE AB$=MID$(AC$,H1,1)
1165 HC=ASC(AB$): IF HC>64 AND HC<91 THEN HC=HC+32 ELSE IF HC>96 AND HC<123
THEN HC=HC-32
1170 LPRINT CHR$(HC);: NEXT H1
```

(Thanks to Herb Coddington, 9 Carmel Terrace, Ormond Beach, FL 32047.)



QUESTIONS AND ANSWERS

Conducted by Hubert S. Howe, Jr.

QUESTION from George D. Montag, 1628 N. E. Knott St., Portland, OR 97212: I have a TRS-80 Level II with two Vista V800 drives (double headed, 80 track) and NEWDOS/80. Could you advise what patches could be used to utilize all 80 tracks?

ANSWER

Assuming that you also have a 35-track disk on your system, you don't need any patches. Simply use the PDRIVE command in NEWDOS/80. Let's assume that your system disk (drive zero) is 35 tracks, and that drive one is 80 tracks. The command you need to use is as follows:

```
PDRIVE,password1:0,:1,DTC=80
```

where "password1" is the password for your system drive (zero). (If you're using a standard system disk, the password is "PASSWORD".) This command will modify the drive one so that it uses 80 tracks. Now you need to hit the RESET button or type "BOOT" to bring this modification into effect.

Next, you need to create an 80-track system diskette. Type "COPY :0 to :1 mm/dd/yy" (where "mm/dd/yy" is the month, day, and year), and place the original NEWDOS/80 diskette (or rather, a copy of it) into drive zero and a blank diskette into drive one, AFTER you have defined 80 tracks for drive one. The copy command will now give you an 80-track system diskette. It is necessary to do these things in this order so that drive zero is defined only for 35 tracks, but drive one for 80, so that the unused tracks are formatted but no data is copied to them. Following this, you can format some non-system 80-track diskettes.

The procedure outlined here can be used to create a system diskette of any number of tracks, provided that you have a 35-track system disk drive on your computer.

(Unfortunately, in subsequent correspondence from Mr. Montag, we have discovered that he has still been unable to get his drives to work, and he has still not received any help from either Vista or Apparat. If any readers can provide additional suggestions, we would be grateful.)

QUESTION from Mark Stolzberg, 3 Seabrook Court, Stony Brook, NY 11790: One of the main features advertised about NEWDOS/80 is its ability to use random files with records of lengths between 1 and 4095 bytes. I have read the NEWDOS/80 manual many times, but have still been unable to figure this out. I have even tried calling Apparat, but they have been unable to provide any help at all. Can you help?



ANSWER

We can't figure it out either. Perhaps if we print this one of our readers will be able to help!

QUESTION from Neil Fishman, 62 Parker Blvd., Monsey, NY 10952: I own a TRS-80 model 1, 32K two disk system and use NEWDOS/80 as my primary operating system. In moving SYSTEM tapes to disk, I use LMOFFSET. This is a very helpful program, but in moving programs such as MICROCHESS, where only part of the program is in assembly language and the rest is called in as data, I cannot seem to get the whole program on disk. Is there any way to move these programs, or must I call them from tape whenever I plan to use them?

Also, is there any way to save a "CMD" program on disk to be called in by the Editor/Assembler after it has been run through the Disassembler? Though I have read the NEWDOS/80 manual many times, and tried countless times, I still have not been able to do this.

ANSWER

If the data for the MICROCHESS program is read off the tape by the program itself after it starts to run, then you will always have to load the program from tape, unless you can modify it to read the data from a disk file. There is no reason why the data could not be read in in the same manner as the program, unless the program was deliberately designed in this way so that you would have to buy the disk version of the program when you get tired of this. (We're not familiar with MICROCHESS ourselves, but we understand that SARGON 2 plays a superior game.)

Apparat's disassembler does not produce a symbolic version of the disassembled program that can be read by the Editor/Assembler program, but some other disassemblers (such as MON-3 and MON-4) do. If you want to reassemble a program from scratch, the best thing to do is to choose the line printer option and type the program in by hand.

QUESTION from Joe Mann, 9083 Cloisters East, Richmond, VA 23229: I would like to know if you will be covering the new TRS-80 color computer in your magazine.

ANSWER

We will probably NOT cover the TRS-80 Color Computer, for several reasons. Most important, it is not based on the same microprocessor as the Models 1, 2, or 3, which is the Z-80, but on the Motorola 6809, which is completely different in design. This means that ALL of the software developed for the other TRS-80 models will not work on it, including Microsoft Basic. The marketing scheme adopted by Radio Shack seems to imply that this will be a "home" computer, whereas the others are "business" computers. It's not clear what that distinction means, but one thing is that there is much more software for serious applications for the Models 1, 2, and 3, and primarily games for the Color Computer. Perhaps this will not always be so, and we will be reviewing the situation. We will cover the computer if there is



adequate reader interest in our doing so, but it will have to be in a different "corner" from the other TRS-80 models.

QUESTION from H. Hanuise, Societe Granitiere Haniuse, Soignes, Belgium:
This is a question about the TRS-80 Model 1 with 48K and two disk drives:
How can I manage a USR call which would get onto drive number 1 the name and
date of the disk situated in this drive so as to check if the correct disk
has been mounted before I/O operations? This problem will arise each time
you attempt to put a non-computer minded person, such as your accounting
aid, at the keyboard, for entering the operations of the month.

ANSWER

You don't really need a USR subroutine to perform this function. Simply ask
the person to do a "DIR" before entering Basic to run the program. The
directory listing prints the name and date of the disk on the screen, so
that he can tell at that point whether the correct diskette has been
mounted. If you have NEWDOS or NEWDOS/80, you can even do this from Basic,
so that you can put something like the following at the beginning of your
program:

```
10 CMD "DIR :1"  
20 INPUT "IF NOT DISK NO. 35, TYPE BREAK";A$
```

I would also stress the importance of giving a page of clear instructions to
any non-computer minded person who is going to work at the computer, listing
each operation he must perform to get the machine running, starting with
"turn on power switch".

QUESTION from Richard J. Keenan, Clifton Park Apts. 2-11 So., Clifton Park,
NY 12065: I own a Model 1 TRS-80 Level II, 32K with three disk drives. I
am currently using TRSDOS version 2.3. It is quite simple, but I wish that
the author(s) had put more into it -- it seems to be lacking commands that
other operating systems have.

I am confused as to whether CP/M (only version 1.4 and not the version 2.2
as for the Model 2) for the Model 1 TRS-80 or NEWDOS/80 would be better to
own. CP/M is advertised the most, possibly due to the fact that it was the
runaway leading OS of the past, and that a majority of micros use CP/M and
compatible software. However, the advertisements for NEWDOS/80 claim it to
be the DOS of the future. I have talked with Radio Shack dealers and people
at other companies, and I have written other letters. The following is what
I have found out so far:

1. CP/M lacks a BASIC module on the system disk.
2. CP/M does not have a Z-80 assembler on the system disk, merely
the 8080 assembler.
3. CP/M is not upward compatible with TRSDOS as is NEWDOS/80.

4. Version 1.4 of CP/M is used for the Model 1, and this version is way behind CP/M version 2.2 which is offered for the Model 2.

5. CP/M was originally written to reside in low memory, which is where Radio Shack has located the ROM for the TRS-80.

6. If one buys CP/M, then one also has to buy CBASIC.

7. CP/M and CBASIC act alone, and CP/M does not down-shift to Radio Shack Disk Basic or Level 2 Basic.

8. On the other hand, NEWDOS/80 blends into TRSDOS Disk Basic with enhancements. It also shifts to TRS-80 Level II Basic.

9. NEWDOS/80 contains a super Z-80 Assembler, a disassembler, SUPERZAP and other features, including MINI-DOS.

I find the NEWDOS/80 write-up to be confusing and mainly boastful at times -- however, it is indeed a great OS. Now someone should write a handbook on it. I find the write-up on CP/M to be simple, well explained, very interesting, and the manual itself reminds me of an IBM manual. I believe that if CP/M for the Model 1 would be updated to, say, version 2.2, with commands added to link up with TRS-80 Basic, and if a Basic module and Z-80 assembler module were added to its system diskette, then I would get it.

ANSWER

It is very difficult to choose between CP/M and NEWDOS/80, and we would rather endorse them BOTH, since we have used both of them successfully, although for different applications. For the reasons you have enumerated, though, it sounds as if you should consider NEWDOS/80 rather than CP/M, in spite of NEWDOS/80's poor documentation; someone will surely write a good book about it soon. (Also, please see our review of CP/M in the May 1980 issue of COMPUTRONICS.)

All of the points you have made above, except one, are true. The error concerns CBASIC: you do not have to purchase CBASIC when you buy CP/M, and this is not a product we would recommend for most applications. CP/M was designed as a kind of "universal" operating systems for microcomputers, and it is the best system of its kind. Most microcomputer systems that use CP/M are larger and more expensive than the TRS-80. If you were using your computer to run a small business, requiring you to have megabytes of data, CP/M would probably be more appropriate. For one thing, there are versions of it available that interface directly to hard disks. It is also easier to modify when you want to work with special hardware, such as a line printer that requires different software from that in the TRS-80's ROM. You can buy Microsoft's Basic and execute programs practically identical to those that run under TRSDOS-compatible DOSs.

The trouble with this is that you already OWN an excellent version of Microsoft's Basic which is in your TRS-80's ROM, and the ROM is unused by



CP/M except for the I/O drivers. CP/M will not "down-shift" to Level II Basic. All of the basic CP/M programs are 8080-oriented, although good Z-80 programs are now available (at extra cost). The fact that the TRS-80 has ROM in low memory makes its version of CP/M different from most, with resulting incompatibilities.

If you owned a TRS-80 Model 2, the situation would be different, for one reason because it has RAM at low memory addresses. Sales reports indicate that up to 80% of the Model 2 owners may be using CP/M, since that many copies of the Model 2 version have been sold. There have also been many problems with the Model 2's TRSDOS disk operating system.

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System Requirements

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For double-density operation, the requirements are the same except a DOUBLER adapter must be installed in the Expansion Interface and a double-density DOS must be used.

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chip. Note: Opening your Expansion Interface may void the Tandy limited 90-day warranty.

- Works with standard 35, 40, 77 and 80-track drives rated for double-density operation.

System Requirements

Both drives and media must be rated for double-density operation. Level II BASIC, a 16-Kbyte system (minimum) and the Radio Shack TRSDOS* and Disk BASIC Reference Manual, Radio Shack catalog number 26-2104, are required.

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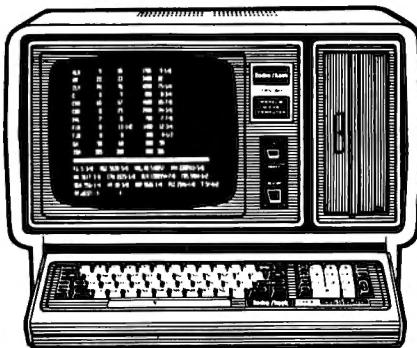
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