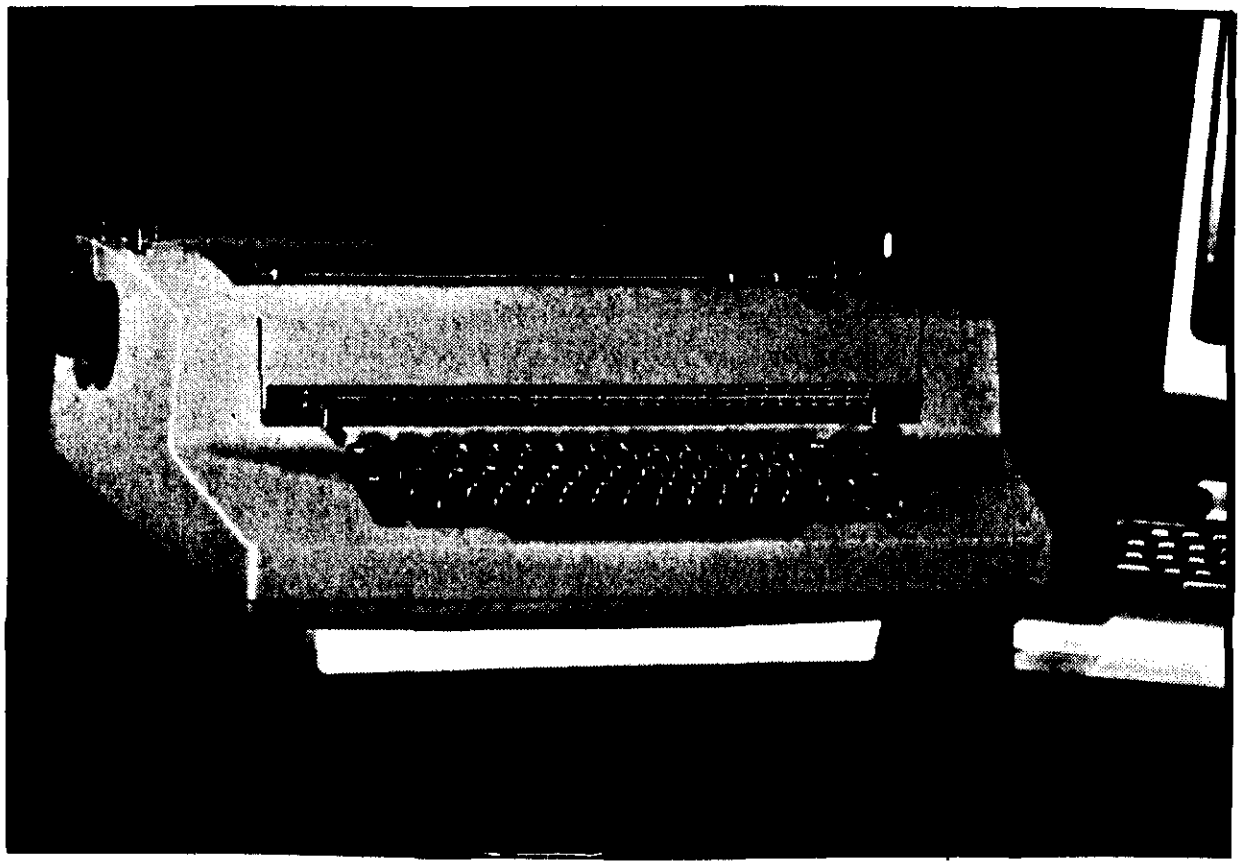
```
888888        000000                    UU      UU      SSSSSSSS
 8    88      00    00                 UU      UU     SS      SS
88     88     00     00                UU      UU     SS      SS
       88     00     00                UU      UU     SS
       88     00     00    000000000000 UU      UU      SSSSSSSS
       88     00     00                UU      UU             SS
88     88     00     00                UU      UU     SS      SS
 88    88      00    00                 UU      UU     SS      SS
 888888        000000                    UUUUUUUU       SSSSSSSS
```

Devoted Entirely to TRS-80

A JOURNAL FOR THE TRS-80 USER

VOL. II NO. 1 Consecutive Issue No. 3 JAN-FEB 1979

GOING FIRST CLASS



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We are seeking material from writers. Send us your TRS-80 related material (except that which has been previously published). Any material, articles, programs, pertinent short stories, will be appreciated. If you think you cannot write, send them; we will edit and give you the credit. You may send programs on cassette (Level II preferred) or on disk- they will be returned if you provide return postage. Generous compensation will be made for well documented and non-trivial works that are accepted for publication.

USER GROUPS

TRS-80 user groups may send the particulars of their meetings and reports of their activities for free publication in the **80-US Journal**

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The 80-US JOURNAL

VOL. II, NO. 1 January-February 1979

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Editorial Remarks * *

In our last issue we announced that we would supply a DOS disk of our programs for those with only one drive. It was brought to our attention rather quickly that TRSDOS is sold by Radio-Shack, and that we could not do that. Obviously, we were in error. For those who specified they had two drives, we sent formatted disks. For the others, we sent a cassette (and a refund) with instructions telling how to transfer to their disk. We are sorry if this has been a problem for anyone.

The lower case modification we spoke about in our last issue works fine! However, since then an item or two have come up which, in all honesty, must be mentioned. When the lower case hardware mod is installed, the TRACE function in DOS will show you control characters instead of hex. Also when using TBUG, control characters will be shown on the screen. This may not be a real problem for some (who uses TRACE or TBUG when they have DEBUG?), but may be for others.

Because an advertiser runs his Ad in 80-US does not necessarily mean that we endorse him. We will only endorse products which have been received for review by us. When a product is sent for review, we try it, and get an opinion from two or three sources, before we write a review on it. This seems to be only fair way to do it, and we will try and be as honest and objective as possible.

A word about our BASIC program listings is in order. There have been many letters and telephone calls about various problems encountered trying to use our listings. Our program listings are made by photographing the line printer listing, which was produced by an LLIST command, immediately after running the program and exercising all options. This is true for all Level II and DOS programs. Level I programs are another problem we will tackle soon. Starting with this issue, our listings are made on a Selectric, which should photograph better than dot matrix, especially for the periods, colons and commas. Also, the Selectric zero is oval shaped, and the "oh's" are almost round.

It seems odd to us that some of the larger publications still refer to the TRS-80 as a "toy", or even worse, refer to it not at all. Our mail indicates that most TRS-80's are being used in a business application of some kind or other. One of our subscribers claims to have used a 16K Level I machine to calculate the mass of a distant galaxy. It took all day to do it, but apparently this astro-physicist was satisfied when the results checked.

Among other uses for the TRS-80 there is a cattle breeder (?), dry-cleaning establishments, printers, service stations, barber shop and more than one who trade on the commodity market, just to name a few.

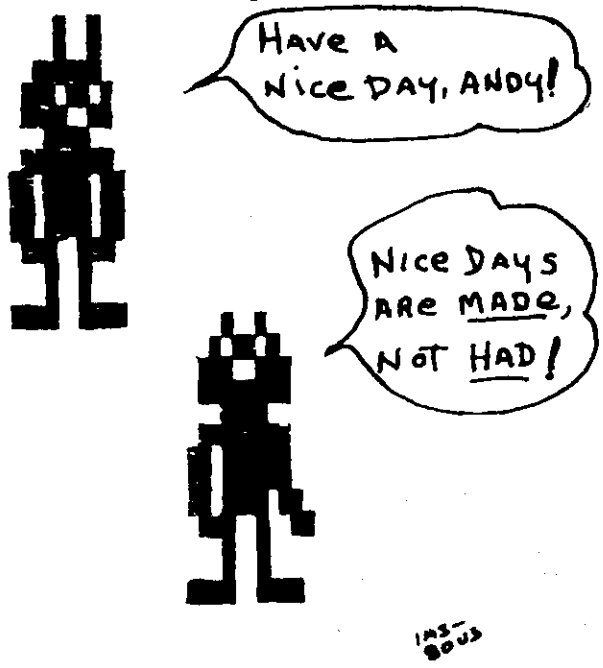
In our case, it is used to keep the subscription files (on disks), the business records (also on disk), print mailing labels, print paycheck stubs and, as a text editor, to set the very copy you are now reading.

Which brings up a very important area of use: Text Editing. Applications of text editing are needed in almost any of the businesses mentioned above.

After all, what business does not need to write letters?

This, of course, means lower case capability, which is probably the major point against the TRS-80 for business applications. Even that though, can be added "on your own", and makes the system complete.

Toy? We don't think so. With the number of machines now out, it may well become the "Chevy" of micros. ..Mike



RANDOM ACCESS (or Midwinter Madness)

If you haven't looked yet, you will be amazed at the length of VIEW this issue. Tom is trying to get through the nitty-gritty and get to the good stuff. Just the thing for these long winter nights. Yes, the signs of winter are here - saw one on the hardware store that said they had weather strip and one on the gas station for Anti-freeze. You can't very well argue with that.

This column will be a regular feature and will contain random things that come up at the last minute, as well as anything we happen to want to write about. If the Editorial is like the Sermon, then this column will be like the bull session after the services.

We will jump on anything, just watch: MICROSOFT is moving to our neck of the woods from New Mexico this month. AND they are announcing FORTRAN for TRS-80! It is a fully compatable package, supplied on two minidisks for $350.00 The package includes FORTRAN compiler, run-time library, macro assembler, text editor and linking loader. How about that, FORTRAN FANS? Write to Steve Wood, General Mgr Microsoft, 10800 NE 8th, Suite 819 Bellevue, WA 98004

SYSTEM/COMMAND is missing this issue. GARY is so immersed in his own business that there was just no time. We do appreciate his brief appearance, and hope he will come back from time to time for a "guest editorial". Starting in the Mar-Apr issue the column will be edited by PHIL PILGRIM. Phil has the machine language experience necessary, and we are looking for some neat things from him. Eventually we plan to merge VIEW and SYSTEM into one, since they are both machine language oriented.

This column will take the place of the "back burner" of last issue. Speaking of which, there are still some things simmering there. Others, which were planned for dessert are now main dishes and so forth--We are still jockying for position here and feel sort of like the cook who has to cook a gourmet meal - but does not know how many guests there will be or when they will arrive.

SELECTRA-TERM is now SELECTRA-PRINT. Micro Computer Devices has changed the name of their Selectric based printer. AND - thru a phone conversation with them it was learned that they will have (in late January) a TRS-80 S-100 bus adapter. Three boards will be available for it: serial & parallel IO and a high resolution alphanumerics board. Write Micro Computer Devices 960 E Orangethorpe, Bldg F Anaheim, CA 92801

INCOME TAX TIME AGAIN! Can you believe this? George Clisham of MICROTAX sent in an Ad for this issue along with a sample of his 1978 MICROTAX cassette. It has five programs, and will do 1040A & B and the rest including Form SE. I ran the 1040A & B on my own last years tax and it checked exactly! The programs are exquisite, and goof proof, with some features like "Skip to end of form" etc. What surprised me was the price of $9.99 Had to be a mistake, so I called Geo and he says NO, thats it AND he is also offering a tax book, showing you how to take all those legal deductions to which you are entitled! Nice going George!

Our MAIL LIST/SORT program last issue was not really intended for Level II, it is a DOS program (available on a cassette). Sorry if you were confused, we were not that clear about it.

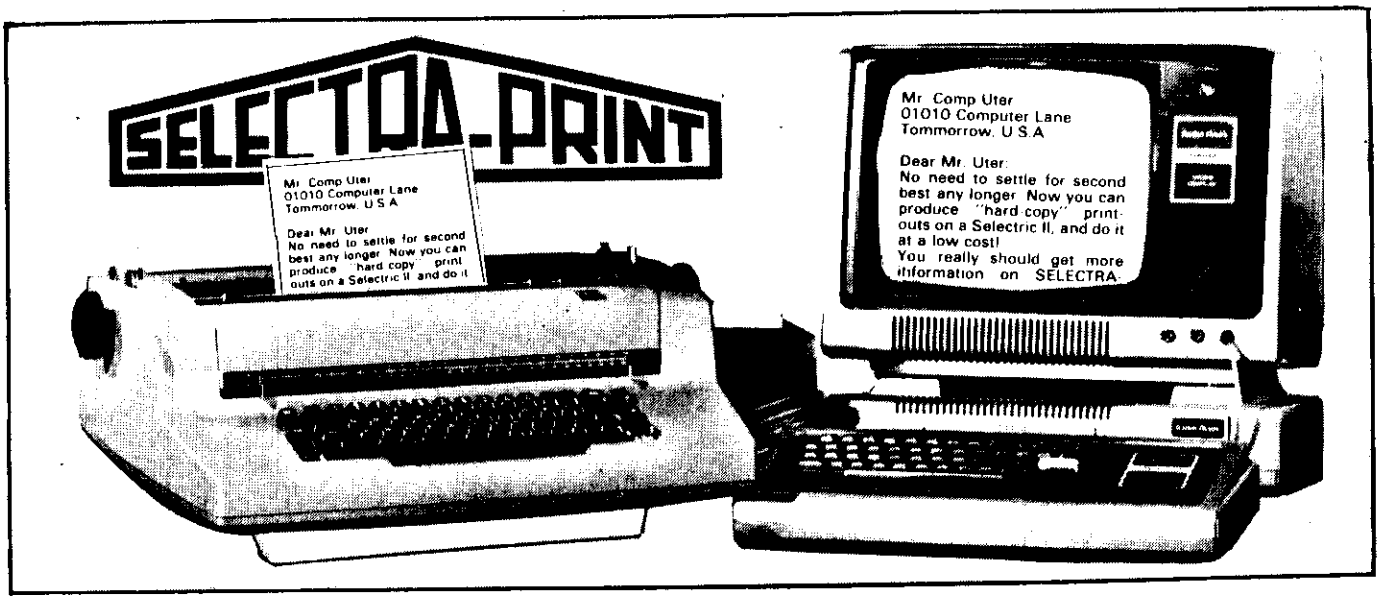
On the subject of last issue, did you know that with the "talk to your printer" article you can list the Directory of your disks on the printer? Get into basic first, then poke the statements and go back to DOS and list them. We stick the paper copy in with the disk, so you can always see whats there.

Don't you wish you could EDIT LINE NUMBERS with Level II's Edit? It would be nice to move lines 10 thru 50 to 100 thru 150, wouldn't it? Well, it can be done with DISCOVERY BAY SOFTWARE's QEDIT (quick edit). It puts a transparent cursor on the screen, and you can insert, delete and edit, even the line numbers! You have to go back and delete where the line came from after you moved it, but it sure beats typing it all over again. Write to Discovery Bay Software, PO BOX 464 Port Townsend, WA 98368 (see ad elswhere this issue).

Our introductory offer on our software is still in effect. March will see some changes, also the Library 100 from THE BOTTOM SHELF is now available through 80-US, and you save postage & handling fees, as we ship postpaid.

'We do not believe in "pre-dating" the JOURNAL, and think it is phoney to do so. It is mailed on the first working day of the publication month, and then it is up to the US of A Mail system. So you may not receive your copy till the second or third week of the month, it will still be a two month interval between issues. Somehow, we are in there with the "Occupant" and "Family Residing at" mail. Have faith, we will soon get to at least a 2nd Class Permit.

Meantime, spread the word. Don't be afraid to tell our advertisers you SAW it in THE 80-US JOURNAL. -80



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LETTERS

Don Bosco High School
Ramsey, New Jersey

Gentlemen:
Your machine language tutorial is very helpful for beginners who don't understand anything about the machine language. How about some simple machine language programs with detailed explanations? Also, what about a turorial article, on assembly, since very few of us know anything about assembly language! I would also be interested in programs on educational uses.

Y.K. Ho,
Instructor

Mt. Prospect, Illinois

Great Mag! Reference your note on page 30 of Nov-Dec issue - the real time clock. You can access it without the expansion interface. Tandy offers a software cassette just out with 2 machine level routines. One fixes the keybounce problem. The other is the real time clock loader.

Al Woodman

Pacific Grove, California

Gentlemen,
OK, I'll byte. Although your subscription price of $2.67 an issue seems pretty steep, I'm going to give you the chance to show me that 1. My faith in you is justified, or 2. I'm a sucker. I have a TRS-80 system with 32K, dual disks and line printer. The TRS-80 has a great deal of potential for small commercial and governmental applications, and this will become even more apparent when Radio Shack releases CP/M, sometime after the first of the year.

I look forward to articles on TRS-Dos and business applications, but don't forget the fun and games (something about all work and no play) speaking of fun and games I enjoyed issue #2, and T. Pepin's Bowling Program is fun, but I did encounter a couple of problems with the Level II conversion.

William S. Pitt

(You are not the only one to have problems with the Level II conversion of bowling. Aside from an out and out typo, in the opening dim statement, there was also a problem with illegal function calls. These can be corrected by changing the references to setting X at 127, to 126. Because of the number of calls and letters regarding the Level II conversion we are again printing bowling in this issue. This time it will be an authentic Level II version, run on the machine and then listed out and photographed, as most of our programs are, so that there will be no chance for error.

....Mike

Sparks, Nevada

Sir,
On your bowling alley program: I had to *remove outside parenthesis to get lines* 210 and 307 to work. Thank you

Fred Boyle

Newberg, Oregon

Dear sirs,
Thanks for the recent copy of 80-NW. You got another subscription! I didn't want to cut out the coupon and ruin the magazine, so hence this letter. Thanks again for the complimentary copy. It is a smart way to sell a subscription, one look and it's sold!

Sincerely,
John Olsen Jr.

(Sounds like we hit on a cheap way to get some letters to the editor! But seriously, our printer got pages 19 and 31 switched. Otherwise, your mailing label would have been on the back side of the order coupon. At least we planned it that way - it just didn't work out the way it was planned.

...Mike

Placentia, Ca.

Dear Sirs,
Thank you for Vol. No. 2. I wish I had been able to receive Vol. 1 No. 1. Any chance on a reprint or synopsis of the articles in No. 1?

Your article and challenge on biorhythm was interesting and I would like to share my own investigation of biorhythm with you.

A neighbor of mine and I play chess with each other quite frequently. I have recorded every game and the date on which it was played. We have played about 250 games. We both have national ratings in chess and are nearly equal. Some days he wins most of the games, on others I win, still others we are about equal in wins and losses.

Since I know both of our birth dates, I have compared our biorhythm curves on the days when he won and the days when I won. I can find no correlation better than chance.

Realizing that interpolating the curves is subject to some ambiquity, here is my own challenge to any reader who feels *strongly that there should be a* correlation. I'll be glad to send them both my neighbor's and my birth dates, the dates the games were played, and let him tell who the winner should have been on each date. It would be interesting to see if anyone can come up with a positive correlation.

H.T.(Tom) Orr
249 Juanita Way
Placentia, Ca. 92670

(Anyone want to take Tom up on this one? We would be interested in that too. As for Vol.1, No. 1. There have been a few requests for it, but not really enough to justify a re-run. We are so busy with the current issue also, and time is a problem. Perhaps, if we ever get as big as the big guys, we will publish a bound book of all the first X number of issues. Any suggestions for a title?

.....Mike)

Sebastopol, Ca.

Sirs,
Today I received a copy of 80-NW. What a neat magazine, but where did it come from? I sent money to TRS-80 computing, who have sent but one issue so far. And Softside, who have yet to send anything. Are you one of them? Was the issue I got designed to bait me? If so, I'm hooked.

Tell me how come I got you and if I need to send money to keep on getting you. Where did you get my name, Tandy?

Love,
Emil

(Emil,
First of all, thanks for the comment about the neat magazine. We kinda like it too.

No, we are not like the "others" you mentioned. As you can see, we gave you a free copy to look at first, so you could decide if it's worth it or not. And no, we are not trying to "Bait" you; the Journal will continue to get better and will be there every two months, you can count on it! Yes, you need to send money to keep it coming to you.

No, Tandy is not giving out names.

Sincerely,
Mike)

Newburg, Oregon

Gentlemen,
I would like to thank you for Android Nim. It has some of the best animation I have seen. A clever job, and the author should be congratulated. However, there is a serious bug: The three "executioners" appear. You choose to let the computer play first. The three rows of androids appear. The computer prepares to make its first move. On the *bottom row, the numbers 4* appear. The 3 android looks at them (like usual), then looks at the row of androids (as usual) then shakes his head "no." This part makes sense since the row only contains 3 androids when the game starts and it is impossible to take 4.

But then things start to go downhill fast. All three rows of androids *disappear, and a large "I Win"* appears and at the same time disembodied heads and arms start appearing on top of the "I Win". If you or the author can find the bug, I would certainly appreciate having a new tape, or at least a printed list of changes to make in the program.

John R. Olsen Jr.

(There is an old saying about "No matter how many times you check a program, etc". Yes, you are correct, there is a bug. It occurs when the computer has the first move and it picks row three and it chooses to take 4 androids. Leo Christopherson, the author, forced the program into this move, and found the bug. There are several ways around it, but he says this one should be easiest to do: In line 7297 insert 'IfRW = 3 then 7296 *else'. So the new line 7297 should read:* if RW = 3 then 7296 else RN = 4:RN$ = '4': RETURN.

Cherry Hill, New Jersey

Gentlemen,

My congratulations on your superb publication - and my check for a year's subscription. Your Journal really stands out from the myriad number of newsletters and users group publications. I found the Nov-Dec issue filled with helpful information, even though I have had prior programming experience. My TRS-80 system has 32K, a single disk drive and a Model 33 Teletype for hard copy. I have both the Small Systems Software printer interface and the TRS-80 Electric Pencil *Word Processor.* I am working on obtaining a Selctric to take advantage of the word processing capability of my system and would appreciate some articles concerning *modifications and* software drivers. Keep up the good work.

Carl H. Liachowitz

(Thanks for the nice words Carl, with people like you writing us we don't need a PR agent! Further on inside this issue you will find a beginning on the word processing articles. In a future issue, possibly Mar-Apr, we will go further and present the complete interface to the TRENDATA 1000, with the required driver. We finally got one and are working on it now. For this issue though, we are featuring the SELECTRA-TERM, which is a very nice package, and is being used to set up the proof copy these very words.

....Mike)

Queens, New York

Congratulations on your new TRS-80 Journal, shown me by a man in my hotel. How badly we TRS-80 users need you - I'am certain that you will be on a monthly basis shortly.

Jack Allison

Clewiston, Florida

Gentlemen,

Today I received a first copy of 80-NW JOURNAL. After a quick glance through it, I typed in Leo Christopherson's "Blorhytyms Program", ran it through its paces, then sat back to read your publication word-for-word. I am very impressed to find a TRS-80 magazine that does not publish heavily-biased *claims that the '80 is*"....the fastest, greatest, most amazing machine ever made..." and other dumb things. Your editorial statement regarding the *UPPER/lower case modification,* referring to the TRS-80 as "an otherwise fine instrument" is as close to perfection as I would ever want to see.

I own two other micro's...one built around the 6502 chip and another which uses the 2650. Each of my computers has its own particular personality. I enjoy working with each system in its machine language, but have an extended BASIC for each system, too. Overall, the TRS-80 is on equal footing with the other systems..no better...no worse; just a dependable, hardworking instrument.

Richard E. Douglas

Portland, Texas

I tried your Bowling program out of your issue #2-could not get it to work. Kept having errors in line 210, also had to change the DIM statement. Was interested in subscribing but lost my cool when I could not go Bowling.

L.G. Evans

(Well, we just had to include one like this too, even if it was the only one!

...Mike)

Laurel, Maryland

If you are taking votes, I'd rather see you keep it 80-NW than change to 80-US. It doesn't hurt to emphasize that something is happening west of the Mississippi.

R.J. Valentine

(Too late! We have already done it. Just for the record though, and to get it straight: THE 80-US JOURNAL is published by 80-NORTHWEST PUBLISHING CO. Only the name of the publication has changed.

.....Mike)

Clovis, New Mexico

Sir,

I am having trouble with MAIL/LIST, anytime it tries to sort I get a TYPE MISMATCH at line 490. I believe it is the same way you have it printed out in your Nov-Dec issue, all the rest of it works fine. Can you help me with this?

Bobby G. Corder

(Check your line 410, it should be INPUT S Also check for typing errors in the sort section, lines 400 to 640. This program was run on the system and then listed out on the printer, after which it is photographed. This does not preclude programming errors, but it was checked with all the options exercised before it was listed and it worked OK. Have someone check your listing, it's easy to keep overlooking the same error.

.....Mike)

Sterling Hts., Michigan

Gentlemen,

Somehow I received a copy of your Journal, for which I was pleasently surprised. This TRS-80 user magazine is just what I have been looking for and will gladly subscribe.

I am interested in the following areas:

1. A printer that will handle graphics & is compatable with the Level II 32K TRS-80 computer.
2. Basic language (Text Book) which covers some of the special programming statements, functions and Disk BAsic.

I really enjoyed your magazine. Thanks.

Ed Zeitner

(Glad you enjoyed it! On the printer, check the ads in some of the other magazines, seems there are several to choose from, some of them under $700. But watch for the type of paper they use. You may not want to be locked into a printer which can use only one kind of paper.

On the Basic Text Book - check out the review on Dr. David Lien's new book in this issue. It may be just what you want.

...Mike)

Lindsay, California

80-NW

The innovative programs, plus background and hardware information on the TRS-80, make a subscription a must for me.

David Carman

San Francisco, Ca.

Dear sirs,

I've seen your game (Android Nim), and I'm amazed at the graphics. it's really a classic for the machine, and I'm going to *do all I can to emulate the use of* character string graphics used in the game, (while avoiding copying, of course!)

Great work; I hope that the *JOURNAL is* up to the same level of quality!

Art Canfil

Salt Lake City, Utah

Sirs,

Would it be possible to get a copy of your "Very Rudimentary Text Editor" program which was mentioned on page 3 of Issue 1? Could you publish your text editor program in the next issue of your publication?

Karl W. Joffs

(No sooner asked than done Karl, it's called "TEXT 80", and it's in this issue.)

....M ike)

Weatherford, Texas

To 80-NW & CIE TRS 80,

I recently received copies of CIE TRS80 Bulletin and 80-NW (I-2). I'm confused. I subscribed to TRS 80 and received only 1-1. Would like to continue on mailing list. I am not aware of having subscribed to 80-NW, unless same is a continuation of CIE TRS 80. If separate item, please put me on mailing list and charge to....

James O. Mullin

(80-NW, now 80-US, was born in July 1978, first issue was Sep-Oct 78. TRS 80 Comp. Inc. came out in August 78, but although I subscribed in March 78, didn't receive anything till Sep 78, and haven't heard a thing from them since. There is no connection between us, but their inaction is making us look better by default. In spite of this, there is room for all of us and we would like to see them back in action.

...Mike)

Knoxville, Tenn.

I received my first copy of your 80-NW Journal. Since computing is new to me, your Journal is really welcome. Keep the graphics coming.

I order many cassette programs from various sources and am having trouble with the loading, mostly from dealers tapes. Some are so low in volume they just will not take. Are others having this problem? I receive about 6 newsletters and yours (and one other) are the greatest. Keep it up.

Andy Brewer

(See Hangups)

(Which other one, Andy?? *.... Mike)*

GOING FIRST CLASS

There are few things which will equal the joy and excitement of finally receiving a shipment of computer equipment. It happened here a few weeks ago. Two rather large cartons arrived, containing an IBM Selectric typewriter in one and a neat little blue box, plus platen and outer cover, in the other. Both items were generously surrounded with foam packing.

It was our SELECTRA-PRINT, from Micro Computer Devices in Anaheim, Ca.

Apparently the people at MCD had anticipated what happens when such packages are received, since the first thing which greets you upon opening either box is a very large sign which says STOP. It then goes on in finer print to tell you the proper sequence used in setting this system up.

Not that there is very much to it, you simply remove two shipping clamps and rubber bumpers, insert the platten and top cover, and connect the cables (which are all provided).

The SELECTRA-PRINT is slightly modified, by the addition of a "pan" underneath, and a pair of feet. On the rear of the "pan" is a connector into which you plug the "electronics package". The electronics package is a 10" X 10" X 5" box, painted to match the typewriter, which contains the interface. A cable from the electronics package connects to the parallel output port on the TRS-80 Expansion Interface. In spite of the very clear directions provided, we got the Expansion Interface connector backwards, fortunately the pin arrangement is such that it simply hung up the system, and after installing it properly we were up and running.

Naturally, the first thing we tried was to load the lower case driver (see 80-NW Nov-Dec 78 page 10) into the computer. This was followed by the TEXT80 editor (in this issue), and we were off for a trial run. Several things were immediately apparent:

It was not as noisy as the TRS-80 line printer (even without the noise reduction mod).

Setting the left margin is as easy as moving a little lever.

The copy is beautiful!

The 15" carriage is a real good feature.

It is slower than the 80 Line printer (12 to 15 characters per second).

You can turn off the switch on the electronics package and go "off line" with it, so you have all the advantages of an output device, plus an excellent regular typewriter.

The unit we have is a "standard" one. It has 10 pitch (10 characters per inch). Some of the other options available are dual pitch, both 10 and 12, self correction, noise reduction, RS 232 interface, Tractor feed and variable vertical line spacing (at half, one,and one and one half spaces). The unit is painted blue, but bronze and black are also available.

Delivery time is 6 to 7 weeks, slightly longer if you order dual pitch or correcting models. You may specify shipping method.

As you have probably noted, this article is being written on the SELECTRA-PRINT. We had to make a slight modification to our TEXT80 program to get two 34 character columns, since we no longer have the continuously variable pitch

we were used to with the TRS-80 line printer.

The question of course, is: Is it worth the 2K price tag to go first class?

Natually, the answer depends on what your particular requirements are. If you want or need to produce perfectly typed form letters, or some perfectly typed "original" copies of manuscripts, the answer is yes. If you have any need for text editing, you will need some output which looks more appealing than a dot matrix output. If you are using your TRS-80 in almost any small business application, and send out your finished output, it is most certain you will want it to look professional.

If all you need is basic program listings then this would be classed as a luxury item, and would be nice, but not necessary.

If you do not want to install lower case in your machine, then it would be a waste also, since UPPER/lower case capability is a must if you want to do any real serious writing. Those of you who remember our Issue #1 will recall the monotony of all upper case dot matrix!

In our own case, we find it is nice to be able to produce good looking letters (and we have been writing them lately!). Also, we use it to set proof copy of these articles, and in this case, the finished copy. Although we cannot get as much on a page as there would normally be there with type setting, it does save the type setting cost. And, most important of all, we can now produce Basic Program listings in which you can actually see the periods, colons and semi-colons. They were just a little difficult to see with the dot matrix printer, especially after going through the printing process.

Hopefully this short review and discussion will help you to make the decision on whether or not to go "First Class". ..80

SMALL SOFTWARE SYSTEM

TRS-80 SOFTWARE

RSM-1S: A MACHINE LANGUAGE MONITOR FOR 4K TRS-80'S - $23.95

22 commands which interact directly with the Z-80 processor in your TRS-80. Examine your ROM's, test your RAM, enter and execute machine language programs, read and write machine language tapes, and much more! A SYMBOLIC DUMP command disassembles object code and displays it as Zilog standard Z-80 mnemonics! Memory may be displayed in HEX or two ASCII formats, and can be EDITED, MOVED, EXCHANGED, VERIFIED, FILLED, ZEROED, TESTED, or SEARCHED for one or two-byte codes. Memory commands dump continuously or one line at a time! LEVEL-I and II 4K TRS-80's.

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RSM-2D: 3 MONITORS FOR TRS-80 DISK SYSTEMS - $29.95

RSM-2D contains 3 versions of RSM-2 on a single disk to load into the top of 16K, 32K or 48K TRS-80's with disk systems. With RSM-2D you can read your TRSDOS into memory using our DISK read command, print disassembled listings using our SYMBOLIC dump and printer output commands, then modify and re-write to disk using our DISK write command!

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A high speed machine language game where *large and small airplanes* fly across the screen at different altitudes. A ground based missile launcher is pointed and fired from the keyboard. Aircraft explode dramatically when hit, sometimes destroying other nearby planes! Score is tallied for each hit or miss, and the highest score is saved to be challenged by other players. AIR RAID provides hours of fun for you, and is a super demonstration program for entertaining friends! 4K LEVEL I and II.

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*

TRS-80 HARDWARE

SMALL HARDWARE SYSTEM

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RSM monitors, The Electric Pencil, Air Raid, RSL-1, ESP-1, T-BUG, or nearly any SYSTEM tape shorter than 5K (21K if you have 32K of memory) can now be executed from disk, even if it interferes with TRSDOS! DCV-1 loads system tapes into high memory and adds a block-move routine. TAPEDISK is then used to create a disk file. When accessed from disk, the program loads into high memory, moves itself to its correct address, then jumps there and executes! A super accessory for disk systems!

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A fully assembled self-contained software-driven output port for printing from LEVEL-II, DISK BASIC or machine language programs! Diablo, Teletype, TI Silent or *any* RS-232 or 20-mil *current* loop printer may be used. The TRS232 is furnished with cassette software and works either with or without the expansion interface! THE ELECTRIC PENCIL and RSM-2/2D use the TRS232, thus word processing, BASIC, and machine language applications are all supported!

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Enter any pattern with unique repeating keyboard! Save your patterns on tape (4 patterns furnished). Play LIFE, a game of birth, growth and death of a colony of cells. FAST - about 1 second per generation! Hours of fascination, and a super demonstration program!

OTHER TRS-80 PRODUCTS

ESP-1: 29.95 Editor, assembler, and monitor using INTEL 8080 mnemonics.
LST-1: 8.00 A disassembled listing of LEVEL-1 BASIC with some comments.

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Bowling game **T. Pepin**

Note - Since there was such a flood of mail and calls about the Level II Conversion of this program after the last issue, we are running it again. This time in its authentic Level II version, and it was run many times before it was listed on the printer, so there should be no errors. As an added bonus, it now tells you your average after each game! ..Ed.

```
4 REM * COMPUTERIZED BOWLING ALLEY *
5 REM * (C)1978 T.PEPIN * ALL RIGHTS RESERVED *
6 CLEAR 200
7 DEFINT A-Z:DIM A(50)
10 CLS
15 GOSUB3000
17 FORI=0TO50:A(I)=0:NEXTI
20 FORX=0TO127:SET(X,25):SET(X,47):SET(X,17):NEXTX
25 FORY=18TO24:SET(0,Y):SET(127,Y):NEXTY
30 FORX=26TO116STEP10:FORY=18TO24:SET(X,Y):NEXTY:NEXTX
40 PRINT@271,"1    2    3    4    5    6    7    8    9   10";
50 PRINT@449,A$;
60 I=0:L=0:F=0
70 B=0
75 IF F<10 F=F+1
80 PRINT@0,"";
100 RESTORE
110 READ X,Y
120 IF X<0 GOTO150
130 SET(X,Y)
140 GOTO110
150 D=2:X=2:Y=28
155 I=I+1
160 B$=INKEY$:IF LEN(B$)<>0 THEN 200
170 IF(Y+D<28)+(Y+D>44) D=-D
180 RESET(X,Y):Y=Y+D:SET(X,Y)
190 GOTO160
200 D=2
210 IF(POINT(X+D,Y-1))+(POINT(X+D,Y))+(POINT(X+D,Y+1)) GOTO300
220 RESET(X,Y)
230 X=X+D:IF X>125 GOTO320
235 IF(G=H)*(X>80) Y=Y-.7499+RND(0)
240 IF(G=H)+(X<80) GOTO250
242 IFRND(10)=5 Y=Y+RND(0):GOTO250
245 IFRND(10)=2 Y=Y-RND(0):GOTO250
247 IFRND(10)=9 Y=INT(Y)
250 IFY<27 Y=27
255 IFY>45 Y=45
260 SET(X,Y)
270 GOTO210
300 RESET(X,Y)
304 Y=INT(Y)
305 X=X+D:R=0
307 IF(POINT(X-1,Y-1))+(POINT(X-1,Y))+(POINT(X-1,Y+1)) X=X-1
310 FORK=XTO127STEP9:R=R+3:FORJ=Y-RTOY+R:IF(J<45)*
(J>26)RESET(K,J):RESET(K+1,J)
315 NEXTJ:NEXTK
320 B=B+1
330 GOSUB1000
```

```
340 IF(A(I)=10)*(B=1) A(I+25)=2:GOTO400
345 IF(A(I)=10)*(B=2) A(I+25)=1
350 IFB=2 A(I)=A(I)-A(I-1):GOTO400
360 IFI>20GOTO400
390 GOTO150
400 GOSUB2000:A(0)=0:FORJ=1TOI
401 IFJ>20GOTO412
402 IFA(J+25)=1 A(0)=A(0)+A(J+1)
403 IFA(J+25)<>2 GOTO410
405 A(0)=A(0)+A(J+2)
407 IFA(J+27)=2 A(0)=A(0)+A(J+4):GOTO410
408 A(0)=A(0)+A(J+3)
410 IFJ<21 A(0)=A(0)+A(J)
412 NEXTJ
415 IFA(I+25)=2 I=I+1
417 IF F=10 PRINT@507,USING"###";A(0);:GOTO425
420 PRINT@462+(INT(I/2)-1)*5,USING"###";A(0);
425 IF(I=20)*(A(I+24)=2) GOTO70
426 IF(I=21)*(A(I+23)=2) GOTO70
427 IF(I=22)*(A(I+24)=2) GOTO70
430 IF(I>19)*(A(I+25)=0) GOTO440
432 IFI<21GOTO70
440 PRINT@1023,""
450 IF A(0)>150 THEN  PRINT"      NOT BAD!":GOTO 470
460 PRINT"   DEFINITE ROOM FOR IMPROVEMENT"
470 INPUT"DO YOU WANT TO TRY AGAIN";RES$
475 CLS
480 IF LEFT$(RES$,1)<>"Y" THEN STOP
490 A1=A1+A(0)
500 A2=A2+1
510 PRINTA$;"'S AVERAGE IS";A1/A2
520 GOTO 17
1000 A(I)=0:RESTORE
1010 READ X,Y,W,Z
1020 IF X=-1 RETURN
1030 IF POINT(X,Y) GOTO1010
1040 A(I)=A(I)+1:GOTO1010
2000 IFA(I+25)=2 PRINT@400+(F-1)*5,"X";:RETURN
2010 IFA(I+25)=1 PRINT@400+(F-1)*5,"/";:RETURN
2020 PRINT@400+(F-1)*5,"-";:RETURN
3000 PRINT"WELCOME TO YOUR COMPUTERIZED BOWLING ALLEY!":PRINT
3010 INPUT"WHAT ARE YOUR INITIALS";A$
3020 H=1:S=2
3030 INPUT"DO YOU THROW A HOOK BALL OR A STRAIGHT BALL";G$
3040 IF LEFT$(G$,1)="H" THEN G=H ELSE IF LEFT$(G$,1)="S" THEN
 G=S ELSE PRINT"JUST TYPE 'HOOK' OR 'STRAIGHT'":GOTO 3030
3060 PRINT:PRINT"OK, THIS IS HOW IT WORKS..."
3070 PRINT"   WHEN WE BEGIN, THE BALL WILL MOVE UP AND DOWN THE LANE."
3080 PRINT"TO THROW THE BALL, HIT THE 'ENTER' BUTTON.  THE COMPUTER"
3090 PRINT"WILL KEEP SCORE."
3100 PRINT:INPUT"     PUSH 'ENTER' TO BEGIN";B$:CLS
3120 RETURN
4990 DATA97,36,98,36,106,39,107,39
5000 DATA106,33,107,33,115,31,116,31,115,36,116,36,115,41,116,41
5010 DATA124,28,125,28,124,33,125,33,124,39,125,39,124,44,125,44
5020 DATA-1,-1,-1,-1
5999 CLS
```

View from the Top of the Stack

T. Rosembaum Technical Ed.

The Binary Number System is the heart of any digital computer system. In order to learn how to program the TRS-80 in its natural, or machine, code one must learn this number system and be able to maniuplate it. The manipulation of the binary number system is called BOOLEAN ALGEBRA.

Boolean Algebra has three primary operations which can be performed on binary numbers. These operations are the AND, OR, NOT operations. All functions of a digital computer such as addition, multiplication, number conversion etc., can be generated with combinations of AND, OR, NOT operations. The symbols and truth table for these operations are shown below. A truth table is simply a list of all the possible conditions which can exist for a given operation.

AND

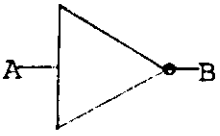
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

OR

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

NOT (Inverter)

A	B
0	1
1	0



Operations involving binary numbers are often referred to as "logical" operations, or just "logic". Binary logical operations can only assume one of two states. These states are referred to as, "true-false", "on-off", "high-low" or some other "two-state" designation.

In electronic digital computers binary states are defined by voltages. The TRS-80 uses POSITIVE logic, which means that the "TRUE" voltage is more positive than the "FALSE" voltage. (NEGATIVE logic is just the opposite, with the true voltage being less positive than the false voltage). However, Level II Basic assigns a -1 value to "TRUE" and a 0 value to "FALSE", which is negative logic.

Positive logic is almost universally used in industrial literature, and I intend to use it throughout this series as all of the technical literature and documentation on the Z-80 Microprocessor (which the TRS-80 has) uses positive logic. I will try to minimize the confusion effect which this will cause but believe it important to use positive logic since we will be doing machine language programming of the TRS-80.

Now for a brief explanation of the binary operations of AND, OR, NOT. The NOT operation takes a logical value and changes it to the opposite value. If you let the logical value of "A" be a "1" (true), then after performing the NOT operation on "A", its value would be "0" (false). Graphically this is shown by A with a line over it (A bar), or by A'. A' is generated by performing the NOT operation on A, and is referred to as the inverse of A.

The AND, OR operations can accept any number of inputs, but produce only one output. The AND operation looks at all of the inputs and returns a TRUE output ONLY IF ALL of the inputs are TRUE. The output is FALSE if any one or more of the inputs are FALSE. The OR operation looks at the inputs and returns a TRUE output if ANY of the inputs are TRUE. It returns a FALSE output ONLY when all the inputs are FALSE.

The graphic symbols for the AND, OR operations are "+" and "•", respectively. Sometimes the "•" symbol is left out in a logical expression, i.e., A•B + C•D = AB + C D

Before we proceed any further a discussion of the basic operating principles of the Z-80 is in order. The Z-80 is a microprocessor which can perform many different logical operations on data which is available to it. Data which the Z-80 uses is stored in the memory connected to it or is read into it from the outside world through a device called a "PORT". The Z-80 can "address" 65,536 memory locations or 256 different Ports. Each memory location or port will store one 8 bit word (also called a byte). Although the Z-80 can address 256 ports, data can only be exchanged with the outside world if the electronic hardware necessary to build the port is connected to it. The TRS-80 has one port connected to the Z-80 at address 255 (FF in Hex), and this is the port through which the cassette "talks" to the TRS-80.

The group of operations which the Z-80 can perform on data is known as the "instruction set". A sequence of instructions from this set is called a program. In order for the TRS-80 to function, a program must be put into memory, and it must be told where to start executing the program. Executing the program means to start doing what the instructions in the program say to do. This happens when you type "RUN" and "ENTER" in a Basic language program.

The Z-80 has the ability to store data inside of itself in special storage locations called "operating registers". These

registers are important because it is faster to store and retrieve data from them than to store and retrieve data from memory.

There are four 16 bit registers - the Program Counter (PC) Stack Pointer (SP) and two Index Registers (IX & IY); six 8 bit registers - the Accumulator (A), Alternate Accumulator (A'), Flag Register (F), Alternate Flag *Register (F'), Interrupt Vector* Register (I) and Memory Refresh Register (R). In addition, there are six 16 bit general purpose registers - BC, DE, HL, BC', DE', and HL', each of which can also be used as two 8 bit registers.

When a program is executed, the Program Counter (PC) contains the address of the *next instruction to be executed.* When the Z-80 has finished executing an instruction, it gets the next instruction from memory. The address at which this instruction is stored is kept in the Program Counter. The Z-80 "fetches" the next instruction from memory and "decodes" it. "Decode" means the Z-80 figures out what the instruction means. For example, if the instruction is "LD A, (DE)", the Z-80 will load the accumulator (A) with the "contents" of the memory location specified by the register pair (DE). The opcode for this instruction in binary is 00011010. The example just shown is a single byte instruction. There are also two, three and four byte instructions. The Z-80 can tell by looking at the first byte of an instruction whether or not a one, two, three or four byte instruction is called for. If the instruction is more *than one byte, the* Z-80 will fetch the required bytes and execute the instruction. Most multiplebyte instructions take longer to execute than single byte instructions, so if you can accomplish the same function with an *n* byte instruction instead of an *n+x* byte instruction, do so.

This is not a hard and fast rule; there are many execptions. One of the most notable is the *push* and *pop* instructions, which take 10 machine cycles as opposed to the LD *r,r* instruction, which takes four machine cycles, even though both are one byte instructions. A machine cycle is a unit of time based upon the system clock. It is an oscillator which provides necessary timing for the Z-80. The clock rate for the TRS-80 is 1.78 Mhz.

When you build a machine language (object) program, try to program it as efficiently as possible, which means to try and minimize the number of machine cycles your program uses. Don't go overboard on this - if it takes you fifteen minutes of programming time to save one cycle, it's not worth it. However, if you save one cycle in a time-sensitive subroutine which will be executed tens of thousands of times, it may well be worth the effort.

Many of the TRS-80 functions are memory mapped. Appendix D of the BASIC Level II Manual shows the TRS-80 memory map. Of particular importance is the fact that the video display can show 1024 characters (16 lines X 64 columns). The TRS-80 has a 1024 byte memory (aside from all other memory) which stores the entire video display. Actually, the 1024 video display "bytes" are only 7 bits each - this is why the TRS-80 cannot display lower case characters (see 80-NW Nov-Dec 78 for a detailed description of how the TRS-80 can be made to display these characters).

The video display is located from 3C00 to 3CFF (hex) in memory. For instance, if you load a 41 (hex) into address 3C39, an "A" will appear in the upper right had corner of the screen.

The TRS-80 uses a code called ASCII (American Standard Code for Information Interchange), which is the commonly used code in microcomputers, to represent alphanumeric characters. Appendix C of the Level II Manual shows the ASCII code.

In order to further confuse the reader, the concept of the hexadecimal (hex) number system is introduced. Hex is almost universally used in the small computer industry, so we will use it too. Hex is a base 16 system with the following numbers: 0,1,2,3,4,5,6,7,8,9,A,B, C,D,E,F. Using this system, a byte can be represented by two hex digits, *i.e.*, 10, 3A, C9, FA. Appendix G of the Level II Manual gives tables for conversion from binary (base 2) to octal (base 8), decimal (base 10) or hexadecimal (base 16). Throughout the articles in this series it will be assumed that all numbers will be in hex unless otherwise stated.

There are over 180 different instructions which the Z-80 can execute and you should be familiar with all of them to really program efficiently. Many of the instructions are very similar and can be place into logical groups.

It is difficult for most people to conceptualize the function of a computer instruction if they have to think of the instruction in terms of its hex equivalent. To make this task easier, the concept of *Assembly Language* (which uses English language mnemonics) was developed. Each machine language instruction is assigned an English mnemonic which corresponds to the opcode. The opcode is the hex equivalent of the instruction. The mnemonics are translated into a list of opcodes which the Z-80 can execute by a special program called an *Assembler.*

For example, if you wanted to load the contents of the C register into the accumulator (A register), you would use the mnemonic LD A,C (opcode = 79). If you wanted to load the contents of the accumulator into the C register, you would use the mnemonics LD C,A (opcode = 4F).

We will consider the logical groups of instructions next. The first group is the 8 bit load group. The general form of these instructions will be: LD R1,R2 where R1 is the register into which the data is loaded, the (*Destination*), and R2 is the register from which the data has come, the (*Source*). R1 and R2

need not be one of the operating registers; they may well be a location in memory, pointed to by the HL register pair or one of the index registers, (IX or IY). R1 or R2 may be the address from which the data may be loaded, or they may themselves be the data. Following are several examples of 8 bit load instructions. Note that when data is "read" from a register or memory location, that data is not destroyed, and may be read again.

Hex code *OP Code*

1. 79 LD A,C
Load the C register into the A register.
2. 4F LD C,A
Load the A register into the C register.
3. 6A LD L,D
Load the D register into the L register.
4. 49 LD C,C
Load the C register into the C register.
5. 5E LD E,(HL)
Load the contents of the memory location pointed to by the HL register into the E register. If the HL register contained the address 49A6, and memory location 49A6 contained the byte C9, executing the above instruction would load C9 into the E register.
6. 73 LD (HL),E
Load the E register into the memory location pointed to by the HL register pair.
7. DD 4E dd LD C,(IX + dd)
Load the contents of the memory location pointed to by IX + dd into the C register. IX is a two byte address and dd is a one byte, twos complement, displacement in the range 126 > dd > -129. For example, if IX = AC2B, dd = D3 and 74 is stored in memory location ACFE, execution of instruction #7 above would leave 74 stored in the C register.
8. FD 73 dd LD (IY + dd), E
Load the contents of the E register into the memory location pointed to by IY + dd.
9. *FD 36 dd nn LD(IY dd), nn*
Load nn (one byte) into the memory location pointed to by IY dd
10. *36 nn LD (HL), nn*
Load nn into the memory location pointed to by (HL)
11. *16 nn LD d, nn*
Load nn into the D register
12. *OA LD A,(BC)*
Load the contents of the memory location pointed to by (BD) into the accumulator (A)
13. *1A LD A, (DE)*
Load the contents of the memory location pointed to by (DE) into the accumulator (A)
14. *3A nn nn LD A, (nn)*
Load the contents of memory location NN (two bytes) into the accumulator
15. *02 LD (BC),A*
Load the contents of the accumulator into the memory location pointed to by (BC)
16. *32 nn nn LD (NN),A*
Load the contents of the accumulator into memory location NN

The above are examples of the 8 bit load instructions. There are many more similar to numbers 1 through 11, but 12 through 16 are unique, only the accumulator can be loaded into (BC), (DE) and (NN) and vice versa.

There are four other instructions:

17. ED57 LD A,I
18. ED 5F LD A,R
19. ED 47 LD I,A
20. ED 4F LD R,A

which deal with transferring data between the accumulator and interrupt and refresh registers. It is a little early to be using these instructions yet, as you may hang up your system or crash your program.

It must be noted that most of the above examples deal with moving data from one 8 bit register to another. In every case the data is copied into the destination register and the data in the source register is left UNCHANGED.

There are two more instructions we will discuss in this session. They are: *INC Q and DEC Q*

They mean INCrement (add one) and DECrement (subtract one) from the Q register. The Q register can be any one of the following: 1.)A,B,C,D,E,H,L 2.) (HL) 3.) (IX d) 4.)(IY d)

In order to find what the opcode and assembly mneumonics for all of the above instructions are, you must get an assembly language manual on the Z-80 microprocessor (the Z-80 is manufactured by ZILOG).

Now you can use TBUG to make some sample programs. Load in TBUG then use the R command to examine the registers. Use the M command to load some of the sample commands given above into the machine. Set a breakpoint with the B command at the end of your list of instructions and then use R to re-examine the registers to see what happened.

It takes nothing but practice to be able to program in any language. Try and build yourself a program that will print your name on the screen. To do this you must store the ASCII characters which represent the letter in your name into the memory mapped video display addresses.

In the next issue we will discuss the 16 bit load instructions and the jump group.

....80

LEVEL I THE "AUDIBLE" MAGAZINE

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Level II TRS-80 + The LIBRARY 100

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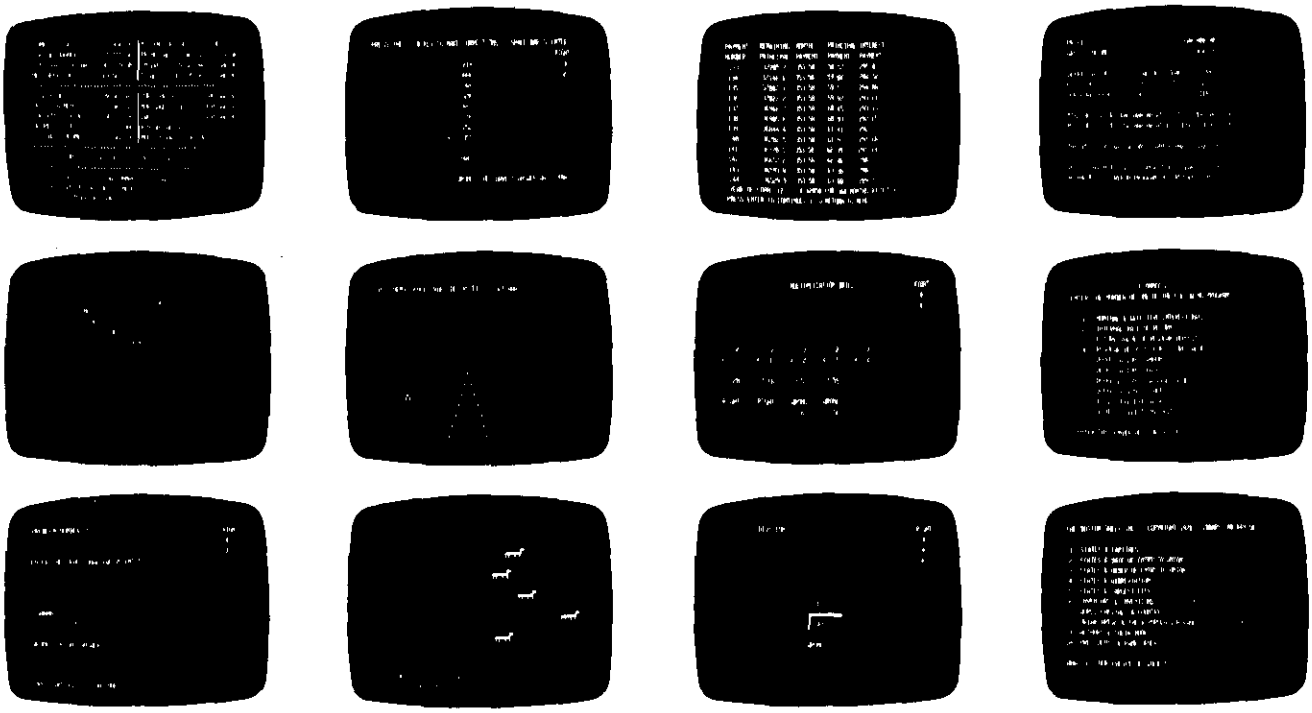

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USR (GROUP)

Pittsburgh Area TRS-80 User group meets immediately after the regular Computer Club meeting at 1 pm on the third Sunday of each month. You do not have to be a member to attend. Location is the Community Room of the Northway Mall on McKnight Road, north of Pittsburgh, PA. Current projects include building an inexpensive modem, shring problems and solutions, evaluating TRS-80 magazines. Moderator of the group is George Blank, (412)845-8470.

AUDIO-VISUAL DEMO

Mike Schmidt

The Level II TRS-80 has a capability which, up to now, has not seen very much application. It seems a natural, since the system comes with a cassette recorder, to create a variety of audio-visual effects.

The problem of control of the recorder is very easily taken care of. There are just a few easy rules to follow, and you can start and also stop your recorder from a basic program.

When controlling the recorder motor in this manner, you need to remove the earphone and the aux jacks, and leave the remote plugged in. Then, with a basic program line (print #-1,A: Out 255,4) you can turn on the motor. Out 255,0 will turn the motor off.

Unfortunately, a clear screen command will also turn off the motor, but you can reinstate the on condition with a Out 255, 4 immediately following any clear screen command. The CLS occurs so fast that you will hardly notice hesitation in the tape speed.

This allows you to record a basic program on one side of a cassette, then use the other side to provide an audio commentary, which will be controlled by your basic program. The program which accompanies this article demonstrates this to some extent, since we cannot present the audio portion on these pages, it needs to be tried to be appreciated.

For example, with this program loaded, you can make a tape to accompany it: pull all the connections to the recorder and remove the dummy plug in the microphone jack. Then set the recorder to record, run the program, and simply speak as the program progresses. This will give you a synchronized audio.

To get things off on the right foot you may sound a gong or bell when the program gets to line 137 and asks you to push enter. Example: "At the sound of the third tone, press enter".

If you need to stop your program for an input statement you can turn off the motor immediately before the input statement, and turn it on again immediately after it. It is best to get your program completely debugged and set up exactly the way you want it before you make the audio portion.

One of the most interesting uses of this system is in the teaching of a foreign language, since one can never get correct pronunciation from a book. In the case of our sample program we had an authentic German speaking person pronounce each word distinctly several times, and add other comments in English to amplify the word usage.

Almost any teaching program can be set up this way, even possibly teaching basic programming! Other uses suggest themselves, such as controling a slide show, and providing commentary. With the proper interface you could even control the slide projector, and have a fully automated show.

Using disks, we have created a 10 minute demo for the TRS-80. You just start it and then sit back and watch and listen. The demo programs were all on disk, and at the end of each there is inserted a command to 'Run"XXXX", (the next program). It called 10 different programs, which showed various aspects of the capability of the system, while the audio provided a running commentary.

Imagine that, a television in which you have control of the commercials!!

Try it sometime, it's fun and it works.

```
 2 REM AUDIO/VISUAL * (C)1978 80-NW PUBLISHING *
 4 CLS
 5 PRINT"INSERT THE AUDIO CASSETTE, REMOVE THE EARPHONE
   AND AUX CONNECTORS, LEAVE REMOTE CONNECTED AND SET TO PLAY.
   PUSH ENTER WHEN THE AUDIO SAYS TO DO SO"
 8 FORI=1TO2000:NEXTI
 10 CLS
 20 PRINT@396,"T H E   8 0 - U S   J O U R N A L"
 30 PRINT
 40 PRINT@533,"P R E S E N T S"
 50 FORI=1TO2000:NEXT
 60 CLS
 65 FORI=1TO50
 70 PRINT@398," A N   A U D I O,  V I S U A L"
 80 PRINT@536," D E M O"
 90 PRINT@398,"                                  ":
   PRINT@535,"          ":NEXT
100 CLS
135 PRINT#-1,A:OUT255,4
137 INPUT"PUSH ENTER WHEN AUDIO SAYS TO DO SO";X
138 CLS:PRINT#-1,A:OUT255,4
140 PRINT@10,"A  G E R M A N  L A N G U A G E  P R I M E R"
145 PRINT
150 PRINT@148,"SPRECHEN SIE DEUTSCH?"
160 FORI=1TO2000:NEXTI
165 PRINT
170 PRINT"              ICH = I OR ME":GOSUB1000
180 PRINT"              DU  = YOU, IN THE FAMILIAR FORM":GOSUB1000
190 PRINT"              SIE = YOU, THE POLITE OR FORMAL FORM
                          ALSO MEANS  S H E":GOSUB1000
200 PRINT"              IHR = ALL OF YOU (OR YOU ALL)":GOSUB1000
210 PRINT"              WIR = WE (OR ALL OF US)":GOSUB1000
220 PRINT"   SIE HAT HUNGER = SHE HAS HUNGER (SHE IS HUNGRY)":
    GOSUB1000
230 PRINT:PRINT"THANK YOU FOR WATCHING AND LISTENING."
240 OUT255,0
999 END
1000 FORI=1TO3000:NEXTI:RETURN
```

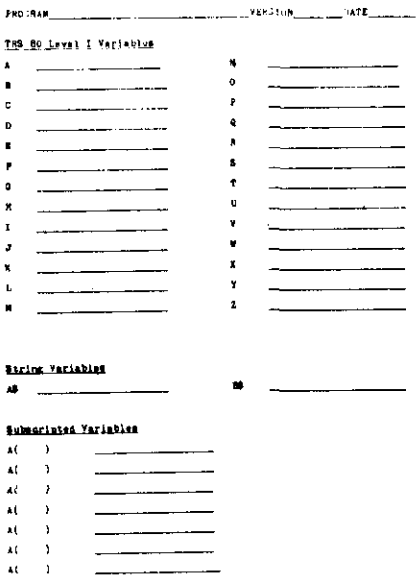
A NOTE ON BASIC PROGRAMMING

by T.R. Dettmann

In Level 1 programming, the number of variables is extremely limited and there are no listings available from the interpreter to tell you what variables you have used in different parts of the program. This can lead to serious problems when you come to writing a long program since you might accidentally use a variable for a second purpose whose value you will need at a later point in the program. The problem becomes particularly acute when coming back to an older program to add modifications since there is no record of the variables used or in what manner. To have extensive variable lists in remark statements would be a waste of memory and so it is obvious that a simple solution is needed.

A simple and uncomplicated way to keep track of the limited number of distinct variables available is to use a variable record such as the one shown in the illustration. This is a copy of my own sheet for this purpose.

The big advantage of the sheet comes when you return to a program after months or years and try to figure out what each variable is used for. In this situation it can save a great deal of your time.



RENEW THAT PROGRAM!

Mike Schmidt

So you have sat for hours, hunched over your hot keyboard, building "the" program to end all programs. You are bleary eyed and should have hit the sack hours ago, and you just did it - you typed "NEW" and wiped out your whole night's effort instead of saving it. Don't give up yet. There is a way to bring those "newed" programs back to life. If you are in disk basic it's a snap. Read on...

It turns out that in disk basic all basic programs start with the first line at memory location 68BA (Decimal 26810). It was rather interesting to find that the very first thing our basic interpreter wants to know when you tell it to run is "What am I going to do after that?". Seems it wants to know these things ahead of time. Apparently the "RUN" command points to 68BA, and the first thing it sees at 68BAis the location in memory of the second line of basic statement. At the second line of basic it sees the memory location of the third line, etc., etc.

Now, when you type *"New"* the interpreter does not go through the entire program listing and erase all the lines or statements.

What it does is simply kill off the pointers in 68BA and 68BB. See figure 1 and 2. Now, the interpreter when told to run, looks at 68BA& 68BB, sees those zeros and says "There ain't nothin there Charlie". So it jumps to another portion of the basic and gives you a ready and a cursor on the screen instead.

But the basic program is still there!!!

All we have to do to un-new a program is to poke in these two bytes, and it will be alive and well again. But how do we know what those two bytes are? Simple: Those two bytes will be the location in memory occupied by the start of the second line of your program. Read that last sentence again, it's loaded. Figures 1 and 2 will demonstrate this. Figure 1 is a hex dump of the following 3 line basic program:

```
 10?"THIS IS THE FIRST PROGRAM LINE"
>20?"THIS IS THE SECOND PROGRAM LINE"
>30?"THIS IS THE THIRD PROGRAM LINE"
```

The "FF" characters preceeding 68BA are empty memory spaces (empty memory is alternate ones and zeros in groups of 256). Note that in 68BA and 68BB there are hex characters that say "E0" and "68". These indicte that the second line of the program starts at 68E0. If you look on thru the dump in figure 1 till you find the first "00" byte, you will find that 68E0 is the location immediately following that zero byte, and that this is the start of line 20, the second line of our program.

Figure 2 is the same program, still in memory after the "new" command was executed. Notice that the program is still there, but that the loctations 68BA and 68BB are now zeros!!

Obviously, all we need to do to get the program back is to poke those two bytes into memory, low order byte (E0) into 68BA, and high order byte (68) and 68BB. And presto! You can now list or run your program as before. Remember that 68E0 is the location of the start of the second program line, and that this location, whatever it is, will always be the first byte after the first "00" byte you encounter in the dump.

Sounds simple, but how do you use it in the real world? Well, you just issued a "new" command and want to get your program back. The screen says ready and you have a cursor. You type in a *'cmd"d"* ' command and use the debug to look at memory starting at 6800. Look for the first "00" byte after about 68BF and use the modify command in Debug to change 68BA & 68BB to the location of the first byte after that 00 byte. Then use the Debug G command and *"enter"* to get back into basic and type list or run.

If you make the very first line of all of your programs the same length, say something like *"1 rem"* or your name, then you can figure out the location of the second line (first byte after the first '00' byte) and poke it in with out ever using debug. Try it with a small, experimental program a few times to get the feel of it. It works if you do it right, but you need to do it a few times to feel comfortable with it.

For example, with the program lines listed above, the second line (line 20) starts at 68E0 and you can enter that program, then new it out and (in command mode) poke 26810,224:poke 26811,104. This is equivalent to putting hex E0 in 68B0 and hex 68 into 68BB. You can then run the program again, after it has been "newed".

Level II basic is not as simple. Yes, you can use the poke statements if you know the length of your first line, but we are not certain yet just where basic programs start in Level II (as of this writing) but think it's about 42E9 or so. Also, with Level II you have to do all the looking around in memory with T-bug, which is a little more difficult to use than debug or RSM-1S. When we get more information on Level II we will present it.

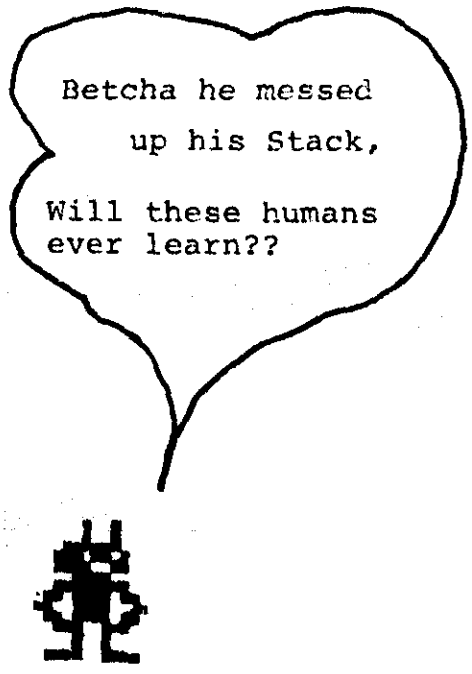
The dumps in figures 1 and 2 were made using the RSM-1S monitor, from Small Systems Software.

```
68B0:  FF FF FF FF FF FF FF FF FF 00 E0 68 0A 00 B2 22
68C0:  54 48 49 53 20 49 53 20 54 48 45 20 46 49 52 53
68D0:  54 20 50 52 4F 47 52 41 4D 20 4C 49 4E 45 22 00
68E0:  07 69 14 00 B2 22 54 48 49 53 20 49 53 20 54 48
68F0:  45 20 53 45 43 4F 4E 44 20 50 52 4F 47 52 41 4D
6900:  20 4C 49 4E 45 22 00 2D 69 1E 00 B2 22 54 48 49
6910:  53 20 49 53 20 54 48 45 20 54 48 49 52 44 20 50
6920:  52 4F 47 52 41 4D 20 4C 49 4E 45 22 00 00 00 FF
6930:  FF
```

FIGURE 1 - This is a hex dump of the program before it was given the "new" command. Note location 68BA, which contains hex E0, and 68BB, which contains hex 68. Following this is hex 0A and 00, which are the first line number, 10.

```
68B0:  FF FF FF FF FF FF FF FF FF 00 00 00 0A 00 B2 22
68C0:  54 48 49 53 20 49 53 20 54 48 45 20 46 49 52 53
68D0:  54 20 50 52 4F 47 52 41 4D 20 4C 49 4E 45 22 00
68E0:  07 69 14 00 B2 22 54 48 49 53 20 49 53 20 54 48
68F0:  45 20 53 45 43 4F 4E 44 20 50 52 4F 47 52 41 4D
6900:  20 4C 49 4E 45 22 00 2D 69 1E 00 B2 22 54 48 49
6910:  53 20 49 53 20 54 48 45 20 54 48 49 52 44 20 50
6920:  52 4F 47 52 41 4D 20 4C 49 4E 45 22 00 00 00 0A
6930:  FF
```

FIGURE 2 - After the "new" command has been given, loactions 68BA & 68BB contain 00 00. The rest of the program is still intact. The "00" byte we are looking for in this case is at location 68DF, and the LOCATION of the byte following 68DF is what we want to insert into 68BA and 68BB. Note that in our listings the "zero" is eliptical, while the "OH's" are more round.



NOTE - There is a sign above my desk and it says: "CHECK EVERYTHING FIVE TIMES BEFORE YOU PRINT!!". On the fourth or fifth time on this idea, it bombed! This article as written, works fine if you type in the 3 line program exactly. On longer programs it may or may not run as described, ie., our Android Nim is 16K, and we got it back to list, but it gave undefined line numbers when asked to run. Another 4k program came back to life, listed and ran ok. Rather than scrap this article we will run it and hope some astute reader will find the time to examine this further and report their findings. It continues to nag us and we will work on it too. .....Ed.

TEXT80

We are calling this a "BASIC" Text Editor for two reasons. It is written in BASIC and it is very elementary, a minimum effort to get the job done. Among its finer attributes is the fact that there are no long lists of sub-commands for you to memorize. The versatility of it is provided by you, and how you use it.

This is a line oriented text editor. It is set up to create one or two columns of print on a page. The two columns are labeled "L" for left column, and "R" for right column. When composing the text on the screen you type the left column first, and then the right column. The printer will print across both columns though, first line of left column then first line of the right column.

Both columns are right and left justified, and there is provision for ending a line in the middle of a column space without having few words streched over the entire space.

You can examine the entire text by scrolling through it, during which column and line numbers are displayed before each line. This allows you to pick out those lines which need to be edited.

In the EDIT TEXT option you can enter the column and line number and that line will be displayed. You can then re-type the line, and it will automatically be re-justified and put back into its proper place.

Typing 3 spaces after any line will over-ride the right justification and will leave that line left justified.

If you type a line over 48 characters long, the editor will ask you to redo the line, and give you that same line number again. We used a felt tip pen to lightly inscribe a dotted line at the 48th character position on the screen to give a guide to work toward. It is a kludge, but it works.

Perhaps the best thing that can happen to this program would be an automatic carriage return on the 49th character. Then you could add hyphenation, and automatic elimination of a partial word that cannot be hyphenated - (It never seems to end, does it?)

You may delete lines from the text, and the following text will "close up" to fill the space left empty by it. As it stands now though, you may not insert into the text, but you can add to the end of either column.

The column lengths are set at 99 lines max, but you can use as many as you need. The 99 maximum should be enough for most applications, since a normal page will contain about 67 lines, and you can fill a legal size easily with less than 99 lines.

If you are using the TRS-80 line printer, you can vary the pitch and make your columns as wide or small as you like (within limits of the printer). It is also possible to use only the left column, then spread it out across the entire 8 inch page.

Text may be saved on disk at any stage of its completion, and called back and more work done on it later, then re-saved with its same name or a new name. The entire text of our Issue #1 was stored on a disk for example, and there was room left over. Well, it really wasn't that big a deal!

When you save a text on disk the program will ask you for a name and number for the file. Just as a matter of form, we always assign

a number after the name, so that when you look at the disk directory, you will know which file it occupies.

When the file is being written onto the disk, it scrolls across the screen. (Nice to have that little bit of reassurance).

Since writing this article, we have acquired a SELECTRA-PRINT. It does not have variable pitch, consequently,we have modified this program so that various column widths may be easily selected.This article is being re-written using two 34 character columns. The program is set up to to 34, 40, 48 and 62 character columns.

In our case, these various column sizes are necessary when we photo-reduce to our normal page size for 80-US.

```
5 REM * TEXT 80 - A BASIC TEXT EDITOR - (C)1978 80-NW PUBLISH-
   ING, TACOMA, WA * CREATED FOR 80-NW BY KRISTI SCHMIDT *
10 CLS:CLEAR10000:DIMA$(99):DIMB$(99)
20 CLS:PRINT@14," * * T E X T 8 0  I N D E X * *"
30 PRINT
40 PRINT" TYPE 1 TO CREATE A TEXT"
50 PRINT" TYPE 2 TO SCROLL THRU ENTIRE TEXT"
60 PRINT" TYPE 3 TO EDIT TEXT"
70 PRINT" TYPE 4 TO SAVE TEXT ON DISK"
80 PRINT" TYPE 5 TO LOAD TEXT FROM DISK"
90 PRINT" TYPE 6 TO LINE PRINT TEXT"
94 PRINT" TYPE 7 TO ADD TO AN ALREADY EXISTING TEXT"
96 PRINT" TYPE 8 TO DELETE FROM THE TEXT"
100 INPUTQ:ONQGOTO150,700,800,1000,1200,1400,1500,1800
150 PRINT"RULES--
152 INPUT"HOW MANY CHARACTERS PER COLUMN,34,40,48 OR 62";QZ
154 IFQZ=34THENQX=36
155 IFQZ=40THENQX=43
156 IFQZ=48THENQX=52
158 IFQZ=62THENQX=63
160 PRINT"IF YOU ARE ENDING A PARAGRAPH, BE SURE TO TYPE AT LEAST"
170 PRINT"3 SPACES AFTER THE PERIOD."
190 PRINT"COLUMN LENGTH IS 99 LINES MAX, ON LINE 99 OR LESS,"
200 PRINT"TYPE ZZZZ TO END THE COLUMN"
210 FORI=1TO99
215 PRINT"L";I;:LINE INPUTA$
220 IFLEFT$(A$,2)="ZZ"THEN P1=I:GOTO300
230 GOSUB500
240 IFZ<>1THEN280
250 PRINT"LINE TOO LONG, REDO"
260 Z=0:FORC=1TO200:NEXTC
270 GOTO215
280 A$(I)=A$
290 NEXTI
300 INPUT"LEFT COLUMN ENDED, ENTER TO CONTINUE WITH RIGHT COL";X
310 FORI=1TO99
320 PRINT"R";I;:LINE INPUTA$
325 IFLEFT$(A$,2)="ZZ"THENP2=I:GOTO400
330 GOSUB500
340 IFZ<>1THEN380
350 PRINT"LINE TOO LONG, REDO IT"
360 Z=0:FORC=1TO200:NEXTC
370 GOTO320
380 B$(I)=A$
```

```
390 NEXTI
400 INPUT"RIGHT COLUMN FULL, PUSH ENTER FOR INDEX";
410 GOTO20
415 END
500 IF LEN(A$)>QZTHEN630
510 IFLEN(A$)=QZTHEN640
520 D=INSTR(A$,"   ")
530 IFD<>0THEN640
540 W=QZ-LEN(A$)
545 Y=6
550 FORK=1TOW
560 J=INSTR(Y,A$," ")
570 A1$=LEFT$(A$,J)
580 S=(LEN(A$)-J)
590 A2$=RIGHT$(A$,S)
600 A$=A1$+" "+A2$
610 Y=Y+6:NEXTK
620 GOTO640
630 Z=1
640 RETURN
700 CLS:FORI=1TOP1:PRINT"L";I;A$(I):NEXT
710 FORI=1TOP2:PRINT"R";I;B$(I):NEXT
730 INPUT"TO SEE INDEX, PUSH ENTER";X:GOTO20
800 CLS:PRINT"ENTER THE COLUMN AND LINE NUMBER YOU"
805 S$=" ":Y1=0
810 PRINT"WISH TO EDIT, SEPARATED BY A COMMA  (L,3)";:INPUTS$,Y1
820 PRINT"THE LINE IS:"
830 IFS$="R"THEN850
840 PRINT"L";Y1;A$(Y1):GOTO860
850 PRINT"R";Y1;B$(Y1)
860 PRINT"RETYPE THE LINE"
870 IFS$="R"THEN890
880 PRINT"L";Y1;:LINE INPUTA$(Y1):GOTO892
890 PRINT"R";Y1;:LINE INPUTB$(Y1)
892 IFS$="R"THEN894
893 A$=A$(Y1):GOTO895
894 A$=B$(Y1)
895 GOSUB500
896 IFS$="R"THEN898
897 A$(Y1)=A$:GOTO900
898 B$(Y1)=A$
900 PRINT"THE LINE NOW READS:"
910 IFS$="R"GOTO930
920 PRINT"L";Y1;:PRINTA$(Y1):GOTO940
930 PRINT"R";Y1;:PRINTB$(Y1)
940 INPUT"TYPE 1 FOR ANOTHER LINE, 0 FOR INDEX";X
950 IFX=1THEN800ELSE20
1000 CLS:PRINT"BE SURE YOU DO NOT DUPLICATE FILE NAMES!!"
1005 PRINT"MAKE # FOL FILE NAME SAME AS FILE #"
1010 INPUT"OUTPUT TO DISK, WHAT IS FILE NAME";AA$
1020 INPUT"WHAT IS FILE NUMBER";BB
1030 OPEN"O",BB,AA$
1035 PRINT#BB,P1
1040 FORI=1TOP1
1050 PRINT#BB,A$(I)
1060 PRINTA$(I)
1070 NEXTI
```

Tired of typing?
This and most other programs in this issue are available in Level II cassettes or disk-- see page 31.

```
1072 PRINT#BB,P2
1074 FORI=1TOP2
1076 PRINT#BB,B$(I)
1078 PRINTB$(I)
1080 NEXTI
1110 CLOSE BB
1120 PRINT"FILE ";BB; "CLOSED ON DISK, PUSH ENTER FOR INDEX"
1130 INPUTX:GOTO20
1200 CLS:PRINT"INPUT FROM DISK, # FOL FILE NAME IS SAME AS FILE #"
1210 INPUT"WHICH FILE NAME DO YOU WANT TO LOAD";AA$
1220 INPUT"WHAT IS THAT FILE'S NUMBER";BB
1230 OPEN"I",BB,AA$
1235 INPUT#BB,P1
1240 FORI=1TOP1
1250 LINE INPUT#BB,A$(I)
1252 NEXTI
1254 INPUT#BB,P2
1256 FOR I=1TOP2
1258 LINE INPUT#BB,B$(I)
1260 NEXTI
1290 CLOSEBB
1295 INPUT"DONE, PUSH ENTER FOR INDEX";X:GOTO20
1400 CLS:INPUT"ENTER34,40 OR 48 CHAR COL, FOR 62 CHAR JUST ENTER";QZ
1402 IFQZ=34THENQX=36
1403 IFQZ=40THENQX=43
1404 IFQZ=48THENQX=52
1406 CLS:IFPEEK(14312)>127THEN1410ELSE1420
1410 PRINTCHR$(23)"TURN ON THE PRINTER!"
1420 PRINT"PUSH ENTER TO START PRINTING";:INPUTX
1430 CLS
1440 IFR>LTHENN=RELSEN=L
1450 FORI=1TOP1
1460 LPRINTTAB(0)A$(I);TAB(QX)B$(I)
1470 NEXTI
1480 INPUT"TO RETURN TO INDEX, PRESS ENTER";X
1490 GOTO20
1500 PRINT"LEFT OR RIGHT COLUMN, ENTER L OR R ";:INPUTE$
1520 IFE$="L"THENHJ=P1ELSEHJ=P2
1530 IFE$="L"THENQW$="LEFT"ELSEQW$="RIGHT"
1540 PRINT"THE ";QW$;" COLUMN HAS ";HJ-1;"LINES, START ON LINE ";HJ
1550 IFE$="L"THEN
1560 FORI=HJTO99
1570 IF E$="L"THEN1590
1580 PRINT"R";I;:GOTO1600
1590 PRINT"L";I;
1600 LINEINPUTA$
1610 IFLEFT$(A$,2)="ZZ"THEN1730
1635 GOSUB500
1640 IFZ<>1THEN 1680
1650 PRINT"LINE TOO LONG, REDO"
1660 Z=0:FORC=1TO200:NEXTC
1670 GOTO1570
1680 IFE$="L"THEN1700
1690 B$(I)=A$:GOTO1710
1700 A$(I)=A$
1710 NEXTI
1730 IFE$="L"THEN1750
```

```
1740 P2=I:GOTO1760
1750 P1=I
1760 INPUT"ENTER FOR INDEX";X
1770 GOTO20
1800 PRINT"IN WHICH COLUMN DO YOU WANT TO DELETE?"
1810 INPUT"ENTER R OR L ";E$
1820 INPUT"ENTER THE BEGINNING LINE #";S
1830 INPUT"ENTER THE ENDING LINE # (INCLUSIVE)";E
1860 FORI=STOE
1870 IFE$="L"THEN1890
1880 B$(I)=" ":GOTO1900
1890 A$(I)=" "
1900 NEXTI
1910 IFE$="L"THEN IO=P1ELSEIO=P2
1915 C=1
1920 FORI=STOIO-(E-S-1)
1930 IFE$="L"THEN1950
1940 B$(I)=B$(E+C):GOTO1960
1950 A$(I)=A$(E+C)
1960 C=C+1
1970 NEXTI
1980 IFE$="L"THEN2000
1990 P2=P2-(E-S+1):GOTO2010
2000 P1=P1-(E-S+1)
2010 INPUT"ENTER TO CONTINUE";X:GOTO20
```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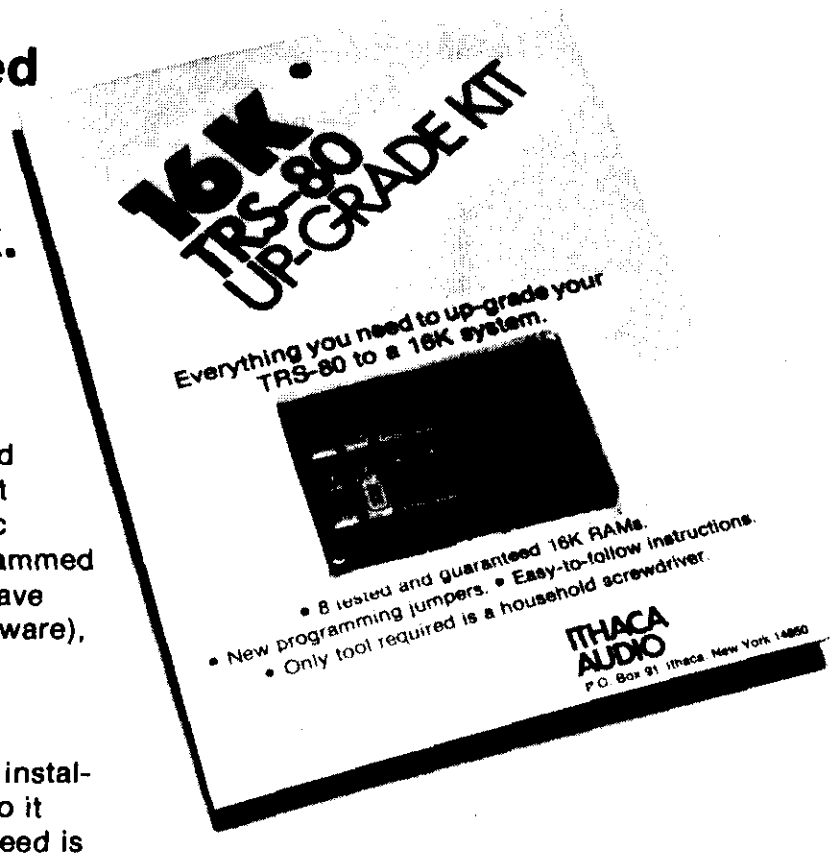

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MATH DRILL A LA KING

By T.R. Dettmann

Although the following article and program are interesting and fun, it is presented primarily to stimulate new Level I owners into doing programming on their own.

Terry has left out GOSUBS and GOTO's and still gets quite an effect from his program. The article and description which go along with it are designed to be more "tutorial" than a "finished" program. The challenge to fit it into a 4K Level I should also be of interest to "new" owners...Ed.

Radio Shack offers a math drill program for use with the TRS-80 that is designed to enable you to interest your children in learning. having tried it in a store, I was unimpressed and felt that I could do better, especially in the area of making the program interesting for my eight year old son. The program in the listing is the result. It is written for a Level I BASIC machine and as will be obvious from the start, it was written a little at a time with the concept changing as I went along. The basic thrust of the program is to provide drill in addition, subtraction, multiplication or division or a random collection of the four. Each correct answer is rewarded by some message or display that congratulates and entices the player to contine. My son has played it a number of times and it is not unusual to see him sit for hours trying to get his favorite display to come up. Since the displays are randomly selected there is no way to tell before a display comes up just which one will show up. This has proved to be an unending fascination for my son and has led him to work several hundred problems at a sitting to see what shows up.

If you adapt the program for your own use, I would recommend changing or adding to the effects regularly to keep the program fresh for your child. Nothing will lose his or her interest faster than an effect he has seen a hundred times. The effects are all set up to run in 10 steps or less and they all start from a statement with a multiple of 100 starting at 1100. Each routine returns to the main section of the program with a computed GOTO.

The program itself is simply constructed through modifications have forced some compromises in terms of programming. As you can see from the listing, it is not written in a particularly elegant style though there is a definite modularization about it. I have specifically not used subroutines for linkages to various parts of the program because I was interested in how I could accomplish the program without them. In addition, the program mixes Level I abbreviations with non-abbreviated statements with no good reason other than the day I started, I was playing with abbreviations and by the day I finished, I decided that I should learn to program without them since my Level II system is on it's way. Anyone could, with a little reprogramming, change the program to fit in less memory though as it stands it only requires 4200 bytes. Putting in abbreviations where I have none would easily cut it down to the size where it could fit in a Level I machine with 4K (you only have to eliminate 617 bytes of storage).

In each of the drill modules, it can be seen that there is a wrong answer module that prints a message that the answer was wrong and then returns to the input line for another try. Space could be saved by using a GOSUB to an error routine instead of repeating the statements each time, but it works nicely as it is and so I have not taken the time to make the admittedly more elegant modification. For the addition and subtraction, there has been no attempt to align the figures in the columns so that results that look like this are possible:

```
What is 20
      + 5
```

This can be bothersome. A possible solution is to test the two numbers and generate the TAB by adding or subtracting spaces depending on whether the number is greater or less than two (or three or four) digits. A modification which will accomplish this for maximum numbers less than 100 for the addition module is the following:

```
14 E=20:F=20
15 IF A>=10 THEN E=19
16 IF B>=10 THEN F=19
20 P."WHAT IS";T.(E),A
22 P.T.(17),"+";T.(F),B
```

A similar modification for the other modules will accomplish the task there.

Many other modifications will suggest themselves to the astute reader (that sounds a little like the textbooks that used to say 'it is obvious to the most casual observer').

The program will delight someone who has never had a chance to play with a computer, even my adult guests in the house are fascinated by the random rewards and will often refuse to leave as long as I tell them that they haven't yet hit all of the rewards.

Going over the program section by section, we see the basic structure of the program:

Statements
1-8 print the menu for the program and ask for the player's name, the type of drill desired, and max number of arguments. An answer of 9999 ends the game.
9 directs the program to the module for type of drill desired.
10-60 are the addition module.
200-267 subtraction module, note statement 205 which assures numbers selected will not give results less than zero.
603-670 division module, statement 605 assures that the numbers selected will give only integer results.
800-810 randomly select from addition, subtraction, multiplication or division.
1000-1040 randomly chooses a reward message.
1100-2630 provides rewards in the form of graphics displays, printed messages, or just odd, unusual displays. In some cases the person's name is included on the display.
9900-9999 when an answer of 9999 is given to any problem, control transfers to statement 9900 which prints the values of the counters R (the number right) and W (number wrong) and computes a grade with 100 being a perfect score.

```
1 CLS:P."CHOOSE THE TYPE OF DRILL YOU NEED":R=0:W=0
2 P.T.(20),"1. ADDITION":REM * (C)1978 T.DETTMANN *
3 P.T.(20),"2. SUBTRACTION"
4 P.T.(20),"3. MULTIPLICATION"
5 P.T.(20),"4. DIVISION"
6 P.T.(200),"5. COMBINATION OF ALL":P.:P."ANSWER OF 9999
  ENDS GAME":P.
7 INPUT "WHAT IS YOUR NAME";A$:P."OK ";A$
8 INPUT"SELECT   THE TYPE OF DRILL";X:INPUT"SELECT THE MAXIMUM
  NUMBER";Z
9 ON X GOTO 10,200,400,600,800
10 CLS:A=RND(Z):B=RND(Z)
20 P."WHAT IS";TAB(20);A
22 P.T.(17);"+";TAB(20);B
24 P.T.(17);"--------"
30 INPUT C
32 IF C=9999THEN9900
40 IF C=A+BT.1000
50 P."SORRY ";A$;" BUT ";C;" IS WRONG"
52 W=W+1
55 F.I=1TO500N.I
60 GOTO30
200 CLS:A=RND(Z):B=RND(Z)
205 IF(A-B<0)T.200
210 P."WHAT IS";TAB(20);A:P.T.(17);"-";TAB(20);B
220 P.T.(17);"--------":INPUT C
230 IF C=9999T.9900
240 IF C=A-BT.1000
250 P."SORRY "A$;" BUT ";C;" IS WRONG"
260 P."TRY AGAIN":W=W+1:INPUT C:GOTO230
400 CLS:A=RND(Z):B=RND(Z)
410 P."WHAT IS";TAB(20);A
420 P.T.(17);"X";TAB(20);B
430 P.T.(17);"--------"
440 INPUT C
```

```
450 IF C=9999T.9900
460 IF C=C*BT.1000
470 P."SORRY " ;A$;" BUT ";C;" IS WRONG"
480 W=W+1
490 F.I=1TO500:N.I
500 G.440
600 CLS:A=RND(Z):B=RND(Z)
605 D=A/B:F=D-INT(D):IFF=0T.610
607 GOTO600
610 P."WHAT IS";TAB(20),A:P.T.(20),"----":P.T.(20),B
630 INPUT C
640 IF C=9999T.9900
650 IF C=A/BT.1000
660 P."SORRY ";A$;" BUT ";C;" IS WRONG"
665 W=W+1
670 GOTO630
800 CLS:E=RND(4)
810 ON E GOTO 10,200,400,600
1000 U=RND(3)
1001 CLS
1002 ON U GOTO 1020,1030,1040
1010 P."ERROR EXIT":STOP
1020 Y=RND(6):ON Y GOTO 1100,1200,1300,1400,1500,1600
1030 Y=RND(6):ON Y GOTO 1700,1800,1900,2000,2100,2200
1040 Y=RND(4):ON Y GOTO 2400,2500,2600
1100 P."CONGRATULATIONS ";A$
1110 P."YOU GO TO THE HEAD OF THE CLASS TODAY"
1120 P."LETS TRY ANOTHER"
1130 F.I=1TO2000: N.I
1132 R=R+1
1140 ON X GOTO 10,200,400,600,800
1200 P."FASCINATING SAYS MR SPOCK"
1210 P."I COULD NOT HAVE DONE BETTER MYSELF"
1220 P."EVEN WITH ALL OF THE ENTERPRISE COMPUTERS"
1230 P."TO HELP ME.  CONGRATULATIONS ";A$
1240 P."CAN YOU DO IT AGAIN?"
1250 F.I=1TO2000:N.I
1252 R=R+1
1260 ON X GOTO 10,200,400,600,800
1300 P."WOW!!!!!!!!!!!!!"
1310 P."BET YOU CAN'T DO THAT AGAIN!"
1320 F.I=1TO2000:N.I
1322 R=R+1
1330 ON X GOTO 10,200,400,600,800
1400 P."CHEWBACCA SAYS, 'ARRRRGH'"
1410 P."THAT'S CONGRATULATIONS FROM THE WOOKIE"
1420 P."TRY YOUR LUCK AGAIN"
1430 F.I=1TO2000:N.I
1432 R=R+1
1490 ON X GOTO 10,200,400,600,800
1500 P."BAH! YOU COULDN'T DO THAT AGAIN IN A MILLION"
1510 P."OR EVEN A MILLION MILLION YEARS COULD YOU?"
1520 P."GO AHEAD, SHOW ME YOU CAN (BET YOU CAN'T)"
1530 F.I=1TO2000:N.I
1532 R=R+1
1590 ON X GOTO 10,200,400,600,800
```

```
1600 P."GOOD LUCK FOR YOUR NEXT TRY.  DO YOU THINK"
1610 P."YOU CAN OUTGUESS ME?"
1620 P."                                        THE COMPUTER "
1630 F.I=1TO2000:N.I
1632 R=R+1
1690 ON X GOTO 10,200,400,600,800
1700 P."AWWWWWWWWW, YOU GOT IT RIGHT"
1710 P."I'LL BEAT YOU NEXT TIME ";A$
1720 F.I=1TO2000:N.I:R=R+1
1730 ON X GOTO 10,200,400,600,800
1800 P."THAT'S NOT FAIR"
1810 P."YOU CHEATED ME THAT TIME"
1820 P."TRY AGAIN AND LETS SEE IF YOU CAN DO IT OVER"
1830 F.I=1TO2000:N.I:R=R+1
1840 ON X GOTO 10,200,400,600,800
1900 F.I=1TO47:P.T.(I),"*";TAB(48-I),"*":N.I
1910 P."BEAUTIFUL KIDDO"
1920 P."I'M PROUD OF YOU"
1930 F.I=1TO2000:N.I:R=R+1
1940 ON X GOTO 10,200,400,600,800
2000 F.I=1TO20:P.T.(I),"PRETTY NEAT KIDDO":N.I
2005 F.I=1TO2000:N.I:R=R+1
2010 ON X GOTO 10,200,400,600,800
2100 F.I=1TO47:P.T.(I),A$;" DID IT":N.I
2110 F.I=1TO2000:N.I:R=R+1
2120 ON X GOTO 10,200,400,600,800
2200 F.I=1TO40S.2:P.T.(I),"WOW!!!!!":N.I
2210 F.I=1TO2000:N.I:R=R+1
2220 ON X GOTO 10,200,400,600,800
2300 F.I=1TO100:M=RND(127):N=RND(46):SET(M,N)
2305 F.J=1TO20:N.J:R.(M,N):N.I
2310 P.AT470;"GREAT JOB ";A$:F.I=1TO2000:N.I
2315 R=R+1
2320 ON X GOTO 10,200,400,600,800
2400 CLS:F.I=1TO50:M=RND(900):P.ATM;A$:N.I
2410 F.I=1TO2000:N.I:R=R+1
2420 ON X GOTO 10,200,400,600,800
2500 F.M=36TO53:S.(M,11):S.(M,12):N.M
2510 F.N=13TO20:F.M=42TO47:S.(M,N):N.M
2520 F.M=66TO69:S.(M,N)
2530 N.M:IFN<18T.2550
2540 O=61:IFN>18T.O=65:F.M=58TOO:SET(M,N):N.M
2550 N.M
2560 F.M=62TO73:S.(M,11):S.(M,12):N.M
2570 F.I=1TO2000:N.I:R=R+1
2580 ON X GOTO 10,200,400,600,800
2600 F.M=1TO127:N=0.3*M:S.(M,N):N.M
2610 P.AT710;"OK TURKEY, LET'S SEE YOU DO THAT AGAIN!"
2620 F.I=1TO2000:N.I:R=R+1
2630 ON X GOTO 10,200,400,600,800
9900 P."YOUR SCORE IS ";R;"RIGHT"
9910 P.T.(13),W;" WRONG"
9920 P.:P."YOUR FINAL GRADE THEN IS ";(R/(R+W))*100
9930 P.:P."SEE YOU LATER ";A$
9999 END
```

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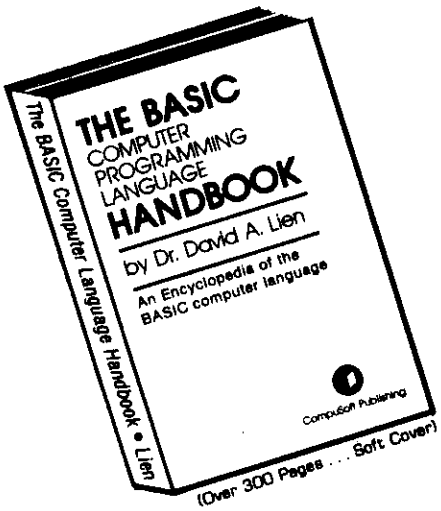

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Radio Shack's TRS-80 Technical manual by T.R. Dettmann

The technical manual for the TRS-80 is now out, and it is clearly a superb addition to your TRS-80 technical library. This manual has been written by a technician for technicians and others with the technical knowledge of computer circuits that would enable them to make their own repairs to their TRS-80 or modify it to meet their needs. If you feel at home with an oscilloscope or a VTVM and can read schematics, then this book is a must if you are to get the most out of your computer. If you don't know a NAND from a NOR gate, or if you think a Video Divider Chain is something found on a bicycle, then this is definitely *not* the book for you. Available from most Radio Shack stores under catalog number 26-2103 (*TRS-80 Micro Computer Technical Reference Handbook, $9.95*) the book will be a great help to those who want to adapt their systems to fit their needs for a microprocessor by adding peripheral equipment to one of the 256 input-output ports or constructing memory mapped control devices as well as those who want to be able to do their repairs themselves without having to go to a Radio Shack Service Center. The book is written in a solid, no nonsense fashion by someone (who isn't given credit for his work on the cover of the book) who is obviously at home with his equipment and has suffered through the growing pains of troubleshooting a new system with only the schematics in hand. After a general block diagram introduction to the system, he lays out the detailed theory of operation of all the parts of the system including the Level II ROM's. After the ground work is laid, he goes on with troubleshooting and adjustments, and then into how to interface the computer with the outside world. He explains nicely the relative differences as well as the advantages and disadvantages of memory mapped vs. port based devices. Working from this section you could control your house with either BASIC or Assembly Language. At the end of the book he provides fold out schematics for the TRS-80 system that will delight anyone who likes schematics. My only objection to them is the fact that much of the schematic is hidden by the pages when it is folded out since he didn't leave a blank page for binding. This requires you to flip the books pages back and forth if you are looking at the connection to the Z80 microprocessor chip for example.

When you get your book, it is best to start reading before you confuse yourself with the schematics. You could easily be confused by noting that there are only 7 address lines for the 4K RAM instead of the 12 you expect. Even more disconcerting is the fact that instead of seeing the keyboard set up to produce ASCII, you find the keys shorting an address line to a data line. Have patience, all is explained in the text, though it is assumed that you have a solid grounding in digital circuitry before you start. Once you get started you find that the CPU thinks that the keyboard is actually memory and not a keyboard. It turns out that it is scanned like a calculator keyboard and that ROM software does the conversion to ASCII code.

If you are just starting out in computers, you should first read through one of the many books available that help you understand digital circuitry before you tackle this manual. It is pretty steep for the beginner who has only a passing knowledge of digital circuits.

In the final analysis, I am impressed by the book, its readability (for the technically minded person anyway), and the general approach to the subject. If you are an expert with computer circuitry, you will have to wade through a lot of extraneous background material to get to the really important material hidden behind all the explanations, but for those who are comfortable with technical material and can understand such phrases as "Z25, pin 4, is tied to IN*.", this manual will become a friend when it comes to understanding the operation of your TRS-80.

hangups

We didn't really anticipate the flood of mail on this one! Since there were so many similar problems we will give a "group" answer.

About one third of all the mail received was, in one way or another, concerning the following symptoms:

Disk "re-boots" itself unexpectedly.

Characters in program change, causing Syntax Errors.

System "locks out" after enter is pushed.

The solution to these problems is called the "BOM Active Cable fix". It consists of a buffered cable between the keyboard and the expansion interface, and adds line drivers and some terminating resistors. The expansion interface is modified in this fix, and a new ribbon connector is supplied. Units so modified will NOT be compatable with units not modified, ie., if you use the new ribbon connector cable with an un-modifed expansion interface, the Screen Printer will no longer be useable.

If this is your problem, talk to your local store manager, there may or may not be a small fee, depending on warranty, your own modifications, etc. Ours does it only when using a ten-key electric adding machine nearby, so we are going to leave well-enough alone.

Another third of the letters were on tape loading problems. You know the symptoms on this one. The volume setting is very critical, especially on machine language tapes and on some mass produced basic program tapes. There is a Radio Shack fix for this one too, this time in the keyboard unit. It adds 3 chips and a couple of diodes, and is supposed to clean up the signal and widen the "window" for the pulses. We haven't seen this in action yet, but have heard that it works. Again, talk to your local store manager, and again, there may or may not be a small fee involved.

Frank Fourqurean at Peterson AFB CO wants to know if he can use the 4K chips which came out when he went to 16K. The answer is no, at least not in the TRS-80 or expansion interface. You might collect them (there must be a lot of them around) and build some other "homebrew" project with them.

A gentleman from Utah called to say that ever since he had Level II installed, his display on the video was way off center, to the right. He wondered why this should happen, since the video was not sent along for the conversion.

It turns out that vertical and horizontal centering is controlled by two pots on the CPU board in the keyboard. They are small pots with the little plastic "wheel", and presumably, during the conversion, one of them got itself turned slightly.

While on this subject, it may be well to mention that the horizontal and vertical adjustment program in the new Tech Reference Handbook (page 76) has a

(Continued on page 36)

TRS-80 TM Mods

1 Upper/Lower Case
installed with switch between "jibberish" and standard Level II. With software for Level II to turn "jibberish" into properly displayed data.

2 Level I/II
installed in same machine switch selected.

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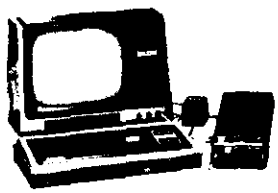

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```
10 RANDOM:'(C)1978 80-NW PUBLISHING - CREATED BY KRISTI -
15 C=0
20 CLS:P=0
30 PRINT"              E R O D E"
40 PRINT"THE OBJECT OF THIS GAME IS TO COMPLETELY"
50 PRINT"ERODE THROUGH THE WALL TO THE RIGHT OF THE "
60 PRINT"SCREEN, YOU CAN DO THIS BY HITTING IT WITH "
70 PRINT"THE LITTLE MOVING DOT.  YOU CAN CHANGE THE"
80 PRINT"DIRECTION OF THE DOT BY USING THE ENTER AND"
90 PRINT"THE SPACE BAR. ENTER MAKES THE DOT CHANGE "
92 PRINT"DIRECTION 45 DEGREES CLOCKWISE AND SPACE"
94 PRINT"MAKES IT CHANGE 45 DEGREES THE OTHER WAY"
96 PRINT"TRY TO BEAT THE HIGH SCORE SO FAR WHICH IS ";HS
98 PRINT"ACHIEVED BY ";NM$;".  ENTER YOUR SKILL RATING"
100 PRINT" 1 FOR SUPER PRO"
110 PRINT" 2 FOR PRO"
120 PRINT" 3 FOR AVERAGE"
130 PRINT" 4 FOR BEGINNER"
140 INPUTW
150 W=W*100:CLS
160 PRINT"      SECONDS          CHANGES LEFT           DESTROYED"
165 I=10000
170 FORY=6TO47:FORX=95TO115
180 SET(X,Y):NEXTX:NEXTY
200 X=15:FORY=6TO47:SET(X,Y):NEXTY
205 X=127:FORY=6TO47:SET(X,Y):NEXTY
210 X=RND(70):Y=RND(40)
220 IFX<20THEN210
225 IFY<10THEN210
230 SET(X,Y)
270 J=RND(8)
290 ONJGOTO300,400,500,600,700,800,900,1000
300 IFX=16THEN1120
310 IFPOINT(X-1,Y)=0THEN330
320 RESET(X-1,Y):P=P+1:PRINT@40,P:GOTO700
330 RESET(X,Y):X=X-1:I=I-1:SET(X,Y)
335 PRINT@0,I
336 IFI=0THEN1150
340 Z$=INKEY$:IFLEN(Z$)=0THEN300
342 C=C+1
343 IFW-C=0THEN1150
345 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
350 IF ASC(Z$)=32THEN1000
360 IF ASC(Z$)=13 THEN400
370 GOTO300
400 IFY=6THEN1000
410 IFX=16THEN600
420 IFPOINT(X-1,Y)=0THEN440
430 RESET(X-1,Y):P=P+1:PRINT@40,P:GOTO600
440 IFPOINT(X,Y-1)=0THEN460
450 RESET(X,Y-1):P=P+1:PRINT@40,P:GOTO1000
460 RESET(X,Y):X=X-1:I=I-1:Y=Y-1:SET(X,Y)
465 PRINT@0,I
466 IFI=0THEN1150
470 Z$=INKEY$:IFLEN(Z$)=0THEN400
474 C=C+1
475 IFW-C=0THEN1150
477 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
```

USR (GROUP)

The TRS-80 User group of Spokane, WA meets the 2nd Wednesday of each month at 7:30 pm at West 818 Riverside, that's the Lincoln Mutual Savings Bank, Mezzanine, Room A. Contact John G[illegible]r at (509)326-4539.

```
480 IF ASC(Z$)=32THEN300
485 IF ASC(Z$)=13THEN500
490 GOTO400
500 IFY=6THEN900
510 IFPOINT(X,Y-1)=0THEN530
520 RESET(X,Y-1):P=P+1:PRINT@40,P:GOTO900
530 RESET(X,Y):I=I-1:Y=Y-1:SET(X,Y)
535 PRINT@0,I
536 IFI=0THEN1150
540 Z$=INKEY$:IFLEN(Z$)=0THEN500
544 C=C+1
545 IFW-C=0THEN1150
547 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
550 IF ASC(Z$)=32THEN400
560 IF ASC(Z$)=13THEN600
570 GOTO500
600 IFY=6THEN800
610 IFX=126THEN400
620 IFPOINT(X,Y-1)=0THEN630
625 RESET(X,Y-1):P=P+1:PRINT@40,P:GOTO800
630 IFPOINT(X+1,Y)=0THEN640
635 RESET(X+1,Y):P=P+1:PRINT@40,P:GOTO400
640 RESET(X,Y):X=X+1:I=I-1:Y=Y-1:SET(X,Y)
645 PRINT@0,I
646 IFI=0THEN1150
650 Z$=INKEY$:IFLEN(Z$)=0THEN600
654 C=C+1
655 IFW-C=0THEN1150
657 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
660 IF ASC(Z$)=32THEN500
670 IF ASC(Z$)=13 THEN700
680 GOTO600
700 IFX=126THEN300
710 IFPOINT(X+1,Y)=0THEN730
720 RESET(X+1,Y):P=P+1:PRINT@40,P:GOTO300
730 RESET(X,Y):X=X+1:I=I-1:SET(X,Y)
735 PRINT@0,I
736 IFI=0THEN1150
740 Z$=INKEY$:IFLEN(Z$)=0THEN700
744 C=C+1
745 IFW-C=0THEN1150
747 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
750 IF ASC(Z$)=32THEN600
760 IF ASC(Z$)= 13 THEN 800
770 GOTO700
800 IFY=47THEN600
810 IFX=126THEN1000
820 IFPOINT(X+1,Y)=0THEN830
825 RESET(X+1,Y):P=P+1:PRINT@40,P:GOTO1000
830 IFPOINT(X,Y+1)=0THEN840
835 RESET(X,Y+1):P=P+1:PRINT@40,P:GOTO600
840 RESET(X,Y):X=X+1:I=I-1:Y=Y+1:SET(X,Y)
845 PRINT@0,I
846 IFI=0THEN1150
850 Z$=INKEY$:IFLEN(Z$)=0THEN800
854 C=C+1
855 IFW-C=0THEN1150
```

(Hang Ups continued from page 33)

misprint. Line 60 of that program says to set (27,Y) and should be set (127,Y).

To all those who had problems converting Bowling to level II last issue (we received many 'corrected' versions), the answer is in this issue. We are re-running it in it's authentic Level II version, and it now includes keeping your average.

For Tim, West Palm Beach, Fl: There is no way, with the stock equipment, to save a machine language program on disk. You can do it with some, if they start above 7000 Hex. The other way to do it is with Small System's Software RSM.

D. Stambaugh, Fountain Valley CA wants to know why he cannot get his 779 printer to print a single line feed without saying LPRINT" ". We don't know Dave, they are all that way. You can also use 'LPRINTSTRINGS$ (138) or LPRINTSTRINGS$(x,138), where x = number of linefeeds you would like. We have a SELECTRA-PRINT here now, and it does line feed on LPRINT.

For the many who's cassette motor will not turn off: take it back (the keyboard unit) and get a new relay put in.

Last, but not leeeeest - (that's the symptom). The answer should be the "Debounce" tape which will be out shortly.

Thanks for all the interesting comments, this column will be fun (and helpful, we hope). ...Tom & Mike

UNCLASSIFIED

TRS-80 DISKETTES/Major Brand: Single $4.50 Ea two sided $6.00. Programs listed 50¢/page. Business programs. All prices plus applicable taxes and shipping. Wm S Pitt & Associates, PO Box GH, Pacific Grove, CA 93950

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TRS-80 YELLOW PAGE on hardware & software. Send $1.00 plus 2 SASE for 2 issues. Vendors send $20. & product description. 96 Dothan St. Arlington, MA 02174.

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OWNERS OR USERS of TRS-80 L2 or DOS systems interested in doing community/humanitarian service drop a postcard with name, address & type equipment to Mike Freeman, 946 N Alder St. Tacoma, WA 98406.

```
857 PRINT@0,I;:PRINT@17,W-C:PRINT@40,P
860 IF ASC(Z$)=32THEN700
870 IF ASC(Z$)=13 THEN 900
880 GOTO800
900 IFY=47THEN500
910 IFPOINT(X,Y+1)=0THEN930
920 RESET(X,Y+1):P=P+1:PRINT@40,P:GOTO500
930 RESET(X,Y):Y=Y+1:I=I-1:SET(X,Y)
935 PRINT@0,I
936 IFI=0THEN1150
940 Z$=INKEY$:IFLEN(Z$)=0THEN900
944 C=C+1
945 IFW-C=0THEN1150
947 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
950 IF ASC(Z$)= 32THEN 800
960 IF ASC(Z$)= 13 THEN 1000
990 GOTO900
1000 IFY=47THEN400
1010 IFX=16THEN800
1020 IFPOINT(X,Y+1)=0THEN 1030
1025 RESET(X,Y+1):P=P+1:PRINT@40,P:GOTO400
1030 IFPOINT(X-1,Y)=0THEN1040
1035 RESET(X-1,Y):P=P+1:PRINT@40,P:GOTO800
1040 RESET(X,Y):X=X-1:I=I-1:Y=Y+1:SET(X,Y)
1045 PRINT@0,I
1046 IFI=0THEN1150
1050 Z$=INKEY$:IFLEN(Z$)=0THEN1000
1054 C=C+1
1055 IFW-C=0THEN1150
1057 PRINT@0,I:PRINT@17,W-C:PRINT@40,P
1060 IF ASC(Z$)=32 THEN900
1070 IF ASC(Z$)=13THEN300
1090 GOTO1000
1100 PRINT"CONGRATS YOU WIN !!! YOUR SCORE WAS:"
1110 GOTO1160
1120 J=RND(3)
1130 ONJGOTO700,600,800
1150 IFI=0THENPRINT"YOU RAN OUT OF TIME!!":GOTO1160
1155 IFW-C=0THENPRINT"YOU RAN OUT OF CHANGES!! NEXT TIME"
1156 PRINT"GIVE YOURSELF A LOWER SKILL RATING!!":GOTO1160
1160 SC=INT((P/820)*100)
1190 PRINT"YOUR SCORE IS:";SC
1192 IFSC>HSTHENHS=SC:GOTO1200ELSE1230
1195 END
1200 PRINT"AMAZING, BUT YOU HAVE BEATEN THE HIGHEST SCORE"
1210 PRINT"SO FAR!!  COULD WE PLEASE HAVE YOUR NAME TO"
1220 PRINT"GIVE YOU DUE CREDIT";:INPUTNM$
1230 PRINT"WOULD YOU LIKE TO PLAY AGAIN";:INPUTH$
1240 IFLEFT$(H$,1)="Y"THEN10
1250 IFLEFT$(H$,1)="N"THENPRINT"O.K. BYE!"
```

Sometime when you are just playing around with your DOS try this: In DOS basic, in command mode, type in a CMD"X", (don't leave out that comma) and then ENTER. Did you expect to see a SYNTAX ERROR? Have you tried all the combinations with the CMD? CMD"A" seems to be same as CMD"S", and CMD"E" is similar, but gives you a "NO ERROR". Get the feeling we don't really understand everything we know about DOS? -80

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All software supplied with a 32 page user manual and a program cassette for Level II or a program diskette for TRS-80 Disk Systems.

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6. Real Estate Management I	24.95	34.95
7. Real Estate Management II	24.95	34.95

User's manual on any of the above programs may be ordered for $5.00 each which cost may be applied towards the purchase of that software at a later date. Two weeks delivery. Price includes postage. Many other business/professional programs under development. Master charge/VISA accepted (Include all info on card). Order from:

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#19.	SALE-I sale analysis	$10
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BOOK REVIEW

THE BASIC HANDBOOK
BY Dr. David A. Lien

The scene is **The Johnny Carson Show.** Johnny has just read excerpts from Dr. Lien's new book, *"The Basic handbook"*. Ed McMahon then goes into his usual harangue, which always ends with: "Evveeerrrthing you want to know about basic is in that book". And Johnny replies with a: "Wrong basic breath" (or some such remark).

The foregoing scene, of course, is phoney. If it did happen though, Johnny would have to say "Right!, Basic Breath".

We don't really have to spend much time telling you who David A. Lien is. If you have TRS-80 you should be well acquainted with him from his excellent *"Users Manual for Level I"*, which came with your system.

Now Dr. Lien, a long time technical author and college dean, has done it again in the form of *"The Basic Handbook, An Encyclopedia of the Basic Computor Language"*. The "Handbook" is completely unique. There is nothing like it anywhere. Inside the back cover there is a list of 78 different types of basic. Even though the Apple and Alpha-Micro are not listed there, they are included in the book itself.

Pages 10 and 11 explain how "the handbook" is organized. Basic words, commands, functions and statements are listed, usually one per page in alphabetical order. Some of the commands take several pages, like "Print Using".

The organization is simple and easy to follow. First the word itself is shown on a small video screen. To the right of the screen you may see the word "ANSI", which means that this word is part of the proposed National Bureau of Standards Institute Minimum Basic vocabulary. Next is the word category: Then there are introductory and descriptive remarks about the word. This is followed by a test program which allows the user to enter a brief program into a computer to see if its interpreter or compiler will recognize the word and make use of it. The sample run, which follows, shows how the computer might be expected to respond to the test program. After this there are "helpful hints" which may show techniques to simplify use of the word. Next comes the section which really makes this book a must: "If Your Computer Doesn't Have It", tells you alternate ways to accomplish the same objective using other basic words when possible (it isn't always possible). So far as I am concerned, this one section makes this book an indispensable aid to programing (and converting programs). This section is followed by another, called "Variations", which shows the various ways other computers may use the same words. The last part of the description is an "also see" section, telling you which other words in basic are related to the one in question.

The "Handbook" is soft cover, contains 360 pages, and the price is $14.95 plus $1.35 postage and handling (Ca addresses add 6%). Get it at your local computer store or order direct from: Compusoft Publishing, 8662 Dent Drive, San Diego, Ca. 92119.

REVIEW OF AUTOK & QEDIT

It isn't very often you come across simple machine language utilities that are so small, do so much, and work so nice !

AUTOK stands for Auto Key, and what it does is to simply give you automatic repeat of any key you hold down. It doesn't interfere with normal typing, as it takes about a half second to take over, then repeats that key about 8 times per second. If you are repeating a shift key, you just have to hold the shift key till the repeat starts, then continue to hold the key you are repeating and let go of the shift.

Nice, you say, but necessary? Well, let's go on to QEDIT, which stands for Quick EDIT, and is on the same tape.

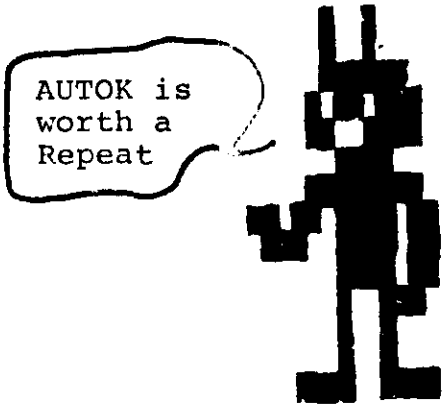
QEDIT allows you to put a cursor anywhere on the screen, regardless of what is on the screen, and using the four arrow keys, WITH AUTOK still in the machine, you can scoot that cursor around the screen like nobodys business. Then when you have the cursor where you want it you can delete, insert, and just generally do what you want to the data on the screen and it does not take effect till you press ENTER.

You get into QEDIT by pushing the CLEAR key. The CLEAR function is still there if you type CLS and ENTER. You still have the up arrow too, if you use SHIFT with it.

These two programs really work together, although they can be used separately. To load them you use the SYSTEM command (you do not have to memory size protect) and load AUTOK after which you push slash, ENTER. Then you go SYSTEM again and load QEDIT, slash, ENTER and they are in. You don't even notice them until you hold down a key too long, or push clear. To get out of QEDIT you push BREAK.

Yes, this is really nice when you are writing a program, as you can go back and make all sorts of changes to it quickly. We use it and we like it and think you will too. Aside from that, the price is just right! Available from:

Discovery Bay Software Co.
PO Box 464
Port Townsend, WA 98368



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