

**SINC-LINK**



**TIMEX-SINCLAIR USERS CLUB**

**NEWSLETTER**

**Toronto, Ontario**

## EXECUTIVE OFFICERS

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**NEWS EDITORS:** Stan Piotrowski  
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**ACTIVITY DIRECTOR:** Ian Robertson  
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Mike Mitchell

## LETTER FROM THE PRESIDENT

As I re-read my last letter I see I mentioned that a lot of members now had the TS2068 computer. At the time I was quite surprised. Since then I have become even more surprised at the amount of activity going on with users of this machine. This gives me some concern.

The concern is this. Our executive tends to be composed of the more active members, which is natural enough. However these members are also likely to be the ones who have moved to the TS2068. Therefore their interest in the ZX81-TS1000 will have waned somewhat and we, the executive, may tend to ignore the interests of those members who are ZX81 enthusiasts.

Elsewhere in our newsletter there is a memorandum which was circulated by the London T/S group which addresses the same concerns which I have for our club. I think one sentence in particular sums up the solution. To quote it: "The answer to these questions is for ZX81 members to support themselves."

I believe that, to maintain club enthusiasm for this machine, we need to have more ZX81 owners on the executive.

I will be canvassing (ZX81 owners) individually to serve on the executive, but I would like to hear from anyone who would be interested.

Because of the equal interest in the two machines, and to reduce the crowding at our meetings somewhat, it was agreed by the members that we would place more emphasis on the ZX81 at the 1st meeting of each month, and on the TS2068 at the 2nd meeting of the month. This means a member could attend only one meeting a month, and still be confident of not missing too many things pertinent to their machine. Our Library will continue to be available for both machines at every meeting however.

I would like to thank two members of our executive who have had to give up some of their executive duties because of the pressure of back-to-school studies. Chris Hart (our out-of-town members liaison), and Ian Robertson (Activity Director), both of whom have served our club well (and will continue to do so in future, I am sure).

One of our members, John Burns, is in the process of setting up a documents library of material pertinent to our machines. I think this will be very useful to members and I invite you to make full use of it. John will have a catalogue ready

shortly so you can see what is available. We welcome members' contributions to this library.

Do you have people ask you: What do you DO with your computer?. The answer to that question is simple. Just say "I muck around with it. I enjoy mucking around with it."

Well that's it for this issue. Happy mucking around in the NEW YEAR.

Yours in computing  
George Chambers  
(President)

**CLUB SURVIVAL**

by Fred Schakel, London T/S Club

The London T/S Users Club started up in April, 1982 with about 8 people. The informal meetings are held at the University of Western Ontario. Attendance increased to a maximum of about 30 by the fall of 1983. At this time, several 2068's appeared and by spring, 1984, attention was focussed on the 2068, resulting in less ZX81 activity at the meetings.

Several of our members joined the Toronto Club last summer to find a whole new world of T/S 2068 support. By the fall of 1984, only a few of the cold-weather members returned for the winter.

Now, the remaining ZX81 and T/S 1000 users are asking, "Will the London Club still support ZX81 users? Who is bringing in new programs for us?"

The answer to these questions was for ZX81 users to support themselves. There are many ways in which they could do this. Participation, contribution and involvement are required to overcome extinction of the ZX81 and T/S 1000.

After visiting the Toronto Club several times, it appears to me that this problem is not as severe there. Nevertheless, most contributions to any membership come from the most enthusiastic members and it is these same members that are likely to move up to the 2068. Following, is a short list of ways one can contribute.

Remember, you are the CLUB

- Type in programs from magazines
- Write newsletter articles
- Write to companies for info
- Invite friends to join the Club
- Give a demo
- Learn more programming
- Learn more about hardware
- Join other clubs (by mail)
- Find newest British magazines
- Pass on program ideas

**DO IT NOW! BE THE FIRST!**

## SYNCSBITS

*Ian Robertson*

**UPDATE FROM LAST ISSUE:** The Russell Electronics "Romswitch" arrived from E. Arthur Brown and it does indeed allow the user to switch between the TS2068 and the Spectrum ROMs. Those 5000 or so Spectrum programs (in the U.K.) are looking better all the time. The spare ZX81 parts (including a spare Spectrum ROM) were received from P.V. Tubes and the price list for the ZX81, ZX Printer and the Spectrum now resides in our ever-expanding Club Library.

**U.K. NEWS:** The Spectrum Plus has been released. From the three reviews that I have read it appears to contain the exact same PCB enclosed in a new "QL like" case with a QL keyboard which has 58 keys. The side-by-side pictures of both models indicates that the Plus is larger and that it has rear legs to elevate the keyboard to assist in typing. Those of us who thought that Sinclair would surely arrange with Timex to issue a U.K. version of the TS2068 were sadly mistaken. Pity! The QL is getting better press lately. It seems that the pundits are warming to this different concept. There also appears to be quite an influx of books, software and hardware from "other than Sinclair" sources. The Spectrum continues to warrant additional hardware/ software entries into the marketplace. The number of mass storage devices is amazing (disc and wafer/microdrive).

**TS2068:** The long awaited Westridge 2050 Modem "Smart Terminal 2" software has finally been released. That's the good news. The bad news is that it is only for the TS2068 and that the documentation is, to say the least, dismal. According to the latest issue (#10) of T-S Horizons the documentation is being rewritten to include a proper explanation of the uploading and downloading facilities. To bridge the gap T-S Horizons have a very good article on this subject.

### THINGS TO THINK ABOUT:

1. Maybe buying a disc interface and drive isn't such a bad idea after all. This way if you change computers the drive is still useable and the interface could be sold. Not necessarily so with a microdrive type device.
2. When is somebody going to come up with a good commercial interface to convert the TS2068 edge connector to the Spectrum configuration. Think about all that Spectrum hardware!
3. How about a good commercial overlay for the TS2068 keyboard which would allow individual labels for the more sophisticated games and business programs. Russell Electronics is purported to be looking into this matter.

**TS1000:** There are 2 more Hi-Res programs available in the U.K. from The Software Farm (who previously issued Forty Niner), one is called "Rocket Man" and the other "Z-Xtricator".

A couple of months ago one of our members, Dave Battershill from Calgary, told me about a Monitor available from Sears department stores (Note: Not their catalogue mail-order dept)

This monitor works as a regular 14-inch TV, and also provides a composite video, and an RGB input. Additionally, it has a push-button green screen capability. All this for the price of \$550 (Sometimes on sale for \$500)

I had some difficulty initially, because I could not get color on the monitor with my 2068 computer. However by adjusting some variable resistors and capacitors in the computer per an article in the magazine TIMELINEZ I was successful. I now have a monitor working in the RGB mode and it is simply marvellous. I can heartily recommend it.

I am incorporating one of Dave's letters in this article as an easy way of providing technical details of what is involved in hooking this model of monitor to your TS2068.

Copy of Dave's Letter follows:  
-----

Dear George:

Recently received the latest newsletter and found your account of the proceedings rather interesting. In the last letter to you I included two different RGB interface diagrams; the Timex-designed model and the model from E. Arthur Brown. In your account of the proceedings with the Sears monitor I am not sure that I clarified to you that I was tickled pink with the screen clarity and colors using the RGB interface and the Sears monitor in the RGB mode. In the other two modes, namely (1) TV signal (rf) using the little switch and matching box; and (2) composite video; the 2068 has to be adjusted to provide the best signal.

At the time of your phone call to me I had not received the TIMELINEZ article with the program "PATTERNS" and the adjustment procedures. I would say that every 2068 (including mine) would need these adjustments.

As received, I thought my 2068 had an acceptable screen but until I had keyed in "PATTERNS" I was unaware of the shortcomings my 2068 had in modes 1 and 2.

Re the RGB interfaces-- I have built the Timex model and it works fine with the errors to the diagram corrected as I indicated earlier. However I built it as a board to plug into the edge connector at the back of the 2068. This makes it difficult (but not impossible) to connect other peripherals such as a printer or modem. Of course the Timex model could be built on a very small board and tucked inside the computer similar to the E. Arthur Brown model. The E. Brown model would be my choice. It should be easy to build with point to point wiring, and of course if you use it with a monitor that accepts negative-going sync signals (such as the Sears model is set at the factory for) then you do not need the jumpers from IC pin 1 to IC pin 10, and IC pin 3 to IC pin 8, as these only add in another inverter each to invert the two output signals one more time each to positive polarity.

There is one other small defect that has turned up with the E. Arthur Brown model... When actually connected into the circuit and operating, the interface exhibits some unacceptable instability with the composite sync, in that single color or 2/3 color screens such as the white screen with two copyright lines, or Flight Simulator blue border, yellow screen with choices 1, 2, or 3 and Wind Effects Y or N; come up fine but have a little jiggle. However when the Flight Simulation full cockpit screen comes up, the screen

immediately skews sideways and then fades out. To correct this problem, the manufacturer advises, replace the 330 ohm resistor that is parallel to (i.e. across) the 3300 ohm resistor, with an ADJUSTABLE 10K thumbwheel pot.

I have not tried this yet but feel reasonably sure that this correction will do the trick. I show a diagram below, of the physical layout of the E.A.B. model. (top side). The bottom side has flat point to point wiring and is then covered up by a sticky two-sided tape such as Radio Shack's #64-2344.

P.S. The 9-conductor cable extends only 6" beyond the board and I have attached a 9-pin female socket (Radio Shack #276-1538) to this end with pins as follows.

| Pin No. | Signal         |
|---------|----------------|
| 1       | Ground         |
| 2       | Ground         |
| 3       | Red signal     |
| 4       | Green Signal   |
| 5       | Blue Signal    |
| 6       | Intensity      |
| 7       | Sound          |
| 8       | V/H Comp. Sync |
| 9       | Vert. Sync     |

Also I have utilized a Sears 3-foot #57-14544 (Monitor to IBM computer) cable that is connected as follows:

| RS 9-pin plug | Signal                                  | 8-pin male EIAJ plug |
|---------------|---|----------------------|
| 1             | ground                                  | 5                    |
| 2             | ground                                  | 6                    |
| 3             | red                                     | 2                    |
| 4             | green                                   | 3                    |
| 5             | blue                                    | 4                    |
| 6             | intensity                               | 1                    |
| 7             | not connected - could be used for sound |                      |
| 8             | V/H comp.                               | 7                    |
| 9             | Vert Sync                               | 8                    |

You could easily make your own substitute for the Sears 57-14544 computer cable, or, to save costs, install a longer (say a 3 or 4-foot) 9-conductor cable onto the RGB interface and just add an EIAJ plug (male) at the far end. A suitable plug would be a Frietag Electronic Video #2284 8-pole Stecker.

Merry Xmas Dave.

End of letter

My comments on subject: GFC

I used the E.A.B. RGB interface and the Radio Shack 9-pin male plug as noted. I shortened the E.A.B. leads, cut a hole in the rear of the computer case (bottom section) and mounted the RS plug to the case. I bought the Sears connecting cable, (cost \$29.95) rather than making up my own.

The Brown instructions are just a bit vague. I had to remove the computer chassis to inspect the underside to determine which pins to make connection to. Since Brown does not know which monitor you are going to use the notes by Dave will prove useful.

There are five 'pots' you can adjust to improve the quality of the picture on the screen. The three located near the BEEP speaker are variable resistors having a single 250 degree turn. There is a variable capacitor inside the metal box at the rear left corner and another one approx. 2" to the rear of the '0' key. Both the capacitors can be identified; they are orange colored.

One complete revolution of the capacitors seems to bring them back to their starting point. Marking the initial position of all these before touching them is a good idea; but in practice it does not seem that important. One caution I would make is to use a wooden or plastic tool, not a metal one. After all, it is a piece of electronic gear you are working on. You will find it awkward to hold the case open while doing these adjustments. While mounting the interface I removed the top keyboard. This was not hard, except the keyboard ribbon cable is a tight fit into the socket on the circuit board, and requires a firm pull to remove.

Adjusting the 'pot' under the metal can will result in some color shift toward a black and white screen.

I found that adjusting the other orange 'pot' reduced the 'Wrigglies' on the screen somewhat (but not entirely).

The adjustment of one of the resistors (the lefthand one of the pair at the rear of speaker) is somewhat critical. You may have to tweak it carefully to get the right spot. In fact you may feel it advisable not to touch this one at all. The screen tears etc. if not right. The other two are non-critical but they are inter-active and will require some fiddling before you are happy.

I have not made the changes to the Brown interface, as suggested by Dave. I must confess to some loss of nerve. The thing is working so well that I do not want to tempt fate.

The error that Dave refers to is one that is in the RGB interface circuit shown in the TS2068 technical manual page 62.

Transistor Q3 is shown incorrectly as an NPN, whereas it is actually a PNP. Dave also says that R5 may be too small; that he has used a 10K variable thumbwheel resistor in place of the fixed 1000 ohms resistor.

There are some drawbacks to the monitor that I have not resolved, however.

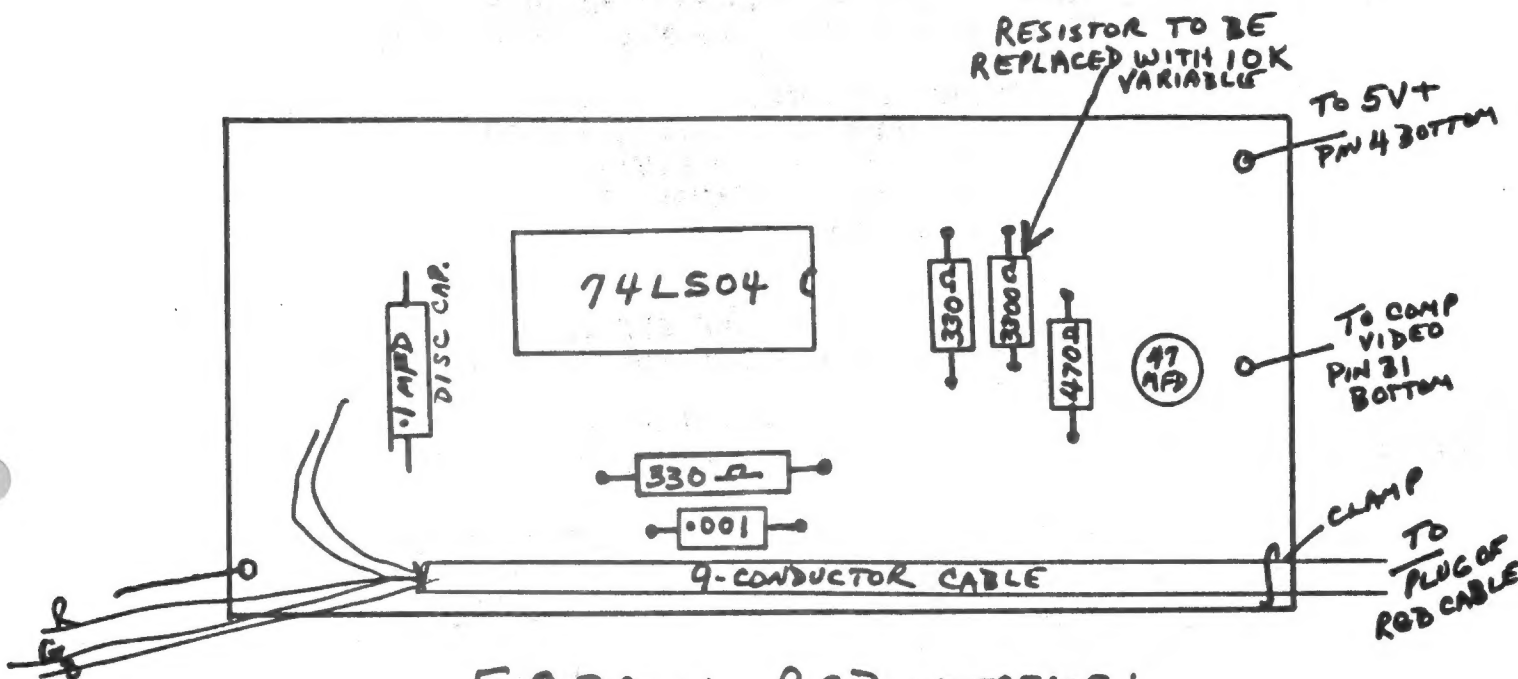
Firstly, when I use it with my ZX81 (yes, I still like the ZX81) in the TV or composite video mode the screen fades off to blackness during SAVES and LOADS, and recovers only when the LOAD/SAVE function is complete.

At the same time, it loads the MIKE lead so that the SAVED signal is too weak to LOAD

properly. I have to disconnect the monitor while SAVEing. Very irritating, I'm sure I will hear of a solution some day.

Secondly, if using the TV or composite video inputs the sharpness and color are no better than that of a regular TV set. You are definitely buying this monitor for the superior color and sharpness the RGB interface offers.

I have placed the "PATTERN" program mentioned in Dave's letter on tape #16 under the name "tv check".



E.A. BROWN RGB INTERFACE  
SHOWING RESISTOR TO BE REPLACED.

EPROM READER AND BURNER USES  
(or Now that I got it what can I do with it?)

by Greg Lloyd  
11-14-84

Since I bought my Eprom Reader and Burner life has become easier and loading has become instantaneous. It is possible to load a BASIC program and start it running in the time it formerly took to find the tape I had stored it on!

Along with this new ability came some added benefits. They are the ability to Read and Copy any Eprom that can be hung on the Reader board. Once you have read the Eprom or From the data can then be burned onto another Eprom. This brings to visions of large scale Copyright infringement! Perish the thought. I don't think it's worth the effort. But a copy of your Sinclair Rom would be of use to the average Soldering Iron Swordsman.

The whole procedure goes like this:

1. LOAD YOUR FAVORITE REM GENERATOR PROGRAM
2. GENERATE YOUR FAVORITE REM LENGTH 2,4, or 8K
3. SAVE THE REM AS "MYREM" OR WHATEVER
4. SAFELY PLUG IN YOUR TARGET EPROM IN YOUR READER BOARD
5. LOAD YOUR NEWLY GENERATED "MYREM" PROGRAM
6. TYPE AND ENTER THIS PROGRAM:
 

```

1  REM .....ETC.
10 FOR A=0 TO 8191(OR LESS)
20 POKE (16514+A),PEEK (8192+A)
30 NEXT A
            
```
7. PRESS RUN AND IN A FLASH YOU WILL HAVE THE EPROM DATA IN THE REM
8. NOW SAVE THIS TO TAPE AS "GOT-IT" or SOMETHING
9. PULL THE PLUG, ATTACH YOUR BLANK EPROM AND BURNER
- AND LOAD YOUR "GOT-IT" TAPE
10. TYPE AND ENTER THIS PROGRAM:
 

```

1  REM .....ETC.
10 FOR A=0 TO 8191(OR LESS)
20 POKE (32768+A),PEEK (16514+A)
25 PAUSE 1
30 NEXT A
            
```
11. THIS WILL BURN THE DATA IN THE REM INTO THE EPROM
12. POWER DOWN, PLUG THE NEW EPROM INTO THE READER AND CHECK IT OUT
13. LUCKY YOU YOU'RE DONE!

If anyone has some neat or illegal ideas for applying this method please don't tell anyone I told you so. Try not to Burn your fingers on your new Eproms.

FOR THOSE OF YOU WHO USE THE "UU-CALC" PROGRAM, HERE IS A WAY TO MAKE USE OF THE COMPARE SIGNS "=", "<", ">" IN YOUR FORMULAS.

IF THE COMPARISON IS TRUE THEN THE RESULT WILL BE A 1 AND IF NOT TRUE IT WILL BE 0

WHEN YOU MULTIPLY A NUMBER WITH THE RESULT OF A COMPARISON YOU WILL GET THE SAME NUMBER IF THE COMPARISON WAS TRUE AND A ZERO IF IT WAS FALSE.

HERE IS PART OF THE 1983 RATES OF FEDERAL INCOME TAX TABLE, THAT IS USED AS AN EXAMPLE TO CALCULATE THE FEDERAL TAX.

| TAXABLE INCOME             | TAX  |
|----------------------------|------|
| 7074-----1085+.19 OF NEXT  | 4716 |
| 11790-----1981+.20 OF NEXT | 4716 |
| 16506-----2924+.23 OF NEXT | 4716 |

F=FORMULA L=DATA C=CALCULATE

|   | 01       | 02       | 03      |
|---|----------|----------|---------|
| A | TAXABLE  | INCOME = | 12000   |
| B | 1ST CALC | FORMULA  | 2020.94 |
| C | >>>>>>>  | RESULT 1 | 0       |
| D | 2ND CALC | FORMULA  | 2023    |
| E | >>>>>>>  | RESULT 2 | 2023    |
| F | 3RD CALC | FORMULA  | 1887.62 |
| G | >>>>>>>  | RESULT 3 | 0       |
| H | FED TAX  | TOT CALC | 2023    |
| I |          |          |         |

HERE ARE FORMULAS FOR BOXES 03  
 NOTE:-THEY ARE ALL ABSOLUTE.  
 B03=1085+(A03-7074)\*.19  
 C03=B03\*(A03>7074)\*(A03<11790)  
 D03=1981+(A03-11790)\*.20  
 E03=D03\*(A03<11790)\*(A03<16506)  
 F03=2924+(A03-16506)\*.23  
 G03=F03\*(A03<16506)\*(A03<21222)  
 H03=G03+E03+C03

TO JOG MY MEMORY I KEEP A CARD WITH THE FOLLOWING INFORMATION:-

DONT "RUN" -GOTO 110 =MAIN MENU.  
 ERROR -GOTO 9000 =SEE ERROR.  
 DONT USE "D" TO DELETE FORMULA AS IT WILL REDUCE THE AVAILABLE NUMBER OF FORMULA (MAX. IS ONLY 40). TO NOT WASTE A FORMULA, JUST CHANGE IT TO A SIMPLE 1+1 THEN MOVE IT TO A SPARE BOX AND NOW YOU CAN DELETE IT FROM THE ORIGINAL BOX. REPEAT THIS TO MAKE USE OF THE STORED FORMULA.  
 BOX NUMBERS ARE ALWAYS 2 DIGITS  
 P=PRINTER Q=MAIN MENU  
 C=CALCULATE L=LOAD DATA  
 H=CURSER HOME D=DELETE FORMULA  
 F=LOAD FORMULA  
 A=ABSOLUTE  
 R=RELATIVE (COMPOUND INTEREST)  
 C=MOVE ACCROSS-( TO )  
 R=MOVE DOWN----(BOX?)  
 E=EXIT

-----BOB CROKER 1984----

### Eprom Burner Program

by Virgil Roman

This handy program will help you burn a basic program on a EPROM using the "Programmer" described in Vol. 2, No. 6. November issue of our newsletter. The program is very simple and self-explanatory. First enter 84 bytes of Machine Code by using the REM statement with 84 characters

```
1 REM XXXXX...(84 x's)
```

To load the Machine Codes use one of the loader programmes you know or just type the following lines:

```
10 FOR X = 16514 TO 16597
20 INPUT Y
30 PRINT X;" ";Y
40 POKE X, Y
50 NEXT X
55 STOP
```

Run the loader and enter the following bytes of M.C. from left to right, line after line, top to bottom. You simply type a code then press enter (N/L) and continue until you read the end of the listing:

|    |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|
| 33 | 33  | 117 | 17  | 0   | 0   |
| 1  | 15  | 0   | 237 | 160 | 226 |
| 32 | 117 | 217 | 8   | 33  | 0   |
| 0  | 17  | 0   | 0   | 1   | 0   |
| 21 | 237 | 176 | 8   | 217 | 195 |
| 9  | 117 | 201 | 205 | 35  | 15  |
| 33 | 0   | 0   | 17  | 9   | 64  |
| 1  | 0   | 0   | 237 | 176 | 201 |
| 33 | 9   | 64  | 17  | 0   | 0   |
| 1  | 0   | 0   | 237 | 160 | 226 |
| 80 | 117 | 217 | 8   | 33  | 0   |
| 0  | 17  | 0   | 0   | 1   | 0   |
| 21 | 237 | 176 | 8   | 217 | 195 |
| 57 | 117 | 201 | 0   | 0   | 0   |

Now you can check your entries by a simple CHECKSUM routine that adds each number to produce a sum of all your entries. Do this by typing:

```
100 LET I=0
100 FOR N = 16514 TO 16597
120 LET I=I+PEEK N
130 NEXT N
140 PRINT "CHECKSUM=";I
145 GOTO 55
```

Run by "GOTO 100" and you should get the sum of 5887. If this is the answer you got, then delete the MC assembler (loader) and checksum routine by typing the line number plus ENTER.

Change line "1" of REM statement to "0" by POKING 16510,0. Now you can enter the basic program starting with line 1.

In case you have a different checksum, you need a routine that PEEK's each address between 16514-16597 to check your entries and locate the error, then make the correction. Here is the routing I am using:

```

10 FOR N=16514 TO 16597 STEP 6
20 PRINT PEEK N;TAB 5;PEEK (N+1);TAB 10;
PEEK (N+2); TAB 15; PEEK (N+3); TAB 20; PEEK (N+4); TAB 5; PEEK (N+5)
30 NEXT N
46 STOP

```

That's it. Here is the basic listing:

```

1 REM SOFTWARE TO BURN A
2 REM BASIC PROGRAM INTO A
3 REM EPROM
4 REM WRITTEN BY U.ROMAN-198
5 FAST
10 LET T$="SOFTWARE"
30 PRINT AT 8,4;T$
40 PRINT AT 9,4;" ";TAB 25;" "
50 PRINT AT 10,4;" E P R O M
BURNER "
60 PRINT AT 11,4;" ";TAB 25;" "
70 PRINT AT 12,4;T$
80 PRINT AT 20,10;"TYPE""C""FO
R HELP..."
90 INPUT C$
95 CLS
100 PRINT TAB 9;"INSTRUCTIONS:"
101 PRINT TAB 9;" "
110 PRINT AT 2,1;"STEP 1:WILL S
ET A NEW RAMTOP."
120 PRINT AT 3,1;"STEP 2:WILL T
RANSFER MACHINE CODE A
BOVE RAMTOP."
130 PRINT AT 5,1;"STEP 3:IS ASK
ING FOR A STARTING ADDRESS."
140 PRINT AT 7,1;"STEP 4:IS ASK
ING FOR THE LENGTH OF THE
BASIC PROGRAM."
150 PRINT AT 9,1;"STEP 5:TYPE""
NEW"".THEN LOAD THE
BASIC PROGRAM TO BE B
URNED.ADD 6 LINES: 9970
STOP ;9975 FAST ; 9980
RAND USR 29952; 9981
RAND USR 30000; 9985
SLOW ;9990 GOTO 1."
160 PRINT AT 15,1;"STEP 6:TO ST
ART THE BURNING ROUTI
NE TYPE GOTO 9975."
171 PRINT
175 PRINT TAB 12;"E.X.E"
180 GOSUB 1000
200 POKE 16388,254
210 POKE 16389,116
220 LET MEM=PEEK 16388+256*PEEK
16389
230 PRINT AT 10,5;"NEW RAMTOP I
S:";MEM
240 PRINT TAB 5;" "
280 GOSUB 1000
290 LET A=16514
300 FOR I=29952 TO 30032
305 POKE I,PEEK A
310 LET A=A+1
320 NEXT I
330 PRINT AT 8,0;"THE MACHINE C
ODE""BURN""ROUTINE IS NOW SAFE
ABOVE RAMTOP."
360 GOSUB 1000
370 PRINT AT 8,0;"TYPE(IN DECIM
AL)THE ADDRESS YOU WANT TO STEP
THE BASIC PROGRAM "
380 INPUT A
390 LET A=A
400 LET X=A+24576
410 LET Z=A+24591
420 LET W=Z-24576
460 POKE 29956,X-INT (X/256)*25
6
470 POKE 29957,INT (X/256)
510 POKE 30004,Z-INT (Z/256)*25
6
520 POKE 30005,INT (Z/256)
560 POKE 29989,W-INT (W/256)*25
6
570 POKE 29990,INT (W/256)
580 CLS
590 PRINT AT 8,1;"TYPE NOW THE
END IN BYTES OF THE BASIC PRO
GRAM"
600 INPUT Y
610 LET Y=Y
650 POKE 29995,Y-INT (Y/256)*25
6
660 POKE 29996,INT (Y/256)
670 POKE 30007,Y-INT (Y/256)*25
6
680 POKE 30008,INT (Y/256)
690 CLS
700 PRINT AT 5,1;"TYPE END,THEN
LOAD THE BASIC PROGRAM TO BE
BURNED.ADD 6 BASIC LINES.T
URN ON THE BURNER. ENTER END 99
75.WHEN RETURNED TO BASIC TURN
OFF THE BURNER AND THE COMPU
TER,PULL OUT THE EPROM AND REA
D IT WITH THE FOLLOWING COM
AND:"
710 LET S$="TYPE RAND USR : "
711 PRINT TAB 16;" "
715 PRINT TAB 1;S$;TAB 17;A
716 PRINT TAB 16;" "
717 PRINT AT 14,16;"| ";AT 14,22
;"| "
718 PRINT AT 18,9;"**END OF END
END**"
720 PRINT AT 21,2;"TO SAVE THIS
PROGRAM PRESS""C"""
725 STOP
730 CLS
740 SAVE "EPROM"
750 GOTO 1
1000 PRINT AT 20,8;"PRESS ENTER
TO CONTINUE:"
1010 PAUSE 4E4
1015 POKE 16437,255
1020 CLS
1030 RETURN

```

LOW MEMORY - SAVE/LOAD PROGRAM

IF YOU HAVE 64K AND USE THE 8192/19383 (2000/3FFF) AREA, THIS WILL HELP YOU SAVE AND LOAD IT.

IT IS A REVISION OF TONI BAKERS HEXLDS TO KEEP RAM TOP AT 64K.

YOU CAN ADD YOUR OWN HEX LOADER OR POKE IN THE VALUES.

THIS EXAMPLE IS TO SAVE MY PROGRAM FROM 335F TO 3FFF.

I USE THAT AREA FOR: -

- H. PRINT TOOL KIT
- H. LIST 1 H. LIST 2
- S. PRINT D. PRINT
- 44.7K VAR- MEM: -
- STORE USED
- SEARCH SPARE
- PRINT RAM TOP

BOB CROKER 3/28/84

|       |    |       |     |
|-------|----|-------|-----|
| 16000 | 00 | 16040 | 205 |
| 16001 | 01 | 16041 | 40  |
| 16002 | 02 | 16042 | 100 |
| 16003 | 03 | 16043 | 04  |
| 16004 | 04 | 16044 | 207 |
| 16005 | 05 | 16045 | 75  |
| 16006 | 06 | 16046 | 102 |
| 16007 | 07 | 16047 | 04  |
| 16008 | 08 | 16048 | 207 |
| 16009 | 09 | 16049 | 176 |
| 16010 | 0A | 16050 | 201 |
| 16011 | 0B | 16051 | 40  |
| 16012 | 0C | 16052 | 16  |
| 16013 | 0D | 16053 | 04  |
| 16014 | 0E | 16054 | 17  |
| 16015 | 0F | 16055 | 0   |
| 16016 | 10 | 16056 | 05  |
| 16017 | 11 | 16057 | 207 |
| 16018 | 12 | 16058 | 01  |
| 16019 | 13 | 16059 | 100 |
| 16020 | 14 | 16060 | 04  |
| 16021 | 15 | 16061 | 207 |
| 16022 | 16 | 16062 | 01  |
| 16023 | 17 | 16063 | 100 |
| 16024 | 18 | 16064 | 04  |
| 16025 | 19 | 16065 | 207 |
| 16026 | 1A | 16066 | 75  |
| 16027 | 1B | 16067 | 102 |
| 16028 | 1C | 16068 | 04  |
| 16029 | 1D | 16069 | 207 |
| 16030 | 1E | 16070 | 176 |
| 16031 | 1F | 16071 | 201 |

```

10 REM ?N?E RND?RND GOSUB ?L?
ND? GOSUB ?6?RND??TAN E(RND)
FOR E?RND GOSUB ?RND GOSUB ?TAN
E(RND) : GOSUB ?RND GOSUB ?R
ND GOSUB ?TAN
400 DIM O$(USR 16520)
410 RND USR 16536
420 SAVE "SAVE L/O MEM."
500 RND USR 16554
510 CLEAR
520 STOP
525 REM - IF LO MEM REV. THEN
CHANGE THE POKE
526 REM - NOTE: - (LIMIT) IS ONE
MORE THAN END OF M/C PGM.
530 REM POKE 16514, LO (BEGIN)
531 REM POKE 16515, HI (BEGIN)
532 REM POKE 16518, LO (LIMIT)
533 REM POKE 16519, HI (LIMIT)
535 REM - RUN TO SAVE L/O MEM.
536 REM - USE GOTO 9900 TO SAVE
THIS PROGRAM
9900 SAVE "SAVE PGM"

```

```

4082 5F - LO (Begin) (335F)
4083 33 - HI (Begin)
4084 A1
4085 0C
4086 00 - LO (Limit) (4000)
4087 40 - HI (Limit)
16520 - 4088 2A8640 LD HL, (4086)
4089 ED5B8240 LD DE, (4082)
408F A7 AND A
4090 ED52 SBC HL, DE
4092 228440 LD (4084), HL
4095 44 LD B, H
4096 4D LD C, L
4097 C9 RET
16536 - 4098 2A1040 LD HL, (4010)
4099 110500 LD DE, 0005
409F 19 ADD HL, DE
40A7 EB EX DE, HL
40A8 2A8240 LD HL, (4082)
40A3 ED4B8440 LD BC, (4084)
40A7 EDB0 LDIR
16554 - 40A9 C9 RET
40AA 2A1040 LD HL, (4010)
40AD 110500 LD DE, 0005
40B0 19 ADD HL, DE
40B1 ED5B8240 LD DE, (4082)
40B5 ED4B8440 LD BC, (4084)
40B9 EDB0 LDIR
40BB C9 RET

```

