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T R S - 8 0 U S E R S G R O U P
N E W S L E T T E R

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FAST T-BUG RELOADER

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Those of you with Radio Shack's T-BUG program have probably been aggravated more than once by finding yourself unceremoniously dropped back into BASIC, or by getting locked up in a program and having to reset the machine. You then have to reload T-BUG, which takes about half a minute. The program is still there (well, most of it) but you can't get back to it without a cassette load. This change to T-BUG will allow you to do that, and repair the damage done by the BASIC monitor, by reloading just two bytes.

First it is necessary to understand how the computer knows it should run T-BUG after loading it, instead of returning to the BASIC monitor. There is nothing in the CLOAD routine to do this. It calls the subroutine CLOADO (which does the actual loading), performs a few other manipulations, and returns to the BASIC monitor. I had to cogitate on this a while (I'm new at this game) but I finally got it. I'll admit the people who designed this are pretty clever. When a subroutine is called, the return address is pushed onto the stack. Level I initializes its stack at 4200, and when CLOADO is called the return address is stored at 41FE and 41FF. BASIC programs start at 4200, but T-BUG runs from 4091 to 43B6 and overwrites the stack. It changes the return address to 40B1, which is the start of T-BUG.

If you get into BASIC you could return to T-BUG with a CLOAD of address 40B1 into the proper location. However, this leaves two problems. CLOADO loads a checksum after the last data byte (at 4200 in this case). Also, the BASIC monitor alters certain memory locations near the start of T-BUG. These changes are repaired by the program below. It occupies memory space not used by T-BUG. Level I uses the space to store variables Q through Z, A$, and B$.

Load T-BUG and write this program at 4070:

```
4070    01 28 00      LD BC, 0028
4073    11 40 40      LD DE, 4040
4076    21 91 40      LD HL, 4091
4079    ED B0         LDIR
407B    21 00 42      LD HL, 4200
407E    36 32         LD M, 32
4080    C3 B1 40      JP 40B1
```

Run this program, which moves 40 bytes beginning at 4091 to 4040. Then change 4073 to 21 and 4076 to 11. Change 41FE and 41FF to 70 40. Now punch 41FE to 41FF, preferably at the head of a leaderless tape to make it easy to find. Finally, punch 4040 to 43B6, which is your new T-BUG. If you find yourself in BASIC you need only rewind the cassette to the head and a CLOAD will put you back into T-BUG in seconds. If you dive into the middle of the ROM or try to do anything in BASIC before returning to T-BUG, there is no telling what damage may be caused. Then you'll just have to reload the complete version of T-BUG.

CORRECTION TO
FAST T-BUG RELOADER

My fast reloader program depends in part on repairing the damage done to T-BUG by a return to the BASIC monitor. I have found that the patch in the original version isn't quite big enough. The following version repairs 4091 to 40B8. It includes 13 bytes of the line buffer (which begins at 40AC); this corrects the changes caused by entering the CLOAD command.

Load T-BUG and write this program at 4070:

```
4070    01 28 00      LD BC, 0028
4073    11 40 40      LD DE, 4040
4076    21 91 40      LD HL, 4091
4079    ED B0         LDIR
407B    21 00 42      LD HL, 4200
407E    36 32         LD M, 32
4080    C3 B1 40      JP 40B1
```

Run this program, which moves 40 bytes beginning at 4091 to 4040. Then change 4073 to 21 and 4076 to 11. Change 41FE and 41FF to 70 40. Punch 41FE to 41FF (the fast reloader). Finally punch 4040 to 43B6, which is your new T-BUG.

As far as I can tell, this fixes all problems caused by a simple return to the BASIC monitor. Of course, if you dive into the middle of the ROM or try to do anything in BASIC before returning to T-BUG, there is no telling what damage may be caused. Then you'll just have to reload the complete version of T-BUG.

NEW#: LEVEL I
PROGRAM RENUMBERER

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When you modify a program, you may find you haven't left enough space between line numbers to add all the new lines you want. Even if you have, you may want the final version to have line numbers with equal increments. It gives a cleaner look to the program, as though you had written it the right way the first time. If you have T-BUG, you can generate a machine language program which will renumber a BASIC program.

Level I stores programs starting at 4200. Each line consists of the line number in two-byte binary form and the text in ASCII, ending with a carriage return (0D). NEW# finds the carriage returns and fills the next two bytes with the new line number.

In order to load NEW# without disturbing the BASIC program, it must be loaded below 4200. The last two bytes, at 41FE and 41FF, tell the computer to jump to the start of the program after loading it.

Since NEW# overwrites part of T-BUG (including part of the PUNCH routine) it must be written above 4400, block-moved to its proper location, then saved on tape under control of a loader program. Load T-BUG, then write NEW# and its loader starting at 4400. Before running it, save it using T-BUG's PUNCH command. This will allow you to modify it later if you want to. Next set up your recorder to record, and jump to 4400. The program will return to the BASIC monitor when it is finished.

To use NEW#, load a BASIC program. Now load NEW# with the CLOAD command. Do not type NEW. The program will run automatically after loading and will end with a return to the BASIC monitor. When you call for a listing, you will find the BASIC program unchanged except that the line numbers are now evenly spaced in increments of ten. To change the increment, change the value loaded into register pair BC (see 4426). Don't forget to rewrite lines with GOTO or GOSUB instructions to agree with the new line numbers.

```
                NEW#  (loader 4400-4416)
4400    21  20 44     LD HL, 4420       ;move block from 4420-
4403    11  D0 41     LD DE, 41D0       ;444F to 41D0-41FF
4406    01  30 00     LD BC, 0030
4409    ED  B0        LDIR
440B    CD  E9 0F     CALL 0FE9         ;CTON
440E    21  D0 41     LD HL, 41D0       ;start of block
4411    CD  4B 0F     CALL 0F4B         ;CSAVE0
4414    C3  66 00     JP, 0066          ;jump to BASIC monitor

4417-441F: don't care

4420    31 90 40      LD SP, 4090       ;initialize stack
4423    21 00 42      LD HL, 4200       ;start of BASIC program
4426    01 0A 00      LD BC, 000A       ;increment (+10)
4429    11 00 00      LD DE, 0000       ;stores line #
442C    EB            EX DE, HL         ;
442D    E5            PUSH HL           ;last line #
442E    2A 6C 40      LD HL, (406C)     ;end of BASIC prog. +1
4431    B7            RST 20            ;Z=1 if HL=DE (done)
4432    CA 66 00      JPZ, 0066         ;BASIC monitor
4435    E1            POP HL            ;last line #
4436    09            ADD HL, BC        ;increment
4437    EB            EX DE, HL         ;DE = new line #
4438    73            LD M, E           ;HL points to next # to
4439    23            INC HL            ;be changed.  Load D & E
443A    72            LD M, D           ;into next two bytes
443B    23            INC HL
443C    3E 0D         LD A, 0D          ;carriage return
443E    BE            CP M              ;find next CR+1
443F    23            INC HL
4440    20 FC         JRNZ, -4          ;to 443E
4442    18 E8         JR, -24           ;to 442C

4444-444D: don't care

444E    D0 41                           ;'return' address
```

RADIO STATIONS

IF ANY BROADCASTERS HAVE THE TRS-80 OR PROGRAMS, I WOULD LIKE TO GET IN CONTACT WITH YOU.

CURT NUNNERY, SALES MANAGER
W F A I RADIO FAYETTEVILLE
P.O. BOX 649
FAYETTEVILLE, NC 28302
PHONE (919) 483-0393

```
5  CLS
10  PRINT AT 22,"*** NOT-ONE ***"
20  REM BY STAN OCKERS 9-78
25  PRINT : PRINT : PRINT
30  PRINT "DO YOU WANT INSTRUCTIONS (YES (Y) OR NO (N))"
40  Y=1 : N=2 : INPUT Q : IF Q=2 GOTO 200
50  IF Q<>1 GOTO 30
60  CLS:PRINT "YOU AND THE COMPUTER TAKE TURNS ROLLING PAIRS OF DICE. "
70  PRINT "THERE ARE TEN ROUNDS.  YOU MAY ROLL AS MANY TIMES IN ONE"
80  PRINT "ROUND AS YOU WISH.  HOWEVER, IF YOU REPEAT THE SAME"
90  PRINT "NUMBER AS YOU ROLLED AT THE BEGINNING OF THE ROUND"
100  PRINT "YOU WILL LOSE ALL POINTS FOR THAT ROUND.  THE COMPUTER"
110  PRINT "WILL THEN TAKE ITS TURN FOLLOWING THE SAME RULES. "
120  PRINT "THE WINNER IS THE ONE HAVING THE MOST POINTS "
130  PRINT "AFTER TEN ROUNDS.  GOOD LUCK!"
140  PRINT : PRINT "PRESS ENTER WHEN YOU ARE READY TO START. "
150  INPUT A$
190  REM * DRAW DICE - SET UP ARRAY *
200  DATA 8,25,28,45,68,85,88,105,8,9,24,25,28,29,44,45,68,69,84
210  DATA 85,88,89,104,105,392,326,458,330,454,390,394,402,336
220  DATA 468,340,464,400,404,422,356,488,360,484,420,424,432,366
230  DATA 498,370,494,430,434
240  CLS : Y=13 : GOSUB 290 : RESTORE
245  Y=25 : GOSUB 290
250  FOR I=1TO16:READ X:FOR Y=14TO25:SET(X,Y):NEXT Y:NEXT I
260  FOR I=1TO28 : READ A(I) : NEXT I
270  GOTO 300
290  FOR I=1TO4 : READ A,B : FOR X=ATOB : SET(X,Y):NEXT X:NEXT I:RETURN
300  REM * INITIALIZE COUNTERS *
310  R=0 : Z=0 : X=0
320  R=R+1 : IF R=11 THEN 600
325  PRINT AT 920,"ROUND NUMBER ";R
330  REM * PLAYERS DICE *
335  T=0 : H=1 : PRINT AT 708,"ROLL # 1";
340  F=0 : GOSUB 390 : F=T : PRINT AT 644,"FIRST ROLL = ";F;
350  PRINT AT 6,"ROLL AGAIN ", : INPUT Q : IF Q=2 THEN 400
355  H=H+1 : PRINT AT 708,"ROLL # ";H;
360  GOSUB 390 : IF A+B=F THEN 380
370  GOTO 350
380  PRINT AT 6,"SORRY, YOU ROLLED ANOTHER ";F
385  FOR J=1TO2000 : NEXT J : GOTO 400
390  O=8 : GOSUB 900 : A=D : O=7 : GOSUB 900 : B=D : T=T+A+B
395  IF A+B=F THEN T=0
399  PRINT AT 772,"ROUND TOTAL = ";T; : RETURN
400  X=X+T : PRINT AT 196,"YOUR TOTAL = ";X;
410  PRINT AT 6,"COMPUTER'S TURN"
415  REM * COMPUTER'S DICE *
420  T=0 : F=0 : GOSUB 490 :F=T:PRINT AT 674,"COMPUTER'S FIRST = ";F;
425  H=1 : PRINT AT 738,"ROLL # 1";
430  IF (F=2)+(F=12) THEN L=20
435  IF (F=3)+(F=11) THEN L=9
440  IF (F=4)+(F=5)+(F=6)+(F=9)+(F=10) THEN L=6
445  IF (F=7)+(F=8) THEN L=4
450  M=0 : FOR J=1TO2000 : NEXT J
460  GOSUB 490 : IF A+B=F THEN 500
470  M=M+1 : IF M=L THEN 500
480  H=H+1 : PRINT AT 738,"ROLL # ";H;
485  FOR J=1TO2000 : NEXT J : GOTO 460
490  O=14 : GOSUB 900 : A=D : O=21 : GOSUB 900 : B=D : T=T+A+B
495  IF A+B=F THEN T=0
499  PRINT AT 802,"ROUND TOTAL = ";T; : RETURN
500  Z=Z+T : PRINT AT 226,"COMPUTER'S TOTAL = ";Z;
```

D

```
520  GOTO 320
600  CLS : PRINT "FINAL SCORE    YOU; ";X;"    COMPUTER; ";Z
610  IF Z>X THEN 670
620  IF Z=X PRINT "IMPOSSIBLE ... A TIE !!!"
625  IF Z=X THEN 700
630  PRINT "FANTASTIC JOB !! YOUR A GENIUS !!" : GOTO 700
670  PRINT "TOUGH LUCK ... MAYBE NEXT TIME ..."
675  GOTO 700
700  Y=1 : PRINT : PRINT : INPUT "WANT TO TRY AGAIN (Y) OR (N)";Q
710  IF Q=1 THEN 200
720  PRINT "YOU PLAYED WELL. I HOPE WE CAN PLAY AGAIN SOMETIME."
730  END
900  FOR P=1TO7 :PRINT AT A(P+O)," "; : NEXT P
920  D=RND(6) : IF (D=1)+(D=3)+(D=5) THEN 970
930  FOR P=2 TO D+1 : PRINT AT A(P+O),"*"; : NEXT P
940  GOTO 980
970  FOR P=1TOD : PRINT AT A(P+O),"*"; : NEXT P
980  PRINT AT 0; : RETURN
```

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WE HAVE AN EXTRA 'TRS-80 LEVEL I 16K' COMPUTER. IT HAS HARDLY BEEN USED. OWNER BOUGHT A LARGER COMPUTER. PRICE $689.00.

CALL (919) 485-4182 OR 485-7147 OR WRITE TRS-80 USERS GROUP.

TRS-80 USERS GROUP

I GOT MY LEVEL II ABOUT 2 MONTHS AGO AND THINK IT IS GREAT. MUCH BETTER THAN LEVEL I (I RECCOMMEND GETTING IT) HERE IS A PROGRAM WHICH USES THE EXTRA COMMANDS OF LEVEL II

DID YOU EVER WANT YOUR TRS-80 TO MAKE SOME NOISE. WELL THIS IS HOW TO DO IT. THE CASSETTE RECORD LINE CAN BE USED AS A TONE GENERATOR IF A MACHINE PROGRAM IS USED.
THIS MUSIC PROGRAM DOES JUST THAT, YOU CAN USE THE CASSETTE RECORDER TO RECORD THE MUSIC BY PRESSING PLAY AND RECORD (REMOVE THE REMOTE PLUG TO ALLOW IT TO RUN). I HAVE ALSO USED A AMPLIFIER TO PLAY THE MUSIC ON SPEAKERS. HERE ARE SOME OTHER THINGS I HAVE LEARNED ABOUT THE OUTPUT PORT:

1. THE ONLY PORT AVAILABLE WITH OUT THE EXPANSION UNIT IS PORT 255. THIS PORT CONTROLS THE CASSETTE.
2. USE THE 'OUT' COMMAND TO CONTROL THE PORT IN BASIC.
3. BITS 0 AND 1 ARE USED TO MAKE THE TONES FOR THE RECORDING
4. BIT 3 IS USED TO CONTROL THE RELAY. THIS CAN BE USED FOR OTHER THINGS BESIDES CONTROLING THE CASSETTE.
   OUT 255,4 WILL CLOSE THE RELAY
   OUT 255,0 WILL OPEN THE RELAY
5. BIT 4 IS USED TO DISPLAY 32 CHARACTORS ON THE SCREEN THIS DOES NOT CHANGE THE STORAGE TO EVERY OTHER CHARACTOR HOWEVER. THERE MUST BE ANOTHER CHANGE IN THE BASIC RAM.
6. THE OTHER BITS ARE NOT USED

TONES CAN NOT BE GENERATED WITH A BASIC PROGRAM BECAUSE OF THE SPEED REQUIRED. THE MACHINE PROGRAM CAN BE SIMPLIFIED IF ONLY A SINGLE FREQUENCY OF SHORT DURATION IS REQUIRED

I HOPE YOU INJOY THIS PROGRAM AND CAN PUT IT TO USE.

DEAN MCCULLOCH
37202 MANCHESTER
STERLING HTS, MI 48077

```
1 '  MUSIC
2 '  BY  DEAN MCCULLOCH
3 '  MACHINE CODE LOCATED FOR 4K RAM
9 ' 10-100  LOADS MACHINE PROGRAM AND SETS UP USR
10 FOR I=20336 TO 20374
20 READ A
30 POKE I,A
40 NEXT I
50 DATA 205,127,10,14,255,6,1,205,136,79,6,2,205,136,79
60 DATA 43,62,0,180,181,194,117,79,201,237,65,237,91,159,79
70 DATA 27,62,0,178,179,194,142,79,201
90 POKE 16526,112
100 POKE 16527,79
101 ' FQ= THE FREQUENCY OF THE TONE DESIRED
102 ' TM= THE DURATION OF THE TONE IN SECONDS
109 'READ NOTE
110 READ FQ,TM
114 ' FIND NUMBER OF CYCLES TO PLAY
115 CY=INT(FQ*TM)
119 ' CHECK FOR FREQUENCY OUT OF RANGE
120 IF FQ>5000 THEN FQ=5000
125 IF FQ<50 THEN FQ=50
129 ' 130-170 FIND AND STORE HALF WAVE TIME DURATION
130 D%=0 : DE%=29480/FQ
140 IF DE%>512 THEN D%=2 : DE%=DE%-512
150 IF DE%>256 THEN D%=D%+1 : DE%=DE%-256
160 POKE 20383,DE%
170 POKE 20384,D%
189  ' CALL MACHINE PORGRAM
190 X=USR(CY)
209 ' GET NEXT NOTE
210 GOTO 110
225 ' DATA FOR MUSIC  FIRST NUMBER IN PAIR IS THE FREQUENCY,
226 ' SECOND NUMBER IS THE TIME DESIRED.
230 DATA 352,.5,352,1,264,.5,352,.5,396,1,264,1,440,.5,396,.5,440,.5
240 DATA 465,.5,440,1,396,.5,352,.5,352,1,330,.5,297,.5,330,.5
250 DATA 352,.5,396,.5,440,.5,330,1,297,.5,297,.5,264,2,528,1,465,.5,440,.5
260 DATA 465,1,440,1,396,.5,440,.5,352,.5,396,.5,330,1,264,.5,352,.5
270 DATA 352,.5,330,.5,352,.5,396,.5,352,1,264,.5,440,.5,440,.5,396,.5,440,.5,465,.5
280 DATA 440,1,396,.5,440,.5,465,.5,440,.5,396,.5,352,.5,330,1,352,.5,465,.5,440,1
290 DATA 396,.5,396,.5,396,2
```

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A UNIVERSAL PRINTER INTERFACE FOR THE TRS-80

THE PROJECT CAME TO LIFE WHIN I TRIED TO INTERFACE A TELETYPE PRINTER TO A FRIEND'S TRS-80. I FOUND OUT VERY SOON THAT THE TRS-80 DOES NOT GENERATE LINEFEEDS. THIS SAVES ENORMOUS AMOUNTS OF PAPER BUT THE LEGIBILITY IS SOMEWHAT SUBSTANDARD. THIS LED TO THE DESIGN OF A BLACK BOX WHICH CAN INTERFACE A WIDE VARIETY OF PRINTERS TO THE TRS-80 DIRECTLY OR TO THE TRS-80 INTERFACE.

THE BOX HAS THESE FEATURES:

AUTOMATIC LINEFEED: A LINEFEED CHARACTER IS AUTOMATICALLY INSERTED AFTER EACH CARRIAGE RETURN (CAN BE DISABLED).

SERIAL INTERFACE: 20 MA CURRENT LOOP OR RS232. BAUD RATES 110, 150, 300, 600, 1200. WORD LENGTH IS SELECTABLE FOR 7 OR 8 BITS, 1 OR 2 STOP BITS.

PARALLEL INTERFACE: CENTRONICS TYPE, CAN BE MODIFIED WITH JUMPERS TO A WADE VARIETY OF CONFIGURATIONS.

INTERFACE TO TRS-80: CONNECTS EITHER DIRECTLY TO TRS-80 BUS (NO TRS-80 INTERFACE REQUIRED) OR TO PRINTER PORT ON THE TRS-80 INTERFACE.

DELAY AFTER CARRIAGE RETURN: MANY PRINTERS NEED A DELAY OF SEVERAL CHARACTER LENGHTS AFTER A CARRIAGE RETURN. THIS IS USUALLY TAKEN CARE OF BY SOFTWARE. THE BOX SOLVES THIS PROBLEM BY GENERATING A BUSY SIGNAL OF ADJUSTABLE DURATION AFTER A CARRIAGE RETURN.

CASE REVERSAL: THE TRS-80 DOES NOT DISPLAY LOWER CASE CHARACTERS, BUT LEVEL II BASIC ENTERS LOWER CASE WHEN THE SHIFT KEY IS PRESSED. THIS IS EXACTLY OPPOSITE TO NORMAL USAGE. THE BOX CAN BE SET TO REVERSE UPPER CASE TO LOWER CASE AND VICE VERSA. THIS FEATURE ALLOWS NORMAL TYPING.

THE BOX COMES READY TO RUN WITH CABLES TO CONNECT TO THE TRS-80 KEYBOARD OR TO THE PRINTER PORT AT THE TRS-80 INTERFACE. IT HAS ITS OWN POWER SUPPLY BUILT IN. THE CONNECTION TO THE PRINTER IS VIA A DB25P CONNECTOR.

PRESENT STATUS OF THE PROJECT (BY OCT. 20, 1978): THE HANDWIRED PROTOTYPE HAS BEEN RUNNING FOR TWO MONTHS DIRECTLY WITH THE TRS-80 (LEVEL II) AND WITH A TRS-80 INTERFACE (DISK).
THE PC BOARD IS CURRENTLY BEING LAID OUT AND I HAVE MOST PARTS FOR A TEST SERIES OF 10.
HOWEVER, MY LAYOUT MAN CAUGHT PNEUMONIA AND I AM GOING ON A TRIP UNTIL DECEMBER. ALL THIS WILL OBVIOUSLY DELAY THE PROJECT.
THE PRICE WILL BE BETWEEN $100 AND $150. I DON'T THINK THERE CAN BE ANY SIGNIFICANT DELIVEARY BEFORE THE MIDDLE OF FEBRUARY, 1979.
LET ME KNOW IF YOU ARE INTERESTED. WRITE TO:

BIGFOOT SYSTEM DESIGN
2925-37TH AVE. SOUTH
MINNEAPOLIS, MN 55406

I WILL ACCEPT ORDERS FOR A WAITING LIST, BUT DO NOT SEND MONEY NOW.
IN CASE YOU WOULD LIKE TO KNOW, BIGFOOT IS MY CAT.
OTTO BAADE

```
10  CLS : PRINT AT 25,"***** SKETCH ******"
12  REM BY STAN OCKERS 9-78
15  PRINT "DIRECTIONS:"
20  PRINT : PRINT "THE COMPASS DIRECTIONS NORTH (N), SOUTH (S),"
25  PRINT "EAST (E) AND WEST (W) ARE USED.  IN BETWEEN DIRECTIONS"
30  PRINT "ARE GIVEN BY THE SUMS ( NORTH EAST= N+E, SOUTH WEST= S+W)
32  PRINT "AFTER THE DIRECTION, YOU WILL BE ASKED FOR THE LENGTH"
34  PRINT "OF LINE IN THAT DIRECTION."
36  PRINT "OTHER COMMANDS CAN BE GIVEN INSTEAD OF A DIRECTION:"
37  PRINT "'D' PUTS YOU INTO DRAW MODE - LINE WILL BE DRAWN"
38  PRINT "'U' PUTS YOU INTO UNDRAW MODE - NO LINE, BUT MOVEMENT"
39  PRINT "'K' KILL - WIPES SCREEN CLEAR, DOES NOT DESTROY MEMORY"
40  PRINT "OF WHAT WAS DRAWN"
41  PRINT "'R' REDRAW - WILL REDRAW ALL THAT YOU'VE ENTERED"
43  PRINT "PRESS ENTER TO CONTINUE"
45  INPUT A$
49  I=0
50  X=64: Y=24
60  CLS
70  SET(64,24):SET(65,24)
75  F=1
80  N=1 : E=3 : S=2 : W=6 : K=9 : D=10 : U=11 : R=12
100  PRINT AT 0,"DIRECTION (N,S,E,W,N+E,ETC.,D,U,K OR R)";
105  INPUT Q
120  IF Q=12 THEN 300
122  IF Q=9 THEN 50
130  IF Q=10 THEN 200
135  IF Q=11 THEN 230
140  PRINT AT 45,"LENGTH"; : INPUT L
141  A(I)=Q : I=I+1 : A(I)=L : I=I+1
142  IF F=0 THEN 170
147  FOR J=1 TO L : GOSUB 590
150  IF (X=126)+(X=0)+(Y=47)+(Y=0) THEN 100
160  NEXT J: GOTO 100
170  FOR J=1 TO L : GOSUB 580
180  IF (X=126)+(X=0)+(Y=47)+(Y=0) THEN 100
190  NEXT J : GOTO 100
200  F=1 : A(I)=1000
210  I=I+1 : GOTO 100
230  F=0 : A(I)=2000
235  I=I+1 : GOTO 100
300  A(I)=0:I=0:CLS:X=64:Y=24
305  F=1
310  IF A(I)=0 THEN 100
320  IF A(I)=1000 THEN 410
330  IF A(I)=2000 THEN 420
332  Q=A(I) : I=I+1 : L=A(I) : I=I+1
335  IF F=0 THEN 380
340  FOR J=1 TO L : GOSUB 590
350  IF (X=126)+(X=0)+(Y=47)+(Y=0) THEN 310
360  NEXT J : GOTO 310
380  FOR J=1 TO L : GOSUB 580
390  IF(X=126)+(X=0)+(Y=47)+(Y=0) THEN 310
400  NEXT J: GOTO 310
410  F=1 : I=I+1 : GOTO 310
420  F=0 : I=I+1 : GOTO 310
500  Y=Y-1
510  X=X+2:RETURN
520  Y=Y+1
530  X=X-2:RETURN
540  Y=Y+1:GOTO 510
550  Y=Y+1:RETURN
560  Y=Y-1:GOTO 530
570  Y=Y-1:RETURN
580  RESET(X,Y):RESET(X+1,Y)
590  ON Q GOSUB 570,550,510,500,540,530,560,520
600  SET(X,Y):SET(X+1,Y):RETURN
```

H

TRS-80 Software

NEW PRODUCT ANNOUNCEMENT
CHANNEL DATA SYSTEMS **PERSONAL LEDGER**
NOW AVAILABLE FOR **RADIO SHACK'S TRS-80 LEVEL II**

After a very positive response to the Personal Ledger from users of Commodore's PET and many inquiries from users of Radio Shack's TRS-80, Channel Data Systems has adapted the Personal Ledger to the TRS-80 Level II personal computer.

Channel Data Systems' Personal Ledger is a complete double entry bookkeeping system with provisions for budgeting and keeping records of income, deductible and non-deductible expenses, assets and liabilities. Its simple interactive features enable entering transactions, adding or editing accounts, and printing of a detailed Income Statement and Balance Sheet. Users completely unfamiliar with computerized accounting and with little or no knowledge of bookkeeping can use the system.

Up to 50 accounts are allowed with names and budgets specified by the user. An audit trail of all entered transactions is printed on the screen where it can be copied with the screen printer or copied to cassette if you do not have a printer. All account data is stored on cassette, loaded prior to entering transactions and stored after entering transactions. There is no waiting for printing to the tape during operation of the system. Extensive error recovery features are included to allow reentry of an erroneous instruction or value.

The Personal Ledger runs in 8K bytes of free RAM on Commodore's PET and 16K bytes on Radio Shack's TRS-80 Level II. Level II BASIC is a version of Microsoft BASIC which can be translated to most other BASIC systems with minimum modifications.

Personal Ledger is supplied on cassette in TRS-80 Level II or Commodore PET format (Please specify) and includes a complete manual with a program listing, flow charts, sample data, and complete operating instructions. All for only $20.00 (Calif. residents please add 6% sales tax) by Channel Data Systems.

ORDERS: Check, money order or VISA/Master Charge accepted; programs and cassetes guaranteed and shipped within five days after receiving your order. VISA/MC telephone orders welcome at (805) 964-6695.

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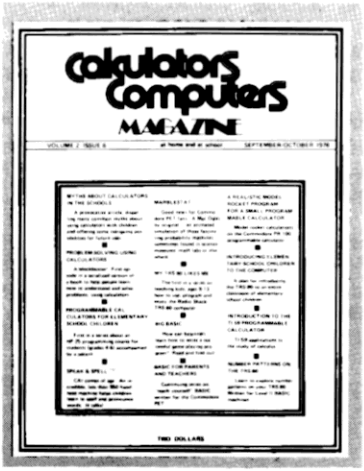

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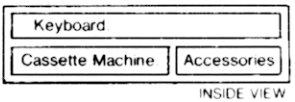

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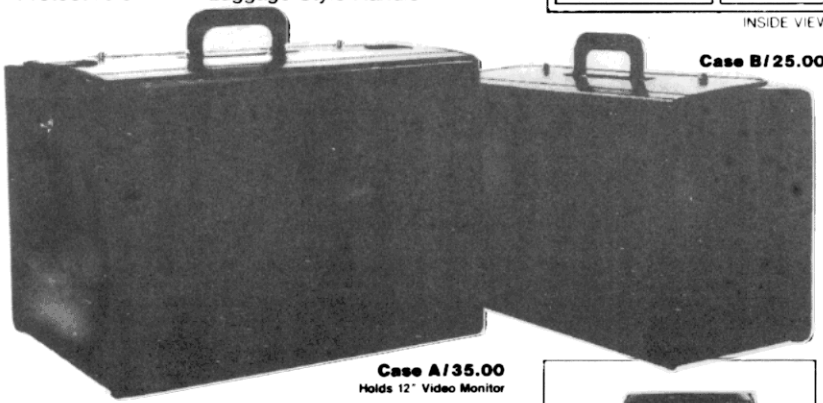

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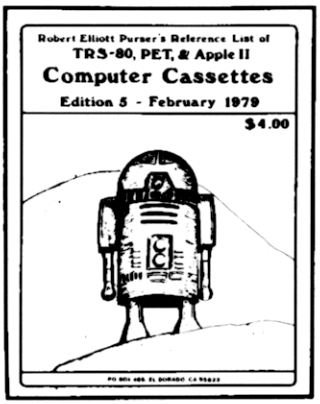

By George, I did it!

A few months ago I said that in August I would publish a list of all the cassettes of software available for trade or sale for the TRS-80. Sure enough, I searched through the computer magazines for software advertisements, compiled the list, and printed it in mid-August, right on schedule. I may not have listed all the TRS-80 software on cassettes, but I sure got a lot.

Well, it's time to try again. In the three months since the last list was published, a whole lot of TRS-80 programs have been written. By mid-November, I should have a much larger and more complete list ready to send to you. Being a capitalist, I charge two whole dollars for the list (postpaid). If after you get it, you don't think it is worth it, I'll refund your money. Can't go wrong there, can you?

If you want to subscribe to this quarterly publication, starting with the November issue, send me $9.00 (before I run out of copies toward the end of November). Otherwise the February issue will be $4.00 and the subscription rate starting with the February issue will be $12.00. (No, that's not inflation; it's just that the list is getting so long that I have to charge that much.) So order now while it's still cheap.

P.S. Do you have any software on cassettes for trade or sale?

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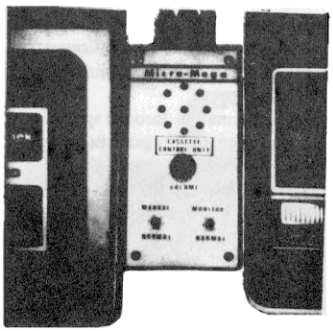

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                00100 ;PROGRAM BY JAMES B  PENNY
                00200 ;FILE NAME  MEMSCR
                00300 ;ENTRY PT  4410 HEX, 17424 DECIMAL
                00400 ;PRINTS ASCII VALUE OF 1K CHUNK OF
                00500 ;MEMORY WHICH CAN SCROLL UP OR DOWN
                00600 ;USING KEYBOARD ARROWS  PROGRAM
                00700 ;BEGINS AT 0000H AND REPEATS WHEN
                00800 ;FFFFH (64K) IS REACHED.  EACH KEY-
                00900 ;STROKE SCROLLS 4 LINES.
4410            01000          ORG     4410H
4410 31FD4F     01100          LD      SP,4FFDH;INIT.  STACK
                01200 ;NOTE:  3840H IS TRS-80 FUNCT  KEY COL.
4413 DD214038   01300 KBD      LD      IX,3840H
4417 DD4600     01400          LD      B,(IX)
441A CD5544     01500          CALL    DLY
441D DD7E00     01600          LD      A,(IX)
4420 B8         01700          CP      B;CHECK DEBOUNCE
4421 20F0       01800          JR      NZ,KBD
4423 FE08       01900          CP      8H;UP ARROW
4425 2009       02000          JR      NZ,DOWN
4427 FD214A44   02100          LD      IY,BYTE
442B FD3400     02200          INC     (IY)
442E 1818       02300          JR      SUB
4430 DD7E00     02400 DOWN     LD      A,(IX)
4433 FE10       02500          CP      10H;DOWN ARRROW
4435 2009       02600          JR      NZ,KDN
4437 FD214A44   02700          LD      IY,BYTE
443B FD3500     02800          DEC     (IY)
443E 1808       02900          JR      SUB
4440 AF         03000 KDN      XOR     A;ZERO A
4441 DDBE00     03100 HERE     CP      (IX);IS KEY ACTIVE?
4444 28CD       03200          JR      Z,KBD;IF NO THEN LOOP
4446 20F9       03300          JR      NZ,HERE;IF YES STAY HERE
4448 2100       03400 SUB      DEFW    21H;FAKE OUT
444A 00         03500 BYTE     DEFB    0H;THIS BYTE CHANGES
                03550 ;SCREEN MEMORY STARTS AT 3C00H AND STORES
                03555 ;400H BYTES OF DATA.
444B 11003C     03600          LD      DE,3C00H;DESTINATION
444E 010004     03700          LD      BC,400H;COUNTER
4451 EDB0       03800          LDIR    ;TRANSFER DATA BLOCK
4453 18EB       03900          JR      KDN
4455 F5         04000 DLY      PUSH    AF
4456 210001     04100          LD      HL,100H;DEBOUNCE DELAY
4459 2B         04200          DEC     HL
445A 7C         04300          LD      A,H
445B B5         04400          OR      L
445C 20FB       04500          JR      NZ,DLY+4;DEC HL TO 0
445E F1         04600          POP     AF
445F C9         04700          RET
4410            04800          END     KBD-3
00000 TOTAL ERRORS
HERE    4441
KDN     4440
SUB     4448
BYTE    444A
DOWN    4430
DLY     4455
KBD     4413
```

Dear Gordon,

Here are a number of observations about the TRS-80 that may be useful to some of your readers with Level II:

Not all string variables are placed into the string space buffer at the end of the RAM! If a string variable receives its value via a READ statement, or from a simple assignment to a string constant (i.e., A$="HELLO"), then it takes up no space in the buffer. Also, any variable set equal to such a variable also takes no space in the buffer. The first time I noticed this, I thought there was a problem with the FRE( ) subroutine, and it took me a while to figure out what was going on: the string address (partially described on page 8/9 of the Level II manual) is an address of a byte, not in the string buffer, but in the program, namely, the first byte of the constant in the DATA or replacement statement. It makes sense, since there's no reason to have two copies of the same string, one in the program, and one in the buffer.

The description of the USR function says that the machine language executes a CALL ØA7F to get the value of the argument, but does not say how it is returned. I've experimented a bit, and found that it is returned in the HL register pair.

Not that it matters much, but if you type a letter on the keyboard with the SHIFT key pressed, you get a lower-case letter (SHIFT-é is an acute accent), but these are all displayed as upper case (and é) on the screen.

Instead of a character enclosed in quotes, the CLOAD and CSAVE commands will accept CHR$(n), where n is an integer from 1 to 255 (zero is not useful). For that matter, a string variable will work, too. The first character of the string will be used for the string defining the name of the file.

Sorry, Roy Hempel, but you won't get any 4x characters out of your TRS-80, or a mixture of 2x and 1x either. Expanded characters are produced by the hardware, and there are only the two modes. By the way, in the 32-character mode, characters or graphics at even-numbered addresses are expanded to fill two locations, and the other characters are ignored. Software usually handles this nicely, but plotting while in the 32-character mode is a pain.

The manual (page 11/2) suggests poking graphics onto the screen to save time. An even faster way is to PRINT them! Try PRINT STRING$(64,181) for a fast example. Set up your plots as strings by packing six plotting dots into one character, and concatenating characters into strings, and you can set up 255 characters of six dots each with a single PRINT statement. For each character position to have plotting dots in it, assign the value CHR$(128+n), where n is the sum of numbers corresponding to the the positions where you you want a white spot.

1	2
4	8
16	32

R

It seems that no matter how cheap a tape I use, my TRS-80 can always get programs on and off, though sometimes with a moderate amount of difficulty, like with the three C-60 tapes (made in Mexico) for $1.29 that I found somewhere...

There are rumors about that a slight hardware mod that adds a 1Kx1 RAM chip and rewires a few existing chips can add lower-case display on the Level II. The video RAM, locations 3CØØ to 3FFF, is only seven bits wide. (There are eight bits in a byte, numbered 7 through Ø.) Bit 6 of the video RAM simply isn't there. However, if you go PEEKing and POKEing in there, this fact is not obvious. Although bit 6 is discarded when you store a byte there, the bit is read back as the NOR of bits 7 and 5.

Whereas Level I Basic comparison operators returned a value of 1 to indicate "true", Level II returns -1. That one caught me a few times.

To make the Radio Shack Blackjack (either level) a bit smarter with regard to which bets it will accept, go ahead and add the necessary code. Make up for it by deleting the code that displays the cards already played, since that function is very unrealistic.

Level II T-BUG differs from Level I in more ways than listed in the manual. The useful subroutines are not in the same locations, but if you can sneek a peek at the Assembler/Editor manual, it will give you some you can use. Also, the register-save area starts at location 4825 on Level II.

The USR function can be very helpful to those who know machine-language. One of my programs ran for something like eight hours when written in Basic; by writing the main subroutine in machine, I got it to run in eight minutes.

Comments and criticisms on the above are welcome, and I feel competent enough (I've been a professional programmer for lo, these seven years) to answer most questions about Basic, etc., that any of the members may have, if they would be so kind as to enclose a stamped, self-addressed envelope.

Steve MacGregor
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S

Dear Gordon,

Here are some tips for using Level II that may not be too obvious to all users.

1. The POINT argument in Level I returns a 1 if on, and a 0 if off. In Level II it returns a -1 if on, and a 0 if off. This can cause some very strange problems on conversion from Level I to Level II tapes.

2. To erase a line in Level II, just plain PRINT" " won't work unless you put 64 spaces between the quotes. Instead use PRINT @ 512,;CHR$(30) to erase a full line at mid=screen.

3. When using tabs, don't put a space between the word TAB and its number:
   WRONG.....PRINT TAB (10)
   RIGHT.....PRINT TAB(10)

4. If you enter programs directly from a magazine, etc. be aware that many BASICs use RND(1) to get a rnadom number between 0 and 1 (such as .0125). Radio Shack BASIC (both Levels), however, use RND(0) to obtain the same thing. RND(1) will always return a 1.

5. If you have defined a letter variable as DOUBLE PRECISION, don't attempt to use it as the counter in a FOR....NEXT loop:
   EXAMPLE..... 10 DEFDBL A-Z
   20 FOR Z=1TO1500:NEXT Z
   The above won't work because Z must be an integer to be used as a FOR....NEXT counter.

Hope this information is of some help to all.

Sincerely,

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```
10 REM WRITTEN BY JOHN MARLER SAN JOSE, CA
11 REM LINE 22 SHOULD BE CHANGED TO THE ACCURACY OF EACH UNIT
12 REM ON THE TIMING LOOP. LINES 130 AND 140 SET STARTING COUNT
20 CLS:PRINT:PRINT:PRINT
21 PRINTTAB(21);"TELEPHONE TOLL ACCUMULATOR":PRINT:PRINT
25 INPUT"DO YOU WISH INSTRUCTIONS (1=YES, 2=NO)";A
26 IFA=1GOTO300
28 CLS:PRINT:PRINT:PRINT
29 PRINTTAB(21);"TELEPHONE TOLL ACCUMULATOR":PRINT:PRINT
30 INPUT"WHAT IS THE INITIAL TIME PERIOD (MINUTES)";P
35 PRINT:PRINT
40 PRINT"FOR THE FOLLOWING ENTRIES DO NOT ENTER DECIMALS!- - -"
41 PRINT"ENTER ALL NUMBERS AS INTEGERS-($1.35 IS ENTERED "
42 PRINT"AS 135; $2.12 IS '212', ETC)":PRINT
43  INPUT"WHAT IS THE INITIAL CHARGE                    :";I
45 PRINT:PRINT
50 INPUT"WHAT IS THE ADDITIONAL CHARGE PER MINUTES     :";M
51 CLS:PRINT:PRINT
55 PRINT"WHEN THE OTHER END PICKS UP THE RECEIVER"
57 INPUT"PRESS ENTER TO START TIMING. . . . . .";A$
60 CLS:PRINT:PRINT
80 PRINT"THE INITIAL COST OF THE FIRST ";P;" MINUTES IS $";I/100
85 PRINT"          THE ADDITIONAL COST PER MINUTE IS:$";M/100
90 PRINTAT(847),"PRESS 'BREAK' TO STOP COUNTING."
100 C=I/100:D=1
110 FORX=22TO93
115 SET(X,22):SET(X,28):NEXTX
120 FORY=22TO28
125 SET(22,Y):SET(93,Y):NEXTY
130 T=56
140 IFP=3THENT=176
150 GOTO221
200 PRINTAT(526),"THE TOTAL CHARGE NOW IS: $";C
210 SET(93,24):SET(93,25):SET(93,26)
215 PRINTAT651,"TOTAL TIME CHARGED IS NOW: ";P+D;" MINUTES"
220 T=59:D=D+1
221 C=C+(M/100)
225 FORX=1TO490:NEXTX
230 PRINTAT330,"SECONDS TO NEXT ADDITIONAL CHARGE: ";T
240 T=T-1
245 IFT=-1GOTO200
250 GOTO225
300 CLS:PRINT"YOUR CHARGES ARE CALCULATED ON 3 THINGS:"
310 PRINTTAB(10);"(1) INITIAL TIME PERIOD (1 OR 3 MINUTES)"
320 PRINTTAB(10);"(2) INITIAL CHARGE FOR INITIAL PERIOD"
330 PRINTTAB(10);"(3) ADDITIONAL CHARGE PER MINUTE AFTER"
335 PRINTTAB(14);"INITIAL TIME PERIOD"
340 PRINT:PRINT"IF YOU USE AN OPERATOR TO ASSIST, THE INITIAL"
350 PRINT"TIME PERIOD IS 3 MINUTES. DIRECT DIAL IS 1 MINUTE."
360 PRINT:PRINT"THE CHARGES ARE BASED UPON THE DESTINATION CALLED. . . "
370 PRINT". . . THESE ARE 'USUALLY' LISTED IN THE FRONT OF THE PHONE"
380 PRINT"BOOK. . . OR. . . CALL THE OPERATOR FOR RATES."
390 PRINT"DO YOU WANT INFORMATION ON DISCOUNT PERIODS"
400 INPUT"(1=YES, 2=NO)";B
410 IFB=2GOTO28
420 CLS:PRINT"THERE ARE TWO DISCOUNT PERIODS IN THE CONT. U.A.S."
430 PRINTTAB(22);"35% DISCOUNT:  5PM - 11PM SUN THROUGH FRI"
440 PRINTTAB(22);"               8AM - 11PM ALL HOILDAYS":PRINT
450 PRINTTAB(22);"65% DISCOUNT: 11PM -  8AM EVERY NIGHT"
460 PRINTTAB(22);"               8AM - 11PM SATURDAY"
470 PRINTTAB(22);"               8AM -  5PM SUNDAYS"
475 PRINT:PRINT"CHARGES BASED ON TIME AT CALLING POINT ORIGIN!"
476 PRINT:PRINT:PRINT
480 INPUT"PRESS ENTER TO INPUT TIME AND CHARGE INFORMATION. . . .";A$
490 GOTO28
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4  REM * P.M.=738 OR 13026 *
5  REM * RADIO SHACK TRS-80 COMPUTER SCREEN DISPLAY *
6  REM * COPYRIGHT FRED BLECHMAN 1978 *
7  REM * 23958 ARCHWOOD ST., CANOGA PARK, CA 91307 *
8  REM * LOOP VALUES *
10  DATA6,14,9,19,26,9,30,38,9,42,43,9,47,54,9,65,72,9
20  DATA76,77,9,84,85,9,89,96,9,101,108,9,112,113,9,119,121,9
30  DATA6,14,12,18,27,12,30,31,12,38,39,12,42,43,12,46,47,12
40  DATA54,55,12,65,72,12,76,85,12,88,97,12,100,101,12,112,117,12
50  DATA6,7,15,14,15,15,18,19,15,26,27,15,30,38,15,42,43,15
60  DATA47,54,15,65,72,15,76,77,15,84,85,15,88,89,15
70  DATA96,97,15,101,108,15,112,113,15,119,121,15
80  DATA30,39,20,42,50,20,55,62,20,75,82,20,87,94,20
90  DATA34,35,23,42,50,23,55,62,23,68,71,23,74,83,23,86,87,23
100  DATA94,95,23
110  DATA34,35,26,42,43,26,50,51,26,55,62,26,75,82,26,87,94,26
120  DATA17,24,31,29,36,31,40,42,31,47,49,31,52,60,31
130  DATA64,65,31,72,73,31,76,85,31,88,97,31,100,108,31
140  DATA16,17,34,28,29,34,36,37,34,40,41,34,44,45,34,48,49,34
150  DATA52,60,34,64,65,34,72,73,34,80,81,34,88,95,34,100,108,34
160  DATA17,24,37,29,36,37,40,41,37,48,49,37,52,53,37
170  DATA65,72,37,80,81,37,88,97,37,100,101,37,108,109,37
200  REM * SINGLE SETS *
210  DATA39,6,7,14,15,18,19,26,27,30,31,38,39,42,43,46,47,54,55
220  DATA64,65,72,73,76,77,84,85,88,89,96,97,100,101
230  DATA108,109,112,113,117,118,119
240  DATA35,6,7,14,15,18,19,26,27,30,31,38,39,42,43,46,47,54,55
250  DATA64,65,76,77,84,85,88,89,96,97,100,101,112,113,116,117,118
255  DATA1,6
260  DATA35,6,7,12,13,18,19,26,27,30,31,38,39,42,43,46,47,54,55
270  DATA72,73,76,77,84,85,88,89,96,97,100,101,112,113,116,117,118
280  DATA40,6,7,12,13,14,18,19,26,27,30,31,38,39,42,43,46,47,54,55
290  DATA64,65,72,73,76,77,84,85,88,89,96,97,100,101,108,109
300  DATA112,113,117,118,119
310  DATA18,34,35,42,43,50,51,54,55,62,63,74,75,82,83,86,87,94,95
320  DATA16,34,35,42,43,50,51,54,55,74,75,82,83,86,87,94,95
330  DATA1,34
340  DATA16,34,35,42,43,48,49,62,63,74,75,82,83,86,87,94,95
350  DATA19,34,35,42,43,48,49,50,54,55,62,63,74,75,82,83,86,87,94,95
360  DATA32,16,17,24,25,28,29,36,37,40,41,42,43,46,47,48,49
370  DATA52,53,60,61,64,65,72,73,80,81,88,89,100,101,108,109
380  DATA28,16,17,28,29,36,37,40,41,44,45,48,49,52,53,60,61,64,65
390  DATA72,73,80,81,88,89,100,101,108,109
400  DATA1,16
410  DATA24,16,17,28,29,36,37,40,41,48,49,52,53,64,65,72,73
420  DATA80,81,88,89,100,101,106,107
430  DATA27,16,17,24,25,28,29,36,37,40,41,48,49,52,53
440  DATA64,65,72,73,80,81,88,89,100,101,106,107,108
500  REM * MAIN PROGRAM *
504  Z=0
505  CLS:RESTORE
506  IF Z=0 GOTO520
510  CLS:RESTORE
511  FOR Y=0 TO 47
512  FOR X=0 TO 127
513  SET(X,Y)
514  NEXTX:NEXTY
520  FOR J=1 TO 89
530  READ A,B,Y
540  FORX=A TO B
545  IF Z=1 THEN RESET(X,Y):GOTO560
550  SET(X,Y)
560  NEXTX:NEXTJ
```

V

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600  GOSUB680
610  GOSUB690
620  GOSUB700
630  GOTO900
680  FOR Y=10 TO 14
685  GOTO705
690  FOR Y=21 TO 25
695  GOTO705
700  FOR Y=32 TO 36
705  READ A
710  FORX=1 TO A
715  IF Z=1 THEN READ B:RESET(B,Y):GOTO730
720  READ B:SET(B,Y)
730  NEXTX:NEXTY
740  RETURN
900  PRINT@0;
905  IF Z=1 THEN Z=0:GOTO910
906  IF Z=0 THEN Z=1
910  FOR X=1 TO 1000:NEXTX
920  GOTO505
```

HERE ARE A COUPLE OF SHORT CONTROL LINES THAT MAY BE OF INTEREST TO OTHER USERS.

```
LNM = LINE NUMBER
NLN = NEXT LINE NUMBER
FLN = FIRST LINE NUMBER
THIS ONE WILL STOP THE SCROLLING AT ANY NUMBER OF LINES (I USE 12)
LNM  T=T+1:IF T<>12 THEN (NLN) ELSE INPUT T:T=0
THIS ONE WILL RERUN OR END AND WITH MODS CAN DO OTHER SPLIT DECISIONS
LNM  A$="":INPUT "DO YOU WISH TO DO ANOTHER (Y/N)"A$
NLN  IF A$= 0  THEN (FLN) ELSE IF A$<> 0  (LNM):END
THESE ARE IN USE ON LEVEL II BUT THE FIRST WILL WORK ON LEVEL I
BY CHANGING ELSE TO : (I THINK).
CAN ANYONE GIVE ME THE FOLLOWING INFO ON THE CABLE BETWEEN THE
EXPANSION PORT AND THE CENTRONICS PRINTER : PIN# 1-21-23-25-26-28
FROM EXP. PORT CONNECT TO PINS# ? ? ? ? ? ? ON THE CENTRONICS PLUG.
DON FIELDING, 2207 NW 61 PLACE, MARGATE, FL 33063
```

I HAVE A 16K LEVEL I TRS-80
WOULD LIKE TO TRADE PROGRAMS. SEND ME A 60 MINUTE TAPE & I WILL RETURN A 60 MINUTE TAPE. I SHOULD HAVE LEVEL II ANY DAY.
J.W. TAYLOR, 611N2, CABOT, AR 72023
I HAVE ABOUT 50 PROGRAMS

---

* 16K RAM * 16K RAM * 16K RAM * 16K RAM * 16K RAM *

UP-GRADE YOUR TRS-80 TO 16K MEMORY OR ADD RAM TO YOUR EXPANSION INTERFACE. 16K RAM FOR ONLY $124.50 OR 32K FOR ONLY $215.50 + $2.00 SHIPPING/HANDLING.
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