

TI - D - BITS

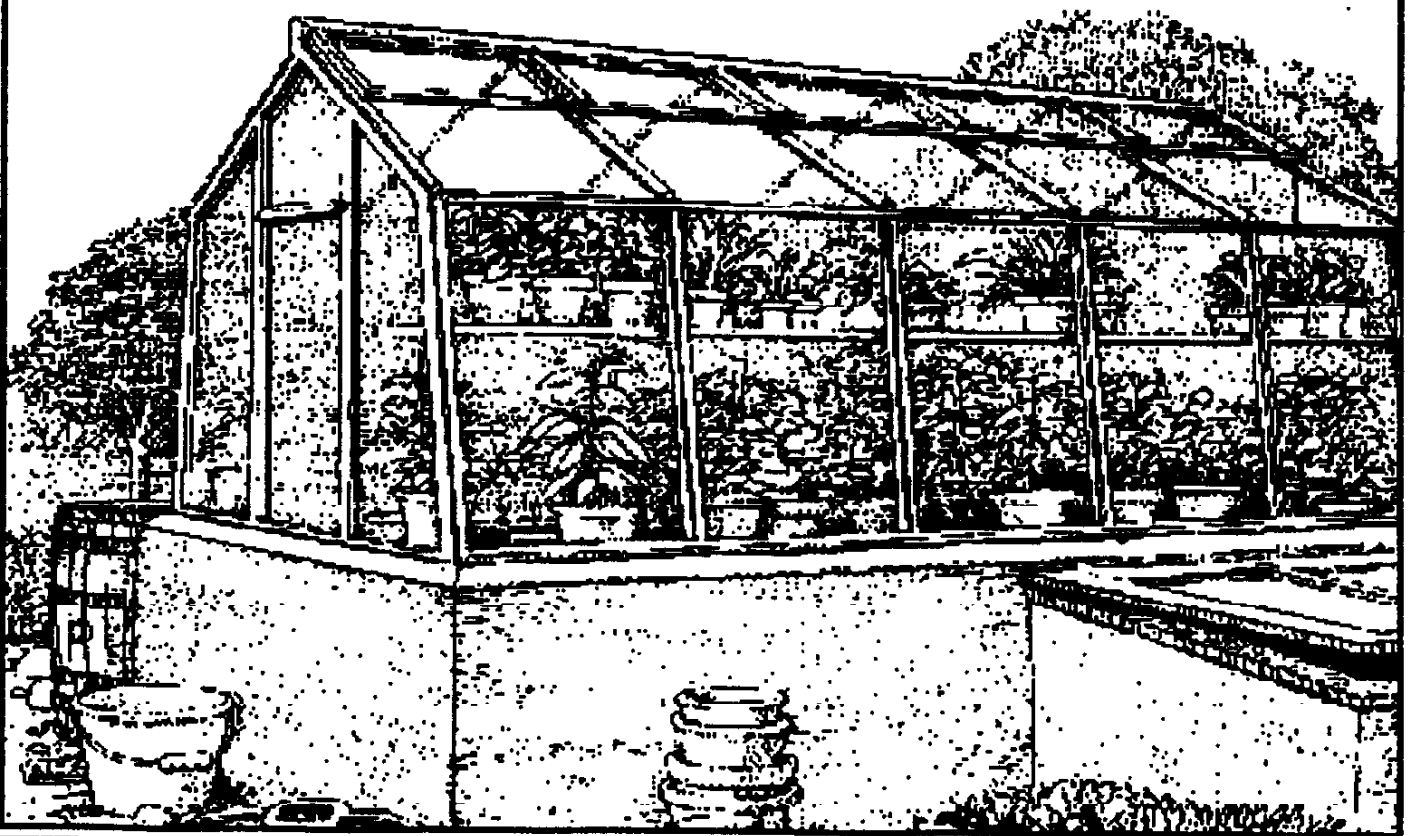
PHILADELPHIA AREA USERS GROUP NEWSLETTER
COVERING THE T199/4A
AND MYARC 9640 COMPUTERS

APRIL 1991

Volume 11 Number 4

COME CHECK OUT OUR GREENHOUSE

FULL OF INTERESTING ~~PLANTS~~
SOFTWARE



The Philadelphia Area TI-99/4A Users' Group meets twice a month. On the first Saturday of any given month, we meet at the Bucks County Youth Development Center, (YDC, which is next to Meshaminy Mall), Administration Building, beginning at 10:00 am. On the third Saturday of each month, we meet at Drexel University, in Matheson Hall at 34th and Marker St. Phila. Pa in Room M-412. Membership to The Philadelphia Area TI-99/4A Users' Group is available to all. We invite anyone that is interested in the TI-99/4A to visit us. Stop in and see what is available to you for your TI and how membership can benefit you!

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REMEMBER to be considerate when calling any of the above people. Limit your calls to the early evening hours. (6pm to 9pm)

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NEW-AGE/99

by JACK SUGHRUE

Box 459, East Douglas, MA 01516

GENTLEMAN GENIUS

Of the two tags, Gentleman and Genius, I think the former gets my approbation concerning the best way to describe John Willforth. My wife, Elaine, agrees. For John is first a real gentleman; and that is what you think of before realizing he's also a genius. Gentlemen, I think, are rarities today, even among Tiers; though I've discovered more in the 99er ranks than in other walks of life. People like Charlie Good, Jim Cox, Jim Peterson, Barry Traver.

Geniuses, though, are a dime a dozen in the computer world, and most of them are far from civilized.

An example, small but significant: Lots of Tiers have been to my home, all of them treated to Elaine's gracious welcome, her extended hospitality in the matters of food and lodgings, so they get to know her and discover, too, that we two rattle alone around our hut, now that our four tykes have leapt into the grownup world, returning us to "couplehood" these past two years. So any female voice answering our phone will be Elaine. But John is the ONLY "adult" TI person who will acknowledge Elaine's existence on the phone. He always says, "Hi, Elaine, this is John Willforth," when she answers, just as if she's not a non-person. Sometimes they converse so long I have to pry the phone from her fingers so I can get to talk to John.

With others who've been here, however, it's usually "Jack there?" when she answers, without even mentioning who they are.

I don't know. Maybe I'm old fashioned, but I still believe a lot in courtesy and friendliness and the acknowledgment of the existence of someone I've met.

Anyway, John's old fashioned in this way, too, and I like it: 19th Century values in a 21st Century mind. It's fun being in tune to someone as family oriented as he is. He talks about his wife (Fay) and his three daughters with such joy that you know love and sensitivity are a VERY LARGE

part of his nature.

My wife and I talk about John so much that my son Matthew and his wife (Carolyn) wanted very much to meet him. The last time he came over for dinner, we had the "kids" over, too, and all of us enjoyed his pleasant, witty company all evening.

John's a talker. That's a compliment. And he can converse about almost anything but literature (as he claims he doesn't have time to read novels, thus leading to the time-worn argument in THIS house that all the major social changes in the world have been brought about by fiction ... and so on). It's fun arguing with John because the conversation is stimulating and he's still your friend in the end.

John's logical. He even tries to use logic with his teenagers (which probably makes him illogical when you think about it).

He's hardworking (to a workaholic degree, I think) at some pretty heavy duty electronic wizardry. John even has a calculator on his watch, which he uses.

He writes well. His articles on printers, as well as the long-term articles on hardware (and software) are lucid, practical, and scary: SCARY in the sense that he takes apart consoles and P-boxes and anything else mechanical, electrical, and electronic that he can get his hands on and performs vivisectionist surgery on their innards. He seems to be able to radically modify anything, from computer chips to his backhoe and assumes everybody else should be able to do so.

Whew! Not me. My hands shake when I have to dump my pencil sharpener or fill my stapler.

But John's made me a believer. One evening he came up to my computer room, still chatting about his family, and, while carrying on the conversation, took apart my working P-box. Completely! Screws, nuts, bolts, fans, stuff, whachamacallits, and thingamajigs. Then he reversed my fan, explaining that it would keep my box cool (maybe even cooler) while it would cut down the noise to one-third. It did. We turned on other P-boxes in the room and compared them to the fix.

He also told me where and how to

order floppy drives and how to install them (5.25 and 3.5 operate with no cable modification on the TI). I learned that I could buy any IBM compatible half-height disk drives and put them in my TI. ERM Electronic Liquidators (1 800 776 5865) for fully warranted reconditioned drives. I called, bought two Panasonic DSDD (\$29 each!!!!), installed them myself, just like a computer grownup. Though they also sell cables and disks (for as low as .15 each DSDD). I ended up getting a Power Y cable for internal power connector (\$.99) and an AT-HDDR cable set for double connector to controller (\$2.89) and a whole lot of other things from another company he recommended: National Computer Accessories (916-441-1568). So, thanks to John, I was able to convert my setup on my school system from one SSSD to two DSDD at a cost of around \$60! And does that make a LARGE difference in my ability to do TI things in my classroom. As a matter of fact I'm writing this at school on my quiet P-box, DSDD system and LOVE it! Everything works great. (Remember, we're talking about John teaching me, the man who has to use a manual to open a jar of peanut butter. You readers are chuckling over this "big" hardware deal, but John opened up new worlds to me. I plan to confidently upgrade another system soon and maybe even do a user group demo.

Which brings me back to John's generous spirit. While at a training session in Connecticut some months ago, John willingly came to our M.U.N.C.H. in Worcester, Massachusetts, one evening and shared some great insights and answered all kinds of questions, including some about things he had written as newsletter editor of the West Penn user group, which he founded many years ago to reach out to users outside the Pittsburgh area.

He was also the hit of the New England Fayuh that same week. Everyone there was thrilled to meet the man they all knew through his writings and references to his work by others. He ended up being the biggest TI star at the whole event. People at the fair were in awe of him and still talk about his visit, yet I've met

very few humbler men.

Now, back at my desk at home, I'm using a console John modified a while ago and recently gave to me. It has a plexiglass cutaway of the interior housing of a Zenoboard containing a clock, speech, 32K, E/A, XB, ADVENTURE, TIW, DM, and a system Pause button. All switchable. I feel as though I died and went to TI Heaven.

The man's a genius, no doubt, but more important, he sure is a warm and sensitive friend. To me, it's worth owning a TI just to have met John Willforth.

If you use NEW-AGE/99 please put me on your exchange list.

TI BITS * Number 13

By Jim Swedlow

This article originally appeared in the User Group of Orange County, California ROM

XMODEM

You may have heard of a transfer protocol called XMODEM and wondered what it is. If you use FAST-TERM or 4A TALK, you probably use it. The following should give you some idea of how it works.

When you communicate with another computer on phone lines thru modems, your data must travel thru the same voice phone lines that we use every day. Some connections are better than others. Most have noticeable static.

Your brain, a computer whose power has never been equaled, can usually distinguish the 'data' (voice) from the 'noise' (static). It is almost impossible for your computer to make this judgement.

In the early days of data transfer, data was simply sent and the receiving computer had to do as good a job as it could to distinguish between data and noise. In a text, or DV80 file, this was not a major problem. If one character was bad you could

easily find the problem and edit it.

With a memory image or Program file, however, one bad byte could render the entire file useless. Although editing is possible, it is very tricky.

In August 1977, Ward Christensen developed an error detection method he called MODEM2. It was also dubbed "Christensen" protocol or XMODEM.

It was very simple. Data is sent in blocks of 128 bytes. XMODEM adds up the values of all the characters in each block and compares that number with a total that is sent by the sending computer. If they don't agree, the receiving computer sends a code to the sending computer and the block is transmitted again.

In 1982, Ward Christensen and Chuck Forsberg released an enhancement called Cyclic Redundancy Checking (CRC). CRC does sequential division on each character in the block resulting in a significant improvement in error detection.

Both protocols continue to be called XMODEM. Although others have been developed, XMODEM is used by all major systems, including Compuserve. (Source: an article in FOGLIGHT)

TI WRITER TIP

Find String (FS) is a powerful tool for finding something in a document. Just hit FCTN 8 and then enter FS. Your TI Writer gives you this prompt:

FIND enter /string/ :

You enter your string and use the slash as limiters. If you want to find the word "John", you would enter /John/. If you wanted to find John only when it is used as the last word in a sentence, you would enter /John./.

Should the "John" you find not be the one you wanted, you would go back to command mode and enter FS again. You will find /John./ still there. You just press enter and the search

resumes.

Lets say, however, that now you want to find the word "Mo". But /John./ is on your screen. You could delete /John./. You could type in Mo but then you would have this:

/Mo/n./

Need you worry about the text after the second slash? No. Your TI Writer only searches for the information between the first and second slash. It ignores everything to the right of the second slash.

You will have a problem with that if you use Replace String, but that is another story.

TRICK QUESTION OF THE MONTH

If a plane crashed on the border between the U.S. and Canada, who would bury the survivors? Answer next time.

Answer to the last trick question: How many birthdays does the average man have? One -- you celebrate it many times but you are born once.

THE PAPERLESS OFFICE

One of the things that futurists often project is the paperless office. Everything would be done on computers so paper would virtually disappear.

Not necessarily so. According to an article in a recent issue of 'The Office', the demand for paper has been increasing at the rate of 5% to 8% a year. Growth is expected to continue at that rate.

Cited reasons include the continuing shift from a production to a service economy and the fact that computers generate reams of paper. Also noted were the need to generate hard copies for filing and the proliferation of photocopy machines.

Enjoy.

A REVIEW OF THE NEW
RAVE PE/2
EXPANSION BOX

By Dave Ratcliffe
Fm Central Pa. User Group

At the 1990 TICOFF Show, lots of people crowded around the RAVE99 table to get a 'first' look at the proposed RAVE PE/2 expansion box for the TI-99 and Geneve computers. What we saw was a prototype, set up to run a TI-99 and what a wonderful sight it was. NO console, (Rave Keyboard Intewrface and computer mounted INSIDE the box). hard drive (Myarc HDFC) and quiet! Several people ordered then and my order was submitted in April. Even though I did NOT receive the unit till January 1991, I am still VERY satisfied. Why? Because every step of the way, Rave's owner, John McDevitt, kept me informed of progress and setbacks. I knew going in that I was buying an as yet unfinished product and the manufactures openness throught the whole process was both refreshing and welcomed. This is the second product I've purchased from Rave (keyboard interface was the first) and I have yet to be disappointed. Now on to the 'official' review.

There are 2 versions of the RAVE PE/2, the A and the B series. I purchased the A series, designed for the Geneve computer. The B version allows the use of both the TI/99 and Geneve, the following description is of the PE/2-A version except where noted:

The cabinet is made by Magitronics and contains a 200 Watt fully regulated power supply. There is room for 3 5.25" 1/2-height drives and 1 3.5" floppy drive all in externally accessible drive bays. The 3.5" floppy space is NOT available if the Rave keyboard interface is used (PE/2-B version). The 5.25" area CAN hold 1 full height and 1 1/2 height if desired. Additionally, there is internal space for a vertically mounted 3.5" hard drive behind the front panel and adjacent to the 5.25" bay. Let me assure you, the power supply is fully capable of running ALL of these devices as well as the CPU

and all related cards. While the power supply contains a cooling fan, RAVE saw fit to install a second fan in front of the card rack that moves air directly across the expansion cards providing extra cooling capacity.

The card rack is a well designed unit and even includes a removable section to make room for the internal 3.5" hard drive. The backplane shows good design and workmanship and all jumpers are laid out well with easy access. One bad note here, while the documentation refers to numbered pins at the jumper selection points, NO numbers are printed on the board. After a quick call to John I found out that the pin closest to the front at ALL jumper locations is pin #1. For the Geneve, there is a small wiring harness that requires a bit of soldering to install. It will connect the front panel reset switch to the Geneve card to provide a HARD reset when needed. An additional connection provides for use of the front panel KEYLOCK switch.

The backplane comes with 5 16 bit slots (#'s 1,2,6,7 and 8) and 3 8 bit slots (#'s 3,4 and 5). There is a reason for this. You have the option of removing your cards from the clamshells or leaving them in. If you choose the latter, you'll need to use slots 3,4, and 5 since the clamshells have no opening for the extra connectors in the other positions. Those 3 positions CAN be made into 16 bit if desired. I purchased the extra connectors with my unit but have not installed them yet. One note here. At present, there exists no hardware to utilize the full 16 hit backplane. This is provided as a possible expansion route for the future.

The front panel contains 2 push button switches, 1 keylock switch and 3 LED's. The 2 buttons are RESET (obvious purpose) and TURBO (inactive with the Geneve, used to PAUSE the CPU in the TI version). The keyswitch is used to disable the system when locked. Two keys are provided with the unit. the TURBO LED (yellow) indicates bus activity. Since all cards are in the BACK of the box,

there is no way to see their respective activity lights. This LED is a suitable replacement. The HDD LED (red) indicates hard drive activity. A pigtail with plug is provided to connect this to your hard drive. The POWER LED (green) serves an obvious purpose. The power switch is at the lower right front corner of the box.

The rear apron contains the openings for the card rack, a jack for the AC line, a jack for running power to a monitor, a 110/220 VAC selector switch, the power supply cooling fan and 2 knockouts for DB-25 and DB-9 connectors (not used).

With the exception of the front panel, the ENTIRE box is heavy gauge steel and VERY rugged. There are 4 rubber feet attached to the bottom. Dimensions of the entire unit are 7" H x 15" W x 16 1/4" D.

Many existing expansion cards will have to be modified for use in the RAVE expansion box but the mod is VERY simple and requires only 2 solder joints per card and a bit of wire. Here's the explanation. The TI PEBox was a power monster. It put out WELL over the 12 volts needed by the cards. In order to keep the cards from self-destructing, the manufacturers installed voltage regulators on their cards to hold the incoming voltage at 12. The excess voltage was bled off as heat. The RAVE box uses a tightly regulated supply that requires no such extra regulation. Extra regulators can, in fact, cause minor problems. So, a jumper is installed across the existing regulator to take it 'out-of-circuit'. Cards modified this way CANNOT BE USED IN A TI PBOX UNTIL THE MOD IS REMOVED! Removal, however, is as simple as cutting a wire. The manual contains adequate descriptions of how to do the mod and what to look for as well as a list of cards that DO require the change.

Now comes the critique. Internally, the unit is well laid out with plenty of room for running cables and maneuvering. Airflow is adequate for keeping things cool. The box, while a bit large compared to the TI

PEBox, is attractive. My documentation for the unit is admittedly preliminary and John tells me it will be improved so I'll skip over that.

I have only one nit to pick with RAVE. The manual recommends the removal of the clamshells around cards to help them remain cool. Unfortunately, the clamshells are also used to hold the cards in place in the card rack. Without the clamshell, the cards tend to wobble in the edge connectors. With nothing inside the cover to hold the cards in place and nothing to keep them from moving sideways, it is possible for a card to come partially out of the socket with disastrous results. This is more of a danger to cards with cables connecting them to the outside world, like Geneves and serial cards. My solution was to glue 2 strips of resilient foam inside the cabinet cover, OVER the edge connectors and perpendicular to the cards. This effectively HOLDS the cards in their sockets and keeps them from moving sideways as well. Since I set my PEBox up in a 'Tower' configuration, this modification was doubly necessary. I sent John a sample of the material I used in hopes that he will add it to future versions

I have been asked how much I paid. My answer is that it is no longer a valid price. I paid for the unit in April of '90. SEVERAL modifications and upgrades have since been made to the initial design that have changed the price upwards. Those of us who pre-paid were locked in with no further charges. For an accurate CURRENT price, contact:

RAVE99 Co
112 Rambling Road
Vernon Ct. 06066

or call John McDevitt AFTER 7pm at (203)871-7824

Finally, the grade. I can't grade the documentation properly since what I received was VERY preliminary. On that basis, I'd say.

Documentation . . - B+

On the PE/2-A, taking into account

workmanship and functionality, I'll say:

Product - A

On RAVE's customer relations, counting willingness to communicate, honesty and willingness to listen, a definite:

Customer Relations - A+

Do I like what I got? YES
 Would I recommend it to others? YES
 Was it worth the wait? YES

Hi! this is Ralph Field your friendly Editor. I just wanted to add to Dave's article by mentioning that I purchased a RAVE PE/2-A Box also at the 1990 TICOFF Show. I received it on Feb. 17th, 91. I had the same exact experience as Dave described in his article. I give it High marks, I feel it is well worth the money if you are interested in a smart looking, compact unit that will handle comfortably a fully expanded system efficiently, all in one unit. I give it an overall rating of A+.

SOME HANDY ROUTINES

Fm LA99'ers Newsletter
 By Chick De Marti

The last couple of months I have been sharing ideas and routines from various programmers. This month I thought I would offer to the TI community a combination of ideas.

My good friend, and late George Steffen wrote this for me one day when I said "I wish I could save part of this program to use in another." He called it 'LINES'.

```

90 CALL CLEAR
100 REM PROG MUST FIRST BE SAVED USING
THE MERGE OPTION.
105 PRINT "(Include DSKdrive)": :
110 INPUT "NAME OF INPUT FILE?
":IF$
120 INPUT "NAME OF OUTPUT FILE?
":OF$
130 INPUT "FIRST LINE TO SAVE?
":SLN
140 INPUT "LAST LINE TO SAVE?
":LLN
    
```

```

150 OPEN #1:IF$,DISPLAY ,VARIABLE 163
,INPUT
160 OPEN #2:OF$,DISPLAY ,VARIABLE 163
,OUTPUT
170 IF EOF(1)THEN 250
180 LINPUT #1:L$
190 ILN=256*ASC(L$)+ASC(SEG$(L$,2,1))
200 IN LN=65535 THEN 250
210 IF ILN<SLN THEN 170
220 IF ILN>LLN THEN 250
230 PRINT #2:L$
240 GOTO 170
250 PRINT #2:CHR$(255);CHR$(255):: CL
OSE #1 :: CLOSE #2 :: STOP
    
```

In the next offering, the change color idea came from a newsletter. I can't remember who wrote it. I've added 2 other methods of displaying a HELP or warning message.

```

10 ! *****
* FLASHING HELP MSG$ *
20 * By A. Nonvmous *
*****
40 CALL CLEAR
50 MSG$="HELP"
60 ! ---Color Changing---
80 DISPLAY AT(14,10):MSG$
90 FOR I=1 TO 10
100 FOR CHARSET=5 TO 7
110 CALL COLOR(CHARSET,16,2)
120 NEXT CHARSET
130 GOSUB 380
140 FOR CHARSET=5 TO 7
150 CALL COLOR(CHARSET,2,1)
160 NEXT CHARSET
170 GOSUB 380
180 NEXT I
190 ! ---Growing Letters---
210 FOR I=1 TO 10
220 DISPLAY AT(14,10):"_____"
230 GOSUB 380
240 DISPLAY AT(14,10):MSG$
250 GOSUB 380
260 NEXT I
270 DISPLAY AT(14,10):""
280 ! ---Crawling---
300 FOR I=1 TO 10
310 FOR C=10 TO 13
320 DISPLAY AT(14,C)SIZE)-1):SEG$(MS
G$,C-9,1)
330 NEXT C
340 GOSUB 380
350 DISPLAY AT(14,10):""
360 NEXT I
370 END
380 FOR DX=1 TO 50 :: NEXT DX :: RETUR
N
    
```


TIPS FROM THE TIGERCUB

#39

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Columbus, OH 43213

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For descriptions of these send a dollar for my catalog!

Answer to last month's challenge - for the longest possible one-liner, run the following "program to write a program" -

```
100 OPEN #1:"DSK1.LONG",VARIABLE 163,OUTPUT
110 FOR J=1 TO 79 :: M$=M$&CHR$(149)&CHR$(130):: NEXT J
```

```
:: M$=CHR$(254)&CHR$(254)&M$&CHR$(149)&CHR$(0):: PRINT #1:M$ :: PRINT #1:CHR$(255)&CHR$(255):: CLOSE #1
```

Then enter NEW, then MERGE DSK1.LONG, then LIST - over 34 lines long! But that one doesn't do anything, so try this -

```
100 OPEN #1:"DSK1.LONG".VARIABLE 163,OUTPUT
110 FOR J=1 TO 52 :: M$=M$&CHR$(162)&"X"&CHR$(130):: NEXT J :: M$=CHR$(254)&CHR$(254)&M$&CHR$(162)&"X"&CHR$(0):: PRINT #1:M$ :: PRINT #1:CHR$(255)&CHR$(255):: CLOSE #1
```

Again enter NEW, and MERGE DSK1.LONG, then RUN. You'll get a message BREAKPOINT IN 32510 (don't ask me why! Can anyone tell me?) but just enter RUN again. Then LIST it - over 24 lines long!

Explanation? Programs are saved in token code similar to MERGE format code. The maximum length of a record is 163 bytes - which is why MERGE files are D/V 163. The token for RANDOMIZE is ASCII 149, for the double colon is 130. Repeating that 79 times takes only 158 bytes, plus one more RANDOMIZE, the two-byte tokenized line number and the mandatory ASCII 0 to end the record, totals 162.

Here's a spooky one for Hallowe'en -

```
100 CALL CLEAR :: CALL MAGNIFY(4):: CALL SCREEN(2) ! The Blob by Jim Peterson
110 CALL CHAR(96,RPT$("3C7EFFFFFF7E3C",4)):: J=-1
120 FOR L=1 TO 28 :: CALL SPRITE(#L,96,16,L*4+20,10,0,L+8):: NEXT L
130 FOR L=1 TO 28 :: CALL MOTION(#L,0,L*J):: NEXT L
140 J=J*-1 :: GOTO 130
```

Wes Johnston published an unusual sprite 2-liner in the Charleston Area 99ers newsletter. It is based on

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a CALL LOAD which freezes all sprite motion until they are turned loose by another CALL LOAD -

```
100 R=PI*2/28 :: CALL CLEAR
:: CALL SCREEN(2):: CALL INIT
T :: CALL LOAD(-31806,96)::
FOR I=1 TO 28 :: CALL SPRITE
(#I,46,16,96,128,COS(I*R)*10
,SIN(I*R)*10):: NEXT I
110 CALL LOAD(-31806,0):: GO
TO 110
```

You might like to try adding my "jewels" to that -

```
100 FOR CH=33 TO 60 :: FOR A
=1 TO 4 :: X=INT(8*RND+1)::
T$=SEG$( "18243C425A667E81",X
*2-1,2):: A$=A&T$ :: B$=T$&
B$ :: NEXT A :: CALL CHAR(CH
,A$&B$):: A$,B$="" :: NEXT C
H
```

```
110 R=PI*2/28 :: CALL CLEAR
:: CALL SCREEN(2):: CALL INIT
T :: CALL LOAD(-31806,96)::
FOR I=1 TO 28 :: CALL SPRITE
(#I,32+I,INT(14*RND+3),96,12
8,COS(I*R)*10,SIN(I*R)*10)::
NEXT I
```

```
120 CALL LOAD(-31806,0):: GO
TO 120
```

Also try CALL MAGNIFY(2)

And, here is a companion program to the TAKE AWAY in Tips #35 -

```
100 CALL CLEAR :: CALL TITLE
(5,"ADD & CARRY")!by Jim Peterson
```

```
110 DISPLAY AT(3,10):"COPYRI
GHT":TAB(10):"TIGERCUB SOFTW
ARE":TAB(10):"FOR FREE":TAB(
10):"DISTRIBUTION":TAB(11):"
SALE PROHIBITED"
```

```
120 CALL PEEK(-28672,A@):: I
F A@=0 THEN 160
```

```
130 DATA FINE,NO,GOOD,UHOH,R
IGHT,TRY AGAIN,YES,THAT IS N
OT RIGHT
```

```
140 FOR J=1 TO 4 :: READ RIG
HT$(J),WRONG$(J):: NEXT J
```

```
150 FOR D=1 TO 1000 :: NEXT
D :: CALL DELSPRITE(ALL)
```

```
160 CALL CLEAR :: CALL CHAR(
95,"FFFF"):: CALL MAGNIFY(2)
:: RANDOMIZE :: CALL SCREEN(
14):: FOR SET=5 TO 8 :: CALL
COLOR(SET,16,1):: NEXT SET
```

PATIUG

```
170 CALL CHAR(120,"E70042001
8007E0000E700420099423CE7004
20099423C00E7004218003C4200"
)
```

```
180 CALL CHAR(124,"0E0004010
00708007000208000E01000")
```

```
190 DISPLAY AT(3,8)."ADD AND
CARRY" :: CALL CHAMELEON
```

```
200 CALL COLOR(14,2,2):: CAL
L HCHAR(4.4,143.2):: CALL HC
HAR(5,4,143,2):: CALL SPRITE
(#25,120,11,25,25)
```

```
210 T=T+1 :: IF T=6 THEN T=0
:: GOTO 250
```

```
220 Z=INT(8*RND+2):: IF Z=22
THEN 220 ELSE Z2=Z
```

```
230 Y=INT(Z*RND):: IF Y=Y2 T
HEN 230 ELSE Y2=Y :: X=Z-Y
```

```
240 N=1 :: GOSUB 470 :: GOTO
210
```

```
250 T=T+1 :: IF T=11 THEN T=
0 :: GOTO 290
```

```
260 X=INT(10*RND):: IF X=X2
THEN 260 ELSE X2=X
```

```
270 Y=INT(10*RND):: IF Y=Y2
OR X+Y<10 THEN 260 ELSE Y2=Y
:: Z=X+Y
```

```
280 N=1 :: GOSUB 470 :: GOTO
250
```

```
290 T=T+1 :: IF T=11 THEN T=
0 :: GOTO 330
```

```
300 X=INT(90*RND+10):: IF X=
X2 THEN 300 ELSE X2=X
```

```
310 Y=INT(90*RND+10):: IF Y=
Y2 THEN 310 ELSE Y2=Y :: Z=X
+Y
```

```
320 N=2 :: GOSUB 470 :: GOTO
290
```

```
330 X=INT(900*RND+100):: IF
X=X2 THEN 330 ELSE X2=X
```

```
340 Y=INT(900*RND+100):: IF
Y=Y2 THEN 340 ELSE Y2=Y :: Z
=X+Y
```

```
350 N=3 :: GOSUB 470 :: GOTO
330
```

```
360 R=96 :: CC=96 :: FOR J=1
TO N :: CALL SPRITE(#J,48+A
(J),11,R,CC):: CC=CC+16 :: N
EXT J
```

```
370 R=116 :: CC=96 :: FOR J=
1 TO N :: CALL SPRITE(#4+J,4
8+B(J),11,R,CC):: CC=CC+16 ::
NEXT J
```

```
380 CALL HCHAR(18,12,95,N*3)
:: CC=CC-16 :: CALL SPRITE(#
22,43,16,R,80):: RETURN
```

```
390 R=140 :: FOR J=LEN(STR$(
```

```
Z))TO 1 STEP -1 :: CALL SPRI
TE(#20,63,11,R,CC)
```

```
400 CALL KEY(3,K,ST):: IF ST
<1 OR K<48 OR K>57 THEN CALL
PATTERN(#20,32):: CALL PATT
ERN(#20,63):: GOTO 400
```

```
410 CALL DELSPRITE(#20):: CA
LL SPRITE(#12+J,K,11,R,CC)
```

```
420 IF K-48<>C(J)THEN GOSUB
480 :: CALL DELSPRITE(#12+J)
:: CALL SPRITE(#20,63,11,R,C
C):: GOTO 400
```

```
430 IF A(J-W)+B(J-W)>9 THEN
CALL SPRITE(#28,49,16,80,CC-
16)
```

```
440 CC=CC-16 :: NEXT J :: GO
SUB 510 :: RETURN
```

```
450 FOR J=1 TO LEN(STR$(X)):
:: A(J)=VAL(SEG$(STR$(X),J
,1)):: NEXT J :: FOR J=1 TO
LEN(STR$(Y)):: B(J)=VAL(SEG$
(STR$(Y),J,1)):: NEXT J
```

```
460 FOR J=1 TO LEN(STR$(Z)):
: C(J)=VAL(SEG$(STR$(Z),J,1)
):: NEXT J :: W=LEN(STR$(Z))
-LEN(STR$(X)):: RETURN
```

```
470 GOSUB 450 :: GOSUB 360 :
: GOSUB 390 :: FOR D=1 TO 20
0 :: NEXT D :: CALL DELSPRIT
E(ALL):: DISPLAY AT(18,1)::
```

```
CALL CHAMELEON :: CALL SPRIT
E(#25,120,11,25,25):: RETURN
```

```
480 DATA 123,124,125,123,124
,125,123,120
```

```
490 IF A@=0 THEN 500 :: CALL
SAY(WRONG$(INT(4*RND+1)))
```

```
500 RESTORE 480 :: FOR JJ=1
TO 8 :: READ P :: CALL PATTE
RN(#25,P):: XX=2^250 :: NEXT
JJ :: RETURN
```

```
510 DATA 121,122,121,122,121
,122
```

```
520 IF A@=0 THEN 530 :: CALL
SAY(RIGHT$(INT(4*RND+1)))
```

```
530 RESTORE 510 :: FOR JJ=1
TO 6 :: READ P :: CALL PATTE
RN(#25,P):: XX=2^250 :: NEXT
JJ :: RETURN
```

```
540 SUB CHAMELEON
```

```
550 M$="1800665AC342DB6G7E18
8100995AC3A5E78142BD24DB6600
81429924007E5AC3A53C241800FF
DB5AFF7EFF0099188100660018"
```

```
560 RANDOMIZE :: CALL CHAR(1
28,SEG$(M$,INT(43*RND+1)*2-1
,16)):: X=INT(14*RND+3)
```

```
570 Y=INT(14*RND+3):: IF Y=X
```

```

THEN 570 :: CALL COLOR(13,X
,Y)
580 CALL HCHAR(1,2,128,30)::
CALL HCHAR(24,2,128,30):: C
ALL VCHAR(1,31,128,96):: SUB
END
590 SUB CIAMWIPE
600 T=T+1+(T=2)*2 :: ON T GO
TO 610,620
610 CALL VCHAR(1,3,128,768):
: GOTO 630
620 CALL HCHAR(1,1,128,768)
630 CALL CLEAR :: SUBEND
640 SUB TITLE(S,T$)
650 CALL SCREEN(S):: L=LEN(T
$):: CALL MAGNIFY(2)
660 FOR J=1 TO L :: CALL SPR
ITE(#J,ASC(SEG$(T$,J,1)),J+1
-(J+1=S)+(J+1=S+13)+(J>14)*1
3,J*(170/L),10+J*(200/L))::
NEXT J
670 SUBEND

```

```

A mathematical curiosity -
100 !MAGIC NINES by Jim Pete
rson
110 CALL CLEAR
120 INPUT "TYPE ANY 3-DIGIT
NUMBER OF 3 DIFFERENT DIGITS
":N :: IF N<>INT(N)OR N>999
OR N<0 THEN 120
130 N$=STR$(N):: IF N<100 TH
EN N$="0"&N$
140 IF SEG$(N$,1,1)=SEG$(N$,
2,1)OR SEG$(N$,1,1)=SEG$(N$,
3,1)OR SEG$(N$,2,1)=SEG$(N$,
3,1)THEN PRINT ">>>THREE DIF
FERENT DIGITS<<<," :: GOTO 12
0
150 PRINT :: N2$="" :: FOR J
=1 TO 3 :: N2$=SEG$(N$,J,1)&
N2$ :: NEXT J :: N2=VAL(N2$)
:: D=ABS(N-N2)
160 PRINT N$;" BACKWARDS IS
";N2$ :
170 N3=ABS(N-N2):: N3$=STR$(
N3):: IF N3<100 THEN N3$="0"
&N3$
180 IF N>N2 THEN PRINT N$;"
MINUS ";N2$;" EQUALS ";N3$
:ELSE PRINT N2$;" MINUS ";N$
;" EQUALS ";N3$ :
190 FOR J=1 TO 3 :: N4$=SEG$
(N3$,J,1)&N4$ :: NEXT J
200 PRINT N3$;" BACKWARDS IS
";N4$ :N3$;" PLUS ";N4$;"
IS 1089": "I KNEW THAT WOUL

```

```

D BE THE": "ANSWER!": "LIS
T THE PROGRAM AND SEE!"
210 !!!!!!!!!!!!!!!!!!!!!!!
220 ! THE ANSWER WILL BE !
230 ! 1089 !
240 !!!!!!!!!!!!!!!!!!!!!!!

100 DISPLAY AT(8,10)ERASE AL
L:"SHENANDOAH": : " Across
the wide Missouri": : : :
: : : : "programmed by
Jim Peterson"
110 FOR D=1 TO 1000 :: NEXT
D :: CALL CLEAR :: DIM S(24)
:: RANDOMIZE :: M$="4218005A
007E9981005A24DBC31824243C5A
7EA56618009CDB66BD3CA542187E
5AC324425A18A51866810081187E
423CBDDBC3" :: R=1
120 FOR CH=40 TO 136 STEP 8
130 CALL CHAR(CH,SEG$(M$,INT
(43*RND+1)*2-1,16)):: CALL H
CHAR(R,1,CH,64):: R=R+2*ABS(
R<23)
140 NEXT CH :: R=0 :: FOR SE
T=2 TO 14 :: X=INT(14*RND+2)
150 Y=INT(14*RND+2):: IF Y=X
THEN 150
160 CALL COLOR(SET,X,Y)
170 NEXT SET :: CALL CLEAR :
: CALL COLOR(1,5,5):: CALL V
CHAR(1,29,1,192):: CALL SCRE
EN(16):: F=262 :: FOR N=0 TO
23 :: S(N)=INT(F*1.05946309
4^N):: CALL SOUND(-999,S(N),
0)
180 NEXT N
190 DATA 2,1,1,1,6,1,1,1,6,2
,6,1,1,1,6,1,8,8,1,10,10,1,1
1,11,1,15,6,3,13,6,2,13,11
200 DATA 1,18,10,1,17,17,4,1
5,11,1,11,15,1,13,13,1,15,11
,1,13,13,1,10,10,3,13,10
210 DATA 2,13,13,2,13,10,1,1
5,10,1,10,15,2,15,15,1,15,10
,1,10,10,1,13,13,1,10,10
220 DATA 1,8,3,3,6,3,2,6,6,2
,8,8,4,10,1,1,10,6,1,6,6,1,1
0,10,1,15,15
230 DATA 2,13,1,2,13,5,2,13,
10
240 DATA 1,6,6,1,8,8,6,10,6,
2,3,3,2,8,5,1,8,1,3,6,1,7,6,
1
250 A=1 :: B=1 :: E=5
260 FOR J=1 TO 144 STEP 3 ::
CALL HCHAR(A,E,32,T*4):: CA

```

```

LL HCHAR(A+1,E,32,T*4):: CAL
L HCHAR(B,E,32,T*4):: CALL H
CHAR(B+1,E,32,T*4):: READ T,
A,B :: E=17-T*2
270 CALL HCHAR(A,E,32+INT((A
+1)/2)*8,T*4):: CALL HCHAR(A
+1,E,32+INT((A+1)/2)*8,T*4):
: CALL HCHAR(B,E,32+INT((B+1
)/2)*8,T*4)
280 CALL HCHAR(R+1,E,32+INT(
(B+1)/2)*8,T*4):: FOR D=1 TO
T :: CALL SOUND(-999,S(A),0
,S(B),7)
290 NEXT D
300 NEXT J :: LL=0 :: FOR SE
T=2 TO 14 :: X=INT(15*RND+2)
310 Y=INT(15*RND+2):: IF Y=X
THEN 310
320 CALL COLOR(SET,X,Y):: CA
LL SOUND(-999,S(6),LL,S(1),L
L):: LL=LL+2
330 NEXT SET :: RESTORE :: G
OTO 260
>>>>>>>MEMORY FULL<<<<<<<<<

```