Personal Computing
For Your Home and Business
Christmas Card Lists
Figuring Incentive Pay
Depreciation Schedules
1980
HOLIDAY GIFT GUIDE for GAMERS and others!
SAY MERRY CHRISTMAS with kilobaud MICROCOMPUTING
electronic toys
computers
audio/video
video games
and more!
In the Christmas 1980 Retro-Spective,
palcotronic
gave to me...

While the availablity and afforability of consumer electronics had steadily increased during the 1970s, arguably the Christmas of 1980 was the first where electronic gifts became common. The cost of video-game consoles had fallen from the stratosphere, new low-priced competitors were introduced into the home computer market, and mass-produced Japanese toys, watches, video and audio equipment invaded shops and department stores at a time when consumers had money in their wallets.

This first issue of the “12 Years of Retro-Christmas” will look at all of these niches and more, giving you a sense (or triggering some memories) of what was under the tree on Christmas morning, 1980, from the Armatron to the Sony Walkman.

Come along with us as we take a look at some of the electronics of Christmas past.

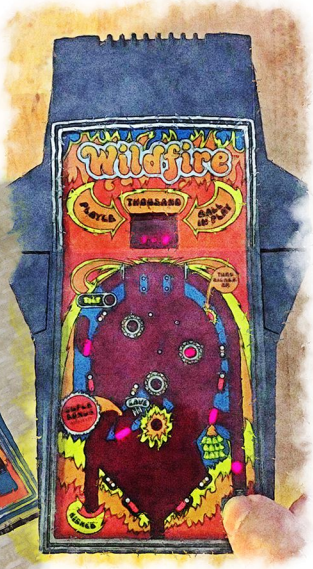
Without a very shiny nose....

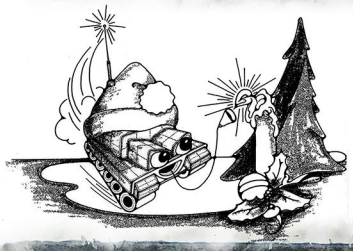
An animal of another type has been observed at the shop lately. He has probably been here a while, but his mannerisms were so similar to our own (sleeping, craving attention, begging for food, etc.), that nobody noticed him until recently. We got suspicious because he never frowned. Closer inspections revealed a furry skin and a looong nose. Grabbing "Clyde's Guide to Fuzzies", we read: 'Jed - cocker spaniel mix dog commonly found underfoot'. Yep....

CLOAD
MAGAZINE, inc.
BOX 1267
GOLETA, CA
93017
DECEMBER 1980

Christmas 1980 saw children recieve a bounty of electronic toys such as the Armatron robotic arm, Wildfire LED pinball game, and the programmable Big Trak electronic tank.

It could be programmed like the LOGO 'turtle', with distances, turns, and sound effects.

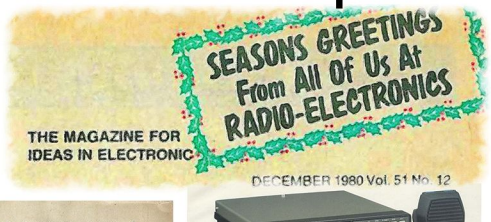




Other popular electronic gifts included games such as Simon, where the player repeated a series of tones by pressing the appropriate buttons, and the Speak and Spell, one of the worlds early speech synthesizers, which had a number of games for learning English, both built-in and on cartridges.

The electronics inside home living rooms also saw upgrades and new arrivals, including updated "hi-fi" stereo equipment, rear-projection televisions and video cassette recorders (both VHS and the eventual loser of the "format wars", Betamax.)

"Breaker, good buddy!" the CB craze of the 1970s continued well into the 1980s. 10-4!



Many living rooms were graced with electronic organs, the vast majority of which sadly gathered dust.

Sony's "Walkman" portable cassette player spawned a rash of traffic accidents, especially at intersections as inattentive teen-agers, deaf to the world around them, stepped out at the wrong time. But at least they were looking where they were going! (Unlike today's teens....)

COLECO Toys & Games '80

ELECTRONIC TWO-PLAYER SPORTS GAMES

head to head™ SOCCER

2170—HEAD TO HEAD™ ELECTRONIC SOCCER Here's plenty of action on the field when you play Coleco's new head to head™ soccer for two. Each player controls the action of his team with a hand control. Play offense or defense! The five different game options give the ball from players setting for a shot while the defensive players attempt to block. The free kick, throw-in and corner kick to the offensive player with the ball. Break away from the defense for a goal with your head. Choose two skill levels, five difficulty levels, the difficulty varies slightly. Three different sound effects highlight it all in this action packed electronic soccer game for two players.

- Electronic head to head soccer competition for one or two players
- Play against the computer or with another player on the same team
- Computer offers one level defensive opponent
- Plays black and white video or color TV sets
- Three different sounds
- Two skill levels, five difficulty levels
- Simple one or two button controls
- Uses 9 volt battery (not included) or Coleco battery terminal pack (AC adapter)
- Full color packaging
- Measures 9" by 6" by 2"
- Ages 8 to adult

head to head™ HOCKEY

2160—HEAD TO HEAD™ ELECTRONIC HOCKEY All the action and excitement of ice hockey is here in this electronic game for two players. Each player controls the action of his team with a hand control. Play offense or defense! Five different game options give the ball from players setting for a shot while the defensive players attempt to block. The free kick, throw-in and corner kick to the offensive player with the ball. Break away from the defense for a goal with your head. Choose two skill levels, five difficulty levels, the difficulty varies slightly. Three different sound effects highlight it all in this action packed electronic hockey game for two players.

- Electronic head to head hockey competition for one or two players
- Play against the computer or with another player on the same team
- Computer offers one level defensive opponent
- Plays black and white video or color TV sets
- Three different sounds
- Two skill levels, five difficulty levels
- Simple one or two button controls
- Uses 9 volt battery (not included) or Coleco battery terminal pack (AC adapter)
- Full color packaging
- Measures 9" by 6" by 2"
- Ages 8 to adult

head to head™ FOOTBALL

2180—HEAD TO HEAD™ ELECTRONIC FOOTBALL Here's the electronic football game where your team plays against the computer or against another player. Play offense or defense! Five different game options give the ball from players setting for a field goal attempt or a pass while the defensive players attempt to block. The free kick, throw-in and corner kick to the offensive player with the ball. Break away from the defense for a touchdown with your head. Choose two skill levels, five difficulty levels, the difficulty varies slightly. Three different sound effects highlight it all in this action packed electronic football game for two players.

- Electronic head to head football competition for one or two players
- Play against the computer or with another player on the same team
- Computer offers one level defensive opponent
- Plays black and white video or color TV sets
- Three different sounds
- Two skill levels, five difficulty levels
- Simple one or two button controls
- Uses 9 volt battery (not included) or Coleco battery terminal pack (AC adapter)
- Full color packaging
- Measures 9" by 6" by 2"
- Ages 8 to adult

head to head™ BASKETBALL

2190—HEAD TO HEAD™ ELECTRONIC BASKETBALL All the action and excitement of basketball is here in this electronic game for two players. Each player controls the action of his team with a hand control. Play offense or defense! Five different game options give the ball from players setting for a shot while the defensive players attempt to block. The free kick, throw-in and corner kick to the offensive player with the ball. Break away from the defense for a basket with your head. Choose two skill levels, five difficulty levels, the difficulty varies slightly. Three different sound effects highlight it all in this action packed electronic basketball game for two players.

- Electronic head to head basketball competition for one or two players
- Play against the computer or with another player on the same team
- Computer offers one level defensive opponent
- Plays black and white video or color TV sets
- Three different sounds
- Two skill levels, five difficulty levels
- Simple one or two button controls
- Uses 9 volt battery (not included) or Coleco battery terminal pack (AC adapter)
- Full color packaging
- Measures 9" by 6" by 2"
- Ages 8 to adult

LIL GENIUS™

2080—LIL GENIUS™ ELECTRONIC LEARNING CALCULATOR Test your mathematical skills or learn to add, subtract, multiply and divide with Lil Genius™. The computer will challenge you with problems in the mode you select. If you answer correctly, the next problem appears. If you answer incorrectly, Lil Genius will help you find the correct answer. Lil Genius will keep track of your score. Lil Genius has a built-in timer to time your answers. Lil Genius has a built-in timer to time your answers. Lil Genius has a built-in timer to time your answers.

- Electronic calculator teaches addition, subtraction, multiplication and division
- Lil Genius™ — The Intelligent Machine
- Plays against you or with you
- Lil Genius shows you if you're right or wrong
- Lil Genius shows you the correct answer if you're wrong
- Lil Genius challenges you with problems
- Lil Genius keeps track of your score
- Lil Genius has a built-in timer to time your answers
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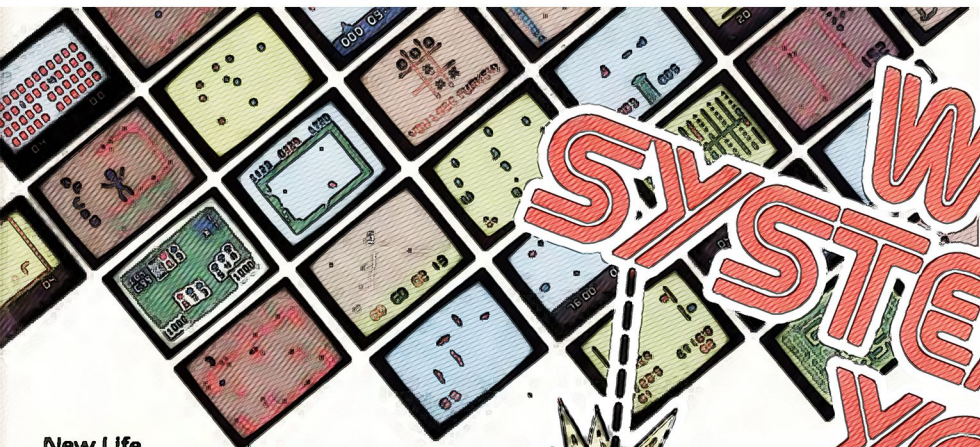
Video Games

The venerable Atari 2600, largely alone in the marketplace since its release in 1977, would find itself facing a threatening new competitor this Christmas season, Mattel's Intellivision. Featuring controllers that sported numeric keypads (with overlays detailing various game functions) and rotational knobs, it was an attractive upgrade from the aging 2600, kept alive only by virtue of its library of recognizable arcade titles and a continuing downward-trending price.

The 2600 would survive, however, and eventually win the longevity battle, selling until 1992, two years later than the Intellivision.

Magnavox's Odyssey 2 provided another option for aspiring Christmas video-gamers. Sold as the Philips Videopac in Europe, the Odyssey 2 was the third most-popular console in the early 1980s. While it featured a full "computer" keyboard, it was mostly useless, and its hard-wired controllers led to "spaghetti" tangles.



WHICH SYSTEM'S FOR YOU?

A distant last, the Fairchild Channel F featured only seven colours and a comparatively small number of games. It would not survive long past 1980.

New Life For Fairchild System

Zircon, Inc. may be the most inappropriately named company in the entire video-game business. Certainly, what the firm is doing for owners of the Channel F system previously manufactured by Fairchild Electronics is worth its weight in diamonds.

Beginning in time for the 1980 gift-giving season, Zircon took the Channel F out of mothballs and started trying to service owners on the customer list bequeathed to it by Fairchild. Not only is Zircon marketing the revised hardware developed just before the system was shelved by the original owner, but the company is willing to help existing owners upgrade by offering a special deal: the new unit costs only $69.95 with a trade-in Channel F.

The system itself has held up very nicely despite the passage of years and the advent of new technology. The controllers, which combine paddle and joystick in a single device, work well and allow designers great latitude with their game designs.

Zircon is rapidly getting the

Videogame System Scoreboard Chart

	Atari VCS	Odyssey²	Intellivision	ActiVision	Channel F
Head-to-Head Games	Excellent	Excellent	Excellent	Good	Fair-Good
Solitaire Games	Excellent	Good	Fair	Good	Good
Variety of Software	Excellent	Excellent	Fair-Good	Good	Good
Arcade Games	Excellent	Good	Fair	Fair	Fair-Good
S.F. & Fantasy Games	Excellent	Excellent	Fair-Good	Fair-Good	Fair
Sports Games	Fair-Good	Good-Excellent	Excellent	Good	Fair
Strategy Games	Fair	Excellent	Excellent	Fair-Good	Fair-Good
Electronic Board Games	Fair-Good	Excellent	Good-Excellent	Fair-Good	Good
Graphics	Good	Good	Excellent	Excellent	Fair-Good

Home Computers

Introduced in 1977 along with the TRS-80 and the Commodore Pet, the Apple II would launch Apple into a successful business, and by the mid-1980s it would become one of the world's most well-known computers (chiefly by virtue of its popularity in North American schools.) Technically rather crude, it had a booming software ecosystem that more than made up for it, spawning a number of popular titles such as Oregon Trail and Prince of Persia.

Two years after the Apple II, video-game manufacturer Atari would enter the home computer market with the Atari 400 and 800 models. Providing superior graphics and sound to other home computers of the time, and with a library of arcade conversions on cartridge, the Atari machines were also quite well-built and attractive as entry-level computers for children.

However, they would have a difficult time in the market with the release of much cheaper machines by competitors such as Commodore in the following few years.

1980 also marked the introduction of the first "pocket" computer. Manufactured by Tandy (owner of the Radio Shack chain of stores), it featured a one-line, 24 character display and was programmed by way of a built-in dialect of BASIC (the Beginners All-Purpose Symbolic Instruction Code.)

While its practicality was limited it was a very cool gadget nonetheless, and would establish a consumer market for portable computers that would finally meet ubiquity with the success of the smartphone nearly thirty years later.

by Jethro Wright III

Tandy Unveils Color Computer

A new computer from Tandy—and a color one at that—is always big news, especially to a vocal TRS-80 cheerleader like myself.

Physically, the Color Computer is similar to its two predecessors, the TRS-80 Model I and Model II. Apart from the most obvious addition, color graphics, there are some less obvious differences worth noting.

For one thing, the basic CPU/keyboard case is large enough to provide room for interfaces for all the peripheral devices designed for use with the system. Gone is the cumbersome—and expensive—expansion interface of the Model I. Hooray! Built into the machine is a faster, dual-speed cassette interface for long-term storage of user-entered or prepared software programs. Also included is a serial interface to facilitate connecting the Color Computer to a disk drive, printer or modem. The unit also features two joystick ports for use when playing computer games, as well as an output for connecting the system to a TV set.

When the hardware "hackers" out there crack the Color Computer's case, they'll be in for a treat. The excitement starts with the CPU (central processing unit). Tandy has switched from its standard workhorse, the Z-80 microprocessor to the more advanced 6809. Internally, this processor looks a lot like a 16-bit mini-computer. This translates into higher speed and greater programming flexibility than can be realized even with the more expensive Model III.

Regrettably, the improvement has almost eliminated any chance of using any of the mammoth number of software programs developed for the earlier Model I. That shouldn't be a real drawback, however, if Tandy achieved the same degree of acceptance with the Color Computer as it did for its previous home computers.

Moving on, there is the video chip (6847). This L'il wonder delivers eight basic colors and programmability in a single package. Gamers who have felt shackled by the black and white output of the TRS-80 series can now fill the screen with green, blue, yellow, red, buff, cyan, magenta and orange. Besides being simple to use, this chip confers the added bonus of improving the computer's reliability through the reduction in the number of parts that can fail.

In its normal display mode, the Color Computer can present 16 lines of 32 alphanumeric characters each. Although the system will print lower-case letters in reversed, block-on-green form, the Color BASIC programming language resident in the smaller 4K version only understands capitals.

Many home arcaders will want to look into the more powerful 16K Color Computer, which has extended BASIC resident in ROM. It makes it much easier to manipulate the color graphics. For example, extended BASIC makes it possible to draw a circle by simply indicating the center, radius and color desired.

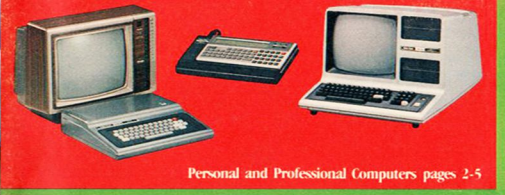
Now for some bad news. Since Tandy has aimed the Color Computer at the home market, it has limited RAM (random access memory) to 16,000 bytes. For some reason, computer manufacturers don't think home computerists need very much memory. In any case, the ROM card connector allows those who want to make the expansion that Tandy didn't think they'd need to do so. A few alternate hardware vendors are already offering such expansion options. Hopefully, Tandy will eventually get the message, too.

The manufacturer wisely elected to stick with a winning hand and turned to Microsoft to develop the BASIC interpreter for the Color Computer. In addition to sophisticated sound, graphics and joystick control, there is some compatability with the Level II/Model III BASIC, so that programs originally written for these machines should transfer to

CHESS

PINBALL

DINO WAR



For decades, nothing said "consumer electronics" like Radio Shack. Founded in 1921, by the mid-1950s it was selling "high fidelity" audio equipment under the Realistic brand. However, in the 1960s it fell on hard times and almost went bankrupt. Lucklily, the Tandy Leather Company saw the potential in the consumer electronics market and bought Radio Shack for not much more than a song. ($300,000)

In the late 1970s they jumped into the computer business with both feet, launching the TRS-80 (Tandy / Radio Shack Z-80 microprocessor) Model 1 around the same time as the Apple II and the Commodore Pet, but the cheapest of the three. It soon became the best-selling PC line of the late 1970s, outselling the Apple II by up to 5 to 1.

In 1980, Tandy released the TRS-80 Color Computer, a reworking of a teletext terminal they had developed for farmers in the late 1970s. While not as cheap as the Sinclair ZX80, it had color, sound and a better (albeit still horrible) keyboard for all of $399, double the price of the ZX80 but still far less than any contemporary competitor.

Derided by users of more expensive computers as the "Trash-80", it would sell well and give millions of people an introduction into home computing.

Why I Like the TRS-80

Stephen B. Gray

It's become fashionable in many personal-computer circles to call Radio Shack's machine the "Trash-80," to speak of Model I's hardware as poorly designed, and to cite various inadequacies of Level II Basic.

Yet, despite all these hardware and software problems, Radio Shack has somehow managed to sell over 200,000 (perhaps 250,000 by the time you read this) of these "poorly designed and inadequate" computers.

How did Radio Shack manage to fool so many people? How were a quarter of a million people hoodwinked into buying such an inferior piece of merchandise?

What They Wanted

One answer is that Radio Shack provided what many people out there wanted, at a price they felt was right, and at thousands of outlets all over the country where a person could go try it out before buying.

Once the TRS-80 caught on, the name became as magic in its own field as IBM's in the mainframe business. IBM may not make the best computers, or the fastest ones, but it knows better than all the rest the importance of service and support. Radio Shack made a lot of mistakes with the TRS-80, as would any company marketing the first popular ready-to-run computer. But they've learned a lot, they've made tens of thousands of free fixes, and they've brought out three more TRS-80 computers that alone may well outsell both Apple and PET.

My TRS-80

Nobody who's used a personal computer for more than a few weeks is completely satisfied with it. There are always some features on other machines I'd like to have on his. I've had a 16K Level II Model I since December 1977. I've been writing the TRS-80 column in this magazine since the Nov-Dec 1978 issue.

It took me months before I realized that some of my dissatisfaction with my TRS-80 was due to my not completely understanding how it works, and exactly how to program some difficult tasks.

Once I began to realize what my TRS-80 could do, and could not do, I began to appreciate it much more.

There's a great deal I still don't know about the TRS-80. I'm not all that much into machine language, preferring to use Basic (which I'm still learning about), in areas such as strings, matrices, and TRS-80 graphics.

But the more I use the Level II computer, the more I like it. I know just about what it can do, and can't, and I recommend it to most of the people who ask me what personal computer to buy.

Most, but not all. The TRS-80 can't please everybody, which is why the Apple II, PET, Atari and Sorcerer computers sell as well as they do.

What I Like About the TRS-80

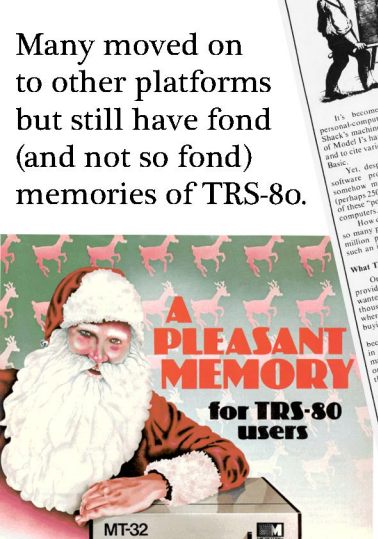
Service and support are two of the main reasons for my liking the Level II TRS-80.

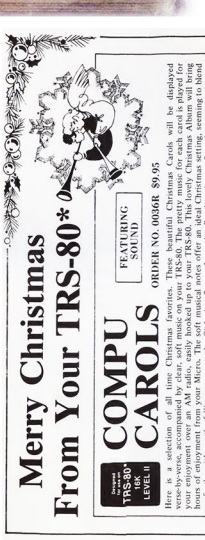
As for service, when I had problems with my RAM memory, and also wanted the lower-case modification installed along with the free cassette-loading fix, all I had to do was take my keyboard unit down to a Computer Center in lower Manhattan, where a skilled technician took all of 55 minutes to fix the memory problem (a faulty RAM IC) and install the two mods.

Who else has over 85 Computer Centers around the country? How many other personal-computer manufacturers require that you mail the computer to them for service?

As for support, I'm talking about the vast amount of absolutely fascinating Level II software available.

I don't mean Radio Shack's programs, most of which have shown a great deal of conservativism and lack of imagination. (Although they're beginning to break away from the mold, and have brought out some good programs, mostly written by outsiders, and some very interesting games are being sold by people who've written software is being sold by programming geniuses. Level II owner, who wrote Dancing Demon, Micklus is another master of the art, and other computer magazines have published for some highly imaginative games and some very useful utility and business programs.)



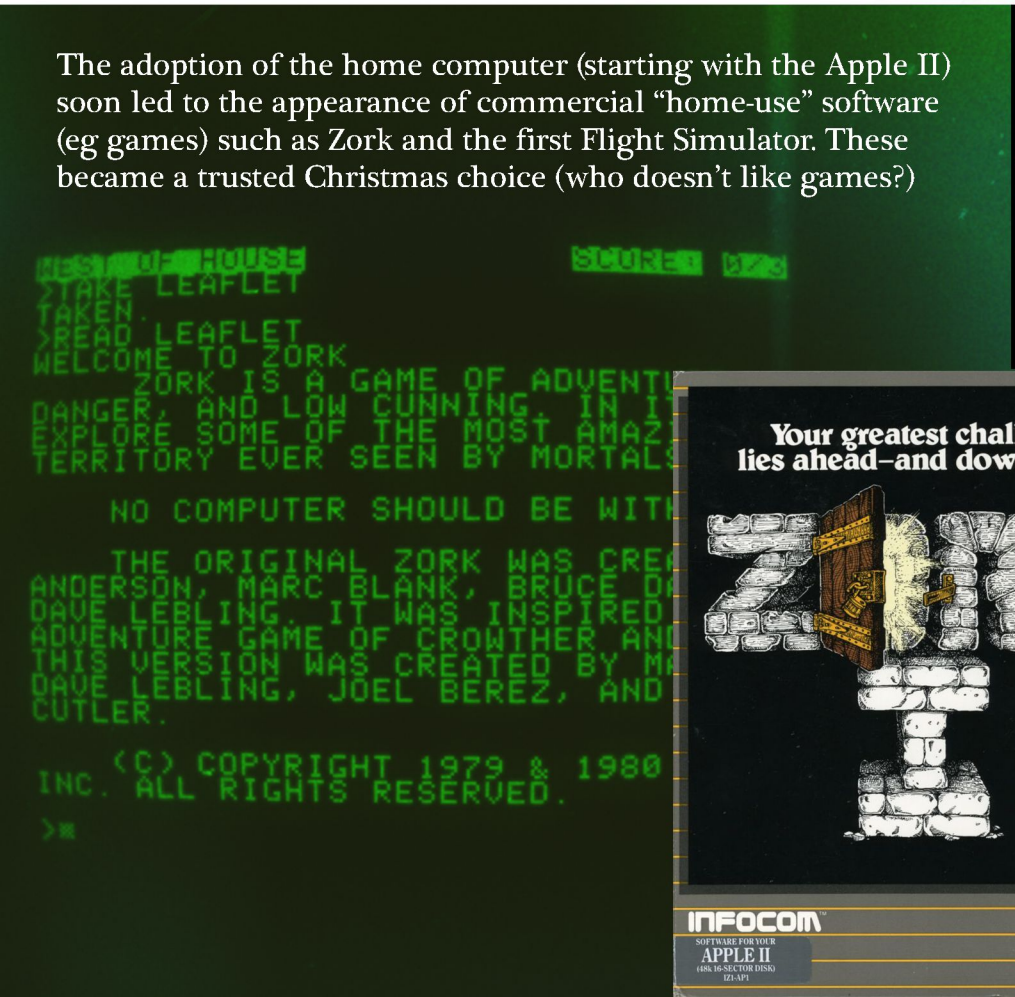


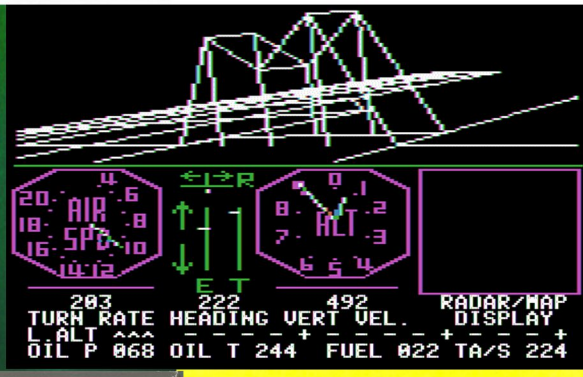
First appearing in the mid 1970s, the Japanese electronics manufacturer Casio brought calculator watch prices down to a more consumer-friendly level in the early 1980s. Kids everywhere rejoiced (and cheated on mathematics exams!)

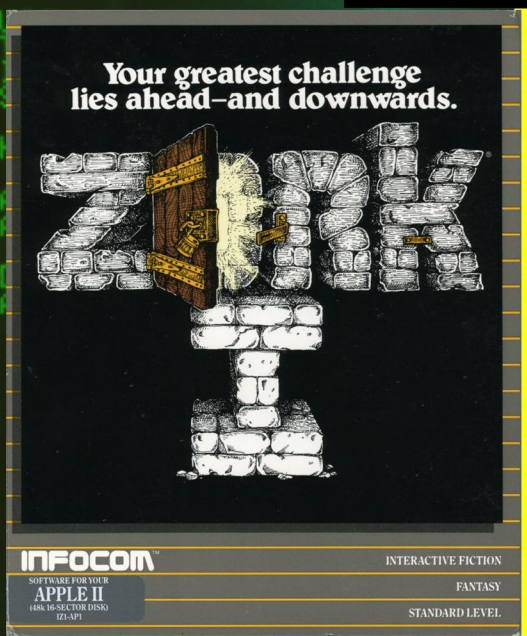
My first calculator watch was really cool, but before long the buttons fell out! It wasn't much use after that happened. Happily later models didn't suffer from such defects.

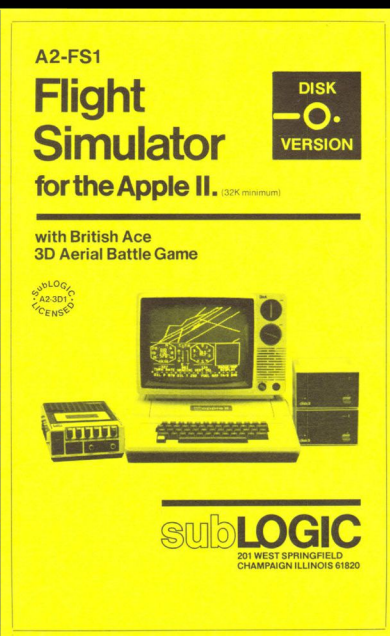
Digital watches with stopwatch timers, reminders and the ability to play synthesized music were also popular Christmas gifts.

The adoption of the home computer (starting with the Apple II) soon led to the appearance of commercial "home-use" software (eg games) such as Zork and the first Flight Simulator. These became a trusted Christmas choice (who doesn't like games?)









The first personal computer for under $200.

The Sinclair ZX80. A complete computer—only $199.95 *plus $5.00 shipping.*

Now, for just $199.95, you can get a complete, powerful, full-function computer, matching or surpassing other personal computers costing several times more.

It's the Sinclair ZX80, the computer that independent tests prove is faster than all previous personal computers. The computer that "Personal Computer World" gave 5 stars for 'excellent value.'

The ZX80 cuts away computer jargon and mystique. It takes you straight into BASIC, the most common, easy-to-use computer language.

You simply take it out of the box, connect it to your TV, and turn it on. And if you want, you can use an ordinary cassette recorder to store programs. With the manual in your hand, you'll be running programs in an hour. Within a week, you'll be writing complex programs with confidence.

All for under $200.

Sophisticated design makes the ZX80 easy to learn, easy to use.

We've packed the conventional computer onto fewer, more powerful LSI chips—including the Z80A microprocessor, the faster version of the famous Z80. This makes the ZX80 the world's first truly portable computer (6½" x 8½" x 1½" and a mere 12 oz.). The ZX80 also features a touch sensitive, wipe-clean keyboard and a 32-character by 24-line display.

Yet, with all this power, the ZX80 is easy to use, even for beginners.

Your course in computing.

The ZX80 comes complete with its own 128-page guide to computing. The manual is perfect for both novice and expert. For every chapter of theory, there's a chapter of practice. So you learn by doing—not just by reading. It makes learning easy, exciting and enjoyable.

The ZX80's advanced design features.

Sinclair's 4K integer BASIC has performance features you'd expect only on much larger and more expensive computers. These include:

- Unique 'one touch' entry. Key words (RUN, PRINT, LIST, etc.) have their own single-key entry and are stored as a single character to reduce typing and save memory space.
- Automatic error detection. A cursor identifies errors immediately to prevent entering programs with faults.
- Powerful text editing facilities.
- Also programmable in machine code.
- Excellent string handling capability—up to 26 string variables of any length.
- Graphics, with 22 standard symbols.
- Built-in random number generator for games and simulations.

Sinclair's BASIC places no arbitrary restrictions on you—with many other flexible features, such as variable names of any length.

And the computer that can do so much for you now will do even more in the future. Options will include expansion of 1K user memory to 16K, a plug-in 8K floating-point BASIC chip, applications software, and other peripherals.

Order your ZX80 now!

The ZX80 is available only by mail from Sinclair, a leading manufacturer of consumer electronics worldwide. We've already sold tens of thousands of units in Europe, so demand will be great.

To order by mail, use the coupon below. But for fastest delivery, order by phone and charge to your Master Charge or VISA. The ZX80 is backed by a 30-day money-back guarantee, a 90-day limited warranty with a national service-by-mail facility, and extended service contracts are available for a minimal charge.

Price includes TV and cassette connectors, AC adaptor, and 128-page manual.

All you need to use your ZX80 is a standard TV (color or black and white). The ZX80 comes complete with connectors that easily hook up to the antenna terminals of your TV. Also included is a connector for a portable cassette recorder, if you choose to store programs. (One use an ordinary blank cassette.)

The ZX80 is a family learning aid. Children 10 and above will quickly understand the principles of computing—and have fun learning.

Phone orders only: (203) 265-9171. We'll refund the cost of your call.

Information: General and technical—(617) 367-1988, 367-2069, 365-1898, 367-2555. Phones open Monday-Friday from 8 AM to 8 PM EST.

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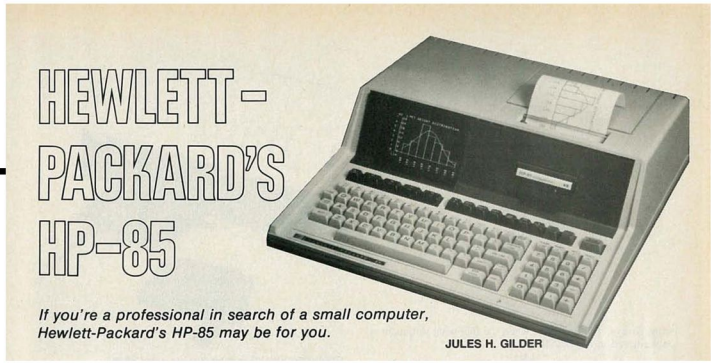
To: Sinclair Research Ltd., 475 Main St., P.O. Box 3027, Wallingford, CT 06492.
Please send me _____ ZX80 personal computer(s) at $199.95* each (US dollars), plus $5 shipping. (Your ZX80 may be tax deductible.)
I enclose a check/money order payable to Sinclair Research Ltd. for $_____
Name _____
Address _____
City _____ State _____ Zip _____
Occupation _____ Age: _____
Intended use of ZX80: _____
Have you ever used a computer? ☐ Yes ☐ No.
Do you own another personal computer? ☐ Yes ☐ No. *For Conn. deliveries, add sales tax.

IA-12-0

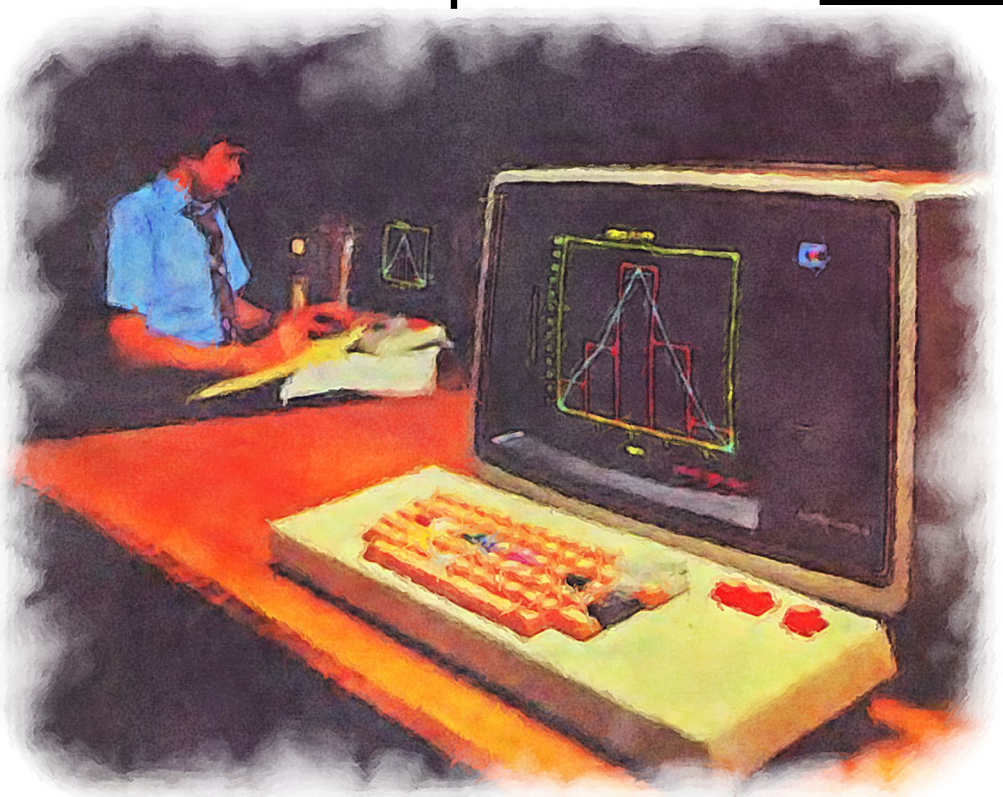
Extensively billed as the "world's cheapest computer", the ZX80 established the budget home computer as a class, but it wouldn't meet true success until the following year in its upgraded form, the ZX81.

In contrast to the ZX81, the HP-85 was insanely expensive, at $3250 1980 dollars ($9652 2017 dollars!) But that got you a whopping 16 kilobytes of RAM, floating-point BASIC, a built-in thermal printer and a tape drive.



The Compucolor II. It had color! Only $1395. Bargain!

Heathkit provided a number of "assemble-it-yourself" computers in the 1970s and early 1980s, the pictured H89 could be had for only $1595! (That ZX80 is looking pretty good...)



Printers were also a popular Christmas gift; the dot-matrix versions could print monochrome graphics, but even a daisy-wheel printer could still replace the hated manual typewriter loathed by children everywhere.

Even in 1980 people thought it was important kids learn how to code!

...and this is how.

A chief method of software distribution in the early 1980s, magazines published "listings" of mainly BASIC programs for readers to type in.

Frequently buggy, and plagued with typos, the reader was usually forced to fix the errors themselves, leading to an enforced learning of computer programming.

Type this into any Apple II (computer or emulator) or Paleotronic microM8!

CHRISTMAS TREE

Stephen R. Berggren

One of the most enjoyable jobs of the Christmas season is decorating the Christmas tree. It is unfortunate that this pleasant and satisfying task can only be done once each year. Besides, how can you be any good at something you do only once a year? You should be able to decorate a Christmas tree whenever you want to. Can a personal computer solve a problem like this? Of course, it can! Using the *Christmas Tree* program you can decorate and display your own Christmas tree any time you want to.

The *Christmas Tree* program displays a Christmas tree and allows you to decorate it with up to 200 colored lights. Game paddles control the placement of the lights. The colors may be red, green, blue, violet or white. A delete function can be used to erase any mistakes. Once the tree is decorated to your satisfaction, it can be displayed with either flashing or non-flashing lights.

The program was written for the Apple II computer. The language used is Applesoft, the floating point version of Basic used in the Apple II. The program can operate under either the ROM or RAM versions of this language. However, under the RAM version, the number of lights used may be limited to about 150. Using any more lights may overwrite the graphics screen. Removing the REM statements will allow more lights to be used. The program makes use of the hi-resolution color graphics, game paddle inputs and shape table drawing routines of this system. Other systems with color graphics such as the Atari or the Compucolor should be able to run the program after changing the drawing and cursor routines. Of course, the data used to draw the tree must be modified to fit the different screen sizes.

The program itself is really very simple. Line 10 sets aside memory for the X and Y position and color of each light. The "%" sign means that they are integer values. After providing directions in lines 200 to 370, it uses lines 600 to 710 to draw the outline of a Christmas tree in green on the hi-resolution graphics screen. The data table at lines 150 and 160 provides the shape. Note that it draws the shape twice with the second shape right next to the first. This just makes a wider line. Next, a very simple shape table is put into the memory using data at line 840. This shape is a tiny square made up of four dots. This shape table is used to draw the lights and is also the cursor that shows where the lights will be placed. Its size is just large enough to show clearly on the screen. Now the program uses lines 1010 to 1060 to put a cursor on the screen in a place determined by the two paddle controls. The

Once the tree is decorated to your satisfaction, it can be displayed with either flashing or non-flashing lights.

XDRAW commands at lines 1030 and 1050 reverse the colors of the background at that position. Since two reversals leave the screen looking just as it did, this procedure does not erase anything. The cursor may be moved anywhere without leaving a trail.

As the cursor is being drawn, the program uses line 1040 to see if a key has been pressed. If one has, lines 2040 to 2080 determine what key was pressed and branch to the needed routines. Line 2035 is simply a warning that all 200 lights have been put on the tree. Lines 2088 to 2130 put the light on the screen at the cursor position and put the position and color into memory. If a light is to be removed, the program jumps down to lines 6000 to 6030. This subroutine checks the position of the cursor square against the positions in memory. If it finds a match, it changes the color in memory to black and erases the light from the screen.

When the Christmas tree is finished, a "Control-N" key will send the program to lines 5000 to 5040. There the cursor square is removed and the program waits for a carriage return while the tree remains displayed. If a "Control-F" is typed instead, the program goes to lines 3000 to 4060. The cursor is first removed. Then a light is selected at random and turned on while another light is selected at random and turned off. This process is repeated very rapidly and gives the effect that the lights are flashing. The flashing continues until interrupted by a "Control-C" or "reset."

Several modifications to the program might be interesting. First, by saving the arrays that hold the light colors and positions a particularly pleasing tree might be kept indefinitely. Second, shape tables for stars, candy canes or bells could be included to allow for decorations besides lights. Finally, a means for drawing lines could be included to draw in background and unique decorations.

Decorating is part of the fun of the Christmas season. With this *Christmas Tree* program your computer can contribute to this fun by displaying a beautiful Christmas decoration designed by you. Merry Christmas! □

```
]RUN
      C H R I S T M A
S     T R E E"

BY STEPHEN R BERGGREN

THIS PROGRAM ALLOWS YOU TO DECORATE
AND DISPLAY A CHRISTMAS TREE.  YOU MAY
PUT UP TO 200 LIGHTS ON THE TREE AND
MAKE THEM FLASH OR GLOW STEADILY.

TO PUT LIGHTS ON THE TREE, MOVE THE
FLASHING DOT TO THE RIGHT POSITION AND
PRESS A COLOR KEY.  WHEN FINISHED,
PRESS 'CTRL-F' FOR FLASHING LIGHTS OR
'CTRL-N' FOR NORMAL.  THESE ARE THE
AVAILABLE COLORS.  'DELETE' REMOVES
THE LIGHT UNDER THE CURSER.

     W = WHITE          G = GREEN

     R = RED            V = VIOLET

     B = BLUE           D = DELETE

(PRESS RETURN TO BEGIN)
```

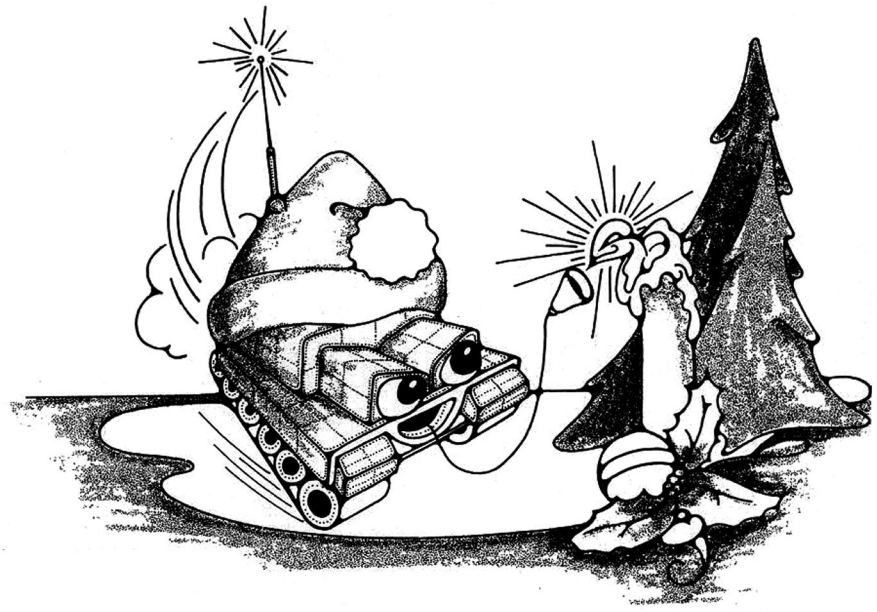
```
LIST

10  DIM XN%(200),YN%(200),CN%(200
    )
20  REM  XN%() = X POSITION OF LI
    GHT
30  REM  YN%() = Y POSITION OF LI
    GHT
40  REM  CN%() = COLOR OF LIGHT
140 REM  DATA TO DRAW TREE
150 DATA 180,124,180,70,148,86,1
    50,80,118,96,120,90,88,106,9
    0,100,58,116,60,110,28,126,2
    0,128
160 DATA 28,130,60,146,58,140,90
    ,156,88,150,120,166,118,160,
    150,176,148,170,180,186,180,
    132,190,132
200 HOME
210 PRINT "     C H R I S T M A
    S   T R E E"
220 PRINT : PRINT "          BY ST
    EPHEN R BERGGREN"
230 PRINT : PRINT "THIS PROGRAM
    ALLOWS YOU TO DECORATE"
240 PRINT "AND DISPLAY A CHRISTM
    AS TREE.  YOU MAY"
250 PRINT "PUT UP TO 200 LIGHTS
    ON THE TREE AND"
260 PRINT "MAKE THEM FLASH OR GL
    OW STEADILY."
270 PRINT : PRINT "TO PUT LIGHTS
     ON THE TREE, MOVE THE"
280 PRINT "FLASHING DOT TO THE R
    IGHT POSITION AND"
290 PRINT "PRESS A COLOR KEY.  W
    HEN FINISHED, '
300 PRINT "PRESS 'CTRL-F' FOR FL
    ASHING LIGHTS OR"
310 PRINT "'CTRL-N' FOR NORMAL.
     THESE ARE THE '
315 PRINT "AVAILABLE COLORS.  'D
    ELETE' REMOVES"
318 PRINT "THE LIGHT UNDER THE C
    URSER."
320 PRINT : PRINT "     W = WHIT
    E     G = GREEN"
330 PRINT : PRINT "     R = RED
          V = VIOLET"
340 PRINT : PRINT "     B = BLUE
          D = DELETE"
370 PRINT : INPUT "  (PRESS RET
    URN TO BEGIN)";A$
590 HGR2
595 REM  DRAW TREE
600 HCOLOR= 1
610 HPLOT 124,190 TO 124,180
620 FOR I = 1 TO 24
630 READ V,X
640 HPLOT  TO X,V
650 NEXT I
660 HPLOT 123,189 TO 123,178
670 RESTORE
680 FOR I = 1 TO 24
690 READ V,X
700 HPLOT  TO X - 1,V - 1
710 NEXT I
720 HCOLOR= 6
790 REM  LOAD THE SHAPE TABLE FO
    R THE LIGHTS
800 FOR I = 768 TO 774
810 READ SHAPE
820 POKE I,SHAPE
830 NEXT I
840 DATA   1,0,4,0,37,55,0
850 POKE 232,0: POKE 233,3
860 ROT= 0
870 SCALE= 1
880 N = 0
1000  REM  DRAW CURSOR DOT, LOOK
    FOR KEY INPUT
1010 XP = 256 -  PDL (0) + 15
1020 YP =  PDL (1): IF YP > 189 THEN
     YP = 189
1030  XDRAW 1 AT XP,YP
1040 KEY =  PEEK ( - 16383): IF K
    EY > 127 THEN 2000
1050  XDRAW 1 AT XP,YP
1060  GOTO 1010
1990  REM  TEST THE KEY INPUT
2000  POKE  - 16368,0
2010  IF KEY = 142 THEN 5000
2020  IF KEY = 134 THEN 3000
2030  IF KEY = 196 THEN  GOSUB 60
    00: GOTO 1050
2035  IF N = 200 THEN  PRINT  CHR$
    (7): CHR$ (7) CHR$ (7): GOTO
    1050
2040  IF KEY = 215 THEN CN%(N) =
    3: GOTO 2090
2050  IF KEY = 194 THEN CN%(N) =
    6: GOTO 2090
2060  IF KEY = 214 THEN CN%(N) =
    2: GOTO 2090
2070  IF KEY = 210 THEN CN%(N) =
    5: GOTO 2090
2080  IF KEY = 199 THEN CN%(N) =
    1: GOTO 2090
2085  GOTO 1050
2088  REM  DRAW A NEW LIGHT
2090  HCOLOR= CN%(N)
2100  DRAW 1 AT XP,YP
2110 XN%(N) = XP:YN%(N) = YP
2120 N = N + 1
2130  GOTO 1010
2990  REM  REMOVE THE CURSOR DOT
3000  HCOLOR= 0
3010  DRAW 1 AT XP,YP
3990  REM  FLASH THE LIGHTS BY RA
    NDOMLY TURNING ONE ON AND ON
    E OFF
4000 P =  INT ( RND (1) * N)
4010  HCOLOR= CN%(P)
4020  DRAW 1 AT XN%(P),YN%(P)
4025 P =  RND (1)
4030 P =  INT ( RND (1) * N)
4040  HCOLOR= 0
4050  DRAW 1 AT XN%(P),YN%(P)
4060  GOTO 4000
4990  REM  REMOVE THE CURSOR DOT
    AND QUIT WITH ALL LIGHTS ON
5000  HCOLOR= 0
5010  DRAW 1 AT XP,YP
5020  INPUT A$
5030  TEXT
5040  END
5990  REM  ERASE THE DOT UNDER TH
    E CURSOR
6000  FOR I = 0 TO N
6010  IF XP = XN%(I) AND YP = YN%
    (I) THEN  HCOLOR= 3:CN%(I) =
    0: DRAW 1 AT XP,YP: PRINT  CHR$
    (7)
6020  NEXT I
6030  RETURN
```

Stephen R. Berggren, 2347 Duncan Drive, Dayton, Ohio 45324.

Thanks to you,

paleotronic

is coming...



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Christmas 1981