Serving the CoCo Community for 11 YEARS

The RAINBOW®

THE COLOR COMPUTER MONTHLY MAGAZINE

November 1991 Vol. XI No.4

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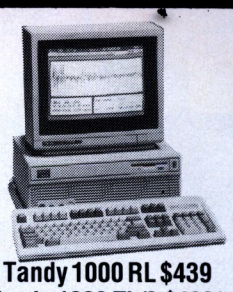

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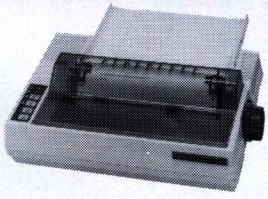

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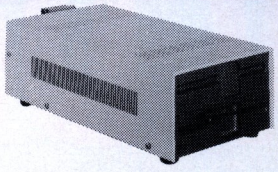

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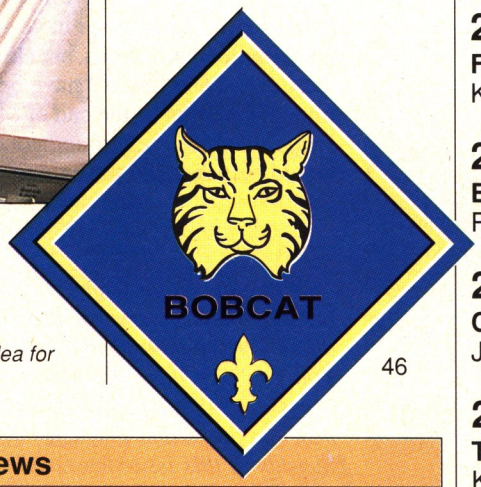

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Letters to the RAINBOW

No Response

Editor:

I feel I must object strongly against Microcom Software. Microcom does not stand behind its products. It is not fair for THE RAINBOW to publish an ad for these people.

I waited six months to purchase Microcom's word processor, *Word Power 3*. When you had the RAINBOWfest in Chicago, I went to the show and bought a copy. I did this based on the ad in your magazine.

I had several problems with *Word Power*. I wrote Microcom four letters asking for help, and they have not bothered to reply. I think many of us have overestimated this company — Microcom shuts the door in our faces after we buy its products.

Paul Elias
Des Plaines, Illinois

Looking for Accessories

Editor:

I own a 64K CoCo 2, and I have been trying to locate a disk drive and other accessories for my computer. I have gone to four local Radio Shack stores, but I keep hearing the CoCo 2 and CoCo 3 have been discontinued. Will this be the end of 64K or 128K? I would appreciate it if someone out there would help me find the equipment I need.

Kelvin Chandler
Lake City, South Carolina

While the Color Computer is no longer being produced, several third-party vendors offer products to support the machine. You can purchase disk drives and other accessories through advertisers in THE RAINBOW. To find a disk drive, for instance, see the ads in this issue for Owl-Ware, Computer Plus, Zebra Systems and Frank Hogg Laboratories.

Word Power 3.3

Editor:

I am sorry to hear that production of Color Computers has stopped. I am glad you are continuing to help the many users of Color Computers with your magazine. I use my Color Computer almost every day.

I have a CoCo 3 with an FD-502 disk drive and a DMP-106 printer. I recently ordered *Word Power 3.3* from Microcom Software and received two disks, a manual for *Word Power 3.2* and three sheets of paper titled WORD POWER 3.3. Using these addendum sheets, I was able to get 80-column screens. However, the letters on the 80-column screen are small and somewhat difficult to read on the TV I use. It was advertised that 40-column screens are available, but I was unable to get them to work by following the instructions.

I feel that *Word Power 3.3* has many good features. I gradually learned how to use most of these features with the exceptions of graphics and the 80,000-word spelling checker.

I wrote a letter to Microcom Software describing my problems. I have recieved no answer. Since I wrote the letter, I have learned how to get 40-column screens. And I have learned a little about print graphics. However, after a picture is printed, the printer starts printing garbage and the program hangs.

Can you or one of your readers help me learn to use the spelling checker and the graphics features of *Word Power 3.3*?

John Buchwald
3932 Lawton Street
San Francisco, CA 94122

CoCo Max III and the NX-1020

Editor:

I own a Star NX-1020 Rainbow color printer and I recently purchased *Max-10* and *CoCo Max III* from Colorware. At the same time, I purchased the color printer driver that I thought would support the NX-1020. (I noted in the advertisement that the color driver supports, among others, the NX-1000. I assumed it also supported the NX-1020.) However, I was not able to get a color print, and the driver would not support wider, longer or sideways printing as it was supposed to do.

I phoned Colorware and was told the color driver would not support the NX-1020. I also learned Colorware has no plans to modify the driver for this printer. Is anyone aware of how how to make *CoCo Max III* work with the NX-1020 color printer?

Keep up the good work! I truly enjoy THE RAINBOW and the information it brings to the readers.

Wayne Johnson
Route 2
Thamesford, Ont. N0M 2M0
Canada

Border Patrol

Editor:

You published a palette-control program by Chuck Katsekes in the August 1991 issue (Page 23). A very simple addition can be made to that program to include automatic

CER COMP

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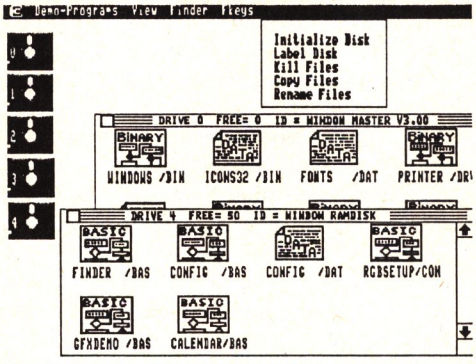

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$49.95

"..it offers so many features that it is probably underpriced. I recommend this software to all CoCo3 owners." -The Rainbow Feburary 1989

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assignment of border color to match the background color selected. To do this, insert the following line:

```
185 CLS9: CLS
```

The CLS9 statement automatically assigns the border color to match that of the background, but it also displays a proprietary message on the screen. The CLS command simply clears this message.

Ken Yarley
Columbus, Ohio

Needs Info on Speech Systems

Editor:

First of all, I want to take this opportunity to thank everyone at THE RAINBOW for all the support it has given to me over the years. Even though THE RAINBOW has gone on a diet, the content is still accurate and informative. Thank you.

Second, I have a Speech Systems clock card and I need a copy of the manual and software for it. Please write to me if you can tell me where I might purchase these items.

William Budenholzer
7115 Lanham Avenue
St. Louis, MO 63143-2511

Atari Modem and the CoCo

Editor:

I bought an Atari SX-212 1200-bps, Hayes-compatible modem. Now I'm not sure if I will be able to connect it to my CoCo 3. Can I connect the modem through the RS-232 port of my CoCo 3 without destroying either the computer or the SX-212 modem? Or should I use the modem only on IBM-compatible computers?

I have asked Atari and Tandy Corporation for help on this. However, because of possible liability for damage to the equipment, neither has offered any advice.

Kenney Trevino
1146 W. Lynwood Street
Phoenix, AZ 85007-1917

We are not familiar with the Atari SX-212 modem. However, if the modem uses an RS-232 port with a DB-25 connector, you should be able to make a cable to connect it with the CoCo. (For reliable 1200-bps operation, consider using an RS-232 Pak.) Also if the modem is capable of being connected to an MS-DOS computer via a standard serial cable, you should have little problem making it work with the CoCo. The main area of concern is whether or not the modem requires any special signals from the Atari computer. A qualified service technician may be able to help you determine this.

Where to From Here?

Editor:

I am a 15-year-old high school junior. I have a CoCo 2 with a disk drive and a DMP-132 printer. I consider myself to be an expert programmer in Disk BASIC, and I have a working knowledge of machine language. I am starting to dabble in electronics and OS-9. During the past two years THE RAINBOW has been a huge help. Whether buying off the shelf, subscribing, or borrowing past issues from my friends, THE RAINBOW is a great value to me.

I have several questions about the CoCo's future. Although I realize your time is limited, I appreciate your responses:

1. Will Tandy continue to provide old CoCo software as well as new releases?
2. If not, will Tandy sell the license of its software and hardware to another company? If so, which company?
3. Will the major third-party vendors decrease their support for the CoCo?
4. Are there any organizations being formed in an effort to strengthen the CoCo Community?
5. What is the future of THE RAINBOW?
6. What can I do to help the CoCo Community stay alive?

Roy Johnston, II
Ebensburg, Pennsylvania

Your questions are difficult to answer because we can't predict what other parties will do. However, we think Tandy will continue to sell hardware as long as there is existing stock. Also, Tandy plans to offer most of its existing software through its Express Order System. For these reasons, we doubt Tandy will sell license to any other company for CoCo software/hardware. We also doubt you'll see any new products for the CoCo from Tandy.

As third-party support decreases (and it could), it is increasingly important that you become involved. You can do this by joining users groups, supporting RAINBOW advertisers and submitting your programming creations to us and to Delphi.

And . . . subscribe to THE RAINBOW. Your support in this manner is what allows us to continue supporting you, as well as the rest of the CoCo Community.

Getting Started

Editor:

I started subscribing to THE RAINBOW in January, and I really enjoy it. As I learn about my CoCo, I get more and more interested in programming. Where can I get good, easy-to-understand books on assembly language, BASIC and C? Also, where can I get assembly language, BASIC and C for OS-9? Is *Disk EDTASM+* still available for the CoCo?

Owen Crabtree
211 SW 6th Street
College Place, WA 99324

Most of the assembly-language books written for the 6809 microprocessor are out of print. However, you can obtain data manuals for the 6809 from Motorola (P.O. Box 20912, Phoenix, AZ 85036, 800-521-6274). Read "The Assembly Line" each month in THE RAINBOW, and check with your local Radio Shack stores for TRS-80 Color Computer Assembly Language Programming *by William Barden, Jr. and* The BASIC09 Tour Guide *by Dale Puckett. Although both of these books are out of print, you might get lucky and find one gathering dust on a shelf.*

To get into assembly-language programming with OS-9, you'll need to get the OS-9 Development System *from Radio Shack. If your local Radio Shack store doesn't have it, contact Tandy's Express Order System at (800) 321-3133. The C programming language for OS-9 is available from Express Order, as is* Disk EDTASM+. *BASIC09 is included with OS-9 Level II.*

THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for purposes of clarity or to conserve space.

Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, type RAI to take you into the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, type LET to reach the LETTERS> prompt and then select Letters for Publication. Be sure to include your complete name and address.

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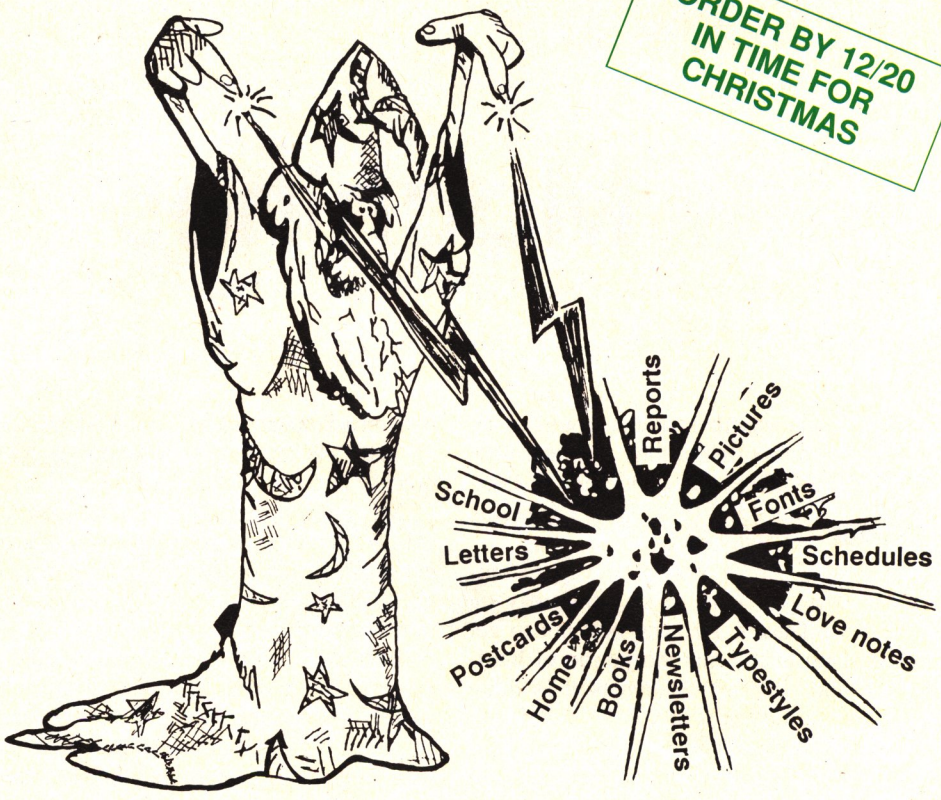

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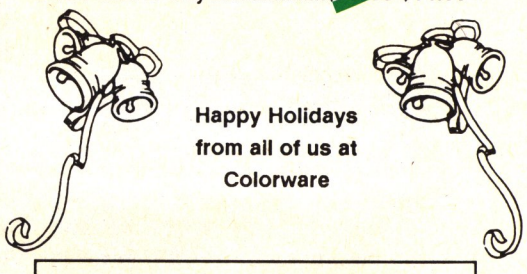

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Print#-2

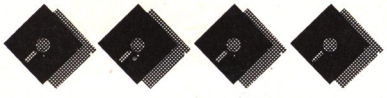
New Machines

Last month I said I would make some observations at a later time about the new generation of computers and OS-9. This, I guess, is that "later time."

Most of you know I am not very technically oriented. I try to stay this way on purpose. That is, I do my best not to get caught up in the mumbo-jumbo of hardware and software. The reason is quite simple: I think most of you are much like this, and I believe it would be a disservice to gear THE RAINBOW to too technical an audience.

This having been said, however, I acknowledge that our readers, to a certain extent, get more technical all of the time. I think this is true in almost any computer area, which is one of the reasons we have a new publication from Falsoft: *Power User*, our newsletter designed for users of MS-DOS machines.

We're doing this because we are finding, more and more, the "average" person wants some measure of control over his or her computing environment. But *Power User* is another story. Suffice it to say that if you *also* use an MS-DOS machine, you might want to call or write us for details on this newsletter.



I also believe the CoCo Community is much more technical than it was, say, two or three years ago. This is why we have expanded our coverage of OS-9. We will continue to provide this coverage and will also continue to provide coverage of Disk BASIC, as we have in the past.

Not being particularly technical, my main observation of the new machines is from the software side of things. When I want to write a letter, I do not really care whether I do it on a Tomcat or a CoCo, a System IV or an MM/1. What I do care about is how quickly I can write the letter.

My interest, therefore, is in the end result. What matters to me is how easy it is to get those words on paper. I really do not give a hoot what I use to do this, at least in terms of hardware.

Because of this, I feel I should add, I *much* prefer a word processor to a typewriter. If I make a goof with a word processor, even if I don't notice it until after the letter is printed, I can reload the letter and make the fix with a minor amount of fuss. I don't think I have to convince any of you about the benefits of being able to do this.

Those of you who have been longtime readers of this column know I am quite fond of quoting Isaac Asimov, who said the computer is a "mind appliance." I submit, however, that the computer can only be that if you have the software to operate it.

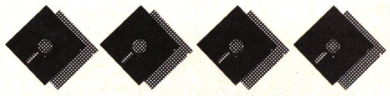
This is an area which concerns me in connection with the new machines and with OS-9 in general. I think it bears your consideration.

In my opinion, until now OS-9 has been used primarily in the industrial area. This, incidentally, is where the System IV "comes from"; an industrial-grade computer its developers are making more user-friendly.

The problem, then, is simply that I do not see a huge market of OS-9 software to run on these new machines. In fairness, each manufacturer is addressing this problem. I think the time will come when there is a better base of programs for OS-9 (which in this context means OS-9 for the 68000 processor). Right now, however, there is not.

One thing you need to ask yourself is whether you are willing to run two computers for a while — a "plain" CoCo and one of the new machines — to keep the flexibility you have now. As more programs are ported to OS-9/68000, the variety will be there.

For the time being, I think you must also ask yourself whether the CoCo you are using serves your real needs. Through Disk BASIC, OS-9, MS-DOS and UNIX/XENIX systems, I have seen a lot of word processors come down the pike. And while I am sure the authors of many of these programs would argue with me, my opinion is that the basic functionality of word processing is about the same as it was five or six years ago, in every market.



There is no word-processing function I know of that is really useful to me that is not also available in *Telewriter-64* for the Color Computer. (And I do a lot of word processing!) For example, if I were to use *Word for Windows*, I would need a $5000 computer system that would do little more (that I would use) than I can get out of a $200 system.

What I am saying is that I believe your "upward" migration to a new computer does not have to be a driving force for most of you. Take away the "latest-and-greatest" syndrome and your CoCo will serve you well for many years.

As more programs are developed for the new machines, we will report about them. In the meantime, I am cheered that the manufacturers are moving to form a Standards committee. Hopefully this will mean one port is all a software author will need to transfer his CoCo program to OS-9/68000. We at THE RAINBOW are lending our support to that effort by agreeing to sponsor this committee.

Some of the discussions will take place on Delphi in the coming months, and we encourage you to add your comments.

— Lonnie Falk

NEWSPAPER09

Finally, there's NO need to leave OS-9 to produce sophisticated-looking newsletters, signs, or documents! Create headlines & columned text, utilizing different fonts, clipart pictures, fill patterns, and text, and create publications that have that PRO-look! Comes complete with fonts, pictures, and fills, ready-to-run! Requirements: 256k CC3, OS-9 lv 2, mouse or joystick. Printers currently supported include Epson-compatibles (Star, etc.), Tandy DMP-105/6, 130/2. **$48.95**

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A New Design

by THE RAINBOW Staff

A look at the 6809-based TC9

Several Color Computer owners have attempted, with varying degrees of success, to repackage their CoCos in PC cases. The impetus for this modification is usually the clutter involved in a Color Computer system — not only is it unsightly, it is unsafe.

In the process of putting a CoCo system in a PC case, many problems must be addressed. For example, physically fitting a CoCo motherboard and a Multi-Pak into one case requires some real ingenuity. Then the power supply must be connected (resulting in some interesting modifications to the circuit board), and provision must be made for an external keyboard. With the Tomcat TC9, Frank Hogg Laboratories (FHL) achieves this and much more.

To be sure, the TC9 is *not* a CoCo 3 repackaged in a PC case. Rather it is a separate computer that happens to share a relatively high degree of compatibility with existing CoCo hardware and software. It offers a lot of things not found on the CoCo 3. In contrast, it does not have some things the CoCo 3 does — at least not yet.

The TC9 is designed around the 68B09E microprocessor, and it provides better I/O and expansion capabilities than existing Color Computers. In addition to two serial ports and one parallel port, the computer provides a CoCo-compatible bus — you can install your floppy and hard drives in the TC9. The TC9 also includes the necessary hardware for use with FHL's K-Bus system, providing many expansion options. Finally, with the optional Tiger board, the TC9 provides a step into the world of the 68000 microprocessor.

Before going further, we must make it clear the TC9 currently requires OS-9 Level II. This may change as new products are developed.

How It's Packaged

The TC9 comes in an attractive mini-tower case with ample room for the motherboard, two 5¼-inch, half-height drives and three 3½-inch drives. (Faceplates and extra mounting hardware are included.) The 200-watt power supply in the case is more than enough to power the system with all drives installed.

The TC9 motherboard is actually a two-board set. The CPU board holds the microprocessor (which runs at just under 2 MHz), the memory, and the GIME chip. The TC9 includes the same GIME chip that is used in the CoCo 3. This is one way it maintains compatibility. Mounted on top of the CPU board is the I/O board, which supports serial and parallel communications, as well as joysticks and the CoCo-compatible bus.

The unit we evaluated has 512K, a 40-track, double-sided floppy drive, and a 30-Meg Seagate hard drive with a Burke & Burke hard-drive interface. (We used Burke & Burke's XT-ROM in the Western Digital interface — it sure is nice to boot OS-9 without having to insert a disk in the floppy drive.) Also included was an AT-style keyboard. Let's take a closer look at the TC9's hardware setup.

Digging Deeper

The CPU board includes four sockets for system memory. The base unit contains two SIMMs, for 512K, that occupy two sockets. The TC9 can be upgraded to one megabyte of RAM by adding two 256K-by-8 SIMMs and a circuit board that handles address translation. The two SIMMs are available from FHL ($59.95). The circuit board is the same as used by Tony DiStefano for his One-Meg upgrade. It, too, is available from FHL (also $59.95). There is a price discount if you purchase both the memory and the circuit board from FHL.

We found 512K to be more than enough for normal use. However, it would be nice to have the extra memory available, and those with specialized needs may require it.

The CoCo-compatible bus is a 40-pin header connector mounted on the I/O board. FHL includes a cable with one connector that allows you to connect a CoCo-type cartridge device to the bus. You can use your existing CoCo disk drives with the TC9. Optionally, you can purchase a two-connector Y cable from FHL and connect two devices. As we implied above, we installed a floppy-disk controller in one slot and a Burke & Burke hard-drive interface in the other. We imagine most users will want the two-connector cable.

Having only two cartridge slots on a Y cable is not a big limitation; after all, having two internal serial ports eliminates the need for an RS-232 Pak, and the only other devices the average user will need to connect are floppy- and hard-drive controllers. However, it does leave open the question of just where we should plug in the MIDI pack we use with *UltiMusE III*. Perhaps we'll see some revision that allows for extra cartridge devices.

Of more immediate concern to present CoCo users is that, in order to use two devices on a Y cable, you need to be using a disk controller that is fully address-decoded — the disk controller must not interfere with other devices on the bus. The disk controllers sold by Tandy with its Color Computer disk drives are not fully decoded. Of course, present CoCo owners using a Y cable may have already met this problem; it is not inherent to the TC9. Still, if you want to connect another device that uses the $FF50-through-$FF5F address range (a hard drive is a perfect example), you'll need to use a non-Tandy, fully decoded controller or a Tandy controller that has been modified for full decoding. (We are currently planning an article describing how to use Tandy controllers with a Y cable, whether connected to a CoCo or a TC9.)

The TC9 supports analog-RGB video through a 10-pin header connector. This connector is mounted on a slot cover on the back of the case, and it is designed to directly accept the cable on a Tandy CM-8 monitor. A Magnavox 8CM515 or other analog-RGB monitor with an appropriate cable works just as well. There are also RCA-type phono jacks on the back of the case for a composite monitor (color or monochrome) and audio output. While no provision is made for television output, you can pur-

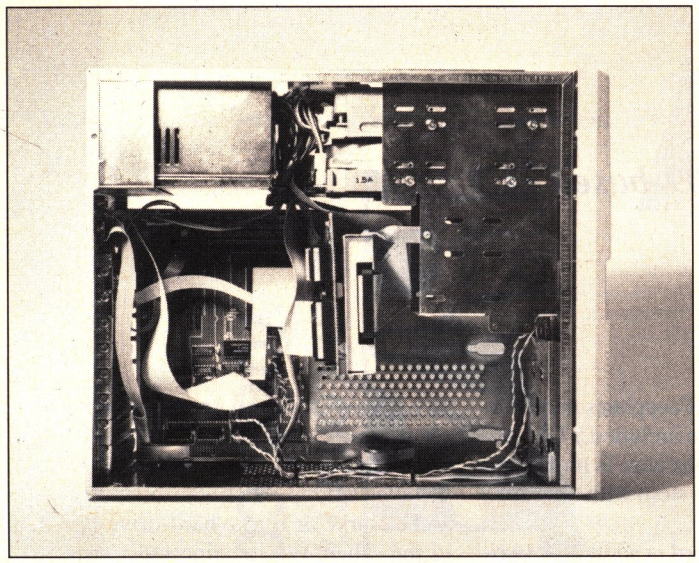

Photo 1: the TC9 case allows plenty of room for drives, controllers and the motherboard.

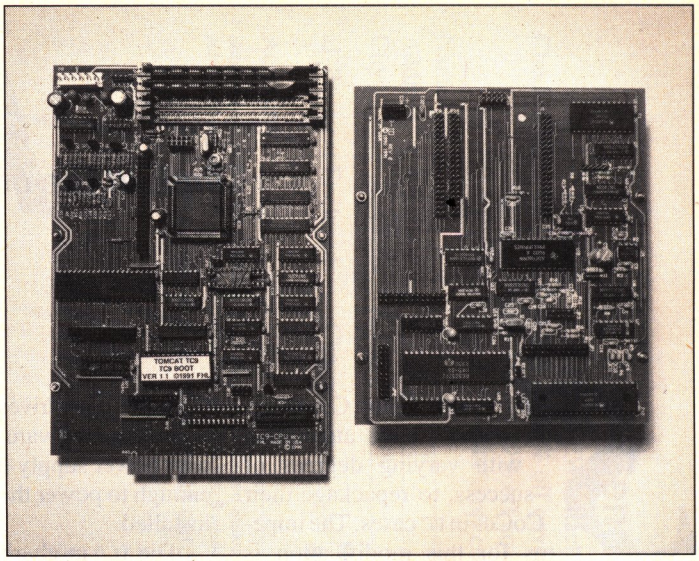

Photo 2: The TC9 Motherboard — the I/O board (right) mounts on top of the CPU board (left).

chase an RF Modulator from Radio Shack that allows you to connect a TV to the composite video output. Any monitor you can use with the Color Computer can also be used with the TC9.

Originally the TC9 was designed to use DB-9 connectors for the two joystick ports. This approach would have allowed the use of IBM-type joysticks. Also, DB-9 connectors fit on a PC slot cover better than the fat DIN connectors used for CoCo joysticks. However, it was discovered that, while they are analog (like standard CoCo joysticks), IBM-type joysticks are different electronically — you would have to modify them internally to make them work.

As an interim solution, on the computer we received there is a single 10-pin header connector for the joystick ports. We had to make an adapter with a 10-pin connector on one end and two female DIN connectors on the other in order to use standard CoCo joysticks or a mouse. In the future, FHL will use a double-wide slot cover that holds two DIN connectors for CoCo joysticks.

The TC9 does not provide a way to use the Tandy High Resolution Joystick Interface; there is no cassette port. However, the TC9's digital/analog circuitry is capable of resolving 256 positions (0 to 255). In contrast, a standard CoCo without the Hi-Res adapter is capable of resolving only 64 positions.

An alternative approach is to use a serial mouse intended for MS-DOS computers. Such mice are more stable and reliable. Bruce Isted patched the original `CC3IO` module for OS-9 Level II to support a serial mouse. (The patches are available on Delphi.) We're waiting to receive a copy of similar patches for `TC9IO`, the TC9's counterpart to `CC3IO`.

The serial ports are ACIA-driven and work much-like the Tandy Deluxe RS-232 Pak. They appear to be very reliable. We were able to connect a terminal and operate the TC9 as a multiuser system at 38,400 bps. Communication speed when using a terminal program is still limited, though, due to OS-9's system overhead. However, we had no problems communicating with Delphi at 2400 bps.

Mounted on the back of the TC9 case are the two DB-9 connectors used for the serial ports. We imagine most equipment currently in use by Color Computer owners uses 25-pin connectors. However, 9-pin-to-25-pin adapters are readily available at most electronics/computer stores.

The fact that the TC9 includes two serial ports allows greater flexibility than most CoCo owners now have. You can connect two extra users, one extra user and a mouse, one extra user and a modem, a modem and a mouse, etc.

The parallel port uses a back-mounted DB-25 connector. You can connect a parallel printer to this port using a standard IBM-type printer cable. These cables are available through most computer retailers. We had no problems using this port with our parallel printers here at THE RAINBOW.

As you can see, the TC9 appears to be a "plug-in" replacement for the CoCo 3. You can use your existing drives, monitors and other add-ons. Some areas of minor concern are the joystick ports, the parallel port/printer cable, 9-pin-to-25-pin serial port adapters and the use of undecoded devices on the CoCo-compatible bus. Obviously some of these areas are easily addressed by making or purchasing different cables; the major hardware is compatible. FHL is working to permanently correct the situation with the joystick ports.

Software and Compatibility

The TC9 is currently "limited" to running OS-9 Level II (which you must purchase separately), and it does this in much the same way as the CoCo 3. We ran a great deal of OS-9/6809 software on the TC9, including *DynaStar*, *DynaCalc*, *Multi-Vue* and *Kyum Gai*. In every case, the computer performed well.

There is one direct incompatibility we found, however. For design reasons, the hardware address for the sound port is at a different location than in the CoCo 3. In order to hear *Kyum Gai*'s sound effects, we had to change three bytes in the program. While this is certainly not a major problem, it is inconvenient.

It appears the TC9 fully supports OS-9 Level II. However, lest you be mislead, because of the differences between the TC9 hardware and the CoCo 3 hardware, you must create an OS-9 boot disk using modules intended for the TC9; FHL does not have the license necessary to distribute a bootable OS-9 Level II disk for the TC9. This means you must run OS-9 on a CoCo 3 and add the TC9 modules to create an OS-9 disk bootable by the TC9. Alternatively, FHL will create the boot disk for you if you send your original OS-9 Level II disks. If you want to purchase a TC9 and don't have access to a CoCo 3, you'll need to go the latter route.

FHL is also working on what it calls the Virtual Machine. This is a combination of hardware, software and firmware. The hardware is already installed in the TC9. When the software is finished, all you will need to do is install a new EPROM in the TC9

to take advantage of it. (This will be provided free of charge to TC9 customers.)

One expected adantage of this setup is that it is designed to emulate operation of the CoCo 3, albeit at the cost of some speed. FHL plans to design the Virtual Machine in such a way that you can boot a standard OS-9 disk on the TC9. Once you have done this, you can create the TC9 boot disk right on the TC9. Then you would need only reboot the system using the new disk, and you'd be able to take advantage of the TC9 at full speed.

Another anticipated advantage of the Virtual Machine is that it will allow a high degree of compatibility between the TC9 and Disk BASIC. As we understand it, the Virtual Machine is designed to act as a go-between for what CoCo software expects and the TC9 hardware provides. For instance, the sound-port address change will be taken care of internally, invisible to the user.

Because of the way some popular commercial programs are written, and also because of some hardware differences between the machines, we expect there will still be some incompatibilities. When we have more information on the Virtual Machine, we'll bring you all the details.

In the interim, it is possible to run many Disk BASIC programs under OS-9, both on the CoCo 3 and the TC9. Burke & Burke's *RSB* provides a platform on which to run most BASIC programs. Within certain limitations (pokes, etc.), most any BASIC program can be run under OS-9 using *RSB*. This program gives an edge toward compatibility that isn't seen elsewhere.

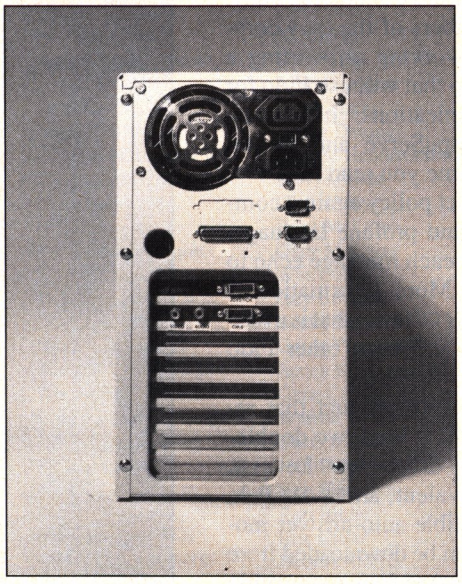

Photo 3: The connectors on the rear of the TC9 case are clearly labeled.

Documentation

We received very little documentation with the TC9. For us, this was a minor concern — we understand the system and had no problems getting around. The machine came assembled, and the OS-9 manuals cover use of the operating system, so the need for users manuals may seem questionable.

Still, we feel documentation is important. It is the easiest way to develop an understanding of the computer's operation. More important, it could be very useful for novices who want to install their own drives and other equipment. FHL is working on a complete manual that should make using the TC9 less-intimidating for the uninitiated user. In the meantime, FHL has been more than willing to provide us with technical information as we requested it.

Operation and Availability

We like the way the TC9 looks and feels; it is neat and, for the most part, comfortable. The computer operates well with OS-9. We had no problems with the TC9 overheating (the CoCo is notorious for heat-related problems), and all the software we tried ran without hitch (with the exception of changing the sound port locations).

When we set up the TC9 as a multiuser system, we found a decrease in apparent speed. This is to be expected as even OS-9 can handle only so many things at once. While 512K worked well for a single extra user, if you plan to run the TC9 a lot this way, or if you plan to connect two extra users, you'll want to purchase the extra 512K of memory.

FHL's implementation of the keyboard seemed a little strange at first. For instance, to recall the last line entered, you use SHIFT-ENTER instead of the standard OS-9 Control-A. As there is no CLEAR key on the Chicony keyboard (or any PC keyboard we know of), you use ALT-Print Screen instead to switch from one window to the next. While these differences may cause a little confusion at first, we were quickly able to get comfortable with them. And the anticipated users manual should help to alleviate some of the confusion. On the positive side, the current keyboard setup allows full editing of command-line entries. For finicky users, it is also possible to remap the keyboard and customize the system yourself.

The TC9 is sold in four basic configurations: System A, B C and D. Each successive system adds something more to the overall package. System A includes the TC9 two-board set, 512K, the case and power supply, and all internal cables. You must supply the keyboard, monitor, disk drives and OS-9 Level II. System B adds a floppy drive and controller. System C adds a 20-Meg hard drive and controller, and System D includes a Magnavox 1CM135 RGB monitor, an AT keyboard and one megabyte of RAM.

We feel it necessary to warn you that production problems have caused delays in shipping for the TC9. Seriously interested users would be well-advised to ascertain current availability and shipping dates. This information should be as important a factor in your decision as the hardware, software and design-philosophy aspects discussed here.

Expandability and the Future

The most obvious area of expansion for the TC9 is memory. As we already mentioned, it is possible to expand the TC9 to one megabyte simply by adding two SIMMs to the existing sockets and a special circuit board to the I/O board.

The circuitry for use with FHL's K-Bus is built into the TC9 motherboard. If you decide to go this route and purchase a K-Bus, you'll gain access to many add-on options, including more serial/parallel ports and other CPU boards.

On the 68000 front are the Tiger and the the TC70. The Tiger is a 68000-based board that connects to the TC9 via the K-Bus. It is designed to allow you to use the 68000 as a coprocessor for Level II. The TC70 is a K-Bus-compatible computer that sports a Motorola 68070 microprocessor and runs OS-9/68000.

When we receive these products, as well as FHL's Virtual Machine and implementation of Disk BASIC, we'll pass the word along to you.

Summary

The TC9 appears in some ways to be a "hacker's" machine. Currently you must have an understanding of (or be willing to learn) OS-9 to use it. Also, you may need to make or purchase some adapters to use joysticks and the serial ports. However, within these restrictions (which FHL is working to counter), the TC9 is a nice successor to the Color Computer. The "bringing-home" of the hardware (drives, serial ports, etc.) eliminates the clutter usually associated with the CoCo.

The full vote still isn't in regarding the TC9 — the computer is in a state of evolution. While the TC9 works very well under OS-9 and provides a great deal of flexibility in a 6809-based system, the possibilities are still growing. There are plenty of things at which we'd like to get a closer look. We'll keep you posted as we receive information and new products for the TC9.

A stick-to-your-RiBBS idea for CoCo communications

RiBBS List

by Warren C. Hrach

Printed in the August 1991 issue of THE RAINBOW is a letter from Scott Amendolaro regarding the RCIS BBS. In his letter, Mr. Amendolaro noted there are eight RCIS BBSs in the network and that it is free. While it may be free for callers to the BBSs, the SysOps must pay for the long-distance charges to link the network. In addition, when I inquired about the system, I was told the SysOp must pay $150 for the RCIS BBS software.

It is not my intent to downgrade the RCIS system. Rather, I feel it is an important service in that it provides a means of communication between CoCo users. Another important service (the one I chose) is the RiBBS system.

I have run RiBBS BBS software on my CoCo since June of 1988, and my BBS has been online since then. I have also been a member of the Fido network since October 1988. FidoNet is a worldwide network. It is a free system, though SysOps in some locations may ask for a monthly donation of around $5 to help defray the cost of importing and exporting electronic mail with the network.

As of June 1991, there were approximately 70 RiBBS systems in operation (Figure 1). Of these, approximately 40 are linked via FidoNet and have valid Fido net/node numbers. This allows users of one BBS to contact members of others. Active message bases in the Fido network include OS-9, CoCo, RiBBS and CoCo Club. These four message bases average 60 to 80 messages from all over the U.S. and Canada each day.

In addition, members of the OS-9 community have been working on starting a new OS-9 users group that will use Fido for intra-group communications. It will be announced on CompuServe and Delphi soon, if not by the time you read this.

FidoNet has a strict policy against commercialism, piracy and profane language. Moderators monitor each message echo to assure compliance. More information is available from a file (POLICY4) that is available on my system and most other Fido BBSs.

RiBBS is a shareware product that requires a 512K CoCo 3, at least two double-sided, 40-track floppy drives, OS-9 Level II, a Multi-Pak or equivalent, an RS-232 Pak, and a Hayes-compatible auto-answer modem. The software can be downloaded from RiBBS HQ (303-343-6707) or from many other RiBBS sites, including mine.

Alternatively, I provide a mail-return service for "RiBBS to Go," which is a five-disk set with a ready-to-run RiBBS system that includes four menus and three message bases. Minor editing is required, but the software runs "out of the box." To go this route, send me five double-sided, 40-track,

---

Warren Hrach is a retired systems-control engineer who runs the Ocean Beach BBS. He has five grandchildren and a sixth on the way. Warren can be contacted at 4369 Newport Avenue, San Diego, CA 92107; or via the Ocean Beach RiBBS system. Please include a SASE when requesting a reply.

formatted OS-9 disks and include a mailer with sufficient return postage. You are responsible for sending the registration fee, which is $10, directly to the author after you receive the software.

Whether or not you decide to start your own RiBBS system, do consider using the BBSs listed in Figure 1. Communicating is most important to the continued success of our community. ❑

System Name	Sysop	Phone#	Zone:Net/Node	BPS
Access CoCo of L.A.	Dave Spicer	(205) 598-2100	1:18/753	2400
ACBBS	* Phil Zeigler	[404] 565-2977	8:7301/2402	2400
Applied OS-9 BBS	Paul Fitch	[407] 677-8865	1:363/186	2400
Arrakis	* Charles West	(405) 752-8955	1:147/61	2400
The Basement	John Farrar	(615) 399-1801	1:116/27	2400
BB's Place	Jim Sartain	[612] 869-7752	1:282/102	2400
The Big Easy	Baron Schwing	[504] 464-0289	1:396/4784	2400
Bit Heaven	Marc Bosley	(405) 721-8304	1:147/67	2400
The Blue Parrot Cafe	Stan Wagner	[303] 757-6197	1:104/432	2400
Byte Box	Jim Harrison	[619] 277-4618	1:202/624	2400
Cajin's Keep	Charles Miller	[619] 584-1506	n/a	2400
Citadel	Mike Nelson	(717) 393-5195	n/a	2400
CoCo City	[2] William Helloms	(817) 538-4745	n/a	2400
CoCo Corner	Randall Ader	(804) 489-4215	1:275/70	9600
CoCo Exchange	John Reece	[619] 272-3643	1:202/719.2	2400
CoCo Express	Dave Fisher	(206) 293-1057	n/a	2400
The CoCo Library	John Wight	(808) 845-5299	1:345/200	2400
CoCoNut Palms Hotel	Harold Kistner	(417) 887-6048	1:284/3	2400
CoCo Plus/Mobile AL	Edward W. Jones	(205) 341-1616	1:3625/461	2400
The CoCo Zone	Charles Hein	(407) 433-3387	1:3609/27	2400
Columbia Heights	Mark Johnson	(205) 425-5804	1:105/641	2400
C.T.V.	[3] Lynn Knisley	[303] 320-6820	1:104/521	2400
Data Warehouse	Dennis Mott	(509) 325-6787	n/a	2400
Data Stash	Kerry Kowalski	(414) 684-4115	1:154/888	2400
Delta Systems	* Bill Wittman	(716) 494-2520	1:260/215	2400
Discus BBS	Yves Souliere	(819) 771-3792	n/a	2400
The DownEaster	Joe Richards	(207) 725-8035	n/a	1200
Download Syndrome	Everett Chimbidis	(813) 367-1285	n/a	2400
The Exotic Zone	Paul Ingson	(301) 969-3083	n/a	2400
Farpoint Station	Brian Wright	[206] 285-8335	1:343/69	2400
Federal Hill	[4] Steve Plank	(301) 685-6975	1:261/1104 (?)	2400
Fire House BBS	* Al Stiebel	(508) 287-0245	1:324/289	2400
Frayed Ends of Sanity	Terry Trap	(615) 781-8679	n/a	2400
Galactic BBS	[1] Albert Baldish	(814) 535-1497	1:129/132	1200
The Galactic Milieu	Eric Carson	(916) 893-5412	1:119/13	1200
Garf's BBS	Gregg Delong	(215) 375-8814	1:273/103	2400
George's Dewdrop Inn	George Hendrickson	(606) 356-1431	n/a	2400
The Golden CoCo	Terry Goode	[713] 941-1542	1:106/941	2400
The Graveyard	Glenn May	(508) 792-0381	1:322/666	34Kb
House of Fire	Brett McLaren	(416) 604-1696	n/a	2400
Kansas Konnektion	Gary McCarty	(316) 342-3967	n/a	2400
Kzin BBS	Wes Gale	(604) 589-5545	1:153/912	2400
The Lost Connection	* Guy Loucks	(403) 249-5365	1:134/71	2400
MACCC	Becky Bowers	(712) 366-5252	1:285/16	2400
MidNight RiBBS	Gerry Thomas	(519) 659-7328	n/a	2400
The MYTHing Link	James Kebernik	(204) 269-5571	1:348/104	2400
The Node III	Gene Clifton	(504) 347-4320	1:396/27	2400
Ocean Beach	* Warren Hrach	[619] 224-4878	1:202/610	2400
OS-9 Tacoma BBS	[4] Chris Johnson	(206) 566-8857	n/a	2400
Pinball Haven	Jeff Chapin	(708) 428-8445	n/a	2400
Pot O' Gold	Ken Flanagan	(604) 564-8869	1:359/617	2400
RiBBS Headquarters	* Ron Bihler	[303] 343-6707	1:104/54	2400
Rock Island	* Eric Chew	(401) 728-8709	1:323/110	2400
Salina Color RiBBS	[2] Dennis Morris	(913) 823-9768	n/a	2400
Sun BBS	* Craig Cross	(413) 447-2346	n/a	2400
TCCC BBS	Bill Yager	(416) 461-7781	n/a	1200
Union Forge	Guy Silliman	(908) 638-5698	1:107/319	2400

(1) Hours: 8 p.m. - 6 a.m.
(2) Temporarily Down
(3) Down until Fall 1991
(4) Temporarily Cut off from Echos
[area code] = PC Pursuitable
* = Beta Sysop
1:xxx/xxx = FidoNet Address
8:xxx/xxx = The Network Address
(?) Not yet confirmed or mysteriously disappeared from Nodelist

Figure 1: Confirmed RiBBS Sites, Compiled by Charles West

Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful, helpful and fun for other CoCo owners.

WHAT TO WRITE: We are interested in what you want to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs that can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

FORMAT: Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included in ASCII format on the tape or disk, using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

COMPENSATION: We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those wanting more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

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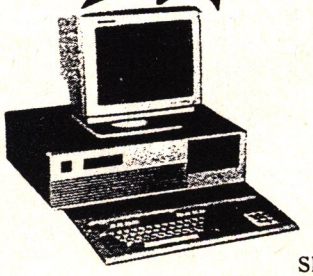

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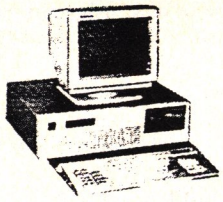

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The Assembly Line

The Game of Life

by William P. Nee

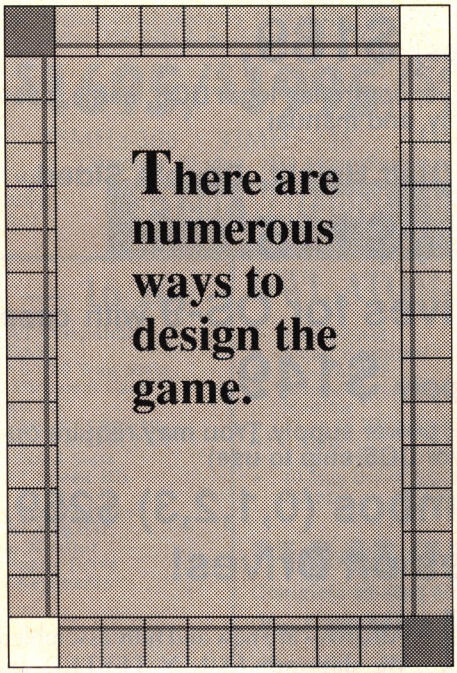
Life is one of those classic computer games; nobody wins, nobody loses — it's just a lot of fun to watch. There are numerous ways to design the game, and as has been illustrated several times in computer magazines, it must be programmed in machine language for speed. Developed in 1970 by mathematician John Conway, the game is "played" on an infinite grid of cells and carries out (hopefully) for several generations. At the first generation, each cell on the grid is either alive (with a value of 1) or dead (with a value of 0). The status of cells in each succeeding generation is based on two simple rules:

a) A living cell stays alive if it has two or three neighbors.

b) A dead cell comes to life if it has exactly three neighbors.

A neighbor is a living cell occupying one of the eight grid spaces immediately adjacent to the cell in question.

I decided to program *Life* for PMODE 0 since the game doesn't need color and this allows a grid of realistic size. I wanted to be able to make any point "alive" initially, so I wrote the program to first check every point on the screen. A two-dimensional, 128-by-96 array keeps track of the current value of every cell, and a second array of the same size stores the total value of each cell's neighbors. The status of current cells is displayed while new values are being computed; then the new living cells are displayed. Finally, I wanted a "wrap-around" grid so a point that goes off the screen to the right or bottom would reappear on the left or top.



The machine-language program (Listing 2) puts both arrays in high RAM, starting at $8000. After the interrupts are enabled, the ZERO macro clears both arrays (from $8000 to $E000) since there are already random values in these locations. The PPOINT macro transfers the graphics screen to the first array on a byte-for-bit basis.

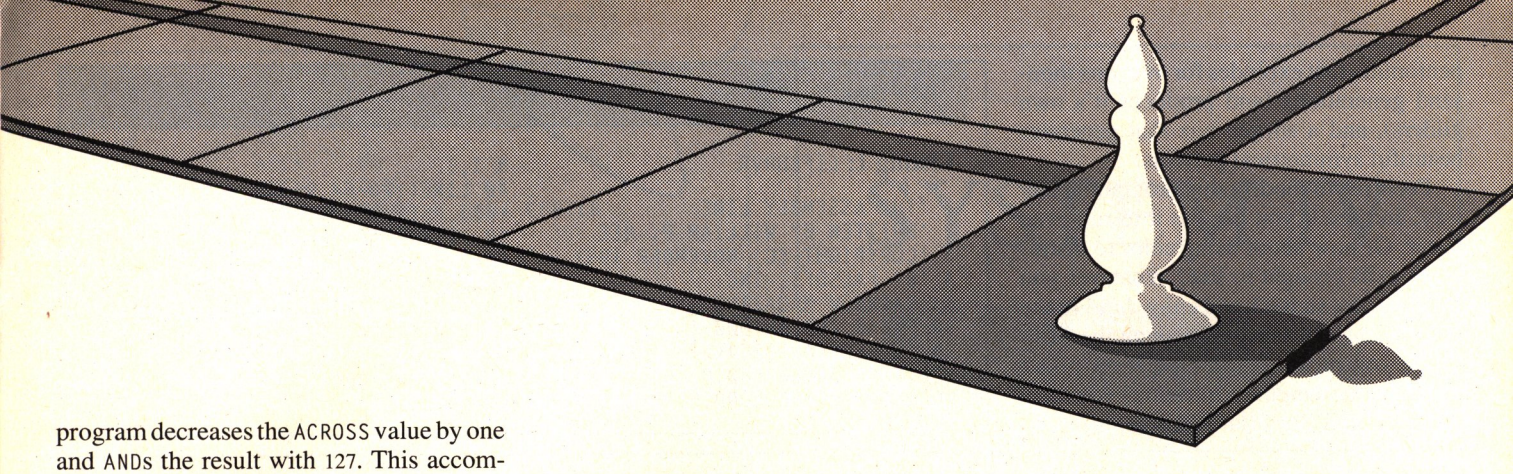
Now the program computes the total value of a cell's neighborhood (Line 930). However, instead of going to each cell, regardless of its status, and totalling the eight cells around it, it's much quicker to do the reverse — the program checks only the living cells and increases the value of each cell around them by one. When it is finished, we have a second array where each location reflects the sum of the neighbors of the corresponding location in the first array. Remember though, we need to wrap around as we increase cell values by one around living border cells.

To compute the neighborhoods, the program loads Register X with the starting address of ARRAY1 ($8000) and Register U with the starting address of ARRAY2 ($B000). Since all variables are at the beginning of the program and originate at $70*xx*, we put $70 in the DP register. Now all variables require only one byte for addressing within the program. The variables DOWN and ACROSS are cleared to zero. Register A is always loaded with the current value in ARRAY1; if it's zero, the array counter increases by one and the program keeps going until Register A finds a value of 1, indicating a living cell. When this occurs, the program increases by one the current values for the eight neighboring cell locations in ARRAY2.

The wrap-around effect is tricky but not too difficult to understand. Since the array is actually numbered 0 through 127 across, to get the top-left neighboring location, the

---

Bill Nee bucked the snowbird trend by retiring to Wisconsin from a banking career in Florida. The success of his 13-part series, "Machine Language Made BASIC" (July 1988 to July 1989), prompted him to continue writing articles about Color Computer machine-language programming. You may contact Bill at Route 2, Box 216C, Mason, WI 54856-9302, (715) 746-2952. Please include an SASE when requesting a reply.



program decreases the ACROSS value by one and ANDs the result with 127. This accomplishes the left wraparound (-1 AND 127 = 127). Since we'll use it again, that value is saved as Variable B1. The program then decreases the DOWN value by one; if it becomes a negative number, it is replaced with 95 (top wrap-around). This new DOWN value is multiplied by 128, saved as Variable A1, and added with B1 to get the upper-left neighbor location in Register D. Finally, this ARRAY2 location is increased in Register U (D,U) by one.

For the top-middle neighbor, the program adds the current ACROSS value to the just computed DOWN value in A1 and increases that location in Register U. The top-right location is found by adding 1 to the current ACROSS value and ANDing that with 127 (right wrap-around). This value is saved in B2 and added to the computed DOWN location in A1. Again increase the corresponding location in Register U by one.

For the left cell, we simply multiply the current DOWN location by 128, save this as A3, and add the previously computed B1 to it. For the right cell, add together the just computed A3 and the previously computed B2. In both cases increase the corresponding location in Register U by one.

To get the bottom-left cell, increase the DOWN location by 1. If it is greater than 95, replace it with zero (bottom wrap-around). Multiply this by 128 and store the result as A2. Add to this the previously computed B1 and increase the corresponding cell in Register U. To get the bottom-middle cell, add the current ACROSS distance to the just computed A2 and increase the corresponding Register U location. Finally, to get the bottom-right location, add together the previously computed A2 and B2 and increase that location in Register U by one. This procedure continues for the entire first array whenever a cell in that array has a value of 1.

The SHOW in Line 1690 compares each cell in ARRAY1 to the sum of it's neighbors in ARRAY2 and decides if the next generation cell will be alive or dead. If it is alive, it is PSET on the screen. First though, let's review the rules for *Life*:

a) Any living cell with two or three neighbors stays alive.

b) Any dead cell with exactly three neighbors comes alive.

Now let's look at this in truth-table form using zero and one for dead and alive:

Old Cell	Neighbors	New Cell
0	3	1
1	3	1
1	2	1
Any other combination		0

If you take the old cell value and OR it with it's neighborhood value, only those combinations that result in a value of 3 will generate a living cell. So all we have to do is get each cell's value and OR it with the corresponding neighborhood value. This occurs in Line 1770. If the result is 3, the program PSETs that point on the screen (using ACROSS and DOWN), and sets the value in ARRAY1 to one. If the value is not 3, the program clears the value in ARRAY1. LIFE alternates between pages PMODE 0,1 and PMODE 0,2 as it recomputes cell values. To stop the program, press any key (Line 860). Save the source code with W LIFE.ASM, and assemble it with A LIFE.BIN /NS/WE.

Use the BASIC driver in Listing 1 to run the program. This driver sets the graphics mode and PSETs the initial points you want. Remember, since it uses PMODE 0, you should only PSET even locations across and down. Save this program as LIFEDRVR.BAS. If you want to use the high-speed poke, insert it just before Line 70. If you do this, also insert the slow-down poke just after Line 70.

Some *Life* shapes die out almost instantly while others seem to take forever to fade away. Still others just flip-flop continuously. The BASIC program includes three examples of designs: A "glider" that keeps going diagonally across the screen, an R

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pentomino that explodes for over one thousand generations (and produces it's own gliders), and a simple box that generates beautiful symmetrical patterns.

Feel free to modify this program in any way, and see if you can get it to run even faster. Or how about using color to distinguish cells brought to life? Whatever you decide to do, sit back and enjoy *Life*! In the next article, I'll run you through the Mill. While you're waiting, let me know about any machine-language questions you have or suggestions for future articles. ❑

64K Disk

Listing 1: LIFEDRVR

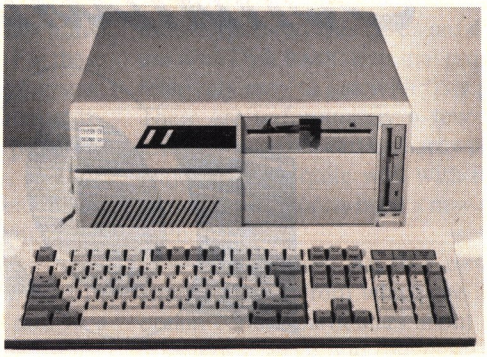
```
1 'THE ASSEMBLY LINE
2 'WRITTEN BY WILLIAM P. NEE
3 'COPYRIGHT (C) NOVEMBER 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLEAR 200,&H7000-1
20 IF PEEK(&H700C)<>26 THEN LOAD
M"LIFE":POKE&HFF40,0
30 PMODE 0,1:COLOR0,5:PCLS:SCREE
N 1,1
40 LINE(128-64,96-48)-(128+64,96
+48),PSET,B:GOTO 70
50 'PSET(128,96):PSET(130,96):PS
ET(126,98):PSET(128,98):PSET(128
,100):GOTO 60:'EXPLOSION
60 'PSET(16,4):PSET(18,4):PSET(1
6,6):PSET(20,6):PSET(16,8):'GLID
ER
70 EXEC &H700C
80 GOTO 80
```

Listing 2: LIFE.ASM

```
00100 * GAME OF LIFE *
00110 ZERO    MACRO
00120         LDU     #\0
00130 \.A     CLR     ,U+
00140         CMPU    #\1
00150         BNE     \.A
00160         ENDM
00170
00180 PPOINT  MACRO
00190         LDU     #$8000
00200         LDX     $BA
00210         LDB     #96
00220         STB     DOWN
00230 \.D     LDA     #16
00240         STA     ACROSS
00250 \.C     LDA     ,X+
00260         LDB     #8
00270 \.B     LSLA
00280         BCS     \.A
00290         INC     ,U
00300 \.A     LEAU    1,U
00310         DECB
00320         BNE     \.B
00330         DEC     ACROSS
00340         BNE     \.C
00350         DEC     DOWN
00360         BNE     \.D
00370         ENDM
00380
00390 PRESET  MACRO
00400         LDA     \1
00410         LDB     #16
00420         MUL
00430         ADDA    >$BA
00440         TFR     D,X
00450         LDB     \0
00460         LSRB
00470         LSRB
00480         LSRB
00490         ABX
00500         LDA     \0
00510         ANDA    #7
00520         LDA     A,U
00530         COMA
00540         ANDA    ,X
00550         STA     ,X
00560         ENDM
00570
00580         ORG     $7000
00590 DOWN    RMB     1
00600 ACROSS  RMB     1
00610 SUM     RMB     1
00620 COUNT   RMB     1
00630 A1      RMB     2
00640 A2      RMB     2
00650 A3      RMB     2
00660 B1      RMB     1
00670 B2      RMB     1
00680 START   ORCC    #$50    ENABLE INTERRUPTS
00690         CLR     $FFDF   HIGH RAM
00700         ZERO    $8000,$E000
00710         PPOINT
00720         CLR     $FFDE
00730
00740 PAGE2   LDB     #2
00750         JSR     $9653
00760         JSR     $9542
00770         BSR     COMPUT
00780         LDB     #1
00790         JSR     $95AA
00800 PAGE1   LDB     #1
00810         JSR     $9653
00820         JSR     $9542
00830         BSR     COMPUT
00840         LDB     #1
00850         JSR     $95AA
00860 DONE    JSR     [$A000]
00870         BEQ     PAGE2
00880         CLRB
00890         JSR     $95AA
00900         ANDCC   #$AF    SET INTERRUPTS
00910         RTS
00920
00930 COMPUT  LDX     #$8000  ARRAY1 LOCATION
00940         LDU     #$B000  ARRAY2 LOCATION
00950         SETDP   $70     VARIABLES BEGIN AT $70--
00960         LDA     #$70
00970         TFR     A,DP
00980         CLR     $FFDF   HIGH RAM
00990         CLRA
01000 CL2     STA     DOWN
01010         CLRB
01020 CL1     STB     ACROSS
01030         LDA     ,X+     FIRST CELL VALUE
01040         BEQ     NEXTON  SKIP THIS IF ZERO
01050 TL      LDB     ACROSS  TOP-LEFT
01060         DECB             NEIGHBOR
01070         ANDB    #127    LEFT WRAP-AROUND
01080 CTL     STB     B1      SAVE IT
01090         LDA     DOWN
01100         DECA
01110         BPL     CTL2
01120         LDA     #95     TOP WRAP-AROUND
01130 CTL2    LDB     #128
01140         MUL
01150         STD     A1      SAVE IT
01160         ADDB    B1
01170         ADCA    #0      TOP-LEFT LOCATION
01180         INC     D,U     INCREASE THIS IN ARRAY2
01190 TM      LDD     A1      TOP-MIDDLE
01200         ADDB    ACROSS
01210         ADCA    #0
01220         INC     D,U
01230 TR      LDB     ACROSS  TOP-RIGHT
01240         INCB
01250         ANDB    #127    RIGHT WRAP-AROUND
```

```
01260 CTR      STB     B2
01270          LDD     A1
01280          ADDB    B2
01290          ADCA    #0
01300          INC     D,U
01310 LEFT     LDA     DOWN     LEFT-CENTER
01320          LDB     #128
01330          MUL
01340          STD     A3
01350          ADDB    B1
01360          ADCA    #0
01370          INC     D,U
01380 RIGHT    LDD     A3       RIGHT-CENTER
01390          ADDB    B2
01400          ADCA    #0
01410          INC     D,U
01420 BL       LDA     DOWN     BOTTOM-LEFT
01430          INCA
01440          CMPA    #95
01450          BLE     CBL
01460          CLRA             BOTTOM WRAP-AROUND
01470 CBL      LDB     #128
01480          MUL
01490          STD     A2
01500          ADDB    B1
01510          ADCA    #0
01520          INC     D,U
01530 BM       LDD     A2       BOTTOM-MIDDLE
01540          ADDB    ACROSS
01550          ADCA    #0
01560          INC     D,U
01570 BR       LDD     A2       BOTTOM-RIGHT
01580          ADDB    B2
01590          ADCA    #0
01600          INC     D,U
01610 NEXTON   LDB     ACROSS
01620          INCB
01630          CMPB    #127
01640          LBLS    CL1
01650          LDA     DOWN
01660          INCA
01670          CMPA    #95
01680          LBLE    CL2
01690 SHOW     LDY     #$8000
01700          LDU     #TABLE   GRAPHICS OR TABLE
01710          CLRA
01720 SL2      STA     DOWN
01730          CLRB
01740 SL1      STB     ACROSS
01750 RULES    LDB     $3000,Y  GET NEIGHBORHOOD VALUE
01760          CLR     $3000,Y  CLEAR NEIGHBORHOOD
01770          ORB     ,Y       OR IT WITH CELL VALUE
01780          CMPB    #3       IS IT THREE?
01790          BNE     NOT      DON'T PSET IT
01800          LDA     #1
01810          STA     ,Y+      THIS CELL IS ALIVE
01820          BRA     SET
01830 NOT      CLR     ,Y+
01840          BRA     CSHOW
01850 SET      PRESET  ACROSS,DOWN
01860 CSHOW    LDB     ACROSS
01870          INCB
01880          CMPB    #127
01890          BLS     SL1
01900          LDA     DOWN
01910          INCA
01920          CMPA    #95
01930          BLE     SL2
01940          CLR     $FFDE    LOW RAM
01950          CLRA
01960          TFR     A,DP     SET DP BACK TO ZERO
01970          RTS
01980 TABLE    FDB     $8040    OUR GRAPHICS OR TABLE
01990          FDB     $2010
02000          FDB     $0804
02010          FDB     $0201
02020          END     START
```


SYSTEM IV



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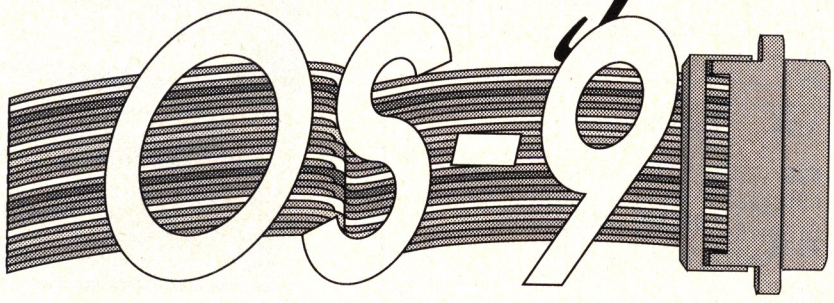

by Tim Kientzle

When OS-9 first became available for the CoCo, there were few options for users interested in telecommunications. Greg Morse's *XCom9* program worked, but its spartan interface made it somewhat intimidating to first-time users. In contrast, under Disk BASIC, several easy-to-use terminal programs were available due to the creative efforts of such people as Mike Ward and Greg Miller.

Now that OS-9 Level II has been available for the CoCo 3 for several years, this state of affairs has nearly reversed. Telecommunications programs for OS-9 now routinely feature batch file-transfers, user scripts and autodial capabilities, the ability to easily interface with other programs, and the ability to work with a variety of hardware setups.

The purpose of this article is to clarify the telecommunications possibilities now available under OS-9. I'll describe some generalities that apply to almost any computer system. I'll then give some hints and suggestions for getting an OS-9 terminal program running. Along the way we'll look at a few of the options available that allow you to create a telecommunications environment to best suit your needs.

Parts of Speech

When using a computer and modem as a terminal, you should be aware of the several different pieces of hardware and software involved. You can think of each piece as a translator. Together they translate what you type into signals that are sent to the remote computer, and they interpret signals from the remote computer and translate them into glowing bits of phosphor on your monitor.

Let's look at the hardware components involved in allowing you to communicate. Starting from the remote computer's end, the first few "translators" are:

— Remote Computer: The ultimate goal of telecommunications is to "talk" to some computer far enough away that it's not convenient for you to sit directly in front of it. This communication might involve transferring files to an office across the street or running programs on a supercomputer on the other side of the country. Knowing how to actually use the other computer is generally the most difficult challenge; the telecommunications system is simply a tool that allows you to "get there." Most information services provide manuals explaining how to get around the system, making the challenge somewhat simpler.

— Packet-switched Network: Large services such as Delphi and CompuServe communicate with your computer through a remote modem located near you. This modem is connected to their computers (which might be across the country) through a *packet-switched network*, which is the digital equivalent of a telephone company. Data is placed in packets and routed through phone lines across the country.

Two of the biggest such networks are SprintNet and Tymnet, although CompuServe also operates its own network. Packet-switched networks transfer enormous amounts of data long distances at fairly high speeds. However, it can take some time for the data to get from one end of the network to the other. When connected to a remote system through a packet-switched network, you may notice a delay between the time you press a key and the time the appropriate character appears on your monitor. This delay is due to the time it takes for the character to travel across the network and back, when echoed by the remote system. Because local BBSs don't use networks, this delay is not a problem.

— Remote Modem: Whether you're communicating with a Cray supercomputer in Los Angeles, Delphi in Boston, or your friend's BBS in the house next door, the signals travel across telephone wires. The telephone system handles voice signals well, but it's almost useless for transmitting digital signals. A modem contains a *modulator*, which converts digital signals understandable by computers into sounds that can travel over the telephone network, and a *demodulator*, which converts those sounds back into digital signals.

— Your Modem: Like the remote modem, your modem converts digital signals from your computer to sounds, and it receives sounds from the other modem and converts them to digital signals. For this conversion process to work, your modem must use the same kind of sounds as the remote modem. As there are many ways to create these sounds, it is fortunate that there is a set of international standards now in place for modems faster than 1200 bps. These standards are: V.22bis for 2400 bps, V.32 for 9600 bps, and V.32bis for 14,400 bps. In the United States, the Bell 212A standard is used for 1200 bps and Bell 103 for 300 bps, rather than the CCITT standards V.22 for 1200 and V.21 for 300 bps.

Tim Kientzle is currently pursuing a doctorate in mathematics at the University of California at Berkeley. He is the author of V-Term *and has worked with the Color Computer since 1982.*

You don't really need to worry about the names of these standards, since any modem advertised as "2400 bps," for example, supports all the appropriate standards for 2400 bps and below (i.e., in the U.S., Bell 103, Bell 212A, and V.22bis). I mention these only because modem ads have in recent years started using the name of the standard rather than the speed, and it's useful to know that "V.22bis modem" simply means "2400 bps modem".

— Your Serial Port: The serial port on your computer converts between the signals the computer uses (for internal communication with memory and other devices) and the signals expected by your modem. Under Disk BASIC on the Color Computer, it is possible to scrape by with the back-panel serial (or printer) port, affectionately known as the "bit-banger" port. This very simple hardware circuit relies on careful programming to generate the exact timing needed for reliable transmission of signals.

Such accurate timing is extremely difficult to achieve under OS-9, where there are multiple programs running in several different address spaces. For this reason, OS-9 users usually depend on a hardware chip known as an Asynchronous Communications Interface Adapter, or ACIA (sometimes called a UART), to handle this critical timing reliably. This allows the processor to spend its time on other tasks. This type of chip is used in RS-232 interfaces available from a number of vendors.

Software Translators

The communications hardware depends on programs telling it what to send and how to handle received data; the remaining translations are performed by software. For those familiar with Disk BASIC terminal programs, the following software routines are usually bundled together inside a single program. We'll describe them separately, though, since they are usually handled independently under OS-9 (and other systems):

— Driver: An OS-9 *driver* is a set of subroutines that knows how to talk to a specific kind of hardware device (disk drive, printer, serial port, etc.). In the case of a serial port, the driver needs to know how to control the speed and parity, as well as how to actually send and receive characters.

Sophisticated drivers can handle several different ports simultaneously, as long as you have a descriptor for each one. They also provide buffering (storage of unprocessed characters) to prevent lost data, and they coordinate the flow of data to the modem. With Disk BASIC terminal programs, the driver is part of the terminal program itself. Though this simplifies use of the program, it makes it difficult for you to change your hardware. Under OS-9, the driver is loaded as a module in the OS-9 boot file, and it can be easily replaced when you change hardware. As a case in point, the serial ports on The Eliminator and the Disto Mini-Expansion Bus cards are difficult to use with Disk BASIC terminal programs but relatively easy to use with OS-9 programs. There are unfortunately a few OS-9 programs that expect certain hardware, but the majority work quite well with these nonstandard serial ports once a new driver has been installed.

— Descriptor: An OS-9 *descriptor* is simply a table from which the driver can obtain certain particulars about a specific port. For a serial port, the descriptor contains such information as the default speed, the memory address of the port, and the name of the port (which is the same as the name of the descriptor). The most common serial descriptor for OS-9 on the Color Computer is called `t2`. (The port itself is a device and is referred to as `/t2`.)

There must be at least one descriptor for each serial port, though they may all share the same driver. Having such a table allows

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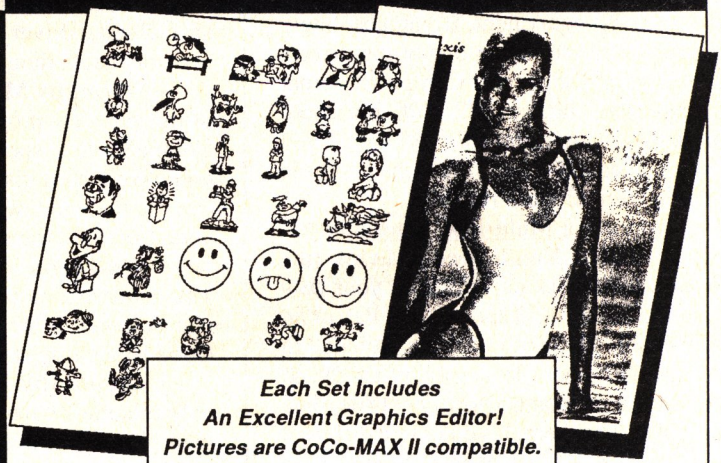

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one driver to handle several similar ports since all the differences between the ports are stored in the table. Some Disk BASIC programs also use this approach by including a table with the differences between types of serial ports, thus allowing one piece of driver code to do multiple duty.

— **Manager:** A *manager* is software that handles communications between a program and a general type of device. Serial communications under OS-9 go through the Sequential Character File (SCF) manager. This manager also handles the printer, the keyboard, and the monitor, which all transfer data one byte at a time.

— **Program:** As hinted at earlier, many OS-9 terminal programs are actually collections of programs. An advantage to this approach is that it allows pieces to be mixed. A programmer who might not have the time or inclination to write a full terminal program might instead write a smaller program that just handles file transfers. This program could then be used with another programmer's terminal program. Several authors have designed their terminal programs specifically to make it easy to use separate programs for file transfers. In this way, users can combine the best programs for each particular task.

Getting Started

Now that you've seen the general layout, let's look at getting your first OS-9 terminal program running. The first fact of life is that you really should use an RS-232 Pak or some equivalent. If you absolutely must, you can try using one of the drivers available on Delphi and CompuServe that support the "bit-banger" port, but these drivers are notoriously finicky. Even experienced OS-9 users have had trouble getting them to work reliably.

If you use a Multi-Pak, put the RS-232 Pak in Slot 1. You'll need `ACIAPAK` (the driver) and the `t2` descriptor in your OS-9 boot file to use the Tandy RS-232 Pak or an equivalent. These modules are included in the standard boot file as sold by Tandy, so unless you've changed your boot file, they should still be there. If you have a different hardware setup (such as one of the add-ins for the Disto Super Controller, or The Eliminator), you should consult the appropriate documentation to find out which modules to use. Enter `mdir` and check to make sure you have the correct modules in memory. As a quick check, if your modem is correctly connected and turned on, you can enter

```
xmode /t2 type=00 baud=04
```

This sets the serial port for 8N1 (eight bits/no parity/1 stop bit) at 2400 bps. (Use `baud=03` for 1200, or `baud=01` for 300). If you have a "Hayes-compatible" modem, you can then enter

```
echo ATDT555-5555 >/t2
```

The redirection `>/t2` tells OS-9 to send the message to the modem. Watch the modem lights carefully when you press ENTER; they should blink briefly, and then the modem will dial the number. You need a terminal program before you can go any further than this. (*Assignment for the ambitious:* After using `xmode` to set the speed and parity, and to disable special characters, write a simple 300-bps terminal program in BASIC09. This really shouldn't be too much trouble. The only real trick is figuring out whether a key has been pressed or a byte is waiting to be read from the serial port, both of which require a system call.)

For their first entry into telecommunica-

So Many Choices

A search on the keyword `TERMINAL` in the Delphi OS9 Online databases reveals 62 entries. These entries include terminal programs (such as *Supercomm*), file transfer programs, and even complete bulletin boards. I'll mention a few of the more popular programs, but I leave it to you to do the comparison shopping. With such a wide variety available, many people find themselves switching between several programs for quite a while before settling on one or two that work best for them.

— ***Telstar*** **(by Merle Kimmerly):** This full-featured program offers programmable macro keys, an auto-dialer, and Xmodem and Ymodem transfers. No Ymodem-Batch, though it should be possible to use a separate program. The screen display is well thought-out and helps make the program easier to use.

— ***XCom9*** **(by Greg Morse):** Spartan but reliable, this now-classic program has seen numerous enhancements to make it work better on the CoCo 3. It's small size makes it ideal for Level I users, or those with 128K CoCo 3 systems that are tight on space. Although it supports only basic Xmodem internally, I had no trouble starting a Shell from inside *XCom9* and then using another program for file transfers.

— ***WizPro*** **(by Bill Brady):** Full-featured is an understatement; *WizPro* is an impressive comment on what can be done with BASIC09. Its onscreen timer and automatic logging of online time is invaluable for those with limited budgets. Its requirement that you install a special serial driver just for this program is a drawback, though.

— ***STerm*** **(by Mark Griffith):** One of the very few programs that supports CompuServe's special B protocol. If you have a hard disk or RAM disk, you can use the windowing B+ protocol for very quick file transfers.

— ***QuikTerm*** **(Alpha Software):** This demonstration program from Alpha Software is small and easy to use. Good for getting started.

— ***KBCom*** **(by Eddie Kuns):** The only reliable VT-100 emulation that I've seen for OS-9. It even supports double-width and double-height characters on a graphics screen. The program's extensive buffer keeps it from losing characters even on a graphics screen, but unfortunately can make the screen-update erratic at times. The shareware version doesn't include file transfer capabilities, though it's easy to program a macro key to run an external program to handle this.

— ***JTerm*** **(by Jim Hollier):** The terminal-mode term "Combat" shows this program's debt to *MikeyTerm*. It is very similar to the Disk BASIC classic in many ways. It seemed quite functional when I tried it, although it's choice of screen colors tended to make it difficult to read the menus.

— ***OSTerm*** **(by Vaughn Cato):** Many people's favorite, *OSTerm*'s automatic-dialing facilities and easy-to-use filepicker for selecting files to transfer are definite pluses. It's special code for preventing serial-port lockups is a nice feature, but only if you have a Tandy RS-232 Pak or equivalent. It requires some patching to work with the Disto MEB boards or The Eliminator. Make sure to get version 2.0.8 (the newest one, as I write this) if you're going to perform batch transfers.

— ***BBTerm*** **(by Bob Ayella):** Another program claiming support for CompuServe B protocol.

— ***CTalk*** **(by Simmy Turner):** A free demonstration version of a commercial program by Simmy Turner. It offers VT-52 emulation.

— ***Com09*** **(by Jason Shouler):** Originally written in BASIC09 for the Dragon 64, it should work on the CoCo as well. Public Domain.

tions under OS-9, many people use a Disk BASIC terminal program to download a terminal program for OS-9. They then transfer it to OS-9 using techniques like those I described in "Making the Move" (October 1991, Page 10). Because it is small (hence easy to transfer) and relatively easy to use, I recommend starting with Dave Philipsen's *Supercomm*. Though the shareware version lacks some features offered by other programs, it is easy to learn and easy to use. Copy the *Supercomm* program to your CMDS directory, set the execute attributes (if they are not already set) by entering

```
attr /dd/cmds/supercomm e pe
```

and enter `supercomm` to start the program. Press the space bar when the copyright message comes up, and press F1 to see a help screen. Press the corresponding key to select a menu, use the arrow keys and space bar to select the options and press ENTER to exit any menu. After setting the speed, you should be able to communicate with the modem. Typing AT and pressing ENTER should get you an OK response from the modem (assuming you have a Hayes-compatible modem). You're now ready to go! If you use CompuServe, you may prefer to look at *STerm*, which has support for CompuServe's Quick B protocol. For a list and general comments about some of the many OS-9 terminal programs available, see the sidebar with this article.

Enhancements and Options

One of the nice features of working under OS-9 is that, by changing parts of the system, you can improve the operation of many different programs; once you have a basic setup, you can begin to customize it. There are many things you can do. First we'll take a look at some general system enhancements. None of these are really necessary for using a terminal program under OS-9, though they can make operation smoother and reduce the chance of problems occurring:

— Updated Clock Module: As described in THE RAINBOW ("The OS-9 *CART Interrupt Fix," November 1989, Page 50; and "CoCo 3 GIME CART* IRQs Explained," August 1990, Page 20), there is a slight discrepancy in the way OS-9 and the GIME chip treat interrupts. There are several hardware modifications that can be used to fix this, but most people seem to prefer the software approach, which involves patching and/or replacing the `Clock` module. This is especially recommended if you have problems with terminal programs dropping characters or locking up on you. A few terminal programs (notably *OSTerm*) have some hardware-specific code to help prevent this problem without any hardware or software changes.

— Revised Driver Module: The ACIAPAK driver is functional, but it could be better. There are a number of small patches floating around to improve ACIAPAK's performance by increasing the size of its buffer. There are even several complete replacements now available; one of the more popular ones is Bruce Isted's SACIA, which is derived from his work on The Eliminator. The SACIA driver works with the Tandy RS-232 Pak and third-party workalikes, as well as the Disto MEB RS-232 interfaces.

— Bit-banger Driver: Written by Richard Kottke, this program gives you the ability to use the back-panel serial port under OS-9. This program patches the OS-9 Kernel, and can have many strange effects on the system, so you may be better off with an RS-232 Pak. But people have had success using this program.

Since it is so easy under OS-9 to run one program from within another (most of the terminal programs mentioned here can run a new Shell from within the program),

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- 80,40 or 32 column text displays

MLBASIC not only contains everything that you would expect a BASIC programming language should contain, MLBASIC has features that offer flexibility of other languages like C, Pascal, FORTRAN and even assembly language. These features will allow programmers to directly access the CPU registers on the COCO, produce modular program code with SUBROUTINES, manipulate memory in blocks, and even call ROM routines in other areas of memory.

MLBASIC revision 2.0 has incorporated all enhancements that were suggested by MLBASIC 1.0 users and more. Revision 2.0 did away with all the incompatibility problems that existed with revision 1.0.

MLBASIC allows for the first time user to quickly compile a program using default compiler settings. The advanced user has the capability of controlling over a dozen settings which control where the program is compiled, which medium to compile to (memory or disk), string space, compiler listings and more.

With all this going for MLBASIC, your might expect the cost to be a little out of your budget. After looking at prices of other BASIC compilers for the COCO 3 you might be correct. But look again at this ad; for only $59.95, you can have a programming language that will spark your interest once again in the COCO.

Before you buy another BASIC compiler for the COCO, find out if it supports everything MLBASIC supports. Then look at the price tag. We feel that it won't be long before you place an order for MLBASIC.

"MLBASIC is a fine program for any serious programmer," said David Gerald in the December 1987 RAINBOW.

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OS-9 Budget System

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Software Developers: MV Systems needs quality OS-9/OSK software to market. MV Systems is actively involved in helping sofware developers like you bring their products to market. We can help you put the finishing touches on your program or its documentation, if needed, and then help you market your product effectively. We can also assist you in porting your product between OS9 and OSK (Version 2.4). So, if you have written (or are writing) software you would like to market, contact us for details. You'll be glad you did!

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The OS-9 and Multi-Vue specialists!

several people have written or ported programs that perform file transfers. Following is a short list of programs that can be used in conjunction with whatever terminal program you prefer, giving you far more capability than you would otherwise be able to find in a single program:

— **Kermit:** There are many versions of the Kermit file-transfer utility available on BBSs and online-information services. Terminal support ranges from minimal to VT-52 emulation, with similar variation in the quality of the file-transfer protocol. Essential for people who want to transfer files to and from mainframes.

— ***XYDown*:** I wrote this stand-alone program for performing Xmodem, Ymodem, and Ymodem-batch downloads. It features automatic detection and conversion of ASCII files, automatic determination of the protocol, and automatic overwrite prevention. *XYDown* can be used with most of the terminal programs mentioned here.

— **Zmodem:** Several people have ported the Zmodem file-transfer program to OS-9. Zmodem is a very fast and efficient file-transfer protocol, and it is supported by Delphi and some bulletin boards.

This list is far from exhaustive; I have mentioned only a few of the more popular programs that are available. For more information, or to locate some of these programs, check Delphi, CompuServe, a local BBS, or your local users group.

A Word From Our Sponsor . . .

Somewhat surprisingly, despite the large number of freely available terminal programs, several commercial programs have been successful. All support Xmodem and Ymodem file transfers, and are quite reliable up through 2400 bps. All can be used with extension programs, and support programmable macro keys and varying degrees of automatic dialing and login. Bill Brady's *The Wiz*, and the commercial version of *Supercomm* are both full-featured programs. The commercial version of *KBCom* offers a very reliable and complete VT-100 emulation. These programs are all worth considering if you intend to do a lot of telecommunicating under OS-9.

Despite a slow start, terminal programs for OS-9 are now just as feature-packed and reliable as their Disk BASIC counterparts. With the added flexibility of being able to use different programs together, every user should be able to create a custom environment that's "just right." The trick, as with any system, is to start with one easy-to-use setup and slowly add the pieces to accomplish what you want. If you have any questions, ask them on-line, ask your local user's group, or write to THE RAINBOW. There's always someone who's eager to help you get started.

RAINBOW ON DISK

Supercomm V2.1A appears on this month's RAINBOW ON DISK. The ready-to-run program is in the `CMDS` directory, and the documentation file is in the `DOCS` directory. We thank Dave Philipsen for his permission to provide *Supercomm* to you, and we appreciate Randy Wilson's permission to use this updated version.

To get *Supercomm* running, connect your modem to `/t1` or `/t2` and copy `supercomm` to the `CMDS` directory of your working OS-9 disk. Then type `supercomm` and press ENTER. (*Supercomm* defaults to `/t2`. If your modem is connected to `/t1`, enter `supercomm /t1`.) When the title screen appears, press any key to enter the communications mode. Press F1 to see a help screen.

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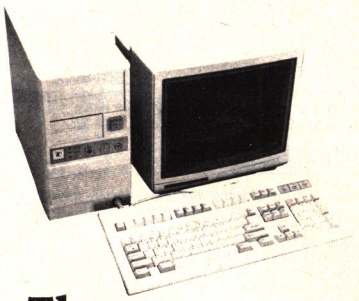

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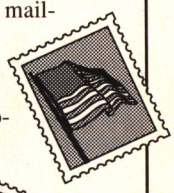
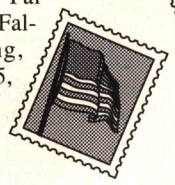




Novices Niche

Utility/16K Disk

File Finder
by Keiran Kenny

Have you ever spent an entire computing session searching disks for a file you *know* you saved *somewhere*? Of course you can use DIR, but then you have to type something for every disk. And the screen scrolls by too quickly. Even using SHIFT-@ to stop the screen doesn't help much — you have to look closely to see if the filename you want is hidden in the mish-mash of other filenames.

File Finder is quick, and it gives you a definite answer — either the file is on the disk or it isn't. Just run the program, insert a disk and enter the filename with its extension. If the file is not on the current disk, replace the disk with another and press D. To look for a different filename, press F at the prompt and enter the new filename.

As listed, *File Finder* works with Disk BASIC 1.1 and 2.1. If you have Disk BASIC 1.0 or 2.0, omit Line 30 and make Line 40 active by removing the apostrophe just after the line number. The code in either of these lines scans the disk for the desired file and returns a zero in Variable A if the file is not on the disk. If the file does exist on the current disk, a non-zero value is returned.

The Listing: FILEFNDR

```
0 'FILE FINDER
1 'WRITTEN BY KEIRAN KENNY
2 'COPYRIGHT (C) NOVEMBER 1991
3 'BY FALSOFT, INC.
4 'RAINBOW MAGAZINE
10 CLS
20 PRINT@128:INPUT"FILENAME/EXT"
;A$
30 EXEC51512 A$:EXEC&HC68C:A=PEE
K(&H973) '*DISK BASIC 1.1
40 'EXEC51338 A$:EXEC&HC65F:A=PE
EK(&H973) '*DISK BASIC 1.0
50 IFA=0THENPRINT@224,A$+" NOT O
N DISK":GOTO70
60 PRINT@224,A$+" ON DISK"
70 PRINT:PRINT"ANOTHER (D)ISK/(F
)ILE/(E)ND?"
80 K$=INKEY$:IFK$<>"D"ANDK$<>"F"
ANDK$<>"E"THEN80
90 IFK$="D"THENCLS:GOTO30
100 IFK$="F"THEN10
110 IFK$="E"THENCLS:END
```

Game/16K

Echo
by Richard Barberian, Jr.

Do you remember those electronic games that tested your ability to repeat sequences of lights and sounds? *Echo* reproduces all the excitment (and frustration) on your CoCo. As a bonus, the program includes a special meter to measure your progress.

To play *Echo*, repeat the pattern of flashing X's, which are accompanied by different musical tones. To do this, press the letter O for top, the comma (,) for bottom, K for left and the semi-colon (;) for right. For each correct response, the computer repeats the pattern, adding a new light/note combination at the end. If you manage to copy the final 21-note pattern, you are treated to a zippy salute.

The Listing: ECHO

```
10 'ECHO
20 'WRITTEN BY RICH BARBERIAN
30 'COPYRIGHT (C) NOVEMBER 1991
40 'BY FALSOFT, INC.
50 'RAINBOW MAGAZINE
60 '  ******************
70 DIM J(40)
80 CLS0:G=21
90 S=1:FOR I=1 TO 4:J(I)=I:GOSUB
 350:NEXT
100 FOR I=1 TO 21:J(I)=RND(4):NE
XT
110 OG=G:G=1:FORH=1 TO OG:FORK=1
TO4:SET(H*3,K,3):NEXT:NEXT
120 FOR TM=1 TO 200:NEXT
130 FORP=1 TO 21
140 FOR I=1 TO P:GOSUB 350:NEXT
150 FOR I=1 TO P
160 N$=INKEY$:IF N$="" THEN 160
170 IF N$="O"THEN N=1
180 IF N$=";"THEN N=2
190 IF N$=","THEN N=3
200 IF N$="K"THEN N=4
210 IF J(I)<>N THEN 270
220 GOSUB 350:NEXT
230 FOR K=1TO4:SET(G*3,K,8):NEXT
:G=G+1:SOUNDG*3,2
240 FOR TM=1 TO 200:NEXT
250 NEXT P
260 FORI=1 TO 254 STEP10:SOUND I
,1:NEXT
270 FORGG=1TO4:GOSUB350:SOUND1,3
:NEXT
280 IF P<5 THENPRINT@384,"YOU NE
ED HELP!!!"
290 IF P>4 ANDP<11 THENPRINT@384
,"YOU'RE A NOVICE"
300 IF P>10 ANDP<16THENPRINT@384
,"YOU'RE AN EXPERT"
310 IF P>15 THENPRINT@ 384,"CONG
RADULATIONS, MASTER!!"
320 PRINT@448,"PLAY AGAIN???  (Y
/N)"
330 D$=INKEY$:IF D$="" THEN 330
340 IF D$="N"THEN END ELSE 80
350 IFJ(I)=1THENX=30:Y=8:C=2:S=5
0
360 IFJ(I)=2THENX=46:Y=16:C=3:S=
60
370 IFJ(I)=3THENX=30:Y=24:C=4:S=
70
380 IFJ(I)=4THENX=14:Y=16:C=6:S=
80
390 SOUND S,1:Q=0:R=5
400 FORM=1 TO 6:SET(X+Q,Y,C):SET
(X+R,Y,C):Y=Y+1:Q=Q+1:R=R-1:NEXT
410 Q=0:R=5:Y=Y-6
420 FORM=1 TO 6:SET(X+Q,Y,5):SET
(X+R,Y,5):Y=Y+1:Q=Q+1:R=R-1:NEXT
430 RETURN
```

CoCo-Dot

by John D. Clemons

Children's Game/CoCo 3

If your children are like mine, they enjoy finishing dot-to-dot puzzles in coloring books. They also enjoy playing with the CoCo (or at least banging on the keyboard). If you have a CoCo 3, *CoCo-Dot* allows them to do both at the same time.

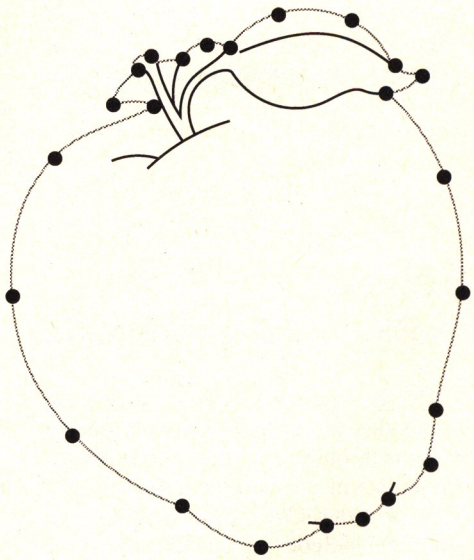
As your child presses the letters of the alphabet in the correct order, a drawing of a familiar friend is created onscreen. If a letter key is pressed in the wrong order, a beep sounds and the child can try again. After the child enters all the letters in the right order, the letters are erased and the computer colors the resulting drawing.

CoCo-Dot is intended for use with a composite monitor. If you have an RGB monitor, you'll need to change the color codes in Line 400. Also, change CMP in lines 50 and 440 to RGB.

I hope your kids enjoy *CoCo-Dot* as much as mine do. But don't blame me if they start taking *your* turn on the CoCo.

The Listing: COCODOT

```
1 'COCO-DOT
2 'WRITTEN BY JOHN CLEMONS
3 'COPYRIGHT (C) NOVEMBER 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 'COCODOT  MARCH 1989 BY JOHN
D. CLEMONS
20 POKE282,1:CLS:CLEAR:DIMA$(26)
,X(26),Y(26)
30 ON BRKGOTO440
40 POKE65497,0
50 PALETTECMP
60 HSCREEN2:HCOLOR8:POKE65434,63
:HCLS4
70 GOSUB80:GOTO180
80 HCIRCLE(143,76),5:HCIRCLE(177
,76),5
90 HPAINT(143,76),8,8:HPAINT(177
,76),8,8
100 HLINE(80,96)-(128,96),PSET:H
LINE(192,96)-(240,96),PSET
110 HLINE(72,104)-(120,104),PSET
:HLINE(200,104)-(248,104),PSET
120 HLINE(64,112)-(120,112),PSET
:HLINE(200,112)-(256,112),PSET
130 HLINE(170,90)-(150,65),PSET:
HLINE-(140,65),PSET:HLINE-(168,9
0),PSET:HLINE-(170,90),PSET
140 HPAINT(152,70),8,8
150 HLINE(152,136)-(168,136),PSE
T
160 HLINE(120,80)-(128,80),PSET:
HLINE-(144,88),PSET:HLINE(176,88
)-(192,80),PSET:HLINE-(200,80),P
SET
170 RETURN
180 PALETTE15,0:HCOLOR15
190 FOR J=1 TO 26
200 READ A$(J):READX(J):READY(J)
210 HSET(X(J),Y(J)):HPRINT(X(J)/
8,Y(J)/8),A$(J)
220 NEXT
230 HCOLOR8
240 FORJ=1TO26
250 B$=INKEY$:IFB$=""THEN250
260 IFB$=A$(J)THEN270ELSESOUND12
5,10:GOTO250
270 IF J=1THENHLINE(152,160)-(X(
J),Y(J)),PSET:GOTO290ELSE280
280 HLINE-(X(J),Y(J)),PSET
290 NEXT
300 PALETTE15,63
310 GOSUB80
320 FOR J=1TO26
330 IF J=1THENHLINE(152,160)-(X(
J),Y(J)),PSET:ELSEHLINE-(X(J),Y(
J)),PSET
340 NEXT
350 HCOLOR3:HPRINT(11,23),"ONE M
OMENT PLEASE!"
360 PALETTE12,63:PALETTE13,63
370 HPAINT(160,60),13,8
380 HPAINT(160,152),13,8
390 HPAINT(0,0),12,8
400 PALETTE12,12:PALETTE13,52
410 B$=INKEY$:IFB$=""THEN410ELSE
20
420 DATAA,152,136,B,144,136,C,12
8,144,D,112,144,E,88,120,F,88,10
4,G,112,80,H,120,80,I,120,64,J,1
28,48,K,120,32,L,144,48,M,176,48
430 DATAN,200,32,O,192,48,P,200,
64,Q,200,80,R,208,80,S,232,104,T
,232,120,U,208,144,V,192,144,W,1
76,136,X,168,136,Y,168,160,Z,152
,160
440 POKE65496,0:CMP
```



Utility/16K Extended

Tape-to-Tape ML

by Keiran Kenny

Have you ever wanted to copy a machine-language program from one tape to another? If so, you may quickly realize the difficulty involved in performing such a task. The problem is determining where the machine-language program starts in memory, its ending address and its execution address. Fortunately, BASIC stores this information in memory so it can be retrieved later. The starting address is stored at locations 487 and 488, the ending address is stored at locations 126 and 127, and the execution address is stored at locations 485 and 486. These three addresses can be found with the following statements:

```
ST=PEEK(487)*256+PEEK(488)
EN=PEEK(126)*256+PEEK(127)
EX=PEEK(485)*256+PEEK(486)
```

where ST is the starting address, EN is the ending address and EX is the execution address.

COPYML allows you to quickly and easily copy machine-language programs. This short program first asks for the name of the machine-language program you want to copy. After you enter the filename, the CLOADM command is used to load the machine-language program from tape.

You are then asked to insert the cassette on which you want to save the machine-language program. The routine in Line 50 computes the three addresses and saves the program.

The Listing: COPYML

```
1 'COPY ML
2 'WRITTEN BY KEIRAN KENNY
3 'COPYRIGHT 1991 FALSOFT, INC.
10 CLS
20 INPUT"CLOADM:";F$
30 CLOADMF$
40 PRINTTAB(3)"TO CSAVEM"CHR$(34
)F$CHR$(34):PRINT:PRINTTAB(6)"PR
ESS ANY KEY":EXEC44539
50 CSAVEMF$,PEEK(487)*256+PEEK(4
88),PEEK(126)*256+PEEK(127)-1,PE
EK(485)*256+PEEK(486)
60 END
```

Home Help/Game Aid/CoCo 3

Egg Timer

by Robert C. Nugent

Egg Timer is a CoCo 3 program that can be used to time any one-, two- or three-minute game or other imprecise event. (The timing is not precise, though it is consistent.) After you run *Egg Timer*, you see a picture of an egg timer on-screen. To its left are three buttons that let you select the timing period. The timing starts when you press 1, 2 or 3.

To indicate timing, drops fall from the top tube to the bottom tube, making a dripping sound when they hit. When the bottom tube is full, the time period is over and an alarm sounds. Press any key to stop the alarm and reset the timer.

The speed of the timer is adjusted in the FOR/NEXT loop in Line 500. Also, there is a high-speed poke in Line 50 and a slow-down poke in Line 650.

The Listing: EGGTIMER

```
10 'EGG TIMER
15 'WRITTEN BY ROBERT C. NUGENT
20 'COPYRIGHT (C) NOVEMBER 1991
25 'BY FALSOFT, INC.
30 ON BRK GOTO 640
40 POKE &HF015,&H21 'OVERWRITE P
```


CoCo III Tool Kit

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```
OKE
50 HSCREEN 2:HCOLOR 8:POKE 65497
,0 'HIGH SPEED POKE
60 HBUFF 1,2360:HBUFF 2,2360
70 HPRINT (12,1),"*** EGG TIMER
***"
80 HPRINT (2,4),"WOULD YOU LIKE
A..."
90 HPRINT (5,20),"MINUTE EGG"
100 '** DRAW EGG TIMER
110 HDRAW "BM190,30;ND5R70D5NL70
L5D130R5D5L70U5NR70R5U130R3ND130
R54D130L10U63L16U4R16U63L34D63R1
6D4L16D63
120 '** ESTABLISH & DRAW BUTTONS
130 A$="R15U15L15D15BD3R19U21L23
D21R3
140 HDRAW "C9;BM77,74"+A$+"BD29"
+A$+"BD29"+A$:HCOLOR 8
150 '** PAINT BUTTONS
160 HPAINT (75,76),3,9
170 HPAINT (74,108),6,9
180 HPAINT (73,140),2,9
190 HPRINT (10,8),"1":HPRINT (10
,12),"2":HPRINT (10,16),"3"
200 '** PAINT FRAME
210 HPAINT (192,32),1,8 'TOP
220 HPAINT (192,169),1,8 'BOTTOM
230 HPAINT (196,39),6,8 'LEFT PO
ST
240 HPAINT (253,39),6,8 'RIGHT P
OST
250 '** PAINT RED & GET TOP TUBE
260 HSET (225,102):HPAINT (210,3
7),3,8
270 HGET (208,35)-(243,165),1
280 '** PAINT BLUE & GET TOP OF
TUBE
290 HSET (225,102):HPAINT (210,3
7),2,8
300 HGET (208,35)-(243,165),2
310 '** START TIMER
320 HPRINT (4,22),"PLEASE SELECT
":PLAY "T255CDEF"
330 S$=INKEY$:IF S$="" THEN 330
340 PLAY "T255FED"
350 IF S$<>"1" AND S$<>"2" AND S
$<>"3" THEN 330
360 HPRINT (2,20),VAL(S$)
370 '** ERASE "PLEASE SELECT"
380 HPRINT (4,22),STRING$(13," "
)
390 HPRINT (5,22),"GOOD LUCK!"
400 '** SWITCH TUBE COLORS
410 M=M+1:IF M>1 THEN M=0
420 IF M=1 THEN C=3:B=1
430 IF M=0 THEN C=2:B=2
440 HCOLOR C
450 '** MAKE DROPS FROM CENTER T
O BOTTOM
460 X=209:Y1=35:Y3=165:X2=225
470 FOR P= 1 TO 62:Y2=Y1+P:Y4=Y3
-P
480 HDRAW "C0;BM=X;,=Y2;R32":HCO
LOR C
490 FOR DR= 103 TO Y4 STEP 2
500 HSET (225,DR):FOR D= 1 TO 42
*VAL(S$):NEXT D
510 HRESET (225,DR):NEXT DR
520 HCOLOR C:HDRAW "BM=X;,=Y4;R3
2
530 PLAY "T255CDE":HSET (225,Y4)
:NEXT P
540 HDRAW "C0BM225,98;D3"
550 HPRINT (5,22),"GOOD LUCK!"
560 '** RESET TIMER
570 HCOLOR 8:HPRINT (14,16),"TIM
ES UP!"
580 HPRINT (6,22),"PRESS <ANYKEY
> TO RESET TIMER":SOUND 200,1:IF
 INKEY$="" THEN 580
590 HPRINT (6,22),STRING$(29," "
)
600 HPRINT (14,16),STRING$(9," "
)
610 HPRINT (3,20)," "
620 '** SWITCH TUBE COLORS
630 HPUT (208,35)-(243,165),B:GO
TO 320
640 '** TAKE OUT OVERWRITE & SLO
W DOWN
650 POKE &HF015,&H21:POKE 65496,
0
660 WIDTH 40:LOCATE 8,10:ATTR 2,
0,B:PRINT "COMPUTER BACK TO NORM
AL":ATTR 2,0
670 LOCATE 6,12:PRINT "Hope your
 egg turned out OK!"
```


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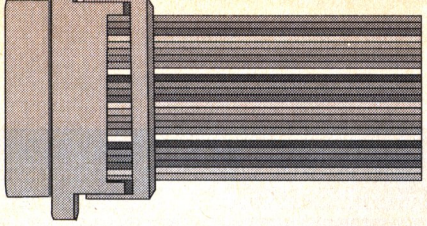


Group Descriptions

by Eddie Kuns
OS-9 SIG Database Manager

Considering our previous discussions about the databases, it's time we discuss the method for submitting files. Before we cover the submission process in detail, let's look at an existing group to get a better understanding of group descriptions. Figure 1 shows the description for **Carl Kreider**'s archiving utility submitted by **Mike Sweet** (DODGECOLT).

```
Name: AR V1.3: FILE ARCHIVING UTILITY
Type: PROGRAM
Date: 9-OCT-1990 22:07 by DODGECOLT

A new version of Carl Kreider's popular AR archiving utility. Completely
compatible with previous versions. This version now stores file attributes.

Keywords: ARCHIVERS, DODGECOLT, AR

Contents:

     1  AR BINARY (Size: 13312 Count: 412)
     2  AR DOCUMENTATION (Size: 5732 Count: 337)
     3  AR SOURCE (Size: 14592 Count: 178)
```

Figure 1: Sample Database Group

The first line shows the group name, AR V1.3: FILE ARCHIVING UTILITY, which is always printed in uppercase. This is the name you see when listing a directory of the database in which this group appears and is also the name shown in the Database Report. Group names should be as meaningful as possible. For example, if you are uploading a custom replacement for TSMon, you might name the group AUTOBAUD TSMON REPLACEMENT rather than the terse and nondescriptive MON.AR. If you are uploading a hand-drawn cartoon, the group name ORIGINAL COMPUTER CARTOON is better than NOBYTES.GIF or CARTOON.

Group names can consist of up to 32 characters, so don't be afraid to enter a long, descriptive group name. Also, when a submission is likely to evolve, it is always a good idea to include a version number in the group name. This makes it much easier to determine which version of a program is the latest and which versions are obsolete.

Following the group name is the group type. Common group types are Program, Art, Document, etc. This field indicates the type of files in the group. Next you see a line showing the date the group was submitted and the username of the person who submitted it.

The lines following the date constitute the description of the group. The description allows the group submitter to explain the contents of the group in some detail. Don't include the entire documentation in the description! Try to keep it under half a page if possible; people may be intimidated by a group with a 2-page description and just skip it. On the other hand, do describe the group adequately so users can skim the description and decide if they are interested or not without having to download any files.

If you feel the need to include a longer description, I suggest uploading a text file containing that information as the first file in the group. As for a filename, you might call it READ ME or READ ME FIRST. This allows each member to decide whether or not to read the additional information. If I decide I might want this program, I can type LIST 1 and read the contents of the READ ME file at my leisure. As a general rule, a description of more than 10 to 15 lines is too much. By all means include a fair description. All we ask is that you not go overboard.

The keywords allow you to search for specific topics without being forced to read every group description in the database. When you are entering keywords, think about what keywords you would use to search for this group. Remember to use the new keyword standards that I described in the September and October issues. Don't use the keywords to describe the group; use a short set of good keywords that you think people will actually use.

Finally, the files in this group are listed by the title. The download name of each file — the filename that will be assigned automatically when you download via a batch protocol — is not listed. The title of the first file in this group is AR BINARY. Notice that the title also appears in all uppercase letters. Size indicates the length of the file in bytes, and Count shows the number of times this file has been downloaded. For groups with only one file, the size and download count information appears near the top of the

---

Eddie Kuns is pursuing a PhD in physics at Rutgers University. He lives in Aurora, Illinois, and works as a programmer and researcher at Fermilab. Eddie is co-manager of the CoCo SIG; his username is EDDIEKUNS.

group, before the description rather than following it.

Understanding the group description paves the way for submitting your work to Delphi. Next month we'll look at the actual process of submitting groups of files.

June Uploads

In the OS-9 SIG, **Bob Kemper** uploaded a list of all the companies Tymnet can connect you with — for the curious. **Donald Thrash** released a new version of **Bruce Isted**'s KUtil, which allows grabbing the OS-9 Kernel from Burke & Burke hard drives, as well as from floppies. The experimental BLOB (boot-list order bug) fix I contributed attempts to make a science out of the art of making working boot disks.

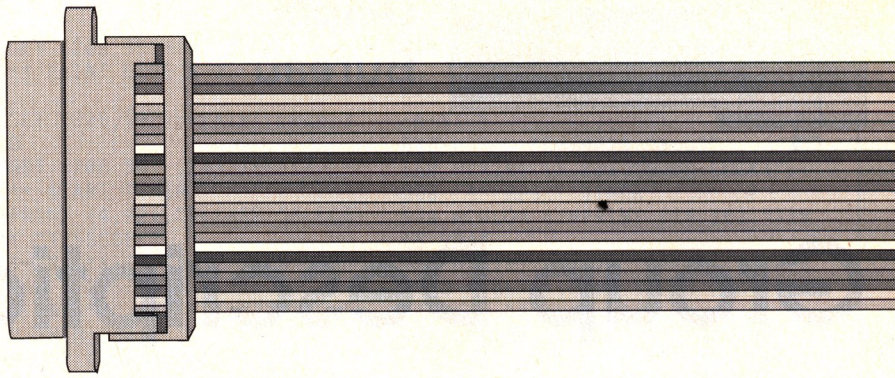
Bruce Isted's patches to *OSTerm* allow use of *OSTerm* with his modem serial drivers, SACIA and DACIA. **Matthew Thompson** posted two files that answer many common questions about modems and the Internet. **Paul Jerkatis** released a new version of the popular Zmodem file-transfer programs.

Mike Knudsen contributed SerMIDI, which drives the internal serial port to send characters to your synthesizer. **Stephen Carville** demonstrates how you can use a computer to test a hypothesis by using a Monte Carlo simulation. Bob Kemper, with beautiful timing, submitted a file describing how to submit files to the databases.

In the CoCo SIG, **Lee Deuell** posted a manual he wrote for the CoCo 3. **Jason Bucata** uploaded a message describing a treaty that may affect software patents. **Michael Trammell** wins an endurance award for releasing a tremendous number of graphics files. **Andrew Jackson**'s *Type Debugger III* aids those who enter programs from THE RAINBOW — it helps find typos. **Bill Vergona** released a demo version of *CoCo Tools*, sold by CerComp.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

1A) Title of publication: The Rainbow, The Color Computer Monthly Magazine. B) Publication No.: 705050. 2) Date of filing: July 29, 1991. 3) Frequency of issue: Monthly. 3A) No. of issues published annually: 12. 3B) Annual subscription price: $31.00. 4) Complete Mailing Address of known office of publication: Falsoft, Inc., 9509 U.S. Highway 42, P.O. Box 385, Prospect, Jefferson County, Kentucky 40059. 5) Complete Mailing Address of headquarters of general business offices of the publisher: Same. 6) Names and complete addresses of publisher, editor, and managing editor: Publisher and Editor: Lawrence C. Falk, 9509 U.S. Highway 42, P.O. Box 385, Prospect, Kentucky 40059; Managing Editor: Cray Augsburg, 9509 U.S. Highway 42, P.O. Box 385, Prospect, Kentucky 40059. 7) Owner: Falsoft, Inc., 9509 U.S. Highway 42, P.O. Box 385, Prospect, Kentucky 40059. 8) Known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: None. 9) For completion by nonprofit organizations authorized to mail at special rates (Section 423.12 DMM). The purpose, function and nonprofit status of this organization and the exempt status for Federal Income tax purposes (Check one): Not applicable. 10) Extent and nature of circulation: (X)=Average No. copies each issue during preceding 12 months: (Y)=Actual No. copies of single issue published nearest to filing date. A) Total No. of copies printed: (x) 21,962 (y) 12,900. B) Paid Circulation: 1) Sales through dealers and carriers, street vendors and counter sales (x) 4,154 (y) 5,251. 2) Mail subscription: (x) 13,920 (y) 7,271. C) Total paid circulation: (x) 18,074 (y) 12,522. D) Free distribution by mail, carrier or other means, samples, complimentary and other free copies: (x) 128 (y) 152. E) Total distribution: (x) 18,202 (y) 12,674. F) Copies not distributed: 1) office use, left over, unaccounted, spoiled after printing: (x) 343 (y) 226. 2) Returns from news agents: (x) 3,417 (y) 0. G) Total: (x) 21,962 (y) 12,900.



Marty Goodman described how to upgrade a CoCo 3 to two megs of memory and also uploaded detailed technical information about the Multi-Pak for people who want to burn their own PALs. **Wes Gale** released instructions for converting a DC Modem Pak to an RS-232 Pak. **Johnny Williams** contributed two trivia quiz programs: One covering European countries and capitals, the other quizzing about actors and their films. **Rick Adams** released *DelphiTerm Version 4.1*, which includes support for double-sided disk drives and drives with more than 35 tracks. ❑

Database Report

OS9 Online

General Information

TYMNET CONNECTIONS	
BOBKEMPER	Robert Kemper
COCOPRO DCMODPAK/RS232 REVIEW	
REDCOAT	Don Joyce

Applications (6809)

KUTIL VERSION 1.2	
DONTHRASH	Donald Thrash
REVFEED - PRINTER REVERSE FEED	
JDWILSON	John Wilson
PSHELL, A TEXT VERSION OF GSHELL	
AYUSKO	Alex A. Yusko
DAY VERSION 1.1 IPATCH	
CHYDE	Chris Hyde
BRU/OS-9 BACKUP/RESTORE UTILITY	
DODGECOLT	Mike Sweet
ENVELOPE PRINTER	
PHENTSCHEL	Paul Hentschel
DBADUMP - DWINDOWS DBASE DUMP	
JDWILSON	John Wilson

Device Drivers

EXPERIMENTAL BLOB FIX	
EDDIEKUNS	Eddie Kuns

Telcom

OSTERM V2.0.8 IPATCH	
BRUCEISTED	Bruce Isted
MUST-HAVE TELCOM DOCS	
MATHOMPSON	Matthew Thompson
ZMODEM FILE TRANSFER PROGRAMS	
MITHELEN	Paul Jerkatis

Graphics & Music

MACPIX OF PAULA ABDUL AND LISA-L	
GRAPHICSPUB	Bob Montowski
REVISED DOC FILE FOR MAC2EPSON	
GRAPHICSPUB	Bob Montowski
UME JUKEBOX VERSION 3A	
RAGTIMER	Mike Knudsen
SERMIDI - SEND MIDI CONTROL SEQ	
RAGTIMER	Mike Knudsen
GIFPIX OF GULF WAR PLANES	
GRAPHICSPUB	Bob Montowski
SOME MAC PIX OF SUPER MODEL CHRI	
GRAPHICSPUB	Bob Montowski
PAPER AIRPLANES TO PRINT AND FLY	
GRAPHICSPUB	Bob Montowski

Programmers Den

CENV: FRONT END FOR C COMPILER	
DENNYSKALA	Dennis Skala
CMENU LIBRARY FOR OSK AND TED	
DODGECOLT	Mike Sweet
CTYPE MACROS	
JDWILSON	John Wilson
EXAMPLE OF HYPOTHESIS TESTING	
PAGAN	Stephen Carville
RIBBS ON-LINE RISK GAME	
EARTHER	Shawn Driscoll

68K-OS9

MACBINARY FILE CONVERTER 1.1	
BRYANC	Bryan Clingman

Tutorials & Education

HOW TO SUBMIT TO THE DATABASES	
BOBKEMPER	Robert Kemper
PWD/PXD MYSTERIES REVEALED	
ZACKSESSIONS	Zack Sessions

CoCo SIG

General Information

COCO MANUAL	
LEED	Lee Deuell
SOFTWARE PATENT TREATY	
JBUCATA	Jason Bucata
AREA CODES / TIME ZONES	
SANNUCCI	Joe Sannucci

CoCo 3 Graphics

BETTY PAGE COLLECTION #1	
LLEMMART	Michael Trammell
VANNA01	
TRAS	Richard P. Trasborg
ASSORT1A	
LLEMMART	Michael Trammell
MT4096C	
LLEMMART	Michael Trammell
MTCAM2A	
LLEMMART	Michael Trammell
MTCAM1F	
LLEMMART	Michael Trammell
MTCAM1E	
LLEMMART	Michael Trammell
MTCAM1D	
LLEMMART	Michael Trammell

THE ROCKETEER		MT4096A		PAL / GAL FUSE MAPS FOR CC3 MPAK	
EARTHER	Shawn Driscoll	LLEMMART	Michael Trammell	MARTYGOODMAN	Marty Goodman
MTCAM1C		MTCAM1B		DCM CONVERSION	
LLEMMART	Michael Trammell	LLEMMART	Michael Trammell	WESGALE	Wes Gale
MT4096B		RASGO3.BAS			
LLEMMART	Michael Trammell	LLEMMART	Michael Trammell	**Games**	
NAGELS FOR CM3		MTGIF1A		EUROPE GEOGRAPHY DRILL	
RICKMAC	Richard McNabb	LLEMMART	Michael Trammell	DRILLMASTER	Johnny Williams
COCOMAX3 MOVIE PICS		COYOTE.GIF		ACTORS TRIVIA	
RICKMAC	Richard McNabb	CPELOSI	Charlie Pelosi	DRILLMASTER	Johnny Williams
MISC. CM3 FILES					
RICKMAC	Richard McNabb	**Utilities & Applications**		**Product Reviews & Announcement**	
TRAINS		TYPE DEBUGGER III		COCOPRO DCMODPAK/RS232 KIT REVUE	
RICKMAC	Richard McNabb	AJACK	Andrew Jackson	REDCOAT	Don Joyce
CM3 SCRAPBOOKS		COCO TOOLS DEMO			
RICKMAC	Richard McNabb	CERCOMPBILLV	Bill Vergona	**Telecommunications**	
RUSSIAN PEPSI ART				DELPHITERM VERSION 4.1	
EARTHER	Shawn Driscoll	**Hardware Hacking**		RICKADAMS	Rick Adams
MTCAM1A		2 MEG UPGRADE FOR COCO 3			
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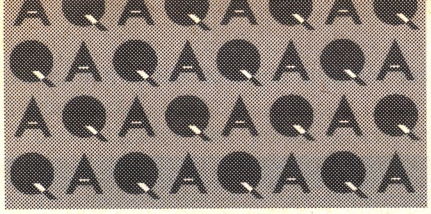

Control Ports

by Marty Goodman
Contributing Editor

I'm having problems with a program that reads and writes data in the address range of $FFC0 to $FFFF. Can you help me?

David E. Chipps
Wilkes-Barre, Pennsylvania

A Those addresses are not ordinary memory addresses. They represent control ports for management of some of the video modes, speed selection, and reset and interrupt vectors. Even the addresses in that range that are meant to be written are not normal locations — they are controlled by writing anything to that area, and they control some video-control registers. Reading these ports is pointless, for they are not electronically meant to be read and yield differing sorts of garbage, depending on what 6809 instruction is used to read them and what was on the data bus prior to that read instruction.

No-Halt Cables

Q *In a previous CoCo Consultations, you appear to have mistaken a letter I sent you. What I was trying to do was share with other CoCo 3 hackers the fact that, when you hook a no-halt controller directly to the CoCo 3 via a ribbon cable, my experience shows that the ribbon cable must be kept very short, otherwise the no-halt controller will not work. I encountered this problem because I was repackaging a CoCo 3 in a baby AT-style case, and was unable, due to space considerations, to attach the controller directly to the CoCo 3 motherboard.*

Maarten Van Wamelen
Oendelem, Belgium

A As readers of this column over the years know well, I am not very enthusiastic about the use of any length of ribbon cable on the system bus for a CoCo 3, due to capacitive loading and other problems that such cables cause. However, as Maarten quite correctly observes, if the cable is kept very short, you can get away with this approach. One way to keep the cable very short is to mount the controller (or Multi-Pak circuit board) back-to-back with the CoCo 3 motherboard, and use a 40-pin ribbon cable that is less than one inch long to allow you to make the required 180-degree bend in the CoCo 3 system bus.

BT-2000

Q *How can I connect my BT-2000 multi-slot interface to use extra cartridges with the Color Computer 3?*

Paul D. Runyan
Saugus, California

A As you know, the folks that made the BT-2000 went out of business years ago. If you have a schematic diagram for the BT-2000 and if you are proficient in electronics, I can tell you in simple terms what is needed to change the data-buffer enable addressing. You must arrange things so the data buffer on the BT-2000 is tristated for any address in the $FF80 to $FFBF range, in addition to whatever other address decoding is already done on that data buffer. You might also try replacing the data buffer (probably a 74LS245) with a 74ALS645. Because I do not have a schematic for the BT-2000, I really can't add much else concerning what other problems you might have using it with a CoCo 3.

Reducing Heat Problems

Q *What are the Radio Shack catalog numbers for the parts needed to mount the power transistor on a heat sink, as described in CoCo Consultations in May 1991? I thought about putting a fan inside the CoCo, but there does not appear to be room inside.*

Ernest Bazzinotti, Jr.
Dorchester, Massachusetts

A Radio Shack sells a 2N3055 NPN power transistor but it does not sell a proper heat sink. You need to buy the heat sink from a better-stocked electronics supply house or make your own using thick aluminum sheeting. I did not supply part numbers because some parts are not supplied by Radio Shack and because the operation requires a degree of tinkering skill such that I thought it inappropriate to write it as a how-to article. I just gave the ideas involved and sufficient information so that those who were experienced with tinkering could easily do it and those who were not experienced would not try it and get into trouble.

Regarding a fan, there is nothing to stop you from mounting a fan on top of the CoCo 3 case and cutting a hole in that case so that air can be blown down onto the CoCo or, better yet, sucked out of the CoCo, producing more even ventilation.

Using Larger Drives

Q *I have* Extended ADOS-3 *in EPROM, but still cannot get* Max-10 *or* CoCo Max III *to recognize the 40- and 80-track drives I have. When I use either of those two programs, only the first 35 tracks of my disk are recognized. Curiously,* CoCo Max III

Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of RAINBOW's CoCo SIG and database manager of OS-9 Online. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.

Bright Idea: Order some of these CoCo programs today!

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SPELLING QUIZ
COCO 3 CLOWN
QUICK 3
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ISSUE #109, JULY, 1991
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*Each Disk/Tape Contains 12 Programs *
GA1 - Blackbox, Poker, Robodice, Startrek +
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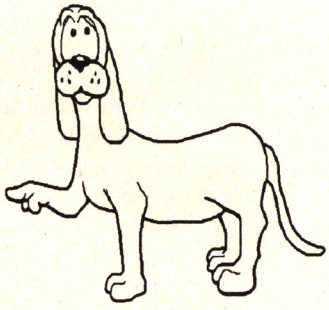
GA5 - Battleship, Chicken, Raceway, Lizer, +
GA6 - Kings Army, Navyguns, Shipsub, Shuffle, +
GA7 - Connect 4, F-16, Pizza, Rubic, Life +
GA8 - Football, Germ Attack, Othello, Slither, +
GA9 - Battle, 3DTTT, Max Graphics, Prix, +
GA10 - Blockade, Life, Missile2, Scramble, +
GA11 - Bunker 3, Ttrek, Nuke Attack, Traders, +



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M3	GR3	E3	U3	GA3
M4	GR4	E4	U4	GA4
M5	GR5		U5	GA5
M6	GR6	H1	U6	GA6
M7	GR7	H2	U7	GA7
	GR8	H3	U8	GA8
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	GR11			GA11
T1	GR12			
T2	GR13			
T3	GR14			

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and Max-10 *recognize the back side of my disks. Any suggestions?*

Keith O'Donnell (INET429)
Prince George, British Columbia

A I contacted Art Flexser (who can be reached on Delphi as ARTFLEXSER), the author of *ADOS-3*. He tells me that although a simple poke to the innards of those programs might fix the problem, he has yet to analyze either program to find what that poke might be. The problem is that neither of those two programs are well-behaved in terms of how they access the disk, for they don't go through the disk sector and file I/O routines provided in the ROM. Therefore, *ADOS-3* cannot affect how they access the disk. Art also notes that 80-track drive owners can use *Max-10* (albeit using only the first 35 tracks of the 80-track disk), but must be careful in doing so to copy the original 35-track master disk to the 80-track disk using the BACKUP command under *ADOS-3* (BACKUP 0 TO 1, 35). If you use the COPY command to merely copy files over, *Max-10* will not run, because one of its files must be in specific granules on the disk for *Max-10* to work.

No-Halt Cassette?

Q *My CoCo 3, when hooked to a tape recorder, causes the recorder to run the tape whenever the recorder is in play or record mode. The recorder does not wait for me to type* MOTOR ON, CLOAD *or* CSAVE, *and will not turn off when I type* MOTOR OFF. *Other than that, cassette functions are normal. I speculate that the problem is with the cassette motor relay, but am unfamiliar with how to identify that relay on the CoCo 3 motherboard, or where to get a replacement. Can you help me?*

Leon Albin
Glen Echo, Maryland

A The cassette-motor relay is almost certainly bad. This relay is typically a blue rectangle located just in front of the 5-pin DIN cassette port on the CoCo 3 motherboard. It is a 5-volt, SPST (single-pole, single-throw) relay. You can get an exact replacement from Tandy National Parts by ordering catalog number 26-3334 through a local Radio Shack store. The manufacturer's part numbers are 581010140A, 581010160A or 581010710A. The price should be quite reasonable.

Far less likely than a bad relay, but still possible, is a bad IC8 (which controls that relay) or a bad connection between Pin 9 of IC8 and the relay's coil. Before you order that relay, you might put a volt meter on Pin 9 of IC8 to see if it delivers +5 volts properly in response to MOTOR ON and MOTOR OFF commands. You should see +5 volts when the motor is off, and 0 volts (or near 0 volts) when the motor is on.

If Pin 9 is responding properly, you might consider going to the trouble of soldering a little wire to the junction of the trace from Pin 9 of IC8 with the cassette-motor relay. See if you get the +5 volts to behave properly there. One other thing to check for is a fused diode (D5). You may want to try replacing D5 with a 1N4148 or 1N914 small-signal diode, or, better yet, replace it with a 1N4001 diode. These diodes are available at Radio Shack stores. When you remove D5, check its resistance with an ohmmeter on the Rx10 scale to see if it conducts in only one direction and not in the other. If it conducts in both directions, it likely is fried. When replacing D5 with another diode, be sure to get the polarity correct, putting the new diode in so that its cathode is connected to +5 volts, and its anode is connected to the side of the relay that goes to Pin 9 of IC8.

Switching Power Supplies

Q *I want to repackage a CoCo 3 into a baby AT-style case using a standard 150-watt switching power supply instead of the internal power supply on the CoCo 3 motherboard. Can you give me some advice on how to connect the power supply?*

Frank W. Randle (JAMMAN)
Kenosha, Wisconsin

A Be absolutely certain you are comfortable reading schematic diagrams and that you understand the relatively simple linear power supply used in the CoCo 3. You will also need a schematic of the CoCo 3 (found in the service manual for the CoCo 3). You can purchase the service manual from Tandy National Parts via any of your local Radio Shack dealers. Be careful when using that schematic because the physical arrangement of traces on the motherboard, while electrically the same as in the schematic, may be different, with T-junctions in the circuit appearing at differing points on the motherboard compared to the schematic diagram. So be careful when cutting traces on the motherboard. With these warnings out of the way, here are some hints to help you.

To tap into the positive 5-volt supply, locate the junction of C14 (.1-uFd) and C15 (100-uFd, electrolytic). It is from this junction that the regulated 5 volts from the CoCo's power supply is routed to the CoCo 3. Cut the fat trace from that junction. This trace can be cut on the underside of the CoCo 3 circuit board after the fat trace leaves the positive side of C15, and just after the T-junction with R66. Attach the 5-volt regulated line from the 150-watt power supply anywhere along the broad trace that connects R66 to R7 on the underside of the circuit board. Now add a 100-uFd electrolytic capacitor (positive to +5 volts and negative to ground) right at the point where the 5-volt line from the 150-watt power supply connects to the CoCo 3, to provide some spike filtration.

To tap into the negative 10-volt supply, locate the junction of D3, D4 and the negative side of C31 on the underside of the CoCo 3 motherboard. Cut the fat trace there between C31 and the two diodes (D3 and D4). Now apply -12 volts from the 150-watt supply to the negative side of C31.

To tap into the positive 10-volt supply, cut the fat trace on the underside of the CoCo 3 motherboard just after it leaves the collector of the big power transistor (Q1), after it passes the T-junction with the trace going to Pin 16 of IC8 and before it gets to the T-junction with the positive side of C29 (the big 4700-uFd capacitor). Now apply +12 volts from the 150-watt power supply to the collector of that power transistor, and connect a 100-uFd capacitor to ground at that point as a spike filter.

If you want to retain the function of the RF modulator, there is one additional trace cut and jumper you need to add. Cut the fat trace that goes between the cathode of D14 and the positive side of C63. Then apply +12 volts from the 150-watt power supply to the positive side of C63.

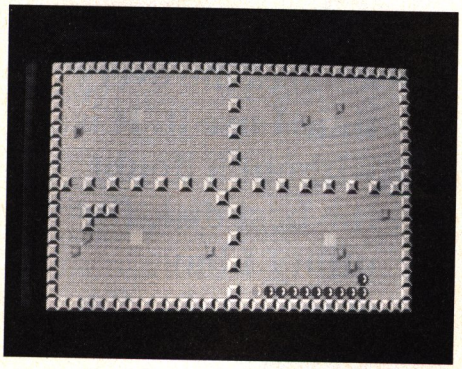
There is one additional little trick you need to be aware of. Some (particularly older) PC-type power supplies require a load of 2 to 4 amps on the 5-volt line to operate. Such power supplies can in fact be damaged if used with a small load that draws less than 2 to 4 amps. Now, the CoCo 3 draws only about 1 amp on the 5-volt line. Thus, you may need to add a load resistor between the 5-volt line of the power supply and ground. This should consist of one or more 10-ohm, 10-watt resistors (available at Radio Shack stores) in parallel. Be sure to mount those resistors away from the CoCo 3 motherboard, and in a place where they can be adequately cooled by air streams in your AT case, for they will run quite hot!

With this information, you should be able to connect a standard PC-type switching power supply to a CoCo 3. Note that I have not checked this in actual use myself, so it is possible there could be some minor errors in the above. Be sure to carefully check what I have described against your own common sense understanding of what you are doing, for custom CoCo 3 modifications are not to be undertaken by those who require step-by-step instructions. You must understand what you are doing if you expect to either succeed or maintain your custom product.

Games CoCo 3

Sidney, The Super Space Snake

Sidney is a clone of such forerunners as *Snake*, *Slither*, *Sneaky Snake* and others. It isn't a new game, yet the super space snake surpasses many others.



The scenario is that Sidney, the near-sighted snake, was caught having an affair with a rope and has been imprisoned by Quellor in a floating electro prison. Quellor is the landlord of a mass of land a mile long and two feet wide (the major products of this land are rope and noodles). Realizing that Sidney does not have a leg to stand on, you have become the champion of fairness and have vowed to help Sidney escape.

In order for Sidney to escape, he must consume all the electro-pods on each screen. There are two types of electro-pods. The most common is a green pod with a blue top (cleverly called 'blue tops'), which, when eaten, makes Sidney one segment longer. The second pod has a red top and makes Sidney shrink one or more units. This leaves dislocated segments in the prison cell, which creates a hazard. Each screen or prison cell has a number of hazards in the form of blocks that, when hit, cause Sidney to lose one of his lives.These hazardous blocks, as well as pods, increase in number with each screen and level. There are five levels, each of which has seven sub-levels for a total of 35 screens. Additional life can be gained by consuming all the pods without running into any obstacles. In addition, each cell has a number of transporters that allow Sidney to go from one section of the cell to another. These transporters play a vital role on later screens, as it is otherwise impossible to reach all the pods.

Points are given after ridding each screen of all pods. Ten points are awarded for each segment that Sidney has when he completes a screen, plus 1000 bonus points and an additional life are given if he does not run into any obstructions. In normal play Sidney has five lives, but it is possible to opt for up to 30 lives by pressing S at the title screen. When the game ends, your score and the highest score played are displayed. You are given the option to quit, start a new game, or continue from the last level reached. Movement is accomplished using the arrow keys or a joystick.

Sidney requires a CoCo 3, a disk drive and an RGB monitor. The graphics and colors are crisp, sharp and artistically done — a visual delight. Unfortunately a TV screen makes the display kind of, well, terrible, actually.

Sidney is well designed and playability is quite good. It comes with four pages of documentation and includes playing hints and loading instructions. I found only one minor bug: The game repeatedly hung on the first screen when the last pod eaten was red. This may be a nuisance but is not fatal. If it happens, just pounce on the Reset button and go at it again. [*Editors note: We have been informed by KLG Systems that this problem has been corrected.*]

(KLG Systems, 38 Clove Rd # 204, Monroe, NY 10950, 914-783-2950; $14.95 plus $2 S/H, NY residents add 6.25% sales tax)

— George Aftamonow

Database CoCo 1, 2 & 3

POW/MIA Database

With the War in the Persian Gulf still fresh in our minds, the apparent success of the mission has lead to an aftermath of media hype, celebration and parades. As lopsided as this war was, most people with loved ones in the theater didn't have to wait very long for the soldiers to return. However, as we are bombarded with the current affairs of our Armed Services' efforts, let's not forget the sobering fact that many people have not returned from wars past.

POW/MIA Database is a database of the 2260 American prisoners and MIAs in Southeast Asia (as of Nov. 1990), from all military Services. It was established to honor these service personnel and to help us remember the sacrifices they make to keep us free.

The program is provided on two disks. The database gives you the ability to scroll through the information, search and retrieve data for viewing or printing, and to print the data in an 80-column report. There is a print query for matching information in the database to a variety of questions. For example, you can search for a particular state or town to see who is listed from a given area. Other query elements include: Asian countries; specific branch of the military; rank; birth date; and name.

POW/MIA Database is a database of American prisoners and MIAs in Southeast Asia.

POW/MIA Database runs on any CoCo with a disk drive; a printer is optional. A general database is also available that allows manipulation and updating of the data.

(Johnson Software, P.O. Box 92, Dayton, OH 45449, 513-866-2601; $17.50 plus $2 S/H)

— Jamie Hensen

Disk Utility CoCo 3

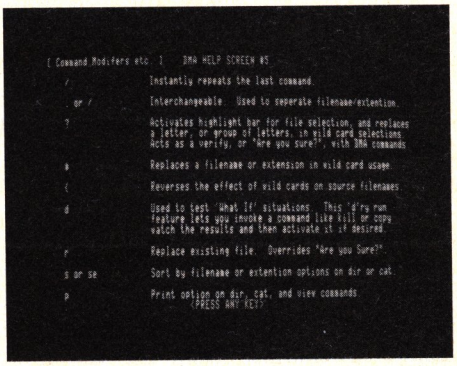
DMA: The Disk-Manager's Apprentice

Every now and then someone writes a program that stands out from the rest. *DMA* is such a program and deserves your undivided attention. *DMA* is a disk-file management utility for the CoCo 3. It requires one or more disk drives and a monitor capable of displaying 80-column text. It runs under

Disk BASIC or *ADOS-3* and eliminates a lot of dirty work associated with organizing your disks and the files on them. *DMA* incorporates various powerful commands that, up to now, were available only with OS-9 and MS-DOS.

DMA is supplied on a single 5¼-inch disk and loads easily. You are greeted with a colorful title page and then a black screen with a blue border and a blinking yellow cursor. You can turn the color off if you have a monochrome monitor; but the program has very colorful displays, so it's worth the extra cost of a color monitor.

DMA boots with 20 hot keys that are easily redefinable if you don't like the defaults. For instance, you can use F2 to toggle between monochrome and color display or use F1 to view a directory. These hot keys are actually macros in that you can predefine a series of keystrokes to save a lot of typing time.



In addition, at any time, you can read the eight memory-resident help screens, which explain the various features of the program. One really nice feature is the ability to route a disk directory listing in one- or five-column format to the screen or a printer. You can copy files in one of several ways, but my favorite is a technique that allows tagging of filenames. A simple keystroke then copies all the selected or tagged files from the source to the destination drive. Or if you prefer, you can copy files via the wildcard technique, using *.* as the filename. You can also view any file right on the screen — it makes no difference if it's text, machine language, or a BASIC file.

DMA simply amazes me every time I use it. It is without a doubt the best disk-file utility I have ever seen for the CoCo.

Other features include sorting the directory by filename or extension, and *moving* files from one disk to another. Reverse logic is used so you can specify various operations to all *but* a specific file or group of files. Another feature worth mention is the built-in Formatting Factory. This allows formatting disks as follows: One disk at a time, sequentially in two or more drives, sequentially in a single drive, and sequentially with a pause between formats.

DMA has so many features, you must see it to believe it. The command-line editor lets you edit what you have already typed without your having to go back and retype the entire line. A simple press of the slash key retypes your last command. A feature is also included to make the program case-sensitive, if you like. This lets you program the same hot key to perform two different functions. The ability to perform all the various disk functions certainly makes this program shine. How many hours have you spent typing `KILL "FILENAME.EXT"`? With *DMA* you can tag all the files you want to kill. Then press a key and they're gone!

DMA simply amazes me every time I use it. It is without a doubt the best disk-file utility I have ever seen for the CoCo.

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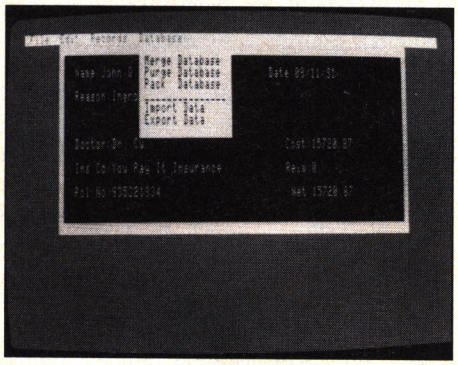
— Jerry Semones

Database	OS-9 Level II

Data Windows Version 1.1b

Perhaps one of the most-used tools on today's home computers is a database — a program used to store and manipulate information. Many databases are specialized for a particular application (for example, an inventory program, disk catalog, etc.). *Data Windows*, however, is a generic database program that can handle just about all of your database needs, and it does so with a great deal of finesse and ease-of-use. Although I do have a few complaints about the package, *Data Windows* is a good choice if you're in the market for a database — it's versatile, fairly fast, and very friendly.

The program functions very smoothly. It requires a CoCo 3 with at least 256K and OS-9 Level II to operate, and it can run under *Multi-Vue*. (This makes it the only OS-9 database I know of that can use *Multi-Vue*'s point-and-click interface!) The product is based on the concept of using windows to manipulate data. For example, to make a database of the tapes you own, first define the database by declaring fields: one field for the name of the artist and another for the title of the recording. Then define a window (which would be the user interface to the database) by graphically designing it on-screen and declaring input and output sections of the window. Finally, to use the database, open the window and use it to enter, view and modify the information.



It's possible to have several data windows for one database, each manipulating and displaying different parts of the database. The idea of a separate user-defined database and window is a very good one. It allows for a great deal of flexibility.

Data Windows allows you to use two different kinds of interfaces: a text interface and a graphical interface (*Multi-Vue*). The graphical interface works well, but it is a bit slow. Nor is it purely graphical — it works using a combination of the keyboard and the mouse. Except for a few dialog boxes that don't respond to the mouse, this is very natural. This type of interface works especially well for the create/edit window operation, and makes it a breeze to graphically design windows.

The file-handling also works excellently under the graphical interface. It's a perfect example of a "hands-free" file-handling system. You use a window to scroll through directories and click on the appropriate file.

The text interface approximates the graphical interface fairly well, and it's much faster. The similarity of the two interfaces increases the ease of using either one, and though some actions are a bit less natural in the text version, the speed makes up for it. The support for two interfaces is a very nice touch, allowing you to choose the type of interface best suited to your needs.

Database manipulation is simple, with fast search capabilities and easy browsing and modification of records through the windows. Global operations are also provided, including purging the data or merging entire databases. Tools are provided to easily export data from *Data Windows* to other programs, and to import data from other sources to *Data Windows*.

There are two types of database printouts possible under *Data Windows*: reports and labels. Reports are useful for general viewing of your data on paper. Labels, on the other hand, are more useful for mailing

...For the CoCo

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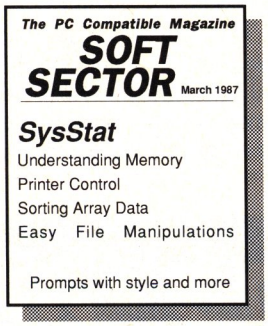

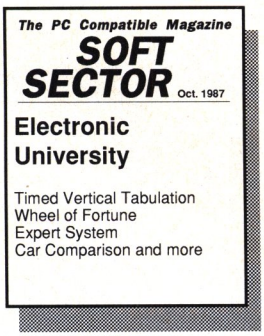

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lists and the like, where addresses need to be used. Both reports and labels are designed in the same user-friendly way as the windows. The user draws the reports or labels and defines the fields where data will be printed. Both reports and labels printed very nicely on my printer.

The documentation for *Data Windows* is also very good. It consists of two manuals with a total of 71 pages. The documentation is split into a users manual and a reference manual, which facilitates quick learning of the program. The users manual, usually non-threatening to the beginner, describes how to set up and use a database without using a lot of technical details. But eventually users will need more information, which is provided by the reference manual that contains detailed descriptions of program operation. It also contains the file specifications for *Data Windows* and some technical tricks on disk drive configuration. I did notice one error in the manual that may confuse beginners, however. The second line of the third paragraph on Page 6 of the users manual should read `backup /d0 #56k` not `backup /d0 /d0 #56k`. Otherwise the documentation is readable and helpful.

There are some negative aspects present in this program. It's not crash-proof, for one thing. I crashed it several times by trying to save a window or add a record to a full disk. And a few of the procedures are not as intuitive as they could be. For instance, printing a report requires that you enter a test condition, or that procedure hangs! Similarly, the create/edit window procedures fail if necessary data is not entered when declaring Get/Put fields. Most of these problems could be solved by the addition of an OK/CANCEL button in several of the dialog boxes.

Little professional touches in software do much to endear it to its users, and *Data Windows* has quite a few. It multitasks well with other OS-9 programs, and it handles single-drive operation quite painlessly (though I strongly recommend a double-sided floppy or a hard drive). It also comes with an excellent installation program, which installs *Data Windows* on whatever type of drive you have. And it comes with several ready-to-use databases — including an address database, a magazine file, a video file, a home inventory, and a medical/insurance database — that make it instantly useful to even a first-time user.

This product represents a significant value for the CoCoist. The price is reasonable, similar to other CoCo databases with this level of power. Even if you don't want to maintain a huge database of customer names and addresses or other business applications, you'll find lots of uses for a database. At first I was skeptical about the usefulness of a database to me. However, after using *Data Windows*, I've set up an address database as well as a database of my music collection.

The service of CoCoPRO! is usually excellent; I've dealt with them before and have been impressed. So, at this price, I think most CoCo users should seriously consider *Data Windows*!

(CoCoPRO!, 1334 Byron, Ypsilanti, MI 48198, 313-481-3283; $59.95 plus $4 S/H)

— Jonathan Dueck

Disk Utiliy CoCo 3

CoCo Tools

One of the first things a CoCo user learns is that computing is more efficient and enjoyable if you have a good set of disk utilities. Although OS-9 users can acquire beneficial utilities and store them in a single directory for easy access, Disk BASIC users usually resort to swapping disks to load utilities available as separate software packages. Furthermore, when you've finished archiving files, for instance, and want to repair a damaged disk, it is often necessary to reboot the machine.

The dream disk-utility program would present an environment wherein one could accomplish most any disk-utility function. *CoCo Tools* is such a program. With a comprehensive set of disk utilities all under one roof, so to speak, what we now have is software for our beloved CoCo 3 comparable to the MS-DOS world's *PC-Tools* and *Norton Utilities*.

CoCo Tools requires a CoCo 3, a disk drive, and a color or monochrome monitor capable of displaying 80-column text. The package contains a 23-page, spiral-bound manual (which could use some editing, though the instructions are clear), and the program disk.

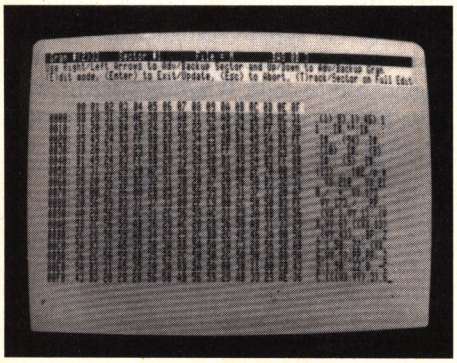
The manual explains each option in full detail, and the program commands have onscreen prompts. The Main menu layout is on an 80-column screen with a sensible three column format listing File, Disk and Miscellaneous commands. Even the smallest details have been addressed to ensure ease-of-use for the operator.

The File commands include: Archive, Copy, Edit, Kill, Move, Compare, Purge, Rename, Salvage and Unarchive. After selecting any of these commands and answering the prompt to determine which drive to access, you'll have the power to use many features with a few keystrokes. The arrow keys move the cursor for file selec-

tion. Hot keys are provided to select all files, deselect all files, use wild cards, and to escape back to the Main menu.

Of special note are the Archive, Unarchive, Edit, Compare, Purge and Salvage commands. Archive is a compression routine designed to condense one or several files into one file to save storage space. Unarchive uncompresses these files and allows you to select any or all files for extraction from an archive file. The Edit command allows you to edit files displayed in Hex or ASCII, 256 bytes at a time. Compare does a byte-by-byte comparison of two files on the same or different disks. Purge, different than the Disk BASIC KILL command, removes all traces of a file's existence by writing FF's to every sector used by the file and deleting the entry from the directory. You have no chance of recovering a file that has been purged. The Salvage command recovers previously killed files. Salvage has three modes: automatic, semi-automatic and manual. This is something for the novice as well as the experienced hacker.

The disk commands include: Backup, which is faster than the Disk BASIC command; Directory, displays gran count and checks to make sure the number of free grans corresponds to the number of total grans used; Gran Analysis, shows a list of the grans used by each file; Full Disk Edit; Initialize, similar to but faster than DSKINI; Rejuvenate, restores the quality of some files before they are lost due to deterioration; Verify; Erase, which writes FF's to every sector of the disk; Write/Sorted Directory; and Disk Speed Check, which indicates the limits for drive speed.



Several miscellaneous commands round out this package. There is an Options menu for selecting screen colors, setting drive step rate, directory sorting options, and setting printer baud. Other miscellaneous commands consist of Communications Mode; New Disk Backup; Locate Information; Verify Files; Test Archive, which gives information of how much a file will be compressed without performing the compression; Extended Memory Edit, which allows you to view and edit the extended memory in the 512K CoCo 3; Full Disk Compare; Print/Display Files, which is handy for viewing ASCII files; and, of course, Quit.

CoCo Tools is a dream come true for Disk BASIC users and programmers. I encountered no difficulties or bugs while reviewing the software. It's about time a program of this magnitude were offered. No longer is it necessary to purchase oodles of programs for the purpose of disk and file manipulation. Buy *CoCo Tools* with confidence; you won't be disappointed.

(Cer-Comp Ltd., 5566 Richochet Avenue, Las Vegas, NV 89110, 720-452-0632; $49.95 plus $4 S/H)

— Jamie Hensen

Graphics | CoCo 3

NIB Kelly & Company

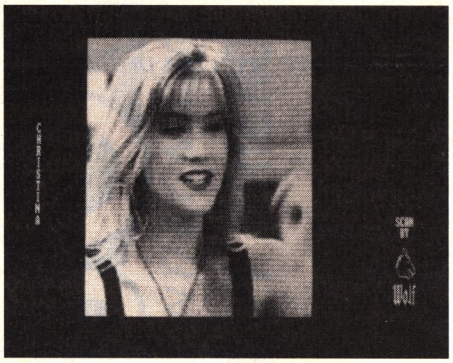
Kelly Bundy, the young temptress from TV's "Married with Children," is one of those characters that people seem to either love or hate. There is very little ground in between. Personally, I couldn't stand her, let alone the show, until I saw Christina Applegate (the actress who plays Kelly) in "Don't Tell Mom the Babysitter's Dead!" Suddenly I find her to be not only a very talented young actress but quite good looking as well.

So what does this have to do with my review? It's just my way of saying that Steve Ricketts hit the timing just right. *NIB Kelly & Company* found its way to my mailbox from THE RAINBOW a few days ago. It's a package of 156 digitized pictures of Kelly (and company) from "Married with Children" in NIB format. Also included are images from "Top of the Heap." If I had received the package a few months ago, I might have considered sending it back or at least ripping it apart in a scathing review. Not so anymore, and for the most part, I think we have a hit here! Let's start off by answering the obvious question, what is the NIB format?

The NIB format takes a picture that has been scanned using a DS-69B digitizer (.PIX format) and compresses the screen using a modified version of the *NIB Compressor* (a product offered by Rick's Computer Enterprise) to save disk space. This allows for more pictures per disk than the maximum eight as with the standard .PIX format.

Each disk, additionally, contains NIBLOAD programs for both RGB and composite monitors. An RGB monitor works best, but a small black and white TV actually produces a better picture than a composite monitor or color TV.

When the program is first loaded, the screen appears to fill with garbage. After a few seconds the drive stops, the garbage does a little dance, and presto, Kelly shows up. The pictures load quickly, the decompression is even faster, and the resolution is okay (it's acceptable). Sorry, Steve.



Let me explain. I have a few other NIB-format pictures that were digitized from magazines, etc. The resolution on those pictures is fantastic. Pictures from TV have a tendency to be a bit grainier because the resolution of the TV is not as high as the resolution of magazine photos. It's that simple. But these pictures are good, and the sheer volume (150 plus) more than makes up for the slightly grainy appearance.

The best part is the price. The package sells for $19.95, which includes postage and handling. Write to Steve to find out how you can get a second package for only $10. Not convinced to place your order yet? Okay, send Steve five bucks and he will send you a sample disk along with a coupon good for a $5 discount on subsequent orders of $45 or more.

Convinced? I hope so because *NIB Kelly and Company* is a great addition to any graphics library. All you need is a CoCo 3 and a disk drive. It works perfectly with *ADOS-3*, and there are statements in the loader/viewer that also allow users of Disk BASIC 1.1 / 2.1 (such as myself) access to the extra pictures on the 40-track disks. (This assumes your drives are capable of using 40 tracks.)

If you are of legal age, Steve also has less-family-oriented NIB sets available. I hope he puts together a package of NIBS for those who are not of legal age — a subject that comes immediately to mind is the Teenage Mutant Ninja Turtles.

So, whip out the checkbook. I think you'll be pleased with what Steve gives you for your money.

(Steve Ricketts P.O. Box 1048, Fairview, Oregon 97024, 503-668-3173; $19.95)

— Randy Cassel

Received and Certified

The following products have recently been received by THE RAINBOW, examined by our magazine staff and issued the Rainbow Seal of Certification, your assurance that we have seen the product and have ascertained that it is what it purports to be.

World Class Chess, is an adaptation of Tandy's popular *Cyrus* chess cartridge. This OS-9 Level II adaptation preserves the excellent playing skills of the original but with better graphics and more utility. Features allow for the use of a mouse, a disk and windows. All three *Cyrus* screens have been combined on a single graphics screen. Requires: OS-9 Level II; CoCo 3 with 256K minimum; composite, monochrome, or RGB monitor; 35-track disk drive; and the Tandy *Cyrus* chess cartridge (Catalog #26-3064). *Burke & Burke, P.O. Box 733, Maple Valley, WA 98038 (800) 237-2409; $29.95 plus $4 S/H.*

ZClock, a continuous date and time utility for OS-9 Level II. Displays a clock and calendar in the upper-right corner of the monitor screen. Options allow for the time, the date and time, whether the clock appears in all or one window, and 12- or 24-hour time formats. *ZClock* doesn't work on VDG screens. Requires a CoCo 3, a floppy drive and the OS-9 Level II operating system. *Burke & Burke, P.O. Box 733, Maple Valley, WA 98038 (800) 237-2409; $9.95 plus $4 S/H.*

1991 Arcade Pak, a bundled offering of three previously released and reviewed programs. Includes *CycleJump* (January 1990), *Minigolf* (March 1991), and *Caveman* (April 1991). Check the mentioned issues for reviews of these programs. *J.T. Rawlinson Software, 660 Briar Hill Ave, #204, Toronto, ON M6B 4B7, Canada, (416) 256-4365; $24 plus $4 S/H, offer expires 1/31/92.*

CoCo Cassette #108, a variety of programs presented monthly for the CoCo 1, 2 and 3. This month's cassette includes: *Sound Generator*, demonstrates the different sound types available on the CoCo; *Hide Directory*, allows you to hide a disk directory for safe keeping (use a password to protect your valuable data); *Lost Treasure Adventure*, a standard text adventure wherein you search for the lost treasure of King Erik; *Club Register*, helps club secretaries maintain lists of members and dues (saves data to tape or disk); *Snack Shack*, as manager of a concession stand your job is to make as much money as possible before the football game is over; *Civil War 3*, lists the site, date, commanders, and victors of most of the battles of the Civil War; *Spelling Quiz*, a drill to help you learn some of the most often misspelled words; *CoCo 3 Clown*, color up to 10 different items on clown face; *Quick 3*, a CoCo 3 game somewhat similar to the *Quix* program by Tom Mix; *Black Beard Adventure*, a Tom Mix adventure in which you search for Black Beard's treasure. *T&D Software, 2490 Miles Standish Dr., Holland, MI 49424, (616) 399-9468; $8.*

FlexeLint Binary for OS-9/68000, is a multi-file C program checker. It can correlate function definition and function use for applications requiring multiple source files. *FlexeLint* comes with `stdlib.c`, a file that contains declarations of the standard library functions. Any other libraries, standard or custom, may be given a library file in this manner. *Windsor Systems, 2407 Lime Kiln Lane, Louisville, KY 40222, (502) 425-9560; $495, $350 for subsequent copies.*

Disasm_os9, takes 68000 object modules and outputs 68000 source code, making use of the information in the OS-9 module header (if it is an OS-9 module), executing up to three passes through the file and using an optional user-supplied labels file to make the best possible attempt at reproducing the original source code. *Windsor Systems, 2407 Lime Kiln Lane, Louisville, KY 40222, (502) 425-9560; $250.*

The *Seal of Certification* is open to all manufacturers of products for the Tandy Color Computer, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the program does *exist* — that we have examined it and have a sample copy — but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW reviewers for evaluation.

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Intercom

An important link in the CoCo community is its ability to communicate with fellow users. If questions arise, a fresh source of information can be invaluable. We here at THE RAINBOW have decided to create "Intercom," an information exchange point for Pen Pals, CoCo Clubs and BBSs.

If you would like a Pen Pal or are running a CoCo Club or BBS, send us a letter including the information listed here to: The Rainbow Intercom, P.O. Box 385, Prospect, KY 40059.

Only those parties who have signed our non-piracy "agreement form" appear in listings of Intercom. Also, please notify us if you want to add or delete any names on this list.

PEN PALS

✍ I am looking for pen pals from all over who enjoy games and adventures. I'm 15 and have a 128K CoCo 3, an FD-500 drive and a DMP-105. I will try to answer all letters.

Aaron Farmer
2055 Burke Road
Ukiah, CA 95482

✍ I would like a pen pal who is willing to fill me in on what has been going on in the "World of CoCo". I've been rather busy since I joined the Marine Corps, and have yet to get my CoCo out here (California from Georgia). Also, are there any users in 29 Palms, CA? Is there a users group nearby?

LCPL McBurnett, J.O.
Box 6122 MCCES MCAGCC
29 Palms, CA 92278-5020

✍ I am 28 years old and would like pen pals from age 23 up, from the Southern states if possible. I will answer all letters. I currently have four computers including three CoCo's and a Franklin ACE 1200 system. I like the outdoors, fishing, hunting (for food), electronics, computers, scale modeling aircraft and science fiction, reading, auto mechanics and talking to people. I work for NAPA as a salesman covering a large area, so it might take time for me to answer. Please respond, and include a picture if possible.

Alan Hamby
107 Ridgewood Drive
Del Rio, TX 78840

✍ I'm 12 years old and I would like a pen pal that I could exchange information with. Could someone please continually write me. I do enjoy programming. Right now the only language I know is BASIC, though I'm working on BASIC09. I would like to know if there are any CoCo clubs in my area and, if so, where.

Owen Crabtree
211 S.W. 6th St.
College Place, WA 99324

✍ I am a Pastor of our church's childrens ministry and I am always looking for new ways to serve God with my CoCo 3, CoCo 2, FD-502 disk drive, DMP printer, and Multi-Pak interface. I have introduced at least 10 people to the Color Computer and at least seven have purchased one (I taught a BASIC programming class with the CoCo 2 as a reward for completion). I would very much like to correspond with people of like interests. Especially anyone who lives in my area. Please write. I will respond to all letters.

Pastor James Dale Altom
3213 Harvard
Collinsville, IL 62234

CoCo CLUBS

CALIFORNIA

☎ StG Net West, Alan Sheltra, P.O. Box 38713, Hollywood, 90038, (818) 761-4135, BBS (818) 716-4721

☎ The Sacramento CoCo Club, William W. Drennon, 2444 Wurth Ct., Sacramento, 95825, (916) 486-9665, BBS (916) 486-1594

COLORADO

☎ Colorado Springs Color Computer Club, Bud Ward, 1118 Claiborne Road, Colorado Springs, 80906-5513, (719) 392-8268

CONNECTICUT

☎ Connecticut CoConut Connection, Charles Joseph Scanlon, 2 Eagle Lane, Simsbury, 06070, (203) 657-8373

FLORIDA

☎ The Color Computer 3 Users Group, Tom Batchelder, 6042 Syrcle Ave., Milton, 32570, (904) 623-4405

GEORGIA

☎ Macon-Warner Robins Color Computer Users Group, Francis G. Swygert, 904 2nd Avenue, Robins AFB, 31098, (912) 328-7859

IDAHO

☎ Snake River Color Computer Club, Emil Franklin, 1750 Carmel Drive, Idaho Falls, 83403, (208) 522-0220

ILLINOIS

☎ Chicago OS-9 Users Group, Howard Lucky, 10 McCarthy Road, Park Forest, 60466-2122, (708) 747-0117

☎ Glenside Color Computer Club, Tony Podraza, 119 Adobe Circle, Carpentersville, 60110, (708) 428-3576

☎ The Sterling Computer Users Group, c/o Greg Adams, 224 Park Drive, Sterling, 61081-3033, (815) 626-7140

IOWA

☎ Metro Area Color Computer Club, Joe Cavallaro, 2425 Ave A, Co. Bluffs, 51501, (712) 322-2438

KENTUCKY

☎ Hardin County Color Computer Club, Paul Urbahns, 2887 Republic Ave., Radcliff, 40160, (502) 351-4757

LOUISIANA

☎ The CoCo SIG, Christopher Mayeux, 20 Gibbs Drive, Chalmette, 70043, (504) 277-6880 voice, (504) 277-5135 modem

MASSACHUSETTS

☎ NorthEast CoCo Club, Jose Joubert, 440 North Ave., Bldg. 9 #210, Haverhill, 01830, (508) 521-0164

MICHIGAN

☎ Color Computer Owners Group, Bernard A. Patton, 388 Emmons Blvd., Wyandotte, 48192, (313) 283-2474

MISSISSIPPI

☎ Central Mississippi Color Computer Society, Boisy G. Pitre, 6011 I-55 North, Jackson, 39213, (601) 956-9377

MISSOURI

☎ CoCoNuts User Group, Clyde Lloyd, 2116 N. Columbia, Springfield, 65803, (417) 866-8738

NEBRASKA

☎ Bruce Gerst c/o Metro Area CoCo Club, P.O. Box 3422, Omaha, 68103

NEW YORK

☎ Adirondack Color Computer Club, Thomas P. Delaney, 10 Rosewood Drive, Clifton Park, 12065, (518) 371-4781

NORTH CAROLINA

☎ Norca Users Group, Matthew Royal, Route 21 Box 906, Fayetteville, 28304, (919) 484-1230

OHIO

☎ Dayton Area Color Computer Users Group, John Teague, 308 Orangewood Drive, Kettering, 45429, (513) 434-9168

PENNSYLVANIA

☎ Cumberland Valley Users Group, Thomas Martin, 9085 Newburg Road, Newburg, 17240, (717) 423-5525

RHODE ISLAND

☎ New England "CoCoNuts" Color Computer Club, Arthur J. Mendonca, P.O. Box 28106 North Station, Providence, 02908, (401) 272-5096 (Sig3)

SOUTH CAROLINA

☎ Spartanburg CoCo Club, Jesse W. Parris, 152 Bon Air Ave., Spartanburg, 29303, (803) 573-9881

SOUTH DAKOTA

☎ Empire Area Color Computer Users Group of South Dakota, Carl Holt, P.O. Box 395, Brandon, 57005, (605) 582-3862

TEXAS

☎ CoCoNauts — Space City, Arthur J. Volz, 16218 Brinkwood Drive, Houston, 77090, (713) 580-6420

UTAH

☎ Salt City CoCo Club, L. Todd Knudsen, 6357 S. Lotus Way, West Jordan, 84084, (801) 968-8668

WASHINGTON

☎ Bellingham OS-9 Users Group, Rodger Alexander, 3404 Illinois Lane, Bellingham, 98226, (206) 734-5806

☎ Port O' CoCo, Donald Zimmerman, 3046 Banner Rd. SE, Port Orchard, 98366-8810, (206) 871-6535

WEST VIRGINIA

☎ Huntington Area Color Computer Symposium, Jim Bush, P.O. Box 391, Lesage, 25537-0391, (304) 736-5314

AUSTRALIA

☎ Australian National OS-9 Users Group, Gordon Bentzen, C/- 8 Odin Street, Sunnybank, Queensland, 4109, (07) 344-3881

☎ Brisbane Southwest Colour Computer Users Group, Bob Devries, 21 Virgo St., Inala, Queensland, 4077, (07) 372-7816

CANADA

% Le Club D'Oridinateur Couleur du Quebec Inc., 8000 Boul. Metropolitain, Ville d'Anjou, Quebec, H1K 1A1, (514) 729-8467

% The Edmonton CoCo Users Group, Lloyd Folden, 13208-128 Avenue, Edmonton, Alberta, T5L 3H2, (403) 426-1888

GERMANY

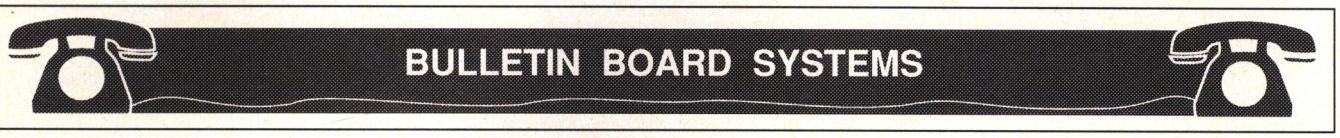
☎ OS-9 Users Group in Europe, Burghard Kinzel, Leipziger Ring 22A, 5042 ERFTSTADT, +49-2235-41069, (OS-9/6809)

THE NETHERLANDS

☎ European OS-9 User Group, Peter Tutelaers, Strijperstraat 50A, 5595 GD Leende, s88405777@hsepml.hse.nl, +31-4906-1971, (OSK)

PUERTO RICO

☎ Puerto Rico Color Computer Club, Luis R. Martinez, P.O. Box 2072, Guaynabo, 00657-7004, (809) 799-8217 or (809) 728-2314



State/City	BBS Name	Access Number	Parameters (Speed-Parity-Word Bits-Stop Bits)	SysOp
Arkansas				
Jonesboro	The 8-Bit Wonderland	(501) 931-9528	300/1200/2400-N-8-1	Mike Smith
Sheridan	The Grant County BBS	(501) 942-4047	300/1200/2400-N-8-1	Eddie Gilmore
California				
Canoga Park	Dune [1]	(818) 992-4279	300/1200/2400-N-8-1	Leonard Cassady(Maudib)
Hollywood	Zog's Cavern BBS	(213) 461-7948	300/1200/2400-N-8-1	Alan Sheltra
Laguna Hills	Rainbow Connection Info Service	(714) 831-6530	300/1200/2400-N-8-1	Eric Levinson
Marysville	09-Online BBS	(916) 742-6809	300/1200-N-8-1	Jim Vestal
Northridge	Plain Rap BBS [2]	(818) 772-8890	300/1200/2400-N-8-1	Jim Sutemeier
Colorado				
Colorado Springs	The Time Safari	(719) 635-7228	300/1200-N-8-1	David Vallier
Connecticut				
Manchester	Silk City BBS	(203) 649-9057	300/1200/2400-N-8-1	Darren Kindberg
Waterbury	Applause BBS	(203) 754-9598	300/1200/2400-N-8-1	Carmen Izzi, Jr.
Florida				
Cocoa Beach	KB Enterprises' CEBBS [3]	(407) 799-3282	300/1200-N-8-1	Kevin Berner
Hawaii				
Ft. Shafter	CoCo'Nuts BBS Service	(808) 845-7054	300/1200/2400-N-8-1	Tommie Taylor
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Kentucky				
Elkhorn City	Cross-N-Crown BBS	(606) 754-9420	300/2400-N-8-1	Tim McIntosh
Louisiana				
Harvey	The Node 3	(504) 347-4320	300/2400-N-8-1	Gene Clifton
Michigan				
Manistee	Crystal Palace	(616) 723-0146	1200/2400-N-8-1	Nelson Howard
Lansing	Benchboard BBS	(517) 394-2447	300/1200/2400-N-8-1	John Evans
Taylor	J & L's CoCo Corner	(313) 292-4713	300/1200/2400-N-8-1	Jim Snider
New York				
Wappingers Falls	The Dutchess CoCo	(914) 838-1261	300/1200/2400-N-8-1	Chris Serino
North Carolina				
Concord	The Stargate BBS	(704) 788-7867	300/1200/2400-N-8-1	Jim Brock
Wilmington	Bill's Board	(919) 395-4366	300/1200/2400-N-8-1	Bill Medcalf
North Dakota				
Minot AFB	The 9-Line BBS	(701) 727-6826	300/1200-N-8-1	David Hensley
Ohio				
Columbus	Springwood BBS	(614) 228-7371	300/1200/2400-N-8-1	Edward Langenback
Reynoldsburg	East Side Connection CEBBS	(614) 755-2492	300/1200/2400-N-8-1	John L. Wilkerson
Oklahoma				
Tecumseh	Pat BBS [4]	(405) 598-5082	300-N-8-1	Pat Aldridge
Pennsylvania				
Conshohocken	Charlie's Help Line	(215) 825-3226	300/1200-N-8-1 or N-7-1	Charles DiMartino
Johnstown	CoCo Electronic BBS [5]	(814) 535-1497	300/1200/2400-N-8-1	Albert Baldish
Rhode Island				
Central Falls	The Weather Connection II BBS	(401) 728-8709	300/1200/2400-N-8-1	Eric Chew
Virginia				
Fall Mills	Clem's Corner BBS [6]	(703) 322-4053	300/1200-N-8-1	Richard Douglas Bailey
Richmond	Tree House BBS	(804) 744-0157	300/1200/2400-N-8-1	Doug James
Wisconsin				
Marinette	Phoenix Interstate Data Systems [7]	(715) 732-1036	300/1200/2400/9600-N-8-1	Joe Boburka
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Notes:
[1]Dune supports OS9/OSK and is part of StG NET International node.
[2]Plain Rap BBS OSK/OS9, RS-DOS supported. Part of the StG Network.
[3]KB Enterprises' CEBBS is up from 5 p.m. to 9 a.m. (EST) seven days a week.
[4]Pat BBS is up 5 p.m. to 9 p.m. weekdays and 10 a.m. to 10 p.m. weekends. This new BBS is counting on you for uploads.
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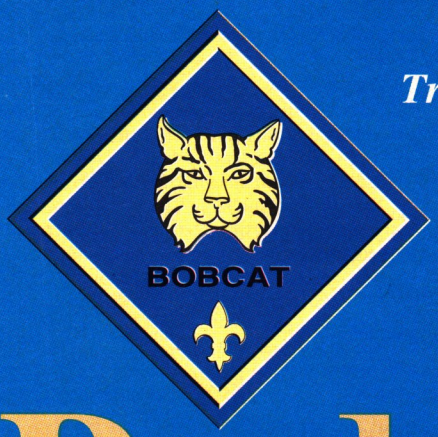
[7]Phoenix Interstate Data Systems has a .75/hr charge for premium services, paid in advance.

Tracking awards for members of your organization



Badge Master

by Stephen Duff

I have been involved with our local Scout troop for the last few years. When my son moved to the Cub Scout level from Beavers, I volunteered to keep track of the badges the boys earned, as well as those they had from previous years. Because of constant use and handling, the chart we used fell to pieces every few months and had to be replaced. I wrote *Badge Master* to solve this problem. *Badge Master* keeps track of the badges earned by each scout, and the Cubs have fun entering their new awards.

The names of the various Cub Scout badges are stored in DATA statements starting at Line 130 of the BASIC program. However, the program can be used by Boy Scout, Girl Scout and Explorer troops, as well as any other organization that uses badges or similar awards — simply substitute the names of the various awards in the DATA lines. Just remember to make the last entry END.

The program is menu-driven and is designed to trap most errors. From the Main menu, you can load data, save data, print forms, display the list of badges, update the Cubs' data or clear that data from memory.

If you select Option 1, Load Data, you can enter a filename or DIR to get a directory. Pressing ENTER without entering a filename returns you to the menu. This works the same for the Save Data option.

Option 3, Print, calls another menu from which you can print a badge list, a badge-request form and data about the Cub(s). A printer is required for any of these options.

Option 4 prints a list of available badges onscreen, and Option 5 is where all the action takes place. Selecting this option displays a menu that allows you to add the names of new Cubs (use this to create your starting data file) or update a record with badges or personal information. You can also see the badge list from this secondary menu by pressing 4.

You must use the correct spelling of the Cubs' names when updating their information. Also, to aid in formatting the screen, some of the names in the badge list have been shortened. You must still use the full spelling. Print the badge list and use that for reference.

Modifications

Badge Master works on any Color Computer with at least 32K and a disk drive. However, it can be modified for use with a tape-based system. To do this, first change #1 to #-1 in lines 2000, 2020, 2050, 2120, 2130 and 2140. Next remove +''/DAT'' from the ends of lines 2000 and 2120. Delete lines 1960 and 1990. Finally change EOF(1) to EOF(-1) in Line 2030.

Badge Master is written to work with a Radio Shack DMP-105/106 printer set to 2400 baud. The printer speed, which can be changed, is set in Line 1180. Remove this line before running the program if your printer is set for 600 baud.

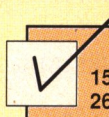
Printer control codes appear in lines

Stephen Duff is a service adviser for Mercedes-Benz. He has owned Color Computers since 1981 and enjoys using them in his work with the Scouts. He can be contacted at 1123 62nd St., Edmonton, Alberta T6L 2H7, Canada. Please include an SASE when requesting a reply.

1300, 1310, 1380, 1390, 1560, 1640, 1670, 1800, 1810, 1820, 1860 and 1900. These may need to be changed if you use a different printer. See "Printer Diversions and Conversions" (August 1988, Page 142) for help in making these changes.

Using *Badge Master* has eliminated costly and time-consuming remakes of the badge chart for our scout troop. It also opens the door for youngsters to get hands-on experience with computers. I hope it works well for your organizational needs.❑

32K Disk



150 171	790 12	1390 22	1980 59
260 240	910 93	1510 122	2120 177
410 29	1040 24	1630 123	2250 5
530 227	1180 145	1770 255	END 57
680 47	1300 19	1850 243	

The Listing: BADGE

```
1 'BADGE MASTER
2 'WRITTEN BY STEPHEN DUFF
3 'COPYRIGHT (C) NOVEMBER 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 '**************************
20 'BADGE MASTER V1.0
30 'BOY SCOUTS OF CANADA
40 'CUB PACK BADGES.
50 '(C)copyright February 1990
60 'Stephen Duff
70 '1123 62 St.
80 'Edmonton Alta. Can. T6L 2H7
90 '**************************
100 CLEAR MEM/2:CLS
110 DF$=STRING$(50,"N")
120 DIM BA$(50),CUB$(50),CA$(50)
,CP$(50),CS$(50),CC$(50),CB$(50)
,CN$(50)
130 'BADGES DATA
140 DATA ARTIST,ATHLETE,CARPENTE
R,COLLECTOR
150 DATA COMPUTER,CYCLIST,FIRST
AIDER,FISHERMAN
160 DATA GARDENER,GUIDE,HANDICRA
FT,HANDYMAN
170 DATA HOUSE ORDERLY,LANGUAGE,
LAW AWARENESS,MUSICIANS
180 DATA OBSERVER,PERSONAL FITNE
SS,PET KEEPER,READER,RELIGION,SK
ATER
190 DATA SKIER,SWIMMER,TEAM PLAY
ER,TROUBADOUR
200 DATA WINTER CUBBING,WOODMAN,
WORLD CONSERVATION
210 DATA WORLD CUBBING,END
220 X=X+1
230 READ BA$(X):IF BA$(X)="END"G
OTO250 ELSE220
240 CLS
250 'MAIN MENU
260 DATA LOAD DATA,SAVE DATA,PRI
NT,DISPLAY BADGE LIST,UPDATE CUB
S,CLEAR DATA,EXIT,END
270 M=M+1
280 READ MN$(M):IF MN$(M)="END"G
OTO290 ELSE270
290 GOSUB410:GOSUB530
300 CLS:PRINTTAB(4);"CUB SCOUT'S
 BADGE MASTER";
310 PRINT:PRINTTAB(11);"MAIN MEN
U";
320 FOR Z=1TOM-1
330 PRINT@(32*Z)+72,Z;MN$(Z)
340 NEXT
350 PRINT:PRINTTAB(9);:INPUT "SE
LECT OPTION";I
360 IF I<1 OR I>M-1 THEN SOUND10
0,3:GOTO300
370 ON I GOSUB 1930,2060,1150,22
90,390,2230,2160
380 GOTO300
390 'MAIN UPDATES
400 IF FL=1GOTO440:CM=0
410 DATA ADD CUB,ADD/DISPLAY BAD
GES,CORRECT DATA,DISPLAY BADGE L
IST,MAIN MENU,END
420 CM=CM+1
430 READ CM$(CM):IF CM$(CM)="END
"THENFL=1:RETURN:ELSE420
440 CLS:PRINTTAB(10);"UPDATE MEN
U"
450 FORZ=1TOCM-1:PRINT@(32*Z)+39
,Z;CM$(Z):NEXT
460 PRINT:PRINTTAB(8);:INPUT "SE
LECT OPTION";I
470 IF I<1 OR I>CM-1 THEN SOUND1
00,3:GOTO440
480 ON I GOSUB 500,670,860,2290,
300
490 GOTO440
500 'ADD CUBS
510 CLS:PRINTTAB(7);"ADDING NEW
CUB DATA"
520 IFF2=1GOTO550:AC=0
530 DATA LAST NAME,FIRST NAME,AD
DRESS,PCODE,PHONE#,SIX,END
540 AC=AC+1:READ AC$(AC):IFAC$(A
C)="END"THENF2=1:RETURN:ELSE540
550 FORZ=1TOAC-1:PRINT@(32*Z)+34
,Z;AC$(Z):NEXT
560 N=N+1
570 PRINT@452,"ADDING CUB #";N
580 PRINT@80,"";
590 INPUTCUB$(N):PRINT@112,"";:I
F CUB$(N)=""THENN=N-1:GOTO390
600 INPUTCN$(N):PRINT@144,"";
610 INPUTCA$(N):PRINT@176,"";
620 INPUTCC$(N):PRINT@208,"";
630 INPUTCP$(N):PRINT@240,"";
640 INPUTCS$(N):PRINT@420,"";
650 INPUT"CORRECT ([Y]/N)";A$
660 IFA$="N"THENGOTO580ELSE510
670 'UPDATE CUB AND BADGES
680 CLS:IFN=0THENPRINT@232,"NO D
ATA IN MEMORY":FORZ=1TO500:NEXT:
GOTO390
690 PRINTTAB(10);"UPDATE CUB"
700 PRINT@37,"";:INPUT"LAST NAME
";N$
710 IFN$=""THEN390
720 PRINT@68,"";:INPUT"FIRST NAM
E";N1$
730 FORZ=1TON:IFN$=CUB$(Z)ANDN1$
=CN$(Z)THEN750ELSENEXT
740 PRINT@235,"NOT FOUND":FORZ=1
TO500:NEXT:GOTO670
750 CLS:PRINTTAB(2);CN$(Z);" ";C
UB$(Z)
760 IFCB$(Z)=""THENCB$(Z)=DF$
770 IF INSTR(CB$(Z),"Y")THEN780
ELSEPRINTTAB(2);"NO BADGES ON FI
LE":GOTO820
780 PRINTTAB(2);"BADGES ON FILE
:"
790 FORP=1TOX:IF MID$(CB$(Z),P,1
)="Y"THENPRINTP;MID$(BA$(P),1,10
),
800 NEXTP
810 GOSUB2380
820 PRINT@450,"";:INPUT"ADD WHIC
H BADGE";AB$
830 IFAB$=""THEN670
840 FORP=1TOX:IFAB$=BA$(P)THEN M
ID$(CB$(Z),P,1)="Y":GOTO750:ELSE
NEXTP
850 PRINT@450,"NOT FOUND CHECK S
PELLING":FORP=1TO500:NEXT:PRINT@
450,STRING$(25," ");:GOTO820
860 'CHANGE DATA
870 CLS:IFN=0THENPRINT@232,"NO D
ATA IN MEMORY":FORZ=1TO500:NEXT:
GOTO390
880 PRINTTAB(10);"CHANGE DATA"
890 PRINT@37,"";:INPUT"LAST NAME
";N$
900 IFN$=""THEN390
910 PRINT@68,"";:INPUT"FIRST NAM
E";N1$
920 FORZ=1TON:IF N$=CUB$(Z)ANDN1
$=CN$(Z)THEN940 ELSENEXT
930 PRINT@235,"NOT FOUND":FORZ=1
TO500:NEXT:GOTO860
940 CLS:PRINTTAB(5);CN$(Z);" ";C
UB$(Z),"  CUB#:";Z
950 PRINT:PRINTTAB(5);CA$(Z):PRI
NTTAB(5);CC$(Z):PRINTTAB(5);CP$(
Z):PRINTTAB(5)CS$(Z)
960 PRINT:PRINTTAB(4);:INPUT" CH
ANGE (Y/N)";A$
970 IFA$="Y"THEN980ELSE1060
980 CLS:PRINTTAB(5);"CHANGING CU
B #";Z
990 PRINT:INPUT" LAST NAME";CUB$
(Z)
1000 INPUT" FIRST NAME";CN$(Z)
1010 INPUT" ADDRESS";CA$(Z)
1020 INPUT" POSTAL CODE";CC$(Z)
1030 INPUT" PHONE #";CP$(Z)
1040 INPUT" SIX";CS$(Z)
1050 GOTO940
```

```
1060 'REMOVE BADGES
1070 CLS:PRINTTAB(5);CN$(Z);" ";
CUB$(Z)
1080 IFINSTR(CB$(Z),"Y")THEN1090
ELSECLS:PRINT@232,"NO BADGES ON
FILE":FORZ=1TO500:NEXT:GOTO390
1090 FORP=1TOX:IFMID$(CB$(Z),P,1
)="Y"THENPRINTP;MID$(BA$(P),1,10
),
1100 NEXTP
1110 PRINT@484,"";:INPUT"REMOVE
WHICH BADGE#";A
1120 IFA<1THEN390
1130 MID$(CB$(Z),A,1)="N"
1140 GOTO1060
1150 'PRINT ROUTINES
1160 'CONTROL CODES FOR DMP105
1170 IFF3=1THEN1220:PM=0
1180 POKE150,18 'SETS BAUD TO 24
00
1190 DATA BADGE LIST,BADGE REQUE
ST FORM,CUB'S DATA,CUB'S BADGES,
MAIN MENU,END
1200 PM=PM+1
1210 READ PM$(PM):IFPM$(PM)="END
"THEN1220ELSE1200
1220 F3=1:CLS:PRINTTAB(10);"PRIN
T REPORTS"
1230 FORP=1TOPM-1:PRINT@(32*P)+3
9,P;PM$(P):NEXT
1240 PRINT:PRINTTAB(8);:INPUT"SE
LECT OPTION";I
1250 IFI<1ORI>PM-1THENSOUND100,3
:GOTO1220
1260 ON I GOTO 1270,1740,1340,14
40,300
1270 'PRINT BADGE LIST
1280 CLS:PRINTTAB(7);"CURRENT BA
DGE LIST"
1290 GOSUB2380
1300 PRINT#-2,CHR$(13);CHR$(27);
CHR$(14)
1310 PRINT#-2,TAB(11);"CURRENT B
ADGE LIST";CHR$(27);CHR$(15);CHR
$(13)
1320 FORP=1TOX-1 STEP2:PRINT#-2,
TAB(20);P;BA$(P);TAB(45);P+1;BA$
(P+1):NEXT
1330 PRINT#-2,STRING$(75-P,CHR$(
13)):GOTO1220
1340 'PRINT CUB PACK
1350 CLS:PRINTTAB(7);"PRINT CUB
PACK LIST"
1360 IFN=0THENPRINT@232,"NO DATA
 IN MEMORY":FORZ=1TO500:NEXT:GOT
O1220
1370 GOSUB2380
1380 PRINT#-2,CHR$(27);CHR$(14);
CHR$(13)
1390 PRINT#-2,TAB(13);"REGISTERE
D CUBS";CHR$(13);CHR$(27);CHR$(1
5)
1400 FORP=1TON
1410 PRINT#-2,TAB(1);P;CN$(P);"
";CUB$(P);TAB(25);CA$(P);TAB(45)
;CC$(P);TAB(55);CP$(P);" ";CS$(P
);"   ";TAB(72);"SIX"
1420 NEXTP
1430 GOTO1150
1440 'PRINT CUB'S BADGES
1450 CLS:IFN=0THENPRINT@232,"NO
DATA IN MEMORY":FORZ=1TO500:NEXT
:GOTO1220
1460 CLS:PRINTTAB(7);"PRINT CUB'
S BADGES"
1470 PRINT@226,"TYPE <ALL> FOR C
OMPLETE LIST"
1480 PRINT@37,"";:INPUT"LAST NAM
E";N$
1490 IFN$=""THEN1220
1500 IFN$="ALL"THEN1600
1510 PRINT@68,"";:INPUT"FIRST NA
ME";N1$
1520 FORZ=1TON:IFN$=CUB$(Z)ANDN1
$=CN$(Z)THEN1540ELSENEXT
1530 PRINT@267,"NOT FOUND":FORZ=
1TO500:NEXT:GOTO1440
1540 IF INSTR(CB$(Z),"Y")THEN156
0ELSEPRINTTAB(4);"NO BADGES ON F
ILE":FORZ=1TO500:NEXT:GOTO1460
1550 GOSUB2380
1560 PRINT#-2,CHR$(27);CHR$(14);
CN$(Z);" ";CUB$(Z);CHR$(27);CHR$
(15);CHR$(13)
1570 FORP=1TOX:IFMID$(CB$(Z),P,1
)="Y"THENPRINT#-2,P;BA$(P)
1580 NEXTP
1590 PRINT#-2,STRING$(80,"-"):GO
TO1440
1600 'PRINT ALL
1610 GOSUB2380
1620 FORP=1TON
1630 IF INSTR(CB$(P),"Y")THEN167
0
1640 PRINT#-2,CHR$(27);CHR$(14);
P;CN$(P);" ";CUB$(P);CHR$(27);CH
R$(15);"  NO BADGES ON FILE"
1650 PRINT#-2,STRING$(80,"-"):NE
XTP
1660 GOTO1440
1670 PRINT#-2,CHR$(27);CHR$(14);
P;CN$(P);" ";CUB$(P);CHR$(27);CH
R$(15)
1680 FOR P1=1TOX
1690 IF MID$(CB$(P),P1,1)="Y"THE
NPRINT#-2,P1;BA$(P1)
1700 NEXTP1
1710 PRINT#-2,STRING$(80,"-")
1720 NEXTP
1730 GOTO1440
1740 'BADGE REQUEST FORM
1750 UL$=STRING$(20," ")
1760 CLS:PRINTTAB(9);"BADGE REQU
EST FORM"
1770 PRINT:PRINTTAB(9);:INPUT"#
OF COPIES";P2
1780 GOSUB2380
1790 FORP1=1TOP2
1800 PRINT#-2,CHR$(27);CHR$(14);
TAB(10);"CUB'S REQUEST FOR BADGE
S";STRING$(3,CHR$(13))
1810 PRINT#-2,"DATE:";CHR$(15);U
L$;CHR$(14);CHR$(13)
1820 PRINT#-2,CHR$(13);"CUB NAME
:";CHR$(15);UL$;CHR$(14);CHR$(13
):PRINT#-2,CHR$(27);CHR$(15);"De
ar Akela,":PRINT#-2,"I have comp
leted my requirements for the fo
llowing badge(s)."
1830 PRINT#-2,"Please test me on
 these requirements and supply t
he necessary badge(s)."
1840 PRINT#-2,"For any home requ
irements I am supplying a confir
mation from my parent/gaurdian."
1850 PRINT#-2,STRING$(80,"-")
1860 PRINT#-2,CHR$(13);CHR$(27);
CHR$(14)
1870 FOR P=1TOX-1
1880 PRINT#-2,TAB(10);"[]";P;BA$
(P)
1890 NEXT P
1900 PRINT#-2,CHR$(27);CHR$(15);
STRING$(22,CHR$(13))
1910 NEXTP1
1920 GOTO1150
1930 'LOAD DATA
1940 CLS:IFN<>0THENPRINT@234,"DA
TA IN MEMORY":FORZ=1TO500:NEXT:G
OTO300
1950 PRINTTAB(7);"LOAD DATA FROM
 DISK"
1960 PRINT@226,"TYPE <DIR> FOR D
IRECTORY LIST"
1970 PRINT:PRINTTAB(7);:INPUT"DA
TA FILE NAME";N$
1980 IFN$=""THEN300
1990 IFN$="DIR"THENCLS:DIR:GOSUB
2380:GOTO1930
2000 OPEN"I",#1,N$+"/DAT"
2010 N=N+1
2020 INPUT#1,CUB$(N),CN$(N),CA$(
N),CP$(N),CS$(N),CC$(N),CB$(N)
2030 IF EOF(1)=-1 THEN2050
2040 GOTO2010
2050 CLOSE#1:GOTO300
2060 'SAVE DATA
2070 CLS:IFN=0THENPRINT@232,"NO
DATA IN MEMORY":FORZ=1TO500:NEXT
:GOTO300
2080 PRINTTAB(7);"SAVE DATA TO D
ISK"
2090 PRINT:PRINT:PRINTTAB(2);"PA
CK NUMBER OR NAME"
2100 PRINTTAB(2);:INPUT"(8 CHARS
 OR LESS)";PN$
2110 IFPN$=""THEN300
2120 OPEN"O",#1,PN$+"/DAT"
2130 FORP=1TON:WRITE#1,CUB$(P),C
N$(P),CA$(P),CP$(P),CS$(P),CC$(P
),CB$(P):NEXTP
2140 CLOSE#1
2150 GOTO300
2160 'EXIT
2170 IFN=0THENEND
2180 CLS:PRINTTAB(09);"EXITING P
ROGRAM"
2190 PRINT:PRINT" DO YOU HAVE TO
 SAVE YOUR DATA"
2200 INPUT" (Y/N) <ENTER> FOR MA
IN MENU";A$
2210     IFA$=""THEN3002220
IFA$="Y"THEN2060ELSEEND
2230 'CLEAR DATA
2240 CLS:IFN=0THENPRINT@232,"NO
DATA IN MEMORY":FORZ=1TO500:NEXT
:GOTO300
2250 PRINTTAB(9);"CLEARING MEMOR
Y"
2260 PRINT:PRINT" DO YOU HAVE TO
 SAVE YOUR DATA"
2270 INPUT" (Y/N) <ENTER> FOR MA
IN MENU";A$
2280 IFA$="Y"THEN2060 ELSEIFA$="
N"THENRUN ELSEGOTO300
2290 'BADGE DISPLAY
2300 CLS
2310 PRINTTAB(09);"CURRENT BADGE
S":PRINT
2320 FORY=1TOX-1
2330 PRINTY;MID$(BA$(Y),1,10),
2340 IFY=20 GOSUB2380:CLS:PRINT:
NEXT
2350 NEXT
2360 GOSUB2380
2370 RETURN
2380 PRINT@484,"PRESS <ENTER> TO
 CONTINUE";
2390 IF INKEY$=CHR$(13)THENPRINT
@484,STRING$(25," ");:RETURN:ELS
E2390
```

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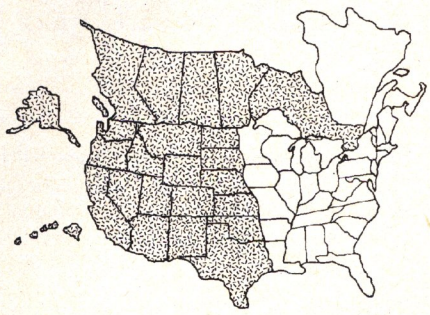

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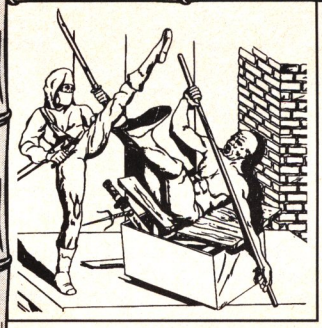

KYUM-GAI TO BE NINJA

OS-9

Kyum-Gai: to be Ninja (OS-9 Version) is the culmination of a project started almost a year ago. The talents of *Glen R. Dahlgren* (RS-DOS game writer for Sundog Systems), *Kevin Darling* (a legend for his work in OS-9), and *Eddie Kuns* (author of KBCom) have been pooled to create a masterpiece of game software under the OS-9 operating system. Fast martial arts action with outstanding graphics, great digitized sound effects, and incredible animation are featured in this arcade game, all in the OS-9 environment.

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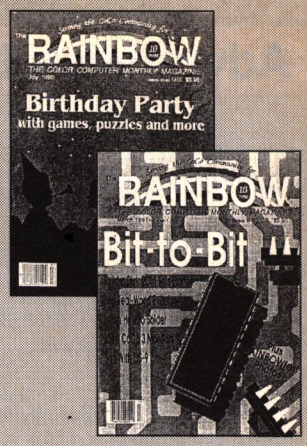

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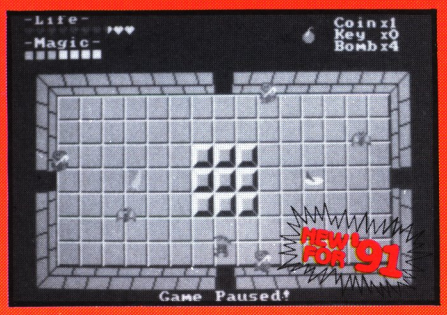

Better men than you have failed the quest, but the hand of the good princess Thelda is too much to resist! Stolen by the evil necromancer Divinax, she has been secreted far from prying eyes and it is now up to you to regain the pieces of the mystical Life Force and save the fair lady. The Quest for Thelda is an outstanding arcade program that combines action and adventure to bring you an incredible video game playing experience. Travel throughout over 500 different screens searching for magical objects and spells, fighting horrible creatures, and gathering the various parts of the Life Force guarded by ever-increasing terrors. You'll enjoy the highest quality 320x200 resolution 16 color graphics and digital sound effects that you've come to expect from Sundog Systems. The game play is fast and furious, and only you can rescue the princess and complete the **LEGEND OF THELDA!** Req. 128K CoCo 3, disk drive, and joystick (2-button joystick supported).

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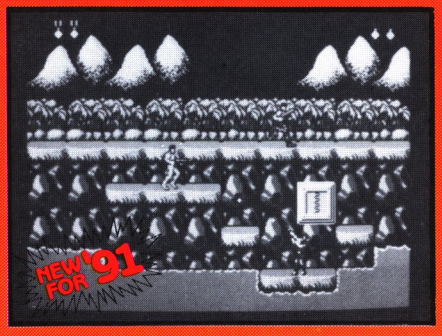

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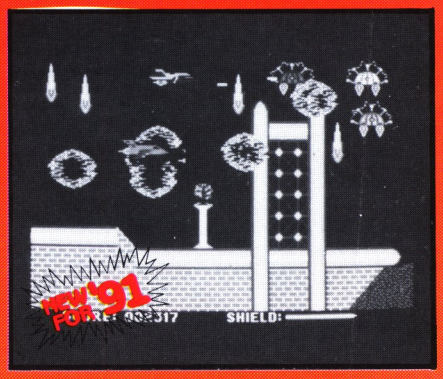

The superior technology of the evil Overlords has ensnared yet another innocent planet; however, this one contains the Crystal City, bastion of democracy and independence. Earth has had enough! Break through level upon level of their virtually invulnerable defenses, defeat the end guardians, and make your way ever closer to freeing the slaves of the Crystal City! This amazing arcade game is an achievement in its own right. Full 128K/512K utilization! Super fast horizontal hardware scrolling on the 128K computer! Wild digital sound effects and background music score! 30 minutes, or over 30 megabytes, of non-repeating 320x200 resolution, 16 color graphics! This game has it all; order a demo disk to see it first! Can you save the Crystal City from unbeatable foes? Req. 128K CoCo 3, disk drive, and joystick.

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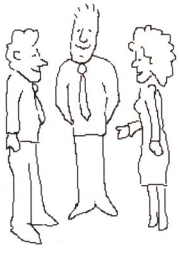

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