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December 1991 Vol. XI No.5

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Letters to the RAINBOW

Users Unite

Editor:

I want to thank THE RAINBOW for bringing me news about the CoCo since October 1987 (when I discovered it). I have been programming since I got a CoCo 2 in 1986 and have been upgrading my system ever since. Without THE RAINBOW, I (like so many others) would have "upgraded" my CoCo 2 by purchasing an MS-DOS computer, not a CoCo 3.

This letter is primarily in response to the September 1991 issue entitled "A New Era." It is indeed just the beginning; it marks the end of Radio Shack's involvement, and it means we need to rely heavily on THE RAINBOW and modem networks.

THE RAINBOW is the most influential publication available for the CoCo. The products it has deemed the best for the CoCo are the ones that have lasted throughout the CoCo era, with only a few minor exceptions. The fact that Delmar's System IV was the first to be reviewed by THE RAINBOW staff makes it a very serious candidate for the "CoCo 4" title so sought after by vendors in this market.

It also makes me worry. Already, there are the MM/1 and the TC9 Tomcat. Many have ordered MM/1s in the expectation that it will be the next step in the CoCo evolution. Others have gone out on a limb and ordered the TC9, and maybe the Tiger to go with it. I didn't consider this Delmar System IV to be a major contender in the battle for the title — that is, until the September issue. This makes three different contenders for the title, which could cause serious confusion in the CoCo community. It seems to be leading to diversification, which could spell downfall.

THE RAINBOW may find itself in a particular place of power now. If the CoCo community is going to stick together, it needs THE RAINBOW to guide it. When THE RAINBOW gets the other two systems, it should give them equal coverage to what was given the System IV — no more, no less. Then the community should discuss what it really wants, and not just listen (while grinning like children) to what these new systems have to offer.

There are only two things I can safely do at this point: resubscribe to THE RAINBOW and write letters. I urge all CoCo users and RAINBOW readers to do the same. Also, since I have a modem, I'll be using both Delphi and the national echo bases on the BBSs. The choice as to the winner of the "CoCo 4" title is still ours. It is our job to

make our individual choices. To keep the community together, THE RAINBOW should do its part by letting everyone else know what those choices are.

Well, I've put in my two cents. I want to know what everyone else is thinking. In order for the community to survive as it is, we have to communicate. In order for it to grow, we have to be active about it. It comes down to what the ad from IMS said a while back: "For the first time, a community has banded together to design their next computer." We are that community.

James Wilcox
Epping, New Hampshire

The new computers affecting this market are a natural extension of the power we have come to know with the CoCo. However, these machines are not CoCos, and the title "CoCo 4" seems inappropriate.

Each of the new computers has individual strong points, and choosing the right one for you can be difficult. We're doing what we can to bring you information now that the machines are actually becoming available. (See this month's article on Page 10 regarding evaluation of the MM/1. The TC9 was discussed in the November issue on Page 10).

At the same time, the System IV, the TC70 and the MM/1 all run OS-9/68000. This sounds more like unification than diversification.

It is our opinion that all of these machines can be winners at the same time — none of them currently holds a particular advantage in all areas. There is no reason to limit ourselves to just one "replacement." Besides, nothing can truly replace the CoCo. But these computers do increase our options.

Packet Radio

Editor:

I am an amateur radio operator, and I am looking for a packet-radio terminal program. I have a CoCo 3 and a Kantronics Packet Communicator TNC. Does anyone know where I can get a disk program for this?

Steve Baker
P.O. Box 5151
Quincy, IL 62305-5151

Help for Tape Users

Editor:

I noticed your response to the letter regarding recovering tape software (September 1991, Page 5). I have also lost programs, after spending an hour or more

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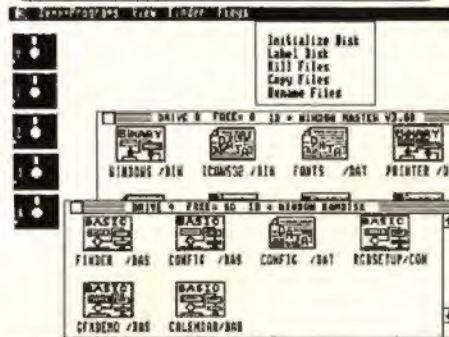
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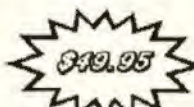
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entering them, due to I/O errors. This is very annoying.

One of the first things I do when confronted with this problem is clean and demagnetize the tape-recorder heads. I use a Radio Shack head cleaner and demagnetizer (Cat. No. 44-631). I have been lucky in some cases — the demagnetizer eliminated the I/O error, and the program loaded. In other cases I was not so lucky. (Perhaps I should have cleaned and demagnetized the heads before trying to CSAVE programs.)

There are some things that might happen for which there is no solution other than to retype the program: a defective tape section, a power failure or voltage change, an unwanted noise signal or a disconnected cable. To counter some of these effects, make two saves of a program when saving it to tape. Also consider using two tapes for each program — if something happens to one save, chances are that you can recover the second.

It is sometimes helpful to listen for excessive noise on the tape. To do this, put the tape into the recorder, press the Play button and enter the following commands

```
MOTOR ON
AUDIO ON
```

Turn up the volume and listen to the sounds. For the best results, the sound should be high in pitch and crystal clear. You can adjust the head alignment by using a small jeweler's screwdriver in the hole just above the cassette compartment. However, any adjustments may cause difficulties when you try to load older tapes; you may have to readjust the alignment for those tapes.

Another trick I sometimes use is to save programs (at least one save) in ASCII format. Then if a problem occurs, I can load the program into *Scripts II* (a ROM-Pak-based word processor sold by Tandy). *Scripts II* can usually load most of the ASCII-saved BASIC program, and I can edit any errors and save the program to another tape.

John Buchwald
San Francisco, California

Formatting Listings

Editor:

Here's a trick I discovered several years ago. I found it is possible to indent BASIC program lines, making listings far more readable. For example, nested FOR/NEXT loops normally look like this:

```
10 FOR X=1 TO 3
20 FOR Y=1 TO 4
30 PRINT X+Y
40 NEXT Y
50 NEXT X
```

Using the Insert function of the EDIT command, insert a space after the line

number in Line 20. To do this, enter EDIT 20, then press I (to get into the Insert mode) followed by a space and ENTER. Similarly, insert two spaces after the 30 in Line 30 and one space after the 40 in Line 40. When you list the program, the screen displays

```
10 FOR X=1
20 FOR Y=1 TO 4
30 PRINT X+Y
40 NEXT Y
50 NEXT X
```

The program is far more readable. Program operation is not affected in any way, and this new format is preserved when printed on the printer.

Also, this past July I bought a Tandy ROM-cartridge game called *SokoBan* (Cat. No. 26-1361) for my CoCo 3. I was totally addicted to it until mid-August, when I solved the 50th and final board. I would like to correspond with other users to share solutions, ideas and approaches.

My thanks to all of you for a most enjoyable magazine. Some of us die-hard CoCo owners often feel like an endangered species (Beta-format VCR owners may be able to empathize), but I am "reborn" with each issue of THE RAINBOW.

Robert Kurosaka
16 Grapevine Avenue
Lexington, MA 02173

A Cool Response

Editor:

Regarding the recent question on how to reduce heat buildup in the CoCo, I found that a small venting fan obtained from Radio Shack fits nicely into the computer and works well. The fan is powered by a 12-volt AC adapter with a 300-mA capacity. Since the fan makes some noise, I put a small switch in the positive side of the line and turn the fan on only occasionally to keep the temperature down to a safe level. You can leave the fan on continuously if the noise level is not objectionable.

Clifford Goddard
Bay City, Michigan

Random Agreement

Editor:

I agree with Ross Chamberlain's letter (September, 1991, Page 4) in which he points out that a routine to randomize a list can be very useful. An application of this technique can be seen in lines 190 through 270 of *Car Bingo*, a program I wrote (November 1989, Page 42).

Warren Cheves
Bristol, Tennessee

Programmer Needs Assistance

Editor:

I recently purchased a CoCo 3, and I am trying to write a graphics adventure using the Hi-Res screens. I have not been able to

make the game remember what items the player gets — the game uses separate programs for each room. I am also having problems making the commands appear as the user types them. Will someone please help me fix these problems, or show me how to add a point-and-click interface to the program. Since the separate programs are so long, I think combining them into one program won't work.

Patrick Dixon
1183 Spartan Avenue
Carson City, NV 89701

Worth the Price

Editor:

I've had a CoCo 3 for almost four years now, and I'm sorry that I didn't subscribe to THE RAINBOW until November of last year. In the middle of this year, I wrote a letter to the editor, which was published in the August 1991 issue. Let me tell you of the royal service I've received so far.

Since the letter was published, I have received helpful replies from two people. One reader sent me disks with some utilities he wrote, and the other knew of dealers that offer books I needed. I, too, have offered help to another reader. That person is now my computer penpal.

On another occasion, I sent a suggestion to Bill Nee, author of "The Assembly Line." Several days after that, I received a polite response from him, and he even offered his assistance to me. He mentioned also that he would try to use my suggestion in one of his articles.

I subscribe to four magazines, and of the four, I find THE RAINBOW is the best. It is an invaluable source of information for me, and it is well worth the price.

Jason Smith
Tamaqua, Pennsylvania

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.

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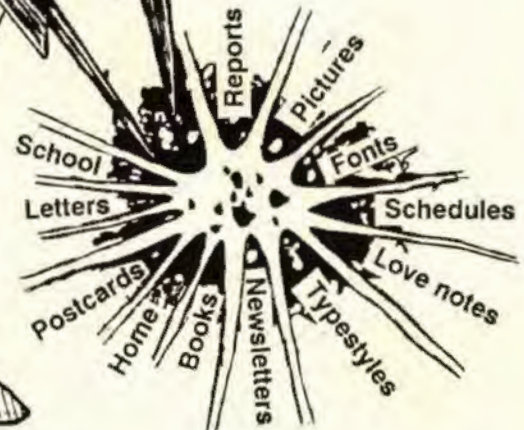
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Play'n'Learn

Since the subject of this month's issue is entertainment and games, let me share some thoughts about "play." When Tandy first developed the Color Computer and people began to see the power that was stored on its Motorola 6809 processor, they chastised Tandy for developing a "game machine" when the computer was capable of so much more.

Some of the most popular games in the early days of the PC world did (and some still do) have what is affectionately known as a "boss screen." If the boss walks into your office, you press a key combination and a fake spreadsheet appears so it looks like you are working.

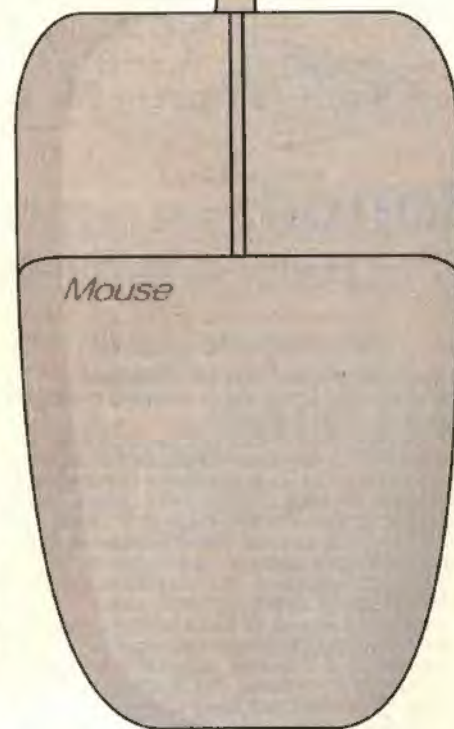
On one occasion when I went to visit my accountant, I happened to look at the receptionist's computer screen. I was somewhat surprised to see she was not doing anything more accountingly than playing a hot game of Mah Jongg while answering the telephones.

Games and entertainment and play seem to have a bad rap. This is too bad.

When I was a little kid, my big treat on Sundays was my father driving me to the corner drug store, where I was able to buy a dollar's worth of comic books. In those days, that meant 10 comic books, and that would be enough to keep me busy most of the day.

The Walt Disney characters were among my favorites, especially Donald Duck. But what would surprise my father the most, I think, is that I actually learned things from those comic books. Some time during the week, we would all be eating dinner and I would add some fact or another. My father would always ask me where I learned that, and I would always tell him from a comic book. He would usually dismiss that with a statement to the general effect that I was trying to ensure a continuing supply of comic books on Sunday.

One night my father's boss, Mr. Widders, came to dinner and, since my father worked for Remington Rand — which sold computers, a relatively new business back then — talk that evening turned from business to science to, somehow, time



travel. I remarked how dangerous time travel might be, since someone going back in time might inadvertently destroy something that would affect things in the future.

Mr. Widders remarked what an astounding statement that was from a kid of seven or so and asked me where I came up with it. "From a Captain Marvel comic book," I told him. In one single stroke, I suppose I ensured my comic book supply for *all* the Sundays to come.

The point of all this is that the comic books, a form of play, contained a lot of interesting and educational material. Disney's Donald Duck wandered off to all sorts of places, and readers found out the name of the capital of Argentina or the highest mountain in the European Alps when they went along.

So, too, with computer entertainment.

Many adventure games teach us all about the power of logical thinking and reasoning. Often, too, we learn interesting facts and information when these games are set in real-world locations. How many of us have learned more about astronomy, not by reading a book, but by playing a game about space exploration?

The *Carmen Sandiego* series of games is brimming with educational information, of course. And the players don't seem to mind learning it while they solve the puzzles. Similarly, there are a host of simulations that teach a whole lot of things about a subject. You have to master the subject to win the game.

Sometimes this learning is somewhat overt, like in the *Carmen Sandiego* series, but sometimes it is much less so, as with *The Microscopic Mission*. Much of what is in *Mission* is fact, from anatomical and disease names to processes of the human body.

The list could continue for a long while, but the basic theme here is that games are usually educational in nature — even the war games, many of which require a great deal of knowledge about history.

If someone in *your* house wants a game, don't just dismiss it. Games and entertainment often lead the way to knowledge.

— 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.

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A New Approach

by THE RAINBOW Staff



A look at the 68070-based MM/1 personal computer

The 68000 microprocessor has been around a long time. While some 68000-based machines are known in the personal computer market (Atari, Macintosh, Amiga), the microprocessor provides computing power for numerous industrial applications, and there is a flood of such machines operating in that market. And whereas the Atari, Macintosh and Amiga use their own operating systems, industrial uses for the 68000 often rely on the OS-9 operating system. It is true the other machines are capable of running OS-9, but the operating system has not caught on in those areas of the market. OS-9 is a natural part of the CoCo market, and by extension should work very well as CoCo users decide to opt for more power.

This is not to say other "industry-intended" machines cannot be used by end users for personal purposes. However, prohibitive hardware and software costs (designed for the industrial market) are part of the reason many have not ventured there for computing satisfaction. Interactive Media Systems, Inc. (IMS) is working to deliver a relatively inexpensive 68000-based computer that is user-friendly and is designed for personal use (though it can be used well in many other applications).

The MM/1 from IMS is built around the Phillips/Sigmetics 68070 microprocessor (a 68000-compatible chip) and the 66470 Video and System Controller. Respectively, these chips provide affordable 16-bit power and a platform for application development that can result in some very user-friendly applications for personal enjoyment, business purposes and everything in-between. Indeed, IMS is putting a lot of effort into the development of good applications software that makes the MM/1 useful from the start.

Because of unforeseen production problems, IMS has chosen for the time being to ship the MM/1 circuit boards and cases as a kit to be assembled by the end user. Therefore we'll be working from the ground up as we discuss the computer.

Assembling the MM/1

The MM/1 we received for evaluation included all boards and cables, the case and power supply, a 3½-inch high-density floppy drive, a 45-Meg SCSI hard drive, three megabytes of RAM and a Chicony keyboard. IMS also provided an installation guide giving step-by-step instructions for assembling the computer.

Assembling the MM/1 components into a working computer takes less than 30 minutes. You must first mount the CPU board in the case and connect cables for the Reset button, the power indicator, the speaker and the floppy drive. Next, you install and connect the floppy drive. After this is finished, you are instructed to connect a monitor and boot the system. (The MM/1 CPU board contains one megabyte of system memory, and the computer works fine as a floppy-based system using only this part of the motherboard set.) The installation guide provides troubleshooting ideas in the event the computer does not work at this point.

When you are sure the computer boots, you can proceed to install the I/O board, which mounts on top of the CPU board. If you plan to install the extra two megabytes of RAM, you must place a jumper on the CPU board before mounting the I/O board. There are two SIMM sockets on the I/O board to hold the extra memory.

The CPU and I/O boards are electronically connected by what IMS refers to as the Minibus. This small circuit board has two connectors for the power supply and two 50-pin header connectors for mounting the motherboard set. Because the individual holes in the 50-pin connectors don't have bevelled edges (at least on our MM/1), mounting the Minibus and the I/O board are the most difficult part of assembling the MM/1. The pins on the CPU and I/O boards must be perfectly aligned with the holes in the connectors, and getting all 100 pins to line up at the same time is not easy.

After the I/O board is installed, all that remains is to connect the parallel-port cable and mount the DB-25 connector to the rear of the case. (You can install the hard drive and connect its SCSI cable at this time.) Once again you are instructed to turn the computer on and boot OS-9 to ensure all is in working order.

All in all, assembling the MM/1 is easy and takes very little time. And the installation guide covers most everything you need to know to get the MM/1 running properly.

A Closer Look

The MM/1 motherboard set has connectors for video, two serial ports, one parallel

port, a keyboard, a joystick and sound. In addition to support circuitry, the CPU board holds one megabyte of RAM, two system ROMs, the 68070 microprocessor (which runs at 15 MHz) and the 66470 Video and System Controller (VSC).

The computer uses a low-profile case that includes a 200-watt power supply. Despite the compact size of the case, there is a surprising amount of room inside for disk drives and cables. As with most PC cases, the case used for the MM/1 can hold two 5¼-inch, half-height drives and three 3½-inch drives (two accessible and one internal), though the power supply provides power connectors for only four devices.

Currently the MM/1 does not include a driver for Microware's universal disk format. However, we have been told such a driver is in development. Also the MM/1 boots OS-9 from the floppy drive rather than from ROM or the hard drive. This is a minor inconvenience, necessary at this time because of the wide array of configurations for the MM/1. We consider this a minor point.

The MM/1 provides analog-RGB video via a DB-9 connector mounted on the CPU board. (All connectors and ports are accessible through a custom backplate mounted to the case.) The computer we received was set for use with a monitor that syncs at 15.75 KHZ; the Tandy CM-8 and similar Magnavox monitors work well. We used an adapter, available from IMS, to connect our CM-8 to the computer.

Jumpers on the CPU board allow you to set the MM/1 for use with just about any analog-RGB monitor. We used a CM-8, but the computer is also capable of working with MultiSync monitors. It also supports both composite and TTL monochrome monitors, providing a cost effective way of getting started. IMS offers cables that work with the MM/1 for most monitors.

The MM/1 uses a 24-bit palette controller that, depending on screen resolution, allows the selection of either 16 or 256 colors from a palette of 16.7 million colors. In conjunction with the VSC, this setup lets the MM/1 decode RLE graphics images in real-time (on-the-fly) without CPU intervention. This is great for cartoon animation, games and instructional software.

The interlaced video supported by the VSC chip looks crisp on the CM-8. While interlaced video does result in noticeable screen flicker (a monitor with long phosphor persistence may help eliminate this), it is useful and particularly advantageous for viewing graphics images. It is possible to see effective screen resolutions up to 320-by-416 in 256 colors and 640-by-416 in 16

colors. In addition, the overscan/interlaced mode supports up to 720-by-480 (in 16 colors) — all visible on a CM-8 monitor. Needless to say, the graphics capabilities of the MM/1 far exceed what we expected from the CM-8, yet the CM-8 stood well in our tests.

One of the MM/1's serial ports is located on the CPU board. This port, /t0, is a general-purpose serial port and can be used to communicate with modems or terminals (via a null-modem adapter). We had no problem communicating in either setup via this port.

The second serial port, /t2, is mounted on the I/O board and is powered, meaning it supplies voltage to be used by certain external devices, such as a mouse. Drivers for a Logitech C7 mouse (or compatible) are included with the system software. Unfortunately, Logitech discontinued the three-button C7 mouse. However, several vendors offer compatible mice, and IMS can point you in the right direction. Also, drivers for the Microsoft mouse are currently being developed.

At the present time, the mouse driver is designed so that the left button is the Select

button and the right button changes windows. In the future, this scheme will be revised so the left button is Select, the middle button is Accept (for those dialog boxes requesting an OK), and the right button calls a help box providing information about the program option you are currently using. Though this sounds nice, it is limiting. Considering the Microsoft two-button mouse is highly touted as one of the best and most-comfortable mice available, we feel the choice of a two- or three-button device should be left to the user. Still, the IMS implementation follows the UNIX standard.

Also available from IMS is a satellite board that lets you add up to three more serial ports (/t1, /t3 and /t4) to the MM/1. In addition, an optional MIDI board with MIDI OUT only is currently available. (A version with both MIDI IN and MIDI OUT is being developed.) It requires that you have the serial satellite board with /t1 installed. /t1 must be reconfigured, which is a simple matter of changing two jumper settings.

The MM/1 parallel port is on the I/O board and works with standard IBM-type printer cables, available at computer stores across

the country. We had no problems sending control codes to the printer and printing text on either dot-matrix or LaserJet printers. In view of some of the software currently in development for the MM/1, it will be interesting to see a graphics driver.

For input, the MM/1 accepts a standard XT-compatible PC keyboard. The keyboard connector is located on the CPU board and is accessible at the rear panel. Alternatively, the case we received with the MM/1 has a front-mounted keyboard connector with an extension cable. It would be no problem to plug the extender into the CPU board and the keyboard into the front of the computer, if we had a reason to do this.

The keyboard driver on the system we received is hard-coded so that the function keys work to select different windows. This is fairly handy, but we'd like to see it done a little differently to allow the use of the function keys with applications software. For example, we were unable to run *SMART*, an integrated desktop package, because it requires use of the function keys. IMS is currently working on a different approach for window selection.

MM/1 Software

Without software, a computer is nothing more than a bunch of parts and wires. IMS knows this and is working hard to provide utilities and other programs that help make the MM/1 useful and relatively user-friendly.

Included Software

The MM/1 comes with Professional OS-9/68000 and a windowing system, written by Kevin Darling, that works like the windows for OS-9 Level II on the CoCo 3. IMS includes a `display` command that uses the same control codes accepted by the Level II `display` command. Equally as important to some is that the MM/1 windowing system fully supports alternate screen fonts created for Level II windows. These features provide a welcome level of familiarity for those who have worked with OS-9 on the CoCo 3. While the current windowing system seems somewhat rudimentary, especially considering the power and capabilities of the 68070 and the 66470 VSC, it forms the fundamental platform for which high-power applications can be designed. Further, its inclusion with the MM/1 shows IMS' dedication to providing a user-friendly package. Down the road, we

expect to see a full-blown graphical user interface (GUI) for the MM/1.

Because of the way the windowing system is designed, the computer is always in the graphics mode. Those who are familiar with Level II understand the screen output is much slower when using graphics windows on the CoCo 3. In contrast, the MM/1 doesn't feel slow with graphics windows.

For those who enjoy exploring graphics, or who are interested in multi-media applications, IMS includes several demonstration sound files and picture files, along with utilities for viewing/playing them. Utilities are provided for converting GIF images to the MM/1's CDI/IFF graphics format. This was enough to whet our appetites, and we found ourselves scouring Delphi and CompuServe looking for more.

We are impressed by the speed with which our hard drive-based MM/1 is able to retrieve and display images. Even when working with 150K+, photo-quality digitized images, it takes the MM/1 only a second or two to pop them on the screen. This speed results from the way the VSC chip works and also the speed of the SCSI hard drive we have. And the VSC specifi-

cations indicate the chip is capable of much more, making the MM/1 ideal for animation applications.

Along the graphics line, also included is a version of *Paint*, a pixel-based graphics editor soon to be released commercially by HyperTech Software. You can't save images with this demo version, but it does provide you with another creative outlet.

To help meet your text editing needs, the MM/1 includes *Emacs*, a big brother of Microware's *Umacs* (also included), and *Proff*. While this text editor/formatter pair isn't the most user-friendly way to write (they are no replacement for a good word processor), they feature a lot of capabilities and do get you started. *Emacs* allows you to personalize the commands it uses and supports other features, such as cut-and-paste and search functions, needed for editing.

For telecommunications, the MM/1 comes with *Sterm*. This application isn't fancy — no pull-down menus and icons — but offers a solid implementation of the Xmodem protocol. The MM/1 also comes with an IntroPak, an introductory subscription to CompuServe. We would like to see this practice spread to other systems, including Delphi.

Included with Professional OS-9/68000 is Microware's C compiler, to which IMS adds a `cgfx` library allowing access to the

A CoCo-type joystick connector (6-pin DIN) is provided on the rear panel and is mounted on the I/O board. The driver for this port has not been completed, yet, but it will make the port a nice feature for arcade-style games when it is.

Audio I/O is supported through a 5-pin DIN connector on the MM/1's rear panel. The port is installed on the I/O board. Provided are two sound output lines for stereo and two input lines used for sound sampling (necessary software forthcoming). It would be nice had IMS simply put four RCA connectors for audio I/O on the computer. Still, you can purchase an appropriate adapter cable from IMS, or you can make your own.

The sound port is a nice addition — sound quality is high and its inclusion adds another dimension to computing. We can't wait to see applications take advantage of this.

As stated earlier, the MM/1 comes with one megabyte of RAM installed on the CPU board. The computer can be upgraded to three megabytes by installing two SIMMs (available from IMS for \$150) on the I/O board. Performing this upgrade is not diffi-

cult except that you must remove the I/O board to set a single jumper on the CPU board. (If you plan to get three megabytes, it is easier if you get it when you purchase the machine, then install it when assembling the MM/1.)



The MM/1 case provides a lot of room for expansion. The SCSI cable has been removed for this photo.

This is one aspect of the MM/1 motherboard design we don't like. To use a different monitor or to upgrade the memory, you must temporarily remove the I/O board. As we said before, this task is the most difficult

part of assembling the MM/1 and seems to be a hassle. Of course you probably won't need to change your memory configuration or monitor settings often, but it would be nice if it were easier to make the changes when you do.

Summary

IMS is doing a good job of providing what they intended from the start — a powerful (but user-friendly) computer with fast graphics and a wealth of applications. The MM/1 works well — we experienced no problems using the system in a variety of configurations. The MM/1 is easy and enjoyable to use. Its graphics and sound capabilities make it a good choice for use in multimedia applications, specifically computer animation, retail business and education.

We are particularly pleased with IMS' philosophy that hardware alone does not a computer make. They offer a relatively complete package, with hardware and user-friendly software. Our feelings about the MM/1 can be summed up with one word: impressed! Now we want to see more. □

graphics functions of the windowing system. For those not interested in the C language, IMS includes *Microware BASIC* (reviewed September 1991, Page 54). A graphics library is forthcoming for this language.

Among the several other utilities is the *OddJob Script Interpreter* from TechnoTeacher Incorporated. *OddJob* supports a wide array of script commands, allowing even novice to intermediate users more control over the system. Based on UNIX's *awk* and *chat*, *OddJob* is a professional language with process synchronization features helpful for creating multimedia applications. With C-style syntax you can create interpreted programs to automate simple and complex tasks. *OddJob* is used by Compact-Disk-Interactive firms to create CDI files.

More along the line of firmware, IMS includes a users guide with the MM/1. This manual explains the set-up and operation of the MM/1 and its included software. It is written for novice users and undergoes many revisions as new products are developed. It does not contain a lot of detailed technical information — IMS offers a complete technical manual separately.

The manuals for OS-9/68000 (including the C compiler) and *Microware BASIC* are included with the MM/1. Also included are *Using OS-9 Net*, a manual for the Network File Manager, and *Program-*

mer's Toolkit, which covers *Umacs*, electronic mail, print spooling and more.

Most of the OS-9/68000 commands include the standard help option — just enter the command name followed by *-?* for a fairly comprehensive overview of the command's usage. The developers of the public domain and third-party products we have seen have done a good job of sticking with the idea of providing this help option with their software.

Third-Party Software

In addition to including software with the MM/1, IMS encourages and supports the development of third-party applications. As mentioned before, HyperTech Software is planning to release *Paint* in the near future. Also from HyperTech is *Tetrix*, a game that plays much like a program with a similar name. Dave Myers at CoCo PRO! has been busy porting his products, including *Data Windows* (a database) and *Presto Partner* (a personal secretary) from OS-9 Level II to OS-9/68000 for the MM/1. Also available are several system and user utilities from Brett Wynkoop.

On the MIDI front is *UMuseK* from Kala Software. This product, originally available as *UltiMusE III* for the CoCo 3, was written and ported by Mike Knudsen. On the way are two game packs from ColorSystems. We were able to play

Pyramid Solitaire and enjoyed it quite a bit. ColorSystems is also working on products for barcode I/O and home control using the BSR X-10 controller.

For more intense applications, there are *Calc9* and *VED*. *Calc9* is a full-blown spreadsheet program produced by Pan Controls Ltd. and distributed by Windsor Systems. It supports graphs, complex numbers and more. *VED* is a very user-friendly text editor written for OS-9/68000. In terms of its ease-of-use, consider it the *Telewriter* for OSK. Its hallmarks are intuitive controls, online help, powerful yet simple macros, and easily remapped key commands. Its author, Bob van der Poel, is currently working on an OS-9/68000 version of *VPrint*, for printing formatted text.

Equally as important as commercial software are public domain and shareware offerings. We obtained OSK versions of *ar* (a popular archive utility), *ded* (a full-featured disk editor) and *more* (which allows reading text files, forward and backward, one page or line at a time).

Also, Scott Griepentrog of StG, Inc., has been busy and has submitted several utilities to the public domain (these are available on Delphi and CompuServe). The one we most like is *pop*, which opens new windows on the fly. It supports the full range of MM/1 graphics/text resolutions and adds several useful options. ☺

Spicy Dice

by Francois Dubuc



While OS-9 is a powerful operating system, and there are many utilities available to help harness its power, I have seen few games written for it. To help balance this lopsided situation, I wrote *Dice Game*. This program is the OS-9 user's road to the glamour, glitter and

```
iniz wl
merge /d0/sys/stdfonts >/wl
wcreate /wl -s=6 00 00 40 24 02 00 02
shell i-/wl&
```

Figure 1: Commands for a 16-Color Window

gamble of Las Vegas.

The object of *Dice Game* is simple. The screen displays six 6-sided dice, and you place a bet that the CoCo will roll four, five or six of a kind. Since we're dealing with funny money (CoCo cash?), you won't have to forego that new hard drive if you lose. *Dice Game* requires a 512K CoCo 3 and OS-9 Level II.

Entering the Program

To enter the listing for *Dice Game*, you should first start BASIC09. To do this, put a

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backup of the BASIC09/Boot/Config disk from your OS-9 Level II package into Drive 0 and enter the following two commands:

```
chd /d0
chx /d0/cmds
```

The first command tells OS-9 to change the current data directory to the root directory of the disk in Drive 0. This is the directory where the system will save the program you enter. The second command tells OS-9 to set the current execution directory to the CMDS directory. This is the directory on that disk where BASIC09 and several other executable programs are stored. After you have done this, start BASIC09 by entering `basic09` at the OS9 prompt. To tell BASIC09 you want to enter (edit) a program, enter

```
edit Dice Game
```

Entering the program listing is easy, but you must remember to press the space bar as the first character on each line. As explained in the BASIC09 portion of the OS-9 Level II manual, the space character is a special command that tells the editor to keep the text you enter after it. (For more complete information about the editor, refer to Chapter 4 of the BASIC09 manual.) Enter each line by typing a space followed by the line itself, pressing ENTER after each one. Don't worry about indenting the lines. BASIC09 takes care of this for you.

When you have entered all the lines, exit the program editor by typing Q as the first character on the line and pressing ENTER. Now save the program to disk by entering

```
save Dice Game
```

This saves the file to the current data directory. After saving the program, exit BASIC09 by entering `bye` at the B: prompt. Since *Dice Game* includes graphics calls to the graphics modules, `gfx2` must be in the current execution directory or in memory.

I wrote *Dice Game* to run on a 320-by-192, 16-color graphics window. You must create such a window be-

fore running the program. To do this, first put a backup of the OS-9 System Master in Drive 0 and enter

```
chd /d0
chx /d0/cmds
```

This tells OS-9 you have put a different disk in the drive, so it knows where to find the files it needs. Now enter the commands shown in Figure 1. As an alternative, use OS-9's `edit` command to build a procedure file with the commands in Figure 1 in it (you could call the file `win.16color`). In either case, once the window is created press the CLEAR key to switch to it. Then put the disk with *Dice Game* back into Drive 0 and enter the `chd` and `chx` commands as shown above. At this point you can run the game by typing

```
basic09 dice game
```

and pressing ENTER.

Taking Your Chances

After you run *Dice Game*, the program draws the six possible faces of a die, then displays the game and title screens. Press any key to start the game, and the computer prompts you for your bet. Your bank starts at \$1000 — you can bet any amount up to the amount you have in the bank or \$5000, whichever is lower.

After you enter your bet, the computer rolls the dice. You are prompted for the dice you want to keep and which ones you want to roll again — you are given two chances to come up with four, five or six dice with the same value showing. If you achieve this, your bet is multiplied by 5, 10 or 20, respectively, and added to the bank. Otherwise, the amount you bet is subtracted from the bank. The game ends when you have no money left.

One last note: If an error occurs during game play and the computer gets stuck in an overlay window, enter

```
$display 1b 23 1b 23
```

to kill the overlay windows. You'll then see the BASIC09 prompt onscreen. □

OS-9 Level II

The Listing: Dice_Game.b09

```
PROCEDURE Dice_Game
0000 DIM i,number,t:INTEGER
000F DIM amount,bet,win:REAL
001E DIM key:STRING[1]
002A DIM n(6),hold(6):INTEGER
003F DIM result:INTEGER
0046 t=1
```

```

0040 RUN gfx2("scalesw","off")
0052 RUN gfx2("curoff")
0070 RUN gfx2("tcharsw","off")
0085 RUN gfx2("boldsw","off")
0099 RUN gfx2("clear")
00A6 RUN gfx2("curhome")
00B5 RUN gfx2("color",2)
00C5 PRINT
00C7 PRINT
00C9 PRINT " 0 "
00D1 PRINT
00D3 GOSUB 10
00D7 PRINT
00D9 PRINT " 0"
00DF PRINT " "
00E7 PRINT " 0"
00EF GOSUB 10
00F3 PRINT
00F5 PRINT " 0"
00FB PRINT " 0"
0102 PRINT " 0"
010A GOSUB 10
010E PRINT
0110 PRINT " 0 0"
0118 PRINT " "
0120 PRINT " 0 0"
0128 GOSUB 10
012C PRINT
012E PRINT " 0 0"
0136 PRINT " 0 "
013E PRINT " 0 0"
0146 GOSUB 10
014A PRINT
014C PRINT " 0 0"
0154 PRINT " 0 0"
015C PRINT " 0 0"
0164 GOSUB 10
0168 GOTO 20
016C 10 RUN gfx2("box",4.4,34,33)
0186 RUN gfx2("color",1)
0196 RUN gfx2("fill",5,15)
01A8 RUN gfx2("color",2)
01B8 RUN gfx2("get",1,t,4,4,31,30)
01D7 RUN gfx2("curhome")
01E6 t=t+1
01F1 RETURN
01F3 20 REM
01F9 RUN gfx2("clear")
0206 RUN gfx2("box",5.5,314,60)
021E RUN gfx2("box",10,10,309,55)
0236 RUN gfx2("color",1)
0246 RUN gfx2("fill",6,6)
0258 RUN gfx2("color",2)
0268 FOR i=1 TO 6
0278 RUN gfx2("put",1,1,i*40,18)
0293 NEXT i
029E FOR i=1 TO 6
02AE RUN gfx2("setdptr",i*40+1,17)
02CA RUN gfx2("draw","ne4,e30,sw4,ne4,s29,sw4")
02F0 NEXT i
02FB amount:=1000
0304 RUN gfx2("box",200,65,314,190)
031C RUN gfx2("box",205,70,309,185)
0334 RUN gfx2("color",1)
0344 RUN gfx2("fill",201,66)
0356 RUN gfx2("color",2)
0366 RUN gfx2("tcharsw","on")
037A RUN gfx2("curxy",27,9)
038D PRINT "DICE - GAME"
039C PRINT TAB(29); "-----"
03AD PRINT TAB(27); "6 identical:"
03C1 PRINT TAB(27); " x20"
03D4 PRINT
03D6 PRINT
03D8 PRINT TAB(27); "5 identical:"
03EC PRINT TAB(27); " x10"
03FF PRINT
0401 PRINT
0403 PRINT TAB(27); "4 identical:"
0417 PRINT TAB(27); " x5"
042A RUN gfx2("box",5,65,195,190)
0441 RUN gfx2("box",10,70,190,185)
0458 RUN gfx2("color",1)
0468 RUN gfx2("fill",6,66)
047A RUN gfx2("color",2)
048A RUN gfx2("fill",0,0)
049C RUN gfx2("owset",1,5,5,30,14,4,2)
04BE RUN gfx2("owset",0,6,6,28,12,2,0)
04E0 RUN gfx2("clear")
04E0 RUN gfx2("boldsw","on")
0500 PRINT
0502 PRINT " WELCOME TO : "

```

```

0518 PRINT
051D PRINT
051F PRINT " D I C E G A M E "
053A PRINT
053C PRINT
053E PRINT " BY "
0551 PRINT
0553 PRINT
0555 PRINT " FRANCOIS DUBUC "
056F FOR t=1 TO 20
057F 1=INT(RND(1)*6)+1
0592 RUN gfx2("put",1,i,5,50)
05AB RUN gfx2("put",1,i,187,50)
05C4 NEXT t
05CF GET #0,key
05D8 RUN gfx2("owend")
05E5 RUN gfx2("owend")
05F2 RUN gfx2("boldsw","off")
0606 RUN gfx2("tcharsw","off")
0618 30 REM game
0625 RUN gfx2("owset",0,2,9,21,13,2,4)
0647 REPEAT
0649 REPEAT
0648 RUN gfx2("clear")
0658 PRINT
065A PRINT "YOU HAVE: "; amount; "$"
066F PRINT
0671 PRINT "How much do you"
0684 PRINT "want to bet "
0694 INPUT bet
0699 IF bet<=0 OR bet>amount OR bet>5000 THEN
06B7 RUN gfx2("owset",1,1,6,38,5,3,3)
06D9 RUN gfx2("owset",0,2,7,36,3,2,0)
06FB RUN gfx2("clear")
0708 IF bet<=0 OR bet>5000 THEN
071E PRINT
0720 PRINT "You have to bet between 1 and 5000"
0746 ENDIF
0748 IF bet>amount THEN
0755 PRINT
0757 PRINT "You have only "; amount; "$"
0771 ENDIF
0773 GET #0,key
077C RUN gfx2("owend")
0789 RUN gfx2("owend")
0796 ENDIF
0798 UNTIL bet>0 AND bet<=amount AND bet<5001
07B5 PRINT
07B7 PRINT "press 'ENTER' to spin"
07D0 GET #0,key
07D9 RUN gfx2("owend")
07E6 FOR t=1 TO 6
07F6 FOR i=1 TO 5
0806 n(t)=INT(RND(1)*6)+1
081D RUN gfx2("put",1,n(t),t*40,18)
083D NEXT i
0848 NEXT t
0853 RUN gfx2("owset",0,2,9,21,13,2,4)
0875 RUN gfx2("clear")
0882 FOR i=1 TO 6
0892 RUN gfx2("clear")
089F PRINT
08A1 PRINT "Do you want to"
08B3 PRINT "hold dice #"; i; " ?"
08CA REPEAT
08CC GET #0,key
08D5 UNTIL key="y" OR key="n"
08E9 IF key="y" THEN
08F6 hold(i)-1
0901 ENDIF
0903 IF key="n" THEN
0910 hold(i)=0
0918 ENDIF
091D NEXT i
0928 RUN gfx2("clear")
0935 PRINT
0937 PRINT "Do you want to"
0949 PRINT "change something"
095D PRINT "[y/n] ?"
0968 REPEAT
096A GET #0,key
0973 UNTIL key="y" OR key="n"
0987 UNTIL key<>"y"
0993 RUN gfx2("clear")
09A0 PRINT
09A2 PRINT "Press 'ENTER' to spin"
09BB GET #0,key
09C4 RUN gfx2("owend")
09D1 FOR t=1 TO 6
09E1 IF hold(t)=0 THEN
09F0 FOR i=1 TO 5
0A00 n(t)=INT(RND(1)*6)+1

```



```

0A17      RUN gfx2("put".1,n(t),t*40,18)
0A37      NEXT i
0A42      ENDF
0A44      NEXT t
0A4F 100  REM
0A55      FOR i=-1 TO 6
0A65          hold(i)=0
0A70      NEXT i
0A7B      win:=0
0A83      result:=0
0A8A      FOR i=-1 TO 6
0A9A          hold(n(i)):=hold(n(i))+1
0AB2      NEXT i
0ABD      FOR t:=4 TO 6
0ACD          FOR i=-1 TO 6
0ADD              IF hold(i)=t THEN
0AED                  IF t=6 THEN
0AF9                      win:=20*bet
0B05                          result:=6
0B0C                  ENDF
0B0E                      IF t=5 THEN
0B1A                          win:=10*bet
0B26                              result:=5
0B2D                  ENDF
0B2F                      IF t=4 THEN
0B3B                          win:=5*bet
0B47                              result:=4
0B4E                  ENDF
0B50          ENDF
0B52      NEXT t
0B5D      NEXT i
0B68      IF result=0 THEN
0B74          win:=-bet
0B7D      ENDF
0B7F      RUN gfx2("owset".1,5,5,30,14,2,2)
0BA1      RUN gfx2("owset".0,6,6,20,12,2,0)
0BC3      RUN gfx2("clear")
0BD0      PRINT "DICE GAME RESULT:"
0BE5      PRINT "-----"
0C04      PRINT "current amount: "; amount
0C1B      PRINT "you bet          : "; bet
0C32      IF result=0 THEN
0C3E          PRINT "you got no good combination"
0C5D      ENDF
0C5F      IF result>0 THEN
0C6B          PRINT "you got a combination of "; result
0C8C          PRINT "identical dices"
0C9F      ENDF
0CA1      PRINT "your amount is change by:"
0CBE      PRINT win: "$"
0CC7      PRINT "-----"
0CE6      amount:=amount+win
0CF2      PRINT "new amount: "; amount: "$"
0D09      GET #0,key
0D12      IF amount<=0 THEN
0D1F          RUN gfx2("owset".1,2,9,36,6,2,3)
0D41          RUN gfx2("owset".0,3,10,34,4,2,0)
0D63          RUN gfx2("clear")
0D70          PRINT "*** YOU LOST ALL YOUR MONEY ***"
0D95          PRINT
0D97          PRINT "-----GAME OVER-----"
0DBC          GET #0,key
0DC5          RUN gfx2("owset".1,10,4,20,16,1,1)
0DE7          RUN gfx2("owset".0,11,5,18,14,2,0)
0E09          REPEAT
0E0B              RUN gfx2("clear")
0E18              PRINT
0E1A              PRINT
0E1C              PRINT TAB(7); "PLAY"
0E28              PRINT
0E2A              PRINT
0E2C              PRINT
0E2E              PRINT TAB(7); "AGAIN"
0E3B              PRINT
0E3D              PRINT
0E3F              PRINT
0E41              PRINT TAB(7); "[Y/N]?"
0E4F              GET #0,key
0E58              UNTIL key<>"y" OR key<>"n"
0E6C              FOR i=-1 TO 6
0E7C                  RUN gfx2("owend")
0E89              NEXT i
0E94              RUN gfx2("clear")
0EA1              IF key="y" THEN
0EAE                  RUN dice_game
0EB2              ENDF
0EB4              END
0EB6              ENDF
0EB8              FOR i=-1 TO 2
0EC8                  RUN gfx2("owend")
0ED5              NEXT i
0EE0              GOTO 30

```

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Program Aid/16K Extended

Press Continue . . . by Bill Bernico

I often look for ways to make the ordinary seem a little more exciting. *Continue* is a perfect example. You have no doubt used programs that pause, allowing you to catch up. These programs usually provide some message, such as "Press Any Key to Continue." My subroutine adds to this, making sure you won't fall asleep or forget to press a key.

The Listing: PRESCONT

```
1 *PRESS CONTINUE
** WRITTEN BY BILL BERNICO
** COPYRIGHT (C) DECEMBER 1991
```

To use *Continue* in your own programs, put your message in Variable A\$, as shown in Line 3. Start the rest of your program at Line 13 — when the user presses a key, program execution continues here. Alternatively, you can relocate the subroutine. Then your program could call it using GOSUB and RETURN.

```
** BY FALSOFT, INC.
2 CLS:PRINT"THIS SUBROUTINE IS U
SED TO SPRUCE UP YOUR ORDIN
```

```
ARY INKEY$ PAUSE ROUTINE.
3 A=400:A$="press any key to con
tinue":PRINT@A,STRING$(31,46)::B
=LEN(A$):IFB>26THENB=26
4 C=INT(A+(34-B)/2)+B:B$=MID$(A$
.1,B):A$="."+B$+"..
5 D=0:E=LEN(A$):B=E:F=1
6 IFB=>D THENB=D+1
7 C$=MID$(A$,F,B):PRINT@C-D,C$::
FORG=1TO20:NEXT
8 I$=INKEY$:IFI$<>" "THEN12
9 IF D=E THEN11
10 D=D+1:IFD<E THEN6
11 B=B-1:F=F+1:IFB<0THEN5ELSE6
12 PRINT@A,STRING$(31," "):A$=M
ID$(A$,2,LEN(A$)-3)
13 CLS:PRINT"YOUR PROGRAM CONTIN
UES FROM HERE
```

Utility/16K Disk

File Size by Darren Blaine Day

Have you ever needed to know exactly how many bytes are in a disk file? If so, *File Size* can help. This utility calculates the length of any file on disk and prints the information onscreen. To use the program, simply enter the drive number and filename. It isn't necessary to use a slash or period to separate the filename from the extension, but do be careful to follow the onscreen prompts.

File Size finds the file's directory entry (lines 1000 through 1055), obtains the starting disk granule for the file (Line 30), and traces the file's occupied granules through the file allocation table (lines 2000 through 2015). It then calculates the size of the file, based on the number of full granules used, and the number of sectors and bytes used in the last granule (Line 45). All of the data *File Size* needs is located on Track 17 of the disk. To learn more about Track 17, consult the technical section of your disk drive manual.

The Listing: FILESIZE

```
1 *FILE SIZE
2 *WRITTEN BY DARREN DAY
3 *COPYRIGHT (C) DECEMBER 1991
4 *BY FALSOFT, INC.
5 CLEAR 1000:CLS
10 INPUT "DRIVE #":DN:PRINT "TYP
E FILENAME UNDER LINES AND EXT
ENSION UNDER STARS. FILL BLA
NKS WITH SPACES.":PRINT "-----
-***":LINE INPUT F$
15 GOSUB 1000
20 DSKI$ DN,17,X,A$,B$
25 C$=A$+LEFT$(B$,127)
30 B$=MID$(C$,N*32+14,1)
35 NB$=MID$(C$,N*32+15,2)
40 GOSUB 2000
45 SZ=ASC(LEFT$(NB$,1))+ASC(RIGH
T$(NB$,1))+((NG*2304)+(ASC(BG$)-
&H00-1)*256)
50 PRINT SZ;"BYTES LONG.":PRINT
" OR ABOUT":PRINT USING "###.#
# % %";SZ/1024;"KILOBY
TE(S)"
55 PRINT "PRESS ANY KEY FOR ANOT
HER":EXEC 44539:RUN
1000 FOR X=3 TO 11
```

```
1005 DSKI$ DN,17,X,A$,B$
1010 C$=A$+LEFT$(B$,127)
1015 N$(0)=LEFT$(C$,11)
1020 FOR N=1 TO 7
1025 N$(N)=MID$(C$,N*32+1,11)
1030 NEXT N
1035 FOR N=0 TO 7
1040 IF F$=N$(N) THEN RETURN
1045 NEXT N
1050 NEXT X
1055 PRINT "FILE NOT FOUND":PLAY
"P2":RUN
2000 DSKI$ DN,17,2,A$,B$
2005 BG$=MID$(A$,ASC(BG$)+1,1)
2010 IF ASC(BG$)=&H00 THEN RETU
RN
2015 NG=NG+1:GOTO 2005
```

PMODE 4 Snapshot

by Keiran Kenny

Snapshot allows you to save a selected part of any PMODE 4 graphics screen. You can use the program with PMODE 4 pictures already in memory (e.g., drawn by a BASIC program) or you can have *Snapshot* load the image for you from tape or disk. If the image is to be drawn by another program, run that program first and press BREAK.

After you run *Snapshot*, select Option 1 to save a part of a picture. You are prompted for whether the picture is in memory. If so, press Y. Otherwise, *Snapshot* asks you for the filename of the previously saved PMODE 4 image. If you are using a disk drive, *Snapshot* knows it and uses the drive for loading and saving files. Otherwise the program saves and loads from tape. Line 100 sets DV=1 (for disk) or DV=-1 (for tape) accordingly.

Once the image is loaded, select the portion you want to save. Move around the screen using the arrow keys. To move diagonally, press two arrow keys at the same time. Press X while also pressing an

arrow key to speed the movement of the cursor. When the cursor is positioned at the upper-left corner of the section you want to save, press U. Then move to the lower-right corner of the section and press L. When you press L, the screen clears, leaving only the portion of the image you have selected. At this point you can move the selected image by placing the cursor where you want the upper-left corner and pressing M.

To save the image, press S. *Snapshot* prompts you for the filename. (As long as you enter a different filename, your original PMODE 4 image remains unaffected.) Again, the program automatically saves to disk (if you have one) or tape. It is important to note that the saved file is actually a complete PMODE 4 image, with the unwanted portion removed, and it occupies the same amount of storage space as the original image. To load a saved portion or a different PMODE 4 image for viewing, select Option 2 when you start *Snapshot*.

The Listing: PM4PTSCR

```
0 'SAVE PMODE4 PART SCREENS
1 'WRITTEN BY KEIRAN KENNY
2 'COPYRIGHT (C) DECEMBER 1991
3 'BY FALSOFT, INC.
4 'RAINBOW MAGAZINE
10 DIMD(1228)
20 CLS:PRINT@160,"1. SAVE A PART
PIX"...,"2. LOAD A PARTPIX":PRINT
:PRINTTAB(4)"PRESS 1 OR 2"
30 K$=INKEY$:IFK$<>"1"ANDK$<>"2"
THEN30
40 IFK$="2"THEN390
```

```
50 CLS:PRINT@224,"IS FULL PIX IN
MEMORY? Y/N"
60 K$=INKEY$:IFK$<>"Y"ANDK$<>"N"
THEN60
70 IFK$="Y"THEN90
80 PRINT:INPUT"LOAD PIX:":PX$
90 PMODE4,1:COLOR0,5
100 IFPEEK(&H15F)=196THENDV=1ELSDV=-1
110 IFK$="Y"THEN130
120 IFDV=1THENLOADMPX$ ELSELOAD
MPX$
```

```
130 SCREEN1,1
140 X=128:Y=96:N=1
150 IFPEEK(341)=247THENY=Y+N
160 IFPEEK(342)=247THENY=Y+N
170 IFPEEK(343)=247THENX=X+N
180 IFPEEK(344)=247THENX=X+N
190 IFPEEK(338)=247THENN=6ELSEN=
1
200 IFPEEK(135)=85THENX1=X:Y1=Y
210 IFP ANDPEEK(135)=83THEN340EL
SEIFP=0ANDPEEK(135)=83THENX=X1:Y
=Y1:GOTO340
220 IFPEEK(135)=76THENH=X-X1:V=Y
-Y1:GET(X1,Y1)-(X1+H,Y1+V),D,G:P
CLS:PUT(X1,Y1)-(X1+H,Y1+V),D,PSE
T:POKE135,0
230 IFPEEK(135)=77THENP=1:PCLS:P
UT(X,Y)-(X+H,Y+V),D,PSET:POKE135
,0
240 IFX<0THENX=0
250 IFX+H>255THENX=255-H
260 IFX>255THENX=255
270 IFY<0THENY=0
280 IFY+V>191THENY=191-V
290 IFY>191THENY=191
300 DR=PPOINT(X,Y):IFDR=0THENCL=
5ELSECL=0
310 PSET(X,Y,CL):FORD=1TO100:NEX
T:PSET(X,Y,DR):GOTO320
320 GOTO150
330 GOTO330
340 POKE135,0:CLS:PRINT@224,"SAV
E PARTPIX NAME:":INPUTPP$
350 SCREEN1,1
360 IFDV=1THENSAREMPP$,3584,9727
,40999:GOTO380
370 CSAREMPP$,1536,7679,40999
380 CLS:PRINT@224,"PARTPIX "+CHR
$(34)+PP$+CHR$(34)+" SAVED.":EN
D
390 CLS:PRINT@224,"LOAD PARTPIX
NAME:":INPUTPP$
400 PMODE4,1:COLOR0,5:PCLS:SCREE
N1,1
410 IFPEEK(&H15F)=196THENLOADMPP
$ ELSELOADMPP$
420 SOUND128,4
430 EXEC44539:CLS:END
```

Utility/CoCo 3 Disk

Improved Directory

by Geoff Friesen

IDIR is a short utility that enhances the CoCo 3 DIR command, causing it to display the total number of files on the disk and the number of granules occupied. (A granule equals 2304 bytes and is the basic unit of allocation for disk files.) This information is useful when you need to know if there is enough room on a disk to store more files.

The program requires a CoCo 3 and

Disk BASIC Version 2.1. To install *IDIR*, simply run the BASIC program. The patch also redirects the reset vector. When the Reset button is pressed, the program automatically reinitializes itself — it is not lost.

IDIR should be installed *after* other machine-language routines, if any. Also keep in mind that since *IDIR* makes several modifications to the DIR command, it

most likely won't work with other utilities that patch this command.

I hope you enjoy using *IDIR*.

The Listing: IDIR

```
100 'IDIR
110 'WRITTEN BY GEOFF FRIESEN
120 'COPYRIGHT (C) DECEMBER 1991
130 'BY FALSOFT, INC.
140 'RAINBOW MAGAZINE
```

```

150 *
160 CLEAR 200,PEEK(&H27)*256+PEEK(&H28)-176
170 SA=PEEK(&H27)*256
180 SA=SA+PEEK(&H28)+1
190 FOR I=SA TO SA+176
200 READ B$
210 POKE I,VAL("&H"+B$)
220 NEXT I
230 EXEC SA+10:CLS
240 PRINT "IDIR INSTALLED":NEW
250 DATA 12,B7,FF,DF,8D,0F,6E,9D

```

```

260 DATA 00,5A,9E,72,AF,8D,00,54
270 DATA 30,8C,ED,9F,72,86,8D,B7
280 DATA CC,A9,30,8D,00,4A,BF,CC
290 DATA AA,87,CC,D7,30,8D,00,49
300 DATA BF,CC,08,86,7E,B7,CC,FB
310 DATA 30,8D,00,43,BF,CC,FC,B7
320 DATA CD,12,30,8D,00,49,BF,CD
330 DATA 13,87,CD,15,30,8D,00,47
340 DATA BF,CD,16,86,42,12,12,12
350 DATA B7,CC,D2,39,0D,46,49,4C
360 DATA 45,53,3A,20,20,47,52,41
370 DATA 4E,53,3A,20,00,00,00,00

```

```

380 DATA 6F,8C,FB,6F,8C,F9,7E,D2
390 DATA 4F,6C,8C,F2,7E,B9,A2,BD
400 DATA CD,1E,34,02,AB,8C,E8,A7
410 DATA 8C,E5,35,04,7E,CC,FF,5C
420 DATA C1,0C,22,03,7E,CC,BB,30
430 DATA 8C,C2,C6,08,8D,B9,A2,E6
440 DATA 8C,CC,4F,8D,8D,CC,30,8C
450 DATA BB,C6,08,8D,B9,A2,E6,8C
460 DATA BE,4F,8D,8D,CC,8D,B9,58
470 DATA 39,*

```

Game/CoCo 3

Peggy

by George Aftamonow

Peggy is a one-player game for the CoCo 3. The object of the game is to fill each box on a diamond-shaped grid with one of five colors. You must do this in such a way that no two adjacent boxes (horizontally, vertically or diagonally) are of the same color. To make things just a little more difficult, you can fill only squares that are next to already-colored squares — *Peggy* gets you started by filling four squares. If you manage to color all the boxes, a new grid appears and the game continues. The game is over

when you can't legally fill any more boxes on the grid.

The color you must use to fill boxes is randomly selected and is shown on the upper-left part of the screen. The number of each color remaining is shown on the right of the screen. Press the arrow keys to position the blinking-square cursor, and press ENTER to fill the square. Press Q to quit the game at any time. Game play is simple, but filling even one entire grid is quite challenging. Good luck!

```

65 HCOLOR9:HLIN(0,50)-(320,150)
.PSET,B:HLIN(56,80)-(0,50),PSET
:HLIN(0,150)-(60,120),PSET:HLIN
E(270,80)-(320,50),PSET:HLIN(25
8,120)-(320,150),PSET
90 HCOLOR2:HLIN(50,162)-(270,18
0),PSET,B:HPRINT(9,21),"NEED INS
TRUCTIONS Y/N?"
91 I$=INKEY$:IFI$=""THEN91
92 IFI$="N"THEN99ELSEHCLS
93 HLINE(2,15)-(318,152),PSET,B:
HLIN(4,17)-(316,150),PSET,B:HPR
INT(3,5),"THE OBJECT IS TO FIL
L EVERY BOX":HPRINT(3,6),"SO TH
AT NO TWO OF THE SAME COLORS":H
PRINT(3,7),"ARE NEXT TO EACH OTH
ER,VERTICALLY,":HPRINT(3,8),"HOR
IZONTALLY, OR DIAGONALLY."
94 HPRINT(3,9),"ONCE A COLOR IS
PLACED, IT MAY NOT":HPRINT(3,10)
."BE REMOVED OR CHANGED.":HPRINT
(3,11),"COLORS MUST BE PLACED
NEXT TO AN":HPRINT(3,12),"EXISTI
NG COLORED BOX."
96 HPRINT(3,13),"USE ARROW KEY T
O MOVE BLINKING BOX":HPRINT(3,14)
).THEN PRESS ENTER. HIT Q TO
QUIT":HPRINT(9,17),"PRESS ENTER

```

The Listing: PEGGY

```

1 *PEGGY
2 *WRITTEN BY GEORGE & ELLEN AFT
AMONOW
3 *COPYRIGHT (C) DECEMBER 1991
4 *BY FALSOFT, INC.
5 DIMB(81)
6 *for the coco 3
10 PALETTE0,0:PALETTE5,63:HSCREE
N2:HCLS0:HCOLOR5,0
15 HPRINT(10,10),"(C)MP OR (R)GB
?"
20 I$=INKEY$:IFI$=""THEN20
30 IFI$="C"THEN40ELSEIFI$="R"THE
N50ELSE20
40 PALETTECMP:PALETTE0,0:PALETTE
1,17:PALETTE2,39:PALETTE3,58:PAL
ETTE4,53:PALETTE5,63:PALETTE6,41
:PALETTE9,7:PALETTE10,52:PALETTE
12,38:PALETTE14,51:GOTO55
50 PALETTERGB:PALETTE0,0:PALETTE
1,16:PALETTE2,38:PALETTE3,29:PAL
ETTE4,55:PALETTE5,63:PALETTE6,45
:PALETTE7,57:PALETTE8,44:PALETTE
12,32:PALETTE13,42:PALETTE14,15:
PALETTE9,32:PALETTE10,52: 0=BLK
1=GRN 2=RED 3=BLU 4=YLW 5=WHT 6
=PUR 9=DRKRED 10=LT RE
55 HCLS0:HSCREEN2:HCOLOR2
57 HPRINT(12,3),"George and Elle
n":HPRINT(15,4),"present:"
60 HDRAW"0M70,120S8L6U20R14F2D2B
L4L6D4R6NU4BR4NU3D2G2L8D8R26 LI
6U15BUU4R16D4L10D4R4D4L4D4R10BD2
D2"

```

```

61 HDRAW"BR14L12H2UBUU14E2R12F2B
D2ND4L10D12R6U4L2U4R6D10G2BR16 L
12H2BU16E2R12F2NU20D2ND4L10D12R6
U4L2U4R6D10NG2D2 R6U16NR6UBUU2NL
6"
62 HDRAW"R18DBDD2L6ND16BL6D16R6B
R18 L6U10H6BU4R2F6R2E6R2D4G6D10"
63 HPAINT(68,118),4,2
64 HLINE(1,50)-(319,150),PSET,B:
HLIN(6,54)-(312,146),PSET,B:HLI
NE(16,60)-(300,140),PSET,B:HLIN
(34,70)-(284,134),PSET,B:HPAINT(
2,51),9,2:HPAINT(7,55),2,2:HPAIN
T(33,68),10,2

```



TO START."

98 IFINKEY\$="" THEN98

99 SC=4

100 HCLS0

110 B\$="L20U16R20D16BR30"

120 HDRAW"C3BM140,25S4"+B\$:HDRAW
"BM110,50"+B\$+B\$+B\$

125 HDRAW"BM00,75":FORB=1T05:HDR
AW"XB\$":NEXT

130 HDRAW"BM50,100":FORB=1T07:HD
RAW"XB\$":NEXT:HDRAW"BM00,125":

FORB=1T05:HDRAW"XB\$":NEXT

135 HDRAW"BM110,150"+B\$+B\$+B\$:HD
RAW"BM140,175"+B\$

140 HCOLOR2:HLINE(251,10)-(315,1
00),PSET,B:HLINE(249,150)-(315,1
00),PSET,B:HDRAW"BM45,48"+B\$

150 HPRINT(0,2),"NEXT COLOR":HPR
INT(33,17),"SCORE"

200 C=0:Y=20:FORZ=1T05:X=260:C=C
+1:FORX=260T0300STEP10:HCOLORC:H
LINE(X,Y)-(X+6,Y+B),PSET,BF:NEXT

X:Y=Y+15:NEXTZ

210 P=14:FORZ=1T05:P(Z)=5:NEXT

220 X=138:Y=23:E=14:FORZ=1T04:A=
RND(5):AX=250+P(A)*10:AY=5+A*15:

HCOLOR0:HLINE(AX,AY)-(AX+6,AY+B)

,PSET,BF:P(A)=P(A)-1:HPAINT(X,Y)
,A,3:B(E)=A:IFZ=1 THENX=48:Y=98:

E=38:ELSEIFZ=2 THENX=228:Y=98:E=
44:ELSEIFZ=3 THENX=138:Y=173:E=6

8

230 NEXT:X=140:Y=25

250 C=RND(5):IFP(C)=0 THEN250

260 XC=250+P(C)*10:YC=5+C*15:HCO
LOR0:HLINE(XC,YC)-(XC+6,YC+B),PS
ET,BF:P(C)=P(C)-1

270 HCOLORC:HLINE(44,47)-(26,33)
,PSET,BF

300 PALETTE15,63:HDRAW"BM-X;,-Y;
C15XB\$:"

310 I\$=INKEY\$:IFI\$="" THENPALETT
E15,0R(PALETTE15,63:GOTO310ELSEHD
RAW"BM-X;,-Y:C3XB\$:"

320 IFI\$=CHR\$(13) ANDB(P)=0THENI
FB(P-9)<0 ORB(P-1)<0 ORB(P+1)<
>0 ORB(P+9)<0 THEN400

330 IFI\$=CHR\$(9) ANDP<>14 ANDP<>
24 ANDP<>34 ANDP<>44 ANDP<>52 AN
DP<>60 ANDP<>68 THENP=P+1:X=X+30
:GOTO3000

340 IFI\$=CHR\$(8) ANDP<>14 ANDP<>

22 ANDP<>30 ANDP<>20 ANDP<>38 AN

DP<>48 ANDP<>58 ANDP<>68 THENP=P
-1:X=X-30:GOTO3000

350 IFI\$=CHR\$(94) ANDP<>14 ANDP<
>22 ANDP<>24 ANDP<>30 ANDP<>34 A
NDP<>38 ANDP<>44 THENP=P-9:Y=Y-2

5:GOTO3000

360 IFI\$=CHR\$(10) ANDP<>38 ANDP<
>44 ANDP<>48 ANDP<>52 ANDP<>58 A
NDP<>60 ANDP<>68 THENP=P+9:Y=Y+2

5:GOTO3000

370 IFI\$="0" THEN425

380 GOTO500

400 IFB(P-10)=C ORB(P-9)=C ORB(P
-8)=C ORB(P+1)=C ORB(P+10)=C ORB
(P+9)=C ORB(P+8)=C ORB(P-1)=C TH
EN500ELSEHPAINT(X-1,Y-1),C,3:HCO
LOR0:HLINE(44,47)-(26,33),PSET,B

F:B(P)=C

410 HLINE(270,160)-(300,175),PSE
T,BF:SC=SC+1:HCOLOR4:HPRINT(34,2
0),SC:IFSC/25<>INT(SC/25) THEN25
0

420 SC=SC+4:PALETTE15,53:HCOLOR1
5:HPRINT(2,22),"NEXT SCREEN":FOR
Z=1T05:PLAY"T250L200EAGAEAGAEAGE

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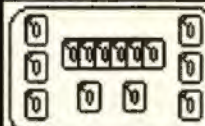
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```
" : PALETTE15,0:PALETTE15,53:NEXT:
GOTO440
425 HCOLOR4:HPRINT(2,24),"PLAY A
GAIN?":SC=4
430 IS=INKEY$:IFIS="" THEN430
```

```
435 IFIS="N" THENCLS:RGB:END:ELS
EIFIS="Y" THEN440ELSE430
440 FORZ=1TO81:8(Z)=0:NEXT:GOTO1
00:ELSE430
500 HCOLOR4:HPRINT(6,23),"ILLEGA
```

```
L":PLAY" T255L20001BADO2BADO3BAD"
:FORZ=1TO50:NEXT:HCOLOR0:HPRINT(
6,23),"ILLEGAL":GOTO300
```

Utility/CoCo 3

Palette Tints by Keiran Kenny

I have seen numerous programs in THE RAINBOW that display all 64 palette tints available on the CoCo 3. However, I needed one that groups the tints, allowing me to choose between all the reds, all the blues, etc. *Tint Pal* is my solution.

When you run the program, you see a menu from which you can select any of seven different color groups. After you select a category, *Tint Pal* displays all the

colors available in that category, along with the corresponding color values.

The color groups are set using PL\$ in lines 120 through 170. The color numbers are given as consecutive two-digit values. Like beauty, color is in the eye of the beholder — feel free to vary the values to reflect the way your eyes interpret color. Also, as written, *Tint Pal* gives appropriate colors only on RGB monitors. You'll

have to change the values to use the program with a composite monitor.

I find it useful to have *Tint Pal* accessible when I write other programs. To do this, you can renumber the program by entering RENUM 10000,10. Also add the line 9990 GOTO9990. Then start writing your program at Line 10. When you want to check a color value, just enter RUN 10000. Press BREAK to exit.

The Listing: TINTPAL

```
0 *PALETTE TINT GROUPS
1 *WRITTEN BY KEIRAN KENNY
2 *COPYRIGHT (C) DECEMBER 1991
3 *BY FALSOFT, INC.
4 *RAINBOW MAGAZINE
10 POKE65497,0
20 ONBRKGOTO310
30 ONERRGOTO320
40 PALETTE0,0:HSCREEN2:HCOLOR1
50 HPRINT(0,0),"CHOOSE PALETTE T
INTS:"
60 HPRINT(0,2),"(1) GREENS":HPRIN
T(20,2),"(2) YELLOWS"
70 HPRINT(0,4),"(3) BLUES":HPRIN
T(20,4),"(4) REDS"
80 HPRINT(0,6),"(5) PURPLES":HPR
INT(20,6),"(6) BROWNS/ORANGES"
90 HPRINT(0,8),"(7) GRAY & WHITE
"
100 K$=INKEY$:IFK$<"1"ORK$>"7"TH
EN100ELSEHCLS
```

```
110 ONVAL(K$)GOTO120,130,140,150
,160,170,180
120 PL$="02061617181920212223263
058":C$="GREENS":GOTO190
130 PL$="484950515253545562":C$="
YELLOWS":GOTO190
140 PL$="01030809101112131415242
5262728293031575859":C$="BLUES":
GOTO190
150 PL$="04323334353637383944":C
$="REDS":GOTO190
160 PL$="04053340414243444546476
1":C$="PURPLES":GOTO190
170 PL$="34385253":C$="BROWNS/OR
ANGES":GOTO190
180 PL$="075663":C$="GRAY & WHIT
E"
190 DM=LEN(PL$)/2
200 X=0:Y=16
210 FORT=1TOLEN(PL$)STEP2
220 PT=PT+1:IFPT>15THENSOUND120,
```

```
3:HPRINT(14,21),"PRESS ANY KEY":
EXEC44539:HCLS:PT=0:X=0:Y=16:GOT
0220
230 PL=VAL(MID$(PL$,T,2))
240 PALETTEPT,PL
250 HPRINT(20-LEN(C$)/2,0),C$
260 HCOLORPT:HLINEX,Y)-(X+32,Y+
32),PSET,BF
270 HPRINT(X/8,(Y+40)/8),PL
280 IFPT=8THENX=0:Y=Y+56ELSEX=X+
40
290 NEXTT
300 HPRINT(14,21),"PRESS ANY KEY
":EXEC44539:PT=0:HCLS:PALETTE1,5
4:GOTO40
310 POKE65496,0:RGB:CLS:END
320 POKE65496,0:RGB:CLS:PRINT@22
4,"ERROR#"ERNO"IN LINE"ERLIN:END
```



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Monitor Conversions

by Marty Goodman
Contributing Editor

Q Can IBM monochrome or VGA monochrome monitors be used with the CoCo 3's RGB video output?

Francis Swygert (DESTFOX)
Robins AFB, Georgia

A The Color Computer's horizontal-sync frequency is 15.75 KHZ while the horizontal-sync frequency of IBM monochrome monitors is around 19 KHZ. This difference is enough that many IBM monochrome monitors can't sync to the Color Computer's horizontal-sync signal unless you adjust the ferrite slug in the horizontal oscillator or make some other modification. Once the horizontal-sync discrepancy is dealt with, you still need a means of converging the three analog RGB signals together and turning them into luminance and intensity signals at TTL levels. Second City Software was selling such a circuit at the last RAINBOWfest. The problem is that even if you get the monitor to sync to the lower frequency, the image will occupy only the center two-thirds of the screen. VGA monitors sync at many different frequencies, but the lowest of those is 31.5 KHZ. Thus, there is no reasonable way that a VGA monochrome monitor is likely to sync to a CoCo 3 video signal. In fact, connecting a VGA monitor to the CoCo might damage the monitor.

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.

PIA Chips

Q What's the story with that mystery PIA chip used for the keyboard in the CoCo 3? The other PIA is a standard 68B21, but the keyboard PIA has a weird, proprietary-looking part number, yet appears to be used just the same as one would use a 68B21.

Douglas Berry (DBBB)
Leland, North Carolina

A Original revision D and E motherboards used ordinary 6821s for the keyboard. With the revision F motherboard and CoCo 2 models, a 6822 open-collector PIA was used, in association with the needed pull-up resistors. Recently Jim Harrison (JIMHARRISON) ordered a replacement keyboard PIA for his CoCo 3 from National Parts and received a regular 68B21 chip! He was rather surprised, as was I when he told me of it. But he tried the chip in his CoCo 3, and it appears to work just fine. Thus, while I am not at all sure what is special about the chip Tandy supplies as the keyboard PIA for the CoCo 3, I can tell you that Jim Harrison's experience is that a 68B21 works fine as a replacement. Jim points out that there are no pull-up resistors on the circuit for the CoCo 3. So you would not expect Tandy to use an open-collector version of the PIA. It seems as if Tandy went full circle, from ordinary PIA to open-collector PIA and back to ordinary PIA in its design.

Star/Commodore Printer

Q My son was given a Commodore 128 and a Star SL-10C printer. Can he use the printer with a CoCo 3?

Stephen H. Wallace (SPARKYWALL)
Kellyville, Oklahoma

A Commodore computers often send data to the printer via a Commodore-

only variant of RS-232 protocol. More specifically, older Commodore computers and printers (and modems) communicated via a 5-pin DIN connector that carried RS-232 signals at TTL voltage levels. If your printer has a 5-pin DIN connector, it likely is one of those printers custom produced for use with the Commodore. If you are a hacker, you can fix this by adding level-converter chips (either Max 232, or 1488 and 1489 line drivers and receivers) to appropriate lines on the interface to turn the Commodore-only serial interface into a general-purpose RS-232 interface. Alternatively, if your printer has a parallel port (and assuming you know the DIP switch setting to activate that port), you can use a serial-to-parallel converter with your CoCo 3. The argument against using a serial-to-parallel converter is that such converters cost about \$50 or more. The argument for using such a converter is that most printers now available include parallel interfaces, and whatever printer you buy in the future for your CoCo 3 will also likely require such a converter.

Null-Modem Cables

Q What is the pin-out for a null-modem cable that I can use between my AT-compatible and my CoCo 3? I have an RS-232 Pak on the CoCo 3. I have DB-25 connectors on both the RS-232 Pak and on the AT serial port.

Ted Jaeger (TEDJAEGER)
Fayetteville, North Carolina

A I recommend using what is called a "non-handshaking" null-modem cable. This cable involves only three wires between the two computers, plus some extra jumpers on the connectors that go to each computer. Between the two computers, connect Pin 7 of one to Pin 7 of the other,

and Pin 2 of each computer to Pin 3 of the other computer. Now, connect together pins 6, 7 and 20 of the connector at each end of the cable. Also short pins 4 and 5 together at each end of the cable. You now have a null-modem cable that should work fine for file transfers. I have used such a cable for the transfer of many megabytes of data between my CoCo and PC-compatibles.

Monitor Conversions

Q *What is involved in converting a Magnavox 8CM652 or 8CM762 monitor so it can accept analog RGB signals, the way the Magnavox 8CM515 can?*

*Barry L. Brooks
Omaha, Nebraska*

A The Magnavox 8CM652 and 8CM762 use exactly the same circuit board as the Magnavox 8CM515. However, the circuit board is not as fully populated. Roughly 50 components, all having to do with the RGB analog input, are left out. This includes the 6-pin DIN connector and a large number of resistors, transistors, diodes and capacitors. Interestingly the total cost of the missing components is under \$10 (excluding the 6-pin DIN connector). In fact, if you are a patient and dedicated tinkerer, and if you have the service manual for that line of

Magnavox monitors (available from Magnavox for about \$15), you can determine exactly what parts are missing (the silk screening on the circuit board helps a lot). When you add all the missing components, you'll get, in effect, a Magnavox 8CM515 monitor.

I actually did this for Howard Medical on one occasion when they were investigating what was involved in doing just such a conversion. It turns out the conversion is possible, and the parts cost is quite low (resistors and small-signal diodes cost about a penny apiece at most electronic supply houses, and the required general-purpose, small-signal transistors are about 15 cents each). However, the conversion is rather tedious and time consuming. You must first remove the solder from over a hundred holes on the wave-soldered circuit board, then add the required components, with careful reference to a comparison of the two schematic diagrams. Note that you will not fill in all the missing components, as some of the missing components on an 8CM672 relate to a missing (and unneeded) comb filter or to other minor differences between it and the 8CM515 that do not need to be rectified. Just add only those components that are part of the analog input circuitry and that appear on the schematic for the

8CM515 but not on the schematic for the 8CM862. This includes some video-input components and some extra power supply circuitry.

Sendless Modem

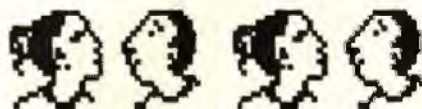
Q *I have an older modem that will not send data when I connect it using a standard CoCo-to-modem cable. Any suggestions?*

*Dennis McMillian (COCOKIWI)
Pittsburgh, California*

A Many older modems require a valid signal (Logic 1 or High) on the RTS (request to send) line before they can send data. Most of these older modems have a source of +12 volts on Pin 9. So, just pull up Pin 4 (RTS) of the modem, possibly by merely tying it to Pin 9 of your modem (if Pin 9 is in fact a source of 8 to 12 volts). This is not likely to be a problem using the Tandy RS-232 Pak, but it could be a problem if you are using the 4-pin serial port or if you are using a Disto or CoCoPRO! RS-232 pak that does not support CTS and RTS lines.

A Mountain of Questions

Q *My computer system was hit by lightning, and my modem was destroyed. I got the CoCo fixed, but it still fails to work*



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with my RS-232 Pak and Multi-Pak, though the rear serial port still works. I have MikeyTerm, VTerm and the DeskMate terminal program for the CoCo 3. What do you suggest? Tandy says it will not repair my RS-232 Pak if it is broken. I cannot at this time log onto Delphi to get your answer.

I was given an IBM monochrome monitor, which I hooked to my Tandy 1000 HX computer. But I get a double image. The screen seems divided in half (top and bottom) where the image repeats. How do I fix this?

Alan Lundaberg
Altoona, Pennsylvania

A It is possible your RS-232 Pak or Multi-Pak was damaged during that lightning hit. First try making a modem cable that connects your modem to the 4-pin serial port of the CoCo, and see if (after configuring VTerm for use with the bit-banger serial port) you can get the modem to work. That, at least, should get you back on Delphi. The cable to use is as follows:

CoCo 3 4-pin DIN	Modem DB-25
1	8
2	4
3	7
4	3

As for your RS-232 Pak, you need to check it fully. Hook it to an RS-232 line-indicator box (the kind that flashes lights when signal levels change). Set the terminal to 300 bps. Now press some keys and see if the outgoing data light flashes. If not, you may have zapped the level-converter chips in the RS-232 Pak. Check the signals going into and out of the 1488 and 1489 chips. If the signals are incorrect, desolder those two chips and replace them. If the RS-232 Pak still does not work, you may have to replace the 6551 chip. If the 6551 chip is dead, replace it with a 6551A chip.

I recently had a disaster at my house, where I accidentally routed 110 volts AC into my RS-232 Pak's serial port due to a faulty wall transformer for a modem. The ground trace in my RS-232 switch box was vaporized. Both the 1488 and 1489 level-converter chips in the RS-232 Pak were destroyed (one of them was literally blown to pieces), and the 6551 chip was also zapped. However, the rest of the RS-232 Pak (the voltage-inverter block and the address decode circuitry) was OK, as was (miraculously) the rest of my system (Multi-Pak and CoCo 3). This experience might be similar to the experience of the modem getting zapped with lightning.

The Tandy 1000 HX, to my knowledge,

puts out only a CGA-type video signal. CGA is quite different from IBM monochrome, for TTL monochrome syncs at 19 KHz while CGA syncs at 15.75 KHz. The IBM monochrome monitor was never meant to work with the CGA output of your 1000 HX. Don't try to use it with the 1000 HX.

Multi-Pak Interface

Q Can I use an old gray-case Multi-Pak Interface (Cat. No. 26-3024) with a CoCo 2 (Cat. No. 26-3134B)?

Paul Kemp
Independence, Montana

A Yes. All Multi-Pak Interfaces can be used with older CoCo 1's and 2's. The old gray-case Multi-Pak has exactly the same circuit as the newer white-case Multi-Pak that bears the same catalog number (26-3024). Actually, any model 26-3024 Multi-Pak can also be used with a CoCo 3, although you will have to remove the old PAL chip and put in a different one to avert an address conflict with the CoCo 3's GIME chip.

CoCo Keyboard

Q How do I install a CoCo 2 keyboard in an old gray-case CoCo 1?

Erwin D. Hansen (ERWINH)
Atoka, Indiana

A The lines on the CoCo 2 keyboard exactly match the keyboard pins of the CoCo 1 keyboard connector. No special circuitry, transistors or resistors are needed. What is needed are appropriate connectors and a cable to hook the mylar ribbon cable from the CoCo 2 keyboard to the pins on the CoCo 1 motherboard. Do-it-yourselfers can probably make an appropriate adapter cable with a bit of tinkering using a 34-pin dual-row header connector, a 34-pin edge connector, some ribbon cable, and a bit of custom tinkering. Contact me via Delphi if you want the connector that fits the mylar ribbon cable. I still have a few I can spare.

Your technical questions are welcomed. Please address them to CoCo Consultations, THE RAINBOW, P. O. Box 385, Prospect, KY 40059.

We reserve the right to publish only questions of general interest and to edit for brevity and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.

Questions can also be sent to Marty through the Delphi CoCo SIG. From the CoCo SIG> prompt, pick Rainbow Magazine Services. Then at the RAINBOW> prompt, type ASK (for Ask the Experts) to arrive at the EXPERTS> prompt, where you can select the "CoCo Consultations" online form, which has complete instructions.

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 M7 - 23 .Bin Files ready to play

Graphics 1-14
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 GR2 - Donald, Snoopy, Worldmap, +
 GR3 - 9 Coco 3 Graphic programs.
 GR4 - 22 Coco Max Pictures
 GR5 - 22 Coco Max Pictures
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 GR7 - 15 Coco Max Pictures
 GR8 - 22 .BIN Pictures
 GR9 - 22 .BIN Pictures
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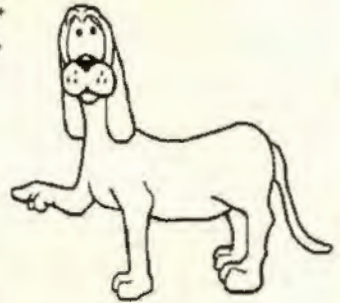
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 U3 - Convert, Disk Library, CO4pic, Relocate, +
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 GA3 - Backgammon, Gremlin, Python, Robots, +
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10	25	40	55	70	85	100			
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12	27	42	57	72	87	102			
13	28	43	58	73	88	103			
14	29	44	59	74	89	104			
15	30	45	60	75	90	105			

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M5	GR5		U5	GA5
M6	GR6	H1	U6	GA6
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	GR8	H3	U8	GA8
	GR9	H4		GA9
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The CoCo Sound Generator

by Walt Noon

You already know, as a CoCo user, the Color Computer is one of the most powerful, easy-to-use computers ever created. You also know that the graphics images you can produce from within BASIC (and the options to manipulate them) are pretty darn spectacular.

If you are like me, when you first got your CoCo you were off and running — designing one program after another, constantly searching for the edge of the CoCo's creative envelope. I don't think we have found it yet. Maybe it will be that next program . . .

One of the few things I feel was left out of my grasp in the CoCo's powerful BASIC language was the ability to create good sound effects. If you have used the SOUND command in your own programs, you know what I mean. Even the little tricks for getting strange sounds using the SOUND command will never really satisfy serious game programmers. (Is there any other kind?) This is the reason I wrote *Sound Generator*.

Sound Generator allows you to create many sound effects, including explosions, machine-gun fire, lasers, even screams (sort of) — all the important things in a programmer's life. You first create the sound effects from within the *Sound Generator* program. Then, once you find the effects you want, you can add them to your own program.

Using The Program

Sound Generator is very easy to use. To

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get started, enter the program and save it to tape or disk as SOUNDGEN.BAS. When you run SOUNDGEN, a title screen appears and you hear a demonstration of many random sound effects. Press any key to see the Main menu.

The program provides two ways to create sound effects: random and manual. The Random Sound Creator is the fastest way to find new sounds. When you select this option, you are asked if you want to keep the generated sounds short. Be aware that if you press N (for No) in response to this question, the random sound generator may create sounds that take several minutes to play. Such long sounds may be irritating when used for game programs, and may cause the user to think the program has crashed. You'll find you almost always answer yes at this prompt.

After answering the question, you will see a new menu and hear a sound. To hear the sound again press A. To hear a new

sound press the space bar. Pressing M takes the program back to the Main menu.

When you find a sound you like using the Random Sound Generator, write down the numbers you see on the screen that correspond to the variables N, D, S and E. When you give these variables the same values in your BASIC program and call a short machine-language routine, your program will produce the sound for you.

The Manual Entry mode allows you to set the variables to specific values. Since some sounds can be quite long, this feature takes some getting used to, but it is very powerful. With Manual Entry, you can create and customize sound effects.

Interfacing with BASIC

Using *Sound Generator* sounds with your own BASIC programs is very easy. To do this, you must include some portions of SOUNDGEN in your own program. First you must run the assembly-language routine in

32K Extended

✓

140	178	640	18	860	150
270	254	740	12	END	80
440	234	770	77		
590	146	790	74		

The Listing: SOUNDGEN

```

10 'SOUND GENERATOR
20 'WRITTEN BY WALT NOON
30 'COPYRIGHT (C) DECEMBER 1991
40 'BY FALSOFT, INC.
50 'RAINBOW MAGAZINE
80 '*****
90 GOTO280
100 A$=CHR$(128)
110 CLS(0):FORA=1TO64:PRINTCHR$(
RND(10)+145)::NEXT:PRINTSTRING$(
34,A$);"coco";A$;"sound";A$;"eff
ects";A$;"generator";STRING$(34,
A$)::FORA=1TO351:PRINTCHR$(RND(1
0)+145)::NEXT
120 PRINT@239,"by";:PRINT@299,"w
alt";A$;"noon";:PRINT@396,"any";
A$;"key";
130 FORA=1TO20:B$=INKEY$:IFB$=""
THENNEXT:N=RND(5):D=RND(255):E=2
3:S=24:GOSUB500:GOTO130
140 CLS2:PRINT@37,"coco";A$;"gam
e";A$;"sounds";A$;"menu";:SOUND1

```

lines 280 through 370 of SOUNDGEN. You can add this routine to the beginning of your BASIC program. Alternatively, you can run it by itself before loading your BASIC program. This routine has to be run only once.

Next you need to copy the sound-player portion of SOUNDGEN (lines 500 through 540) to your BASIC program. This part is used as a subroutine, so placement within your program is up to you.

To create a sound from within your program, assign the values you recorded above to variables N, D, S and E. Then use a

GOSUB statement to transfer program control to the line where you placed the sound-player routine. That's all there is to it.

Here's a tip for creating great machine-gun and laser sounds: Find an effect that sounds like one "shot" and repeat it several times. Once the program has played a sound by going through the sound-player subroutine, it will repeat the sound by immediately executing the A=USR0(0) statement again. Remember, though, when you change the variables and send the program through the subroutine, the sound will be different.

Though I have had no problems using *Sound Generator* sound effects with my own programs (even those that use other assembly-language routines), I recommend you add these sound effects after all other work is done on your program. *Sound Generator* uses a short machine-language routine, and it is always wise to make sure your BASIC program runs smoothly before interfacing with such a routine.

Have fun with *Sound Generator*. And keep pushing the CoCo envelope! □

```

1:FORI=98TO124:PRINT@I,A$::FORJ
-1TO10:NEXTJ:NEXTI:SOUND1,1:PRIN
T@166,"a":A$:"information":PRIN
T@236,"b":A$:"manual":A$:"entry"
::PRINT@290,"c":A$:"random":A$:"
sound":A$:"creator":
150 PRINT@360,"d":A$:"exit":A$:"
program":
160 B$=INKEY$:IFB$=""THEN160 ELS
ESOUND255,1
170 IF B$="A" OR B$="a" THEN 760
180 IF B$="B" OR B$="b" THEN 700
190 IF B$="C" OR B$="c" THEN 570
200 IF B$="D" OR B$="d" THEN CLS
:END
210 GOTO 160
220 *****
230 '... BASIC SOUND DRIVER ...
240 'MAKE THE NEXT 10 LINES
250 'THE FIRST LINES OF YOUR
260 'BASIC PROGRAM...
270 *****
280 CLEAR200,&H3EFF
290 DATA 182,255,1,132,247,183,2
55,1,182,255,3
300 DATA 132,247,183,255,3,182,2
55,35,138,8,183
310 DATA 255,35,16,190,63,0,190,
63,3,166,128,132,255,183
320 DATA 255,32,141,10,188,63,5,
38,242,49,63,38,235,57
330 DATA 182,63,2,74,38,253,57
340 FORI=&H3F07 TO &H3F07+56
350 READ A:POKE I,A
360 NEXT I
370 DEFUSR0=&H3F07
380 *****
390 GOTO100
400 'N=TIMES (0-255)
410 'D=DELAY (0-255)
420 'S=START (0-255)
430 'E=END (0-255)
440 *****
450 '... SOUND PLAY ...
460 'ADD THE NEXT 5 LINES TO
470 'YOUR PROGRAM TO PLAY BACK
480 'SOUNDS FROM BASIC.
490 *****
500 POKE &H3F00,INT(N/256):POKE
&H3F01,N-INT(N/256)*256
510 POKE &H3F02,D
520 POKE &H3F03,INT(S/256):POKE
&H3F04,S-INT(S/256)*256
530 POKE &H3F05,INT(E/256):POKE
&H3F06,E-INT(E/256)*256
540 A=USR0(0)
550 *****
560 RETURN
570 Z=0:PRINT@453,"keep":A$:"sou
nds":A$:"short":A$:"y/n":
580 B$=INKEY$:IFB$=""THEN580 ELS

```

```

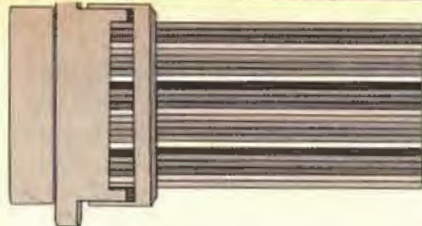
EIFB$="Y" OR B$="y"THENZ=1
590 CLS0:FORI=1TO15:SOUND255/I,1
:PRINTSTRING$(32,CHR$(169)):NEX
T:PRINT@69,"generate":A$:"random
":A$:"sounds":
600 PRINT@150," "":PRINT@204,
" "":PRINT@269," "":PRINT@
330," "":N=RND(255):D=RND(255
):S=RND(255):E=RND(255):GOSUB610
:GOTO600
610 IFZ=1 THENN=RND(5):D=RND(255
):E=23:S=24
620 PRINT@131,"n":A$A$:"number"
:A$:"of":A$:"times":A$N::PRIN
T@195,"d":A$A$:"delay":A$D::PRIN
T@259,"s":A$A$:"start":A$S::PR
INT@323,"e":A$A$:"end":A$E::PR
INT@389,A$A$A$A$A$:"playing"
:A$:"sound":A$A$A$A$A$A$
630 GOSUB500
640 PRINT@389,"spacebar":A$:"for
":A$:"next":A$:"sound":PRINT@45
3,"a":A$A$:"again":A$A$A$A$A$
:A$A$A$A$A$:"m":A$A$:"menu":
650 B$=INKEY$:IFB$=""THEN650
660 IFB$="A" OR B$="a" THEN A=US
R0(0):GOTO650
670 IFB$="M" OR B$="m" THEN140
680 RETURN
690 A$=CHR$(128)
700 CLS0:Z=0:FORI=1TO15:SOUND255
/I,1:PRINTSTRING$(32,CHR$(185)):
:NEXT:PRINT@39,A$A$:"create":A$
:"a":A$:"sound":A$A$
710 N=2:O=117:S=24:E=23:GOSUB500
720 PRINT@196,"n":A$:"is":A$:"fo
r":A$:"number":A$:"of":A$:"times
":A=USR0(0):PRINT@260,"d":A$:"i
s":A$:"for":A$:"delay":A=USR0(0
):PRINT@324,"s":A$:"is":A$:"for"
:A$:"start":A=USR0(0):PRINT@388
,"e":A$:"is":A$:"for":A$:"end"::
A=USR0(0)
730 N=5:D=1:S=1:E=1:GOSUB500
740 PRINT@96,STRING$(32," "):PR
INT@96,"ENTER NUMBER 0-255 FOR N
"::INPUT:A=USR0(0):PRINT@121,"
":PRINT@119,"D"::INPUTD:A=U
SR0(0):PRINT@121," "":PRINT@
119,"S"::INPUTS:A=USR0(0):PRINT
@122," "":PRINT@119,"E"::INP
UTE:A=USR0(0)
750 PRINT@92,CHR$(185):B$=STRIN
G$(32,CHR$(185)):FORI=1TO10:PRIN
T@85:NEXT:GOSUB620:GOTO700
760 CLS0:CLR1000:DIMB$(37):B$(
1)="WELCOME TO THE COCO SOUND":B
$(2)="GENERATOR! THIS PROGRAM W
ILL":B$(3)="ALLOW YOU TO DESIGN
REAL":B$(4)="ARCADE SOUNDS FOR Y
OUR BASIC":B$(5)="PROGRAMS. BY

```

```

ADDING JUST A FEW":B$(6)="LINES
OF THIS PROGRAM TO YOUR"
770 B$(7)="BASIC PROGRAM, YOU WI
LL BE ABLE":B$(8)="TO ADD ANY SO
UND YOU MAKE HERE":B$(9)="TO YOU
R GAME. FIRST, USE THIS":B$(10)
="PROGRAM TO MAKE A SOUND YOU":B
$(11)="LIKE, THEN WRITE DOWN THE
":B$(12)="NUMBERS (N,D,S,E) THAT
MADE"
780 B$(13)="THE SOUND. WHEN YOU
HAVE AS":B$(14)="MANY SOUNDS AS
YOU LIKE, ADD":B$(15)="THE 'SOUN
D PLAY' LINES IN THIS":B$(16)="P
ROGRAM TO YOUR PROGRAM. RUN":B$(
17)="THE 'POKE' ROUTINE TO SET U
P":B$(18)="THE ML, THEN SIMPLY G
IVE"
790 B$(19)="THE VARIABLES (N,D,S
,E) IN":B$(20)="YOUR BASIC PROGR
AM THE VALUES":B$(21)="FOR THE S
OUND YOU WANT AND GOTO":B$(22)="
THE 'SOUND PLAY' PART OF THIS":B
$(23)="PROGRAM THAT YOU COPIED T
O":B$(24)="YOUR PROGRAM. NOTE:Y
OU MAY"
800 B$(25)="WANT TO KEEP SOME VA
RIABLES":B$(26)="SUCH AS 'S' AN
D 'E' SMALL":B$(27)="SO THAT TH
E SOUND EFFECT WON'T":B$(28)="GO
ON TOO LONG":B$(29)="SOME SOU
ND COMBINATIONS":B$(30)="PRODUCE
VERY LONG SOUND"
810 B$(31)="PLAYBACKS...) HAVE F
UN WITH THE":B$(32)="PROGRAM, AN
D, GOOD LUCK WITH":B$(33)="ALL Y
OUR PROGRAMMING EFFORTS":B$(34)
="THANKS!":B$(35)="WALT NOON":B$
(36)="3283 BELVEDERE":B$(37)="RI
VERSIDE, CA 92507 <ANY KEY>"
820 N=1:D=37:S=24:E=23:GOSUB500
830 I=I+1:PRINT
840 IFI=10 THEN N=3:D=9:S=24:E=2
3:GOSUB500
850 IFI=15 THEN N=1:D=121:S=116:
E=199:GOSUB500
860 IFI=20 THEN N=1:D=40:S=24:E=
23:GOSUB500
870 IFI=29 THEN N=1:D=211:S=24:E=
23:GOSUB500
880 IFI=30 THEN N=5:D=13:S=24:E=2
3:GOSUB500
890 IF I=35 THEN N=4:D=28:S=24:E
=23:GOSUB500
900 FOR B=1 TO LEN(B$(I)):PRINT
MID$(B$(I),B,1);
910 A=USR0(0)
920 NEXTB
930 IFI<37THEN830
940 B$=INKEY$:IFB$=""THEN940 ELS
ERUN

```



Submission Ideas

by Eddie Kuns
OS-9 SIG Database Manager

Last month I defined all parts of the description for a database entry. Now we're ready to submit a group of files to the database. Before beginning the submission process, enter the database topic in which you will be submitting the group. For example, if you are submitting a group to the General Information topic of the CoCo SIG, enter DATABASE GENERAL (or DAT GEN for short) at the CoCo SIG Main prompt, and enter SUBMIT to begin the submission process. At this point, you will see the menu shown in Figure 1.

Delphi will prompt you for the necessary information if you enter BEGIN, or you can enter each item individually by using the other commands shown in the menu. Generally, you need only type the first three characters of each command for Delphi to understand what you want to do. For the sake of brevity, I've deleted the menus in this discussion; refer to Figure 1 to see the list of possible commands.

You will notice that as you use each menu item, it disappears from following menus; Delphi keeps track of what you have entered and what you have not. If you want to change something, use the REVIEW-EDIT command to edit the group. In other words, keep entering new information until each item of the group is entered, then edit the items you want to modify. To review, the necessary items in a database group are the group's name, description, topic, filetype

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Database Submit Menu:

Begin Submit (Step by step)	Upload File 1
Description of Group	Batch Upload Files
Topic of Group	Review-edit Group
Filetype of Group	Copy File 1 from Workspace
Keywords for Group	Help
Name of Group	Exit
Choose Upload Protocol	

Figure 1: Database Submit Menu

and keywords, as well as a download name and title for each file.

Before we start, one final comment: If you are not the author of the group you are uploading, please make certain that you have the author's permission to upload the group to Delphi. This permission doesn't have to be in writing; a verbal or E-Mailed agreement is fine. The fact that a program or article has been uploaded elsewhere does not necessarily mean that it's OK to upload it to different systems. For example, on the computer networks and USENet it's considered rude to take a person's E-Mail and post it elsewhere without the permission and knowledge of the author.

Down to Business

The following text is taken directly from submitting a sample group to the databases. To help avoid confusion, all text displayed by Delphi is shown in Letter Gothic (like this), all text I entered is shown in bold (like this) and the comments I added are shown in Times Roman (like this).

```
COCO> database general information
```

I could have typed DAT GEN instead to

enter the General Information database. The following command tells Delphi we want to submit a new database group into the current database topic:

```
DBASES:Gen> submit
```

Looking at Figure 1, I notice the first item to be entered is the group's description. So I type

```
SUBMIT> description
```

NOTE: You must have the legal right to distribute any material you contribute. Type /COPYRIGHT at any prompt for details.

Enter a BRIEF description of the file(s) you are submitting. Control-Z when Complete. /HELP for Help. **This group is a sample to illustrate the process one follows to upload.**
^Z

This is the same editor used in Forum. If you type /EDIT, you are taken into the chosen editor — either EDT or Oldie, depending on your settings. The text is for-

Program or Program Pack
 Newsletter
 Article(s)
 Transcript
 Documentation
 Data (Graphics, etc.)
 Miscellaneous Text

Figure 2: File Types

matted in the same manner as forum messages and accepts the same dot commands. Please keep the description brief and to the point.

SUBMIT> topic
 Topic? [General Information]

Notice that Submit knows I'm in the General Information database. Thus, I press ENTER to use the default topic. If you start Submit from General Information but then realize the group would be more appropriate in Product Reviews & Announcements, for example, you could type PRO at this prompt to select the appropriate topic. You need only type enough of the database topic name to be unique. Please make sure you are in the appropriate database topic or enter it at this prompt. Remember, in the

OS-9 SIG, files are automatically moved into New Uploads so don't use New Uploads as the topic.

SUBMIT> filetype

Filetype: misc

Enter the appropriate filetype to describe your group. If you aren't sure which filetype to use, you can enter ? to see the options or refer to Figure 2 for a complete list of the available file types.

SUBMIT> keywords

Primary Keyword: other
 Primary Keyword: Other

You may now supply any optional keyword(s) of your choice, subject to review by the Database Manager.

Enter /LIST to display the keywords or /EDIT to change them. Control-Z when Complete. /HELP for Help.

eddiekuns
 sample
 example
 submit
 ^Z

If you type ? at the primary keyword prompt, you will see the primary keywords fully spelled out. Each database topic has a separate list of primary keywords. If none of the primary keywords fit, this may not be the appropriate database for this group. When you are entering the remainder of the keywords, enter one keyword per line. This allows Delphi to search for keywords much more efficiently and faster. Each keyword should be two or three words maximum — usually one word per keyword is sufficient.

SUBMIT> name

Name for Group/Set: just a sample upload

This is the group name that appears at the top of the screen when you are looking at a database entry. Make it as descriptive as possible, keeping in mind there is a 32-character limit, and use a version number if appropriate. At this point, you have done everything except upload the files. Let's check the options left.

SUBMIT> ?

Database Submit Menu:

Choose Upload Protocol

RELIEF



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```

Upload File 1
Batch Upload Files
Review-edit Group
Copy File 1 from Workspace
Help
Exit

```

Now we're ready to copy a file from our workspace or upload a file. Be warned that you cannot upload a file until you have entered all the above information. Your best option is to upload while in submit — this way you don't pay for the time spent uploading the file. When you upload or copy a file from your workspace (except when using a batch protocol), you are prompted for a download filename. Assign a meaningful name, please. Be warned: Delphi cannot handle filenames with more than one period. Extra periods in the filename are converted to an x when the files are downloaded via a batch protocol. If you use Ymodem Batch, Zmodem or Kermit to upload files, Delphi automatically assigns the download name as the name sent during the batch transfer.

Remember each file has a title. After uploading or copying each file, Delphi prompts you for the title for that file. If you assign a download filename, this title will not be used as a filename. Thus, try to make the title meaningful as shown in last month's example.

If you are uploading a file, you must choose which protocol to use. If you already have a default file-transfer protocol, you may skip this step.

```

SUBMIT> choose
Do you want to use YB (YMODEM batch)
to upload? yes
You have selected YB (YMODEM batch)
for uploading.

```

You will be uploading files using a batch protocol. You can change this by using the Choose command.

Above, the Submit program notices that I already have a default file transfer protocol (Ymodem Batch). I enter YES to use this protocol. Menus here allow you to choose any protocol supported by Delphi. I can now upload files by using the BATCH or UPLOAD command. The UPLOAD command allows uploading one file at a time while the BATCH command allows uploading multiple files at once using one of the batch protocols (Ymodem Batch, Zmodem or Kermit).

```

SUBMIT> batch

```

You may now upload your files. If you have trouble uploading, just do the SUBMIT procedure again, and it will

remember what you have already uploaded.

```

Will you be sending text files only
(Type ? for help)? no
Type three consecutive <Control-C>'s
to abort.

```

```

YMODEM batch mode
Ok, send! (non-text)
FINAL STATUS = 1 file successfully
transferred.

```

```

What is the Title for "report"?
Database Report

```

Be careful if you are uploading a binary file — graphics or digitized sound, any file with an extension of .BIN and any executable file are all binary files. Make certain that you answer no to the above prompt if you are uploading binary files. If you are uploading a combination of ASCII and binary files, you should upload the binary and ASCII files separately. If you are using a batch protocol, upload the ASCII files in the first batch upload, then upload the binary files in the next batch upload. In this way, the ASCII files (such as the documentation) can be read online to help other users determine if they want to download this group.

Once you have uploaded all the files and have reviewed the group to make sure everything is correct, exit the submission process by pressing CTRL-Z or type EXIT and press ENTER.

```

SUBMIT> exit

```

Thank you for your submission.

You are taken back to the database prompt. Next month I will describe the commands available at the Review-Edit prompt.

July Uploads

In the OS-9 SIG databases, **Paul Ward** (PKW) and **Frank Hogg** (FHOGG) uploaded several news bulletins and information about their products. **Don Vaillancourt** (DONVAIL) released more information about the new OS-9 Users Group that is being formed. **Jason Bucata** (JBUCATA) contributed two files from the Free Software Foundation that contain information about this organization and the software practices they are trying to encourage. **Mike Hanewinkel** (MIKEHAN) released MAKEB09. This program takes any binary file and creates a BASIC09 program that re-creates the file.

Several patches to OS-9 drivers were posted to the Device Drivers database: **Guy Loucks** (GUYLOUCKS) released a new version of his patch to the Kernel that allows filenames to be more compatible with OS-9/68000 filenames. **Paul Seniura** (PAULSENIURA) is still looking for information to help

construct a device driver for the CoCo's 12-bit timer. **Saul Bendersky** (SAUL) contributed a patch to Tandy's CC3D1sk driver that allows it to cache floppy sectors.

Rick Adams (RICKADAMS) released the latest version (3.0) of his UUCP package for the CoCo. **Mike Hanewinkel** contributed PATHFINDER, a subroutine written in BASIC09 that uses pull-down menus to prompt the user for a filename. This subroutine returns the full path of the selected file to the calling program.

In the CoCo SIG databases, **Don Hutchison** (DONHUTCHISON) uploaded the entire text of the U. S. Constitution, including all amendments. **Michael Trammell** (LLEMMART) released *Rasgo Color View Edition 4.0* for displaying IMG pictures. **Joe Sannucci** (SANNUCCI) released Version 2.0 of **Roger Taylor's** graphics viewer *The Projector*, which displays a variety of graphics formats.

Art Flexser (ARTFLEXSER) released a patch to *Telewriter-128* that increases compatibility with *Extended ADOS-3*. **Judy Emge** (JEMGE) contributed a demo of *Soviet Bloc*, a game written by **John Strong**. **Joe Sannucci** uploaded CUTS — a file encoder that is popular on some computer networks. CUTS collects a group of files and encodes them so that they may be safely transmitted over most networks. □

Database Report

OS-9 SIG

General Information

MMI DISK #3	
PKW	Paul K. Ward
TC-XT ANNOUNCEMENT	
FHOGG	Frank Hogg
NEW OS9UG UPDATE	
DONVAIL	Don Vaillancourt
CD-1 UPDATE	
PKW	Paul K. Ward
TC9/TIGER TECH	INFO
FHOGG	Frank Hogg
MM/1 SOFTWARE	INFO#2
PKW	Paul K. Ward
MMI SOFTWARE SPECS	
PKW	Paul K. Ward
NEW OS-9 USERS	GROUP
DONVAIL	Don Vaillancourt
FREE SOFTWARE	FOUNDATION INFO
JBUCATA	Jason Bucata
A PLEA FOR COPYLEFTING	
JBUCATA	Jason Bucata
SOFTWARE SUPPORT FOR MM/1	
PKW	Paul K. Ward
IMS PROVIDES SHIPPING UPDATE	
PKW	Paul K. Ward

Applications (6809)

WHATS - HEX, DEC, BIN CONVERTOR	
DONTHRASH	Donald Thrash

MAKEB09
 MIKEHAN Mike Hanewinkel
 DSCAN VERSION 2.0
 01GEN40 Eugene Anderson
 MD, COLOR CODED MDIR
 TBIRT Tom Birt
 SCAND - CHECK DISKS
 JSUTEMEIER Jim Sutemeier
 R3 SYSTEMS UTILITIES
 DONRGOOD Donald Good
 MANDEL09 - PLOT THE M-SET
 OS9BERT Bert Schneider
 DBL NEW VERSION
 WOAY Jim Martin
 UNIX-LIKE LS
 HERMAN Chris Strickland
 PRINTER CONTROL
 THUNDERFNGRS Bruce Moore
 PSHELL SOURCE
 THEFERRET Philip Brown

Device Drivers

CACHING FOR CC3DISK
 SAUL Saul Bendersky
 TIMER DRIVER DESCRIPTION 2
 PAULSENIURA Paul Seniura
 OSK FILENAMES KERNAL PATCH
 GUYLOUCKS Guy Loucks
 ADAPTEC INFO
 07ESRTIMOTHY Tim Fadden

Telcom

RICK ADAMS' UUCP 3.0
 RICKADAMS Rick Adams
 CPREADER ONLINE CATALOG
 EMTWO Paul M. Fitch, Jr.
 DOMINIONS09 V1.91
 EMTWO Paul M. Fitch, Jr.

BBS ON-LINE GAMES
 EARTHER Shawn Driscoll

Graphics & Music

MAHNAMAHNA.UME
 OS9BERT Bert Schneider
 MACPIX OF AIR SUPPORT
 GRAPHICSPUB Bob Montowski
 WHITNEY HOUSTON MACPIX
 GRAPHICSPUB Bob Montowski
 MORE MANDEL09 GRAPHICS
 OS9BERT Bert Schneider
 COMMANDO SOUND FILE
 OS9BERT Bert Schneider

Programmers Den

PATHFINDER SUBROUTINE
 MIKEHAN Mike Hanewinkel

MTCAM2C
 LLEMMART Michael Trammell
 MTCAM2B
 LLEMMART Michael Trammell
 RGBHELLO.BAS
 LLEMMART Michael Trammell
 PAL640D.ARC
 LLEMMART Michael Trammell
 THE PROJECTOR V2.0
 SANNUCCI Joe Sannucci
 PLAYBOY PLAYMATE TWINS
 SCOTTJ Scott Corley

Utilities & Applications

TW-128 PATCHER FOR EXT. ADDS-3
 ARTFLEXSER Art Flexser

Games

TABLOID HEADLINE GENERATOR
 ESCHULMAN Erich Schulman

Classic Graphics

ASCIIPIX
 TOMTHOMAS Tom Thomas

Music & Sound

FROMART.ZIP
 BOOG Art Doud
 MUSIC
 TMB Terry M. Blackwell

Product Reviews & Announcement

BLOCDEMO.BIN
 JEMGE Judy Emge

Telecommunications

CUTS
 SANNUCCI Joe Sannucci

CoCo SIG

General Information

CONSTITUTION OF THE U.S.
 DONHUTCHISON Don Hutchison

CoCo 3 Graphics

MISC. CM3 PICS
 RICKMAC Richard McNabb
 GRAB BAG CM3 SCRAPBOOKS
 RICKMAC Richard McNabb
 RASGO CVE 4.0
 LLEMMART Michael Trammell
 SADDAM.CM3
 DRILLMASTER Johnny Williams



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Cybervoice



Every once in a while, a versatile, high-performance product comes along that makes you sit up and take notice. Imagine having a CoCo that can laugh, cry, sing, talk, whistle and make other sound effects. Combining *Cybervoice* and a CoCo 3 with OS-9 can give you the power to do just that. Technology that can make a difference at a reasonable price is one of those rare gems, and *Cybervoice* is such a diamond, in the rough, ready for shaping into a variety of forms.

Cybervoice is a bundled hardware and software package. You must have a minimum of 256K RAM to use *Cybervoice*. It combines a well-designed circuit assembly packaged in a ROM pack that works with the Multi-Pak Interface, a Y-cable or the Disto Super Controller II. The Super Controller II requires setting a jumper and using an alternate device driver set provided by Disto. As it turns out, the versatile software that accompanies *Cybervoice* is also compatible with the old *Supervoice* cartridge from Speech Systems. An appendix in the manual tells you how to modify the *Supervoice* cartridge to work with the *Cybervoice* software. This permanent modification prevents further use of the *Supervoice* cartridge under Disk BASIC.

Cybervoice is designed with very few electronic components and is fully hardware decoded and Multi-Pak slot independent. The Votrax International SC02 chip set

used in the cartridge is a phoneme-based speech synthesizer, or phoneme generator, which has a seven-octave range and is easily controlled at a number of different register levels. The *Cybervoice* unit can produce a wide range of sound effects. It can even sing and allows for foreign accents!

Included with *Cybervoice* are several programs that operate voice servers, which allow you to control the *Cybervoice* under OS-9 Level II. A *Cybervoice* device driver with a built-in data pipe, a text-to-speech device descriptor and a synthesizer I/O device descriptor all allow an incredible range of fine-tuned control over the synthesizer. Using the CTTS (*Cybervoice* Text-To-Speech) program, an OS-9 command, and some embedded control codes, I was able to get *Cybervoice* to re-create some excellent sound effects, a Swedish accent, and the song "The Rose." Once you get the hang of using the control codes, which are embedded in text as printer commands are, it is fun to try new sounds and voices. You can make the CoCo sound like several people talking to one another.

Besides entertainment value, *Cybervoice* has a lot of potential for educational uses as well as being an aid for the sight-impaired or people learning English or a foreign language. To an extent, you are limited more by your own knowledge and skills than by the software and hardware. For example, I had a lot of difficulty encoding

the pronunciation of Russian words, due to some of their sound complexities. As a fluent speaker of Russian, I was horrified by some of what I produced in the name of language. Still, it was fun.

Burke & Burke was very thorough in designing and implementing the *Cybervoice* package. The hardware design is excellent, the included software superb, and the documentation very detailed and thorough. The manual is well-thought-out, and divided into introduction, hardware, software, and application-theory sections. There are a few typographical errors, such as the reference to an Appendix E that does not exist, or the consistent misspelling of the word *vowel*. However, none of them is enough to confuse or mislead the user. The manual includes a substantial amount of information — more than enough to get anyone started — on the elements of speech and sound production. A special section on the elements of elocution is included to help users understand how the software and hardware combine to mimic the human brain (CTTS) and voice box (VOICE) using the synthesizer cartridge.

In addition to the drivers, the speech server and device descriptors, several other software tools are included. The first is the well known Burke & Burke product *EZGen*, which allows users to quickly and easily create a new boot file and boot disk with the new drivers. Even potential problems, such

as IRQ (Interrupt Request) polling discrepancies, are covered so that users can get themselves smoothly underway.

Five rules tables help you produce quality speech. The tables include preprocessing rules, stress and syllabication rules, phonics rules, and dialect rules, which give direct control to the very smallest elements of speech. It was using the final dialect rules that I was able to add a lot of inflection to the accents I was trying to produce.

Dictionaries incorporated into the CTTS server are helpful. A set of maintenance tools for the dictionary allow you to check the existence of a word in the dictionary, add a word, delete a word, or to list all the words in the dictionary and pronunciations for them. *Cybervoice* has about 75 words in its dictionary when you get it. The average person uses about 10,000 out of approximately 100,000 words in the English language. Because of the size of the dictionaries and the need for speed when accessing

them, a hard drive is practically a must when using *Cybervoice*. Using any of the utilities is extremely easy. A file may be used as input, or individual words may be added to the dictionary.

One particularly interesting and flexible filter controls immediate inflection in the pronunciation of a word or sound. This filter is especially helpful when you want *Cybervoice* to sing. By selecting a particular frequency range with control codes, you can create many different types of voices, such as a slow-motion voice, a low or high male/female voice, chipmunk or space alien.

In some ways *Cybervoice* can be very challenging. It is more an engine and drive train than a whole car. The user must be willing to learn how to handle data registers and control codes to get the full use of *Cybervoice*. This takes some learning and patience. Although the manual is extremely successful in its treatment of the various elements of speech and their relationship to

the use of the program, the subject of artificial speech generation is rather complex. Its uses, while myriad, require a lot of consideration and careful planning to be properly implemented. It is beyond the scope of the manual to tell you how to do this. The manual, however, tells you everything you need to know to develop applications using *Cybervoice* and to implement speech synthesis in several different ways on the CoCo. If you are interested in speech synthesis, need it for a custom application, or are simply experimenting with it, *Cybervoice* for OS-9 Level II is an excellent, cost-effective and complete way to start.

(Burke & Burke, P.O. Box 733, Maple Valley, WA 98038; 800-237-2409; \$75.95 for hardware with OS-9 software, \$24.95 for software only; plus \$3 minimum S/H)

— Jeffrey S. Parker



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OS-9 Calendar Utilities

Those of you who use *Multi-View* under OS-9 should by now be quite familiar with the Tandy desk accessories. Included in the *Multi-View* package is a calendar program (*gcal*) that is quite useful for keeping track of appointments. The calendar is very easy to use and reasonably flexible. However, as is the case with most software, the *Multi-View* calendar could stand some improvements — especially in the area of multiple entries, i.e., a particular appointment that spans a number of days.

MV Systems has released *OS-9 Calendar Utilities*, which greatly improves the operation of *gcal*. Included in this utilities package are four programs: *dcal*, *ical*, *sca1* and *remind*. These utilities read and write *gcal*'s data files, allowing the user to make insertions (*ical*) or deletions (*dcal*) of text messages for any date or combination of dates. *sca1* provides the ability to sort text lines for any date or dates into lexicographic order. *remind* reads and displays the text messages in a *gcal* file for any date or combination of dates.

Now you may be asking, what is the advantage over the original *gcal*? Let's take an example. I plan to attend a seminar on August 13 and 14. With *gcal* I select August 13 and enter text for the seminar. Next I select August 14 and enter the same information. This isn't too bad, but what if the course were for two weeks? That's 10 entries of the same text. Using *ical*, I simply enter:

```
ical -d=08/13/91:08/14/91
```

ical prompts for the appropriate text (e.g., HPLC seminar), and then I enter the information for the date range specified. At a later date, I can delete these same entries using *dcal*.

```
dcal -d=08/13/91:08/14/91
```

Unfortunately, *dcal* deletes all entries for this date range. Obviously, *dcal* is intended for what may be called global deletions. Individual entries can still be deleted directly through *gcal*. These two utilities

thus provide a high degree of versatility in the insertion and deletion of text in the *gcal* file for ranges of dates.

remind is essentially a search utility that provides a listing of text messages contained in the calendar for a combination of dates. An interesting use of *remind* is to put it in the startup file and obtain a listing of messages for a date combination. For example:

```
remind -d=+++
```

provides a listing of messages for today and the next three days.

The *sca1* utility is used to sort the text messages for a date or range of dates. This is useful if the messages are out of order (for example, the appointment times are not in sequential order). Using some excellent suggestions provided in the manual, you can come up with a scheme for entering text messages that makes *sca1* quite useful.

Using the calendar utilities is quite easy. They run from the standard shell command line and do not require a graphics window. Or, using the provided icons, you can run the utilities (including *gcal*) directly from *Multi-View*. I should emphasize that these utilities run separately from *gcal*. They perform their functions directly on the *gcal* file.

A very important plus point for these utilities is the identical command-line syntax used for all utilities. This syntax provides excellent capability of specifying date information. The general format is:

```
-d=[begin date]:[end date]:[incrementation value]
```

Several examples from the manual illustrate this point:

```
-d=04/01/91:04/30/91
```

operates on all days between April 1 and 30;

```
-d=01/01/91:
```

operates on all days between January 1 and the current system date; and

```
-d=04/01/91:04/01/00:0/0/1
```

operates on April 1 between 1991 and 2000. As you can see, there is quite a degree of power in these utilities for operating on the calendar file.

If any of you read my review of *High*

Finance (September 1991, Page 52), a previous product from MV Systems, you know I think very highly of software from this company. The *OS-9 Calendar Utilities* are of equally high quality as previous products. This goes for both the software and the documentation. Both are first rate and I highly recommend them for your software library.

(MV Systems, P.O. Box 818, Arvada, CO 80001-0818, 303-420-7777; \$14.95)

— Donald Dollberg

ZClock

The *ZClock* utility allows for continuous display of the time and date on OS-9 Level II windows. The display appears onscreen in the upper-right corner. You can use either a 12- or 24-hour time format, and the clock can be displayed on one or all windows (as long as they're not VDG screens).

You can start *ZClock* from the OS-9 prompt using the *zclock &* command. This command may also be included in your startup file, making *ZClock* run whenever you boot your system. Three display options are included with *zclock*: *-a* to display the clock in all windows; *-d* to display current time and date; and *-m* to display 24-hour format. If no options are included, the time appears in 12-hour format only on the window from which the program is run.



To turn off the clock, you need to kill the process ID from the OS-9 prompt. If you have forgotten the process ID, which is echoed when *ZClock* is launched, you can find it by using the *procs* command.

ZClock does not require the installation of a SmartWatch. The package contains the program on floppy disk and a brief four-page manual of instructions for getting the program up and running. Requirements for ZClock are a CoCo 3, a floppy-disk drive and the OS-9 Level II operating system.

ZClock is easy to install and can be a handy tool for monitoring events that do not require precise timing. (The clock varies depending on the number of times you access a disk and the accuracy of the 60-second timing interrupt.)

(Burke & Burke, P.O. Box 733, Maple Valley, WA 98038, 800-237-2409; \$9.95 plus \$4 S/H)

— Tony Olive

Desktop Publishing

CoCo 3

CIH PagesE 2.5

You can achieve impressive desktop publishing with a CoCo and the aid of *CIH PagesE 2.5* from Coless Computer Design.

THE RAINBOW actually sent me pieces of a desktop publishing package that must be purchased separately, but I'll cover all of them here since they work together, forming a complete set of publishing tools.

CIH PagesE 2.5 requires a CoCo 3 (running Disk BASIC, OWLDOS, or ADOS3), and the Tandy Hi-Res joystick interface (it will not work with the interface included with the *CoCo Max* or *Max-10* software). It supports Epson, Gemini, Panasonic, DMP-105/106, CGP-220 B/W, Imagewriter/Prowriter, C.Itoh 8510 Prowriter, NX-1000, NX-1000 II, NX-1020 and the NX-1000 Rainbow printers.

The *CIH PagesE* package I received consists of an 88-page manual, a handy quick-reference guide and an addendum for the Version 2.5 upgrade. The upgrade came on a floppy: Side A is the new system disk and Side B contains the font-conversion files necessary to convert 2.0 font sets for Version 2.5. You must replace the FONT.BAS files on each font disk.

The upgrade adds a "sculptured frame" of icons representing program choices. This frame reminds me of the toolbars and toolboxes you see in Microsoft *Windows* software. Support for the second button on the Tandy mouse has been added, and you can

now scroll while in the Magnifier/Zoom feature. Version 2.5 also allows easy creation of *Max-10* clip files (you must have TRANSML.BIN from the *Max-10* system disk), and you can now set the drive with which to save and load your files.



The detailed manual provides a glossary of desktop-publishing terms and an explanation of the various cursor and function keys used by *CIH PagesE*. Screen shots accompany the explanations. The back of the manual is full of appendices on printing, handling errors, the paste options, page composition, creating *Max-10* clip files, using *CIH PagesE* on single-versus mul-

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KYUM-GAI TO BE NINJA

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.

Always wanted to play the great CoCo 3 games but didn't want to sacrifice your OS-9 features? *Multitask while playing Kyum-Gai. Have multiple Kyum-Gai's* running in memory. Don't worry about switching windows, because *Kyum-Gai: OS-9* auto-pauses, to wait for your return.

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multiple-drive systems, clip art samples, fonts samples, icon clip art, border clip art and hints and tips. Coless spent a lot of time getting the manual into shape.

CIH PagesE is really too large a program to cover in depth here, so I will just mention some of its neat functions. You must remember that it is a desktop publishing program. This means it facilitates page layout/composition but is not supposed to be a word processor or a graphics/drawing program. It has some capabilities of both, but they are weaker than those found in a dedicated product.

The icons of the "sculptured frame" interface border the drawing area. Across the top is the menu bar for selecting pull-down menus: File, Edit, Special, Fonts, Graph, Fill and 512K.

The File menu allows you to clear pages, set the file drive, load and save pages, load ASCII files, view a disk directory, kill a file, save or load a *Max-10* clip, access utilities, print and quit. The ASCII file import menu has various options for placing formatted text (formatting done in the word processor) or unformatted text onscreen. You can put the text in two or three columns or in standard word-processing format. You can also pull up a form so that text can be imported into it. The *CIH PagesE* utilities allow you to convert PMODE4 graphics to HSCREEN3 format, convert *Color Max 3/Color Max Deluxe* pictures, import *RAT* picture files, save the current HSCREEN3 to disk, load and save a compressed page, and view PMODE4.1, PMODE4.5, HSCREEN3 and HSCREEN4 pictures.

The Edit menu provides the standard Undo, Cut, Copy, Paste, Stamp, Move, and Qsave and Qload options. Qsave and Qload allow for quick saves and loads of the entire screen.

The Special menu allows you to flip a selected object horizontally or vertically, rotate it 45 or 90 degrees, enlarge it 4x or 16x, stretch it, reduce it 4x, view the clipboard, swap screens, and lighten or soften screen images.

CIH PagesE comes with 14 banner fonts, nine type fonts and two graphic fonts. It is possible to import *CoCo Max* fonts into *CIH PagesE*. The program allows you to perform manual kerning, a help to anyone working with desktop publishing.

The Graph menu allows you to import any PMODE picture saved in binary format. Once placed onscreen, a picture can be cropped or used as-is. You can also load clip art under the Graph menu.

The Fill menu provides several options for filling objects. Select Paint and a small dialog box appears with different paint patterns that cycle as you move the mouse up or down. It takes a little while to get the

right pressure to move up or down just one pattern. Boxfill allows you to select a pattern, then create a filled box on the drawing screen. The Patterns choice provides you with 48 patterns to use as stamps. They cannot be used to paint objects. They are mainly for use as brush options; I would like to see them be used as paint options.

The last pull-down menu option is the 512K choice. A 512K CoCo has two extra pages to work with, and you select them via this menu. One suggestion is to use Page 1 as your composition page and use pages 2 and 3 to hold fonts or clip art. You can copy from any page to any other page. The Batch function allows you to import larger portions of ASCII text, making them flow onto pages 2 and 3.

The final function found on the menu bar is Scroll/View — when you click on this choice, the frame disappears and you can see the entire page, navigating via mouse. The rest of the sculptured frame contains icons or buttons that represent a program function. The left side of the frame contains basic drawing primitives. Here you find icons for diagonal, horizontal or vertical lines, circles, boxes, polygons, rays, line width choices and a trash can. Most of these icons are self-explanatory. The trash can serves as an easy screen eraser.

Along the top of the frame, immediately under the pull-down menu, are the editing functions — magnifier/zoom, text input, pencil, eraser, brush, shapes, copy-and-paste panel, page preview, rulers, toggle box, screen slide, and foreground/background color.

If you need guides to place text or pictures, select the Rulers icon. Guide lines help you determine the center of the screen, horizontally and vertically. The screen-slide icon provides you with choices on moving or sliding the screen to see hidden areas.

The right side of the frame contains icons for movement. The solid up and down arrows at the top and the bottom of the icon bar scroll quickly to the top or bottom half of the page (you only see one half of the page onscreen at a time.) The two solid arrows scroll the screen in eight-pixel increments. The double up and down arrows once again allow you to scroll up or down but at a different speed.

I have only a few minor suggestions to improve *CIH PagesE* — I would like to see the changes in Version 2.5 listed in an upgraded manual. The addendum is a big help, but some of the examples are no longer valid, due to the 2.5 update. My only other criticism is not of the program itself, but one due to the environment in which I work. I'm used to laser-printed output and my nine-pin dot matrix printer just doesn't stack up. *CIH PagesE* gives CoCo users a

strong desktop-publishing base — wouldn't the output look great on a laser printer?

CIH PagesE Font Set 2 & 3

Also developed by Coless Computer Design and included with your purchase of *CIH PagesE 2.5*, *CIH PagesE Font Sets 2 & 3* give you a variety of fonts from which to choose. Font sets 2 and 3 each contain 14 banner fonts, used mostly for signs and headers. Owners of *CoCo Max III* will immediately recognize most of these fonts, as they are almost identical to some included in that package. The fonts come on floppy disk with a three-page manual. The disks are not copy-protected and you are encouraged to make backups. You are referred to the *CIH PagesE* users manual for instructions on loading the fonts. The manual has a sample of each font, so you can easily choose the one you want. Also included as a bonus in each package is a clip-art file. *Font Set 2* has extra brush shapes, which are selected from the Graph pull-down menu, while *Font Set 3* contains animal clip art. The fonts are easy to select through the menu and are a nice addition.

CIH Clipart E

A necessary addition to any desktop-publishing package is clip art. In *CIH Clipart E*, Coless Computer Design gives you more than 1500 pieces of Clipart for *CIH PagesE*. The package contains a 36-page manual, which describes how to view the clip art with the included viewing utility and how to incorporate the clip art into *CIH PagesE*. The bulk of the manual is a catalog of each clip included in the package.

Loading and viewing clip art are simple procedures. The art comes on five double-sided, nonprotected disks. To encourage you to back up the originals, Coless has included disk labels and write-protect tabs for the backups.

With 1500+ clips, you can imagine this package contains something for everyone. You get famous cartoon characters, art for holidays and special seasons, signs of the Zodiac, office and school symbols, letters of the alphabet, symbols for transportation and government, sports, animals, state outlines and many more. I consider this a must-have for any desktop publisher, and it's priced right for what it contains.

(Coless Computer Design, 1917 Madera St., No. 8, Waukesha, WI 53186, 414-549-0750; *CIH PagesE 2.5*, including *Font Sets 2 & 3*, \$29.95 plus \$3 S/H; *CIH Clipart E*, \$19.95 plus \$3 S/H. Owners of *CIH PagesE 2.0* may upgrade to 2.5 for \$7)

— Kay Cornwell

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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.

DIR, a disk utility that allows directory manipulation. Options exist for removing the entire filenames of killed files (instead of changing just the first letter) and writing the revised directory to disk. Other functions include displaying and printing a directory. You can exit the directory in memory and get a new one from disk. Also of use are functions in a Copy/Kill menu. This program can work in conjunction with *BED*, a binary disk editor. You can call *BED* and the help routine via a keystroke. *Soft & Friendly*, 129 Prairie, Virden, IL 62690, (217)965-4199; \$9 plus \$3.95 SH.

The MIDI Manual, a guide to help you master the mysteries of MIDI. Learn how to integrate your computer with a MIDI system. You'll also learn: MIDI components, functions, and fundamentals; MIDI's full range of production techniques; the science of synchronization; how to combine MIDI and sync pulse timing; and the art of sequencing. *SAMS*, 11711 N. College Ave., Carmel, IN 46032, (317) 573-2500; \$24.95.

CF83-4 Double Numbers Extension Word Set, a word set that requires the BDS Software's product, *CF83 Forth*. The three-page manual is available on disk or in hardcopy form. You can view and print the manual using the reader program supplied on disk. Requires a 64K CoCo 2 or a CoCo 3 with at

least one disk drive. *BDS Software*, P.O. Box 485, Glenview, IL 60025-0485; \$5.75.

The Printer Bible, a guide to printers, offering hints, troubleshooting tips, printer management techniques and things to consider when buying hardware and software. *Que Corp.*, 11711 N. College Ave., Carmel, IN 46032, (317) 573-2500; \$24.95.

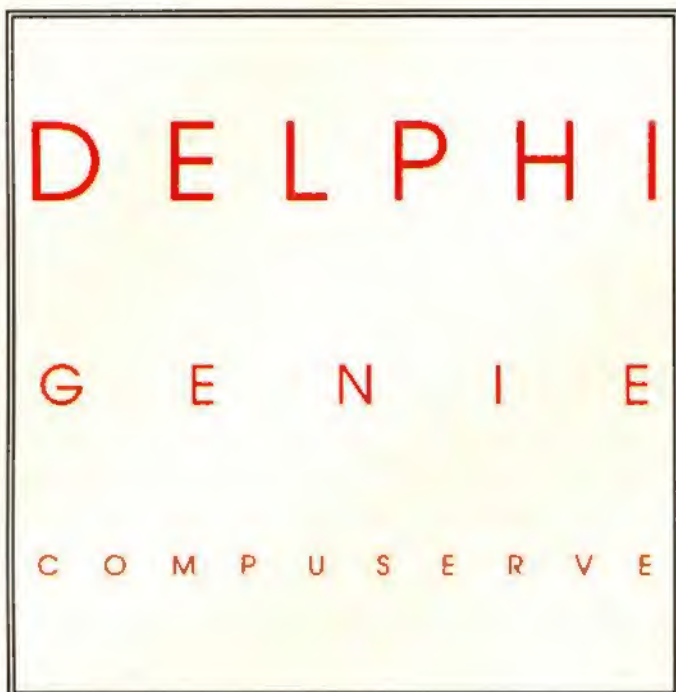
CoCo Cassette #110, a variety of programs presented monthly for the CoCo 1, 2 and 3. This offering includes: *Wedding Planner*, intended to help plan financial aspects of a

wedding; *Paladin Legend*, a text adventure; *To-Do List*, a planner featuring an onscreen display or hardcopy of your agenda; *5 Printer Graphics*, five CoCo 3 pictures; *Old-Time Penny Scale*, this program, like the old fair scales, will try to predict the future; *Multiply Fractions*, an educational math program; *Siege on Sirius 3*, a CoCo 3 graphics game for one or two players; *Diskbase 3*, a CoCo 3 disk database program requiring two disk drives; *Biorhythmic Theory 3*, charts biorhythms; *Mazey*, a Pacman-type maze game; and *NFLINS*, a prediction helper for the 1991 NFL season. *T & D Software*, 2490 Miles Standish Dr., Holland, MI 49424, (616) 399-9468; \$8.

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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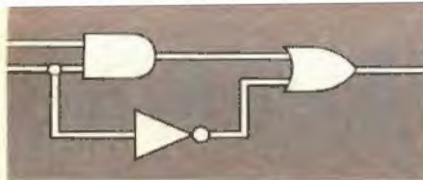
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The Procedure Generator

by Greg Law
Technical Editor

ProcGen is a utility, written by Stephen Goldberg, that reads an executable binary file on disk and creates a BASIC09 program that re-creates the original file. ProcGen is useful here at THE RAINBOW because it allows us to print OS-9 assembly-language listings in the magazine as well as provide a listing useful to those of you without an OS-9 assembler. It is also useful in that it contains a wealth of information on handling file I/O with both binary and ASCII files.

The program begins with the standard variable declaration and initialization, and then asks you to enter the filename or path-list of the file to convert. It then opens the file for reading (Offset \$01AD) and reads two bytes into variable length. You might wonder why it uses GET instead of READ or INPUT; the reason is that INPUT is used for interactive input (such as from a keyboard) and READ is used primarily with ASCII and sequential-access data files. While GET is primarily used with direct-access data files, it often provides the best method of reading data from a binary file.

If the first two bytes in the file are not \$87CD, the program prints a warning and program execution ends. This check is used to ensure the file contains an OS-9 memory module and is important because the next two bytes in an OS-9 memory module contain the length of the module. The module length is used in a FOR loop in the generated

In addition to being OS-9 Online SIGop, Greg Law enjoys programming on all types of computers and has worked on systems ranging from the CoCo to the Burroughs B6700 super mainframe. He lives in Louisville, Kentucky.

BASIC09 program (Offset \$041E) to re-create the module. Once the length is determined, SEEK is used (Offset \$0247) to start input back at the beginning of the file.

The REPEAT loop at Offset \$028A is used to extract the actual filename from the path-list. For example, if you enter /d0/CMDS/Format, ProcGen extracts the filename (Format) and stores it in infile. The first pass through the loop results in d0/CMDS/Format, the second pass CMDS/Format, and finally Format. Once the filename is extracted, variable outfile is assigned Make plus infile. This results in the filename MakeFormat that is used as the name of the BASIC09 procedure created.

The statement at Offset \$0339 creates a file in the Write mode and writes a short BASIC09 procedure to the file. Examine the two REPEAT loops (offsets \$04F0 and \$04FF) closely. The outer loop (Offset \$04F0 through \$0556) begins each DATA statement and re-

peats until all data in the file has been read (end-of-file is reached). The inner loop (Offset \$04FF through \$053C) reads the next byte from the file and appends it to the DATA statement. The IF statement (Offset \$0519) appends a comma to the DATA statement if the length of the line is less than 50 characters (width) and if end-of-file has not been reached. If a comma is appended to the DATA statement, the inner REPEAT loop continues. Finally the input and output files are closed and the program ends.

Making Improvements

Run through the program listing a few times mentally and try to imagine each of the steps taken while converting a module to a BASIC09 program. Now imagine that you merge two or more modules into a single file and use ProcGen to convert that file. Since the file contains an OS-9 memory module, it performs the conversion but not

OS-9

The Listing: ProcGen.b09

```
PROCEDURE ProcGen
0000 DIM infile:STRING[100] \(* input path list *)
0021 DIM outfile:STRING[29] \(* output filename *)
0042 DIM dataline:STRING[80] \(* DATA statement line *)
0067 DIM cls,bell:STRING[1]
0077 DIM inpath,outpath,byt:BYTE
0086 DIM count,length,width:INTEGER
0095
0096 cls=CHR$(12) \(* clear screen *)
0080 bell=CHR$(7) \(* terminal bell *)
00CB width=50 \(* maximum DATA line length *)
00F0
00F1 PRINT cls; "CREATE A BASIC-09 PROGRAM TO GENERATE A BINARY MODULE"
012E PRINT "-----"
0167 PRINT
0169 INPUT "Enter BINARY SOURCE filename or pathlist: ",infile
0198
019C IF infile="" THEN
01A8 END
01AA ENDIF
01AC
```

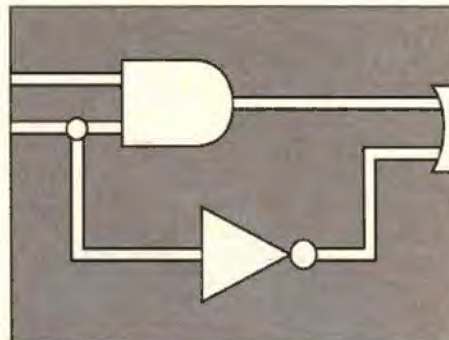
```

01AD OPEN #inpath,infile:READ
01B9 GET #inpath,length \(* get sync bytes $87CD *)
01DD
01DE IF length<>$87CD THEN
01EB PRINT bell; "**** "; infile; " is not an OS-9 memory module ****"
0221 END
0223 ENDIF
0225
0226 GET #inpath,length \(* get module length *)
0247 SEEK #inpath,0 \(* rewind file *)
0261
0262 (* Extract module name from pathlist *)
0289
028A REPEAT
028C count=SUBSTR("/",infile)
0298 infile=RIGHT$(infile,LEN(infile)-count)
02A9 UNTIL count=0
02B4
02B5 outfile="Make"+infile
02C4 PRINT
02C6 PRINT
02C8 PRINT "Now generating your program "; outfile; ""
02F1 PRINT "Please be patient . . . ";
0312
0313 (* Generate the Basic-09 procedure *)
0338
0339 CREATE #outpath,outfile:WRITE
0345 PRINT #outpath,"PROCEDURE "; outfile
035C PRINT #outpath,"(* Generates the binary module "; infile; " *)"
038E PRINT #outpath,"(* Level I - change all /dd to /d0 *)"
03BC PRINT #outpath,"DIM path,byt:BYTE"
03D6 PRINT #outpath,"DIM count:INTEGER"
03F0 PRINT #outpath,"CREATE #path,""/dd/cmds/"; infile; """:WRITE"
041E PRINT #outpath,"FOR count=1 TO "; length
043A PRINT #outpath,"READ byt"
0448 PRINT #outpath,"PUT #path,byt"
0461 PRINT #outpath,"NEXT count"
0474 PRINT #outpath,"CLOSE #path"
0488 PRINT #outpath,"SHELL ""attr /dd/cmds/"; infile; " e pe""
04B3 PRINT #outpath,"END"
04BF
04C0 (* Generate DATA statements from binary code *)
04EF
04F0 REPEAT
04F2 dataline="DATA "
04FE
04FF REPEAT
0501 GET #inpath,byt
050B dataline=dataline+STR$(byt)
0518
0519 IF LEN(dataline)<width AND NOT(EOF(#inpath)) THEN
052D dataline=dataline+","
0539 ENDIF
053B
053C UNTIL RIGHT$(dataline,1)<>","
054B
054C PRINT #outpath,dataline
0556 UNTIL EOF(#inpath)
055F
0560 CLOSE #inpath
0566 CLOSE #outpath
056C PRINT
056E PRINT
0570 PRINT
0572 PRINT "Your program "; outfile; " is ready."
0596 END

```

completely. Follow along as I explain why.

The length of the first memory module is obtained at Offset \$0226. Also the BASIC09 procedure created (Offset \$0345 through \$04B3) uses a FOR loop (Offset \$041E) to reproduce exactly that many bytes — FOR count=1 TO length. However, the REPEAT loop (Offset \$04F0) stores every byte in the file into DATA statements in the created BASIC09 procedure file. For that reason,



several modules may be stored in the DATA statements but only the first module would be re-created.

What methods might be used to overcome this limitation? One method you might use is to change the REPEAT loop (Offset \$04F0 and \$053C) to a FOR loop — FOR count=1 TO length. This modification would store only the first module in the DATA statements if more than one module is contained in the file. Another method is to use the SS.Size Get Status call to get the size of the file instead of the size of the memory module. This modification would re-create the entire file instead of a single memory module.

But suppose you wanted to use *ProcGen* to re-create data files as well as memory modules. What methods might be used to accomplish this? One method I can think of is to remove the code between Offset \$01B9 and \$0261, and replace it with a call to SysCall using the SS.Size Get Status call to get the size of the file. ☺



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A text
adventure for
use with the
CoCo 1, 2 and 3

Pirate's Treasure

by Jon Dueck



As an explorer, you have wandered the world in search of hidden treasures. In your travels you come across a secluded cave by the sea. After checking your charts and asking the locals, you discover this abandoned cave was once used by several bands of pirates for storing their loot. Ignoring rumors of black magic, you stand at the door of the cave, thinking only of the greatest treasure believed to be hidden inside: an enormous ruby called the Demon's Eye.

Demon's Eye is a text adventure that accepts standard, two-word commands. The program is in BASIC and was written using a CoCo 3, but it should work on any CoCo with at least 32K and a disk drive. As it uses no special commands, *Demon's Eye* also runs on the Tandy 1000 under GW-BASIC, assuming you transfer the file to an MS-DOS disk in ASCII format.

This adventure game is two-dimensional, with 64 rooms arranged in an eight-by-eight pattern (though there are some Ups and Downs — hint, hint). Unlike many other adventures, your score when playing *Demon's Eye* is based on the number of treasures you find, not the number of turns it takes you to finish.

Demon's Eye accepts commands such as Examine, Go, Get, Drop, and Inventory, which are standard fare for adventures. For movement, use the abbreviations N, S, E, W, U and D. The game has a rather small vocabulary, so if one of your commands is not accepted, try a synonym.

As an interesting aside, when I was nearly finished with the

Jonathan Dueck enjoys programming in BASIC and BASIC09. He also sings and plays the trumpet. Jonathan's favorite sports are soccer and ice hockey.

program, I made the mistake of formatting a new disk on which to save it. Of course this wiped the program from memory. Then I remembered Geoff Friesen's *BASIC+* (THE RAINBOW, June 1991, Page 32), which provides an OLD command. While OLD is intended for recovering programs mistakenly

erased with the NEW command, I found it can also be used after memory is trashed by DSKINI. Needless to say, I learned a few lessons from this experience: Where there is a will, there is a way to overcome problems; and keep your old RAINBOWS—they may save you hours of frustration.

Demon's Eye is a fairly simple adventure. However, I think you will find the game entertaining. So go ahead, fire up your CoCo, and challenge *Demon's Eye* to a rollicking round of adventure. And good luck!

32K Disk

✓ 160	..... 113	1040	..... 150	2030	..... 227
330	..... 78	1110	..... 252	2100	..... 30
490	..... 11	1190	..... 54	2180	..... 161
540	..... 175	1300	..... 92	2320	..... 142
680	..... 199	1460	..... 201	END	..... 92
850	..... 42	1670	..... 22		
940	..... 235	1850	..... 229		

The Listing: DEMON

```

1 'THE DEMON'S EYE
2 'WRITTEN BY JON DUECK
3 'COPYRIGHT (C) NOVEMBER 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 REM THE DEMON'S EYE
20 REM AN ADVENTURE
30 REM BY
40 REM JON DUECK
50 REM **INITIALIZATION**
60 V=22:W=22:G=16
70 DIM D$(63),R$(63),O$(W),V$(V)
  ,L(G),C(G),F(W)
80 GOSUB 1820:RM=0 'READ IN DATA
90 CLS
100 PRINT "THE DEMON'S EYE"
110 PRINT "-----"
120 REM **DESCRIPTION AND FEEDBACK**
130 PRINT
140 PRINT "LOCATION:";
150 PRINT D$(RM)
160 PRINT "EXITS:";
170 FOR I=1 TO LEN(R$(RM))
180 : PRINT MID$(R$(RM),I,1)
  :";":
190 NEXT I
200 PRINT
210 FOR I=1 TO G
220 : IF L(I)=RM AND F(I)>1
  THEN PRINT "I SEE ":"O$(I);" HER
  E"
230 NEXT I
240 PRINT M$:PRINT
250 M$="WHAT?"
260 REM **INPUT**
270 PRINT "WHAT NOW":
280 INPUT O$
290 V$=""
300 W$=""
310 FOR I=1 TO LEN(O$)
320 : IF MID$(O$,I,1)=" " A
  ND V$="" THEN V$=LEFT$(O$,I-1)
330 : IF MID$(O$,I+1,1)<>"
  " AND V$<>" THEN W$=MID$(O$,I+1
  ,LEN(O$)-1):I=LEN(O$)
340 NEXT I
350 IF W$="" THEN V$=O$

```

```

360 REM ** ANALYSIS **
370 VB=0
380 FOR I=1 TO V
390 : IF V$=V$(I) THEN VB=I
400 NEXT I
410 OB=0
420 FOR I=1 TO W
430 : IF W$=O$(I) THEN OB=I
440 NEXT I
450 IF W$="" AND OB=0 THEN M$="N
  O CAN DO!"
460 IF VB=0 THEN VB=V+1
470 IF W$="" THEN M$="I NEED TWO
  WORDS!"
480 IF VB>V AND OB>0 THEN M$="SO
  RRY-I WON'T "+O$+"!"
490 IF VB>V AND OB=0 THEN M$="TH
  AT'S NONSENSE!"
500 IF VB<V AND OB>0 AND OB<=G T
  HEN IF C(OB)<>1 THEN M$="I DON'T
  HAVE "+O$(OB)
510 REM **OVERRIDES**
520 IF (RM>60 AND RM<64 AND F(7)
  <2) OR (((RM+1)/8-INT((RM+1)/8))
  AND F(7)<2) OR (RM>0 AND RM<8 A
  ND F(7)<2) THEN M$="TOO DARK!":G
  OTO 120
530 IF RM=2 AND C(4)>1 THEN PRI
  NT "THE PIRATE EYES ME AND SAYS.
  .. 'WHERE'S YOUR RING? NO RUBY
  RING?!? YOU SHALL NOT PASS!' A
  ND WITH THAT HE REACHES OUT A SU
  RPRISINGLY SUBSTANTIAL HAND AND
  SNAPS MY NECK.":GOTO 580
540 IF RM=0 AND C(5)=1 THEN PRIN
  T "I HAVE ESCAPED THE PIRATE'S C
  AVE WITH THE FABLED DEMON'S EYE
  RUBY! I GO DOWN IN HISTORY AS ON
  E OF THE GREATEST TREASURE-HUNTE
  RS EVER! CONGRATULATIONS, YOU MA
  DE ME WIN!":GOTO 580
550 REM **VERBS**
560 ON VB GOSUB 630,660,740,740,
  740,740,740,740,960,960,1050
  ,1140,1170,1210,1270,1140,1340,1
  370,1520,1680,1730
570 GOTO 120
580 REM END ROUTINE

```

```

590 GOSUB 1730
600 PRINT M$
610 PRINT"GAME OVER."
620 END
630 REM VERB 1-HELP
640 M$="HEY! YOU GOT ME INTO THI
  S, YOU GET ME OUT!"
650 RETURN
660 REM VERB 2-INVENTORY
670 PRINT "I AM CARRYING:"
680 FOR I=1 TO G
690 : IF C(I)>0 THEN PRINT O$
  (I);":":
700 NEXT I
710 M$=""
720 PRINT
730 RETURN
740 REM VERBS 3-9-GO,N,S,W,E,U,
  D
750 D=0
760 IF OB=0 THEN D=VB-3
770 IF OB>16 THEN D=OB-16
780 IF RM=18 AND D=6 THEN D=2
790 IF RM=26 AND D=5 THEN D=1
800 R$(18)="SW":R$(26)="NS"
810 F(W)=0:RL=LEN(R$(RM))
820 FOR I=1 TO RL
830 : U$=MID$(R$(RM),I,1)
840 : IF (U$="N" AND D=1 AND
  F(W)=0) THEN RM=RM-8:F(W)=1
850 : IF (U$="S" AND D=2 AND
  F(W)=0) THEN RM=RM+8:F(W)=1
860 : IF (U$="W" AND D=3 AND
  F(W)=0) THEN RM=RM-1:F(W)=1
870 : IF (U$="E" AND D=4 AND
  F(W)=0) THEN RM=RM+1:F(W)=1
880 NEXT I
890 M$="OK":R$(18)="WD":R$(26)="
  SU"
900 IF F(W)=0 THEN M$="CAN'T GO
  THAT DIRECTION!"
910 IF D<1 THEN M$="GO WHERE?"
920 IF RM=32 AND D=2 THEN M$="TH
  E CAVERN WALL BEHIND YOU SOLIDIF
  IES WITH A MYSTERIOUS CHUCKLE!"
930 IF RM=61 AND D=4 THEN M$="TH
  E BOULDER ROLLS BACK IN PLACE!":
  F(17)=0
940 IF RM=2 THEN M$="THE PIRATE
  EYES ME AND SAYS... 'YOU ARE A W
  ISE SCOUNDREL, FOR WITH A RUBY R
  ING YOU CAN SAFELY PASS ME STIN
  G AND GET THE REAL RUBY.'"
950 RETURN
960 REM VERBS 10-11-GET,TAKE
970 IF OB=0 THEN RETURN
980 IF C(OB)=1 THEN M$="I HAVE I
  T ALREADY!":RETURN
990 IF OB>16 THEN RETURN
1000 IF OB>9 THEN M$="I CAN'T TA
  KE THAT!":RETURN
1010 IF L(OB)<>RM OR F(OB)=1 THE
  N M$="I DON'T SEE A "+O$(OB)+" H
  ERE!":RETURN

```

```

1020 IF OB=2 AND RM=36 AND F(8)<
2 AND L(8)>36 THEN PRINT "A SMA
LL SQUARE OF ROCK WHERE THE BAG
RESTED POPS UP AND THE CIELING C
AVES IN WITH A RESOUNDING CRA
SH. ONE OF THE STALACTITES IMPAL
ES ME.":GOTO 580
1030 C(OB)-1:L(OB)-65:M$="I'VE G
OT IT."
1040 RETURN
1050 REM VERB 12--EXAMINE
1060 M$="NOTHING SPECIAL FOR A "
+W$
1070 IF RM=36 AND OB=2 THEN M$="
I SEE A SMALL SQUARE TRACING IN
THE STONE AROUND THE COINS."
1080 IF RM=60 AND OB=11 THEN M$="
"IT LOOKS LIKE I MIGHT BE ABLE T
O MOVE IT."
1090 IF RM=50 AND OB=12 THEN M$="
"I DISCOVER A BEAUTIFUL PEARL NE
CKLACE HIDDEN WITHIN THE RUBBLE!
":F(1)=0
1100 IF RM=37 AND OB=13 THEN M$="
"ONE BEARS THE INSCRIPTION 'LIKE
A ROLLING STONE'. FUNNY BOB WA
S AROUND IN THE 1600'S, EH?"
1110 IF RM=34 AND OB=14 THEN M$="
"ON ONE OF THE BONY FINGERS ON I
TS TIGHTLY CLENCHED HANDS I SEE T
HE BLOODY GLINT OF A RUBY RING!
":F(4)=0
1120 IF RM=1 AND OB=16 THEN M$="
I GASP AS I NOTICE ONE OF THE EY
ES ON THE DEMON WATCHING ME--IT'
S A RUBY THE SIZE OF MY FIST!
THIS IS THE DEMON'S EYE!":F(5)=
0
1130 RETURN
1140 REM VERB 13 & 17--OPEN & UN
LOCK
1150 IF RM=30 AND F(16)=0 AND C(
9)=1 THEN M$="THE KEY TURNS RELU
CTANTLY IN THE RUSTY LOCK AND TH
E DOOR SWINGS OPEN.":F(16)=2:R$(
30)="--SW"
1160 RETURN
1170 REM VERB 14--LIGHT
1180 IF C(6)=0 THEN M$="NOTHING
TO LIGHT IT WITH."
1190 IF OB=7 AND C(7)=1 AND C(6)
=1 THEN M$="THE ANCIENT BRASS LA
NTERN LIGHTS SPATTERINGLY.":F(7)
=2
1200 RETURN
1210 REM VERB 15--PUT
1220 IF OB<>8 THEN GOTO 1270
1230 IF C(8)=0 THEN M$="I DON'T
HAVE IT.":RETURN
1240 M$="IT FALLS OVER AND I PIC
K IT UP AGAIN."
1250 IF RM=36 THEN M$="IT FITS U
NDER ONE OF THE STALACTITES AND
FORMS A PILLAR SUPPORTING THE CI
ELING.":F(8)=2:C(8)=0:L(8)=36
1260 RETURN
1270 REM VERB 16--DROP
1280 IF C(OB)=0 THEN M$="I DON'T
HAVE IT.":RETURN
1290 M$="DONE."
1300 IF OB=7 THEN M$="AS I DROP
IT, THE LIGHT SNUFFS OUT.":F(7)=
0
1310 C(OB)=0
1320 L(OB)=RM
1330 RETURN
1340 REM VERB 18--ROLL

```

```

1350 IF RM=60 AND OB=11 AND F(11
)=0 THEN M$="MY MUSCLES STRAIN T
O THEIR LIMIT, BUT WITH A FINAL
GROAN I MANAGE TO ROLL THE BOU
LDER AWAY TO REVEAL A ROUND BLAC
K HOLE.":R$(60)="--WE":F(11)=2
1360 RETURN
1370 REM VERB 19--SAVE
1380 OPEN "O",#1,"DEMON.SAV"
1390 PRINT #1,RM
1400 FOR I=1 TO G
1410 : PRINT #1,L(I),C(I)
1420 NEXT I
1430 FOR I=1 TO W
1440 : PRINT #1,F(I)
1450 NEXT I
1460 FOR I=0 TO 63
1470 : PRINT #1,R$(I)
1480 NEXT I
1490 CLOSE
1500 M$="SAVED."
1510 RETURN
1520 REM VERB 20--LOAD
1530 OPEN "I",#1,"DEMON.SAV"
1540 INPUT #1,RM
1550 FOR I=1 TO G
1560 : INPUT #1,L(I),C(I)
1570 NEXT I
1580 FOR I=1 TO W
1590 : INPUT #1,F(I)
1600 NEXT I
1610 FOR I=0 TO 63
1620 : INPUT #1,R$(I)
1630 NEXT I
1640 CLOSE
1650 M$="HERE I AM AGAIN!"
1660 RETURN
1670 RETURN
1680 REM VERB 21--QUIT
1690 INPUT "ARE YOU SURE YOU WAN
T TO QUIT";Q$
1700 IF Q$="Y" THEN GOTO 580
1710 M$="OK"
1720 RETURN
1730 REM VERB 22--SCORE
1740 SC=0
1750 IF C(1)=1 THEN SC=SC+5
1760 IF C(2)=1 THEN SC=SC+10
1770 IF C(3)=1 THEN SC=SC+2
1780 IF C(4)=1 THEN SC=SC+5
1790 IF C(5)=1 THEN SC=SC+18
1800 M$="YOUR SCORE IS"+STR$(SC)
+" OUT OF A POSSIBLE 40."
1810 RETURN
1820 REM **READ DATA SUBROUTINE*
*
1830 FOR I=0 TO 63
1840 : READ D$(I)
1850 NEXT I
1860 FOR I=0 TO 63
1870 : READ R$(I)
1880 NEXT I
1890 FOR I=1 TO W
1900 : READ O$(I)
1910 NEXT I
1920 FOR I=1 TO V
1930 : READ V$(I)
1940 NEXT I
1950 FOR I=1 TO G
1960 : READ L(I)
1970 NEXT I
1980 FOR I=1 TO W
1990 : READ F(I)
2000 NEXT I
2010 RETURN
2020 REM DESCRIPTIONS DATA
2030 DATA BEACH NEXT TO CLIFFS,R

```

```

OOM WITH DEMON STATUES,FROZEN RO
OM,FREEZING NARROW BLACK CORRIDO
R
2040 DATA FREEZING NARROW BLACK
CORRIDOR,CHILLY NARROW BLACK COR
RIDOR,CHILLY NARROW BLACK CORRID
OR,CHILLY NARROW BLACK CORRIDOR
2050 DATA BEACH,DARK ALCOVE,NARR
OW PASSAGEWAY,DAMP PASSAGE
2060 DATA ROOM WITH WATER-COVERY
D FLOOR,DAMP PASSAGE,GLOOMY CORN
ER,COOL NARROW BLACK CORRIDOR
2070 DATA BEACH COVERED WITH SHE
LLS AND SEAWEED,HALL SMELLING OF
DEATH,DUSTY WORN STAIRS,DAMP PA
SSAGE
2080 DATA PIT FILLED WITH WATER,
ROOM WITH CAVE DRAWINGS,COLD ROO
M,COOL NARROW BLACK CORRIDOR
2090 DATA MOUTH OF CAVE,DIM PATH
,MAUSOLEUM ENTRANCE,DAMP PASSAGE
2100 DATA DAMP ROOM,ARMORY COVER
ED WITH WEAPONS,ROOM WITH CRUMBL
Y DRY MOSS,NARROW BLACK CORRIDOR
2110 DATA CAVERN ENTRANCE,POOL O
F LIGHT,MAUSOLEUM,DAMP PASSAGE
2120 DATA LOW ROOM WITH STALACTI
TES,ROOM WITH DARK STATUES,MOSSY
WALLS,NARROW BLACK CORRIDOR
2130 DATA GLOOMY HALL,THIN PATH,
THIN PATH,ROUNDED CORRIDOR
2140 DATA SLOPING CORRIDOR,SLOPI
NG CORRIDOR,HIGH CORNER ABOVE WA
LL,NARROW BLACK CORRIDOR
2150 DATA DEPRESSION IN GROUND,T
HIN PATH,CORNER STREWN WITH RUBB
LE,ROUNDED CORRIDOR
2160 DATA COBBLEBY ROOM,FALLEN P
EBBLES,CRUMBLING WALL,NARROW BLA
CK CORRIDOR
2170 DATA HALL WITH DRIPPING STA
LACTITES,VAULTED HALL,VAULTED HA
LL,VAULTED HALL
2180 DATA VAULTED HALL,NARROW BL
ACK CORRIDOR,NARROW BLACK CORRID
OR,NARROW BLACK CORRIDOR
2190 REM ROUTES DATA
2200 DATA S,WE,WE,WE,WE,WE,WS
2210 DATA NS,SE,WE,SWE,SWE,WE,SW
,NS
2220 DATA NS,NSE,WD,NS,,E,NW,NS
2230 DATA NS,NS,SU,NSE,NSW,E,S,N
S
2240 DATA S,NS,N,NS,NE,WE,NW,NS
2250 DATA NS,NSE,WE,NSWE,WE,WE,S
W,NS
2260 DATA NS,NE,W,NS,E,WE,NW,NS
2270 DATA NE,WE,WE,NWE,W,E,WE,NW
2280 REM OBJECTS DATA2290 DATA
NECKLACE,COINS,GOBLET,
RING,RUBY,FLINT,LANTERN,LOG,KEY
2300 DATA DOOR,BOULDER,RUBBLE,ST
ATUES,SKELETON,GHOST PIRATE,STAT
UE,NORTH,SOUTH
2310 DATA WEST,EAST,UP,DOWN
2320 REM VERBS DATA
2330 DATA HELP,INVENTORY,GO,N,S,
W,E,U,D,GET,TAKE,EXAMINE,OPEN,LI
GHT,PUT,DRDP,UNLOCK,ROLL,SAVE,LO
AD,QUIT,SCORE
2340 REM LOCATIONS OF OBJECTS DA
TA
2350 DATA 50,36,52,34,1,48,29,21
,34,30,60,50,37,34,2,1
2360 REM FLAGS DATA
2370 DATA 1,0,0,1,1,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0

```


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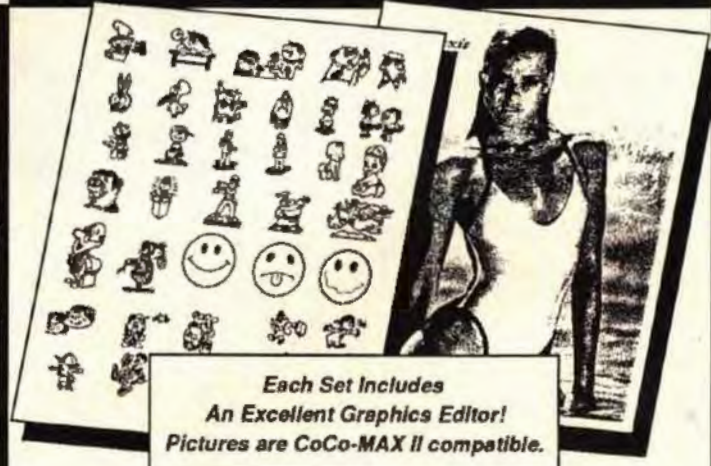
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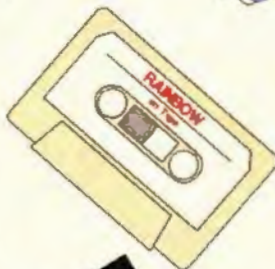


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