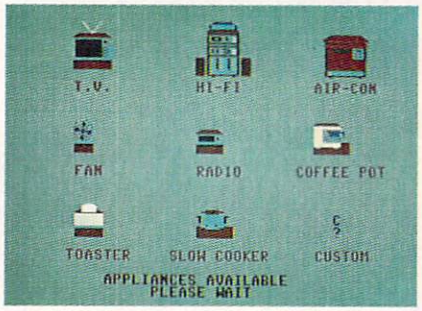
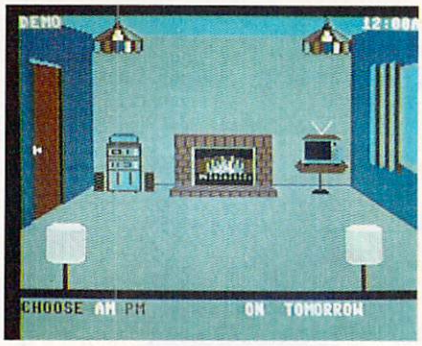




Top: appliance module icons. Middle: wire your living room. Bottom: or your house—up to 256 locations.

mode programs the various functions into the Powerhouse as they are assigned. An operate mode lets you actually exercise the Powerhouse by sending the requested controlling pulses to the various remote modules.

After the Powerhouse has been programmed it may be disconnected from the computer and placed in its final location. The computer is no longer required for its continuing operation. At this point the Powerhouse also doubles as a remote controller for eight units. As with most other X-10 appliances it is simply plugged into an existing power outlet. Power consumption is a minimal 2½ watts. This comes out to about $3.29 per year based on electricity costs in New York City. Most other parts of the country will be cheaper.

To prevent the loss of programmed data during power outages, a 9-volt alkaline battery is housed in the module. This stores enough energy to maintain the data and run the built-in clock for 100 hours.

Before disconnecting the Powerhouse from the computer you should store your schedule on disk. A separate, easy to use utility is provided for this purpose. Its sole function is to transfer the contents of the Powerhouse's memory to disk and back again. This is very convenient for saving summer, winter, holiday, and vacation schedules. Note that the graphic codes for your house are stored in the interface as well as on disk.

BASIC programmers have the option of writing their own code. A utility wedge is included on the disk. This adds nine new BASIC commands to the C-64's vocabulary. These all deal with setting the various Powerhouse functions. The accompanying manual includes detailed explanations, with examples, of each command. An additional program module is included for use when RUNning your BASIC programs which contain X-10 commands.

Advanced programmers have not been neglected. A 35-page programming guide details the operation and programming of the interface, via the RS-232 port, at the machine language level.

Conclusion

The X-10 Powerhouse is an ideal choice for owners of an X-10 system and a Commodore 64, as a replacement for an X-10 system which has outgrown the capabilities of the Timer Console. The accompanying software is well-designed for convenient and easy use. It is too soon to comment on the long term reliability of the Powerhouse; however, we have found the X-10 system components have had an excellent track record.

USA: X-10 (USA) Inc., 185A LeGrand Ave., Northvale, NJ 07647 (phone: 201-784-9700).

Canada: X-10 Home Controls Inc., 1200 Aerowood Drive, Unit 20, Mississauga, Ontario L4W 2S7 (phone: 416-624-4446). *—Morton Kevelson*

MEMORY DUMPERS FOR THE C-64

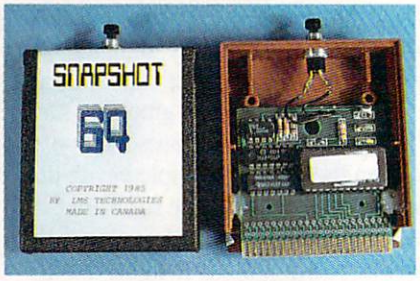
This Is What Memories Are Filled With

By Morton Kevelson

Back in October we scrutinized *Isepic,* the first of what has become a new breed of C-64 peripherals. The ink was barely dry on our review when ads began to appear for additional products along the same vein. The actual hardware appeared shortly thereafter and here we are again to tell you about it.

For readers who missed the October issue, we are talking about hardware products which at the press of

Isepic: *2K RAM, TTL chips, toggle.*
READER SERVICE NO. 226



Snapshot *(front);* **Clonebuster** *(back).*
READER SERVICE NO. 227

Capture, *with 8K PROM up front.*
READER SERVICE NO. 228

a button take total control of the computer. The intent of this activity is the transfer of the contents of RAM, as well as all hardware device registers, to floppy disk. The ultimate objective is the creation of a LOADable series of program files which can be used to reinstate the original program's operation at the point of interruption.

Several benefits can be obtained by these operations. Commercial software may be freed from the encumbrances which restrict to the originally purchased disk. The lifting of these restrictions allows a copy of the program to be conveniently placed on the same disk as its resultant data. Transference of the application from the 1541 format to a higher capacity drive (an SFD-1001 or a hard disk) becomes an alternative. Lengthy opening screens and other introductory material may be bypassed. Even BASIC programs may benefit by the saving of all initialized variables and arrays along with the program.

With these considerations in mind we take a look at the products which have been introduced subsequent to our *Isepic* review. We examine some new and unique features provided by these latest offerings.

SNAPSHOT 64 (originally CODEBUSTER)
LMS Technologies
Available from
(In Canada):
Marshview Software
P.O. Box 1212
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Canada E0A 3C0
Price: $49.95 + $3.50 shipping
(In the USA):
CSM Software, Inc.
P.O. Box 563
Crown Point, IN 46307
Phone: 219-663-4335
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or as
CLONEBUSTER from:
Micro-W Distributing Inc.
1342B Route 23
Butler, NJ 07405
Phone: 201-838-9027
Price: $49.95 + shipping

This cartridge plugs into the C-64 expansion port where it benignly awaits its cue—a simple press of its button. Upon the occurrence of this singular event all computational activities apparently cease. This is totally deceptive. Behind the now blank screen and placid exterior, the computer awaits further instruction via its four function keys and RETURN key. Lest you forget, a convenient paper overlay is provided with the CSM version as a functional reminder.

The first step in *Snapshoting* or *Clonebusting* is a press of the cartridge button followed by the f3 function key. This sets the computer to its power-on state with all of RAM preinitialized to a predetermined value. This lets the four-kilobyte operating system in the cartridge ROM distinguish between a newly loaded program and unused RAM.

At this point simply boot your original software in the approved fashion. Once your application has reached the desired state, simply push the cartridge button once again. If for some reason you were hasty or with the button press, just hit the f7 key. This should start things right up again where you left off. Otherwise hit the f1 key and the memory save process begins—provided you have remembered to prepare a formatted disk to accept the ensuing binary regurgitation. What's that? You have neglected this essential step? Fear not! The f5 key will perform the identical function while first formatting the disk.

The manual recommends that the disk drive be reset before starting the *Snapshot 64/Clonebuster* operation. On the SX-64 simply push the drive reset button. A 1541 or other separate drive should be turned off and back on. We found that more often than not this would also force a reset of our C-64, which seems to have a power supply sensitive to these things. Carefully removing the disk drive serial bus cable and reinstalling it after resetting the drive seemed to alleviate the problem. Our C-128 is apparently immune to these drive reset activities (as well as many other power line phenomena which have aggravated our C-64's).

The *Snapshot 64/Clonebuster* op-

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eration creates seven files on your disk. These include a stand-alone boot routine which does not require the continued presence of the cartridge. The *Snapshot* manual describes the contents of these files in adequate detail. The *Clonebuster* manual neglects to provide this interesting and potentially useful bit of information. Unlike the other two memory dumper products we have seen, *Snapshot 64/Clonebuster* does not provide its own fast load routines. However, the resultant files may be compatible with commercially available fast loaders. We found the Epyx *Fast Load* cartridge worked just fine.

The *Snapshot/Clonebuster* autoboot routine displays the assigned program name along with a "BACKUP – NOT AN ORIGINAL" message on the monitor screen while the program is LOADing. This will be an embarrassment to some, mildly disturbing to others, and of no particular consequence to most. Any feelings of anxiety may be alleviated by simply turning down the brightness control on your monitor.

Snapshot 64/Clonebuster offers one final feature for the technically adept. Hitting the RETURN key after pressing the cartridge button will display the vital processor statistics at the instant of program interruption. These include a readout of all the processor registers as well as the IRQ and NMI vectors, the 6510 on-chip I/O registers, the VIC II chip IRQ mask and raster compare latch value, and the CIA ICR mask values and timer latch values. At this point you will have the option of LOADing your own machine language routine such as a machine language monitor. Or you may resume execution from any address, display the contents of a range of memory (in hexadecimal), or exit to BASIC.

The *Snapshot 64/Clonebuster* cartridge is easy to use. We found that it worked well with the C-64, the SX-64, and the C-128 in C-64 mode.

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CAPTURE
Jason-Ranheim
580 Parrot Street
San Jose, CA 95112
$39.95 + $3.00 shipping
Phone: 800-421-7731; in CA 800-421-7748

When Jason-Ranheim is mentioned we immediately think of PROM programming and the Promenade (see *Ahoy!*, July 1985). The *Capture* cartridge is no exception to this rule. Its ultimate destiny goes beyond the mere transfer of the contents of C-64 memory to disk. In its final configuration *Capture* will support the creation of cartridge-based software in user-programmable PROMs from your existing disk-based programs. As of this writing, the PROM programming feature had not been implemented. Look for an upgrade ROM to relieve this deficiency early this year. We will report only on the disk-based activities of *Capture*—which still gives us plenty to say at this time.

The *Capture* cartridge contains its own eight-kilobyte operating system in a PROM set in an IC socket for easy user upgrade to the latest version. Also on board is eight kilobytes of static RAM. It is this large operating system with ample RAM which gives *Capture* its power and flexibility. Also present in the cartridge are several logic chips and the mandatory pushbutton to set the whole thing off.

The first use for the onboard RAM is as a storage buffer for the screen memory, and other vital C-64 statistics, when the *Capture* button is pressed. This allows *Capture* to initially display a detailed conscience message followed by a complete operating menu. What could be simpler?

As with other memory dumpers, *Capture* gives you the option of preconfiguring RAM. This allows *Capture* to save only the contents of RAM used by the application program. *Capture* files are all exactly two kilobytes long. Thus up to 32 files may result from a complete memory dump. The file names are indicative of their starting address. This will allow you to easily go back and analyze the *Captured* program. The

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Capture menu also lets you display a preview table of RAM used by your program.

Five additional files will appear on the *Capture* disk. These are the C-64's I/O data and program boot files. *Capture* also lets you save the contents of the disk drive's RAM, although only for informational purposes. A fast boot routine is included for 1541 users. Even with the fast boot routine, a 64-kilobyte *Captured* file took nearly one minute to LOAD. This time can be cut nearly in half by combining the various two-kilobyte modules. The manual gives complete instructions on this procedure.

If you transfer the *Captured* files to another disk, be sure to use a disk sector editor to copy blocks 15 and 18 on track 18. The data for the 1541 fast boot routine is stored here. The programs will not LOAD without it. Other disk drives which do not use this fast boot routine will work just fine. For some reason the manual leaves out this vital bit of information.

The next menu option lets you create a stand-alone disk image of the program currently in memory. You may select both the drive and device numbers for your output files. Thus separate drives can be used for booting your original program and *Capturing* the result. You must remember to have a preformatted disk on hand, as *Capture* does not offer a disk format option.

The last two menu items hold the promise of *Capture's* future. Neither of these options were implemented as of this writing. First there is the create a PROM cartridge option. To use this you will need a Promenade PROM programmer ($99.50) and a CPR3 cartridge kit ($29.95 price includes three EPROMs). You will not need a high school graduating class. *Captured* programs placed in PROM will be instantaneously available on power-up as plug-in cartridges. We intend to report on this option when it becomes available.

Capture's final option is intriguing to say the least. Jason-Ranheim intends to publish a number of application programs which will LOAD into and RUN from *Capture's* onboard RAM. These utilities will operate on your raw captured data to, among other things, automatically link the *Captured* two-kilobyte modules. Specific details of these other things were not available at press time, but we expect they will have something to do with PROM programming.

Capture is easy to use, being virtually foolproof in its basic operation. The proposed PROM programming powers hold great promise from our point of view. The version of *Capture* we looked at did not work with the C-128 in C-64 mode. According to the company, this was due to differences in the prototype C-128 from the current production models (a problem we can sympathize with, having been bitten by the same bug). The *Capture* upgrade PROM is expected to solve this problem as well as incorporate the PROM programming feature. If C-128 compatibility is important to you, check with the manufacturer for the latest word before ordering.

IN RETROSPECT

We reviewed *Isepic,* forerunner of the current crop of memory dumpers, in October. While *Isepic* did not do bad as a forerunner, it does not measure up to the products reviewed here, each of which has its operating system in ROM (eliminating the need to boot up from disk), compacts files in a single step rather than as a separate operation, and allows dumped programs to run as stand-alone routines, without the presence of the parent cartridge.

With regard to the ability to provide a working dump of commercial software, all these products were about equal. Programs which resisted the efforts of one cartridge resisted the efforts of the others as well. None of the cartridges could cope with software which performed multiple disk access for copy protection. Custom DOS routines will also act to stymie the efforts of these products. The memory dumpers are best applied to increasing the convenience of older, but still revered, programs in your library.