A few quick photos of the GoldCard in action

2 x 256Kb storage expansion for Model T (Tandy 100/102)

Initial explorations as of early January 2021

More details available from Steve Baker if there's interest

GldCrd (application)

As seen in the Model T main menu

installed after CALL 63012

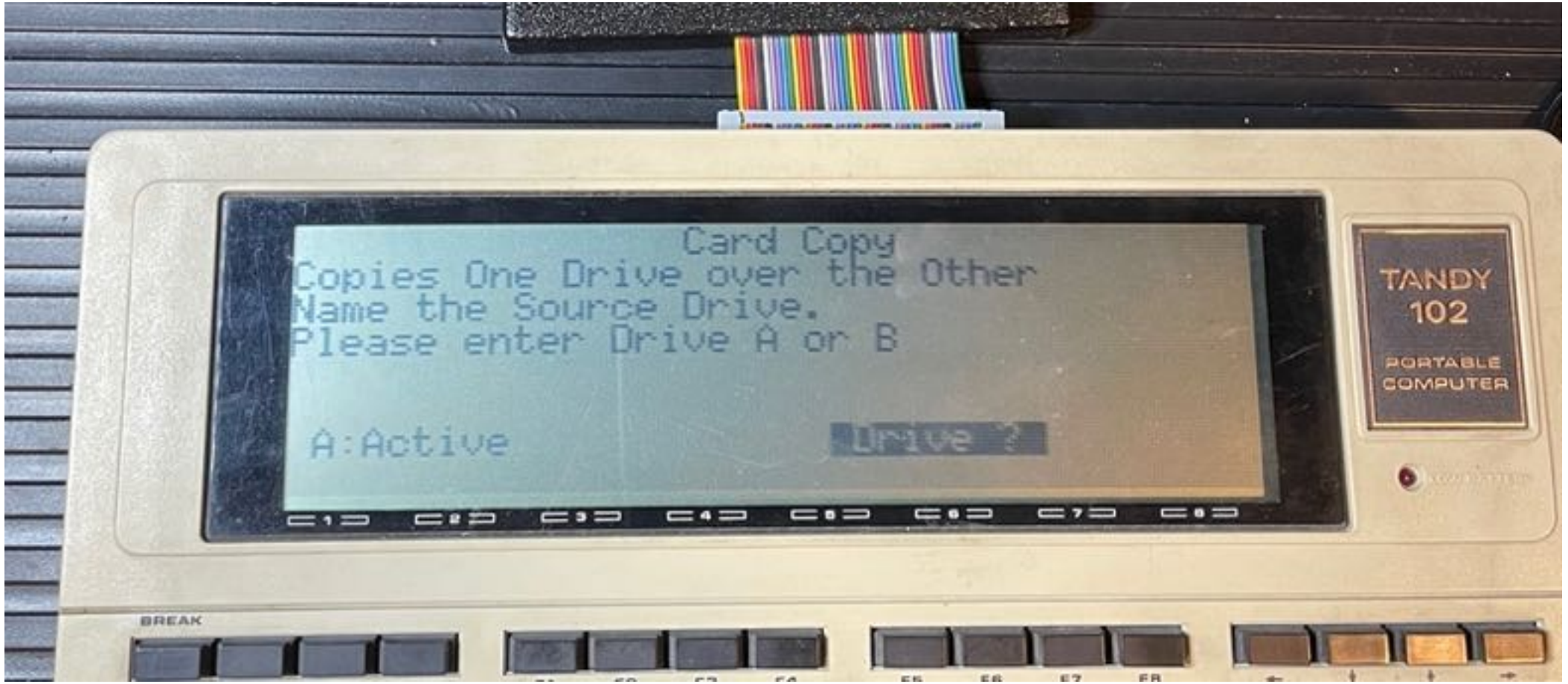
GoldCard Directory (primary interface)
Showing Drive A (active at the moment)
which is currently blank (252.5K available)

GoldCard Directory (primary interface)
Showing Drive B (active at the moment)
also blank (type A/B to toggle between)

GoldCard Utilities (config options)

F1 shows the GoldCard files, F2 shows RAM

Copyright screen shown on page 1 (above)

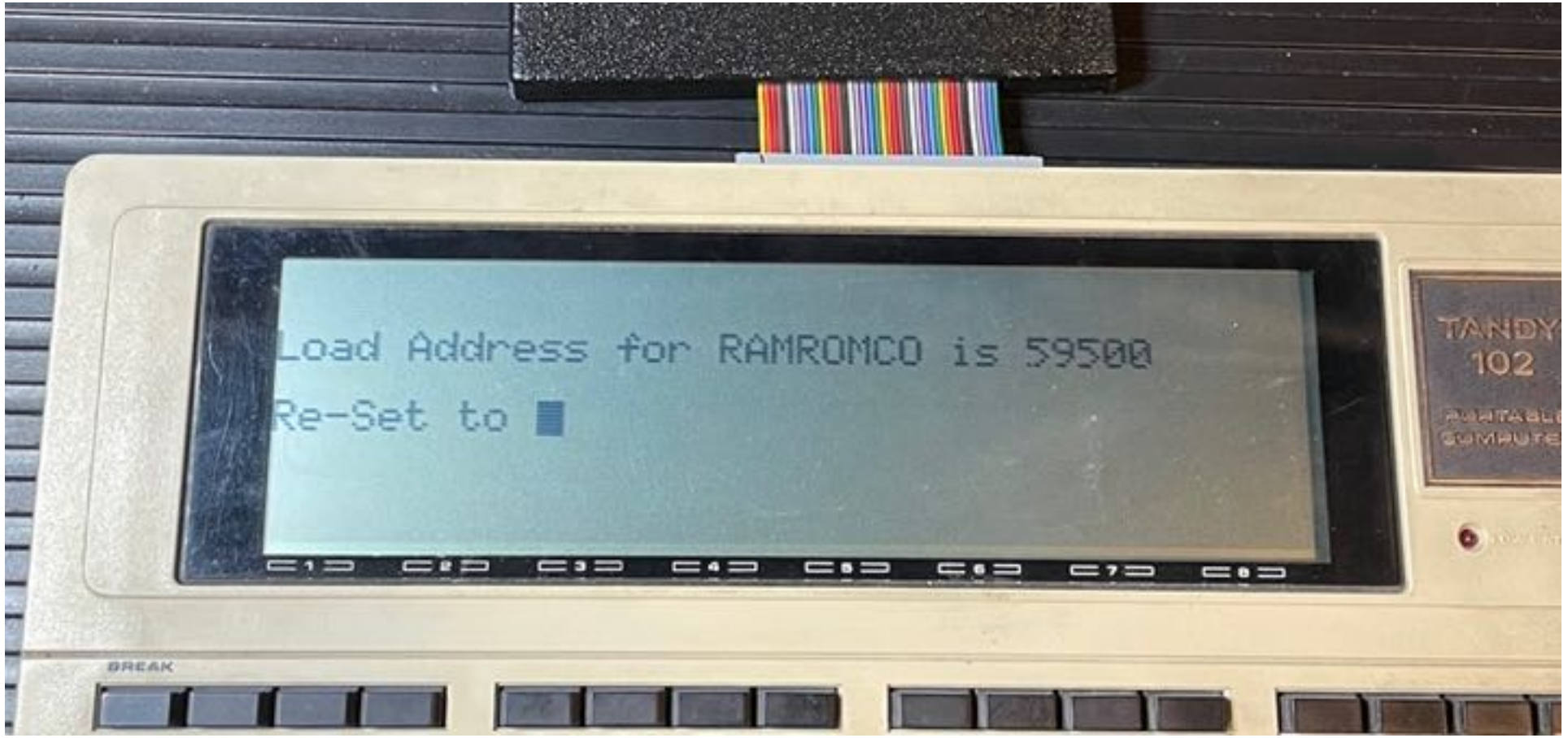


Card Copy (utility option)

As noted, copies the contents of one drive onto the other drive (user chooses source, etc.)

Test Gold Card (utility option)

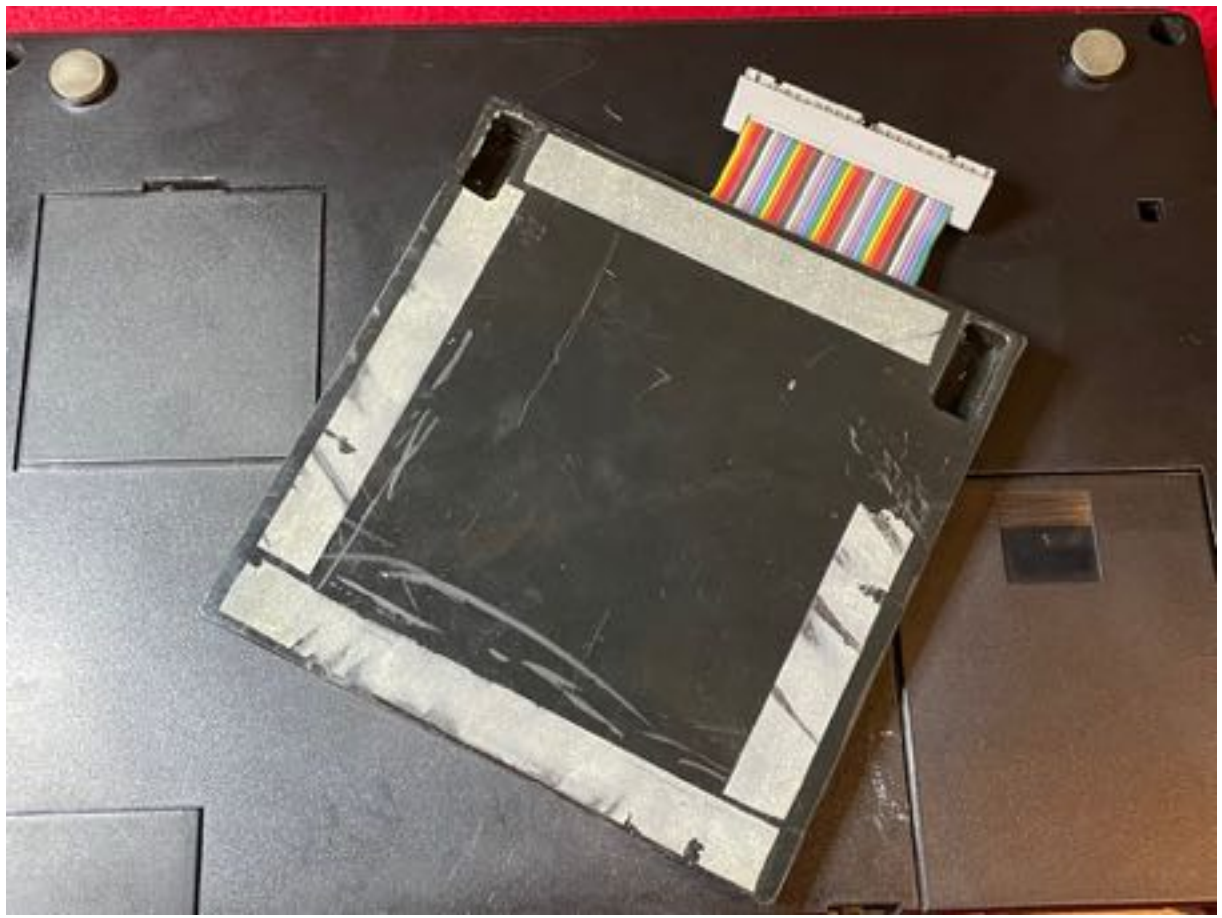
Built-in diagnostics to ensure that the selected drive is error-free (takes a few minutes)



RamRom (utility option)

Creates a RAMROM.CO file that loads into the specified memory address

The custom Option ROM itself
Installed in the Option ROM Socket (left)
Chip top (center) and bottom (right)



The drive hardware module

Top with "OPEN" label (left)

Back with some adhesive (right)

The two 256k drives (A and B)

The two drives installed (left)

Back of the second card (right)

Inside one of the 256Kb IC cards

Battery panel access and on/off switch (left)

Looks like CR2325 batteries it is! (right)

Trying out a different IC Card (32Kb)

The card installed (left), close-up (center), and back/bottom (right); initialized and working!

"SOUNDSIGHT INTERFACE BD. REV. 2"
Zoomed photo of the board edge
inside the plastic case (not opened)

The Gold Card:

24-Karat Technology

by Mike Nugget

Dust! That's how I'd sum up the Gold Card. Naturally, I considered "fantastic," "outstanding," and "revolutionary"—all appropriate but cliche. And "totally gnarly, dude" wouldn't work anywhere east of SoundSight. (That's in, like, California, man.)

So it's "dust." The dust collecting on my RAM banks, ROM's, ROM Safe, disks, drives, and related hardware and software. Beyond occasional disk drive use, I don't need all that paraphernalia. Gold Card has taken its place.

On the surface, SoundSight's Gold Card is an expansion RAM product, the most compact expansion to date. Underneath is a rich vein of powerful features. And deeper still is the raw ore of potential, the chance to realize some of the most cherished items on our *wish lists*. Gold Card technology might be the most important Model 100/102 development in years!

I've had Gold Card units on my Model 100 for many months, starting with beta test version 3.8. This review describes v7.10, along with the ROM Eliminator option, operating on a 32K RAM Model 100.

The Gold Card system attaches to the underside of the computer. The standard package is a small, flat interface unit containing one or two Gold Cards. The cards themselves are plug-in random access memory (RAM) modules in the shape of credit cards. Currently available cards have capacities of 128K, 256K, or 512K each. So a two-card unit can put 1M (one megabyte, or one million bytes) of RAM on your lap today. With 1M cards expected within two months and 2M cards by Christmas, that's a potential of 4M on your Model 100/102.

Gold Card RAM is non-volatile. Each card has it's own lithium battery to maintain the memory when the computer is turned off. This takes the hassle out of cold starts. Just keep your DOS and other important programs on the Gold Card, and after a cold start, they're just a *BASIC CALL* statement away.

MODEL 100 RAM DRIVES

Unlike RAM banks, the entire Gold Card memory is always available to your programs in a form similar to RAM disks. One card is drive A and the other, in a two-card system, is drive B. You get the speed of a hard disk or RAM drive, but since you can easily swap cards in and out, you still keep the swap-ability of floppies. You could keep a mailing list on one card, all your spreadsheets on another, have yet another card for financial programs and data, and still another for games.

INSTALLATION

The Gold Card looks like its picture in the ads. Lightweight and tiny, it consists of a black plastic interface unit with one or two Gold Cards already mounted and a ROM containing the operating software. The manual includes an illustrated hardware installation guide.

Installation is a snap. Plug in the ROM, plug the interface unit's ribbon cable into the system bus, and press the unit into place. Double-sided *stickum* on the interface binds it tightly to the computer. Mine have taken abuse for months with no hint of letting go.

Now, turn the computer on and enter *BASIC*. Type *CALL 63012'i* and press *ENTER*. The Gold Card installs and initializes, running self tests to verify and format itself. When done, the Gold Card menu is displayed on the screen, and the name *GldCrd* has been put into the Model 100 directory, so you can run it from the main menu.

GOLD CARD MENUS

Gold Card has three types of menussimilar in appearance and operation to the Model 100 main menu. Additionally a function key menu appears on the bottom line to display function key labels (i.e., for loading, saving, renaming files, etc.).

The RAM menu displays your RAM files, the number of free bytes in RAM, and the currently active Gold Card (A or B). Pressing *F1* toggles between this menu and the Gold Card file menu.

The Gold Card can contain 191 file names, displayed on nine menu pages with up to 19 files per page. Gold Card memory is not partitioned; only the directory is, to let you group the names of related files together. The menu first comes up showing Page 1 of the files on the currently active card. Pressing a number key (*1-9*) displays any page you want. Each page also shows which card is active, the free space on that card, the function key labels, and the size (in 0.25K increments) of the file selected by the cursor.

Pressing *F4* from any menu calls up the "Utility" menu, with selections for testing the Gold Card hardware and software, initializing cards (like formatting disks), setting *GolDOS* hooks into *BASIC*, write protecting a card, and copying one card to the other.

GolDOS

The *GolDOS* operating system, manages the Gold

Cards, and since it's on ROM, it uses no RAM. Its flexibility allows your operation to be as simple or as complex as you require. *GoIDOS* provides a wide range of services.

One service is its menu system. You can load, save, kill, rename, and move both RAM and Gold Card files with function key ease. The *Move* function, in one easy step, copies a file from the source to its destination (RAM to Gold Card or vice versa) then kills the source file. One stipulation: you can't load, save, or move to a file of the same name on the same card or in RAM. You'll get a *File Exists* message. You must first kill the offending destination file or rename either the source or destination file. Fortunately, that's easily done with a few keystrokes. But an option to overwrite the destination file or rename the source file at load/save/move time is definitely #1 on my list of suggested improvements.

You can enter text (*.DO*) files from the Gold Card file menu by pressing *ENTER* with the cursor over the file's name. The file loads into RAM for editing and is re-saved automatically to the Gold Card on exiting, so you needn't remember or bother to save the edited file. *CUT*, *COPY* and *PASTE* works between RAM and Gold Card files. As with normal RAM files, the size of a file that can be edited is limited by the amount of free RAM. (Note: *GoldText*, a product developed especially for the Gold Card, edits files directly on the card, using no RAM, allowing you to edit files as large as your Gold Card will hold. Look for a review soon.)

A Portable prospector finds gold in them thar New Hampshire Hills. He disappeared shortly tharafter.

GOING DIRECT WITH GOLD CARD *BASIC*

Another service, Gold Card *BASIC*, lets *BASIC* programs read, write, run, open, close, merge, rename, and kill files on the Gold Card, using standard commands as *LOAD*, *SAVE*, *OPEN*, *PRINT#*, *INPUT#*, *MERGE*, *KILL*, etc. For example, *RUN "A:MYPROG"* will load and run *MYPROG.BA* from drive A. Rather than keep your RAM full of files, just run them directly from the Gold Card. This allows bigger programs. You can even chain, with one program running another. Chaining lets you run very large programs by breaking them into a chain of modules.

Machine language (*.CO*) files can be handled with *LOADM*, *RUNM* and *SAVEM*.

GOING DIRECT IN *TEXT*

In *TEXT*, you can load and save text files directly to and from the Gold Card. For example, to load *MYFILE.DO* from drive B, press *F2* (Load) and at the *Load from:* prompt type *B:MYFILE* and press *ENTER*. Save (*F3*) it the same way, as *A:MYFILE* or *B:MYFILE*.

Note that direct operations can load from one card and save to either card. And unlike menu-driven saves/loads, it automatically overwrites like-named destination files.

REALLY GETTING DOWN WITH EXTENDED SERVICE CALLS

Extended service calls really unlock the power of the Gold Card. Appending parameters to the *CALL 63012* statement (e.g., *CALL 63012'i* in the installation process), lets *BASIC* perform the functions above, plus it can install, initialize, or remove Gold Card, verify, test memory, display the Gold Card menu, copy one card to another, set the currently active drive, return the size of a card and its free space, find files on the cards, display any directory page and get the file selection, and much more.

Extended service calls offer advantages with machine language (*.CO*) programs. Whereas normal *LOADM* and *RUNM* statements destroy the current *BASIC* variable list, their extended equivalents do not, making it possible to load and run a *.CO* file in the middle of a running *BASIC* program without losing the values of existing variables.

SECTOR ACCESS!

Most powerful of all, extended service calls allow operation at the sector level. *BASIC* programs can read and write physical sectors on the Gold Card, test whether a sector is in use, mark a sector as free or in use, find the next free sector, find the first sector for a directory entry, update a directory entry.

This is the "raw ore." With direct access to any byte on the card, fantastic possibilities become closer to reality. Large random access databases are now possible, even in *BASIC*. The largest mailing list could be accommodated.

Editing massive text files is not only possible, it's already here! I've been editing a 48K text file which, if it grows to 100K or more, will be no problem, thanks to SoundSight's *GoldText* ROM. What's more, I can do it without disturbing any existing files in my Model 100 RAM. Should I decide to transfer the file to my 1400LT (MS-DOS), I can send it out the RS-232C port via a *SAVE* to *COM:*. I can upload it to a BBS, using *XMDPW6*, the newest *XMODEM* telecommunications program on CompuServe's Model 100 Forum. I can also download any size file up to the limit of my Gold Card memory.

Most existing *BASIC* programs that work with RAM files also work with Gold Cards just by turning on the Gold Card hooks and adding drive specifiers to the file names in the program.

With machine language, the possiblities are even greater. All it needs is the interest of software developers. The developers of Gold Card and *GoIDOS* have done their utmost to encourage this development. The *GoIDOS* manual is an excellent example of this attitude, clear, concise, and very well written. It's not fancy, but it's one of the best I've seen. It proceeds logically and explains everything from the simplest operations, for the non-programmer, to the most complex capabilities, for those who write their

own software. The manual is filled with examples and sample programs to explain the use of advanced features. They obviously want to make it easy for you. The *GoIDOS* operating system's developer, King Computer Services, has developed a cross compiler for writing C language programs for the Model 100, a cross assembler for writing machine language programs for the 100, and has released a book on option ROM programming. If developers pick up on this, you may soon see your wish list become a list of existing software.

SAVING THE BEST FOR LAST

Probably the hippest, slickest thing ever to come along is the *ROM Eliminator*! Built right into the Gold Card interface, this optionlets you copy ROM's to a Gold Card. Then you can give the ROM's to your sister. You won't need themagain. You can store as many ROM's as will fit on the card. A Gold Card Utility menu option loads *RAMROM.CO* into RAM. *RAMROM.CO*, displays a menu of ROM's already on the Gold Card, with the extension *.RM* after their names. The screen shows whether the normal option ROM socket or the ROM Eliminator is currently active. Function keys offer options. *F1* (Save) copies the image in the selected device (i.e., the socket or the Eliminator) onto the card and gives it the name you specify, adding an *.RM* extension. *F2* (Load) loads an *.RM* file selected by the cursor into the Eliminator, automatically connecting the Eliminator and disconnecting the ROM socket. The image in the Eliminator is now your ROM and operates just like the real chip would. *F3* (Switch) switches whichever connection was established. For example, if the socket was connected, the Eliminator will now be connected. With the Gold Card ROM in the socket, I load the Eliminator with another favorite. I use *F3* to switch between them with just a couple keystrokes. When I need a ROM that I don't use very often, I "*F2*" it into the Eliminator, and I'm set to go. Quite an elegant hassle saver! When I write my own ROM's with the King Computer Services package, I can just load them onto the card, too. Nothing extra to carry, and no moving parts. This thing is unreal! If you intend to use option ROM's now or in the future, be sure to order your interface with this option.

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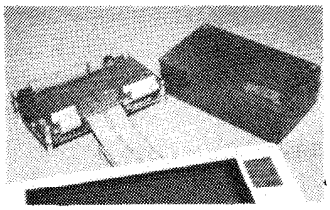

Other options available, call or write for more information. Specify (M100-DACQ for Model 100, M4-DACQ for Model 4) interface cables.

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TO BE CONTINUED ...

Rats! I'm running low on magazine space. So tune in next month for more details on the Gold Card, the ROM Eliminator, and other related products.

If it seems a bit pricey, consider the price, bulk, and maintenance of comparable peripherals. And where else will you get file editing on massive *TEXT* files, unlimited download to memory, and who knows what future developments. It's great to have a notebook that can compete with the big boys, with no moving parts, cold start immunity, dual RAM drives, removable storage that slips in and out in a second, heavy duty error checking (discussed next month), etc. Maybe I sound like a commercial, but I'm excited by the Gold Card. Check it out for yourself!

Bio: Mike Nugent is ...oh, forget it--
Hi Shannon! Hi Mom!

Manufacturer's Specifications

Standard interface: $199.95
Industrial interface: $299.95
Pull-up resistors on all leads, 8-layer board with ground planes for maximum radio frequency shielding, and other features.

ROM Eliminator option: $100.00
Available on industrial interfaces only
Cards:
128K: $200.00
256K: $350.00
512K: $550.00

The Gold Card:

24-Karat Technology (Part 2)

When we last left Nuge, he was expounding on the Gold Card. He ran out of magazine long before he ran out of RAM.

by Mike Nugget (Part Irish, Part French, too)

Last month, I tried to provide an overall picture of SoundSight's Gold Card. This month I'll go into depth on a couple of features and throw in some miscellaneous tidbits.

HEAVY-DUTY ERROR CHECKING

Since the Gold Card is used in some industrial and medical environments, where the integrity of the data can be critical, Gold Card's operating system (*GolDOS*) incorporates extensive error checking and reporting, as well as multiple levels of testing. Here's an excerpt from the *GolDOS* manual:

"Much of the Beta testing for the Gold Card was done in a very brutal environment. Extremely cold temperatures, wet environments, and nearby static electrical discharges. An error checking system was built into the operating system that checks the result of any sector that has just been read or written. The sector just read or written is read back in and compared to the original to ensure correctness. Each read or write results in an additional read and compare.

"At the very lowest level, Error Checking is enabled as a write verify option which reads back in each sector written and compares it to the original. A write is tried three times before the system gives up and provides error messages to the user that may be used to diagnose the problem. Read cycles also use error checking.

"If a Read or Write fails an Error Check, a screen of information is displayed that may be printed for analysis of the problem."

Much of the Beta testing was done in a very brutal environment.

I saw this error checking after I crashed a Gold Card by letting its battery go almost dead. The cards rely on the computer's power to recharge their lithium batteries, so it's necessary to run the computer at least a few hours a week. By leaving my machine off for an extended time, I allowed the battery of my oldest card to drain to a very low level. It began to lose its mind, and I was presented with detailed error check screens.

The first screen tells whether it was a read or write error and, if a *BASIC* program was running, displays the *BASIC* line number active when it happened. Also shown are the sector number where the error occurred; the number of bytes being written at the time; the offset of the bad byte within the sector; stack, moat, and beginning RAM address of the block from which data is being read or into which it is being written; the actual memory address at which the error occurred; a pass count (valid only for initialization and non-destructive memory tests); and the good and bad bytes (i.e., the expected value and the actual value). If an invalid sector was referenced, that is also indicated.

The bottom of the screen lists your options: abort the operation, retry it, print the error screen to a printer, turn off error checking, and display another screen of information. That second screen shows a hex dump of the offending data and offers the same options as the first.

TESTING

GolDOS offers several memory and hardware tests. Two are similar, the destructive and non-destructive tests. Both write, then read, two separate patterns of bits to every byte on a card. The destructive test is performed whenever the Gold Card is initialized. It clears the card and destroys all files. The non-destructive test is performed when the user requests it. It preserves a sector's data and restores it after the sector has been tested. It also allows you to set a pass count. That is, you can choose to run the complete test from one to 9999 times. You can even choose to run the test continuously until a key is pressed. That's useful for "burning in" cards and for laboratory testing, to show the effects of environmental changes made during the test.

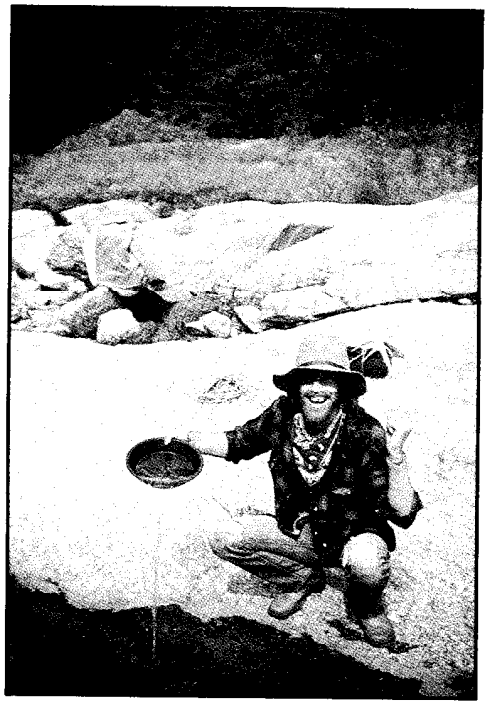
Another (destructive) test is the memory test, designed to test a card's ability to "remember," or retain, data. It has a write test which writes a shifting bit pattern to the card. When done, you can immediately go to the read test or wait any amount of time, to allow the card to be subjected to some environmental condition (e.g., extreme overnight cold) before running the read test. The read test runs continuously until a key is pressed. It displays an error count on the screen and writes a list of sectors where errors occurred to a RAM file for later study.

```
Pg:1  -GoldCard Directory- Free:249.25K
[DATA.DO  ]PLAYER.BA -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 A:Active     3.25K
Ram  L/fl Move Util K/fl  --  Rnam Menu
```

Figure 1. Directory page 1 (of nine pages) showing the files on drive A. Drive B has its own similar directory.

```
          -Ram Files-    19268 Bytes free
[GCREVW.DO]NOTE.DO    HI_SUZ.DO -.-
 -.-        -.-        -.-        .
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 A:Active
GldC S/fl Move Util K/fl  --  Rnam Menu
```

Figure 2. The RAM file menu lets you manipulate your RAM files. You can even edit RAM text (.DO) files directly from this menu.



It looks like things really panned out for this Portable prospector!

VERIFY

The verify routine can be run at any time from the utility menu. It goes through the card and checks that the files are in good shape. If something got scrambled somehow, the verify routine offers the option of killing the file or trying to save what it can. Verify is also used when changing cards. When you replace a card with another, you run verify to check and log in the new card and update the menu display with the new file names.

BLOOPERS

A minor problem when running PCSG's *Lucid* from the ROM Eliminator happens when the first cell you edit contains data. The edit line displays garbage, the computer emits a long beep, and you must press the reset button to exit. It's harmless but annoying. SoundSight is working on the problem. Meanwhile, a simple solution is just to edit a blank cell before any others. Once the blank cell has been edited, the problem is gone.

Another minor glitch is that Gold Card's menu mode defeats the computer's automatic power-down feature. It won't time out, so if you're running on batteries, remember to turn off the computer when you're not using it. Or at least exit Gold Card.

I found only a few small errors in the documentation, information that was correct for earlier versions and needs to be updated for the current version.

ROM ELIMINATOR

SoundSight is working on another glitch of sorts in the ROM Eliminator. The manual says you can turn the Eliminator on from *BASIC* via an *OUT 56,17* statement and turn it off via *OUT 56,1*. This works on the majority of machines, but on a few, mine included, *OUT 56,17* sends them into limbo. Pressing reset gets my Model 100 back on its feet, apparently unharmed.

There seems to be no pattern, no way to predict which machines will react badly. So far, they haven't figured out why it happens or how to get around it. Again, the interim solution is simple. Those with finicky machines should just use *RAMROM.CO* to switch the ROM Eliminator on and off.

I'm thoroughly impressed with the attitude of the developers.

GOLDCARD IPL

Supposedly, you can't run the Gold Card as an IPL (initial program load) program, since *IPL* requires a legal file name, and *GldCrd* (the name of Gold Card's trigger file) is not a legal name.

Well, it can be done. You just have to be sneaky. At IPL time, the cursor is always over *BASIC*. *GldCrd* is always at column two, row two on the computer's menu. To run *GldCrd* manually, you'd press the right arrow, the down arrow, then *ENTER*.

Since the IPL procedure simply stores keystrokes (usually a program name) and types them in at IPL time, I've assigned the arrow keys and a carriage return (*ENTER*) to the IPL string. To set it up, enter *BASIC* and type: *IPL CHR$(28)+CHR$(32)+CHR$(13)* and press *ENTER*.

This technique will run any file whose name is in column two, row two, not just *GldCrd*.

MORE WISHES

Last month, I wished for an option to overwrite or rename files when loading, saving, or moving to a destination file of the same name while in Gold Card's menu mode. I'll add two more wishes.

First, in Gold Card's menu mode, the RAM menu doesn't

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```
 A: SoundSight ROM Eliminator  v 3.00
[GOLDCD.RM]GOLDTX.RM FORMS.RM  -.-
 -.-        -.-        -.-      -.-
 -.-        -.-        -.-      -.-
 -.-        -.-        -.-      -.-
 -.-        -.-        -.-      -.-
ROM Socket is Enabled
Save Load Swtch  --   --   --   --   -- Exit
```

Figure 3. Running RAMROM.CO *displays the ROM Eliminator menu. Here, you can load, save, kill, and switch ROM's.*

```
Error on Wr at Line 120
Sect/IO Size/Offset  27 256 0
Stk/Moat/Mem 60138 42507 60511
Add of Er/Pass 60515 0 0
Gd Byte/Bd Byte 4F  4C
Error in BASIC I/O - Invalid Sector
(A)bort (R)etry (M)ore
(P)rint (E)rror Check Off
```

Figure 4. The first error-check screen contains a wealth of information about any error that might occur.

```
F108: 20 15 1C 08 8C 95 FF 5C  .......\
F110: 42 43 15 5A 5B 55 12 12  CD.Z[U..
F118: 12 02 00 00 5A 71 7B 10  ....Zq{.
F120: 20 15 1C 08 8C 95 FF 5C  .......\
F128: 42 43 15 51 5B 55 12 12  CD.Z[U..
F130: 12 02 00 00 5A 71 7B 10  ....Zq{.
(A)bort (R)etry (M)ore
(P)rint (E)rror Check Off
```

Figure 5. The (M)ore option of the first error-check screen produces this hex dump of the erroneous block of data.

show the size of the RAM file under the cursor. I think it should.

Second, I'd like to see the ROM Eliminator indicate the name of the ROM file currently loaded in the Eliminator.

DOCS AND ATTITUDES

I've referred to the Gold Card documentation as excellent. That's partly because it goes far beyond describing how to use the product. There are technical explanations of ROM trigger files and a list of system hooks used by the Gold Card, very good compatibility notes, discussions of Gold Card's RAM memory usage and card sector layout, and scads of sample programs. And anything more I've wanted to know has been just a phone call away.

They talk freely about their systems.

I'm thoroughly impressed, not only with the Gold Card and ROM Eliminator products, but with the attitude of the developers as well. Unlike almost every other developer I've seen in the notebook computer field, who tend to keep everything a secret, SoundSight and King Computer Services talk freely about their systems. I've always found them quite willing to share information on the inner workings of their products. With such openness, programmers and developers should have an easier time creating new applications. And that will benefit all of us.

❑