G-PROM Review

(Or How To Increase H–89 Graphic Resolution For Under $20!)

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Introduction

I made some improvements recently in my H–89A, so it would continue to meet my computer needs. I'll explain how I got higher resolution graphics out of my old war horse. Any modification I try has to really improve performance, be reliable and inexpensive. It has to be easy and quick to install.
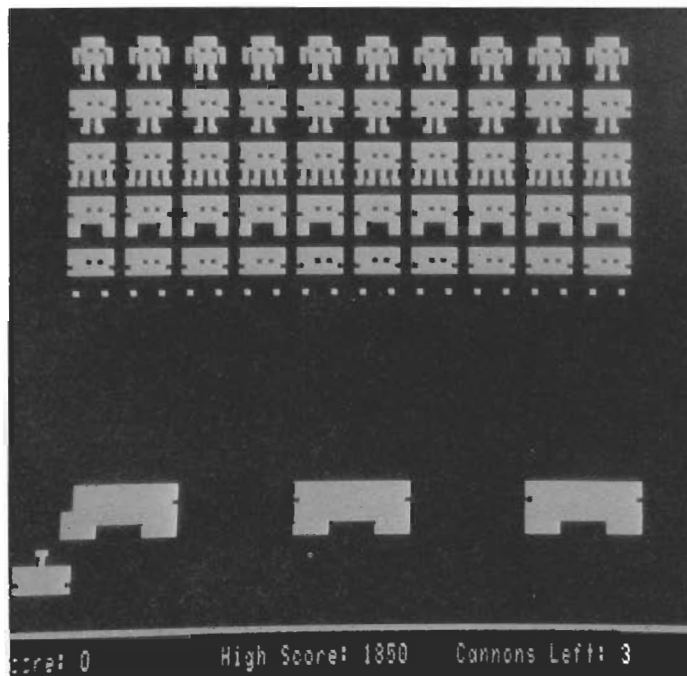
My H–89A, prior to these modifications, was stock Heath. It was set up with 64K RAM, H–88–3 serial ports, H–17 disk drive controller, and three H–17 (hard sectored, 100K, old style) disk drives. My mechanical and electronic ability are somewhat limited, so "if I can do it, so can you" really does apply.
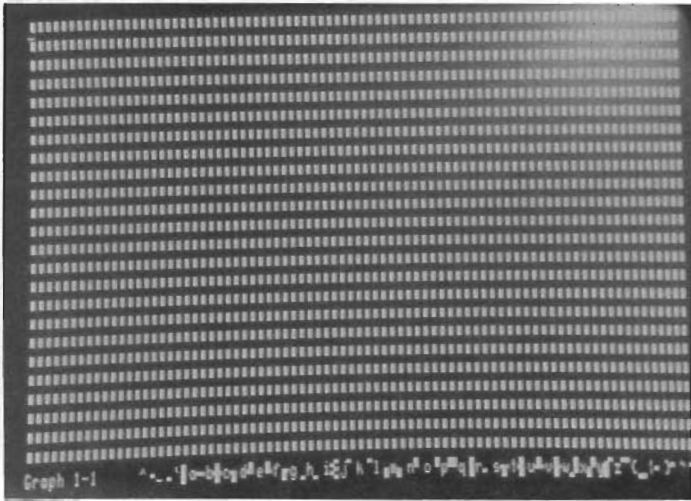
Evaluation Of G–PROM

I improved screen resolution by replacing the Heath character generator with G–PROM ($19.95, including shipping, handling and complete documentation, available from NORCOM, 9630 Hayes, Overland Park, KS 66212). G–PROM is a character generator replacement for both the H–89 and H–19. Physically, it is a single ROM chip which replaces the Heath 24 pin DIP ROM at position U473 (H–19/H–89) or U420 (H–19A/H–89A) on the Terminal Logic Board (TLB).

G–PROM produces a new character set on the H–19/H–89 display. G–PROM will work under either/both the CP/M 2.2 and HDOS 2.0 operating systems without modification to any software. The new character set includes 23 revised ASCII and 24 graphic symbols, plus 81 unrevised characters. Photo 1 shows how the new graphic characters are more rectangular than the old Heath graphics. Note that in Photo 2 the shapes are square. This was a diagonal shape before. The new graphics have a two and one half times higher vertical resolution than the old set.

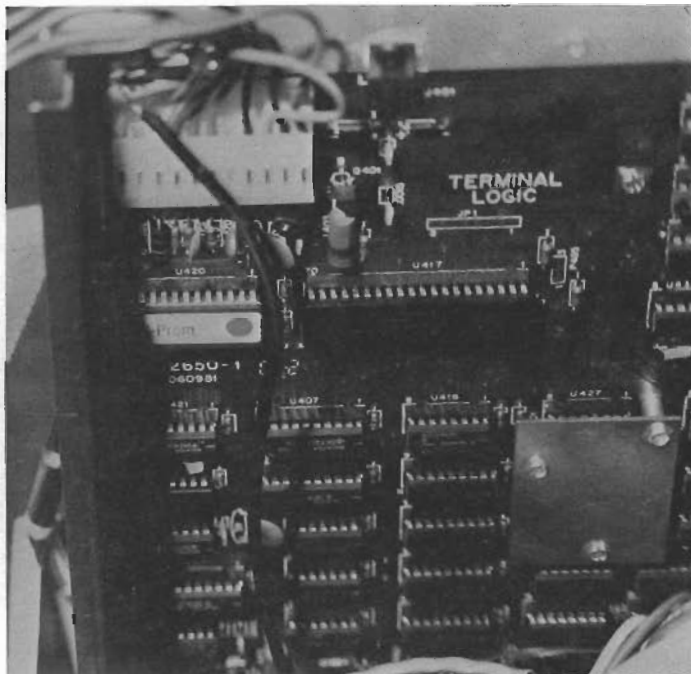NORCOM has included an MBASIC program that demonstrates the new and old resolutions.

Photo 1
Demonstrates rectangular shapes to old "Invaders" game.

Photo 2
New rectangular shapes instead of diagonal shapes.

I was able to install G-PROM easily by following the directions supplied. Time was one hour, including the time for pulling the CPU and terminal logic boards out twice (I failed to label one connection since "I knew how it was oriented"). I inverted the plug on position P513 on the CPU board. I got only one "beep" when I powered up, and could not get the "H" prompt. However, the screen worked fine in the "off line" mode. If I had followed the directions supplied with G-PROM, which boldly stated to label each plug, I wouldn't have had a problem. I should add that it has been over a year since I "popped the top" on my H–89A. So, I was a little rusty, as you might guess. Photo 3 shows the G-PROM installed on the Terminal Logic Board.
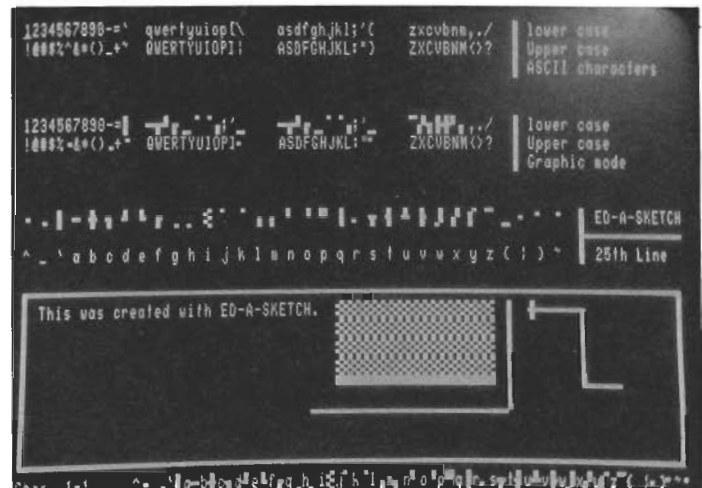
Speaking of following directions, please pay special attention to the instructions for making sure the ROM's DIP pins are straight before you try to install the G-PROM ROM. Every DIP I've ever worked with has needed a little work to ensure the pins are straight up and down (perpendicular to the socket). Just roll the ROM's "legs" over a table top to straighten them. Be careful of static electricity. You can "zap" the ROM and ruin it if you don't ground yourself before picking it up.

Once the G-PROM was installed, I ran every program I had to see how each looked with the G-PROM character set. Most displayed just as before, only better. The only troublesome exception was Galactic Warrior. It looked "a little funny". It uses the "crossed lightning" graphic character which was replaced by a rectangular symbol. Shuttle Lander, marketed by Hoyle & Hoyle, and Invaders, marketed by The Software Toolworks, were affected to a lessor degree. See photo number two for an idea of the differences. All games played fine, though. Other programs that used graphics looked great. For example, if you use Pat Swayne's neat DIR19 program (HUG P/N 885–1126 title: HDOS Utilities by PS and the CP/M version, HUG P/N 885–1226), you will really like the full dividing lines. His SEE program (also on P/N 885–1126 and in CP/M, on a different HUG disk, P/N 885–1237), which uses graphics in the 25th line, looks fine. See Photo 3.

ED–A–SKETCH (a graphics editor), by the Software Toolworks, worked fine with G-PROM. Even the 25th line displayed the correct graphic characters with the corresponding keyboard elements. I enjoyed the increased resolution of the pictures I created with ED–A–SKETCH. For example, I sometimes make colored transparencies of my screen displays for briefings. The G-PROM graphics are much better than the original Heath graphics. This is my primary use of G-PROM's capabilities.

I tried to dump the pictures I created with ED–A–SKETCH and G-PROM characters to my Zenith MX–80A printer (same as Epson MX–80, type III) using FBE's SCREEN DUMPER program. Unfortunately, the old graphic characters were printed. See Figure 1 and Photo 4.

Photo 3
G–PROM installed on Terminal Logic Board of an H–89A.

Photo 4
This is a picture of the screen that produced Figure 1.

Photo 1 shows new characters which Figure 1
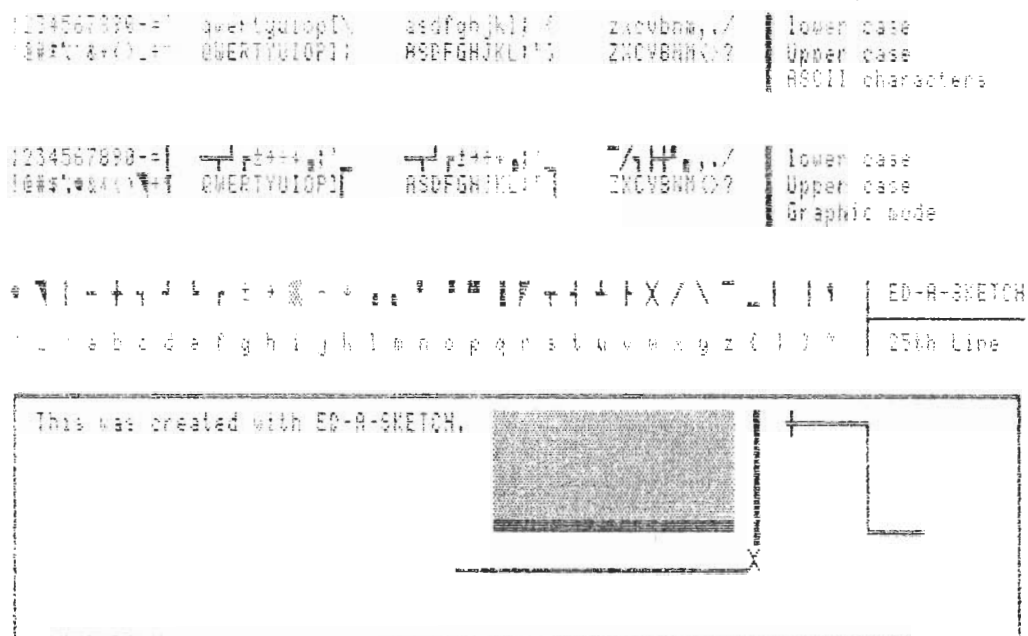**shows old characters.**

Figure 1

I asked NORCOM if there was some way to turn the old graphics "on and off" since they publish an MBASIC program to demonstrate the new and old resolutions. They told me that there was no way to do it. If they ever bring out a revision, I recommend they include a way to use the old graphics for games and SCREEN DUMPER.

Are there any other products which increase screen resolution for the H–89 or H–19? Yes, there are. Two of the most prominent are SigmaSoft and System's, Interactive Graphics Controller/Pseudo Disk (4488 Spring Valley #107, Dallas, TX 75234, 214–392–1025) and Cleveland Codonics Inc's, Imaginator (18001 Englewood Dr., Cleveland, OH 44130, 216–243–1198). Both start at more than $400. However, they do more than increase screen resolution.

SigmaSoft and System's product offers resolution of 640 × 250 pixels. It also has a 64K (optionally expandable to 256K) pseudo disk. It supports ULTRAROM and SUPER19 ROM's. Expect to pay about another $100–$200 for options such as increased pseudo disk memory, cables, ROMs, and printer drivers. This product does produce a very nice printout on an MX–80 (and other printers as well), which I understand, is the same on screen as on paper.

The Imaginator is a screen graphics hardware system (504 × 247 pixels) with an instruction set that allows you to draw graphics from high level languages. Wizard Software House (79 Marshall Street, Providence, RI 02909, 401–331–5034) offers a program called "Illustrator" for about $90, which is a screen and printer editor for the Imaginator. Newline Software (P.O. Box 289, Tiverton, RI 02878, 401–624–3322) used to offer the same product at the same price.

Can I recommend the G–PROM? Yes. It works well, with the exception of distortion in some graphic intensive games and the inability to dump the higher resolution graphics to a printer. However, it has absolutely superior screen graphics when compared to Heath's original set. G–PROM excels at screen oriented graphics. As far as I can tell, it is totally compatible with ED–A–SKETCH. Other graphic editors, such as Video Artist by Newline,

might also be compatible. G–PROM is inexpensive, less than $20 including shipping, and support is there from NORCOM. If my experience is typical, you will like the increased screen resolution with G–PROM. My impression, after working the terminal for over 300 hours with the programs listed in Figure 1 is that G–PROM is one great buy for the Heath/Zenith computer community.

Figure 2
G-PROM/Software Compatibility Chart

Program *	Compatibility with G-PROM
PIE	Appears totally compatible
TEXT	Appears totally compatible
SPELL	Appears totally compatible
TEXT PROCESSOR	Appears totally compatible
EDIT19	Appears totally compatible
HOME FINANCIAL SYSTEM	Appears totally compatible
MYCALC	Appears totally compatible
ZENCALC	Appears totally compatible
QUERY!2 Series of programs	Appears totally compatible
AUTOFILE	Appears totally compatible
MBASIC CAI	Appears totally compatible
MBASIC QUIZ (HUG P/N 885–1097)	Appears totally compatible
MBASIC DATABASE SYSTEMS (HUG P/N 885–1108)	Appears totally compatible
ZLYNK I	Appears totally compatible
TYPING TUTOR	Appears totally compatible
MBASIC 4.82	Appears totally compatible
ED–A–SKETCH	Appears totally compatible
PACK & CRYPT	Appears totally compatible
SCREEN DUMPER	Doesn't print the new characters. What you see on the screen is not what is printed
SHUTTLE LANDER	Slight distortion
SPACE INVADERS	Slight distortion
GALACTIC WARRIOR	Moderate distortion
HUG'S HARD SECTORED SUPPORT PACKAGE	Appears totally compatible
HUG'S HDOS UTILITIES BY PS	Appears totally compatible
SPEEDUP	Appears totally compatible
MX.DVD	Appears totally compatible
SUPERSYSMOD 2	Appears totally compatible
WORDSTAR (CP/M)	Appears totally compatible
HUG'S CP/M UTILITIES BY PS (CP/M)	Appears totally compatible
TEXT PROCESSOR (CP/M)	Appears totally compatible
CPS (CP/M)	Appears totally compatible
GALACTIC WARRIOR (CP/M)	Appears totally compatible

* All programs under HDOS unless otherwise noted.

About The Author

R. Kenneth Strum (Kent) is an officer in the USAF. He is Directory of Administration at the Aerospace Medical Division, Brooks AFB Texas. He's working on his Master's degree in Computer Resource Management through Webster University, and built his H–89A through one of his microcomputer courses in 1983. He published an article in REMark in November of 1984 on printing graphics with the H–89 and MX–80A. He uses his computer for church membership databases, home finance, writing, and at the office. ✱