JACG NEWSLETTER

Vol.3 No.12

Aug. 1984

Single Copy Price $1.50

THE JERSEY ATARI COMPUTER GROUP

MEMBERSHIP RENEWAL SLIP INSIDE

From the Editor's Desk...

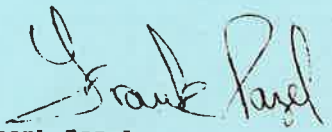
The first thing you might have noticed about this month's newsletter is that it is a lot thinner than the past few months. We have been averaging twenty-four to twenty-eight pages since the February issue, all of it original JACG member generated material. As editor I don't have any illusions that we could, month after month, generate such a volume of writing without supernormal dedication. I am also not averse to printing material from the other many newsletters we receive every month from other user groups. This issue, in fact, contains such material.

We are not so egotistical to think that there isn't some great material in other newsletters. The fact is that we have almost always had articles from our members which covered the subjects which were done in other publications. Often our articles are reprinted in the other newsletters. When we find new and exciting information we will print it, space allowing.

Perhaps this is much ado about nothing. It is, after all, summer vacation time and most of us have many other things to occupy our time, even if it only means a couple of hours at the keyboard. Perhaps the newsletter is getting too big. One member expressed such an opinion at the July meeting. I would like to hear your opinion on that topic. Perhaps my mailbox will be overflowing with contributions for the September issue by the time this newsletter goes to press. In any event, talk to us.

I am very excited about a new product called Pro*Plus. It is a hardware/software mod for those of us with Prowriters and allows you to load any character set into the printer's memory. Once loaded you can word process, list files, do everything you normally would with the resident set. I normally would not endorse any product editorially but I think that Pro*Plus is so terrific and expands the Atari system so much that it deserves mention here. I have printed this editorial in Standard font, "Beyond Armageddon" in Old English, and the JACG T-shirt article in Computer. At this printing I have more than fifteen fonts avaialable and you can generate your own with any standard font editor. I will write a comprehensive article on Pro*Plus in next month's newsletter.

Keep those letters coming.



Frank Pazel
Editor-in-Chief, JACG Newsletter

In This Issue

MARK YOUR CALENDARS!!

JACG Meeting Schedule

September 8, 1984
October 13, 1984
November 10, 1984
December 8, 1984

RE:VAMP

by Kirk McDonald - JACG

In 1894 in his Introduction to Psychology William James encourages the serious student of the mind to undertake a dissection of a sheep's brain (then readily available in all Boston markets). In 1984 Vamp Inc. entices the enthusiast for Atari color graphics to perform a bypass operation on his (her) television set to achieve performance approaching that of a composite monitor. In either case much of the benefit comes from the hands-on experience as well as the technical result.

I learned about Vamp from an article in the January 1984 issue of Byte by Richard Gillette (p. 339), which is a good source for further information and a circuit diagram. For $66.95 Vamp offers the DVM-1 kit which allows the composite video output of an Atari 800 or 800XL to be injected directly into the video amplifier of your home television set. Then you bypass the considerable loss of video resolution due to the r.f.-modulation and demodulation in the usual connection to a home television. For completeness the audio signal may also be injected directly into the audio circuitry of the television (an arguable benefit I found). The modifications include a switch which restores the ordinary performance of your television so that you may continue to watch Dallas reruns, or use the r.f.-modulated signal from your computer for comparison.

Installation of the Vamp DVM-1 does put you at some risk of electric shock, not to mention possible loss of your T-V. The situation is aggravated by the design feature of modern T-V's that the chassis is tied directly to the common wire of your household A.C. power lines. The purpose of the polarized A.C. plug on T-V's is to insure that the chassis is not tied to the "hot" 120 volt wire. If you have defeated the polarization of the plug or if your household wiring does not conform to standard electrical code the DVM-1 is not recommended. In fact the key feature of the DVM-1 is an optical isolation chip which separates the ground of your computer from the potentially hazardous chassis "ground" of the television.

Accepting the challenge laid down by Mr. James I mailed in my check for $66.95 (which includes shipping inside the U.S.A.) to:

Vamp Inc.
POB 411
Los Angeles, CA 90028
tel. 213-466-5533

The kit arrived in a mailing tube within 2 weeks.

The 10 page instruction manual is reasonably detailed, with important tips scattered throughout. A very useful suggestion was that I obtain a SAMS Photofact schematic (Howard W. Sams & Co., Indianapolis, Indiana 46206) of my television to supplement the meager documentation available with my set (a G.E. 19" WY-C made in 1977). In the Trenton area the SAMS Photofacts are available at Jackson Distributors on Genesee St. (SAMS purports to publish schematics of Atari computers, disk drives etc., although I haven't seen them.) An important bonus of the Photofact is the instructions for the color alignment and convergence adjustments of the T-V. I believe that about 50% of the improvement in the image of my T-V during this project came from these adjustments. They must be made with the power on, and you must reach into the high voltage area around the base of the T-V tube, so be very careful. You might be assisted by alignment tools from Radio Shack, part no. 64-2223, $.99.

Assembly and installation of the DVM-1 kit took me 3 evenings. You need a soldering iron, wire strippers, pliers, screwdriver, hand drill with up to 3/8" bits, and a volt-ohm-meter. A solder sucker is useful in the event of soldering errors. I built a mounting bracket to hold the DVM-1 board away from other components inside my T-V set. I definitely benefited from access to an oscilloscope, much of the benefit being educational, however. The kit came with a mysterious warning that the leads of certain transistors were reversed. Two weeks after I had verified that the transistors were normal Vamp sent a flyer advising me to disregard the warning.

You need to know the pin configuration of the Atari composite output jack. This has been illustrated in an article by Art Leyenberger on p. 255 of the March 1984 issue of Creative Computing, and also on p. 7 of the August 1984 issue of Antic. Pin 2 is ground, pin 3 is the audio ouput, and pin 4 in the composite video. I purchased the corresponding 5 pin plug at Radio Shack, part no. 274003, $1.49. Vamp does not provide the RG-174 coaxial cable which is recommended for use between the 5-pin plug and the DVM-1 interface board, although they do provide short pieces for connections inside the T-V set. (There is a certain knack to stripping coaxial cable not easily described...)

The video amplifier of my set differed slightly from the schematic provided by G.E., and by SAMS, which required extra care in determining the proper place to inject the composite signal, but clearly this was in the spirit of the whole endeavor. The design of my set is such that the audio signal had to be injected beyond the volume control, so I added an additional variable pot for this. But I ended up feeling it would have been just as well not to install the audio portion of the DVM-1. Instead one might use the r.f.-modulation connection for audio only, which is of sufficient quality to my taste.

Was the effort worth it? I think so. The composite video image on my household T-V is definitely better than the image from the r.f.-modulator. I would judge it as good as that shown by Gillette in his article in Byte. There are of course no miracles. A 4-MHz bandwidth T-V set does

not compare with a 15-MHz RGB monitor. For $70 I also have the pleasure of having successfully pschyoanalyzed my T-V set, and this is about what you'd pay for a one hour session dusting the upholstery in the office of one of William James' successors.

JACG

A Look At Some Special Features of BASIC.XL....

by Tom Reichard - JACG

BASIC.XL by O.S.S. (reviewed in previous issue) has a number of powerful features which are not generally available for any of the other major micros on the market.

For example BASIC.XL allows subscripted strings, unlimited string length and direct string indexing simultaneously !!

Example:
A$(N;3,5) Returns the 3rd thru the 5th character of A$(N;)

Notice the use of the semicolon in conjunction with N in the subscripted string. This is the primary difference between BASIC.XL and other MICRO-SOFT BASICS.

BASIC.XL also supports LEFT$,RIGHT$ AND MID$ ..... so if you have (or can borrow) an editor with a global search and replace function it IS fairly easy to convert from one to the other.

Even BASIC programs from other machines (GOD forbid) can be translated if downloaded (ASCII format) thru your modem (Graphics and sound create special problems, however).

One of the BASIC.XL commands that I find particularly useful and interesting is the MOVE command. (also avaiable in BASIC A+ the predecessor of BASIC.XL)

The syntax of the move command is as follows:
MOVE FROM(START ADDRESS),TO(START ADDRESS),BYTES (#BYTES TO MOVE)

This command allows one to move a block of memory (any size!) from anywhere to anywhere .... instantly.

This is a terrific aid for many purposes.

Just a few examples:

1. Page Flipping
2. Vertical Scrolling (No need for DLI's etc)
3. Screen Layout Control
4. Rapid change of player missile graphics characters

An example of Vertical Scrolling is given in the following program

This program will run under BASIC.A+ as well as BASIC.XL.

```
10 REM SAMPLE USE OF THE MOVE COMMAND
20 HOLD=40:LOCATIONS=30:BEGIN=70:GOTO BEGIN
25 REM "subroutines"
30              POSITION                0,0:?
"    MEMORY LOCATIONS ";ML1;" THRU ";ML2;"_
__";:RETURN
40 WHILE PEEK(53279)<>6
50              POSITION                0,23:?
"         press START to continue        ";
60   ENDWHILE :RETURN
65 REM "begin main program"
70              ?                       CHR$(125):POKE
752,1:ML1=1:ML2=880:POKE 82,0:POKE 710,0
80 POSITION 4,5:? "THIS DEMO USES THE  MOVE
COMMAND":?  "       TO   SCROLL  THRU   THE
MEMORY":? "          OF YOUR COMPUTER"
90 GOSUB HOLD
100 MOVE ML1,DPEEK(88)+40,880
110 GOSUB LOCATIONS:GOSUB HOLD
120 ML1=ML1+40:ML2=ML1+879:IF ML1>65000:RUN
:ELSE :GOTO 100:ENDIF
```

Progam explanations:

Lines 40 -60 WHILE COMMAND LIKE PASCAL

Line 100 - DPEEK(88) is equivalent to PEEK(88)+256*PEEK(89) and returns the start address of screen memory.
The +40 [DPEEK(88)+40] reserves the first line of the screen to be retained for the memory locations message.

By incrementing ML1 by 40 each time thru line# 130, the effect is a one line (40 bytes) scroll.

By previously loading pictures etc. into memory and changing the values used with the move command it is a simple matter to vertictally scroll in any graphics mode..

JACG

GIVE A BIT!!!

Don't let the Newsletter crash!
Contribute an article this month.

12490

BYTE ®

JANUARY 1984 Vol. 9, No. 1
$3.50 in USA
$3.95 in Canada/£2.10 in U.K.
A McGraw-Hill Publication
0360-5280

the small systems journal

FUTURE TRENDS

The Vamp DVM-1 Computer/TV Interface Kit

Interface a computer's video and audio outputs directly into a TV for enhanced picture quality

by Richard F. Gillette

The DVM-1 kit can help you overcome the display degradation that often disappoints users of systems employing an RF (radio-frequency) modulator to interface a computer's video output to a standard color television. The DVM-1 lets the computer's output bypass the TV's RF section; it applies the computer's audio and video outputs directly to the TV's audio and video amplifiers, eliminating the need for an RF modulator.

Shortly after I had purchased a computer for text and graphics applications, I became disappointed with the display quality of my RF-modulator/color-TV combination. I had no right to expect better; after all, a color TV's tuner and IF (intermediate-frequency) stages pass only a 4-MHz video signal to prevent interference among adjacent TV stations; even the cheapest black-and-white monitor has twice this bandwidth. Although the 4-MHz bandwidth is fine for TV, most computer text and graphics applications require a wider bandwidth to take advantage of their higher resolution capabilities.

To solve this problem I thought I could simply bypass the TV's RF section and connect the computer signal directly into the TV's video amplifier. Right? Wrong. My TV, like most modern TVs, has its chassis connected directly to one side of the 110-V power line. TV manufacturers have eliminated the 60-Hz power transformer found on older models to make the new sets lighter and less costly. If I had input the computer's video directly into the TV, I would have burnt out the computer and given myself a potentially lethal electric shock. Obviously, safety considerations dictate isolation of some sort.

My solution at the time (the DVM-1 was not yet available) was to purchase a bulky 110-V, 60-Hz isolation transformer and wire it permanently into the TV's line cord. The transformer would not fit in the TV, and when it was close to the TV's picture tube, or CRT (cathode-ray tube), it distorted the picture. I then added a jack (with an integral switch) to connect the microcomputer's video directly to the TV's video amplifier. The TV had a video test point with a composite video signal at the same level as the computer; thus, no bias was required, and unplugging the computer automatically switched the CRT back to TV. The results were spectacular. It looked almost as good as any of

Photo 1: *The DVM-1 kit, including the instruction manual.*

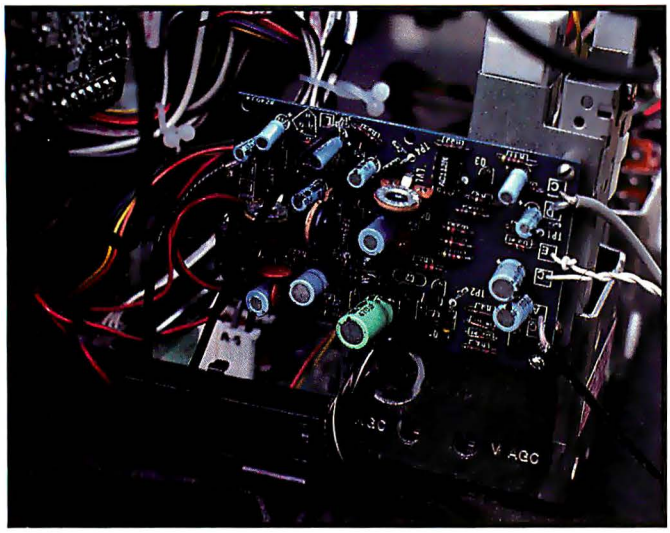


Photo 2: *The assembled DVM-1 printed-circuit board, mounted in a TV. (All photos were taken by the author.)*

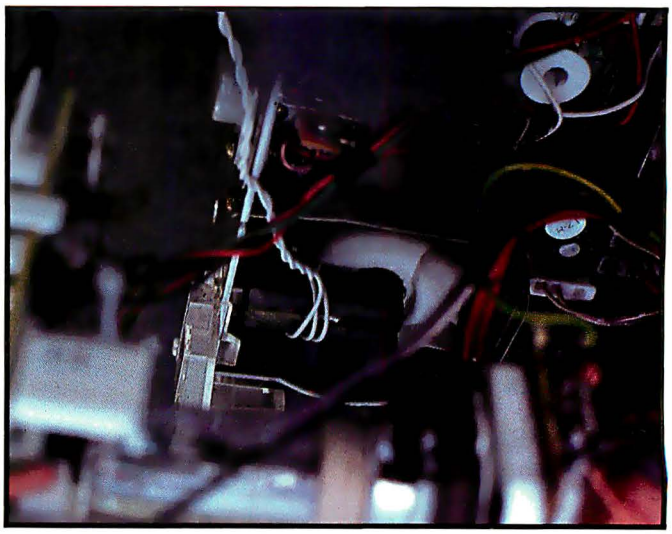


Photo 3: *The flyback-transformer pickup coil (the white twisted pair in the center of the photo) that derives power for the DVM-1 board.*

the composite video monitors I saw at the computer store. It was just as spectacular when used with a videocassette recorder.

I decided to upgrade the computer monitor from a 9-inch TV to a 12-inch Sony KV-1207 TV (my daughter was planning to take the 9-inch set to college). The larger TV required a larger isolation transformer, and while looking for this transformer I found the Vamp DVM-1. This kit provides all the circuits necessary to interface both the computer or videocassette recorder and audio directly into the TV. The required isolation is provided by a pair of optoisolators, one for video and one for audio. The conversion fits inside the TV and requires no bulky isolation transformer.

The optoisolator consists of a light-emitting diode (LED) coupled optically to a photo diode. The isolator can couple signals across a 3-kV potential difference, much more than is required for the TV set.

Another feature of the DVM-1 kit is that it uses the TV's flyback transformer to supply power for the optoisolator LEDs and their drivers, eliminating the need to take power from the computer (or videocassette recorder) or to provide a separate power supply.

The kit comes in a small box complete with all parts

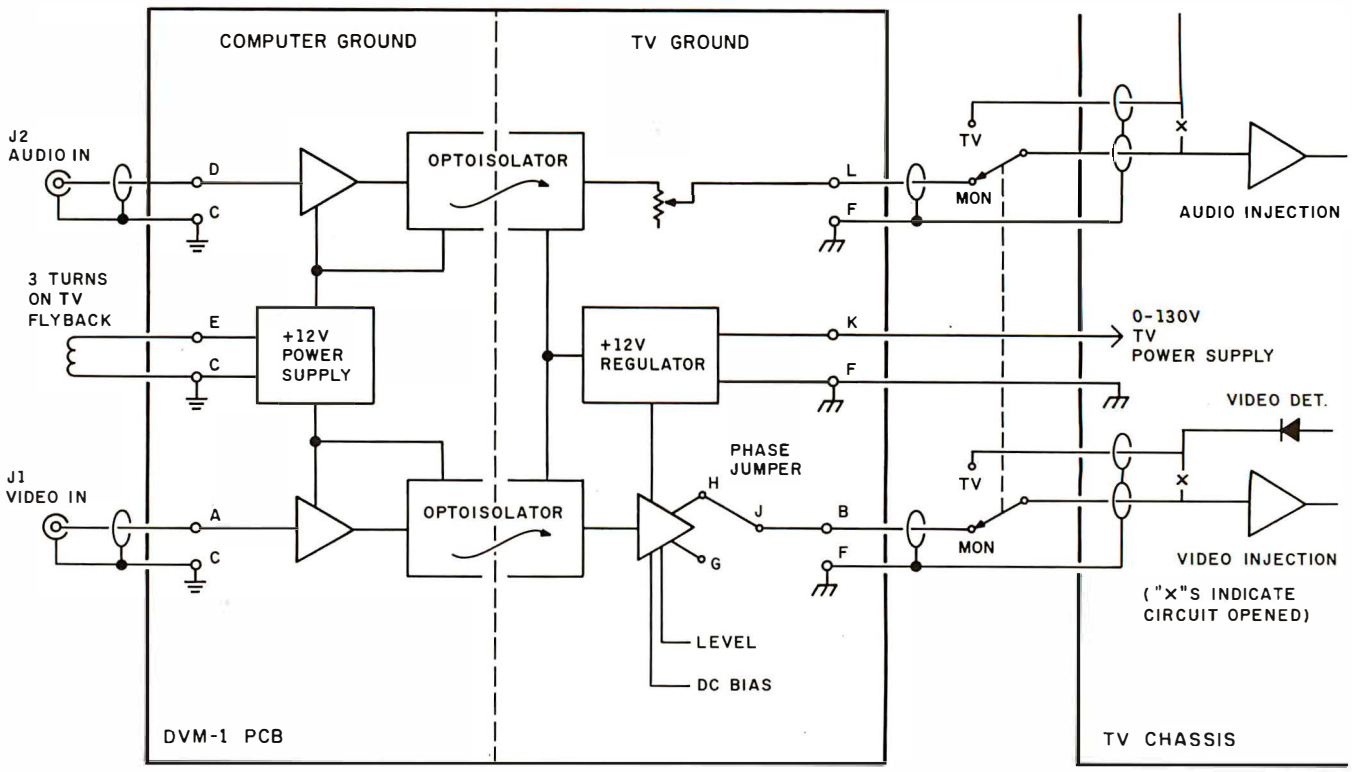


Figure 1: *The DVM-1 block diagram, showing interface wiring.*

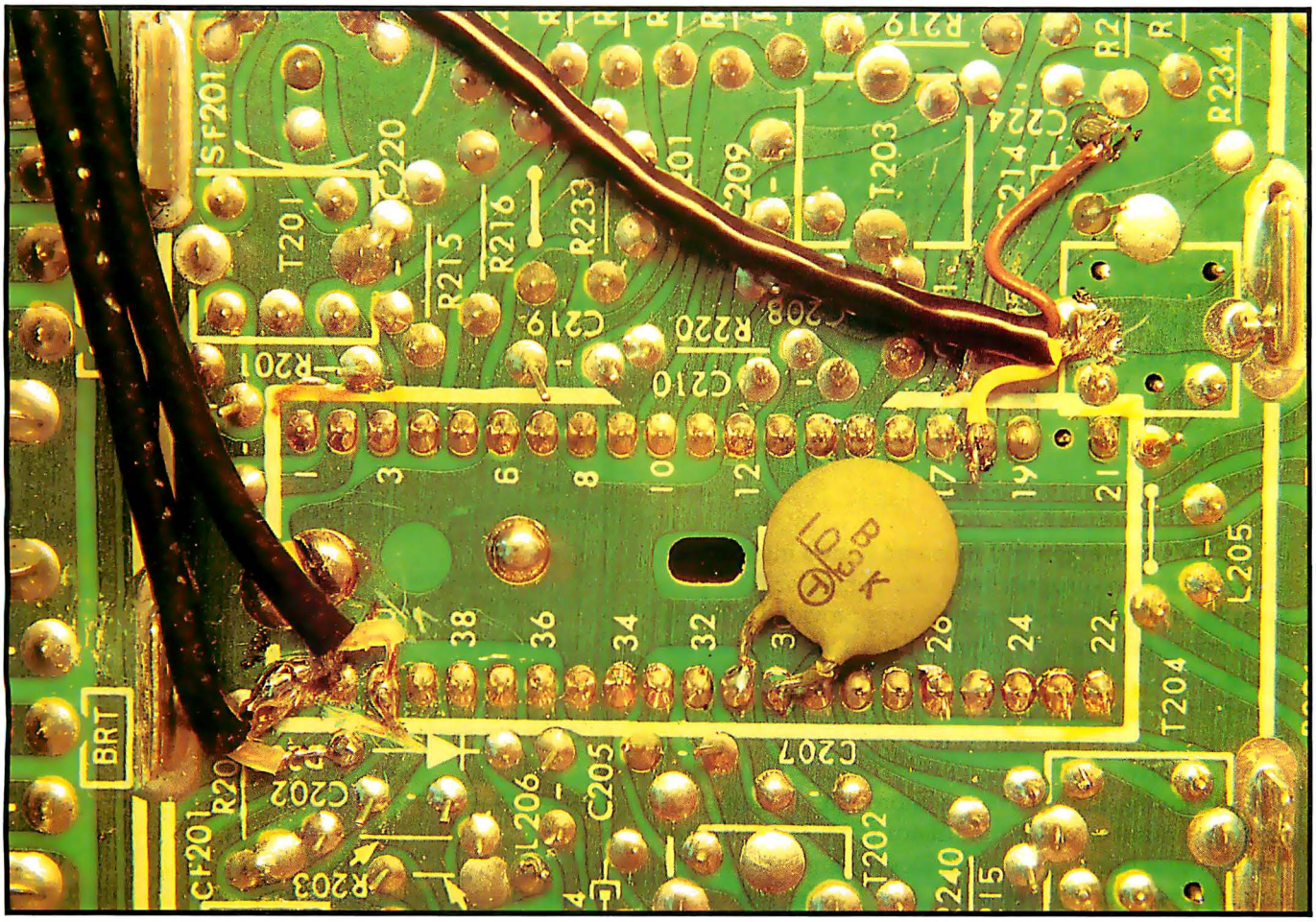


Photo 4: *Video and audio connections to the TV.*

and straightforward instructions (see photo 1). Only one printed-circuit board is involved; you just follow the parts list and insert the components into a well-marked board, solder, and trim the leads. You have to provide your own solder. The assembled printed-circuit board as mounted in my TV set is shown in photo 2.

Figure 1 shows the DVM-1 block diagram and the TV interface wiring. The combination of optoisolators and use of the TV's flyback transformer for the power supply to drive them provides complete isolation of the computer from the TV. The computer's video and audio signals are coupled across this interface (the dashed line on the block diagram in figure 1) by a light beam. No RF modulator is used, and thus cross-hatch interference due to modulator operation is eliminated from the other TVs in my home. The DVM-1 provides independent video and audio level settings and includes an adjustable bias supply for the TV's video; this feature allows an easy interface to TVs that have their video detector operating at a DC (direct current) voltage offset from ground. I needed this feature to use the DVM-1 with my Sony. (See "Add A Video Input to Your TV," *Radio-Electronics*, April 1983, for more technical details.)

Included with the kit are insulated jacks and a switch. The switch allows easy selection of either monitor or TV operation.

After the printed-circuit board is assembled, the next step is interfacing with the TV set. For this task, the DVM-1 manual provides a wealth of information. However, if you are not qualified to service your TV set, you will need help. If you are qualified or if you have a friend who is, you will have few, if any, electrical problems. The manual provides a good section on checking the kit. All parts are covered by warranty. Your challenge will be mechanical: where to mount the board, the input jacks, and the TV/monitor switch. The kit's small size enables it to fit inside any TV suitable for use as a monitor.

I am tempted to go into detail on the installation; however, each TV will pose unique requirements. My Sony KV-1207 installation is best described with pictures: photo 2 shows mounting details, and photo 3 shows the flyback-transformer pickup coil (the white twisted pair in the center of the photo) that derives the DVM-1's power. As you can see, installation was easy once I decided where to mount the hardware and route the wires. Photo 4 shows the video and audio wiring to the TV. You can see the cut video-printed circuit trace between the two coaxial cables (the audio trace that was cut cannot be seen in this photo).

After I installed the interface and adjusted the video and audio gain and the DC offset (simple procedures explained in the manual), I found that I wanted to touch

Listing 1: *A color dot-generator program written in Applesoft.*

```
10  REM  COLOR DOT GENERATOR
11  REM  * TO EXIT TYPE *
12  REM  * CTRLC RETURN *
13  REM  * TEXT RETURN  *
14  REM   R.F.GILLETTE 9/25/83
20  HGR2
30  HCOLOR= 3
40  FOR X = 0 TO 279 STEP 8
50  FOR Y = 0 TO 191 STEP 8
60  HPLOT X,Y
70  NEXT Y
80  NEXT X
90  END
```

up the TV's convergence. I followed Sony's instructions using a software-programmed dot generator. The program for an Applesoft dot generator is provided in listing 1. At my wife's urging I adjusted the TV's color so the white would appear more green, as she finds green easier on her eyes. Color monitor owners may want to try this; all that is required is to turn down the red and blue CRT drive controls.

While giving the interface a thorough checkout, including a number of RF modulator to DVM-1 comparisons, I found horizontal instabilities on large-area graphics displays output from my Apple II. The top of the graphics display had a wave (horizontal displacement), as photo 5 shows. This large-area graphics display was generated using the program from listing 1, modified by changing the step size in lines 40 and 50 from 8 to 1. Close examination revealed that the wave could appear with either the RF modulator or the DVM-1. The AC (alternating current) coupled video signal from large-area graphics upsets the DC-restore circuits in some TV sets because the sync level (most negative level) is close to the level of the video signal preceding it. This small level difference can be seen on a scope, as photo 6 shows.

At a Glance

Name
DVM-I kit

Use
Converts a television set into a composite video (not red-green-blue) computer/videocassette record (CPU/VCR) monitor while retaining the TV function

Manufacturer
Vamp Inc.
POB 411
Los Angeles, CA 90028

Dimensions
2½ by 4 inches single-sided printed-circuit board

Price
Complete kit: $64.95 plus $2.00 shipping ($4.00 foreign)

Features
Provides wide-band video and audio channels that are isolated from a hot TV chassis; uses two optoisolators

Tools Needed
Soldering iron, screwdriver, drills (10-, 7-, and 4-mm or ⅜-, ¼-, and ⅛-inch), voltmeter, wire cutter, and schematic of TV set

Documentation
10-page manual

One solution to this problem involves a simple modification to the Apple II, and it works with both the RF modulator and the DVM-1. The video, sync, and color-burst signals are summed at the base of the Apple II's video-output transistor (Q3), which is connected as an emitter follower. Adding a fourth summing resistor (5.6KΩ, ¼W) from Q3's base to +5V increases the amplitude of the sync pulse, solving the instability. I called Apple and the person I spoke with stated that the change is not approved by Apple; hence, such modifications to your Apple will be at your own risk.

How well does the DVM-1 coupler work? Judge for

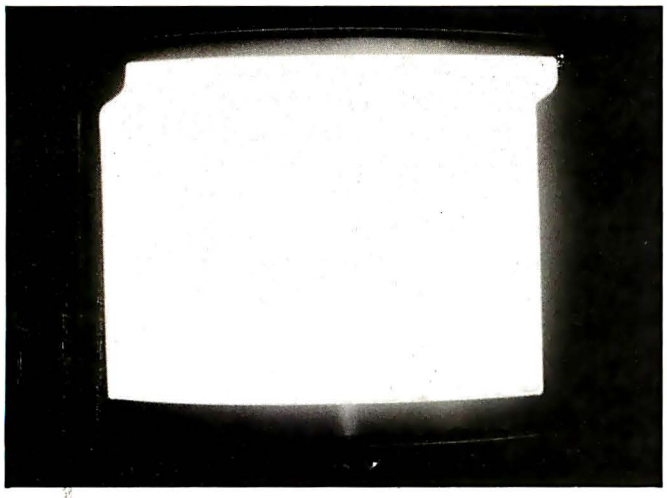


Photo 5: *A horizontal instability accompanying a large-area graphics display.*

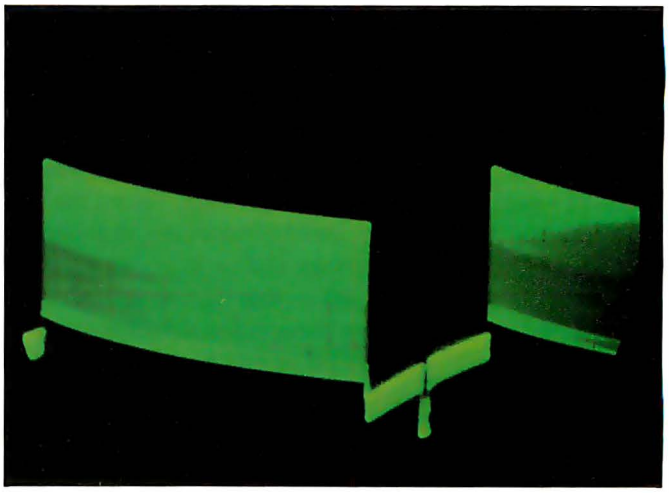


Photo 6: *A scope photo showing a large-area-graphics video signal.*

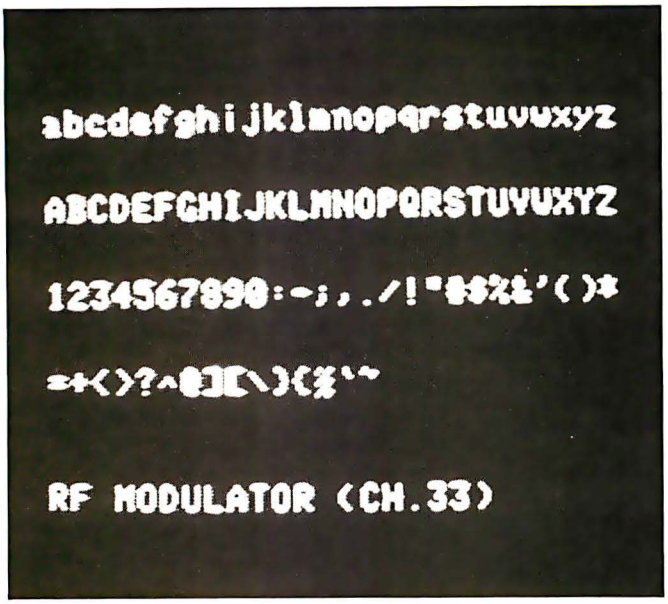


Photo 7a: *Forty-column text displayed on a TV screen via an RF modulator.*

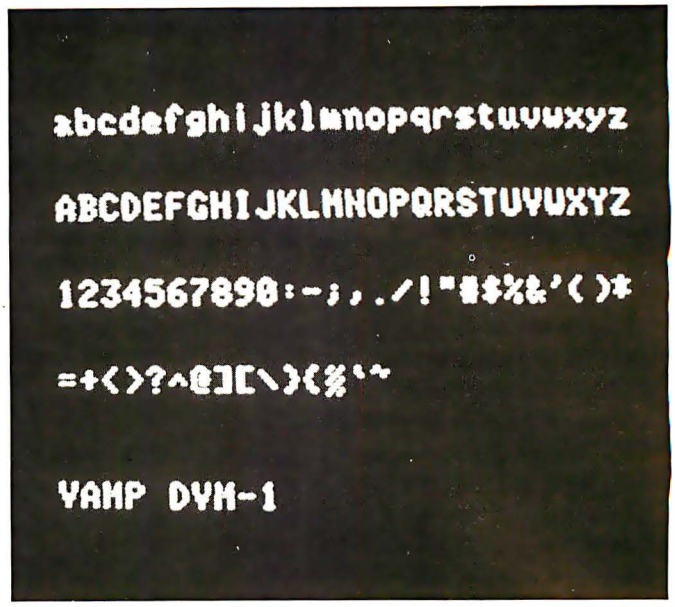


Photo 7b: *Forty-column text displayed on a TV screen via the DVM-1.*

Photo 8a: *A color-graphics display interfaced to a TV via an RF modulator.*

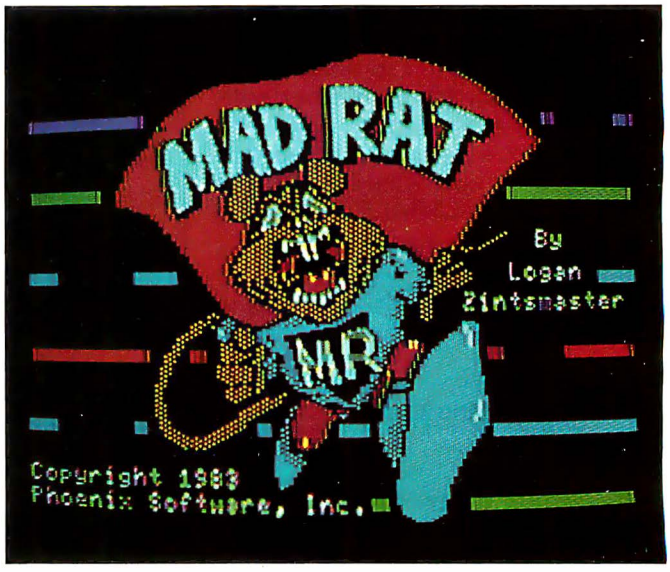


Photo 8b: *The same color-graphics display interfaced to a TV via the DVM-1.*

yourself. Photos 7a and 7b show 40-column text with the RF modulator and the DVM-1, respectively. The DVM-1 provides a bandwidth in excess of 8 MHz; mine extended past 10 MHz. These photos show the bandwidth/resolution improvement. Photo 8 shows high-resolution color graphics from the game Mad Rat (Phoenix Software), first via the RF modulator (photo 8a), then via the DVM-1 (photo 8b) (the TV was adjusted for as close a color balance as possible). The shadow mask on the screen of the color CRT reduces resolution, and TV video circuits can also reduce bandwidth. The Sony can almost, but not quite, let you use 80-column video with the DVM-1 adapter. (I tried a wider band video input and obtained the same results; the TV is the limitation.) Adding the DVM-1 to a black-and-white TV will allow 80-column operation. As you can see from the photos, my converted color TV set has the video quality of an expensive composite video monitor. The kit also provided me with an audio channel including volume control.

When considering the upgrade of a TV to a monitor, I recommend that you consult the TV's manual to make sure you understand the video and audio circuits before you invest in the DVM-1. If you do understand the circuits, then I wholeheartedly recommend this kit. One note of caution: the TV set's warranty may be voided by this monitor conversion. (My applause to Vamp, as it noted the warranty problem in its manual.) A letter to the TV manufacturer, however, may get you conversion approval. In any case, most warranties do run out.■

Richard F. Gillette (311 W. Daniels Rd., Palatine, IL 60067) is an engineering manager with Northrop Corporation's Defense Systems Division. He holds both a B.S.E.E. in communications and an M.B.A. in operations research.