

\$2.00

VOLUME 2 · 1987

R/D COMPUTING

VER 26

Dedicated to TI 99/4A and 9900 Computer Systems

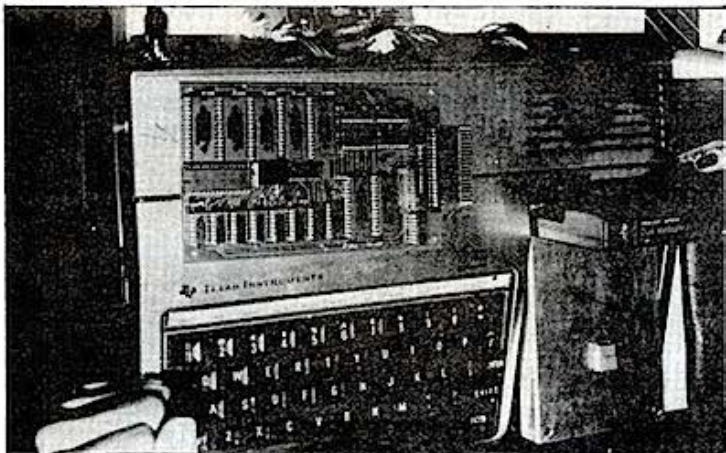
Ryte
.....Data.....

210 MOUNTAIN STREET,
HALIBURTON, ONTARIO K0M 1S0
(705) 457-2774

Notice anything different? We've had to exercise an option open to us in order to catch up from the summers doldrums. The results are still not in regarding increasing subscribers.

GERMAN GRAM CRACKER:

Mike Heuser of TI Workshop Rhineland sent us back the enclosed photo and more information on their GRAM simulator device.



The device will be available here through the purchase of parts, circuit boards, case and the documentation manual.

Final price appears to be less than the MAXIMEM and the discontinued GRAM KRACKER with the added value of a built in module port.

Stay posted. A certain number of these have to be ordered to bring the project IN.

An awful lot of backbiting is going on. Some folks think the orphanage is able to handle it - others believe that it detracts from the spirit and helps destroy what support is left.

There is only one way to get beyond all that... act in a positive manner. As Thumpers mother said, "If you can't say anything nice, don't say anything at all".

TI 99/4A HARDWARE MANUAL
by The Bunyard Group
PO Box 53171
Lubbock, TX 79453

Author: Michael Bunyard, PE

This book is a MUST for anyone who is interested in or involved with hardware design for the TI 99/4A. It contains 144 pages: an in-depth discussion of how the entire system is organized. A great deal of information is presented in a very straightforward manner.

The author is a former Senior Member of the Technical Staff of T.I. He was involved at TI with the 99/4A home computer as a system engineer.

This is the first book done by an "insider" of Texas Instruments... and it shows. The information is covered in a very straight forward, detailed manner.

You are also given a number of useful circuit diagrams. In this area the book goes beyond simple description and raw data. The circuits alone are worth the price of the book itself.

The first chapter deals with the purpose and organization manual with a list of additional documents from Texas Instruments.

Second chapter is a general system description with various comments on the major aspects of the hardware design and two block diagrams.

Third chapter describes the major logic blocks in the 99/4A. This chapter is useful for repairs and diagnostics on the machine. A number of circuit diagrams and illustrations complete the chapter.

Chapter 4 covers a variety of common "pitfalls" in designing and interfacing equipment to the system. This makes a lot of sense for all the hardware wizards and for anyone who wishes to understand the logistics of new equipment design.

Chapters 5 and 6 cover the TMS 9900 central processor unit and its instruction set... including the unsupported instructions available of the chip - but not on the 99/4A.

The seventh chapter provides a glimpse of the Peripheral Expansion Box and some of the additional potential that TI did not develop.

Chapter 8 discusses the 32k memory expansion design and implementation for the 99/4A.

Chapter 9 covers the RS-232 card in good detail and provides information on the CRU address change to make the RS-232/2 card. Details regarding the CRU status & control, PAL logic and pinouts are included.

Chapter 10 describes the P-Code card - of interest to owners.

Chapter 11 provides information on the TI Disk Controller, electrical specs, pinouts and general data on the card.

Appendix (A) describes the Command Module Port pinouts, (B) I/O port pinouts, (C) PEB Backplane pinouts, (D) A Grom Simulator design with circuit theory, diagrams and circuits, (E) GROM Characterization Program, (F) Extended Basic Command Module - paging and schematics, (G) TI 99/4A schematics in great detail separated into functional units.

CONCLUSION: Even the accomplished

hardware gurus can learn something here. Those of you who are new to the subject of hardware will have a wealth of information not found in other books on the TI 99/4A. There ARE some subjects that are not covered; but this does not detract from the excellent coverage. Mr. Bunyard informed us that TI had certain areas they did not want published (sound familiar?). The job done in providing hard core USEFUL information is truly excellent. I would absolutely recommend the book to anyone using the TI 99/4A.

Volume discounts are available.

AFTERWORD:

The need for new subscribers still exists! In all fairness, we did manage to give away two demo disks for a new subscriber lead.

Also enclosed with these issues is a complete description of the 99AT Expansion System. If this does not appeal to you - please pass it along or have your friends write. We have to sell a good number to reach the legendary financial plateau termed "break-even". A few folks have also indicated an interest in a bare board "kit" w/ docs: \$55.00 (US).

Interesting how things work out. We found that to achieve any profit margin (at all) required volume production. To then locate parties willing to fund and/or produce the system was a task of geometrically increased difficulty. Hard road. I can see why Myarc took that long to come out with the 9640.

What happens from there is up to you and all the TI owners you know.

John Johnson of the Miami Users Group has agreed to write a new users perspective on the Myarc 9640. This should prove interesting as he is not a software developer (per se) and reports an excellent fit with current TI 99/4A software. See other information in this issue.

THE 9640 DECISION

by John A. Johnson
Miami Users Group

As a Sysop on the GENie TI Roundtable, I've seen a lot of controversy concerning the new Geneve 9640 computer from Myarc. Most of us aren't ready to make a \$450 investment in a computer that we really don't know much about. We feel the machine may pan out, but we better play it safe and see how many of them are sold, and how much software will be available before really thinking seriously about it. After all, monochrome - 256k - single drive 'PC clones' can be had for the same price, and we know about the software available for them!

So why should you consider a 9640? Previously I didn't, for reasons stated above. I bought one two weeks ago and I'd like to tell you how I came to take the plunge.

I've programmed the 99/4A for 5 years in almost every language available and I feel I know the machine well. It's ease of use is well known. From the first time I typed PRINT "jj" in Console BASIC, I've been hooked. I've marveled at the speed of the video display created from a fine assembly program and I strived to learn more about the inner workings; both hardware and software. In the past year I've been doing a fair amount of hardware work, getting even more performance out of the computer. I guess it's this constant challenge that finally drove me to the Geneve 9640.

A thirst for more. This is the same thirst that drives the computer industry.

You see, my goal is to write a true, "what you see is what you get" word processor. This word processor would have the capabilities of on-screen right justification, many fonts displayed on the screen at once such as italics, bold, underline (or any combination of those), utilizing diskettes (or ramdisks and winchester

The **GENEVE 9640** by MYARC, Inc.



hard disks) as true virtual memory to allow unlimited file sizes, interfaces to spell checkers and other utilities and many more features found in the best word processors for other machines. It was to be quite a learning process, so I started studying the manuals. But, alas, it was not to be. I ran into one brick wall after another as I discovered that 16k of VDP memory just wouldn't allow those fancy bit mapped screens, or a lack of a keyboard buffer knocked out the idea of the program fetching new data from the disk (or saving it) as I kept typing.

A real dilemma. I just couldn't cross over to another computer, I had so much time invested in this one. All those hours staring at a monitor trying to figure out why a simple statement created a SYNTAX ERROR (or later, a locked up computer); all those tricks learned over the years, and all the great friends I've had

Legends



Dear Mr. Editor,

I feel your glorification of the life of an adventurer in the editorial for the May 13th issue of *Popular Spellcasting* was inaccurate. At best, it isn't easy to be an adventurer. Whether you are fighting the monsters (which are invariably big and ugly) that wander about, or exploring dank, dark and slime encrusted dungeons, an adventurers job is hard, the pay is poor in the beginning and expenses are high, and all too often life is brutally short. Not to say our lot is all bad - as you get a bit more experienced the monsters are easier to kill, traps aren't so tough, and the monetary rewards are very good. However, I think telling it like it is is preferable to convincing a lot of novices to take up the profession. Besides, there is only so much gold and treasure to go around.

- Zarmak the Fighter, *Wizards Rock*

With over one year spent in development and testing, *Legends* is one of the most flawless adventures ever for the 99/4A.

Based on popular role-playing games, *Legends* occupies two complete SS/SD disks. You must guide your party of four characters through a vast island, and six separate dungeons in search of the answer to your quest, gold and treasure. Along the way you will fight with spells and weapons animated, full-color monsters against a background of detailed forests, mountains and dungeons.

Legends features a character generator for creating your own players, 44 distinct game screens, and over 50 detailed monsters. During your travels you can stay at inns, use teleporters, drink potions, avoid traps, solve puzzles, talk to the natives, bribe monsters, and be bribed. As your characters advance in experience you can send them to the Adventurer's Guild for additional training in the arts of combat and magic. These skills will be needed for the challenge below.

Donn Granros and Ed Johnson, the authors, carefully crafted a fine program that features custom assembly language routines for rapid graphics action. *Legends* requires a TI-99/4A with 32K, TI Extended BASIC and one disk drive, or a Myarc Geneve 9640. It is furnished unprotected and is available from all Asgard Software dealers. Suggested retail:

\$27.95

Shipping and Handling Included

Asgard Software
P.O. Box 10306
Rockville, MD 20850
301-559-2429

the pleasure to know because of this common interest. This type of investment can't be rebuilt as easily as going to Radio Shack and buying a Tandy 1000 and replacing all my TI 99/4A software with MSDOS programs.

My solution was a Geneve 9640 Computer. I'll tell you why. I HAVEN'T LOST A THING! The majority of my existing software still runs, but with these important differences:

1. It's faster. I never really had any complaints about the speed of the 99/4A, but I don't like waiting on a computer to do anything. Once I give the computer a command, I expect that command to be executed and I expect it now. Absolutely no waiting allowed! Of course no computer will satisfy this crave, but the 9640 is much faster in all the speed and performance benchmarks I've run.

2. With the 4A, I'd settled for the fact that only a few color combinations produced readable text. I've owned 2 color TV's (9 and 13 inch devoted to the computer), 2 color monitors, and 2 green screen monochrome monitors, all in the search for sharper video. I've had the 80 column card stuck into the right port of my 4A, a Morning Star CPM card driving an ADM3A Televideo terminal off to the side of the 4A, but my search for great video was never satisfied until I put the Geneve card into the Peripheral Expansion Box. I am typing this in 80 column color right now, and it is infinitely sharper than any text I've ever seen on my 99/4A. Almost any two color combinations are perfectly readable. I amuse myself by going into Fast Term, and just toggling through the colors. It's fantastic to actually be able to USE ALL THE AVAILABLE COLORS! When I check my mail on GENIE, I can see the letter the way it is. We all know the benefits of 80 columns but in living color it's fantastic! Running all the old assembly games shows me colors I never knew existed!

3. The keyboard. It will spoil you

rotten. Once you get the hang of it, using function keys and arrows by just pressing a single key is a joy!

4. I feel I still have a 4A at heart, but I also have a machine I can advance with. A whole new learning process that could take another 6 years or longer. It's up to me. I can sit back and use it as a 4A or I can play with the super graphics, or maybe even get that word processor started. I don't look at my purchase as an abandonment of the 4A, but a shortcut to the many hardware modifications I'd planned to do anyway. I've also received extras I couldn't have possibly modified the 4A to do.

So should you wait and see? No one but you can make that decision, but if you really like the 99/4A and it's ease of use, and you really don't care about IBM clones (just the power available with them), we have it, the best of both worlds. Our upgrade has arrived.

WHAT'S IT REALLY LIKE?

The big day came as UPS pulled up with my new 9640, and things haven't been quite the same since. If you're thinking about upgrading to a Geneve, read on, I'll tell you about my experiences and perspectives.

Inside the well packed box were three items: the keyboard, 9640 P-Box card, and a large manual about the size of TI's Editor Assembler manual. There were also three SSSD floppy diskettes enclosed. Of course I didn't read the documentation! I removed my two Horizon RAMdisks and TI 32k card from the p-box, installed the diskette labeled "DOS" and fired it up!

I've been using a green screen monitor for the last year as most of my work has been with text, but I could tell that the swan on the screen was done with great detail, and had to be seen in color to be appreciated. Well, about 8 seconds after powering up the computer and

away from GROM, a Basic program could be compiled), Assembly, GPL, Pascal, C, and Fortran compilers, and a memory scheme allowing large programs, I see fantastic software being easily developed or ported from existing machines.

The big question that a lot of us are asking is whether outside software manufacturers will write programs for this machine. Or will they play that snob game with us like they did with the 4A? We'd all like to have the choice of running MS-DOS software on our computer, and even though we know that in time, our "in-house" programmers will write powerful programs, we'd still like to have the variety. The easiest way to do this would be to have an IBM type MS-DOS compatible board sitting right next to the Geneve board sharing the 512k (or more). I'd personally love to see it and encourage Myarc to work diligently on it.

We have a path to upgrade, and we have the manufacturers support. Join me in the future!

-by John Johnson copyright 1987

EDITORS COMMENTS:

There are a number of factors that dictate software support from third party software companies.

First is the straight number of computers sold. Machines with a relatively small installed base (250,000 units seems to be the magic number), achieve software support. This is related to the economics of developing and publishing software. It is difficult to justify spending a small fortune for a few thousand sales.

Second is the availability of cross compilers and other tools that allow existing programs to be ported from one machine environment to another. This is relevant with languages such as "C" - which was designed to allow different machines to run the same

code without a great deal of re-writing. There ARE cross compilers that will take INTEL 8088 code and rewrite the program to conform to 9900 specifications. The limitation here, again, is the willingness of the software owners to port the software to another machine.

Third is manufacturers' support. In the case of Texas Instruments, the policy was clearly to limit third party support. By the time they woke up to smell the coffee, it was too late. Some companies were threatened by TI's proprietary attitude. We can hope that Myarc has the wisdom to actively solicit support from third party hardware and software companies. In this industry, NO ONE does it alone. Some companies even go so far as to provide financing for great ideas from other companies. Beyond that, technical specifications are essential to developers. Rumour has it that Myarc will provide the complete details for their machine... rather than waiting until they've ceased production before publishing the specs - as in the case with TI!

Fourth point, that many people in the TI community miss, is that most computers (approximately 60%) are used for word processing. The primary applications are in place: word processing and spreadsheet uses. Software support already exists. With most of the 99/4A programs running on Myarcs 9640, a software base exists. New programs from third party companies do run on the machine. This is a position that often takes a year or more for other new computers.

In other words, there really isn't any reason NOT to buy a 9640. After all, it is the only LONG TERM support option open. We are rapidly approaching the legal limit to TI's support of the 99/4A. No can seriously expect that TI will provide any support after October 1988. Think about it!

getting the picture of the swan on the screen, disk drive #1 started running and 257 sectors of operating system loaded into the computer. Didn't really take as long as I'd have thought, maybe 30 seconds.

The machine is alive and prompting me for the filename of a cartridge to load. Okay! Time to read some documentation! The manual describes in great detail the functions of an operating system called MDOS, but that isn't what's supplied with the computer at this time. Instead, we have an operating system that sets up the Geneve 9640 as a TI 99/4A. The program running before me wants to know what cartridge (in Gram Kracker format) I'd like to load into the cartridge GRAM area of Geneve. I notice that one of the programs on the operating system diskette is 34 sectors, and named "E/A". So I guess I'll try that. It's successful so I press ENTER again, and I'm running a TI 99/4A complete with the TI color bars title screen! Because I've loaded the E/A cartridge, the second screen of options gives me 2 choices, TI BASIC and EDITOR ASSEMBLER. Note: A program to save cartridges to diskette using the 4A is included with the 9640.

Let me regress a bit over what I've covered. I just spent over \$400 for a 99/4A! What a deal! Hey, just to think some of us only payed \$50 for ours! Then again, I do have a nice keyboard, the video display is actually clear, 80 column display, more memory, an operating system in RAM and the machine runs a bunch faster. But what else warrants the price I paid for it? In a word, more!

Or the promise of more. Myarc is telling us that the real operating system will be along within a week or so, and I believe them. I know, their week is a hell of a lot longer than a real week, but I know this to be true. The final operating system, as best as I can tell, will emulate MS-DOS just about perfectly. Same commands and everything.

There are two other pieces of software that come with the computer. One is a BASIC interpreter by Myarc. It looks to be their Myarc XB II version 2.11. It loads with the E/A option 5 loader and defaults into 80 columns. First impressions look good, but it's full of bugs. No problem there as the real BASIC, the one described in the manual, is due out the same time as MDOS. Another program, MY-WORD is an enhanced TI Writer. It's 80 columns of course, but that isn't all. Many, many features that couldn't be included with the original TI Writer are available with MY-WORD. Suffice it to say, it's fantastic! I've since re-installed my Horizon RAMDisks and they work just great loading MY-WORD, BASIC, and the Operating System. By the way, the operating system, all 257 sectors takes less than a second to load from the Horizon!

So now you know. The machine is complete, but it lacks the final software. All of the programs I've talked about are preliminary versions of what's to come, and I see a great future ahead for this new computer. As far as emulating the 99/4A, I think the programmers and engineers involved did a super job. I've been running the 32k memory on the 16 bit bus on my 99/4A for about a year, and the programs that won't run on it won't run on the Geneve. The problem is speed related, and I can live without a half a dozen games easier than I can live without the features this new computer provides.

So just what is in store for the Geneve owner. Time will be the only teller, but the way I see it, we have just now begun to figure out the inner workings of the 4A, and many of us are becoming handy with programming tactics and languages recently introduced. Will this spill over to the 9640? Yep, it has to, because the Geneve is compatible. Will new software be written for the Geneve? Yep, many programmers have expressed the desire for more memory and better graphics, and now we have

GENEVE/RGB MONITOR CABLE

Introduction

Many people that have purchased their Myarc Geneve 9640 computers did so for its advanced graphics capabilities. The 9938 advanced video processor can not only duplicate the composite display of the 99/4A's 9918 VDP, it can also drive an analog RGB (red, green, blue) monitor directly. The following article outlines how to construct your own Geneve-to-RGB monitor cable and provides pinouts for an 'Amiga' monitor as an example.

Monitor signals

The analog RGB monitor requires the following signals to operate:

- 1) Red
- 2) Green
- 3) Blue
- 4) Sync
- 5) Ground

The audio amplifier needs only 2 signals:

- 1) Audio
- 2) Ground

Geneve Video Connector

The pinout of the Geneve video on-board connector (looking into the connector) is shown in Fig. 1. The function of each pin is listed below:

<u>Pin</u>	<u>Function</u>
1	12V for RF modulator
2	ground EXCEPT for RF modulator
3	Audio out
4	Composite video out
5	RGB Red (also modulator grnd*)
6	RGB Green
7	RGB Blue
8	RGB Sync signal

*see text

Figure 2 is the pinout of the plug, looking into the pins.

You'll need an 8 pin DIN connector, which is not commonly available through Radio Shack, but can be purchased through mail order electronics firms (eg- Jameco Electronics Part # DIN-P8, \$1.09). Myarc utilized an 'odd' connector to retain compatibility with the original TI RF modulator.

Pin 1 is not used at all on the 8 pin plug, and it is recommended that you cut

it off to eliminate the possibility of accidental shortage of 12v to the other pins. Pin 4 is the composite video signal, and has no connection. Pin 5 is a compromise. As shipped, it provides the ground for the RF modulator. To use a RGB monitor, you have to switch a jumper on the board from ground to the Red signal. There is a jumper block and pins between the capacitors directly behind the video connector, and you must move the jumper block to the red wire. Keep the jumper in mind in case you use the RF modulator later. Also, always use caution when inserting and removing the plug from the video connector to prevent damage to the connector mounts.

Audio Connector

The audio connector is the simplest item to wire up. Most monitors require an RCA phono plug, the kind commonly used for stereo components. The Audio signal from Pin 3 of the Geneve connector goes to the center post, while the outer connector shield goes to ground (solder the cable outer braided wire to Geneve pin 2).

RGB Monitor Connector

Most RGB monitors use a 9 pin D connector even though some pins are not connected. As noted previously, they require 5 signals: red, green, blue, sync and ground. If you purchase a RGB monitor, make sure you have the manual, or at least a copy of the pin description for the connector. Then it will be up to you to properly match and cross-connect the signals. Hopefully you'll get a video cable with the monitor, and can put a 8 pin DIN connector on the computer end (as in the example below). If not, you'll need to purchase the appropriate connector and shielded multiconductor cable (at least 5 wires).

Geneve to Amiga Monitor Example

A common cable application would be for the Amiga monitor. If you purchase the monitor and audio/video cables, all you'll need is a 8 pin DIN connector. The Amiga video cable has a 23 pin D connector on the computer end, and a 9 pin D connector for the monitor (Fig 3

and 4). To cross-connect the 8 pin Geneve plug to the Amiga cable, use the following table:

Geneve Pin #	Amiga Pin #	Signal
2	16*	ground
5	3	RGB red
6	4	RGB green
7	5	RGB blue
8	10	RGB sync

*multiple ground wires; see text

The audio cable is a "Y" configuration with 3 RCA plugs. Cut and discard one of the two lines at the two line end, and cut off the plug on the remaining wire. Geneve pin 3 goes to the center wire, and the braided outer shield wire is connected to ground, Geneve pin 2. Note that the finished Geneve/Amiga cable will consist of the video and audio cables both connected to the Geneve 8 pin plug.

Remove the 23 pin connector outer shell and identify the wires (Fig 3). The red, green and blue wires have a clear insulation, but are paired with ground wires of the signal colors (ie- the Red signal wire is paired with a ground wire that has a red insulation cover, and so on for Blue and Green. Note that there are 2 green ground wires.) The sync wire is white. Note that the red, blue, 2 green, blue, and black wires (Amiga 23 pin #s 16-20 respectively) are all ground wires. Connect one of the red or green wires to ground, and either the blue or black to ground. You do not have to solder all 5 wires to ground, since they are tied together at the 9 pin connector end. (See 23 pin/9 pin table.) These multiple grounds provide protection to the RGB signals to prevent outside electromagnetic interference from degrading the signals.

Amiga 23 pin to 9 pin reference

23 pin	9 pin
3	3
4	4
5	5
10	7
16,17,18	1
19,20	2
1,2,6-9,	6,8,9 NC
11-15,21-23	NC

Carefully cut every wire away from the 23 pin D connector, and trim back the insulation on each wire to be soldered. Put the audio cable and video cable together, and slide the black rubber sleeve of the Geneve 8 pin connector (Fig 5) over both cables (you'll have to trim the sleeve to allow both video and audio cables to extend out of the sleeve). Starting with the Geneve pin 7, solder the appropriate wires to the 8 pin connector in the following sequence: 7-3-5-8-6-2. The last pin, 2, is the Geneve ground and will have 3 wires: audio and two video. If this pin gets too crowded, solder one wire to the pin, then solder it to the other wires about 1/4" away from the pins. Cut the #1 pin (12v) if you desire.

Check and make sure all wires are soldered properly and no bare wire sections are touching. Check for continuity from the Geneve 8 pin connector to the Amiga 9 pin D connector, using the chart below:

Geneve 8 pin	23 pin	Amiga 9 pin
1	NC	NC
2	16	1*
3	(RCA center pin)	
4	NC	NC
5	3	3
6	4	4
7	5	5
8	10	7

*ground, check for continuity to RCA plug outer shield

If everything is OK, then put enamel paint, fingernail polish, etc. on all bare wires that go inside the 8 pin connector, especially the ground wires. Wrap the wires in one layer of electrical tape, reassemble the 8 pin outer shell and slide the black rubber sleeve back over the outer shell. Using an ohmeter, recheck continuity on all lines (video and audio). Then with one ohmeter probe on one of the eight pins, touch the other probe to each of the other 7 pins and the metal outer shell. This is a check to insure that the wires didn't short together when you reassembled the 8 pin connector. Check for shorts this way for

each of the eight pins. If possible, have a friend review your work prior to use.

If you're confident that you have properly assembled and checked (and rechecked) your cable, it is now ready for use. Be gentle in plugging in the 8 pin plug, and always grasp it by the black sleeve that surrounds the metal shell - never pull the plug out by the cable! If any problems occur in use, power down the computer and monitor ASAP and recheck for shorts, breaks, etc.

Conclusion

Although the previous example was for the Amiga monitor, the general principles of design and construction apply to all cable building efforts. Several of the computer networks, such as COMPUSERVE, have text files with more details on specific monitor cables and Geneve-compatible monitors. If the details of the project seem overwhelming, have a friend construct the cable, or wait for a commercially produced version.

References

- Micropendium, "Connecting a 9640 to an Amiga", July '87
- Amiga Reference Manual, page 7-14, 'RGB Monitor Connector'
- Phone conversation with Myarc personnel, 9/9/87
- COMPUSERVE TIFORUM Geneve text files:
ANALOG.TXT
NOTES.GEN
MAGNVX.CBL

If you have any questions or comments concerning this article, write to Ryte Data, or

Tony Lewis
409 Drolmond Dr.
Raleigh NC 27615
Compuserve # 73357,1730

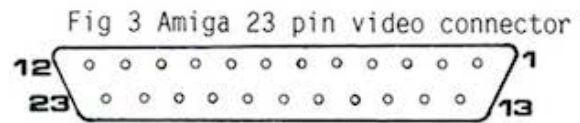
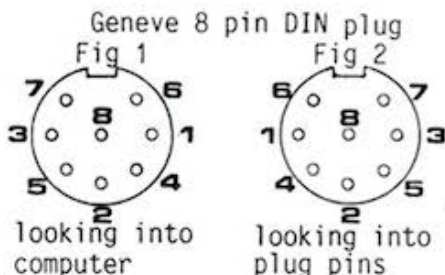


Fig 4 Amiga 9 pin connector

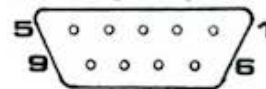


Fig 5 Geneve 8 pin DIN plug

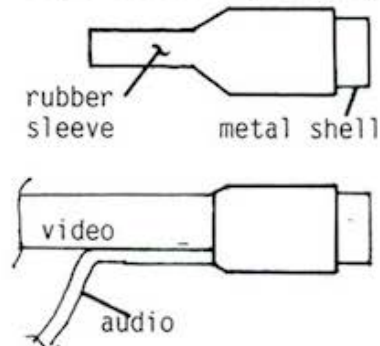
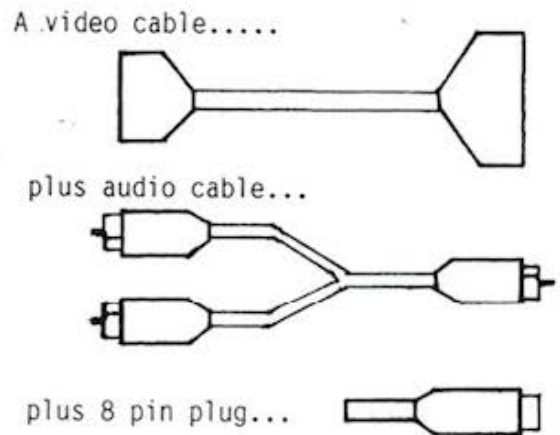
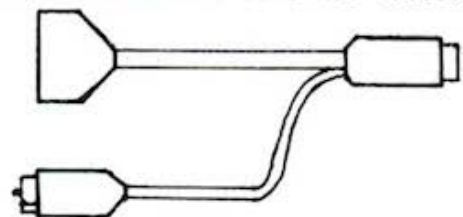


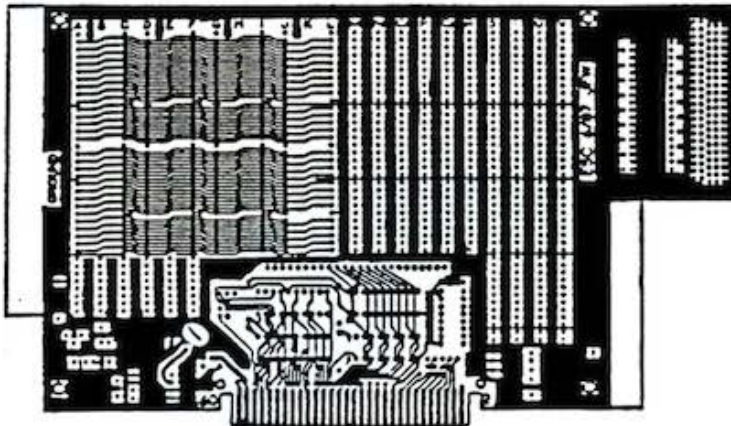
Fig 6 Modified plug



equals a new Geneve 9640 RGB cable!



WHO NEEDS IT ?!



NEW PROTOTYPING BOARD AVAILABLE

It's finally here! The PEB PROTOTYPING BOARD, which may just "make your day." This board is designed for Peripheral Expansion Box (PEB) use, and will allow for the assembly of a KII or the design of a NEW IDEA. The design was inspired by the original II Prototyping Board, plus it has some NEW features, and makes the assembly of TODAYs state-of-the-art components such as high speed static RAMs a snap.

The board also supports the 99/8 and 9640 (Geneve) environments. The picture above illustrates the layout of the component side of the board and shows the major areas.

- The standard bus interface is predefined, requiring only the insertion of four IC's to buffer the address lines, data lines, and eight of the control inputs.
- The address and data busses appear in a convenient row above the interface chips, numbered A00-A15 and D00-D07 in order.
- Connections to all control signals are provided, including the three additional address lines and DMA signals for the Geneve.
- Power from a 5 volt regulator is distributed across the back of the board. Space is provided for a second regulator to supply +12, -12, or -5 volts.
- Two RAM busses each have room for four 28-pin chips. Using 62256LP-12 static RAMs in each location would give you 256K bytes before piggybacking.
- The board is wide enough to reach the card guides in the PEB for a secure fit.
- There is room for the I/O connector of your choice to access the outside world.

Extensive documentation is included, covering all signals on the 60-pin PEB bus. A separate copy of the II hardware specifications (not included) is strongly recommended, however. Two sample project schematics are included. More ideas for projects using this board will be collected and made available in the future.

Boards may be purchased for \$35/board + \$2.50 S&H (PA res add 6%) from:

The Computer Bug
5075 Clairton Blvd
Pittsburgh, PA 15236

412-882-3374

Technical Questions:
John Willforth
RD 1 Box 73A
Jeannette, PA 15644
412-527-6656

Quantity Orders: (10+, \$25)
Scott Coleman
823 North Ave
N. Braddock, PA 15104
412-271-6293

R/D COMPUTING is published monthly by RYTE Data in Haliburton, Ontario. Copyright 1985.

All material is from sources believed to be accurate. The publisher takes no responsibility for errors, omissions or misprints. Articles may be reprinted with credits giving source and address by users groups for publication.

Articles dealing with Texas Instruments 99/4A and 9900 based computers are published. Special attention is given to projects and information on upgrading and modifying the 99/4A console and system.

Please send any information on products, hardware, software, or modifications to our address. We cannot accept responsibility for materials submitted and, unless stated otherwise, will assign all manuscripts etc. for publication.

Only manuscripts with sufficient postage and self-addressed mailer will be returned.

Un-classified ad rates are \$1.25 per 40 character line. Count ALL characters, spaces, etc. and submit with payment to our address. Ads are run in order received. Deadline is 21st of each month.

YOU MUST NOTIFY US OF YOUR CHANGE OF ADDRESS SIX WEEKS IN ADVANCE. PLEASE SEND A CHANGE OF ADDRESS CARD WITH YOUR OLD AND NEW ADDRESS.

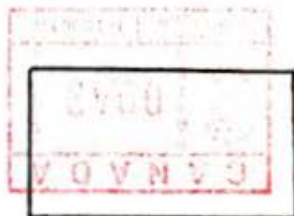
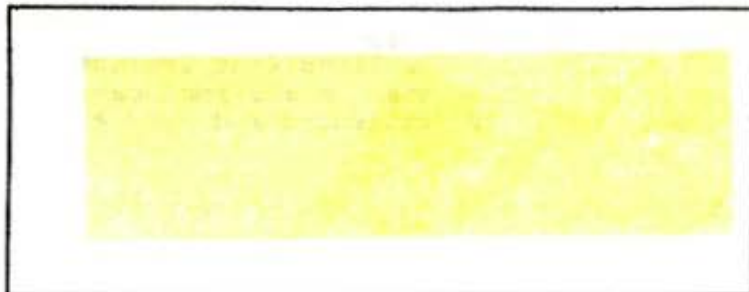
SUBSCRIPTION COST:

\$14.00 (US) for 12 issues \$20.00 Cdn. all via First Class Mail.
\$19.00 (US) overseas Airmail Delivery.

BACK ISSUES:

Back issues are available for \$2.00 each, **subscribers** only for these issues —

- V 2 sold out.
- V 3 TMS 9995 Memory Map & specs numeric keypad project.
- V 4 XB II plus by Mechatronic, Myarc 128k card, Autofire joystick project.
- V 5 32k internal memory project, DS/DD Ramdisk, Auto power-up project.
- V 6 Myarc 256k computer, "C" compiler, RAM/GRAM card.
- V 7 Maximem review, EEROM programmer, Sense and control card.
- V 8 Sold out.
- V 9 Dual disk controller project, RESET switch project.
- V 10-11 Double Issue: LA TI FAIR, Bill Gronos on Assembly, Super load switch, EPROM programmer.
- V12.5 Myarc 640k Geneve, Console speed upgrade, Video monitor filter, Gramcracker review, ATRONIC products.
- V14.5 Expansion Box 8k 'module,' Super Clock Support, Basic Compiler, 9938 Video Chip.
- V15 Video upgrade @ 15mHz, Quad Density TI Disk Controller, 80 Column Display preview.
- V16 P Box Modification, Multi-Module project.
- V17 Tigercub, Eprommer update, Quad density update.
- V18 Power Supply, RAVE 99 Keyboard, Year Review.
- V19 Geneve, c993.0, RAM Disk backup, HI-Speed cassette.
- V20 99AT, T.O.D., Horizon modification, Rapid Copy 32k project, GRAM card software, etc.
- V21 Expansion system, 8k DSR RAM Project, C99 by R. Albright, TI Writer in Memory, AE1 etc.
- V22 EEPROMS, C99 part II, File Utiliter, Command DOS, 8k DSR RAM part II.
- V23 Hardware group, co-processors, Improved Video, Real Time Clock, C99 part III, Memory LED's.
- V24 Triple Tech project. 80 Column Display II, RGB Conversion Project Part II, 64k
- V25 German GRAM CRACKER, Co-processor update, Proto Board, Console Calc., etc. 64k on the bus project.



IRVING L. KIRBY
HALBURTON & DISTRICT

210 MOUNTAIN STREET
HALBURTON, ONTARIO K0M 1S0
705 457-2774

Ryte Data

