CEDAR VALLEY 99er UG   FEBRUARY 1993

PRESIDENT: Jack Johns   (319) 366-4541
VICE PRES: Wayne Betts   (319) 377-2493
TREASURER: Bruce Winter   (319) 393-0610
SECRETARY: AVAILABLE
NL EDITOR: Gary Bishop   (319) 377-9574
LIBRARIAN: Bob Heiderstadt   (319) 927-4215

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CEDAR RAPIDS/MARION

Supporting the TI-99/4A and Geneve 9640 in Eastern Iowa

NEXT MEETING: 6:30 PM FEBRUARY 9, 1993
WEST MUSIC, COLLINS ROAD SQUARE

FUTURE ATTRACTIONS AND UPCOMING EVENTS:

MARCH 6: EASTERN IOWA COMPUTER FAIR, IBEW HALL, 8 AM - 6 PM.

MARCH 9 MEETING: ELECTION OF OFFICERS

APRIL MEETING: 10TH ANNIVERSARY OF THE CV99UG!!!

OCTOBER : 10TH ANNIVERSARY OF BLACK FRIDAY! A WAKE HAS BEEN PROPOSED. WHAT DO YOU THINK?

Future Developments:
The opinions of one 99/4A developer

By Chris Bobbitt

OVERVIEW

With the apparent final demise of Myarc, and most likely the Geneve with it (not-withstanding the efforts of those trying to salvage the remains), the TI community is at an impasse.

For the last 6-7 years a substantial portion of the software and hardware developers among us have been focusing on the Geneve. While some interesting work has been done, the frustrations in developing for the machine has driven more developers out of the community than anything since the 99/4A was discontinued. The Geneve is the only computer that could make what little TI published about the 99/4A look like an embarrassment of riches.

In fact, considering how everything turned out (the intentions and hopes of all parties involved aside, including myself), I would say the Geneve was probably the worst thing that could have happened to the TI-99/4A. It siphoned off developers who would otherwise have worked on addressing the shortcomings of the 99/4A itself. The Geneve itself was a radical answer to those same shortcomings, and the fact that it was a total solution in one neat package goes a long way towards explaining the efforts and passions it inspired.

However, any reasonable assessment of the situation would conclude that it is too late to make lemonade out of this lemon. Even if the machine were readily available today, we would be addressing ITS shortcomings by now. In 1985 512K of RAM and 128K of Video RAM was still something to talk about. But today, the capabilities of the machine are about as relevant to current computing requirements as the IBM PCjr, Atari 520ST or Amiga 1000. Further, the basic problems with the Geneve's design would insure that the task of updating the machine would be just as great as that of updating the 99/4A.

While 1 am not trying to discourage all of the developers who have spent years working on the machine and in some cases are still at it, the simple fact of the matter is that the window of opportunity for it has long been shut. The Geneve just can't compete against the 80386 and 68030 computers of the world, much less computers using the 80486, 68040 and RISC processors.

ASSESSING THE 99/4A

The basic problems with the TI-99/4A have been discussed to death, but its important to restate the obvious sometimes.

1. Memory

The 99/4A never had enough of it. There probably isn't a single PC program available today that will fit in 32K (or even the 40K available with a Supercart).

Granted, we've gotten a lot of mileage out of virtual memory techniques, the 9900 processor's more efficient use of memory, and programming in straight assembly. But the fact of the matter is we are quickly coming to the end of the road on that. Who would use a virtual-memory word processor that had to go to disk to get a bit of code every time you did a search and replace? Putting all of the features people expect from modern software, not to mention modern graphical user interfaces, in 99/4A programs is very difficult to impossible with current memory constraints.

Oh, people can still write games and utilities and some types of application programs, but when is the last time that a major new application (like TI-Base or Page Pro 99) has been released? How can someone improve much on those programs when they've run out of memory and can't make the program any smaller? As programs for PCs and Macs improve they inevitably get larger and larger because developers are loath to remove features found in previous versions. Hence, programs like WordPerfect that have been through 5 major revisions have everything but the kitchen sink, and 1200 page manuals to prove it.

Developing software for the 99/4A has always been about tradeoffs, but you eventually get to a point where the tradeoffs cost too much, and so new software development stops. We are about at that point with 99/4A software. Without more memory we will not see any more advances in databases, spreadsheets or desktop publishing, much less newer applications like computer faxing.

2. Speed

The 99/4A is slow, especially by today's standards. Personal computers that perform 20 million instructions per second are found on the desks of secretaries. The 99/4A can just about manage 1/100th of that. The only thing that has kept the 99/4A competitive for so long is that the vast majority of the power is wasted on PCs and Macs by abominable software that needs 32K of code to read the keyboard.

The proliferation of graphical user interfaces (GUI) has put a premium on speed like nothing before in the PC world. While Mac users have been enjoying their benefits for years, the PC world has only recently awakened to the fact that they go a long way towards making PCs less user-hostile (one of the big things that kept people using the 99/4A for so long). While Windows is still a pile of you-know-what compared to (say) the NeXT or the Mac interface, it almost makes the PC as intuitive to use as a circa 1979 TI-99/4A.

To keep up with the Jones' a GUI for the 99/4A is inevitable. However, to produce a practical GUI for the 99/4A you'll need more speed and a lot more memory. Please note that the latter goes quite à bit of the way towards mitigating the lack of the former because effective speed is still sometimes more a product of logical design and efficiency than raw power. However, all programs (especially efficient ones) benefit from increased speed.

3. Video

Of all the areas that we have tried to keep up with other machines, video display has probably been one of our more successful attempts. Despite occasional supply problems, since the mid-80's we've had a steady stream of new video products first based on the 9938 and more recently the 9958. We've been extremely fortunate that the video processor line used in the 99/4A found a wider commercial following than the 9900 itself did.

However, this is not to say there isn't room for improvement. Desktop publishing, GUIs and more advanced applications like Multimedia and Desktop Video make the 9938/58 adequate at best. Despite the fact that the improved resolution offered by these processors is still largely unexploited, within a couple of years it will seem as antiquated as, well, the 9918a.

However, the interest in advanced video that exists today is enough to insure that we will see continued products using 9990s and perhaps even 34000 series processors. However, there is no point in tying a state-of-the-art video system to the 99/4A if there isn't enough CPU RAM to hold a single screen of data (there isn't even enough now with the 9938).

4. Sound and Speech

This is one of the least painful shortcomings of the 4A because compared to much of the opposition, we STILL have competitive sound and speech capabilities.

There is nothing like our speech system available in the PC or Mac world today which relies on hideously inefficient digitizing to achieve comparable sound quality (10 seconds of digitized speech can take 1000 times more storage than 10 seconds of speech from our synthesizer). While our sound system has aged less gracefully (it was second-best even to the Commodore 64), the 99/4A still sounds better than many PCs sold today. However, Desktop Video and Multimedia - granted both cutting edge applications that won't be widespread for a while yet - both require tremendously enhanced sound and speech capabilities. The emergence of these applications has also started to drive PC developers to improve sound and speech on the PC - its a safe bet that in the next year or two virtually every PC sold will have a Sound Blaster-like sound board as standard equipment (the Mac always had it).

Any expansion of sound and speech technology for the 99/4A will require an increase in memory and probably speed - especially if it includes input of speech and sound as well as output. As with advanced video, there is no point to improving sound and speech capabilities if you have no place to put this type of data, or you can't get the data to the

hardware fast enough.

5. Storage

As with video, the 99/4A development community has tried hard to keep up with the latest in storage technology. This has been as much out of necessity as virtue - because of the limited RAM of the 99/4A the only way to increase the functionality of 99/4A programs has been to use disk space as program storage space (virtual memory).

The HFDC brought the 99/4A up to the level of an IBM AT, and the promised IDE and SCSI controllers would bring the 99/4A into the modern age - on par with the latest from the clone makers and Apple. The SCSI controller, in particular, would give the 99/4A access to the wide range of storage peripherals outside of disk drives - CD-ROM players, tape-backup units and so forth.

While increased storage is always useful, it won't permit any new types of software application development, however, beyond what we can do already do today with the HFDC, RAM-disks and the like. However, speedier storage WILL make living with virtual memory techniques a lot easier. If it only takes a half-second for the "search and replace" function to load off of your SCSI hard disk, then you can probably live with a virtual- memory word processor.

6. Input/Output Devices

Along with storage and video, the variety of input and output devices has for the most part kept up with technology. You can attach the latest printers and serial mice to the 99/4A as easily as you can with a PC. We can thank the fact the we were fortunate TI supplied us with standard RS232 and Centronics-compatible Parallel ports for this (not necessarily a given with older computers).

There is, of course, always room for improvement. Many PCs nowadays sport second-generation parallel ports that can handle much higher speeds and two-way communications, and Apple Macs have featured the RS422 interface for years and years (which also works faster). Further, our serial interface is not quite compatible with some applications. MIDI has pushed the 99/4A to the limit in this respect - the technical problems related to properly exploiting this technology are great because of shortcomings with the interface.

Also, as with improving most other aspects of the 4A, an improvement in memory is also important to optimize improvement in input/output devices. Additional memory would permit better buffering of data (which would facilitate faster 1/0), and make supporting MIDI a lot easier.

SUMMARY

As it stands the 99/4A could stand major improvement in memory and speed, and substantial improvements in storage, and modest increases in speech and sound, video and 1/0.

This isn't meant to indict the 99/4A - the machine will still be useful for years to come. But lack of improvement in these areas will mean that TI-99/4A applications will seem ever more and more primitive by comparison with what can be done on other computers. Without improvement it will be impossible to even contemplate many up-to-date applications.

PRESCRIPTIONS

While the situation is not good, it is far from hopeless. Despite the thinning of the ranks caused in part by the Geneve, there still exists a dedicated group of people interested in developing new hardware and software for the 99/4A. Chances are any substantial improvement in what the 99/4A can do will bring more of these people out of the woodwork as it did in the past with the introduction of GRAM devices, higher capacity drives, new programming languages, and so forth.

Lately small groups of individuals have tried to help solve the problem by defining it better in conferences and meetings. The best known of these efforts is the 99/4A Standards discussions that have been held on various electronic networks and at TI conventions.

1. Memory

The 99/4A Standards committee (the NTISC) has evolved into a general discussion on addressing the memory shortcomings of the 99/4A - essentially by defining common protocols for accessing these types of devices (physically and through software). While there is a lot of utility in such discussions, I also have some concerns about them. I believe that in the short run they unnecessarily raise expectations; the great disparity in the way currently available memory devices work will make what they are trying to do very complex; and, actually developing devices and software to pre-designed specifications sometimes points out inadequacies in the specifications more than anything else. In this way they can be counter-productive.

Further, trying to write software that interfaces to a wide variety of memory devices promises to be most difficult. Optimizing a program to work with a variety of different page sizes and interfacing methods, even smoothed over by common access routines, may be impossible. One program we worked on at one time, Press, became impossible to complete on this point alone.

The best way to promote a standard memory device for the 99/4A is to let the community vote with its dollars. The most popular memory device becomes the de facto standard. If there are shortcomings in products that are currently available, anyone who makes a better one can probably sell a lot of them if they address those shortcomings.

This isn't to say that a standards committee can't help the matter along. While it may be impossible to set a standard access method for currently existing memory devices, a standards committee could certainly design an "ideal" memory system that addresses the problems with current systems. This design could then be licensed to multiple vendors - better to insure steady supply and price competition.

2. Speed

Speed is a much harder commodity to come by. The only really compatible speed improvement currently available is to increase the clock speed. While this improves speed up to 30% or so, even this causes problems with some programs.

Recent efforts in this area (besides the Geneve) include a 99105 based daughter-board that would plug into where the 99/4A's CPU currently resides. While this would certainly meet the need for speed, it has evidently hit a stone-wall during development.

A better long-term answer may be to simply replace the entire motherboard - in essence what Myarc did with the Geneve. While this would probably be more costly than a daughterboard, the technical problems might actually be less - particularly if the designers put all of the common peripheral ports on the motherboard and didn't worry about access to the P-Box.

The cost of such a thing would certainly be an issue, particularly if the designer used one of the few remaining available 9900 compatible processors. A 99105 costs around $225 EACH in quantity (making the COST of a full-blown system built around it $500-1000 depending on the components and peripherals included).

The designer of such a system may want to consider using another microprocessor and emulating the 9900. The upside to this is the cost per processor may go down dramatically. The downside is the technical problem of emulating a 9900, and potential compatibility problems that may result from a buggy emulation. Of course any emulation done depends on the microprocessor that is running your emulation - and it may be easiest to do a 9900 emulation with the new TI SPARC chips or the TI 34020. These chips have a few 9900 genes floating around in them and have enough raw speed to make a emulator that is 20 times faster than the original. Of all the problems facing the 99/4A, the speed problem is probably the hardest.

3. Video

Hold the course! More 99/4A software is becoming 80-column aware all of the time. If only we could convince more people to buy the upgrade - that would insure both a steadier supply and future development of both high-resolution software and hardware.

4. Sound and Speech

There have been several efforts to improve both of these things on the 99/4A - ironically both by Tl.

The MBX system is STILL just as good or better than the typical speech recognition device for the PCs and Macs, and Tl speech synthesis technology is peerless. It is rumored that Tl has also married the two with speech recognition devices that interpret the spoken word into the Linear Predictive Coding system used by Tl synthesizers (including our own Speech Synthesizer). A board built around this technology would be on the cutting edge for all computers!

Also, Tl reportedly was behind the design for the FORTI music card, which expanded our system to 12 voices with stereo output.

All we would need to bring the 99/4A into modern times would be a Sound Blaster for the 99/4A with an expanded version of the speech technology we already use.

5. Storage

This area promises to be one of the first addressed, particular if the new IDE and SCSI hard disk controllers are ever released. Both IDE and SCSI offer enough speed and capacity to meet the 99/4A's storage needs for years to come. They could also facilitate cutting edge applications like multimedia, and current hot topics such as GUIs, desktop-publishing and so forth.

6. Input/Output

The only thing the 99/4A needs is a device offering 1-2 true Centronics parallel ports and 2-4 improved RS232 ports. With the former it may be possible to attach all of those peripherals designed to work on a parallel port that are available for the PC. With an improved version of the latter, some of the technical problems of MIDI would be solved.

CONCLUSIONS

The 99/4A has come a long way in the 13 or so years since its first incarnation as the 99/4. It is reliable, useful and addictive. However, if it is to become more useful, and stay as challenging and addictive, it is going to have to be improved.

My purpose in writing this was not to deride the 4A, and certainly not to offend anyone in the past or present who was/is working towards the common goal of improving the machine. Everyone's effort in this respect has been invaluable to the cause. I also didn't write this to quibble with anyone's approach to the problems at hand. While I disagree with some aspects of the NTISC, as a programmer I can certainly empathize with their aims.

The point of this article was to ask a few question of myself and others - "What's wrong with what we have now?", "What can be done to correct what's wrong?" and "What hardware would I like to write programs for?". I look forward to reading other answers to these questions.

Please send all comments to:

Chris Bobbitt
c/o Asgard Software
P.O.Box 10306
Rockville, MD 20849-0306

--WP♦

COMMENT ON THE CHRIS BOBBITT ARTICLE
by Gary Bishop

Chris' article should be read and reread, and studied carefully. He has provided a clear assessment of the state of the TI community. I have some disagreements with a couple of his prescriptions, but the overall condition of the TI situation is as he describes.

I take issue with his urging to let the TI community decide a standard memory device by voting with its dollars. There are few enough dollars left in the TI arena to scatter among competing standards. If dollars are spent on some eventual loser technology, that money and probably its spender(s) will be disgruntled with the result, and leave the TI fold forever. The FCC tried the same thing with AM stereo: let the market place decide. Untold millions and maybe billions of dollars later, much of which was wasted on losing technologies, there is no clear winner. The factions were divided, and no single technology had the strength to move forward. The FCC wimped out. Do you think we would have had color TV if the FCC took the same approach in the 50's? No way. They took the proper regulatory stance then: a technical and performance competition, with the winner required to reasonably license anyone that wanted to make a color TV. RCA won, and would have probably licensed everybody for the shear prestige of being selected the winner.

Another underlying assumption with letting the dollars vote is that the voter has the technical expertise to make a wise decision concerning the future of the TI. I beleive most spenders will make a short-sighted decision, such as satisfying a single, narrow need, and no others. Worse yet, the cheapest may win out. Although this may not be all bad, it could certainly limit the expansion and versitility of some other slightly more expensive alternatives. Why bother taking another step if that next step is doomed to be the last step?

My proposed method: Let the best heads, hardware and software, get together with the standards committee, and have them make their best proposal, based upon the concensus of members. I have faith that any reasonalby concerned group will make the best overall decision. Even if some baggage and personal agendas are present, the movers and shakers must be heard.

SPEED: I agree with Chris; this will be the hardest to come by. the 30% he mentions is simply insufficient to be worthwhile, except for the hackers among us. I have toyed with the idea of installing the original and faster crystal in the console. I have also read there is a byte in the console ROM to tell the RS232 and others what speed to use. My switch would not only shift gears on the crystal, but switch out ROMs with the proper divisor burned in them somewhere. Additional areas to gain some speed, along with the spectre of incompatibilities, are moving devices off the slow and clunky 8-bit bus internally, and put similar functions on the 16-bit bus. The 32K memory would be the most obvious choice, but here again, wide-spread use would require some sort of daughter board. The daughter board has its share of drawbacks. How about faster console ROMs on the 16-bit bus?

How about a full basic compiler? This would certainly achieve speed. We may be closer than we think in this regard. An excellent series of articles by Barry Traver about his graphics compiler is a good start. His routines could be licensed, combined with other assembly language marvels, to produce some great performing software. PRE-SCAN-IT! and SMASH do produce great results, but they can only go so far. The next step would have to be a compiler. What would the cost be? Would $50 fly? After all, that compares favorably to the cost of the XB cartridge. What incremental amount of money would be worth a drastic improvement in the performance of existing software? I don't know, think about it.

I'm very encouraged with the developments surrounding the buy-out of the source code for Myarc operating systems. The project is now in the hands of those who stand to gain the most from its success. If I could stumble across a Geneve for reasonable, I have been thinking of making the leap. Repair work now seems available. It's just too bad that there isn't some way to reproduce the Geneve for us late-comers. The basic cost of chips is very high, even if they are still available. To make such a device available in the present climate is probably not profitable for anyone.

The Geneve is a natural extension of the TI archetecture. If things could have been different (20/20 hindsight) the computer would still be selling briskly. My opinion is not as harsh as Chris' concerning the effect it had on the TI community. If there wasn't an avenue for advancement, all those Geneve people would have gone to PCs without looking back. Most owners may already own PCs, but stick with the Geneve out of dedication and inertia. At our last meeting, the discussion revolved around why we have stuck with the TI. Almost simultaneously, we answered that all of us are just plain too stubborn to move on to something else. As Jim Peterson stated, the TI is still a good home computer, able to handle mailing lists, correspondence, utilities, and other uses not requiring lightning speed or dazzling graphics. There are quite a few uses that fall into that category.

I've only met Chris a couple of times, at the Chicago Faire. He is not looking for a few "yes" votes or a blind acceptance of his proposals. I'm certain he is concerned with the best interests of the TI at heart. Think about our situation, put pen to paper or words to the screen. Let him know how you think, and what you need, and would be willing to support. -My two cents. Gary Bishop

NEWSLETTER REVIEW By Bob Wahlstrom

The Cleveland Area User Groups January 93 newsletter had a three page review of the word processing/publishing program called FIRST DRAFT by Art Gibson.

The West Penn 99'ers newsletter for Nov 92 has a page of products available from CaDD Electronics for the TI and Geneve. Their January 93 issue has a section on the Page Pro Cataloger program and Page Pro 99. They have a step by step listing on how to make a page which includes pictures and writing using these programs. The January issue also has a page of useful hints to help in using the TI.

HARD WIRING IN YOUR MODULES By Bob Wahlstrom

The thing that got me started on this project was the many lockups that I seemed to be having with my computer. I tried the super-juice on the contacts before doing anything major to stop the problem, but for me it didn't seem to work. I have been using the Navarone Wigit and super-juice was applied to all the contacts except where the L-bracket plugs into the main computer board. After using the juice, the computer was given a good check out and I was able to make it lock up twice in one evening. We had our Christmas vacation from work comming up, so it looked like a good time to try something different.

I took the Wigit apart to see how they were doing the module switching and the reset button connections. I proceded to solder in four of my modules inside the computer using multi colored ribbon cable, connecting them to the bottom side of the computer board at the cartridge socket. I used a small six position double throw rotary switch and a pushbutton switch for the reset button. Most of the wires run in parallel between the modules, with pins 29 and 34 being the exceptions. These two pins are switched between the modules to select the one in use. With my switch I could have installed five modules leaving one position blank for use when using the normal module socket. Not all modules are using the contacts on the back side of the board. On the ones that are using pin 34 you will need to hook a 49k resistor between pins 34 and 19 on the module. The reset switch runs between pin 29 and pin 1 and this should be a momentary contact switch.

I have been using the internal cartridge set up now for a couple of weeks and have not had any computer lock ups and it is a lot handier not having the Wigit plugged into the front of the computer. I had plenty of room to install the four module boards inside in the area above the metal enclosed computer board, just under the top of the computer. The switches were installed at the top left side, near the back of the computer. All the soldering on the modules was done above the area where the contact is made with the socket, just in case you might want to put the module board back into its enclosure and use it that way again. The modules I selected for inside installation were Extended Basic, Disk Manager, Editor/Assembler, and Terminal Emulator II. You might be surprised at how few parts there are in some of these modules.

If you should decide to install your modules inside your computer it would be a lot easier to be sure of getting the wiring right if you could look inside a Wigit and see just how they are doing it, check things out as you go with an ohm meter. It is easy to get a short between the contacts on the module boards, so check this out also. Good luck if you do give it a try.

Reviewed by Jack Johns: Chicago Times, December 1992: The Prez Sez..Another good Faire has passed, Schmalgemeier awards went to Bob Demeter and Tony Zlotorzynski, Attendees came from Holland and Germany, Hal is retiring as Prez; Impressions of the Faire by Charles Good..Most of the speakers ran over their time- Thats good. He picked up some cheap used equipment. SCSI, Horizon 4000 and Asgard memory cards were available; Editors Column..He was in the hospital; A mystery program; Membership Views..Renewals time, BBS has been upgraded, Executive Board Meeting..The Faire was successful, Tony Z. had a ruptured appendix, Next Faire is November 13, 1993, Disk Protection Schemes..Many explained, Good article.

NEXT REGULAR MEETING: Tuesday
February 9, 1993 6:30 PM
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COLLINS RD. SQUARE, MARION
NORTH OF LINDALE MALL

Cedar Valley 99'er Users Group
c/o Jim Green
377 Cambridge Dr. NE
Cedar Rapids, Iowa 52402-1446

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