Lima show attracts old computers and those who love 'em

By STEPHEN HUBA
The Lima News

Only a computer could be considered "vintage" at 10 years old.

But to users of the Texas Instruments 99/4A, vintage doesn't mean antique.

The 200 people who attended Saturday's national computer conference at the Ohio State University-Lima don't think there's anything outdated about the TI 99/4A.

"We're all proponents of the idea that if it ain't broke, why bother trying to fix it," said Charles Good, associate professor of botany at OSU-Lima.

Good is faculty adviser of the Lima Campus TI 99/4A Computer User Group, which has hosted the national conference every year since 1988.

"Back in '83, we spent a fair amount of money on this equipment, and we still use it," Good said. "You can buy a complete TI set for about as much as you pay for an electronic typewriter — about $150."

User groups and dealers, many from outside Ohio, attended the day-long Lima conference, buying and selling old hardware and components and learning about the newest software.

"This sort of has the flavor of a flea market," Good said, wearing a baseball cap with the words "I Love My TI 99/4A" on it.

Seminars were scheduled continuously from 9 a.m. to 5 p.m. at the conference.

Alonzo Slade, of Los Angeles, Calif., said this was his first year at the Lima conference.

"It's up there with the best that I've been to — if not better," Slade said. "At least they have food."

Even though Slade bought his TI in 1984, he still uses it for word processing, personal finances, record keeping, games and education.

Ted Kieper, owner of Competition Computer Solutions, came to the Lima conference all the way from Milwaukee, Wis. He learned about it while at a show in Chicago. "It's different." Kieper said of the Lima show. "It's quite favorable. We did more sales here last year than we did in Chicago. Our expenses to come here are probably less because we don't have to pay to come in."

Because the Lima user group is a student organization, it gets free use of the campus facilities, hence costs are kept to a minimum, Good said.

The Lima user group publishes a monthly newsletter that it sends to its 80-plus members, many of whom live out of state, said member Bob Harshe. The club was started in 1984.

"In November 1983, Texas Instruments went out of the home computer business, and that's where all this originated," Harshe said. "The TI 99/4A was probably the largest selling home computer until IBM got involved in PCs."

The factor that keeps the TIs popular is the constant development of new programs, he said. Most of the programs are public domain and, therefore, can be copied and disseminated to users across the country through mail order and shows, he said.

"A show like this is the only opportunity that users of this equipment have to see and try out new software and new hardware," Good said. "We're ancient technology, and you can't buy it at the local store."

A BRIEF RETROSPECT OF THE 1993 LIMA MUG CONFERENCE
by Charles Good, chief conference disorganizer

I was so busy trying to keep things running smoothly that there was much that I didn't see. Things DID run quite smoothly, with one significant exception. Some observations, not in any particular order:

--Attendance was UP compared to last year, probably over 200. 167 signed the signup sheet. We ran out of name tags.

--Gary Bowser had 80 column devices (TIMs) for sale.

--Bud Mills sold a lot of Horizon 4000 cards.

--The SCSI operating system still isn't ready. Maybe in about a month, we were told by Don O'Neil..I'll believe it when I see it.

--I know of 4 new TI users that purchased complete systems. Two of these individuals purchased new printers to go with their TI systems.

--The 40 column Funnelweb v5 text editor was available, in part. (See the notice elsewhere in this newsletter about how to get the complete 40 column editor).

--First Draft is now compatible with the AMS memory card.

--I saw XB3 running at the Asgard table.

--I never ate so much pizza in my life. The "after the show pizza party" was free and offered unlimited pizza and soda pop.

--I really goofed in setting up the video equipment in one of the seminar rooms. I didn't plug in a cable. The result was 7 hours of SILENT video. Nobody is more upset than I that this happened.

✻✻DONE✻✻

LETTER from AUSTRALIA - No. 4 Mar / 93

Last letter it was coming up to Xmas, and now the New Year is well and truly under way, and already it is starting to feel like summer had never really happened. We just had a Federal election yesterday, Saturday. US readers of course had theirs on regular schedule last November, but Canadian readers, if any, will understand the system here where elections occur more or less at the convenience of the pollies. Also to confuse US readers, the conservative party is called Liberal for historical reasons, but was pushing policies to make Baroness Margaret Thatcher proud, and proposing to make the medical system as like the American model as possible. The result caught two particular people in Australia as an immense surprize. The less surprized of these was the previous Prime Minister who was partially expecting to lose, and the other the Opposition Leader who absolutely expected to win. The PM had no trouble switching to to a winner's acceptance speech, but the other fellow just couldn't believe the result, and was pretty reluctant to admit defeat and positively ungracious. I had a look at the newspaper headlines in the Sydney Sunday rags when I went down to the Minit Mart for some milk the next morning (the more serious papers have the same owners but come out in weekend editions on Saturday) and here was the headline "Photo Finish" with a picture of the Liberal leader underneath. Not quite Chicago Tribune 1948 (it did have a two way bet quality), but it was quite obvious which way the editors had expected the result to go. The TV networks and all the computers had made it clear late the night before that the current ALP government would be returned with an increased majority. No doubt all the promises from the pollies are inoperative now the elections are over. That seems to be a political universal.

The Libs had imported some hired guns from George Bush's campaigns, who came up with some very nasty TV ads, one showing a voter in the cross-hairs of an assassin's rifle. I guess these guys are now two time losers. How about the pollsters? Well maybe some of them got it right within sampling error at the very end, but at 6 pm on the TV news just as the voting closed in the east of Australia, Gary Morgan - big cheese of the Morgan Gallup poll - declared for a narrow Lib win. The funny thing was his own organization's exit polls showed clearly the opposite was going to happen. Such is the power of the running pack. It's like thinking that just because everyone is buying 80x86 PCs, they are computers to be enthusiastic about.

Just reading the latest BB&P article on the CYC list. Good to see the Vincent and Gill book, 'Software Development Handbook' mentioned. This has been over the years my main source of background information on 9995 and 99000 details, as well as a good reference on 9900 family assembly programming. Only part of it is really relevant to 99/4a users, but it is a good general text on program design. I had always wondered if it had ever made it to the US of A, as it was a product of the UK operation of TI. I saw it in the RadioSpares catalog years ago and ordered a copy for the library. I gather that 9900 series processors were widely used in England in commercial applications, more so than in USA.

I think I may have been too kind about Myarc in recent Letters. The 80-track ROM in my Myarc Floppy Disk Controller (FDC hereafter) is not a genuine Myarc original but a modified version from Richard Sierakowski in England, and works consistently on DSQD (80-track) disks with 2 sectors per allocation unit. Recently I had occasion to install an original Myarc DSR 80-track ROM in the Hawks Nest machine and found that this this did not handle sector counts correctly in DSQD, sometimes losing track of the last sector on record by record saves of text files.

The gremlin that inhabited one of my 192Kb HRDs finally stuck its head up far enough to get it lopped off. This card, though extremely neatly put together has always been strangely unreliable on power cycling, even with the extra wire prescribed. The other two live in the second machine which resides at Hawks Nest, 50 miles away, while the Kotara home machine is supposed to rely on the HRD3000b, and these have always been reliable, with this third one as emergency backup. With all the HRD3000 problems it has had to take the leading role again, even though DSSD is inadequate for a serious collection of utilities. It had been behaving itself but then decided to die every time. Maybe it was surprize at seeing William back on the TI. Nothing is more likely to get a TI-99 consigned in anger to the back of the deepest closet than a dodgy system boot HRD, and now both were bad. Out with the voltmeter, and all the NiCads looked good when checked individually --- but in circuit the one at the earthy end appeared to have reversed voltage reading. Aha -- here was the clue to all the troubles! The total voltage across the string of good NiCads was fairly small. The obvious conclusion was a open circuit between the + end of the first cell and the solder tab, and indeed the connection in the battery holder was only a press fit which could be rotated. So there it was, a dodgy battery holder. Now I know what the problem is, it just does not seem so frustrating any more. Geoff Trott down in Wollongong very kindly checked out the HRD3000 and found that the 8K RAM chip was causing it to hang. The design seems fairly critical in these as several samples had been substituted before. So it worked but now died on power cycling. The green LED turned out to be one of the low voltage jobs so I added a series diode as per Bud's recent change order. No joy on power cycling. With the extra diode raising the ante, the 3v lithium battery with its reverse protection diode now seemed too low a supply. After finding any Li battery with solder leads, let alone a 4.5 V, impossible to buy in Newcastle, I settled for a Varta 4 V NiCad battery as replacement and installed it with suitable charging resistor. Joy of joys, it worked like a charm, and

I was even thinking the time had come to install the RAMBO. Then a week or so later it started locking up again, and the old gloom descended. At least the small HRD is functional now. Actually my own preference for experiments in expanded memory in the past was to use my third small HRD, but I have never felt able to spare it for that.

The !I Gotcha!s struck here too, renaming and apparently reformatting a drive. I was not at all amused, and singularly unimpressed. I must say I find the comment by Gary Bowser that "it takes the system a very long time to realize an invalid drive number or letter was picked" difficult to understand in any reasonable ROS code. Somehow it seems that doing some checksums at power-up might be a better idea for user protection. The comment is almost as strange as that published in the Nov/92 Micropendium about the RAMBO developer's package.

One thing I can attest to is that the new SCSI card should work quite well at the lowest level when the DSR is done. It will be at TI rather than Amiga speeds, but it works. A real attraction of SCSI for TI owners is that SCSI devices are transferable to or from other machines. How can I be so confident? Well, there has been one in this very PE box, communicating with a SCSI device over the bus (a 52 MB Quantum drive, the preferred test device here - if any SCSI fixed hard drive will upset a controller, a Quantum will). William has now gone to Sydney to a job in computer graphics and special effects, but his last task in January before moving was to get back on the TI to write the low level SCSI driver for the card. So that was done, with the benefit of years of experience of writing SCSI drivers for Amiga cards, by a former master of 9900 code, and should be a pretty solid foundation for the higher level DSR functions being done elsewhere. As he said a week or two ago, when overcoming difficulties getting a new SCSI device, a magneto-optical drive, running on his big Amiga - "SCSI is easy -- if you know how to roll your own drivers".

The review topic for this Letter will be VDP memory and disk DSRs, triggered by a letter I received and by the public discussion of the I Gotchas. The TI-99 was designed originally in the days when memory cost a fortune and 8K was normal on most smaller computers. The disk peripheral was to be usable without the 32K expansion, and to accomodate this need the disk DSR was designed to operate with all RAM used (except for a small block in the scratchpad) being in VDP memory as were Basic or XB programs in the unexpanded machine. The overall regular device independent DSR structure of the machine has been an essential reason for its continuing even now 10 years after its creators set it adrift, but the downside of the original design is that we are still living with that decision of TI's to use VDP memory for functions that had nothing to do with video display. TI allowed for other devices to steal VDP memory, which permitted major new developments such as 80-column cards to function. In summary then, as TI left it, disk DSR memory

usage was as follows

(1) The DSR ROM itself in the range >4000 up to >6000 with some addresses used for memory mapped byte wide communication with the disk controller chip.

(2) CPU RAM in the scratchpad, >22 bytes from FAC at >834A for communication with the DSR and scratch usage, as specified and reserved by TI for use by any DSR. Strictly speaking DSR writers were at this stage not even allowed to assume PAD was at >8300, and it had to derived from the GPL workspace location.

(3) Areas in VDP RAM used transiently by the program for setting up Peripheral Access Blocks (PABs) and for data buffer areas, as generally specified by TI for all DSRs.

(4) A permanent block of VDP RAM used by the DSR to hold disk information and for stack usage. This had a prescribed header at a VDP address stored in PAD at MAXMEM >8370, a location to remember. Normally space was allowed at power-up for 3 files to be open, and more space had to be assigned for extra files, or could be removed for fewer. The disk DSR block extended up from there towards the top of memory, and the internal details were not officially available for applications programmers, though they gradually became known. TI did specify clearly in internal documents that the TI disk DSR did not assume that the block extended to the top of VDP at >3FFF, and that its position always be located from the MAXMEM pointer. This block is only a detail that went with TI's FDC, and not an essential feature of disk DSRs.

So that was the situation on Black Friday, 1983. The first new development was the CorComp disk controller, which apart from that silly capture of the screen on power-up and non-standard method of loading its disk manager, otherwise obeyed all of TI's rules and matched TI's usage of VDP exactly. Come to think of it, I forgot to mention this in the last Letter as an example of a DSR that captured the machine, but we have never had one so it did not come to mind. A later update eliminated the annoying initial screen, and should be the one used in 80-column systems. Most if not all programs of this era which attempted low level access to disk details assumed absolute addresses in the VDP block (TI internal documents emphasizing use of MAXMEM had not leaked outside a tight and secretive circle at this time).

Next came the Myarc FDC, first and only ever seen here as a PE box card. This card was very different from the TI/CorComp in its memory use. The DSR ROM was bankswitched in two 4 Kb blocks at >4000 and had an internal 2 Kb RAM at >5000. It used more of PAD on a temporary basis, otherwise its software intensive design with minimal hardware assists would never have been able to handle DD tracks (DD raw track reads are still dodgy at best but are not routinely used, and it also has various file level bugs and disk sector

allocation incompatibilities). The real change was the use of the internal RAM for all disk buffering instead of upper VDP, and also a convention for programs to signal use of CPU RAM for data buffer areas. The DSR initialized VDP RAM in mimicry of TI cards but then ignored it. The designers chose to emulate the TI DSR in restricting the number of open files according to CALL FILES(x) setting of the VDP pointer, instead of always using the number available in the DSR RAM. The later HFDC seems to have followed the same general outline. This approach of faking handling of VDP was unnecessary and in retrospect a very unwise decision that gave users less performance than they could have had. Myarc users could have had cassette length Basic programs from disk all along.

It is clear then that the Myarc FDC had no business in VDP supporting CALL FILES(x) in the first place, as the function was specific to TI/CorComp disk DSR usage of VDP, and it was only ever a command line function in Basic or XB. Various TI programs such as the Formatter and Assembler did manipulate VDP memory allocation, but only to let an assumed TI FDC have adequate open files. The correct behavior for an FDC or emulation is to support the >16 VDP file allocation subprogram as defined for TI FDCs only if the DSR uses VDP in TI-style, and for programs which call it to clear the error byte at >8350 first, and only flag an error if the error byte is set, whether or not the subprogram is found. What is also crystal clear in retrospect, though obscured at the time, was that as soon as the Myarc FDC card appeared, any programming technique that assumed use of upper VDP by disk DSRs, let alone intimate details of that area, was no longer generally valid. Funnelweb's boot tracking code after that time still looked in VDP for TI/CorComp data but also checked for the Myarc FDC, and if found assumed specific details in the Myarc internal RAM. The Funnelweb system always gave the user the option to turn off this search altogether. Long after this commercial programs were still being issued that would not run on Myarc FDCs because they rigidly assumed TI/CorComp VDP usage details.

The next big step was the first of the continuing family of Horizon RAMdisks. The Johnson/Ballman Miami ROSs for these cards remained externally similar to the TI original (except that they improperly ignored MAXMEM) and shared use of the VDP area with the FDC, and observed the CALL FILES(x) limit. Again in hindsight this was an unnecessary and performance limiting design decision. When 80-column cards came along the last (Vn 7.3) of these ROSs had to be patched to respect MAXMEM, but the public availability of source code made this running correction possible. The HRDs by their nature contained RAM, and all sectors on the simulated disks already were accessible at CPU RAM speed and so did not need to be buffered from slow physical disks to RAM for reasons of speed. The later OPA Vn 8.1x ROSs have embodied this understanding. The HV99 Quest RD, though internally very different, uses a ROS like 7.3 to this day, and provides the test in my Myarc FDC based system of correct function for

TI/CorComp. Funnelweb's internal Files(x) equivalent routine became more complex to allow for possible pushdown of MAXMEM by unknown small amount with arbitrary number of files set. It has to reserve VDP just in case it is needed by a TI type disk DSR so that all FDCs are handled transparently. Life would be very much simpler all around if all disk DSRs were like the Myarc model without the unnecessary CALL FILES.

Why are programmers interested in the leavings of disk DSRs anyway? The reason is that most substantial program packages need to load subsidiary files automatically from their original disk, and the TI operating system made no direct provision for returning information on which drive this disk was in. Within the package it is under control, but it is that first load by the OS or another program that is the difficulty. An elegant but partial solution to this problem was given by Bruce Harrison recently. It relies on the prior use of standard form DSRLNK routines to load the main program initially, that store intermediate pointers in known PAD locations, and backtracks into the DSR devicename list to find the last one used. Given the pointers, this is a properly device independent method. I always knew there had to be a reason why nonstandard DSRLNKs never appealed. Funnelweb now uses Bruce's method in FW and LOAD, with the usual override provision. You can't always work in the simple-minded way of looking for "n" in the name "DSKn." so expected. Files loaded through a disk volume name or hard drive path do not fit this model in the final detail, which is why Funnelweb still needs alternative support for configuring in pathname access. Also direct DSR program level access (MENU, FW, LOAD or whatever) as supported by Horizon style DSRs fails to satisfy the necessary conditions. The solution here is for the DSR writer to arrange that the DSR ROM pointer in PAD is left at the drive name entry "DSKn." on which the program called directly by name was stored, just as if it had been loaded normally. The CRU pointer should already be correct.

This brings us to the latest letter from OPA as attached to the March BB&P. In the light of the above discussion, a well written DSR for HRDs has no business with VDP at all, except to look at PABs and read or write data if so instructed. Since the function of the HRD is to be indistinguishable from physical drives, application programs must treat all alike. This means that if the Files(x) function is needed to cover TI type FDCs, the program should provide its own universal routine to cover all possibilities, or else handle the >16 subprogram correctly as covered above. Calling the physical FDC's VDP allocation routine (subprogram >16) may not be adequate for the worst case of a 7.3 style ROS using VDP, combined with an FDC that ignores VDP and this subprogram. The OPA letter seems to be an implicit admission that ROS 8.14 still has misconceived and bad code in this area. Pity, because it does so many other things so well. There is this legacy of programs which make obsolete and now clearly illegitimate VDP references, at absolute addresses in

worst case. I believe the best way to handle such problems is to do the DSR correctly in the first place, and provide special options to handle ill-behaved programs, callable when needed (like the AVPC's TI-Mode). It is sometimes possible to cover up for bad applications by cunning code called transparently. If Gary Bowser is unwilling or unable to update ROS 8.14 to fix its sins of comission (VDP reference or interference, I Gotchas) or omission (no 800K DSDD equivalent drives in big HRDs) then Bud should hand it over to someone who will, as a solid DSR is an essential part of the HRD, and leave OPA to supply alternative third party products, all of them no doubt wonderful.

That had better be all for now folks, or it will soon be Text Buffer Full.

Tony McGovern
Funnelweb Farm
Mar / 14 / 93   **DONE**

THE FUNNELWEB V5 40 COLUMN EDITOR IS NOW AVAILABLE

In early June we received the COMPLETE 40 column funnelweb v5 text editor from Tony McGovern. SOME of the new features include:
  --The ability to display on screen and print with almost any printer directly from the editor all the high ASCII graphic shapes, math symbols, and foreign language characters. Just type PF (print file), and the graphics displayed on screen will print on your printer. The result is similar to the commercial software FORM SHOP, but you don't have to use the Funnelweb (TI Writer) formatter to print these graphics. Tony calls this feature ALL CHARS.
  --For hard disk users: the ability within ShowDirectory to page back and forth through the entire tree structure of your hard disk directory. Moving the cursor next to the name of a sub directory will allow a display of that sub directory. You can also display the root directory of the currently displayed sub directory. [This is also now available on a revised 80 column v5 Funnelweb editor available form us.]
  --An unlimited number of HELP screens can be displayed by pressing H from the command line.
  --Foreign language (non English) command line text, commands, and character sets can be optionally selected at powerup or configured to automatically boot when the editor is powered up.
  --Text scrolling and windowing up/down from the command line.
  --ALL CHARS tab records with saved files are now compatible with other versions of TI Writer. This is true for both the 40 and (new) 80 column Funnelweb v5 editors.

Some of you picked up the 40 column Funnelweb editor we had available at the recent MUG conference, but this was an incomplete version that did not include ALL CHARS. What we now have available for distribution includes ALL CHARS. My demonstration of this COMPLETE version is on the 1993 MUG conference video tape. The Lima UG will send to everyone on our mailing list a disk with this complete (with ALL CHARS) editor when we mail our September newsletter.

What we have in hand now has a couple of problems which we hope will be fixed by the time the Sept newsletter is mailed. Right now, ALL CHARS only works if you boot the editor from a ramdisk or use a Myarc floppy disk controller. ALL CHARS will also probably work from a hard disk. ALL CHARS doesn't work properly from floppy if you are using a TI or CorComp floppy disk controller.

This text editor is really neat, with SIGNIFICANT new features not available on previous versions of Funnelweb. If your 40 column system includes a horizon ramdisk, you may not want wait for our free distribution with the September newsletter. ANYONE, not just members of the Lima UG, can obtain both the 80 and 40 column Funnelweb v5 editors from us NOW on a DSSD disk. Put a $1 bill ($2 for both editors, two disks) in an envelope carefully hidden inside a piece of paper with your name and address written on it. We will mail you the software. Your $1 pays for the disk and postage, and the rest goes into the "send Charlie on a Florida vacation" fund.   **DONE**

A NEW CARTRIDGE FROM TI? BACK TO TRONICS SALES!
A letter to the editor from Joseph Cohen

Dear Charlie:
In a previous newsletter (October 1992 BB&P) you wrote about Tronics Sales Corporation. In that article it was reported that they used demo programs on tapes. The problem is, of course, that tape loading is noisy and slow, however the Tronics salesmen could not carry full PE boxes for obvious reasons (nor did they try to sell them for the most part) - so diskette loading was not a good idea, I guess.

If sales were good (I have no statistics on that!) it would have made sense to use demo cartridges instead of tapes. I have recently discovered the closest such thing. A Scott Foresman "Space Journey" cartridge I have seen was housed in a cartridge black plastic shell (All the other of Scott Foresman's own cartridges I know of are in white shells) with a TI serial number 65544094 ATA0483. This is unusual at best, as none of those SF cartridges had serial numbers. And, to add to the above, the title label is printed in red rather than the usual blue. How is this related to Tronics? Well, the SF title label was placed on top of an older label, and the latter is clearly printed "Tronics".

My own guess is that TI did, at some point, produce Tronics cartridges. Whether or not they were ever used is another question, but the existence of a cartridge with a label and serial number means that they probably existed.

I am also not sure why these shells were used by SF. It is well known that TI had a large surplus of cartridge parts, including unused shells, when the Lubbock plant was shut down. Perhaps certain circumstances made it necessary to use older shells, or they were recycled before the decision was made to shut down the Home Computer project. Or perhaps there never was a finished Tronics cartridge. **DONE**

FOR SALE

Joseph Cohen offers the following, an excellent price for a backup system. Phone him at 804-293-8973 if interested.

PE box with disk drive, TI controller, memory expansion, flex cable, DM2 cartridge, manuals, ready to use for $80.

RS232 card $45.

Parallel and/or serial printer cables $5 each with RS232 card purchase.

TI Extended Basic with manual, $10. **DONE**

VIDEO TAPES OF THE 1993 LIMA MUG CONFERENCE

Because of technical goof ups we managed to not video tape many of the seminars. The following material, 7+ hours of viewing, IS available to any user group and to any individual who is a member of the Lima User Group. To obtain these videos send $10 OR send TWO video tapes and $2.50 to the Lima User Group at P.O. Box 647, Venedocia OH 45894.

TI MULTI USER GROUP CONFERENCE
Lima Ohio----May 15 1993
TAPE #1   5.5 hours of viewing

```
TAPE COUNTER/SPEAKER/TITLE
```

100/Don O'Neil/DigiPort demo and a discussion of the SCSI card

1315/Mike Maksimik/Demo of software for the SCSI card, MIDI MASTER 99 demo, a tower case for the 99/4A and Geneve

2390/User Group Officers' meeting to discuss issue of common interest.

3235/Chris Bodenmiller/The current and future of game programming for the TI, with XB and TML programming techniques based on his commercial games.

3950/Ken Gilliland/Products of Notung Software including demos of DISK OF THE ANCIENT ONES and Ken's book HOW TO USE THE PRINTER'S APPRENTICE

4290/Charles Good/The newly released FUNNELWEB v5 40 column text editor.

4900/Rick Kellogg/Our roving reporter with videos of the exhibits and interviews with people in the exhibit area.

5275/Lima WLIO-TV 35/Coverage of the conference on the 11PM news.

TI MULTI USER GROUP CONFERENCE
Lima Ohio--------May 15 1993
TAPE #2   TWO hours of viewing

```
TAPE COUNTER/SPEAKER/TOPIC
```

35/Tony Delekto/Tutorial on use of Asgard's development software to create applications for the ASGARD MEMORY SYSTEM card.

ALL PARTS OF THIS TAPE AFTER COUNTER 3290 HAVE NO SOUND.

3290/Art Gibson/Demo of FIRST DRAFT V2

3925/Bruce Harrison/Demo of THE ULTIMATE "ACCEPT AT" and THE HARRISON WORD PROCESSOR.

4270/Gary Bowser/Demo of O.P.A. POP CART with lots of software on one cartridge, including RICH GKXB and GRAPHIC EDITOR v5. Also a demo of RAMOS, an operating system for Horizon ramdisks. **DONE**

LIFE WITHOUT THE NEXUS, or
HOW TO USE A CGP-115 4-COLOR PLOTTER ON THE TI-99/4A
by Joseph Cohen
Lima Ohio User Group

We have heard many times about those wonderful things we COULD HAVE done with our TI-99/4A IF only we had the hex-bus interface, that little item listed, I believe, for about $60 by TI in late 1983. With it you could attach -and use- the hexbus peripherals to your TI-99/4A. (Ed. note: For a complete description of the hex-bus interface see the April 1993 issue of BB&P, the Lima newsletter.)

It so happened that the hex/bus interface was never marketed after all, and only a handfull of units are in existence mostly as collectors' items. Certainly that does not encourage any of the regular TI-99/4A users. On the other hand, some of the hexbus peripherals themselves were released and marketed for the CC-40. Reviews of most of these peripherals have been published by Charles Good in Bits Bytes and Pixels (BB&P) - the Lima Ohio User Group newsletter. (Ed. note: Anyone can obtain the complete set of articles in DV80 format by sending two DSSD disks and a paid return mailer to P.O. Box 647, Venedocia OH 45894.)

Well, all is not lost. For one thing, some of these peripherals are mostly of historic value. The wafertape drive, for example, was fine as an inexpensive alternative to a disk drive. Back in 1983, when disk drives were very expensive, this was important. However nowadays, with prices of expansion boxes heading down, it is no longer necessary. As an aside, it is interesting to note that the Adam computer (another orphan, with a TI video chip!) originally came out with a wafertape drive. It is my understanding that practically all serious users have upgraded to real disk drives. There were also wafertape drives designed and sold for the Radio Shack TRS-80 and the Commodore Vic-20 (ok, ok, the computer wars are over since 1983!) and C-64; they never got too popular, to say the least.

A really handy and useful hexbus peripheral was the 4-color pen printer/plotter HX1100, reviewed in the October 1983 issue of 99'er Home Computer Magazine and more recently in the January 1991 issue of BB&P (Volume 7, number 1). This little device was capable of both text and graphics modes. In the text mode it would write in 40 (regular size) or 80-(tiny letters characters per line. In the Graphic mode it could plot in four colors using little pens. It was fully programmable from BASIC and capable of plotting mathematical equations including the axes and using different line types (solid, dashed, dotted, etc.), business graphs (pie charts etc.) in color, 3-dimensional drawings, and much more. Text in the graphics mode could be in ANY size and in ANY direction (e.G., sideways, upside down, and so on) so it could be usefull for preparing little posters and name tags, among other things. Pen color was fully controlled and could be changed at any stage during the program.

Sounds like a big loss, doesn't it? Well, all is not lost! Atari was marketing a very similar device, called the 1020 printer/plotter, for their line of 8-bit computers. I understand that those are readily available in practically unlimited quantities from atari 8-bit dealers, but they use the special Atari interface that is difficult, if not impossible, to adapt to the TI. However, if anybody knows how to do this, here is the information on the availability of such units. For the rest of us, though, there is a better solution - the Radio Shack TRS-80 CGP-115 printer plotter.

The CGP-115 was described in the April 1985 issue of Mini-Mag 99, a short lived TI-99/4A related publication. the article contains a detailed description of hooking it up to the TI-99/4A and numerous short TI BASIC programs that produce amazing results on the printer plotter. More examples are given in the radio Shack manual. If you try to run those programs on your regular printer, you will only get lines full of ASCII characters, but the CGP-115 has built in graphic commands that respond to these programs. As a result, very simple and short BASIC programs will produce beautiful plots. (Some sample plots are shown with this article.)

The CGP 115 ROM contains, among other things, the following commands: (i) establish the origin and send the pen to this origin at any time; (ii) move the pen, with or without drawing, between specified points; (iii) move the pen, with or without drawing, from the established origin to any desired point on the paper; (iv) choose between the four pen colors; (v) select any of 16(!) line types; (vi) write text in graphics mode from 1/16 of an inch high characters up to 4 inch ones in 64 steps between these sizes; (vii) select text printing direction in graphics mode; (viii) shift freely between text and graphics modes.

In text mode the CGP-115 produces superb 40 or 80 characters per line letter quality output, in any of the four colors, at 12 cps. Since the paper is about 3.8 inch wide, the 80 character per line text is written in very small letters. however they are perfectly readable. The drawing resolution is 0.2 mm/step, and the results are really outstanding. The graphics mode produces high-quality plots of equations, all kinds of geometric shapes, pie charts, business graphs, and your own designs! The plotter is small and compact. The effective plotting range is 3.8 inch wide (fortunately this is larger then the HX1000 paper!), and the weight, without paper pens and the power transformer, is 1.76 lbs. The device is highly mechanical: drawing involves pen movement, pen holder rotation to change colors, and a lot of paper movement in and out of he plotter to achieve lines in the y-direction (the pens move along the x-direction, while the paper moves along the y-direction).

The CGP-115 interfaces directly with the TI-99/4A. I have not seen the hexbus printer/plotter, but it seems that apart from the interface, the only diference between this and the HX1000 unit is the power supply and paper size (the CGP-115 uses wider paper). The Hex-bus unit was powered through a rechargable battery, and according to the BB&P article this is actually a disadvantage. The Radio Shack unit is powered through a DC transformer (you might be able to build your own battery holder and power it this way if you like). The interface is somewhat of a problem though.

The CGP-115 has two interfaces. The parallel 8-bit interface uses BUSY handshaking, STROBE, and AACKNOWLEDGE, and it is suitable for use from the TI-99/4A PIO output from the RS232 PEBox card. However, like all other Radio shack, Okidata and a couple of other printer models, this interface requires the so-called Okidata parallel printer cable to operate (this cable corrects som timing problems in the 99/4A PIO). What this means is that, if you are using a printer that does not require the Okidata cable (and most printers fall under this category; e.g. Epson, Panasonic, Star/gemini), you will need another cable. (Ed. note: The "Okidata" parallel printer cable for the TI RS232 card is inexpensively available from Competition Computer; 800-466-8902.) I suggest the CGP-115's serial interface. If the parallel interface is your choice, you can still use it

and leave your regular printer attached if you have in your PEBox a second RS232 card (i.e., PIO/2) with the Okidata cable. It is also possible that that more standard 3rd party parallel outputs will work better, and this is left for the user to check. another attractive possibility is to use a serial-to-parallel converter. These small devices will ake a serial output and convert it to parallel. they are attractive because every RS232 card has two built in serial outputs, and unless you have got a modem or a serial printer, you are not using any of them! Also, the converter usually has a printer buffer built into it, and this is helpful as the CGP-115 (and any plotter) is rather slow and unless you have a buffer you will have to wait while it is plotting. The serial-to-parallel converter/buffer would usually accept inputs at very high speeds (up to the maximum of your RS232 output, 9600 bps) into its RAM, and your computer will be free very quickly. It is also handy when you need multiple copies of the same plot. Incidentally, such a device is also useful with cartridges that only print to the serial prot (RS232) when your printer has a parallel interface.

Perhaps most users who will try using this plotter will end up hooking it up through its serial port. The Radio Shack TRS-80 serial port uses a round, 4-pin DIN serial connector with DATA and BUSY signals. The CGP-115 operates at 600 baud, 7-bit character, no parity, 2 stop bits. there

NEXT COLUMN

is no problem with this slow baud rate, since the unit itself is rather slow, and TI BASIC is even slower. as pointed out in the Mini-Mag 99 article, the required connections to he TI-99/4A RS232/1 port are:
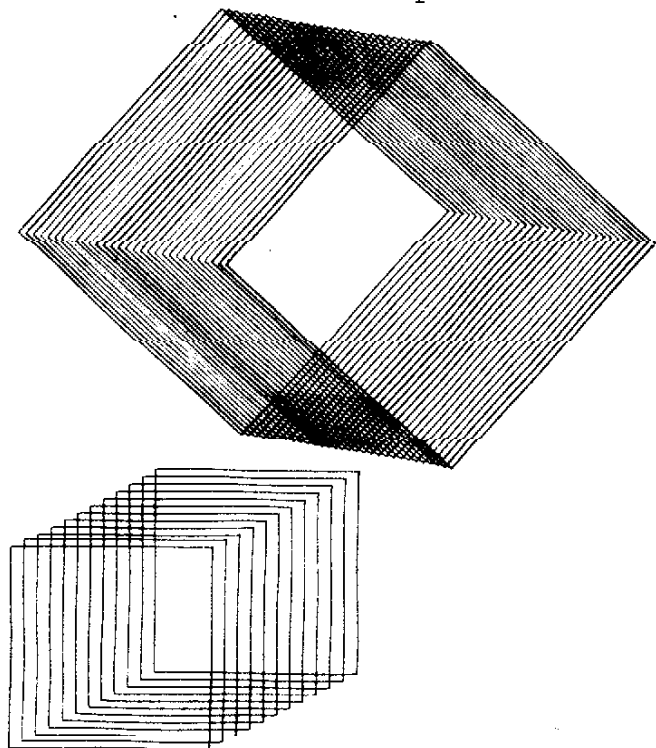
```
CGP-115 male DIN PLUG    TI99/4A male DB25 plug
PIN 1-----------------------> No connection
Pin 2-----------------------> Pin 20
Pin 3-----------------------> Pins 1 and 7
Pin 4-----------------------> Pin 3
```

The CGP-115 can now be OPENed as RS232/n.BA=600 where n=1,2,3, or 4 depending on your system configuration.

Don't rush out to the nearest Radio Shack to but this unit, as the TRS-80 line has long been discontinued and you won't find it there. If, however, you are lucky enough to find a used one, Radio Shack still sells the paper and pens for it.

I am grateful to Charles Good for showing me his copy of Mini-Mag 99, where I have found all about this device. If anybody out there has a copy of th second part of the article, I'd like very much to see it! I would appreciate any help on this. and finally, if you proceed to hook up this device to your RS232 card, you are doing so at your own risk! I take no responsibility for any of the consequences, good or bad!

```
*****************************
*    BITS, BYTES & PIXELS    *
*    Published by Lima OH     *
*       99/4A User Group      *
* Material contained herein  *
* may be copied by any user  *
* group as  long as  credit  *
* is given.  DV80 files of   *
* most articles in BB&P can  *
* be obtained by sending  a  *
* disk and return postage.   *
*                             *
* ADDRESS-  P.O. Box 647      *
*           Venedocia Ohio    *
*           45894             *
* Published monthly except   *
*      July and August        *
* -------------------------   *
*      GROUP OFFICERS         *
* President-Andy Frueh        *
* Vice Pres-Peter Harklau     *
*            419-234-8392     *
* Treasurer-Leonard Cummings  *
*            419-738-3770     *
* Newsletter editor and       *
*    Librarian-Charles Good   *
*            419-667-3131     *
*****************************
```

Below, and on the next page are diagrams and the programs used to create these diagrams using a TI99/4A to control a CGP-115 printer.

```
10 REM  WRITING SIDEWAYS
20 OPEN #1:"PIO"
25 PRINT #1:CHR$(18)
26 REM  ALLOW LEFT MARGIN:
27 PRINT #1:"M50,0"
30 INPUT "TYPE YOUR NAME:   ":N$
31 INPUT "ENTER SIZE (0-63);   ":SIZE
33 PRINT #1:"S";SIZE
40 PRINT #1:"P";N$
45 REM  CHANGE DIRECTION
50 PRINT #1:"Q1"
60 PRINT #1:"P";N$
70 REM  NOW UPSIDE DOWN
75 PRINT #1:"Q2"
80 PRINT #1:"P";N$
80 REM  CHANGE DIRECTION AGAIN
95 PRINT #1:"Q3"
100 PRINT #1:"P";N$
105 REM  R-X (LINE 270) CONTROLS TIGHTNES; LOW X FOR A MORE CLOSELY WOUN
L; HIGH X FOR A LOOSER ONE.
110 CALL CLEAR
130 PRINT #1:"Q0"
140 PRINT #1:"A"
310 CLOSE #1
```
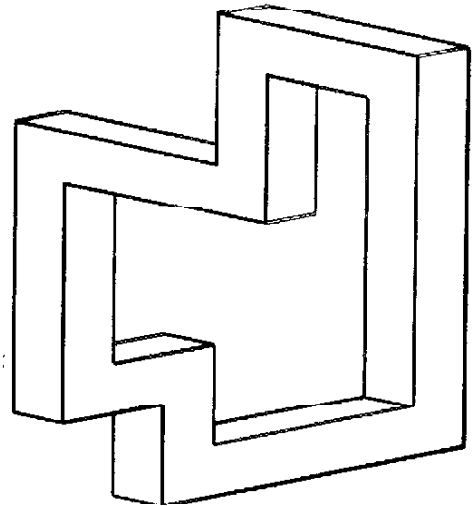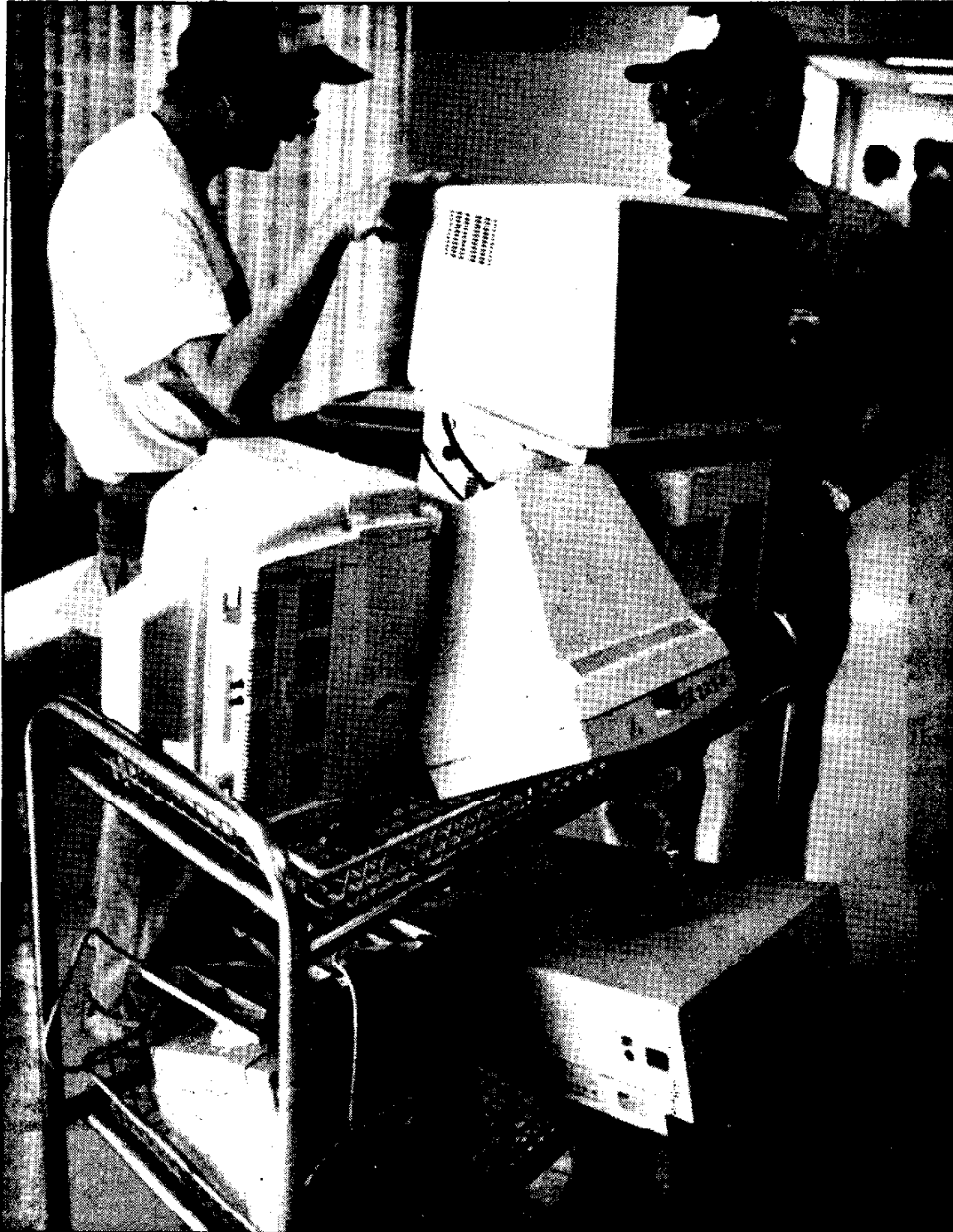


```
100 REM  ESCHER DRAWING
110 DIM X(50),Y(50)
120 FOR N-1 TO 50
122 READ X(N),Y(N)
125 NEXT N
130 CALL CLEAR
132 OPEN #1:"PIO"
135 PRINT #1:CHR$(18):"C0":"M5,-500":"I"
140 FOR Q=1 TO 2
142 FOR N=1 TO 50
145 PRINT #1:"D";X(N);",";Y(N)
147 NEXT N
148 PRINT #1:"H":"R2,-2":"I"
149 NEXT Q
150 PRINT #1:"HM0,-200":"A"
152 CLOSE #1
155 END
160 DATA 0,290,200,250,200,270,50,300,0,
290,200,250,200,400
170 DATA 400,360,450,370,250,410,200,400
,400,360,400,10,350,20
180 DATA 200,-10,200,-30,400,10,350,20,3
50,320,250,340,250,190
190 DATA 300,200,300,330,250,340,250,190
,50,230,50,-10,0,0
200 DATA 50,-10,150,10,150,-90,100,-80,1
00,0,150,10,150,-90
210 DATA 450,-30,450,370,450,-30,150,-90
,150,10,50,-10,50,230
220 DATA 100,220,100,50,200,70,150,80,10
0,70,100,50,200,70,200,-30
```



```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
HIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmno
pqrstuvwxyz(|)~▨
```

Bits, Bytes & Pixels

Sunday, May 16, 1993   The Lima News

News photo by Denise Hunter

Charles Good (left) talks with Tony Zlotorzynski of Steger, Ill., as Zlotorzynski carts a load of unsold equipment out of the computer show Saturday at OSU-Lima.