

BITS, BYTES & PIXELS

LIMA 99/4A USERS GROUP



AUGUST/SEPTEMBER 1990 Volume 6, #7

VIDEO TAPES AVAILABLE TO MEMBERS OF THE LIMA UG:

In addition to the 3 tape/16 hour set of the 1990 MUG conference presentations, we have the following available to members in VHS format. Out of area members can obtain copies by sending one VHS tape and \$1 return postage OR \$5 for each tape desired. The following are available, all relating to the T199/4A or Geneve:

---Regular monthly meetings of the Lima UG are videotaped using a VCR (without a video camera) hooked directly to the computer with a microphone for voice recording. You can SEE the demos presented at each meeting as they appear on screen and HEAR the discussions and comments of those at the meeting. The tape continues to run for the entire meeting to record discussions. It is the next best thing to being there, and we have several standing orders from our out of area members. Each meeting uses 1.5-2 hours of tape time and requires a separate tape.

---Formal presentations at the 1988 Lima MUG Conference, 1 tape, run time about 5.5 hours. Presentation titles include PLUS! (Jack Sughrue), HORIZON RANDISK (Bud Mills), HOME CONTROL 99 (software demo by Paul Wheeler), A BLIND PERSON USING THE TI (by Irwin Hott), NUTS BOLTS (shown by Mr. Tigercub himself, Jim Peterson), GENE III (genealogy software shown by Dick Berry), OUTPUT TO A VCR (by John Perkins), FUNNELWEB v4.10 (shown by Charles Good), DSKU v4.12 (shown by Charles Good), and 1000 WUKUS (TI Artist - to DV80, by Norman Rokke).

---Formal presentations at the 1989 Lima MUG Conference, 2 tapes, run time about 11 hours. Speakers and their topics include: Barry Traver- contents of GENIAL TRAVELER, volume 2 number 4; Barry Traver- Linking XB to assembly language via CALL LINK; Chris Bobbitt- Recent and future releases from ASGARD SOFTWARE; Bud Mills- The latest information on HORIZON RANDISKS and P-GRAM cards; Andy Frueh- (member Lima UG), music programming on the 99/4A; Ron Markus- (Rancharge Computers) the DIJIT AVPC 80 column card; Charles Good- New 80 column FUNNELWEB quick directory, and FUNNELWEB's 80 column text editor; Jim Horn- Services on COMPUSEVE and other selected topics; Martin Smoley (Northcoast 99ers), TI BASE tutorial; Paul Scheidewantle- (P&A software), converting from one "artist" format to another and other "artist" tips and tricks; Steve Karasek- (St. Louis 99ers), SUPERBASIC v2.0; Irwin Hott- (C.O.N.N.I.), how the blind use speech; Karl Romstedt- (C.O.N.N.I.), PANDRAMA, a new artist program; Milo Tsukroff- (Nutmeg 99ers), MX-DOS v3.0 an icon/joystick based program loader with disk management features.

---A Public Broadcasting NOVA show shown a few years ago about the LOGO programming language. One tape, run time

approximately 1 hour. T199/4A computers are featured prominently in this video.

---The 1989 Chicago TI Faire, interviews with the major vendors and participants at this event. The video was made by Bill Saner of the Bradenton FL user group and was done mostly in the main exhibit room. Run time approximately 1.5 hours.

---BILL KNECHT memorial. Some of Bill's religious music XB software adapted to video by Bill Saner. Run time approximately 1 hour.

---NEVER RELEASED SOFTWARE AND XMI TUTORIAL. The "never released official TI software" described in a recent series of articles in BB&P is shown. Some of this software is really first rate, and unless you have a Gram device you will never be able to run the software even though it is in the Lima UG disk library. This video by Charles Good is the only way you can see "what might have been." The end of the video includes a tutorial on how to use the HARDCOPY part of XMI to print MYART pictures. Even those without 80 column systems can use HARDCOPY. Run time 3.5 hours.

---FUNNELWEB v4.20 CONFIGURATION and new features. This video by Charles Good was favorably reviewed in Micropendium. If you have trouble configuring FWB v4.2x or v4.3x this video will probably help. The configuration process is walked through step by step. The major features of the 80 column part of Funnelweb are also demonstrated, so those of you without 80 column systems can see what you are missing. Run time 1.75 hours.

---GENEVE AND 80 COLUMN SPECIFIC SOFTWARE done by Don Alexander of the Macon GA user group. You can see the speed of the Geneve coupled with a hard drive. Some spectacular graphics are included. Software briefly demonstrated includes PICASSO, FUNNELWEB 80 columns, TELCO v2.3, SECTOR ONE, Myarc Disk Manager 5, MYWORD, MYART, Hypercopy, and other nice stuff. Run time 2 hours.

---MULTIPLAN BEGINNER'S TUTORIAL. Made by Bob Wozniak and Dick Gerondale, who are the Green Bay WI subgroup of the Lima OH UG, this video shows the basics of how to use Microsoft Multiplan. If you are confused by the instruction book, or have never used Multiplan before then this video may be for you. Run time about 1.5 hours.

---BEGINNER'S GUIDE TO THE T199/4A by Bill Saner. Introduction to the 99/4A console, its various ports, its keyboard, and its basic peripherals. This video includes demonstrations of some nice "demonstration" XB software.

DONE

T.I.'S "COMPACT COMPUTER 40" AND IMPORTANT PERIPHERALS ARE ALIVE AND WELL

by Charles Good
Lima Ohio User Group

The CC40 was, in early 1983, T.I.'s first and maybe only entry into the laptop computer market. It is battery powered. Anything entered into the CC40's RAM stays there even after the computer is turned off. Four alkaline AA cells are said to provide enough power for 200 hours of operation and many more hours of "computer off" time. The CC40 can also be powered with an AC adapter. I had long assumed that the CC40 was abandoned by T.I. a few months after its introduction, even before BLACK FRIDAY, and that the CC40 and its Hex Bus peripherals were no longer available except sometimes as used items. I also was under the impression that since T.I. never sold the promised WAFERTAPE DIGITAL DRIVE, there was no way to save data or programs typed into the CC40 onto permanent magnetic media such as a disk or cassette tape. After watching Gary Taylor's CC40 presentation at the recent 1990 Lima MUG Conference I discovered how wrong I was! The CC40 is no longer available directly from T.I., but you get one NEW from L.L. Conner Enterprise. Important HEX BUS peripherals and useful CC40 software are available NEW directly from T.I. and from various dealers.

When it was introduced in 1983 the CC40 had a list price of \$250. I recently paid \$95 for my new CC40. For an extra \$25 I had dealer installation by L.L. Conner Enterprise of the necessary chips to bring the CC40's internal RAM to the maximum 18K, up from the 6K RAM that the CC40 normally comes with. This extra memory increases the CC40's internal buffer capacity to around five text pages (up from one text page) when using the MEMO PROCESSOR word processing software cartridge. Although T.I. never released it's WAFERTAPE DRIVE, it turns out that MECHATRONIC made a small "QUICK DISK" disk drive for the CC40. MECHATRONIC is no longer in business, but you can still buy one of these drives NEW, with a dealer warranty, for \$110 from T.A.P.E. of Ontario California. No controller cards or other hardware are needed to hook this small drive directly to the CC40. The original printing device made by T.I. for the CC40 prints on rolls of adding machine paper. This HEX BUS PRINTER PLOTTER prints in 4 colors and two font sizes. Its main limitation is the width of the paper it uses. This device is still available new from dealers. What I didn't know before Gary Taylor's presentation was that T.I. also made a battery (or AC adapter) powered 80 column HEX BUS printer called the "PRINTER 80". This printer uses small ribbon cartridges to print on ordinary 8.5 inch wide typing paper or can print on rolls of 8.5 inch wide FAX paper without the ribbon cartridge. T.I. will be glad to sell you one of these printers NEW for \$70. That's right folks, a new 80 column printer for only \$70! ~~What you are reading now has been printed on a PRINTER 80.~~ As with the MECHATRONIC disk drive,

no additional hardware is needed to connect this printer directly to the CC40 and print documents. No, you can't easily use this inexpensive printer with the 99/4A. The MEMO PROCESSOR word processing cartridge is still available new directly from T.I. for \$20. Thus, for \$320 + tax and shipping (since T.I. is registered to conduct business in most states, T.I. will charge you local sales tax even if you purchase T.I. products mail order from Texas) you can purchase a small, complete, portable (capable of battery operation except for the disk drive), word processing and printing package that includes a very powerful computer. The portability of such a system is illustrated by the fact that I am typing part of this article with the CC40 sitting in my lap while on an overnight Cub Scout camping trip with my 9 year old son.

Why am I writing this article for publication in a newsletter devoted to the T.I. 99/4A home computer? The CC40 uses a different microprocessor than the 99/4A, with a different assembly language instruction set. However the editor assembler manual of the CC40 describes how to convert CC40 assembly code so that it can be understood by the 99/4A microprocessor, and T.I. once made a hardware device that does just that! If I had the rare and never officially released 99/4A HEX BUS INTERFACE, I could load this article or any CC40 program or file from my CC40 into my 99/4A for display on a monitor and processing with Funnelweb or T.I. Extended Basic. The back of the box that contained my gray plastic 99/4A has a nice picture of this HEX BUS INTERFACE connected to a 99/4A console. Don't I wish! If anyone reading this article has one of these interfaces they are willing to sell me, PLEASE let me know. In this series of articles I will first describe the CC40 and then go on to describe the 80 column printer, the MECHATRONIC "QUICK DISK" drive, the printer plotter, the wafertape drive, and word processing using MEMO PROCESSOR, all of which I own.

The CC40 measures about 9x6x1 inches, the size of a small textbook. It uses a 2.5MHz TMS70C20 8-bit processor and has 34K of ROM and 6K (expandable to 18K internally) CMOS RAM. The RAM can be expanded beyond 18K up to 34K with a plug in 16K memory expansion cartridge. The ROM includes a very powerful "Enhanced Basic" which is quite similar to TI Extended Basic for the 99/4A. Both upper and true lower case letters (not just small upper case letters) are provided. Error and system messages can be displayed in either English or German.

I have no idea what the "40" in CC40 refers to, certainly not the CC40's display. The LCD display shows 31 characters of a single 80 character line. You can scroll or window left/right to view the entire line. Four dedicated cursor keys allow you to scroll up/down to view other lines or left/right within a line of text or program code. The LCD display includes special indicators for such things as low battery, the status of the shift function and control keys,

upper case lock, and special math functions. Some LCD display indicators are user programmable. A control on the left side of the CC40 regulates the contrast (intensity) of the LCD display.

The CC40's keyboard consists of chicklet keys. Alpha numeric keys are arranged in a 44 key qwerty typewriter layout with number keys on the top row, looking very similar to the 99/4A key arrangement. No, you can't easily touch type. The alpha keys are just too close together. One finger pecking is the usual method of laptop data entry while holding the CC40 steady with your other hand. It is usually not ever necessary to press two keys at once. For those features such as one time capital letters that require the use of the SPACE, FN (function), or CTL (control) keys, you press the special key first and an indicator on the LCD display turns on. You then press the second key (for instance SHIFT and then D to display an upper case "D", or FN and then ~ for insert), and the special LCD display indicator turns off. A separate numeric keypad is to the right of the qwerty alphanumeric keys. The number keys on the top row of the qwerty layout are duplicated in this keypad. Special keys are included for cursor movement (4 dedicated keys), BREAK, RUN, ON, OFF, and reset.

The BASIC that comes as standard equipment on the CC40 closely resembles T.I. Extended Basic, but lacks most of the T.I.'s graphic, color, and sound features. There are no sprites and only one kind of programmable BEEP. Multi line statements up to 80 characters in length are supported, as are user defined subprograms with variables independent of the main program. Seven, and only seven characters (ASCII 0-6), can be user defined with CALL CHAR on a 5x8 pixel grid. CALL's relating to assembly code include POKE, LOAD (an assembly subprogram from an external device), PEEK, and EXEC (starts an assembly language program). Two dimensional arrays are supported.

Typing BASIC code into the CC40 is made easier with automatic line numbers (NUM) as in TI extended basic. DELETE will delete one line number or a specified group of line numbers from the middle of a BASIC program. You can type the words for BASIC functions and commands with the alpha keys one letter at a time. Many BASIC commands and functions can also be displayed on screen by pressing only 1 or 2 keys. A plastic keyboard overlay that comes with the CC40 shows these special keypresses, most of which involve pressing the CTL or FN key followed by another key.

A particularly powerful feature you can access from command mode or from a running BASIC program is CALL DEBUG, which brings up a built in assembly language monitor and memory manager. This is designed to be used with the CC40's Editor Assembler Module, but can be used by itself. When in the DEBUG monitor you can display, modify, or copy any memory in hex. You can also change the microprocessor's program counter, stack pointer, and status register. You can set

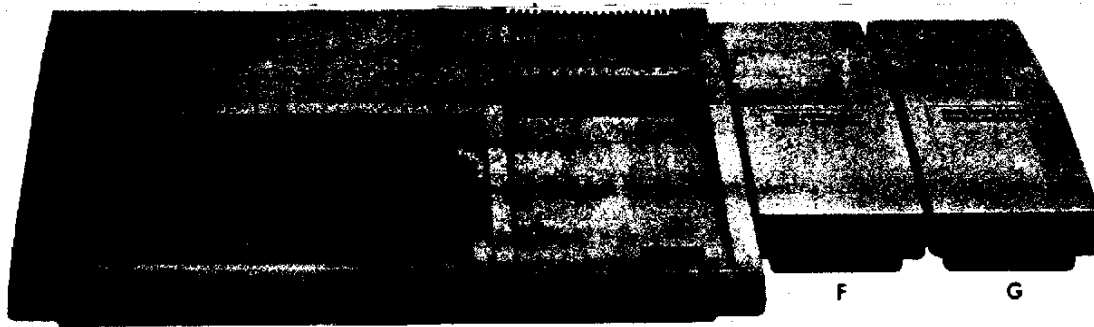
break points, single step through assembly code, start execution at a given address, and control paging in and out of system ROM and cartridge ROM. DEBUG is very powerful, and it is built into the CC40 for use whenever needed.

User defined hot keys can be set up, and remain in battery backed memory even after the CC40 is turned off. FN + 1-9 are the potential hot keys. These can, for example, be set up for commonly entered BASIC code, number sequences used in math calculations, or short text memos such as names and addresses.

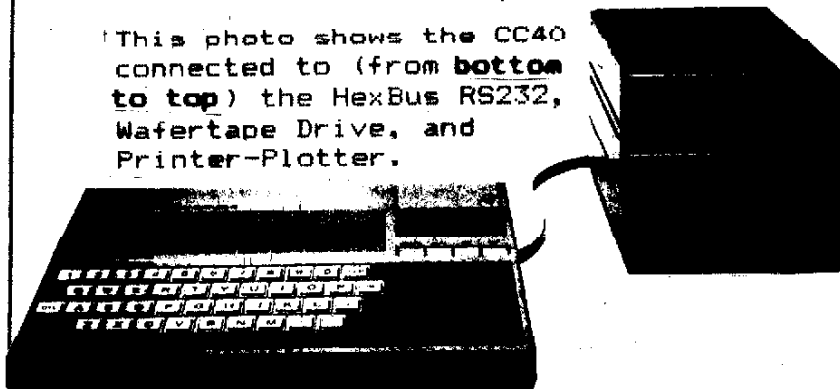
You can use the CC40 as a scientific calculator by typing in your calculations directly rather than writing a BASIC program to do the calculations. The separate numeric keypad makes data entry easy. You can type in a string of calculations up to 80 characters long, press (enter) to display the answer, and then use the displayed answer as the starting point for more calculations. Or, when an answer is displayed you can press PLAYBACK (FN/up arrow) to redisplay the calculation that gave the answer. Calculation accuracy is 13 significant figures, with 10 significant figures usually showing on the CC40's display. Scientific notation is supported, allowing the CC40 to deal with numbers as small as +/-1E-128 or as large as +/-9.999999999999999E+127. PI, SQRT, any other power or root, log (base 10, and base E), sine, cosine, tangent, arcsine, arccosine, and arctangent are all supported with special keypresses. Angles are calculated in either degrees, radians, or grads. A special indicator on the LCD display (DEG, RAD, or GRAD) shows which kind of angle is in effect. RAD is the powerup default. You could easily spend \$30 for a hand held scientific calculator, and you would still not have a 31 column display or a scrolling 80 column data field. For a few more dollars you can have a new CC40, which is a real programmable computer and not just a calculator.

A modern product, almost the same physical size as the CC40, is described in the June 1990 issue of CONSUMER REPORTS. The ATARI PORTFOLIO computer has 128K RAM, built in word processing, spreadsheet, and address book software, and can be used as a sophisticated calculator. Unlike the CC40, the PORTFOLIO is not user programmable in BASIC. It only runs its built in software. The display shows eight 40 column lines. Batteries are good for only 39 hours of powerup time. Commenting on the typewriter like keyboard with no numeric keypad, CU says: "Touch typists will be reduced to hunt and peck- good enough for spreadsheets perhaps, but not for writing anything longer than a note." Price? -\$400 plus \$50 for a printer interface. It seems to me that the much cheaper CC40 is in most respects comparable to or better than the ATARI computer. CU recommends a regular laptop computer over the ATARI PORTFOLIO. CU says, "we've seen some advertised for less than \$600." Comparing price and features makes the CC40 look like a good bargain.

The photograph immediately below is reproduced from a box that contained a gray console. The box says "copyright 1983". "F" is a cosmetically redesigned speech synthesizer. "G" is the never released HexBus interface that allows 99/4A's to use (OLD, SAVE, PRINT#, etc.) all the HexBus peripherals.



This photo shows the CC40 connected to (from bottom to top) the HexBus RS232, Wafertape Drive, and Printer-Plotter.



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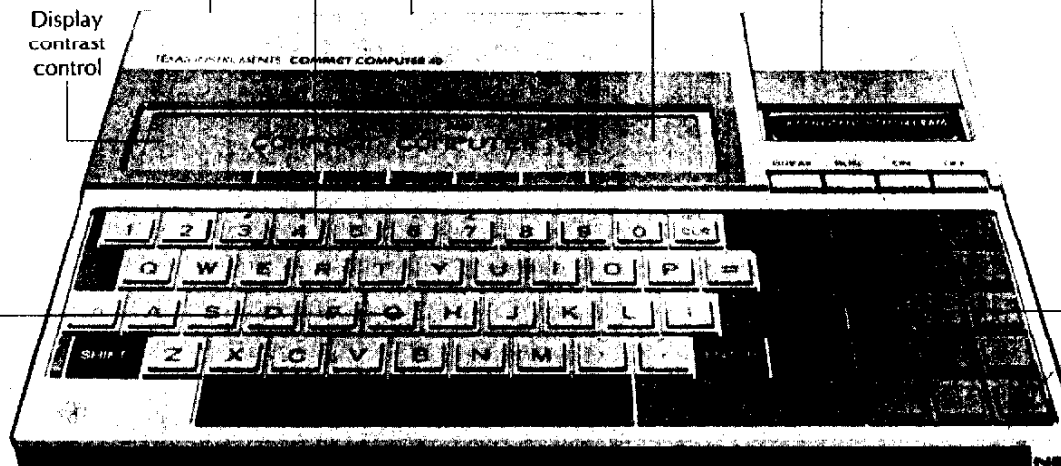
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Sources of hardware and software: Phone first to check shipping charges and product availability.

L.L. Conner Enterprise
1521 Ferry St. Lafayette Indiana 47904
Phone 317-742-8146

A source of new and used CC40s, Hex Bus peripherals, and cartridge software. They will upgrade CC40s from 6K up to 18K of internal RAM.

T.A.P.E.
1439 Solano Place, Ontario California 91764, U.S.A.
Phone 714-989-9906

This is the only source for new MECHATRONICS disk drives for the CC40. This device is the only readily available mass storage device for the CC40.

T.I. Accessory Department
P.O. Box 53, Lubbock Texas, 79408.
Phone 806-747-1882

You should probably phone before ordering in order to get the correct part number. T.I. accepts credit card orders over this phone line. The following are available new for the CC40:

AC adapter, model AC9401, output 6V, 1A. \$18.95. This can be used to power the CC40 or most of the other the Hex Bus peripherals including the MECHATRONICS drive and the PRINTER 80.

Book: LEARN BASIC: A GUIDE TO PROGRAMMING THE TEXAS INSTRUMENTS COMPACT COMPUTER. This is for beginners. The CC40 comes with an extensive user's guide that explains the CC40's BASIC. Price \$10.

16K RAM expansion- \$40. This cartridge contains RAM that can be added to the CC40's internal RAM to provide up to 32K total RAM.

8K constant RAM- \$30. This battery backed cartridge is sort of like the 99/4A's MINI MEMORY in that you can save programs or data to this cartridge and then remove the cartridge from the CC40. It is an alternative to a mass storage device.

PRINTER 80 full width Hex Bus printer- \$70

Pascal cartridge- \$20. Comes with extensive documentation.

MEMO PROCESSOR word processing- terminal emulator cartridge- \$20.

FINANCE software cartridge- \$20

ADVANCED ELECTRICAL ENGINEERING software cartridge- \$20

STATISTICS software cartridge- \$20

MATH software cartridge- \$20

GAMES 1 software cartridge- \$20

Jim Leshar
722 Huntley
Dallas TX 75214
214-821-9274

A nice selection of used CC40s, HexBus peripherals, and rare documentation.

DONE

LETTER TO THE EDITOR AND A SIGN OF THE TIMES

Dear Charles,

I am still an active member of the TICOFF committee and was much interested in your comments on the number of attendees at Lima. TICOFF had an audited (by the state of NJ) 925 PAID admissions thru the door in 1989. That year we figured we had about 425 to 450 present for the 99/4A/9640 and the balance for IBM compatible part of the fair (vendors and seminars).

At TICOFF 1990 we were substantially off to 700 paid - but of the 225 attendees lost, almost all were on the TI side of the fair. So you can see Lima did O.K. to have 250 at an all TI event. You, obviously, pulled better than New England. The rumors I heard from the Boston fair were that the attendance was not even 100!! The BCS used to have more than that as dues paying members of its TI section alone, so you can see local Boston area attendance must have been very poor.

TICOFF '91 will still support the 9640 99/4a -but- if the owners do not support TICOFF, it will be the last TICOFF for 99/9640.

Also, TICOFF '90 missed several key 99/4A vendors including Chris Bobbitt. It was quite a disappointment - because after the '89 TICOFF, when we felt we pulled the largest TI99/Geneve gate in the nation and probably the world in that year, (We certainly had more than Chicago did in Nov. of the same year.) we thought we would have almost all the major vendors for our '90 faire. Without a couple of the best innovative vendors, there was less reason for 99'ers to attend. With less attendees it will be harder to get vendors in the future. Catch 22 ???

I often thought about the fact that, in the NJ/NY metro area, over 500000 99/4A consoles were sold. Yet at our best we only pulled 450 99'ers.

The plain truth is that the number of TI users is steadily dwindling. The directors for TICOFF are pretty much resolved that if TICOFF '91 does not pull close to 200 for the TI side, '92 will be strictly for current mainstream IBM and MAC computers. My personal opinion is that we probably will not even get 100 TI and Geneve owners in '91! That's not too cheerful. I sincerely hope I am wrong and TICOFF '91 pulls a big group of 99'ers.

Another "downer" is that when we started we had lots of adult assistance from some six TI computer clubs. In '90 it was three men, including myself, from 2 clubs. The lack of adult help [Editor's note: TICOFF raises money for a high school scholarship fund. Lots of students help with TICOFF.] for supervision made things frantic for those few of us who inherited the work. For '91 we will make a concerted effort

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to get people from the MS DOS clubs because the 99'ers who were willing to work seem to have evaporated. One New Jersey 99'er club that once boasted over 75 members was described to me in March of this year as consisting of "only about six or seven old men, mostly retired."

On the bright side, I look at all the money we raised for student scholarships. Our first year it was only \$500. In the next four we raised \$2000, \$3000, \$4000, and \$3000 for a total of \$12500. The school told us that before our computer fair, an all day event such as a book or cake sale was considered very successful if it netted \$300!

Arthur J. Byers
1261 Williams Dr.
Shrub Oak NY 10588

DONE

NO MYSTERY ABOUT 32767
by Alexander Hulpke

(BB&P editor's note: This article is a response to "The Mystery of 32767" by Andy Frueh, published in the June 1990 issue of BB&P. Alexander is the author of a TI version of Tetris, XHi, YAPP, and other fairware software.)

If you had to remember a phone number, which would be easier: 123-456-7890 or 314-159-2653? Surely the first one! If you had to describe a two dimensional object, which would be easier: A circle or a oddly shaped polygon? Most likely the first.

What is the reason for these examples: They show, that "simplicity" is very often a question of your point of view: If you are regarding numbers, as a ten-fingered person using the decimal system, the different symbols in their natural order are quite simple. If you regard objects, you look at their geometrical properties. If you were to regard them as numbers, for example calculating the area, the "simplicity" would be quite different: A polygon will most likely have an rational area, for example 523/45. The area of the unit circle cannot be described rational, it is an irrational number, its decimal evaluation starting with 3.141592653.

You have seen, that "simplicity" is not always the same, it depends on what you think to be the important part of an object.

Let's think, you were a computer. As we all know, computers can only count 1 and 0. Which numbers would be more simple: 1000 0000 0000 0000 or 1100 0011 0101 0000? Most likely the first one. Since we are decimal creatures, we should want to regard these numbers as decimals: The first one is 32768, the second one is 50000, much more "simple" than 32768.

You see, that the powers of two: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768 and 65536 are "simple" numbers for dual creatures like computers, which also means that building something using these numbers is easy. For example, it means: Line 0 is Hi Level, the other lines are ALL Lo Level.

This is the reason for the proliferation of these powers in computers: We have a 16 Bit processor, having 64k=65536 Bytes Address Space (1k is 1024 Byte), the screen is 32 characters wide, each an 8x8 grid, thus having 256 horizontal resolution (the lower vertical resolution is due to the compatibility with the TV system, which is not a digital invention). We have 256 characters (though Basic allows only 128, thus saving some memory), that may fill a string up to size 255 (+1 size byte is 256). etc. etc.

But why 32767 which is clearly 2 to the power of 15 -1! Why the -1???

We all know, that there are two kinds of numbers: positive and negative. If we have to count apples, surely no negative counts can be possible. Thus, if we have numbers 1 to 65536, we could use them.

Now instead of counting apples, lets look at the thermometer (having only an integer scale). It might be necessary to use also negative numbers. If you have only positive numbers, what do you do? You would surely take (perhaps half of them) and CALL them negative numbers. So you would get 32768 positive and 32768 negative numbers. But wait: There also is a a number, neither positive, nor negative; the 0. We have to spare one number to be able to display a 0. Shall we take a positive or a negative one? To understand what is done, lets look closely at calculating with a finite set of numbers:

If its 22 o'clock and you "add" 4 hours, its 2. We were using a system of 0 to 23 and were "throwing the 24 away", regarding it again as zero. Thus 26=24+2 becomes 0+2=2.

What we have done is usually called "modulo arithmetic". A funny result is, that also negative numbers can be positive. Modulo 24 you can say either 22 or -2 since 2+22=0.

This arithmetic has very interesting properties. For example, you can show that a full calculations; which means, that you may add, subtract, multiply AND divide each two numbers and get a result again IN THE SAME SET, you started in (The mathematicians call a set, that has these properties "field") if and only if the number, by which you were doing the modulo arithmetic is a prime number. If you only add, subtract and multiply, it can be any number (this is called "ring"). Further examinations of these numbers lead far into the subject of abstract algebra, and we shall not cover this subject in this article much further.

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Bits, Bytes & Pixels

Coming to the computer again, we already know that the powers of two are very important. Especially, since we have a 16 Bit processor, we have 16 Bit registers, which means, we have 65536 possible numbers for each register. So we will do again modulo arithmetic (note that 65536 is NOT prime, thus we cannot do fully division, but most times get a remainder, so the DIV command in machine language will always give quotient and remainder): As we have seen, -10 will be the "same" as 65526. There comes a very neat idea: if you add 65536 (which is in fact the 0 in our modulo arithmetic) to a number, you will get a positive number, that is the "same". We will cover this later.

This fact leads us to the system of number representations, used in the 9900. It is called "two's complement" and works like the following: To create a negative number, just invert all bits, and add 1 to the result. Thus -32767 is: 32767 equals 0111 1111 1111 1111 inverted: 1000 0000 0000 0000, add 1: 1000 0000 0000 0001 equals 32769, 32767+32769 = 65536 equals 0. Voila!

The interesting property is: Since its modulo arithmetic, its fully compatible with larger numbers. You can use either positive numbers 0 to 65535 or numbers -32768 to 32767 with the SAME routines for calculation. Its only dependent on your point of view!

If you regard numbers as negative, you can easily say if a number is negative, just by looking at it's first bit, that contains the sign. Of course, its not as simple as using Bits 1 to 15 for the number and Bit 0 for the sign, but then you would need different calculating procedures.

Now we can understand the multiple occurrences of 32767: Whenever Basic passes a number to Assembler, the number is regarded as to be signed. When we address memory, as for LOAD and PEEK, we calculate only with positive numbers. So we must subtract the number from 65536 to get the correct negative number if the address is too big to be a "register positive".

Other routines, that do not need to get numbers that big, would be very confusing: What is a negative position in a string? Thus SE6\$ and POS are limited to 32767. Negative line numbers are not allowed, thus the largest line number is 32767. By the way: Line number 0 may not be entered, but you can create it by some manipulations. A program with line 0 will run correctly.

The fact that RES will place 32767 for each line number that could not be found is quite arbitrary. If you look at address >2314 in the Basic Interpreter (see TI Intern, pg.137), you will detect, that >7FFF equals 32767 is taken as an error value. I guess this was done, since most time this line will not exist and the program will break with an error instead of running into other routines that were prohibited. In fact only the line number 32767 generated by RES is arbitrary, the other occurrences of 32767 in the TI are due to the internal number format.

DONE

XB LOCKUP WITH CALL SAY IF NO SPEECH noted by Charles Good

While I was checking out my customized copy of AIRTAXI for the first time on the club's system the computer locked up as soon as the plain began to land for the first time. The game worked fine on my system at home. I finally figured out that the problem occurs only when CALL SAY is encountered on the club's system, which does not have speech. On black and silver 99/4A's without a speech synthesizer XBASIC will ignore a CALL SAY and continue program execution. The club's system includes a gray plastic console. Although the club's console is 1981 (I have never seen a title screen that says 1983.) this is apparently a rather consistent difference between the operating systems (gray 0) of gray and silver consoles. One of my own gray consoles came with an insert stating that CALL SAY will cause a lockup from XBASIC or TI BASIC.

The bottom line: you probably have to remove CALL SAY statements from software you run on a gray console if no speech synthesizer is attached.

DONE

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```

PagePro/99 Open: 7 Used: 351 Files: 21 Date: 07/06/90

Filename	Col	Row	Filename	Col	Row	Filename	Col	Row
99/4A	15	6	GREETING1	PGM		LETTERHEAD	PGM	
AD	PGM		GREETING2	PGM		WIZARD	23	16
C-EXA01	D/V	80	HDLNR_L6	PGM		LOGO	26	13
CANDLE	18	16	INDIAN	15	10	PENGUIN	12	10
CASLON_L6	PGM		INVITATION	PGM		PRINTER	24	9
FONT1_L6	PGM		INVOICE	PGM		STATIONARY	PGM	
						WINEGLSS	5	7

Property of: Charles Good

Filename Col Row Filename Col Row Filename Col Row Filename Col Row

PAGE PRO PIC CAT

a mini review by Charles Good

Here is a sample output from Paul Scheidemantle's Page Pro Pic Cat utility. This cataloger is designed for use with disks containing pictures in Page Pro format. It shows the size of each Page Pro picture on the disk, the file type of all other files, a date, and the disk owner's name. As shown here, this data can be printed on a disk jacket, and you can also print a more standard looking disk catalog. Also included on the same disk is one of Paul's Page Pro headline fonts. If you have disks full of Page Pro pictures, you should have this software. It is fairware. The requested donation is only \$5.

DONE

699 GRAPHICS PGM.

by Bob Mozniak

Lima Ohio User Group

DHMI60D! In a word, that is what I think of the 699 graphics display program. I received it in the mail from Mr. Good a couple of weeks ago and I was truly impressed. I'm not one to do a whole lot of graphics because in my opinion you can't do much except just look at them. I will make an exception with 699. I am the proud owner of an AVPC card from DIJIT systems and just love what it can do but never really got into the graphic potential of the card. Well, 699 changed all that. I have viewed most all the pictures and will admit that they are all great! The clarity makes them soo wonderful to look at that I almost hated to take the picture off the screen to see what the next one looked like. The pictures are the quality of some that I have seen on an Amiga, maybe better. There were a couple of things that I had to do differently. When it said to use FCTN/E or X I found out by trial and error that all I needed to do was to press E X etc. and no function key. It probably has something to do with the RAVE 99 enhanced keyboard that I am using. With all the neat graphics and goodies that I have for my T199/4A I can't see any reason to go with (God forbid) an IBM clone.

(EDITOR'S NOTE: 699 will display in up to 512 colors all GIF pictures, all MYART pictures, and most YAPP pictures using a Geneve or a T199/4A with an 80 column card. 699 is public domain.)

The HARRISON SOFTWARE GOLF ANALYZER

reviewed by Charles Good

Lima Ohio User Group

If you do alot of golfing, you will find this program a useful addition to your hobby. It is written entirely in assembly, and can be easily used by those with only one SSSD drive without any disk switching. There is plenty of room on one SSSD disk for the program and all needed data files. Although initially configured to boot from DSK1.LOAD, the Harrison Golf Analyzer can be configured to hoot from any drive, randisk, or hard drive. Once loaded, any screen can be printed any time by pressing FCTN/7. Screens are printed in expanded pica.

First you input data for EACH golf course you use, the course's name and rating. The rating is number, obtainable from the golf course management, that corresponds to how well a group of really good golfers would do on the course. You then input the par for each hole.

Later you enter data for each round of golf you play. You enter the date, and for each hole enter the total score and number of puts. You can also enter a comment for each round, such as "extra windy", or "rain soaked from the day before". When you are satisfied that the round data is correct you press PROC'D to place the round in memory. The computer then calculate your current handicap using the round you just entered plus the previous 9, as well as the following information for the just entered round:

- Par for entire course:
- Gross score (your actual score):
- Net score (gross minus handicap):
- Birdies:
- Eagles:
- Total puts:
- Pars:
- Bogies:
- Double Boogies:
- Total score and puts OUT (first nine holes):
- Total score and puts IN (last nine holes):

This information is calculated for each round entered and saved in a data file. You can have as many as 360 rounds in a file. The formula for calculating your current handicap is "sum of gross scores for the ten most recent rounds, minus the sum of the ratings for the courses, times 9/10 rounded to the nearest whole number. If there are fewer than 10 rounds in a data file the computer will calculate based only on the data available.

At any time you can view data analysis in various formats. You can specify analysis based on only a single course, or all courses you play. You can analyze data from a single date, all data between a start and end date, or analyze the entire data file. Asking for an analysis of more than one date gives you these choices:

1. Full round display
2. Quick summary
3. Averages
4. Best on hole.

Full round display shows all your data for every hole of every round, within the limits you have specified for dates and courses.

Quick summary gives you the calculated results for each round without displaying the individual hole by hole scores.

Averages gives these data for all rounds within the course and date limits you specify:

- Gross score
- Net score
- Puts
- Score IN
- Score OUT
- Puts IN
- Puts OUT

Best. on hole displays the best score you ever made on a hole by hole basis based on the course and date limits you specify. This only works when you specify a specific course for analysis. What you get is your "dream round", your best possible game for that course based on what you have done so far.

This software comes with an extensive printed user's manual which includes many sample screen dumps. You also get a sample data file. Finally, you get a support telephone number. It is not toll free, but if you call evenings you will be talking to the software author himself, Bruce Harrison. I really appreciate this sort of voice help instantly over the phone. (DIJIT systems, makers of the AVPC, provide the same service.) Since I am not a golfer, I called twice during the preparation of this review in order to get information about golfing terminology (I didn't know what IN and OUT meant). My questions were promptly answered.

Price: as of this writing (7/22/90) not yet established, maybe \$8 - \$10.

Available directly from
Harrison Software
5705 40th Place
Hyattsville MD 20781
Phone 301-277-3467

DONE

Storing Data

By: Andy Frueh, Lima US

Data handling is discussed in detail (confusing detail) in the User's Reference Guide, pp II-118 to II-136. You can use numeric variables such as A or A(x), and strings such as A\$ or A\$(x). The TI will accept null strings. An example is A\$="". You can use a READ to get nulls.

```
10 DATA 3,4,A,,B
20 READ A,B,C,D
```

The "B" is not read.

In the default DISPLAY mode, you need to specify "delimiters" in quotes. If you specify INTERNAL format, life is easier. For example:

```
10 OPEN #2:"CS1",INTERNAL,OUTPUT,FIXED
20 PRINT #2:A,B,C
```

When reading the data, change the INPUT to INPUT, and the PRINT to an INPUT. File numbers can be from 1 to 255, or use #5+X if X is already defined (an application of this is using it in a loop).

I also suggest reading pp 29-41 of the Disk System manual.

DONE

Widgits and QBert

By: Andy Frueh, Lima US

Odd things have been known to happen to "widgits" (a.k.a. Navarone's TI Cartridge Expander). Usually, these have to do with moisture or computers locking up. Mine is rather different and isn't actually the widgit's "fault".

Let me explain the configuration in which I know this to occur. For this article, cartridge slots are numbered top to bottom (from the GROM port to the user) as 1, 2, and 3. 3 is closest to you. Extended BASIC is in slot 1, Return to Pirate's Isle is in number 2, and QBert from Parker Bros. is in slot 3. I turn on the computer and select the switch on the widgit for Extended BASIC. I press any key to get the selection list. It says: 1 for TI BASIC, 2 for TI Extended BASIC, 3 for Parker Bros. Game. Pressing 3 gets me nothing. This doesn't interfere with XB's operation so far as I can tell. It did interfere with "Return to..." I don't know if this is because of which cart. slot it is in, or what. It may happen regardless of the order of the cartridges.

It is very unusual in that it happens only with QBERT. I have Popeye, which is a Parker Bros. game, but it doesn't do this for me. Very unusual.

DONE

A BUG IN 80 COLUMN FUNNELWEB V4.30

reported by Tony McGovern

The following is quoted from a letter dated July 19, 1990 from Funnelweb senior author Tony McGovern: "A bug has surfaced in DR(80) FORMAT. Tell it to do DSSD and it really does SSSD. The problem comes up when people with TI controllers can't read supposedly DSSD disks. I'll update the files later on before issuing any more."

DONE

SPIDERS

The following is quoted from an Associated Press interview with Dr. Michael H. Robinson, director of the National Zoo and former director of the American Arachnological Society. It was published July 27 in the Van Wert Ohio Times-Bulletin.

"Of the thousands of spider species in the world, Robinson said, only three are poisonous to humans- the black widow, the brown recluse and the dreaded Australian funnel web spider, or Atrax robustus, which is "very aggressive" and whose repeated bites will kill a person within a few hours.

"The tarantulas used in filming "Arachnophobia" actually are pretty innocuous."

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