business with Lou Phillips...! Here's hoping for the best anyway. As we TI'ers lose sources of parts and equipment, it just makes it harder to keep interested users. And,

Speaking of sources, if you want to get an extra key-set (KEYBOARD PORTION of console) ACE Electronics here in Houston had some for $2.95 each, the Stackpole grey-key assembly. Might be the last time you see these laying around locally, folks! 3210 Antoine Drive, between Old Hempstead Hwy and Hwy 290, off W.34th -- 688-8114.

Also, please keep in mind that one of the few locations which still attempts to get and sell equipment for the TI'ers is MICRO-TRADE-MART in Bear Creek, Hwy 6 north of Clay Rd.-- 859-2200. Name of possible system for sale locally: Judith Kerr, 713-585-5882/331-4702. And Kevin Luntz would like to get a modem and RS-232 card--per message on HUG TIBBS.

---------------- end Bits and Bytes, Nov/Dec 1990 rtl ///

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H U G    N E W S
   NOV / DEC  90
*EXCHANGE GROUPS*
 PLEASE NOTE NEW
  MAILING ADDRESS
MEETING SCHEDULE
SUNDAY DEC 09  1:00
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AGENDA: _DEC 09: ELECTIONS AND
          _DEMOS: __ANNUAL PARTY
>> New Place and Time: NPOA Clubhouse
   Claridge Drive   (see map) Key 530Z
-- 2nd Sunday each month
: Meetings: DEC. 09, 90 // JAN. 13, 91
:   FEB. 10, 91 // MAR. 10, 91
: HUG TIBBS - 24-hour BBS - OPEN AGAIN
: CALL 300/1200------- 713-495-7368

[The Houston Users Group is organized to promote the use of the TI-99/4A Home Computer and the Myarc Geneve (TM). We invite persons of similar interest to meet with us. HUG is a non-profit group and is not affiliated with TEXAS INSTRUMENTS, INC.

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                                                          IN THIS ISSUE

]***

Darn formatter did it to me again.   1990 HUG OFFICERS
[President --- BOB McCARTHY ...955-7939   BBS SysOp --- GLENN COX   ...495-8931
Membership/VP HENRY KNECHT ...473-8870
Soft Libr --- LARRY PIPKIN ...568-1898   Program/VP -- RON TOWE   ...999-3686   Nwsltr Libr - BILL MAUTNER ...463-9557
SIG/VP ------ open   ...--------   Secretary --- LYNNE NEVILL ...771-9357   Cartr. Libr.- BILL MAUTNER ...463 9557
Treasurer --- RAY BLACKSTONE..869-4029   N/L Editor   RICHARD LUMPKIN.469-5089   Asst. Editor- open !!!   ...--------

]***

     EXCHANGE EDITORS / LIBRARIANS: IF you have missed an issue of the HUG NEWS OR if you have changed your N/L mailing address lately please let us know!! If you want a copy of our Library Catalog of Programs, please send $3.00 for disks for DV/80 files, approx. 80 pp. Contact ADDRESSES are: Bill Mautner, 4615 Lochshin Drive, Houston TX 77084; or Larry Pipkin, 12139 Monticeto Dr.,Stafford TX 77477; or R. Lumpkin, 11610 Inga Lane, Houston TX 77064; Bob McCarthy, 10303 Horseshoe Bend, Houston TX 77064.

                           HUG MEMBERSHIP INFORMATION
     Annual membership fees for HUG are $20. A ONE TIME initiation fee, for new members only, is $5. The initiation fee, used to maintain user group services, entitles the new member to receive any six programs of his own choice from the groups Public Domain / Shareware Disk Library, plus catalog of this library. Members receive all issues of the HUG newsletter, may order programs from the software library and are permitted access to all "user" levels on the Group's bulletin board (BBS), HUG-TIBBS. All renewal and/or new membership fees and applications may be sent to the Group's Treasurer at: Houston User Group, c/o Ray Blackstone, 525 Woodland, Houston Texas 77009; or brought to the meetings. Please direct any questions regarding membership status to the Treasurer. Membership applications are available at the same address, at meetings, or from any of the officers. For information concerning the Group or joining, please contact any of the Officers, see list above.   NOV 90 circul.: membership = 58; Exch.= 97; Trial Exch. = 03.

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Houston Users Group
HUG CURRENTS
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It's that time of year again. Yes, the time when we come together to enjoy food, fellowship, and VOTING for HUG officers for the upcoming year....

DECEMBER MEETING is always the annual party, and elections, and the only thing we have to worry about is not getting as "down and dirty" as our recent Gubernatorial candidates did this year. "GOOBER" is a good sounding word to describe this years election, I guess--they really sounded like GOOBERS. Now is you don't want to be a GOOBER yourself, show up on DEC. 9th and participate.

Last sheet of this N/L is a list of the Nominees of the Nominating Committee (R. Lumpkin, Ray Blackstone, and Jim Barnes) who have worked tirelessly (without wheels) to decimate depraved declension in our group as typified by those who would not serve. In other words, we tried to come up with some names of people who did not outright refuse to participate as officers of the Group for 1991. Problem is this: Many of the backbone members of the group are tired of being the ones to carry the same old load, and even some of the ones who served very well this year are (for various reasons) not going to perform the same jobs next year. So please be understanding as you are asked to DO a job, task, position, program, demo, this year -- we are just a semi-special interest group for the 99/4A and we need to keep in mind that our group and our meetings are not on the formal level of the "HAL"; we're just a bunch of guys and gals who get together to have fun with a small black box.
(For you out-of-towners, HAL is the Houston Area League of PC Users-- the IBM users group for Houston -- at 9500 members and growing, with a 100 page monthly slick-printed magazine and a speakers list with people like Bill Gates, etc... Big Business, compared to little FUN computer users like us!!)

Recap of October meeting: Free Programs were won by Ray Blackstone--5; Scott Young--10; and R. Lumpkin--5. With only about 12 people at the meeting, the odds of winning are pretty good, huh? Balance in treasury is $247.00 with $68.00 owed to me for N/L printing, and two phone bills ($35.00+/) owed. Demos were pretty short on printers, codes, and DIP switches. And I did not have any printer articles finished and run off to hand out so that is what is in this N/L! But we had a lot of fun fixing Mrs. Young's disk drive in her PEB box and found out that the 32k card didn't work, so now we know why she can't get most stuff to load up. And that is why the group is here-- so people can help each other with problems, ideas, etc.

Note on money and members. I have updated as well as possible the membership records for the mailing list, and if the "TO:" date on your label DOES NOT MATCH to what you think you are renewed to, better let the Treasurer know!! We now have 41 current members and 16 due or over-due to renew this year, and I expect about 50 paid members

continuing for 1991, so we are NOT a small group, by 4A standards, and not in financial "dire straits", but certainly not booming like in years past. Just have to watch expenses, etc.

Ruth and Sandy Herman are baa-aack! from Venezuela; I understand Ruth is checking out the living in some other areas in anticipation of another "paid vacation". Sandy says, "What vacation?- I had to work every day!!" Claims he can't remember where he lives, also. I bet they both enjoyed it anyway! A big
W E L C O M E   B A C K !
to the Hermans. Glad to have you with us again.
--------------------------HUG CURRENTS, NovDec 1990.

October 1990 Board Meeting and 1991 Offficers:
Yes, Yes, it's true.... We finally had a bored meeting, at which R. Lumpkin got stuck with (oops) WAS NAMED as head of the nominations committee. Note the lack of capital letters there? That is because of the informal nature of our organization. Anyway, I picked Ray Blackstone and Jim Barnes as my co- conspirators in finding some warm bodies to fill positions in HUGs Masthead, and HOPEFULLY in its operations. As a general note, Bob McCarthy is going sailing next year, sailing toward profits as a software rep, I think he said. Ron Towe, who did such a good job as Program VP says he is into other things also, and we have been advised by Henry Knecht that he will not serve as an Officer next year either.

So I managed to prevail upon Jim Barnes himself to agree to serve as Program/VP (BUT HE ISN'T GOING TO GIVE ALL THE PROGRAMS HIMSELF, (except maybe occasionally)) so we (YOU GUYS) have to do your part also. And Phil Van Nordstrand has agreed to serve as Membership/VP for the group, which is quite a load to take since he also is pretty much the heart of the JUG group these days. Glenn Cox and Larry Pipkin will remain as BBS Sysop and Group Librarian (thank goodness!!!!!) and Bill Mautner says he has a few more inches of space left in his house and will keep the Newsletter Library next year (and the Cartridge Library if we get it back--something I am contacting Waco about, since no one ever offered to pay the postage apparently). Ray Blackstone will continue to watch over the Treasury for a while, and I will continue to be N/L Editor (sort of) as long as I do not have to be PRESIDENT. That position, and Secretary, are the ones we do not have anyone eager to serve as, so far. But a couple of ideas are kicking around....
See you at the Nov and Dec meetings...

Bits and Bytes of News
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WELL, just about the time that I took the Sep/Oct N/L to the printer and got it back, I found out that as of OCT 10th, 1990, ** TRITON ** left the TI 4A equipment business, and sold all their remaining inventory over to:
T.M. DIRECT PRODUCT MARKETING
at 1-800-336-9960. Phone calls show they are now up and running, and accept VISA and M/C, and if you have the FALL-WINTER 1989 TRITON catalog, you have the items and prices!!! They are attempting to get set up as a vendor for MYARC products (but probably not for CORCOMP, which has pretty well shot itself in the foot, TI-vendor-wise; now essentially only available through TEXCOMP). Of course, we all know how fast it is to do any business with Lou

PRINTER INFO -- IN GENERAL
r.lumpkin, Houston U.G., Nov. 1990

Before attemping to talk about how to use Control Codes, DIP Switches, and how to use Graphics on printers, I am going to describe in some detail HOW A PRINTER WORKS, electro-mechanically speaking. Although it is difficult to separate the subject of the "printer" from the subject of the "print-or" or device DRIVING the printer (usually a word processor, or a Basic or Machine Language Program), I am going to attempt to keep away from talking about the activities of the SOURCE of the printed information until another article.

First of all, the "printer" I am speaking of is an "8 or 24-PIN DOT MATRIX" type. Comments will be made along the way to contrast it with other types. Generally speaking, the price of a printer may range from around $139.00 (8-pin) or $275.00 (24-pin) to $3000.00   What determines the price is 1) the Speed (below 200 cps is common, above 200 cps is "fast" and considerably more expensive); 2) the User Features (basic features are a few fonts and print styles--expensive printers have lots more specialties); 3) Size of paper handled ("wide-carriage" printers cost about 25% more in each model line); 4) Durability (heavy duty printers designed for business use are substantially larger and more expensive than the typical "economy" printer, and tend also to have the high speed and special features).
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1. All printers have a method for paper to feed through, either "SINGLE SHEET" by rollers and a platen, like a typewriter, or "COMPUTER PAPER" (and forms) by "tractor" pins on each side . SOME printers have both systems available (much more useful!) Some more expensive printers allow individual envelope feeding, sometimes without removing the main paper supply, or other special paper-handling features. One feature which is not often noticed until it is needed is the option of dual LOCATION of paper supply with paper feeding from the back OR from the bottom.

The width of the paper which can be handled is often 9.5" (8-1/2" paper size) but "wide-carriage" printers can use 15" paper for spreadsheets, etc. MOST "tractor feeds" can be adjusted to the width of whatever forms are being used, and post-cards, forms, and labels are available in various styles with tractor-type perforated edges for these "CONTINUOUS FEED" type printing jobs.   .
----
2. Printers also have some method of providing "DARK" material to mark the paper. In the general group of "IMPACT" printers, this is usually an inked fabric ribbon or plastic-based pressure-sensitive "ribbon" which is struck by the letters or by pins to mark onto the paper. THERMAL printers are a variation on this type--they use HEATED pins on a heat-sensitive paper, without a ribbon.

One major variation is the "INK-JET" printer which actually sprays the ink onto the paper through nozzles, and another is the "LASER PRINTER," which forms images through heat and electrostatic transfer of inks, much like a copy machine. Both of these can produce very sharp, clear images at high speed. Ink-jet printers are also often capable of multi-color printing operations. Colored ribbons (and multi-color ribbons) are available for most impact printers anyway.
----
3. All printers also have some method for inputting signals to tell them WHAT TO DO (PRINT). The typical typewriter has keys which are struck by fingers, toys, etc, as the input device. Computers "strike" their output signals electrically through several typical wiring and signal patterns, called "INTERFACES."

The most commonly used input interface for printers is now the "CENTRONICS PARALLEL" in which all eight BITS of data per CHARACTER BYTE travel on eight signal wires simultaneously, at TTL logic voltage levels of 0 and +5 volts. PLUG TYPES and WIRING

CONNECTION POINTS are well-defined in this type interface, so very few "cable" problems are encountered. Data transfer rate is usually in the range of 8000 bits/second (1000 CPS). Cable length with parallel output is limited to about 10 feet maximum for reliable service, although with a proper conductor design distances of up to 25 feet could be possible, depending on the output device and printer involved.

Another commonly used system of computer signal input/output is the "RS232 SERIAL" in which the data bits are sent on a single wire for each direction, one bit after another for each of the eight bits per character. Voltages used are +6 to +12 volts, and -6 to -12 volts. The signals used in RS232 vary greatly in speed (BAUD RATE) and in many other parameters, so that matching the printer (or other device) to the computer output is sometimes difficult, even if the wiring and plugs appear to match!

RS232 data transfer rates in common use range from 300 bits/second to 9600 "BPS", with both 1200 and 4800 bps being typical. RS232 signals allow longer cable lengths to the printer, quite often 50 feet or more. Proper conductor design will allow RS232 transmission at 1200 bps up to several hundred feet between source and printer.

One other part of the input section of a printer which is often included in the design for both RS232 and PARALLEL inputs is an INPUT BUFFER. This is a section of RAM MEMORY which receives the incoming signal and holds it until the printer is able to accept and use it. This "storage tank" allows the computer to send information in larger blocks and the printer to then "catch up" at its own speed. MOST RS232 inputs are buffered with at least one or two KILO-BYTES, while many PARALLEL inputs are not buffered separately from the internal operating section of the printer. Most printers in the "better quality" price range provide (larger) buffers on each input, often up to 32 k-bytes even on parallel inputs.

A new Serial Interface now found on some Laser Printers is the RS-422A; I am not familiar with its characteristics. Additionally, there are other signaling systems such as IEEE-488 and some others used in the proprietary systems on main-frame computers and in such devices as TELEX systems, but virtually ALL home and office computers now use one of the two above, although sometimes with wiring or plug differences which can create hook-up headaches. Some "home" computers (Commodore) were previously designed with "different" character code or interface systems in an attempt to force purchasers to stay with a manufacturers brand of printers or other peripherals--this proved to be futile and counter-productive and has been a limiting factor to users of those systems!
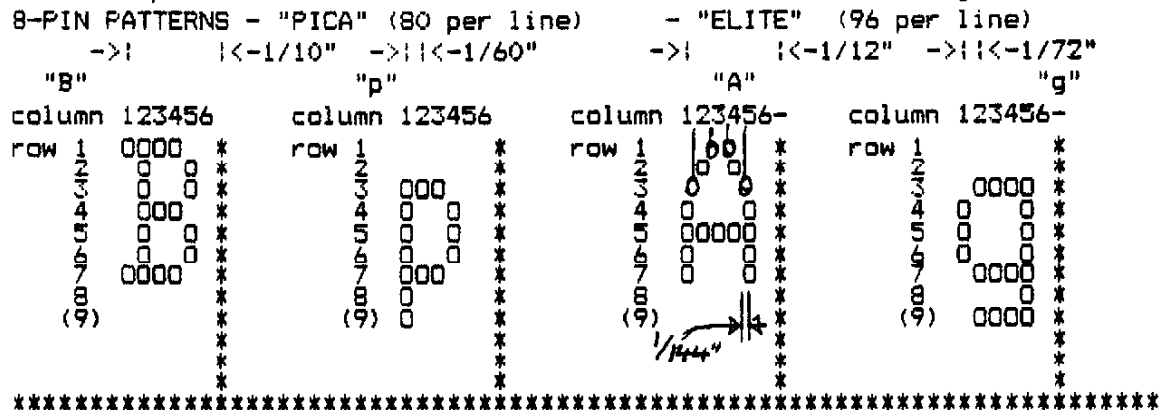----------------
4. All IMPACT printers also have a device for MAKING THE MARKS on the paper--either having the set of characters pre-formed on a set of bars or a ball or wheel and swung into position to strike the ribbon (typewriters, IBM selectrics, and "DAISY-WHEEL" printers), or else by having a "printhead" which strikes the ribbon with pins to form PARTS of the character ("DOT-MATRIX" printers).

Daisy-Wheel printers and typewriters have the DISADVANTAGE of having only ONE SET of possible character size and shape available, until and unless the print-wheel (or print-ball on an IBM Selectric) is changed. They have the ADVANTAGE of printing a very clear and crisp image of that one character set. Dot-Matrix Printers have the advantage of being able to print almost ANY SHAPE character or GRAPHICS IMAGE, if given the proper data input. Impact printers have the advantage of being able to print MULTI- PART FORMS of from two to eleven sheets thick-- "Page Printers" such as Laser or Ink-Jet type cannot do this!
----
5. The most common type of DOT-MATRIX PRINTER is called an "8-PIN" type, although most 8-pin printers actually have a vertical group of NINE pins in the printhead, which "prints" the CHARACTERS or GRAPHICS IMAGES by striking the appropriate pins to form small VERTICAL SECTIONS of the complete character or image. The ninth (bottom) pin is not directly accessible by external signals, but is used for forming the extenders or "legs" for lower-case letters such as "g" and "p".

Almost all these printers base the characters on a ' 5 by 7 ' dots PATTERN in a
' 6 by 7 ' dots CHARACTER SPACE SIZE when in the PICA (10 per inch) or when in the ELITE
(12 per inch) mode. The difference in "characters per inch" is made by reducing the
HORIZONTAL SPACING of the dots-columns WITHIN the characters and BETWEEN the characters.
In fact, CONDENSED print is the same height as the others--it is just that the vertical
columns spacing is "squeezed" to give 16.5 OR 17 characters per inch. SUPER-SCRIPT and
SUB-SCRIPT are actually physically smaller--shorter in number of dot-lines of height.

A representation of the dots used to form characters is given below:
8-PIN PATTERNS - "PICA" (80 per line)   - "ELITE" (96 per line)
    ->!   !<-1/10" ->!!<-1/60"   ->!   !<-1/12" ->!!<-1/72"
    "B"   "p"   "A"   "g"
column 123456   column 123456   column 123456-   column 123456-
row 1 OOOO   *   row 1   *   row 1 |oo| *   row 1   *
    2 O   O *   2   *   2 oo   *   2   *
    3 O   O *   3 OOO   *   3 O O *   3 OOOO   *
    4 OOO   *   4 O   O *   4 O   O *   4 O   O *
    5 O   O *   5 O   O *   5 OOOOO *   5 O   O *
    6 O   O *   6 O   O *   6 O   O *   6 O   O *
    7 OOOO   *   7 OOO   *   7 O   O *   7 OOOO   *
    8   *   8 O   *   8   *   8   O *
   (9)   *   (9) O   *   (9)   *   (9) OOOO *
              *   *   \ || *   *
              *   *   1/144" *   *
              *   *   *   *
              *   *   *   *
              *   *   *   *
****

TECHNICAL NOTE: In virtually EVERY character (font), EITHER the top two rows OR the
bottom two rows may have dots active, but NEVER both at the same time. It would seem
that printers actually use SEVEN BITS of height for character definition data coding,
and in fact, printers which allow the re-definition or uploading of character (font)
definitions into RAM, only allow 7-bits per dots-column, with the 8th bit used to
indicate whether the highest bits will correspond to ROW 1 or to ROW 3 -- in essence,
only a 5-wide by 7-high block is available either HIGH or LOW in the 9-dot-high
character block!

Typical dots spacing on the page is 1/72" vertically and 1/60" horizontally, and the
typical line spacing is 1/6" top-to-top, or 'twelve dots'. Dots spacing stays the same
VERTICALLY in ELITE, but the HORIZONTAL spacing goes to 1/72", for 576 dots-spaces
across the 8" page. Also, in ALL MODES, the CHARACTER SET contains "half-dot" spacings
such as what I hand-placed on the Elite letter 'A' above. These are extra dots at a
1/120" or 1/144" spacing during the horizontal movement, halfway between the normal
vertical columns. EMPHASIZED printing adds these "additional dots" on ALL THE VERTICAL
LINES, to fill in the normal open spaces, which is why CONDENSED and ELITE cannot be
run in EMPHASIZED mode, since the dots-columns are already being squeezed closer than
normal.

This is also why a print-out of a "bit-mapped" circle is usually elongated-- printers
in normal graphics DO NOT USE THE SAME SPACING FOR VERTICAL AND HORIZONTAL dots-lines.
If a printer could run in "ELITE + GRAPHICS" we could get a true 72x72 dots per inch,
or 144x144 dots per inch in double density, and direct-printed BIT-MAP graphics would
be properly proportioned. As it is the print-driver programs have to compensate for
this distortion. Spacing of dots is closer in HIGH-RESOLUTION GRAPHICS MODES, and can
be as close as 1/144" on most printers, and 1/216" in some of the newest 8-PIN
printers.

The characters formed by these dot patterns LOOK crude in the form above, and in
fact, look crude on the paper also!   It is only by the "smear" effect of our vision that
we "see" a recognizable image of those characters when they are printed in "NORMAL" mode.
For this reason, most printers have a "NEAR-LETTER-QUALITY" or "NLQ" mode, or at least an
"ENHANCED" mode of printing in which the printer strikes for each dot TWICE, the second
time approximately one-half a dot width to the right, so that the spaces between the dots
are more fully filled in. The images produced then are approximately as good as a

standard typewriter, but not as good as a SELECTRIC or a DAISY-WHEEL printer. Due to more printhead "activity" per character, fewer characters can be printed per second, and printing speed suffers greatly in these modes.

A newer type of dot-matrix printer is the "24-PIN" printer, in which each of the vertical-line groups of dots in printed characters are formed by two or three strikes of two columns of twelve smaller pins, over-lapping in vertical position. The result is a printed character in which even in "normal" mode the round shape of the pins and the spaces between them is not so evident. The "NLQ" mode of these printers is clearly superior to that of the 8-PIN printers, without such a penalty of loss of speed as the 8-PIN printers suffer on "NLQ".

Advertised "Dots-per-inch" spacing or resolution on these machines can be as high as 360 x 360 DPI but true graphics resolution is not as good as a 300-DPI laser printer would produce, since each dot-matrix printer pin itself is actually LARGER than 1/360", usually closer to 1/120" in diameter. The STRIKE-POINTS SPACING is 1/360", and the dots overlap each other, which is not the same visual resolution as a LASER printer where the actual "dot-size" is 1/300".
----
6. Printers also must have an internal "brain" or CONTROLLER SECTION which understands and interprets the incoming signals and tells the various motors and other parts of the printer what to do, when, and how much. This controller often has been a simple CPU processor such as a Z-80 chip, coupled to a small amount of ROM for DIRECTIVE CONTROL and CHARACTER DEFINITION.

As printer features and options become more complex, the amount of processing required for EACH printed character increases almost geometrically. Many printers now have over 10k of ROM memory devoted to the various FONTS and printing functions. Large-scale CPU's and dedicated design processors are found in many new printers, while LASER printers usually require internal processors running with 1/2 to 4 Megabytes of memory, which is one reason the price has remained so high on those printers.
----
7. The actual OPERATION PROCEDURES of a printer are quite complex. I am not going to delve into the mysteries of the actual signal sequences passed between the computer and printer; I will just say that IF the printer is properly hooked up and "ON LINE" it will allow the computer to send 8-bit BYTES or CHARACTERS to it, each representing a value from 000 to 255.

The controller section of a printer sits and waits until a character is inputted to the printer. The character is checked to see if it is in the range 000 to 027, in which case it is treated as a CONTROL CHARACTER; otherwise it is passed to a LINE BUFFER section of the internal RAM. Succeeding character inputs are checked the same way when received, and placed into the line buffer in sequence, until the printer receives a character code 013, or "CARRIAGE RETURN." This signals the printer that THIS line is complete--TIME TO PRINT IT! Then the status of the printer is checked to see if it is "out of paper" or if some other problem exists. If not, the real work begins:

The CPU then checks the status of numerous internal REGISTERS to see if the printing is to be of CHARACTERS or if GRAPHICS MODE is active; to see which FONT (style of printing) and PRINT OPTIONS are active; to see where the print-head IS AT on the width and height of the paper--something that the printer keeps up with AT ALL TIMES to within 1/72" vertically and 1/60" horizontally, in PICA. (In Elite, 1/72" x 1/72", and in Enhanced, NLQ, or graphics mode it monitors to within 1/144th" or down to 1/360th of an inch on 24-pin types. The actual "incremental" position sensitivity for most 8-pin printers is 1/720th inch-- LOCATION is is by "counts" of that distance: 12 counts = 1/60", etc.

The printer also checks to see whether this "line" will actually FIT on the page line or whether it will have to be split during printing. It decides whether the printhead should move to the right and print to the left, or move to the left and start printing toward the right, and whether it should retrace and print over the same line (DOUBLE-STRIKE) or wait on the next line.

Then, IF the printer is in CHARACTER MODE, it looks in the ROM memory for the CHARACTER PATTERN information for the first character of the line, interprets it according to all the conditions outlined in the REGISTERS, and sends to the PAPER MOTOR (vertical position) and the PRINTHEAD MOTOR (horizontal movement) control drivers the instructions to move to the FIRST position of that character.

The printhead is then given the IMPACT instructions for the 9 tiny electro-hammers on the pins, then as the printhead is moved over 1/60" to the second vertical location, that component of the character is printed, and so on across the character-- this process of READ -INTERPRET- MOVE-CHECK POSITION-IMPACT continues on until all vertical parts are created for that character. Ribbon advancing is usually coupled to the horizontal movement of the printhead so that "fresh" ribbon is constantly under the printhead pins.

The CPU then looks up the NEXT character from the LINE BUFFER, checks to see if it is a control character, and if not it re-checks all the registers, looks up the matching CHARACTER PATTERN definition and goes on to print the six vertical "slices" of that character, continuing in this manner to the end of the line. The controller then allows the information bytes for the next line to begin, either from the computer or from the input buffer, again checking each one as it comes in. At 200 CPS, this process of pin-strikes, movement, and monitoring occurs at over 1000 times per second.
----
8.   IF at any time during the input OR during the printing a CONTROL CHARACTER is found, the printer EXECUTES the action dictated by that CONTROL CHARACTER or series of CONTROLS. Some control characters are acted on immediately when received by the printer, such as #019 which turns the printer to "OFF-LINE", and #017 which turns it back to "ACTIVE" status, or #064 which (in many printers) RESETS all the REGISTERS to the default settings, just like turning off the power and turning it back on would do. Many other Control Characters are placed INTO the Line Buffer to be acted on DURING the printing of the line.

The PRIMARY Control Character is code #027, called the "ESCAPE" character, apparently in reference to "escaping" from the direct-print mode. This "FLAG" character does not do anything on its own--it flags the computer to consider the FOLLOWING code(s) to be a Control Character even if the code is higher than 027. It is in this manner that codes such as 56, 75, etc., wind up being used as CONTROL CHARACTERS, even though these codes "normally" are seen by the printer as being printable characters (56="8"; 75="K"). Codes below #027 are recognized as being for control purposes and USUALLY don't require a code #027 preceding them.

MOST CONTROL CHARACTERS are placed into the LINE BUFFER and acted on AS THEY ARE ENCOUNTERED DURING PRINTING. Therefore, it is possible to activate condensed printing, super-script, sub-script, special fonts, etc at the desired locations in a line of text. A FEW such items MAY "back-up" to the beginning of the line and act on the entire line, as "Double-width" does on my Epson printer; placement of code #014 at any point in a line causes the entire line to print Double-width.

On the other hand, MOST conditions set up by control character codes remain in effect UNTIL CANCELLED by an "off" code; or until OVER-RIDDEN by a higher precedence code (Emphasized will take precedence over Condensed in most printers); or until the printer is turned off. DOUBLE-WIDTH selection on many printers lasts only until the end of that one line and then resets to the previous setting. On some printers Double-width may be set by #014 for one line, or by another code to stay in effect until cancelled.

John Willforth's article "PRINTERS #2" explains the use of CONTROL CODES as well as any that I have seen, so check back to the SEP/OCT 1990 HUG NEWSLETTER for the reprint of that article.
------------   " TBC " - " Houston Users Group   --   Nov/Dec 90

Personal Note: When trying to print special or graphics characters, I am
often amazed or amused or frustrated by what occurs ON PAPER, compared to   --   page 7
what I HOPE is going to happen. PRINTER activities are not hard to direct
but the FORMATTER sometimes CANNOT be set to give the desired actions. The
portion of this document with the dots patterns had to be printed through the
the Editor because the Formatter kept changing the Embedded Control Codes!rtl

PRINTER INFO -- IN GENERAL   (graphics portion)
                                    r.lumpkin, Houston U.G., Nov. 90
                    GRAPHICS -- THE FUZZY STUFF

9.   Printers normally start and stay in CHARACTER MODE unless commanded to go into GRAPHICS MODE by a series of control characters. The condition of being in a Graphics Mode changes how the printer CPU acts on the bytes in the Line Buffer. If at the beginning of PRINTING a line (or during the line), the CPU encounters a Control Character Set such as   027;075;30;1;xxx;xxx;xxx;xxx..., the CPU knows these xxx data bytes are to be printed in SINGLE-DENSITY Graphics Mode, and in fact WILL PRINT these next 296 xxx codes as GRAPHICS, whether such was your intent or not.

     Why "296"?? -- because 027;075 says "Normal Density Graphics information follows" and the NEXT TWO BYTES tells the CPU HOW MANY BYTES OF GRAPHICS DATA WILL OCCUR, according to the formula: 027;075;n1;n2 where n1 + (256 times n2) is the NUMBER OF BYTES IT WILL CONSIDER TO BE FOR GRAPHICS PRINTING. So, 30 + 256x1 = 296, and the following 296 characters or bytes WILL be printed as Graphics, regardless of the DATA CODE VALUES contained there.

     If 68 graphics dot columns are to be printed in Normal Density, the codes used would be: 027;076;068;000;xxx;xxx;and 66 more xxx codes. Obviously there must always be an accurate correlation between the numbers entered into n1 and n2 and the actual number of bytes of graphics data following in that line!

     Since Normal Density was called for, the dot-to-dot horizontal spacing will be 1/60th inch, and the 296 DOT COLUMNS printed will occupy 4 and 56/60ths of an inch of width (and probably 8 dots high, at 1/72" spacing, or one-ninth inch high.) In Double Density, horizontal spacing decreases to 1/120" and the 296 graphics dot columns would occupy 2 and 56/120ths inches width. The VERTICAL SPACING INCREMENT is then 1/144th inch, or one-half a dot heighth, so a second pass can fill in between normal rows of dots, but the first pass line height will still be 8/72nds inch high, since the PHYSICAL spacing of the pins in the print head is fixed at 1/72" center-to-center.

     To achieve maximum utilization of the possible dots-resolution of "Quad-density" graphics would require 8-times as many data points to be printed (determined, programmed, calculated, input, etc.,) since 4-times as many Data Bytes would be needed for each "line" width, and a second "inter-line" pass at 1/144" line advancement could be used with an additional slightly different set of Data Bytes to achieve true "half-dot" resolution.

     Depending on the printer, up to 3264 individual graphic data bytes may be used in a printed graphics line on an "8-pin" printer, which results from codes 027;122;192;012;xxx;xxx;xxx;..., or "Quad density graphics follows, 192 plus (256 times 12) bytes:" which will work on a Gemini 15X with 15" carriage. Newer 24-pin printers have data capabilities of up to 5000 data bytes per graphics line.

     While in Graphics Mode, the printer CPU will NOT USE the Character Shapes from the ROM or RAM character patterns to print, and will not even recognize a "Carriage Return" code of #013 or other "Control Characters" IF the printer is looking at it AS BEING GRAPHICS DATA. Unlike "printable" characters which lie in the range from #032 to #127 (plus #128 to #255 or #160 to #255 on some printers), ALL VALUES FROM 000 TO 255 are considered valid DATA for GRAPHICS, and while in Graphics Mode, a printer does not check for control characters or pull up print-shape info from the character table in ROM. On the other hand, if the printer is in Character Mode and then receives Bytes intended to be printed as Graphics, some very strange printer activity may be seen!!
----
10. Actual interpretation of the Graphics Data Bytes is done on a fairly straightforward basis. The BINARY BITS of each Data Byte used for graphics are used to activate the pins

in the print head on a one-to-one basis: the "128" bit activates the top pin, the "64" bit activates the second pin, on down to the eighth pin which is controlled by the "ones" bit. IF you do not know how binary numbers are formed from decimal numbers you will not understand this, so my "quick lesson" on this follows:

A "binary" representation of a value is formed by adding successive powers of two. This can be visualized as a vertical "stack" of values:

```
        2 to the 7th = 128
        2 to the 6th = 064
        2 to the 5th = 032
        2 to the 4th = 016
        2 to the 3rd = 008
        2 to the 2nd = 004
        2 to the 1st = 002
        2 to the 0th = 001
                       ------
Largest possible sum= 255
```

and smallest possible=000, which is why "8-bit" values range ONLY from 000 to 255. These are WRITTEN in "Binary" in the form:

%11111111 or %11011001 or %00011010 where each 1 shows that the corresponding "power of two" is active, while a "0" shows that value is not active--Highest values are on the left and "001" value is on the right side:

%11011001 equals 128 + 64 + 0 + 16 + 8 + 0 + 0 + 1; sum equals "217".
%01011010 equals 0 + 64 + 0 + 16 + 8 + 0 + 2 + 0 equals "090 , or, shown vertically:

```
  0 which corresponds    ┌─┐  OR   1  PRINTS: o    OR   1  PRINTS:  o
─ 1 to a GRAPHICS MODE ─ │o│       1  ──────  o          1          o
  0 character (column    │ │       0                     1          o
─ 1 of pins strikes) ─── │o│       1  ──────  o          1          o
─ 1 as seen to the right>│o│       1  ──────  o          1          o
  0 thus indicating the  │ │       0                     1          o
─ 1 one-to-one matching ─│o│       0                     1          o
 _0_of binary-to-pins:   └─┘      _1_ ──────  o         _1_         o
  90                              217                   255
```

So that sending the printer a series such as:
027;075;014;000;061;061;061;061;047;047; 047;047;066;066;066;078;078;078 would print:
⌐⌐⌐ or 14 normal density graphics pin-columns with pin-strikes corresponding to the BINARY-BITS of the GRAPHIC DATA VALUES.

One of the major problems in dealing with Graphics Printing on a dot-matrix printer is in determining the data values for the line or lines of data values to be sent to the printer. It is not hard to send these values in Basic with "strings" of values, but it is time-consuming to determine WHAT VALUES will create the graphics desired. Graphics can also be done via a word processor through direct values (special characters and alternate keyboard codes) or through "transliteration" of values, but this is hard to understand and very time-consuming also. The one advantage to using "transliteration" is that multiple bytes of graphics data can be assigned to, and printed by placement of, a single "trigger" character.

For these reasons, "artist" or graphics programs which take a pattern and automatically translate it into the actual values to be sent to the printer are very popular and the way most computer users will do these tasks.

The above explanation of the form of graphics data statements is given so that you might understand HOW this information is passed to the printer and how the printer acts on it, and is not meant to be a tutorial on printer graphics or on the use of particular programs or word processors.
----------------- /// mif (more info follows)

(r.lumpkin, Houston, Nov 90)

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11.   Printer STATUS or CONDITIONAL REGISTERS are what tells the CPU in the printer how to
act--what it is supposed to be accomplishing with the DATA bytes it receives. This is how
the Printer is "PROGRAMMED" to follow a specific set of procedures while printing.   The
register values or "flags" may be set up in three ways:

     A. HARDWARE (DIP) SWITCHES: When the printer is "powered up" (turned on), it
looks at the settings of several switches on the control boards and ACTIVATES THE REGISTER
SETTINGS ACCORDING TO THESE "DIP" SWITCH SETTINGS. This "pre-sets" many of the printer
characteristics to those which the user (presumably) will want to start with.

     Most printers have these DIP switches FACTORY SET to Pica Font; Single-strike, 6
Lines Per Inch, English-language Character Set, etc.   Optionally, the printer can be set
to default on power-up to: Other Language Character Sets; Skip Perforations (Skip One
Inch Between Pages); Optional Form Length Of 12 inches ; Condensed Print or Emphasized
Print; Paper End detector Turned OFF; Line Spacing Of 8 Lines Per Inch.   These are what
are available on an OLD Epson, on the main control board. Depending on the printer, MANY
other pre-set options may be available.

     In order to change the DIP Switches to another setting, it is necessary to READ the
Manual for the specific printer in question, since the switch locations and settings vary
greatly from model to model, EVEN IN THE SAME BRAND.   In fact, if you do not have access
to the manual or to some sort of guide to the switch functions, DO NOT ATTEMPT ANY
SETTINGS ON THESE SWITCHES, since it is possible to damage the printer with conflicting
settings!   The Manual will list the factory default settings of the switches, tell what
they produce, list what other options are available and the switch locations and settings
to achieve those defaults.   Usually, if any of these switches are changed while the
printer is ALREADY TURNED ON, no effect on operation is noticed until the printer is
"Reset" or turned off and on again, since most printers only "Read" these switches during
the power-up sequence.

     B. SOFTWARE SWITCHES: On the other hand, it is not really necessary to change
the DIP switches to other settings in order to achieve ALL the characteristics changes
listed above. EACH PRINTING OPTION which can be changed on the Control Board with a DIP
switch default setting, CAN BE CHANGED "ON LINE" via CONTROL CODES input as part of the
DATA sent to the printer. A DIP Switch setting is just a way to make the change
semi-permanently, automatically activated whenever the printer is turned on.

     Most printers fall into the EPSON standards category, in that the Control Codes used
to make most of these settings are those used by EPSON on its printers.   Another
additional set of characters is available in the "IBM" Graphics-Compatible printers, and
many manufacturers also equip their printers with special characters, fonts, or printing
capabilities in addition to these two "standard" types. so that other Control Codes would
be used along with the "Epson" codes. Star Printers in particular allow many "Print
Options" in addition to the "EPSON" codes to be used, with specific additional codes in
the printers "vocabulary".

     Certain brands of printers such as Okidata and Panasonic have their own set of codes
for SOME (not all) of the options, and these printers will often create problems when used
with software set up to drive the Epson/Star type printers. Differences usually show up
in the Graphics Commands and the Fonts portions of the available "Options", in that some
printers may not respond to the widely used Control Codes in the same   (or expected!)
manner.

C. FRONT-PANEL SWITCHES: One of the User Features which is very convenient to have on a printer is a set of PANEL SWITCHES which can be used to change printing styles or fonts DURING OPERATION. This can help avoid the necessity of re-editing a document to include Control Codes to add or change a font choice, and allows trial printing with different styles of print.   Many of the newer printers are making some (or many) print style choices "panel selectable," and in some cases a LCD display gives information on the choices in effect/available, which is a great advance in convenience to the user. If you are shopping for a printer and can afford to pay for this feature, this is one I recommend looking for!   It really doesn't help to have a printer with 78 print styles, etc., if it is so difficult to set up that you never can get it to do what you want at the appropriate place in your documents!!
----

12. But wait, there are switches on the OTHER internal circuit board--the RS-232 Interface Board. As regards MOST Printers, the SERIAL BOARD switches only set up the RS-232 characteristics, such as Baud Rate, Parity, etc., while the MAIN BOARD switches control the default values for the actual PRINTING CHARACTERISTICS, which will REMAIN IN EFFECT for BOTH Centronics Inputs and RS-232 Inputs. Therefore, if you are using a "Parallel" input, don't worry too much about the RS-232 switch settings--just set them to the factory default settings and leave them alone.

       On the other hand, if you are going to USE the RS-232 Input on ANY printer, you will have to READ the manual and make sure that the CABLE ends are set up to match both the computer and the printer (4A is reversed from "normal" to emulate a "communications" device rather than a "terminal" device). It is also necessary to verify that the printer RS-232 Board DIP-Switch settings ARE MATCHED TO WHAT THE COMPUTER IS GOING TO SEND, as regards: BAUD RATE (speed); PARITY CHECK on or off, and set for ODD or EVEN parity; DATA BYTE LENGTH of Seven or Eight bits. This can be done by Trial-and-Error- (and-Error-and-Error) sometimes, but usually requires a little effort in finding out what the "Output" of the computer is going to be and then MATCHING the switches of the printer to that.
----

13.   TELETYPE INFO COMPARISON: Why do some printers (older ones, mostly) list "75 Baud" as one of the speed settings available??   This is why 75 Baud ever existed as an option on some printers with RS232 inputs: Many computers back in the early to mid-70's were designed to output to Teletype Machines for printing, since those machines were readily available and LOTS cheaper than Printers were then. As printers of the early 80's were designed to MATCH these early computers, they often were made capable of accepting a 74.2 Baud signal, which is "TELETYPE 100 word-per-minute" speed standard.

       THOSE Teletype Signal CONTROL CODES are EXACTLY where some of the printer control codes from #000 to #027 CAME FROM--Have you ever seen a "BELL" on a printer??   Buzzer, yes!, but Bell, NO!, but code 007 is still often labeled "bell".   ALL Teletype machines actually HAD A BELL which dinged on receipt of code #007 (if preceeded by an "upper-case" code!). Now code #007 sets off a buzzer (if preceeded by an "Escape" code #027!   Care to guess what code puts a teletype machine into "upper-case" ????). On a teletype machine, Line Feed and Carriage Return were separate Functional Keys and therefore the same separate codes of #010 and #013 still are used for each of these!   CODING for the ALPHABETIC characters to be printed was set by the ASCII convention to go from #032 upward, which is different from Teletype 5-bit (BAUDOT) code (limited to values #000 to #031), but many Teletype systems of the 70's could use a 7-bit coding system, thus giving available values of #000 to #127, our familiar range of codes in the basic ASCII set of character codes!!!

And why not 8-bits?? -- ALL teletype systems use (used) not only a "STOP BIT" at the end of each character, but also a "START BIT" to indicate the beginning of a character. This teletype "space" or "binary 0 " value bit corresponds to the "most significant bit" or "128 bit" of our 8-BIT CHARACTER BYTES, therefore, ONLY SEVEN BITS WERE AVAILABLE FOR THE ACTUAL CHARACTER VALUE, since the Highest Bit was ALWAYS a "0" . Now some of the weird features of our interfaces systems may be un-needed, but they are already in place and widely used, and only slowly being changed.

Final TTY note: In some cases, the POLARITY of the RS232 signal accepted by the printer can be reset via DIP Switches for use with Teletype or other "reversed polarity" inputs, since "standard" RS-232 uses negative voltage as "1" and positive as "0" binary values. while Teletype systems used negative as "Space" (binary "0") and positive as "Mark" (binary "1").

(If you have read this far, you are either REAL interested, REAL confused, or REALLY Laughing!. rtl)

SPECIALTY PRINTING CODES AND DEVICES

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14. LASER PRINTERS have their own set of dedicated codings, with their own protocol systems. Software "Drivers" for Laser Printers tend to be memory intensive, as the printers need to create a Bit-Mapped layout of the entire page of printing to be done before starting on the printing operation itself. Since they operate on a 300 x 300 DPI (dots per inch) bit-mapped basis, on an 8" x 10.5" page, approximately One MegaByte of memory is needed for a single page of layout. Non-bit-mapped "character" printing routines and various RLE techniques allow Laser Printers to get by with "only" about 1/2 Megabyte of internal operating memory at the minimum, with some loss of printing speeds.

Several standards or "protocols" exist for Laser Printers. The first, and most common, is the "H-P LaserJet" or LaserJet Series II, which is used by many machines, and available as an EMULATION ("acts-like-one") on almost all others (although often requiring separate cards or adapters!). Most "non-HP" Laser printers allow operation in the "Adobe Postscript" emulation, which gives great speed and wide range of print fonts, and is used by many desktop publishing programs. Many Laser units can operate with both systems, plus others including emulation of standard dot-matrix printers including "special fonts" or options codes specific to Printer Brands and Models--Emulation of specific Star or Epson models is common.

Most Laser Printers also provide for operation with the H-P Graphics Language (for CAD-CAM and other "plotter" operations). IBM also has a CAD-CAM driver and there are other printer "drivers" which some of these printers use or emulate. Many Laser Printer require complete cards to be installed into the printer in order to achieve these (extra) certain Emulation Modes, usually at a substantial additional cost.
----
15. PLOTTERS are used for CAD or "Computer-Aided-Drafting" for large paper sizes where primarily lines will be drawn, for plans, etc. These are often hooked to dedicated machine systems which include massive amounts of memory and parallel processing to handle the data needed to create the imaging and drawing plus plotter control. Normal computer "printer" outputs have nothing to do with these machines, and only via specialized "driver" programs can the typical "computer" output the data to be used with them.

--------------- "e4n" -- (enough for now!) rtl / Houston TX / Nov 90 ///

NEW HARD/FLOPPY CONTROLLER FOR THE TI-99/4A IS REALLY COMING.............................

I TALKED LAST NIGHT WITH CHRIS PRATT (PROUD TO SAY A MEMBER OF THE WEST PENN 99'ERS) ABOUT A HARD/FLOPPY CONTROLLER THAT HE AND A FRIEND HAVE DEVELOPED AND TESTED ON A PROTO BOARD. I NEEDED MORE SPECIFICS ON THE CARD, WHICH WILL BE UNVEILED OFFICIALLY IN ABOUT FOUR WEEKS.

CHRIS WILL HAVE A COMPUTERIZED AUTO-ANSWERED PHONE LINE TO TAKE CREDIT CARD ORDERS, AS WELL AS THE USUAL METHODS OF ORDERING IN PLACE SOON. I EXPECT TO HAVE OFFICIAL ORDER FORMS IN THE JULY ISSUE OF THE WEST PENN 99'ER. HEY, I'M SO EXCITED, I'M GETTING THE CART BEFORE THE HORSE.

THE NAME OF THE COMPANY IS ELECTRONIC SYSTEMS DEVELOPMENT CORPORATION (ESD). THE CARD WILL USE SURFACE MOUNT TECHNOLOGY, AND FEATURE AN EEPROM FOR DSR CONTAINMENT AND EASE OF UPDATING AND THE ELIMINATION OF SET-UP SWITCHES. IN OTHER WORDS, IF AN UPDATE BECOMES A NECESSITY, YOU WILL JUST HAVE TO LOAD IT AND STORE IT IN THE EEPROM PERMANENTLY WITH NO NEED OF SPECIAL EQUIPMENT, OR REMOVAL OF THE CARD FOR DISASSEMBLY. IT CAN BE DONE IN A FEW SECONDS! YOU WON'T HAVE ANY OF THOSE CONFUSING SWITCHES TO SET EITHER, BECAUSE THE INFORMATION THAT THEY REPRESENT, WILL BE STORED IN THAT SAME EEPROM, AND WILL BE SET BY MENU SELECTION.

THE CARD WILL SUPPORT ALL FLOPPY DENSITIES RIGHT NOW. 360K 720K AND 1.2K 5¼" DRIVES, AND 720K AND 1.44MEG 3½" IN ALL THE CURRENT TI, CORECOMP AND MYARC DENSITIES. THE CARD WILL SUPPORT UP TO FOUR FLOPPIES, AS WELL AS FOUR HARD DRIVES OF VARIOUS DENSITIES. THEY INDICATE THAT THE WD1010A (WESTERN DIGITAL) HARD DISK CONTROLLER CHIPSET IS BEING USED, AND ALLOWS FOR 256, 512, OR EVEN 1024 BYTES/SECTOR TO BE USED. THEY WILL BE USING THE 512 BYTES/SECTOR AT 17 SECTORS/CYLINDER (TRACK), AND WILL MULTIPLEX THIS TRANSPARENTLY TO THE CPU. THE FLOPPY DRIVES WILL HAVE A 2793 FLOPPY DISK CONTROLLER.

THE PRICE OF THE CONTROLLER WILL BE $225. AND YOU MIGHT AS WELL START TO SAVE THOSE COINS, BECAUSE IT WON'T BE LONG NOW. I'D LIKE TO GIVE YOU MORE INFORMATION RIGHT NOW, BUT I'VE LEARNED THAT TI'ERS ARE PATIENT!

West Penn 99ers

MORE NEXT MONTH. JOHN F. WILLFORTH

Bits & Bytes, Pixels - Page 2

THE NEW FEATURES OF FUNNELWEB v4.30
described by Charles Good
Lima Ohio User Group

Funnelweb v4.30 was officially released at the May 26 Lima MUG Conference. The main features new since v4.21 relate to an enhanced DISK REVIEW.

You can now, using the configuration utility, configure FWB to immediately boot DISK REVIEW instead of a central menu, or if you keep your finger in the space bar you can instead boot a central menu. You can also configure FWB the old way to always go directly to a central menu. The choice is yours. This "immediate boot of DISK REVIEW" can happen when loading FWB any way EXCEPT as LOAD from extended basic. If you boot from XB, you go through the usual XB user list.

The main changes to FWB are enhancements to the 80 column DISK REVIEW. Later, the 40 column DISK REVIEW will be rewritten to incorporate some of these enhancements. The 80 column DISK REVIEW is now a complete disk manager and sector editor, and can give you immediate access to all software configured into either central menu.

When 80 column DR first appears on screen you are given these options:
Disk Dir <1-9>
Colors <0>

Utils <U>
Fnl'Web <F>
Exit <Ctl =>

You can cycle through the configured FWB color combinations by pressing 0 (zero) repeatedly, as is the case from other parts of FWB.

Pressing "F" from the first DR menu brings up a simultaneous display of BOTH central menus. The arrow keys (E/X) move the cursor up and down the list. Pressing <enter> runs the selected central menu program.

CTRL/= will exit DR and bring up one of the central menus. The same is true for S(how) D(irectory) in the text editor. Pressing CTRL/= will bring you back to the text you are editing.

You can bring up the directory of any disk drive or ramdisk drive emulation by pressing a number, 1-9. Several new options are available once a disk directory is on the screen. You can now   T(ag) or U(ntag) files, perform an A(ction) on all tagged files, and I(nspect) the sectors of a file. Move the cursor next to a file name and press "T" to tag the file. A little mark appears after the file name. You can tag all files in the directory at once by pressing CTRL/T. You can untag the file under the cursor bar by pressing "U". You can untag all files that are currently tagged by pressing CTRL/U. You can bring up a menu of

NEXT PAGE

Bits, Bytes & Pixels

possible A(ctions) to perform on all the tagged files by pressing "CTRL/A". This is what you get:

    C(opy)
    P(rotect)
    U(nprotect)
    D(elete)

The P, U, and D options need no explanation. D(elete) requires you to verify that you really do want to delete each and every tagged file, so that an chances of an error on your part are reduced.

The C(opy) option is really neat! You are given the opportunity to designate one, or several destination drives. You can then COPY TO MULTIPLE DRIVES, ALL WITH A SINGLE PRESS OF THE <ENTER> KEY! You can put a master disk in DSK1., tag all files, and file copy the entire master disk to drives 2, 3, and 4 all in one smooth operation. It is necessary to have preinitialized disks in the destination drives. DR will stop the copying process and give you a "device error" message if it detects an uninitialized disk. Another limitation is that single drive copying is not supported. There are no "take out the master disk and insert the copy disk" messages.

You can, if you want, copy single files one at a time directly from the disk drive menu without bothering to T(ag) the file to be copied. This is neat too. You can copy the single file to the destination drive UNDER A DIFFERENT NAME if you want. Also, you can copy a file back to the same drive using a different file name. Very few disk managers permit you to copy a file back to the master disk under a different name.

From the disk directory display you can move the cursor bar over a file name and press "I" to I(nspect) disk sectors. This brings up the sector editing options.

    1. Sector edit
    2. File search
    3. Disk search

Items 2 and 3 allow you to search for a specified ASCII or HEX string on the disk. Item 2 searches only those disk sectors that contain the file marked by the cursor bar. Item #3 searches the entire disk starting at sector zero. You can include a wild card character within your string. Once a match is found you are given the opportunity to edit the sector, continue searching, or exit back to the disk directory display.

When you edit a sector by selecting "1. Sector Edit" from the I(nspect) menu, you get this submenu:

    1 Volume information
    2 File descriptor
    3 Initial sector
    4 Offset in file
    5 Absolute sector

Selecting 1 brings up sector zero for editing. Selecting 2 brings up for editing the file descriptor sector of the file name under the cursor bar. If you select 3, you can edit the actual first sector of the file marked by the cursor bar. Item 4 allows you to inspect a file beginning in the middle of the file, X many sectors from the beginning of the file. For items 3 and 4 you are told how many sectors you are into the file, and CTRL/N brings up the N(ext) sector of the file even if that sector is part of a fractured file and thus somewhere else on the disk. Item 5 ignores the file name under the cursor bar and selects a disk sector by absolute number.

When a sector is brought onto the screen, the display is simultaneously in ASCII and HEX. The ASCII window is at the bottom of the screen and is a rectangle that stretches across the full width of the screen. Text (ASCII characters) is very readable looking very much likE, well, text, in this long rectangular 80 column display. Keypresses for the options available all require the CTRL key and resemble as much as possible those of Birdwell's DSKU and Funnelweb's Disk Patch. The options from a disk sector display are:

    C-ESDX Cursor
    C-B/N Back/Next one sector
    C-A/H Ascii/Hex moves the cursor between the two windows.
Changes in one window are immediately updated in the other window, and changed bytes are shown in the alternate color combination.
    C-W Writes the altered display back to the disk.
    C-MRO displays the M, R, and O buffers.

When a sector is read in for screen display, a spare copy of this screen display is stored in the O(riginal) buffer. Pressing CTRL/O restores to the screen the O(riginal) sector to undo editing changes. Pressing the CTRL/M M(akes) the currently displayed and edited screen the contents of the M buffer. Pressing CTRL/R R(ecalls) the M buffer back to the screen. You can use CTRL/M-R to move sectors. Read in a sector and put it in the M buffer. Then read in a second sector to the screen, R(ecall) the M buffer to the screen and press CTRL/W to W(rite) the M buffer to the second sector.

Selecting "D" from the original DR powerup menu brings up the following disk utilities options:

    Format Disk
    Validate Disk
    Rename Disk
    Sweep Disk
    Myarc RD madk

You use the arrow keys to move the cursor bar up and down this list, and press <enter> to select the option under the cursor bar. Format works with 80 track drives if your hardware supports such drives (a Myarc disk controller with a special eprom is needed). When the disk is formatted, you are asked if you want to validate. You can bypass validation if you are in a hurry. Validate Disk gives you a display of

Bits, Bytes & Pixels

the sector being checked, the sector number of the most recently found bad sector, and the total number of bad sectors. The Myarc RD (ramdisk) screen option is now operative in FWB v4.30.

One other new feature of the v4.30 DR is that sectors used and free are properly displayed for those with 80 track drives. Apparently other disk managers are off by a few sectors when displaying this information from a disk formatted in quad density.

Well, there it is folks, a really slick 80 column DISK REVIEW for use by those with Geneves and 80 column cards. Some of the disk management features described here are not found elsewhere. Soon, you 40 column users will also have some of these enhanced features in a rewritten 40 column DISK REVIEW. To do this, Tony McGovern will have to decrease the size of the 40 column VIEW buffer (currently 17K) to find space to fit in new stuff. Which of the new features do you 40 column users want to see in the future 40 column DISK REVIEW, or do you want to keep the View buffer at 17K? Send Tony McGovern your response to these questions. There isn't room to put all the new stuff in the 40 column DR. What is your pleasure??   !!DONE!!

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IS THE AVPC CARD INCOMPATIBLE WITH SOME ASSEMBLY STUFF SHOWN AT THE CONFERENCE? PROBABLY NOT. Some technical problems occurred in one of the demonstration rooms because the system available to speakers included an AVPC 80 column card. This card was needed for the 80 column part of the Funnelweb v4.30 demo given in that room. Barry Traver could not get some of his XXB assembly routines to run from the AVPC card in 32 or 40 column mode. Also Chris Bobbitt, of Asgard, couldn't get the Asgard mouse software to work properly. Chris went so far as to note that 80 column card that Asgard will sell sometime in the future will be totally mouse compatible. Had I known of these incompatibility problems in advance, I probably could have done something about them. With the AVPC eprom #1, there is a software fix with sets up the 99/4A to ignore the AVPC. With the newer AVPC eprom #2, there is a certain keypress you use when the console is reset to make the 99/4A behave as if the AVPC wasn't there. If I would have told Barry and Chris about the magic 'reset keypress', they probably wouldn't have had any problems with our AVPC equipped demonstration room system. I apologize.   !!DONE!!

TI Fair Report
By: Andy Frueh

The 3rd annual Lima TI Fair was held May 26, 1990 in the cafeteria of Cook Hall. As far as I could judge, it was a success. Our fair is lucky in that attendance has been fairly consistent over the three years. Other fairs are suffering from drops in attendance. Several of these fairs appear to lack great organization. I do not wish to brag (well, not TOO much), but our group received great comments on the fair, and on its ORGANIZATION! This topic had been discussed by our group recently, in fact. It appears that the smaller number of people and committees you have, the better the show. We have about 5 regular members at our meeting, and we can get it done. When someone asks for something, it can get done because there are no channels to go through. We also did not offer a catered dinner. Instead, we had a dutch treat pizza party which, although I didn't get to attend, I heard went pretty well.

The following is a listing of the various tables we had at our show, and what each table was offering.

The Lima table had a new Funnelweb version, Don Shorock6s educational language programs, and we took orders for taped demos of the conferences. Of course, our library was there for copying by user groups.

The Great Lakes group was there. They had a few modules to sell, but the real focus was their financial software. A demo of this was running.

The Kawartha group was there as a representative of Comprodine. Comprodine manufactures a lot of graphics stuff and are currently branching out into great games.

The North Coast and TI Chips groups had a table. They, too had modules to sell. Also held here was a raffle by the group for a modem. This was sponsored by their group. Raffle tickets were available for sale.

COMMI was at our fair also. This group had tons of disk software, mainly fairware. This included graphics, music, games, and utilities. Their SLIDESHOW disks were also sold.

Another group that was there was the Hoosiers. They were selling some TI hardware. They also had neat buttons with messages such as "I love my TI". Also available were professional looking Fairware and Telco manuals.

The huge Chicago group had a few tables. The main focus was a tremendous selection of software and hardware. DD/DS drives could be had for $25! The MBX system was also being sold (if anyone knows more, please tell me about these. I am interested.)

A fascinating new (I believe it's new, anyway) product was on display at the WAS Controls table. It is a hardware

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project called The Extended BASIC module expander. It allows you to have Extended BASIC plus 5 other cartridges in one shell. You must provide all the GROMs. A rotary switch selects which module will run. These can be had for a total of $28 which includes shipping. I don't know if these work with a Navarone widgit, but I doubt it.

At the Pittsburgh user group table were flyers regarding the new hard drive controller. It is available from Electronic Systems Development Corp. The flyers claim the EDS card controls "4 hard drives and 4 floppy drives!" It can use SS/SD to the 1.44MB 3 1/2 drives. The DSR is on EPROM so it can be updated, and separate internal/external drive connectors. It adds pathnames and BASIC commands, and it is claimed to be 100% TI compatible. No price is given, but I asked for more information and will report on it as I get it.

Ramcharged computers was offering many old games, along with new products like TI-Artist + and The Missing Link. They also had a wide array of joysticks.

Of course, L.L. Conner was there. From him you could by several books, modules, disks, and joysticks. He also had Geneves, 80 column cards, several other cards, and the Prototype board. This board lets TI hardware developers create their cards on a pre-made board.

Jim Peterson brought his Public Domain software. These were $1.25! Towards the end of the day, he had a 'suicide' sale. Almost all of his copyrighted Tigercub software went for $0.25 each!

OPA was there displaying their current TI hardware, including their super cartridge expander.

Bud Mills was there selling the Horizon ramdisks and other P Box cards. I'm not sure if the RAMBO was at the Fair or not.

Paul Scheidemantle was with Harry Brashear. They had a lot of Paul's work which includes some games, and tons of graphics stuff. Also for sale was a guide to Home Publishing on the TI.

Asgard had a table and was displaying some of their new software including Rock Runner and Spell It! Also displayed was the Casio keyboard which could be controlled by the TI. When asked about the new MIDI interface, Chris Bobbitt said that the TI had the capability all the time! It was just never explored.

Jim Horn, a sysop on BBS's was selling TI hats, books including The Orphan Chronicles, and just about every issue of MICROpendium.

As for the demonstrations given in our two conference rooms...

Charles Good demoed Air Taxi, and other education programs from Don Shorock and the latest Funnelweb v 4.3 with a newer Disk Review program.

Barry Traver presented ways to combine BASIC and Assembly.

OPA's Garry Bowser, Asgard's Chris Bobbitt, and Bud Mills Services Bud Mills all demonstrated the latest hardware/software from their respective companies. Of course, each demonstration was held separately.

Jim Horn gave a talk on ways to get owners of TI's who don't use them to give them to places such as schools. This is a worthwhile cause, and is TAX DEDUCTIBLE!

There was quite a bit on Assembly programming. Bruce Harrison spoke on programming music in Assembly, and Bill Hudson showed an Assembly prescan routine.

The magazines-on-a disk, 9640 News and Genial TRAVeIER were showed by Beery Miller and Barry Traver, respectively.

Utilities were also displayed. Carl Roemstedt showed some label makers, Irwin Hott showed how to use ALSAVE, and Harold Hoyt gave a presentation on using Super BASIC.

A history demo was given by Gary Taylor. It was a bit of a history lesson to see the TI CC-40, the compact computer. This was termed the 4A "little brother," along with the 99/2. Also showed were items used with the Hex-bus interface.

Another demo of interest was the demonstration of Page Pro v 1.5 and some utilities to use with it. The demo was given by Paul Scheidemantle.

Finally, a typical fair-style discussion of problems with user groups was held with user group officers,

All in all, it was quite an event. I like fairs because they give me a chance to keep on top of the TI community and actually use things before I buy them. That is important to me. Also, they're FUN! There are those who think spending a day around computers isn't fun, but oh, well. As long as the attendees had fun.

And they did. I myself received numerous comments, none of them bad, about our show. Charlie Good also noted how many positive comments he had received. I believe there was over 200 people at our show. Considering the size of Lima and our group, that is a very good outcome. Hope to see everybody next year.

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