

UN ER GROUP





NEUBLETTER

July/August, 1991

LISTEN

In the middle of summer when everything usually goes to sleep, the news about the 99/4A and the Geneve is popping like firecrackers. Still, I planned my vacation at a place where the copying facilities I need to produce a meeting newsletter aren't around, so I make this a double issue, to do double duty for my July and August meeting news.

The copy inside is heavy on the historical archive stuff. That is, it's the kind of stuff you might want to cut out and paste into your archives to remind you how to make a 40 key keyboard do the work of a full-fledged PC keyboard, for example.

These kind of articles, like the article on TICARES, are full of white space, so to break the monotony, I peppered CSGD pictures that are used on my label program throughout the following pages. There's little narrative significance to the pictures; they just serve to ease your eye movement.

The narrative structure, to this article if not to the newsletter structure itself, I sum up in the words INSIDE and OUTSIDE to denote what is in the following pages, and what is out in the marketplace and coming, but not inside.

INSIDE is an article on TI CARES. The old equipment might need servicing. It's nice to know TI still cares enough to repair that old equipment. As time passes, it becomes clear that the home computers that won the marketing battles were not constructed to last and have lost the war. Look around. How many Commodore 64's are in use and being programmed in 1991?

Ron Williams has #32 of his P code articles inside. He's mixing P code and Assembly programming and showing US how.

You can look them up in the TI Writer manual in Your archives, or you can clip the article on TI Writer commands inside. It leaves off any discussion of the special character mode (a mode that deserves its own article).

the list of commands inside will serve as a quick reference reminder.

There's a rather longish article about modem standards for the techies among you. To know how modems work is to know how to choose a product that will work on your system and do what you want it to do. The 99/4m was built with device-independent Input/Output, but some of the devices being sold today weren't even on the drawing board.

peading of new devices, you'll also see an article about Mike Maksimik's MIDI interface inside. (Is anyone who owns a Commodore 64 marketing a MIDI interface to go with the new electronic keyboards?)

And printer ribbons are a constant supply you must obtain. The re-inking solution is in the spotlight inside.

Laserprinters certainly weren't around when the C64 & the TI99/4H were going head to head. There's an article inside about driving a Laserprinter with your home computer.

From the outside, from the Siouxland 99ers, comes news of an update to YAPP, Alexander Hulpke's paint program that takes advantage of all the 80 column devices for the 4A which give it a graphics capability near that of the Geneve Asgard still markets it.

The Cleveland area 99 users bring news of a new project which may be marketed by Bud Mills and Gary Bowser (OPA) called the Accelerator. It is a hardware project that speeds up the 4A to 20 times that of the 9900 CPU in the 4A and 4 times as fast as the Geneve CPU, the 9995. Let's hope the Accelerator board is not vaporware.

Speaking of overdue products ESD, the company who promises an alternative product to the Myarc Hard and Floppy Disk Controller (HFDC), ESD promises to give a card to Tony McGovern, who wants to delay his migration to the Amiga to add hard disk support to Funnelweb. Maybe that's a "two-fer".

This month's meeting will be held in the museum's new amphitheater. We will look at some new programs, like a Teenage Mutant Ninja Turtle game that uses The Missing Link. We'll also look at some speech stuff as prologue to the August meeting when I plan to show the new program from Germany that codes speech from fragments of the XB speech words.

There's work as well as play at these meetings. We have to discuss the next round of fairs, and what we plan to do about them.

Now, INSIDE!

MIDIMASTERSS TO BE MARKETED BY CRYSTAL SOFTHARE

(Reprinted from the June edition of Vast News)

Mike Maksimik has created Crystal Software Project to market the MIDI Master PP interface. You may recall that

(cont, from P.2)
a deal with Assard to market the device fell through due to a disagreement between Maksimik and Assard. V2.2 of the device is currently available for \$45, with Version 3 due at any moment. Registered owners of version 2.2 will receive version 3 at no charge as long as they have sent in their registration cards. For more information, contact Michael J. Maksimik, Crystal Software Project, 635 mackinaw nve., Calumet City, IL 50409-4014. [Incoording to the May Micropendium, V2.2 allows loading of disk-based music files and compiling of symbolic music files for playing on the MIDI interface. Version 3.0 will record keyboard-based music. I believe these YAMAHA keyboards being sold in department stores are MIDI devices. ——ed]

NOTES ON LASERPRINTING WITH THE T199/48

by Larry Fairbanks (Reprinted from the June 1991 Mid-South Newsletter)

One of the best things about the TI-99/4R computer is that it is compatible with most commonly used printers, including the revolutionary Laser Printer. Most of these use the parallel port that is used for dot matrix printers and function in much the same way in text mode, using the same signal for producing a letter "A", that the TI-4A Impact or Epson FX use. Graphics will require the use of printer drivers designed for raster graphics. Fortunately, most printing is of text so taking advantage of the Laser printer's 300 dot per inch (DPI) resolution and true letter quality is usually very straight forward. Just plug the parallel printer cable from the RS-232 card into the Laser printer before you turn it on. Then print to device "PIO.LF". Most Laser printers also have an R5-232 port that operates at 9600 baud.

The Laser Printer is also faster and quieter than the dot matrix. The first page comes out in about 30 seconds, and subsequent pages are printed at from four to ten pages per minute, depending on the model. It makes about as much noise as a Xerox because it is based on a copier engine. Special paper is not required but there are some limitations on the size and weight so consult your manual for specifics.

Paper size is limited to one dimension by the width of the fuser drum, which actually puts print to paper. In all but expensive models, it is 8.5" wide. Paper bins are 8.5 x 11 or 14 inches, but most units also have a manual feed capability for long or odd sized paper and envelopes. Colored or textured paper can also be used for special projects such as announcements or resumes. One can even double print, send the same print through twice, or print on previously printed paper.

A wide variety of fonts are available on IBM compatible diskettes that can be downloaded into laser printers with at least 512K of memory. In addition, all Laser Printers are now sold with a variety of fonts of different character sets, sizes and often type faces built right into the NEXT PRGE

(D.)

From P 3 printer. Additional fonts are available on cartridges which do not require downloading. [You can probably download a software font with Font Writer to PIO,LF-- ed].

Some differences are very apparent. Bold is a different font, rather than a double strike, so it often has thicker letters in addition to being much darker. Compressed print is a different font, as in dot matrix, but since many type sizes are available, CHR\$(15) is not sufficient to make the change. A CHR\$(12), on the other hand, will still give you a form feed.

A large number of escape sequences are available to control font usage, lines per page, underlining, margins, and positioning. They can also control orientation so you can print sideways. The escape sequence gets its name from the escape character, CHR\$(27), with which it starts, and it ends with a capital letter.

Many laser printer sequences are long and contain upper and lower case letters, numbers and symbols. Spelling and syntax are critical.

There are two different escape sequence formats for selecting downloaded fonts, the font description sequence, or long form, and the font ID sequence or short form. To use the short form, you must set the ID when downloading.

Escape sequences can be sent to the printer in basically two ways. If you are using the formatter, create a transliteral with a puctuation mark like an = sign which is ASCII 61. After using it, you will wish to reset it since it may be used in the text. Remember, do not use any real characters in your transliteral definition. Just ASCII definition numbers. Even the number 8 for 8 lines per page must be entered as a 55 in the transliteral.

The other way is to imbed the escape sequence in your This works for a straight print-out [by "a straight text. print-out, the author seems to mean a PF from the TI Writer editor-- ed], but not with the formatter. On the other hand, the translitteral won't work with a straight print. It is good for small projects that do not require formatter exclusive functions such as fill and adjust. advantages are that you do not need to look up ASCII numbers and keep going to the formatter to print each test To create the escape characters at the start of the sequence, press CTRL + U, FCTN + R, and CTRL + U again to turn the special character mode [of TI Writer] off. will see a little 1b character [the escape character], then proceed to type in the rest of the sequence with actual characters, not ASCII numbers.

Using the printer is often much easier than you might think. I dumped the "General Notes" documentation file from my Funnelweb 4.30 diskette to the printer without modification and it could be sent to the printer "as is". It is even easier with software that is designed to support it.

NEH RIBBONS OR OLD

by Marshal H. Ellis (Reprinted from the June 1991 Mid-South Newsletter)

Since augmenting my computer with a printer I have generated a lot of paper copy. Funny how printers seem to

go well with the computer, but that's another story. At one point, I found that I was constantly running my ribbon 'till the print turned grey. Not wanting to splurge on a re-inking machine, and since the ribbon spools seemed cheap, I delayed looking into a solution. I just kept buying new ribbons.

About 2 years ago, while using my Star - Gemini 10X, I decided that I would begin spending less money on printer ribbons. A newsetter article from the Northcoast TI Chips User Group had alerted me to a useful product called Ribbon Re-New, a low viscosity lubricated printer ribbon ink for dry ribbons. Still, without an inking machine, I tried it out, and it worked! Even using manual methods, re-inking is like having an almost new ribbon, after allowing a few days to dry out.

Originally, I was re-inking the spool ribbons used by the 10%. In order to keep things simple, I folded a finger sized piece of heavy paper towel in a 'v' shape, and positioned it behind the print head, toward the front panel. I placed the ribbon inside the paper loop, at the level of the print head. Then I could turn the spools by finger pressure while applying a few drops of ink to the pad. In little time in storage and it would be ready for use. This is where I also learned that a sure-fire cleaner is the mechanics' hand cleaner (GOOP). I'm sure that a re-inking machine would be much cleaner.

Now I have a Panasonic KX-P1180 printer (9 pin) which uses a cartridge type ribbon. So, now I gently pry open the cartridge, apply a few sparing drops of the ink to the ribbon and to the roller pad, then close it up. After a thorough winding and a few days on the shelf, and turning the ribbon some more, it will be ready for use. One could also pass a folded pad under the exposed portion of the ribbon, and proceed as noted above. The provided instructions also note that their regular viscosity or roller cartridge viscosity ink, the thicker type, should be used for cartridges which have a self contained re-inking roller.

Since the time that I bought my supplies the prices have been stable. At this time, the low viscosity Ribbon Re-New, for rejuvenating old dry ribbons, sells for only \$5.00 for a 2 oz. bottle. You could choose from three colors. The regular viscosity ink sells for only \$2.75 for a 2 oz. bottle, available in 10 different colors. Also they supply a thicker roller cartridge ink for \$2.90 in a 2 oz. bottle for Panasonio type cartridges with re-inking rollers. The above noted prices include shipping costs. A variety of ribbons, inks, inking machines and cartridge refurbishing kits are also available.

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WORD PROCESSING COMMANDS

WORD PROCESSING - Part 2 by Ted Peterson

(reprinted from the June 1991 issue of the PUNN newsletter)

In text editor there are three different modes in which you may give commands. Then in text formatter, there are formatter commands. So there are altogether four different sets of commands that you should become familiar with when doing word processing with the TI.

Below are listed three of the four sets. We will not cover the "special character mode" because the use of this mode depends upon the type of printer you are using. Most people never use this mode anyway, because you can do basic word processing without ever getting into it.

Keep these pages handy for reference when you are doing word processing. But read the TI-Writer manual if you don't understand how a certain command works.

Edit Mode Commands

•					
Back Tab	CTRL	T`			-
Beginning of Line	CTRL	V			
Command - Escape	FCTN	9	or	CTRL	C
Delete Character	FCTN	1	or	CTRL	F
Delete End of Line	CTRL	K			
Delete Line	FCTN	3	or	CTRL	N
Display Line Numbers	FCTN	_			
Down Arrow	FCTN		or	CTRL	X
Duplicate Line	CTRL	5			
Home Cursor	CTRL	L			
Insert Blank Lines	FCTN	_		CTRL	
Insert Character	FCTN			CTRL	
Last Paragraph	CTRL	-	or	CTRL	H
Left Arrow	FCTN		οr	CTRL	S
Left Margin Release	CTRL	_			
New Page	CTRL	9	or	CTRL	P
New Paragraph	CTRL			CTRL	
Next Paragraph	CTRL		or	CTRL	J
Next Window	ECTN	_			
OOPS!	CTRL	_	or	CTRL	Z
Quit	FUTN				
Reformat				CTRL	R
Right Arrow	FCTN			CTRL	D
Roll Down	FCTN		-	CTRL	
Roll Up	FCTN		or	CTRL	В
Screen Color	CTRL				
Special Character Mode	CTRL				
Tab	FCTN	7	or	CTRL	Ι
Un Blank Screen	FCTN	S	or	CTRL	S
	FCTN	D	or	CTRL	D
Up Arrow	FCTN	E	or	CTRL	E

CTRL 7 or CTRL W











Word Tab

CTRL 0 Word Wrap Text Editor Command Mode C Copy Enter a start line, space, stop line, space, after line. Delete Enter start line, space, stop Delete File DF Enter disk number & file number. Edit Ε Enter. Find String FS Enter. /, string,/,Enter Load File LF Complete File Enter DSKx.Filename Part of a file The line number of the first line, space, line number of the last line, space, DSKx.Filename Merge part of a file with contents of RAM Line number in RAM to Merge, space, same as above М Move Start line, space, stop line, space. after line PF Print File Device name (e.g., PIO, DSKx) P Purge Are you sure? Y/N Quit Enter, S(ave file), P(urge), E(xit), Enter Recover Edit RE Recover Y/N (will not recover ist line) RS Replace String Enter. /,old string,/,new string,/, Enter, replace string (yes, no, all, stop) Save File SF Complete file DSKx.Filename, Enter Part of a file First line to save, space, last line to save,

NEXT PAGE



Show line

Show Directory

Tabs

x = Disk Number

FORMAT COMMANDS

Adjust



SOURCE

Alternate Input Begin Page Center Comment Define Prompt

Fill Footer Header Include File

Include File

Left Margin Line Space Mailing List No Adjust No Fill

Overstrike

Page Number Reset

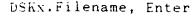
Page Length Right Margin Required Space

Space

Transliterate Underscore

New Page

n = number
t = text



Type the line number of the line to be shown

SD

mes number

. [

het Tabs

. AD

n

.ce n

.DP n:r

. F l

.FO t

.IF "DSKn.Filename"

IN n

.LM n

.LS n

.ML .NA

NF

@

.PA n

.PL n

.RM n

^ (SHIFT 6)

.SP

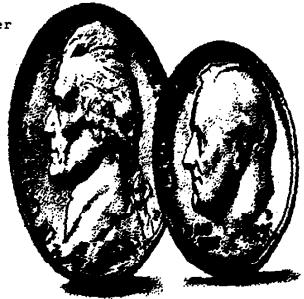
.TL n1:n2, nz & (SHIFT 7)

CTRL 9 or CTRL P









TI STILL CARES

From the Pittsburgh User's Group, Gary Taylor writes...

Texas Instruments still cares: Texas Instruments still provides a great service to the TI-99/4A user by providing repair service for our computers: I called Texas Instruments at 1-800-TI-CARES (1-800-842-2737) and asked about their repair service. I was told that they still repair all the equipment manufactured by them for fixed prices and if it could not be fixed they would replace it with on hand stock. Following are the prices I received today, March 15, 1991 to repair the equipment:

EQUIPMENT	PRICÉ	S&H	
TI-99/4A console	3 1 5	\$ 6	
Peripheral Expansion Box	s 70	s 6	_
RS232 card	5 33	\$ 6	84 m
32K card	s 4	s 1	L. Art.
Disk controller card	\$14	s 6	
Flex cable (fire hose)	\$ 25.95	\$ 5	<u> </u>
SSSD disk drive	s 80	\$ 6	
P-code card	\$ 33	5 6	
Speech synthesizer	s 3 0	\$ 5	
TV modulator	\$12.95	\$ 4	
Joy Sticks	\$9.75	\$ 3	
Power transformer	510	s 3	

They will also require state sales tax for whichever state you are ordering from. They accept Master Charge, Visa, and personal checks. You can send your broken equipment with the payment to:

Texas Instruments ATTN: Repair Center 2305 North University Ave. Lubbock, TX 79408

they will also repair CC-40 equipment at the following rates:

CC-40	\$ 60	\$ 6	~15
Printer/plotter	\$ 55	\$ 6	BATSIS
Printer 80	\$55	\$ 6	- L. 17
RS232	\$33	\$ 6	
Modem	\$33	\$6	
8CS3	OHIO	.	
Computer Constant Contracts	ОН	- 1	
GEROCK	CIN-DAY	CIM	
TE DISA C	CIN	SIM	,

WORD PROCESSING TIPS

LITTLE TIPS AND TRICKS FROM THE TI EXPRESS

Funnelweb's Editor-

- 1. To change screen color hit control and 3 at the same time.
- 2. (ontrol and . changes the letter under the cursor to lower case.
- 3. Control and , changes the letter under the cursor to upper case.
- 4. Control and A move screen down one screen (page down).
- 5. Control and B move screen up one screen (page up).
- 6. Control U and then Shift J puts in a line feed. Control U returns to original mode.
- 7. Control M can be used for a carriage return.
- 8. Control C returns you to the command line. 9. Control E S D $\rm X$ H J act as arrow keys.
- 10. Control Z acts as the Tab.
- 11. Control T acts as the back tab.
- 12. Control G places a blank line above the line you are on.
- 13. Control L places the cursor in the top left corner of the
- 14. Control P places a new page mark.
- 15. When using Show Directory using the arrow keys moves the little lines up and down. Hitting the space bar places a carat beside the file and marks it. Then just hit enter and LF for load file. The name of the marked file will now appear in the command line.

Funnelweb's Formatter

- 16. When at the prompt for a file name Function 7 for a disk directory. Then proceed as above (except no carat). Control = brings you back to the Formatter. Now hit Function D and the marked file will appear.
- 17. When at the TI Writer menu or E/A menu, Function 9 allows you to exit Funnelweb in a graceful manner. The error checking allows you to be sure that this is what you want to do.



INTRODUCTION TO THE UCSD P-SYSTEM BY RON WILLIAMS



This month as promised I have the Assembly and Pascal code to put the date in the p-system memory. This code is a supplement to the code in my article last month to get the date from memory.

When the p-system puts the date in memory when using the Filer program it also puts the current date as entered on the disk in volume #4: or the root volume. This is why you always see the last date you used the system after boot up. If you use this program I have supplied it does not put the date on the disk in volume #4: so at boot up as it gets the date, the date it gets may be off by a lot of time. If this is a problem use the date command in the Filer program. But I think you could use this program not at boot up but for programs you have written where you would like to change the date without exiting and going to the Filer.

You may want to compare the code in this article with the code in my last article. The biggest difference is that I broke up the code before into functions for each month, day and year. But when I put the date into memory I put it in with one procedure.

Please keep in mind that this program does no error checking for good dates. So you may want to put in some error checking. If you try to put in a date like June 31, 1991 the program will have no problems with that. As you can see this date is not possible but the program will not know that. It will put this date into memory just as easily as a correct one. Well thats it for this month I hope you have fun with this code. Program inputdate;

var
dayın, monthin, yearin : integer;

PROCEDURE DATEIN(DAY, MONTH, YEAR : INTEGER); EXTERNAL;

Begin

end.

```
writeln('This program will let the');
writeln('user enter the date and the');
writeln('program will put the date in');
writeln('p-system memory');
writeln('WARNING THIS PROGRAM HAS NO');
writeln('ERROR CHECKING FOR PROPER DATES');
writeln;
write('Enter year(last two digits only)=>');
readln(yearin);
write('Enter month=>');
readln(monthin);
write('Enter day=>');
readln(dayin);
DATEIN(dayin,monthin,yearin);
```







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Taking The "Buzz" Out of Buzz Words by Alan D. Applegate Copyright 1990 by eSOFT, Inc. All Rights Reserved

Note: The following three part series on modem fundamentals is reprinted from the May 1991 CPUG newsletter. This series of articles may not be reproduced in any form except by inclusion of the above copyright notice. This file is authorized for distribution without charge only if it is unchanged in any way. Any use of this information in any other way must include proper credit to its source: the June, July, and August 1990 issues of "POSSIBILITIES", a monthly customer support publication of:

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Part I 9600 BPS Modems - Are There Standards?

Contrary to what might he believed, standards for high speed data transmission have been in place for some time. Acknowledged standards came in two forms - a half duplex standard, commonly used in fax machines and called V.29, and a full duplex standard called V.32 (we'll take a look at half and full duplex later). The technology implement the V.32 in the series). required to standard remained prohibitively expensive for many years. forced most modem manufacturers to create their own less expensive proprietary transmission methods. U.S. Robotics, for example, created the Courier HST, ("High Speed Technology"). This design is not full duplex, meaning that it does not support high speed transmission in BOTH directions. Current HST modems send data at 14,000 bps in one direction, and 450 bps in the other direction. The high speed channel changes direction depending on which side of the transmission has the most data to send. modems can only talk at high speed

with other HST modems, although they also adhere to existing standards for 300, 1200 and 2400 bps operation.

Telebit, another modem manufacturer, created PEP ("Packetized Ensemble Protocol"), which is used in their Trailblazer modem series. Like the GST, PEP modems will only connect at high speed with other PEP modems.

Hayes also developed their own technology for high speed transmission, in the absence of an inexpensive standard. Like the others, Hayes high speed modems only talk high speed to other Hayes modems.

Fortunately, the cost of V.32 high speed transmission technology has come down drastically in recent years, and is displacing other high speed modems proprietary protocols in popularity. This means that, finally, speed modems are high starting to communicate with common standard. U.S. Robotics' new Courier HST Dual Standard is one of a new high speed modem utilizing U.S. Robotics' own transmission standard and the V.32 high speed standard. The new Hayes V-series Ultra Smartmodem 9600 is

another "multiple-standard" high speed modem that utilizes the V.32 standard.

In the next part, we'll discuss the CCITT and the international compression standards. What works, what doesn't, and what is realistic to expect from data compression in a modem? MNP vs. V.42bis.

Part 2: Modem Standards

The CCITT is the acronym for the Consultative Committee o n International Telephone and Telegraph. This is an international of technical experts responsible for developing data communications standards for world. The group falls under the organizational umbrella of the United Nations and its members include representatives from major modem manufacturers, common carriers (such ATT), and 8.8 governmental bodies.

CCITT Modulation Standards

The CCITT establishes standards - actual for modulation modem methods. also signaling determines standards for correction and data compression. For this reason, it is possible (and likely) that one modem might adhere several CCITT standards. depending on the various features and capabilities the modem offers.

All modems signal one another at a variety of speeds, so CCITT standards for modulation are utilized by virtually every modem manufacturer. Some of the standards which are primarily modulation do include some of the higher layers (such as negotiation) as well. Multi-speed modems may use several of these standards, which include:

V.21 is a data transmission standard at 300 bps. This standard is used primarily outside of the

United States. (300 bps transmissions in the United States primarily use the BELL 103 standard.)

V.22 is a data transmission standard at 1200 bps. This standard is also used primarily outside the U.S. (1200 bps transmissions in the US primarily use the BELL 212A standard).

V.22bis is a data transmission standard at 2400 bps. This is the international standard for 2400 bps, and is used both inside and outside the US.

V.23 is a split data transmission standard, operating at 1200 bps in one direction and 75 bps in the reverse direction. Therefore, the modem is only "psuedo-full-duplex", meaning that it is capable of transmitting data in both directions simultaneously, but not at maximum data rate. This standard was developed to lower the cost of 1200 bps modem technology, which was still very costly in the early 1980's, when such modems designed. This standard is still in use, but primarily in Europe.

V.29 is a data transmission standard at 9600 bps which defines a half duplex (one-way) modulation technique. Although modems do exist which implement this standard, it has generally only seen extensive use in Group III facsimile (FAX) transmissions. Since it is a it method, half-duplex substantially easier to implement this high speed standard than it would be to implement a high speed full-duplex standard. V.29 is not a complete standard for modems, so V.29-capable modems from different manufacturers will not necessarily communicate with one another.

V.32 is also a data transmission standard at 9600 bps, but V.32

full-duplex (two-way) defines modulation technique. It is a full modem standard, and also includes correcting forward error negotiation standards as well. Many modem manufacturers already will bе introducing or This is V.32-compatible modems. generally considered "the" standard for high-speed modems today.

V.32 is expensive to implement, since the technology required for it As this standard is complex. and becomes more common manufacturing techniques are refined, the pricing for V.32 modems should go steadily downward. this writing, V.32 capable modems are selling for between \$500 and \$1000 each.

Some manufacturers have created modems that can use both their own proprietary high speed standard and the V.32 standard, for compatibility with their older, non-V.32 modems. Haves Ultra and The new HST Dual Standard are Robotics "dual examples ٥f the new personality" modems that are now on the market.

V.32bis is a developing high speed standard. When fully defined (likely by early 1991), V.32bis will operate at 14,400 bps and, like V.32, will be a full-duplex method. The CCITT has not yet defined this standard, so no modems currently use it (although some new modems have implemented what is expected to be the standard and may claim V.32bis compatibility).

Error Crrecting and Data Compression

The CCITT also has adopted formal standards for the higher layers of Error Correction and Data Compression. In order for any error correction or data compression protocol to work, modems on BOTH ends of the connection must support

it. Once two modems are connected, they automatically negotiate between themselves to determine the best mutual protocols they both support.

V.42 is a CCITT error-correction standard that's similar to MNP Class 4 (See below for what is MNP). because the V.42 standard includes MNP compatibility through Class 4, all MNP 4-compatible modems error-controlled establish connections with V.42 modems. This standard, however, prefers to use its own better performing protocol - LAPM (Link Access Procedure for Modems). LAPM. like MNP, copes with impairments line phone automatically re-transmitting data corrupted during is that transmission assuring only error free data passed through the modems. Many modem manufacturers make MNP Class 4-compatible modems offer V.42-compatible and some modems as well.

V.42bis CCITT data iя a compression standard similar to MNP Class 5, but providing about 35% better compression. Of course, this means it provides better throughput. V.42bis only compresses data that needs compression. Each block of data is analyzed, and if it benefit from compression, compression is enabled. Files on bulletin board systems are often compressed already (using PKZIP, and similar programs [these programs are in the PC world; i.e., they run on MS DOS machines. 99/4A and Geneve are I/O device independent so this article is also relevent to the above machines -ed].) While MNP Class 5 can actually decrease throughput on this type of data, V.42bis will not - compression is only added when a benefit will be realized.

To neglotiate a standard connection using V.42bis, V.42 must also be present. Thus, a modem with V.42bis data compression is assumed to include V.42 error

correction. Some modem manufacturers already make V.42bis compatible modems, and more are on the way.

MNP stands for "Microcom Networking Protocol" and was created by Microcom, Inc., a modem manufacturer. MNP offers end-to-end error correction, meaning that the modems are capable of detecting transmission errors and requesting re-transmission of corrupted data. Some levels of MNP also provide data compression.

As MNP evolved over time. different classes of the standard were defined, describing the extent that a given MNP implementation supports the protocol. Most current implementations support Classes 1 through 5. There are higher classes, but are usually unique to modems manufactured by Microcom. Inc. since they are proprietary.

MNP is generally used for its error correction capabilities, but MNP Classes 4 and 5 also provide performance increases, with Class 5 offering real-time data compression. The lower classes of MNP are not usually important to you as a modem user, but they are included here for completeness.

MNP Class 1 is referred to as Block Mode. It uses asynchronous, byte-oriented, half-duplex (one-way) transmission. This method provides only about 70% efficiency. It provides error correction only, and is rarely used today.

MNP Class 2 is called Stream Mode, and uses asynchronous, byte-oriented, full-duplex (two way) transmission. This class also provides error correction only. Because of protocol overhead (the time it takes to establish the protocol and operate it), throughput at Class 2 is actually only about 84% of that for a connection without MNP, delivering about 202cps (characters per second) at 2400 bps CDS is the theoretical maximum). Class 2 is rarely

used today.

MNP Class 3 incorporates Class 2, and is more efficient. It uses a synchronous, bit-oriented, full-duplex method. The improved procedure yields throughput about 108% of that of a modem without MNP, delivering about 254 cps at 2400 hps.

MNP Class 4 is a performance enhancement class that uses Adaptive Packet Assembly (tm) and Optimized Data Phase (tm) techniques. Class 4 improves throughput and performance by about 5%, although actual increases depend on the type of call (local or long-distance, noisy or clean connections), and can be as high as 25% on some links.

MNP Class 5 is a Data Compression protocol which uses a real-time adaptive algorithm. It can give an increase of up to 50% in throughput, but the actual performance of Class 5 is very dependent on the type of data being sent. Raw text files will allow the highest increase, while program files cannot be compressed as much and the increase will be less. On pre-compressed data (files already compressed with ARC, PKZIP, etc.), MNP can actually EXPAND the data and performance can actually decrease. For this reason, MNP 5 is often disabled on BBS systems.

MNP Class 7 is the other major MNP protocol you are likely to encounter. MNP 7 provides Enhanced Data Compression. When combined with Class 4, it can obtain about a 300% improvement in performance. It is designed primarily for use with V.22bis (2400 bps) modems. This currently is unique Microcom modems. Since it requires much more hardware and is usually inferior to V.42bis, it is not likely to proliferate.

What does it all mean?

Despite the fact that they can seem quite confusing, all of these standards exist to benefit you the

modem user. You want to be able to compare modems on price, reliability, performance, and support. You also want to be able to know that modems from different manufacturers will communicate with each other.

The past couple of years in the high speed modem arena has shown what happens when market demand occurs faster than associated standards. You are forced to pick a single manufacturer and become locked in to gain the capabilities you want. The purpose of standards is to prevent this situation.

When standards are widely adopted, you get the best of technology and competition. However, you need to know what the standards mean to be able to be an informed consumer.

Next month we'll wrap up this discussion with explanations of most of the rest of the various terminology common to the modem world, but not always fully understood.

Next Month: Part 3: Communication Terminology

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DADDR	; PUT DATE IN MEMOR .EQU 3610H	Y FROM KEYBOARD	
	PROC DATEIN, 3 MOV *R10+,R2 SWPB R2 SLA R2,1 MOV *R10+,R3 SWPB R3 SRL R3,4 MOV *R10+,R4 SWPB R4 MOVB R4,R3 SRL R3,4 4R R2,R3 LI R1,DADDR MOV R3,*R1 B *R11 .END	GET YEAR FROM KEYBOARD SWAP BYTES MAKE ONE BYTE SHIFT BILS FOR YEAR GET MONTH FROM KEYBOARD SWAP BYTES MAKE ONE BYTE SHIFT BILS FOR MONTH GET DAY FROM KEYBOARD SWAP BYTES MAKE ONE BYTE MOVE BYTE TO REGISTER 3 SHIFT BITS FOR DAY ADD BYTES FOR LAST BITS INPUT LOAD ADDRESS OF DATE IN MEMORY MOVE TO ADDRESS OF DATE RETURN TO CALLING PROGRAM	STOP2
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