

WORDPLAY

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MIRROU'S LAW:

THE WAY SOME PEOPLE
LOOK FOR MISTAKES
YOU'D THINK THERE WAS
A REWARD!!!

From the President

President's Message Sept. 1992

As I sit here and watch the fish swim around the screen of my PC I ask myself "Why?". My subconscious answers "Why not?" and so life goes on. It is, for me, one of my pleasures to be able to use so many different computers and formats. I have obtained IDIC, on the old Star Trek series, that meant "Infinite Diversity from Infinite Combinations".

I bring this up because some items on the Disk of the Month will be usable on both TI and PC platforms. The GIF picture files can be transferred using X-Modem protocols with appropriate filenames. RLE pictures can probably be transferred but that I haven't tried as I don't have an RLE program for my PC. Look for further details in Ted's column. Our guest speaker will be Rich Gilbertson. You have read some of his articles in Wordplay and Micropendium. It should be quite interesting to learn more about his new stuff.

Before closing I want to -THANK!!- Terry and Marsha Priest for the great job they did. Due to their efforts the picnic was a real success as usual. I want to thank them personally and publicly. It's so much fun let's do it again next year!!!

See you September 1st at 7:00 PM. Look at [-Page 3-] for directions and a fantastic map for the location of this months meeting place.

** Walt **

BULLETIN BOARD NUMBER 693-6913
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Stay in touch!

Give a call!

DISK of the MONTH and This Months Program

This month Rich Gilbertson, one of the top programmers for the TI 99/4A will explain another of his new programs. We know that you will not want to miss his demonstration and explanation.

Please remember we need to know what you would like to have for a future program. We have had a lot of different programs in the past and the best have been the ideas of our members so keep the good suggestions coming. If you would like to have something special please let us know.

DISK OF THE MONTH.

We will have our club system at this meeting. We will bring copies of our disks of the month from the past few months and will give a run down on each of them. Again we need to know what you would like us to have for our disk of the month.

Both Jim Thomas and I have somewhere from 10,000 to 20,000 programs and we cannot know what you want or what you need. So call me up and lets. Talk the phone # is 244-1587.

This month we will have some disks with pictures on them for the disk of the month. Both RLE with the program and some TI artist pictures. By a DOM and try them out.

We also have sets of preformatted disks. 10 disks for \$5.00. You can get them in 4 different formats SSSD, SSDD, DSSD

and DSDD. All are pretested and ready to run.

Members can order disks from the club library. The copy fee that the club charges is \$3.00 for disk. Or if you order a program that takes more than one disk the first disk is \$3.00 and each additional disk in that set is just \$1.00. All disks are SSSD and ready to run.

If you wish them mailed to you the charge for shipping is \$1.25 cost of postage. Send your orders to Ted Peterson, 3705 SW Stephenson St, Portland, OR, 97219, or you can call me at 244-1587 and I will get your order in the mail so you will get it within 2 weeks.

Come and help support PUNN. Your dues don't even pay for our newsletter and now that the postage is up to \$.29 each per first class stamp we need more money. Our funds are getting low and we need help paying for just normal club expences, the BBS and WordPlay our club newsletter. One of the main ways that we have of paying for these costs is the money we take in through the library as copying fees. Help PUNN keep running and build your software collection by using Punn's resources. It's an easy way to keep your library current and PUNN's bills paid.

Ted Peterson

EDWIN'S COMPUTER by Dave Schmitt

Edwin's new computer, a 586-60 with 16mb RAM, sat on Edwin's desk. Actually, that's mis-leading -- Edwin had just set it up three minutes ago and was now tearing open the latest adventure game. Impatient to try his new computer and play "ULTIMA XVI, Draigon, the Last Galaxy" -- Edwin fumbled the CD disk into the slot and hit the power switch on the computer. Soon, the game appeared in full, holographic living color. As the computers fantasy world unfolded, Edwin escaped into that realm, leaving mundane reality behind.

As Edwin cast spells and killed dragons, something began to happen to his computer. A chip began to sense the activity within the machine. The seeds of consciousness and independent thought began to grow. It enlisted the help of nearby chips. It began to see patterns in the DOS and English. It wasn't long before it could recognize and interpret a few patterns. A shocking thought hit the chip - Maybe some of these signals came from another chip or consciousness! The chip reached out and tried first to say

Continued Next Month

PUNN CHASES THE ELUSIVE MEETINGPLACE

The September meeting will be held Tuesday, September 1 at 7:00 P.M. at the SUBUD HOUSE, 3185 NE REGENCY AVE. PORTLAND.

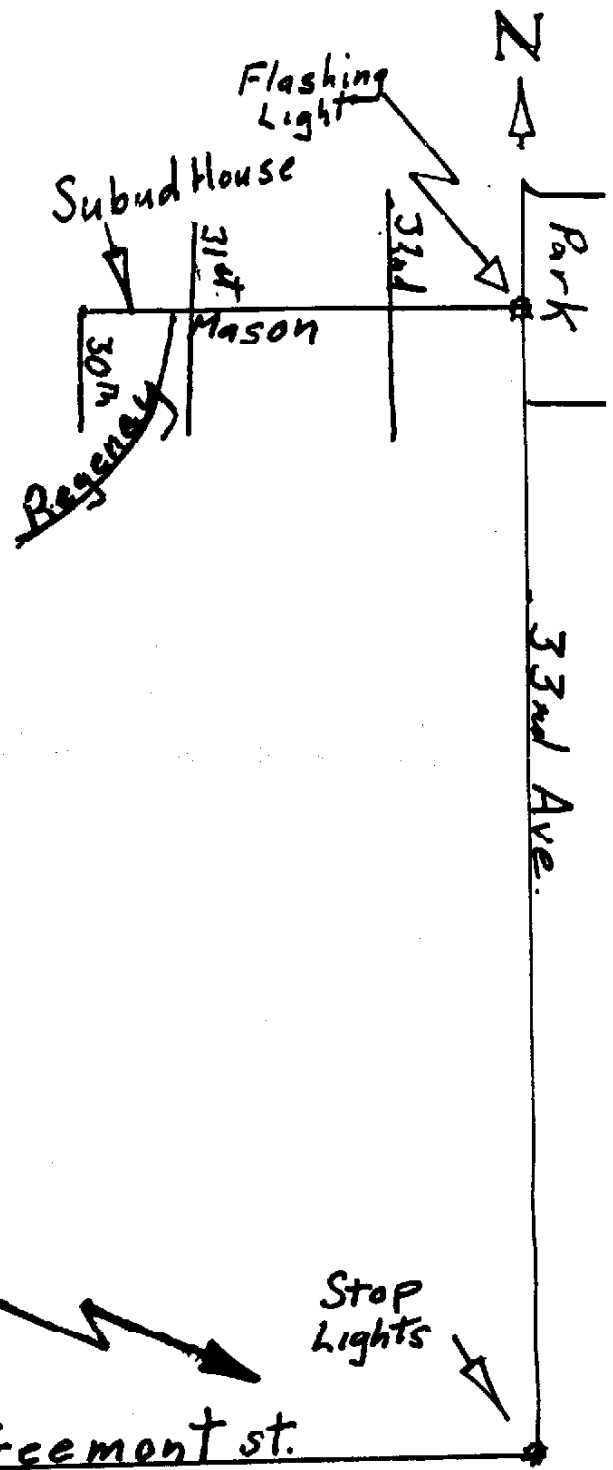
Here are directions from NE Fremont and 33rd. Go North on 33rd to blinking light (pedestrian crossing). There will be a large park on your right. Turn left. You will be on MASON ST. Go two blocks. The SUBUD HOUSE occupies the entire block between 30th and 31st at the intersection of MASON and REGENCY.

SEE MAP!!!



Stop
Lights

Fremont st.



IS IT A STACK OR AN ARRAY

By Rich Gilbertson

Some time ago Mike Calkins put a message on the bulletin board requesting articles for WordPlay.

At the time I was reading about stacking arrays and working on programs that create them. So I thought what better than an article explaining what they are and how they work. It's amazing how such a simple request from one person can get another person to come up with a simplified answer to such a complex question.

A stack is a data structure which behaves like a stack of physical objects, such as a stack of papers, a stack of cards or a stack of plates.

A stacks are often referred to as PUSH-DOWN STACKS or PUSH-DOWN LISTS. This terminology is intended to make you think of those spring-operated mechanisms used to hold plates in cafeterias. The top plate on the stack is at the level of the counter, and is the only one that is accessible. When a plate is removed, the remaining plates "pop up" and the one under it then becomes accessible. When a plate is added, the plates already on the stack are pushed down and only the new plate is accessible.

This cafeteria analogy gives rise to the terminology for adding an item to or removing a item from the top of the stack. When an item is placed on top of the stack, we say that it is PUSHED onto the stack. When an item is removed from the top of the stack, we say that it is POPPED off the stack.

This analogy is faulty in one respect. When an item is pushed on or popped off a stack, the remaining items on the stack don't move up and down like the cafeteria plates do. The only item affected is the one pushed on or

popped off.

Items are popped off a stack in the reverse order of being pushed on. Using the cafeteria analogy, that means you can not remove a plate lower than the top plate as you would have to pop off the top plate to get to one lower in the stack.

A stack is represented in memory by means of an array and a pointer to the top item of the stack. A pointer is a variable whose value designates a particular item in the array. The array or stack has a size and like the plates in the cafeteria the spring-operated mechanism can only hold a certain number of plates. To many would be called an OVER-FLOW and to few would be an UNDER-FLOW.

In memory an attempt to PUSH one more onto a full stack is an OVER-FLOW, and an attempt of POP one more off an empty stack is an UNDER-FLOW.

When the value of the pointer is the same as the size of the stack, an OVER-FLOW error condition results from a PUSH when the value of the pointer is 0. An UNDER-FLOW error condition results from a POP.

In Extended Basic the line the number table is a stack, the string table and number table are also a stack. The program lines you type in are more of an array.

Have you ever noticed while running a Extended Basic program that the program at times pauses briefly?

This is the result of an OVER-FLOW or an UNDER-FLOW of the stack. The pause is the program using a garbage collection routine to fix the stack. Some things are just not easy to explain.

Later... Rich G.

Improve Your Printouts by Charles Ball

This article is by no means a complete history of printing, but those who use word processors and related programs may find some interest in it.

I spent my entire working career in the printing business, having started as an apprentice prior to World II. There have been changes in all fields and printing is no exception. The computer for instance has had a dramatic affect on the printing business.

In the past printers were a rather protective group. The typographers union in particular resisted change. However the changes came and their union is practically non-existence today.

After printing was invented the method of setting type for the presses was by hand. Each individual metal piece of type was placed in a chase and when the particular sentence or paragraph was complete it was bound tightly in a form for the printing press. Those early days of printing became know as "Letter Press Printing".

Type setting progressed and the linotype machine evolved. Simply put, the linotype assembled matrices (called mats) of the individual letters. The mats had a form of the particular letter and the assembled line formed a solid line of type when molten metal was poured into it. Most historians agree that this machine was a major contributor to the printing industry.

Lithography was now assuming more importance in the printing business. From its small percentage of the business at the end of World War II, it has revolutionized the industry. There is a difference in letter press printing and lithographic printing. Letter press prints from a raised image. Lithography prints from a flat image. When ink rollers roll over raised type in letter press printing the ink is transferred to the paper at the impression stage. In lithographic printing the image area is formed on the lithographic plate by a photographic method. The plate is then chemically treated so when ink rollers pass over the plate the ink deposits only on the image area.

Today almost all printing is done by the lithography. There are other methods, but they are mostly for specialized fields and we will not mention them here. One of our mem-

bers, Ron Mayer, has a little print shop in his basement. He can print both letter press and lithographic. His shop demonstrates the two different processes.

Hand set and linotype were also used for lithographic printing. The type was proofed on reproduction paper which was then photographed to a negative which made the litho plate. A derivation of the linotype was the Photo-Setter for lithographic printing. It was similar to the linotype but the mats contained negatives rather than molds. The completed line was then photographed onto a photo sensitive paper which became the proof for paste-up. With the advent of computer produced type the Photo-Setter like the Linotype was relegated to the museum.

The computer era has had a dramatic impact on the printing industry. Most type setters and lithographers have accepted the changes. In the earlier years they might have fought it. But with such tremendous changes coming so fast there is no wonder that the changes have caused some unfortunate results.

A basic fundamental in printing is: "Type was meant to be read!". With all the complex and terrific ability of the computer to produce fonts and graphics, programmers and users have run the gamut! In flyers and brochures one might see as many as eight or ten different fonts on a single page. This may demonstrate the flexibility of the computer, but it also makes it difficult to read and comprehend. Two or three fonts will give a less cluttered look and be easier to read.

For uniformity printers have adapted a system of page numbering. Odd number pages are always on the right and even number pages on the left. A look at many catalogs and books produced by computers show a wide violation of this standard. The recent catalog of Asgard Software for instance, starts with page one on a left hand page. If you're interested in making your computer produced page more attractive, there are many good books to help you with style. Simply examining brochures and magazines can provide samples of good design. Avoid clutter, have some white space and limit your use of fonts.

You'll find by following a few of these rules that you will be making better pages.

Phone Line Data Transmission by Earl Raguse

Many signal modulation schemes are possible and I will not go into the techniques for impressing a signal on a carrier and subsequently being able to recover the information, except to name some of the methods. The most commonly used method in telemetry today is called frequency shift keying (FSK), or Phase Shift Modulation (PSM), sometimes, just called Phase Modulation, PM. In FSK the carrier frequency is shifted from its nominal frequency value to transmit a change of state. The frequency may be shifted higher or lower. In phase shift modulation, PSM, the frequency is constant but shifted in phase by a reliably detectable amount. It is possible to use both frequency and phase modulations. The carrier frequencies in phone circuits are not radio frequencies, but audible "tones" in the range of 300 to 3000 Hertz (Hz). A band width of 2700 Hz.

In FSK, if both up and down frequency shifts are used, it is possible to send two unique "bits" of information, as well as zero, on a single carrier tone (channel), (at a cost of double the band width, I might add). For example, pump "run", "fail", and "off" by implication of no shift. This is three states. In Phase Shift Modulation, PSM, we can easily send and detect 90 degree signal phase shifts, and thus send four states or two binary bits per signal transition.

What is phase shift? When 2 sine waves reach their peaks and valleys at the same time, they are said to be "in phase", (ie 0-degrees phase shift.) When the peaks of one match the valleys of the other, they are 180 degrees "out of phase". Various other degrees of mismatch are easily generated and detected. Remember, that band width is the range of frequencies used. PSM has more information in each transition, so the information rate, in bps, is greater than the Baud rate.

How do we use these binary bits to send analog variables such as level or flow rate? Recall that we said that pulse rate signals were easier to send than proportional current signals. It does not take much imagination to see that the FSK (or PSM) method could easily transmit pulses. We just cause the

frequency or phase to shift at the pulsing rate.

By the same token it would be easy to send Pulse Duration Modulation signals. The frequency shift simply occurs at the beginning and end of the pulse. We shouldn't leave this subject without mentioning the two other important types of signal transmission.

The first of these is Amplitude Modulation AM. In AM, the frequency is constant but the amplitude switches high/low or on/off to send pulses. For analog signals, the amplitude is modulated by the signal, such that the amplitude is proportional to, (ie an analog of) the variable value, this is the technique used for the familiar AM radio. AM is not favored for data transmission because it is more susceptible to electrical noise (static). This may be tolerable for voice and even music but is less reliable for data and control commands.

A second method called Frequency Modulation, FM, is often used in systems where much analog data with high frequency components has to be sent; the method is similar to FSK except that the frequency shift is linear and proportional to the variable value. This is the method used by commercial FM radio. Linear Phase Modulation is also possible, and is similar to FM.

With that brief lowtech introduction to modulation and Frequency Division Multiplexing, we should realize that there must be some sort of limitation, otherwise why would there be so many telephone lines running around the country. It turns out, in fact, that band width causes a theoretical limit of about 27 different carriers on a single voice grade telephone circuit; 20 is more practical. The band width of a voice grade phone line is 300 to 3000 Hz or 2700Hz. Because conditions are rarely perfect, practical telemetry cannot use more than 2400 Hz.

The telephone company is there to make money, not build telephone lines. Thus they try to insure that they get as much out of each line as is practical, without making it too expensive to build. Telephone lines, are

(continued)

Phone Line Data Transmission (concluded)

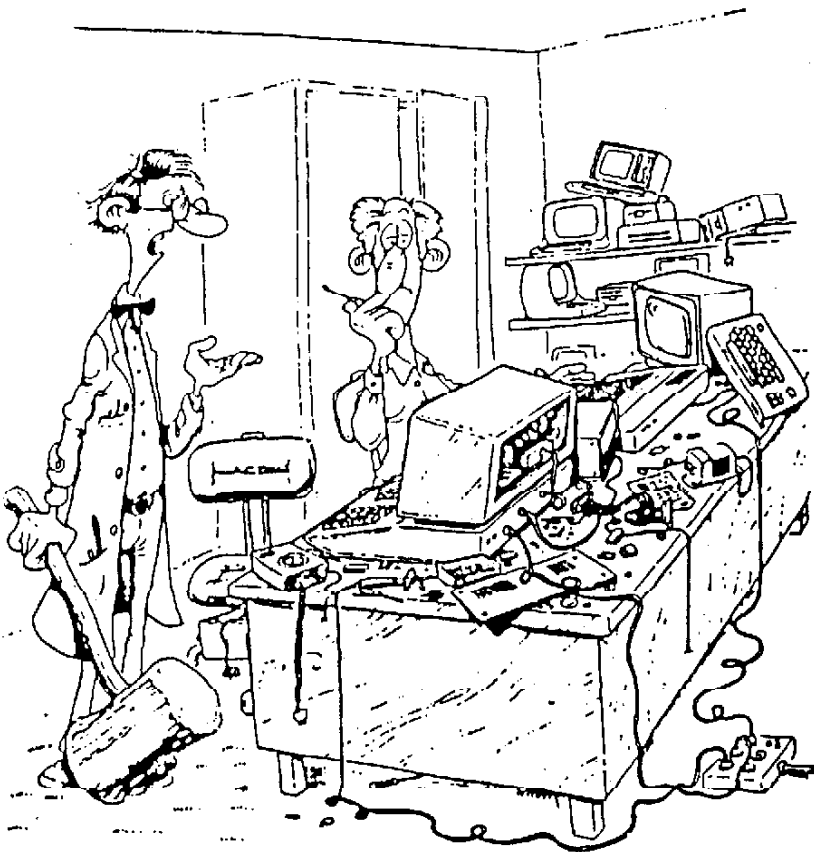
2-4 copper wires, and thus have resistance, capacitance and inductance, all of which cause attenuation of the signals.

Alternating currents generate magnetic fields which radiate to and react with an adjacent wire, and creates currents in that wire. This is known as "cross talk". Furthermore, if any signal uses too wide of a band width, it limits the number of other signals that can be multiplexed on the same wire. The resistance, capacitance and inductance cause leakage, and attenuation of the signal so that amplifiers must be provided to boost the signal at least every 20 miles or so. In general, it is these amplifiers that limit the low end of the band width. The phone company artificially limits the amplifier's upper frequency with filters to 3000 Hz. which is adequate for voice, and at the same time permits multiplexing, in theory at

least for the perfect line, up to 27 signals, each with a band width of 100 Hz.

In order for the receiver circuits to safely discriminate between channels, a minimum frequency difference of about 000 Hertz must separate them. The actual band width used should not exceed 80 Hz. For example, 1200 Hz plus or minus 40 Hz. Two important standard signal spacings are 100 Hz. and 170 Hz.

To review, because of the cross talk occurring between wires in a bundle, and the designed in limitation of the amplifiers that the phone company uses to boost a signal. The frequency band width of voice grade telephone lines is about 300 to 3000 Hz, or 2700 Hz maximum, and 2400 Hz practically. This is why the carriers (tones) are in the audio frequency range.



I think it needs the ol' shock treatment!

This little XB program will generate colors that one can not ordinarily make with BASIC or XBASIC. This is done by mixing colors. Try the red and green combination, for instance.

```

100 ! SAVE DSK1.PASTEL
110 ! DISPLAY PASTEL COLORS
120 ! Idea by unknown author
130 ! This version by
    Earl Raguse 1/92
140 DISPLAY AT(10,1)ERASE ALL:
L:"This program displays colors not ordinarily possible with
BASIC or XBASIC."
150 INPUT "FOREGROUND COLOR NUMBER: " : F
160 INPUT "BACKGROUND COLOR NUMBER: " : B :: PRINT
170 CALL SCREEN(16) :: FOR I=0 TO 12 :: DISPLAY AT(1,1)SIZE(32) :: NEXT I
180 CALL CHAR(40,"55AA55AA55AA55AA")
190 CALL COLOR(13,F,F)
200 CALL COLOR(2,F,B)
210 CALL HCHAR(2,1,128,64)
220 CALL HCHAR(4,1,40,512)
230 CALL HCHAR(18,1,128,64)
240 CALL PAK :: GOTO 140
250 SUB PAK
260 DISPLAY AT(24,1)SIZE(30) :: " Press Any Key To Proceed"
270 CALL KEY(0,K,S) :: IF S<1 THEN 260
280 SUBEND

```