PRint SCreen

The Newsletter of Stanford/Palo Alto PC User's Group

C•O•N•T•E•N•T•S

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HP's NewWave for Windows and
Surfin' the Internet
Wednesday, Aug 31st
7:30pm at Varian, Bldg. 7 Auditorium

President's Piece

Double Spin....

for your downloading amusement. The second CD-ROM drive is installed and running on the SPAUG BBS. Per WildCat statistics we now have 10,338 files in 246 subdirectories awaiting your curiosity. Drive 1 is Windows files and Drive 2 is MS-DOS files. An easy way to explore these files is by downloading ALLFILES.EXE in the *Directory* area of the files subdirectory listing. Go to the Files Menu and request a listing of the subdirectories. Choose *Directory* and request a list of files. Select [D]ownload and follow the instructions. ALLFILES.EXE is a self-extracting compressed file. Put it in an empty subdirectory on your system and type ALLFILES at the command prompt. The extracted file is ASCII text. Scan and search it with the viewer of your choice. A BIG THANKS goes out to Catherine Haynes and Cookie & Christine Cook for helping with this drive installation.

A Power PC debate...

at the Planning Meeting was drawing more excitement than the refreshments. The controversy centers on whether Apple Corp should be invited with IBM to the October meeting to discuss the Power PC. Many of our members use both PCs and MACs, so it is presumed you get a warm, fuzzy feeling at the sight of an Apple logo. A thumbs up or down vote at the General Meeting will probably call the play.

Disk-of-the-Month ...

beta testing has shown that not every shareware program is compatible in every OS environment. Please advise Larry if you experience unusual problems with a DOM program. We want to update our membership on a potential problem.

The Favorites ad...

is for real. We want to publish your computer related comments on what works best for you.

Non-profit legal...

and bulk-rate happy is SPAUG. Arlan advised us at the July General Meeting that all of our state and federal forms have been accepted by the Great White Father. Blessed are we that can make the sign of the bulk mailers. A BIG THANKS goes out to Arlan Kertz, Esther & Sidney Felix and Beverly Altman for making this happen.

Insider trading...

can happen if you scan (no OCR) the monthly pile of promotional mail for SPAUG. I give you the literature and you give me the scanned files (Rich Text format - RTF) which can be zipped each month and put on the BBS. The intent is to advise our membership of all the great deals and events which are mailed to us each month. A new volunteer should call me on this position. We want to share the fun-ware.

"Connection cable...

mysteries exposed" is an article I want to publish in PrintScreen. If you can write or know of a lucid article which discusses building computer connection cables, then please call me. Including component sources like Fry's Palo Alto aisle 13 should be worked into the article. The tribal knowledge on this subject is on paper somewhere. It would be highly enlightening to summarize it in one document.

"Hewlett-Packard twice?"...

asked the furrowed brow member in reference the July and August presentations. Miles Kehoe, the August presentation is a technical writer who wrote the NewWave for Windows manual. He is not an HP employee. He is a lively and Internet proficient speaker. Join us for this enlightening technical presentation.

The next Planning Meeting is on September 7th, call Bev for details (415) 329-8252

See you on August 31st..........Brian

Video Basics: Taking a Fast Bus

by Boo Haggerty, DVPC
Diablo Blue

*This is the second of several articles on PC video
by Bob Haggerty of DVPC.*

This piece follows last month's article The Video Sub-System. It looks at the speed advantages offered by a local bus. Originally devised as a way to improve video speed the early designs were either integrated into the mother board or offered as proprietary expansion slots. The advantages for faster data transfer were not lost on hard drive and networking adapter card designers so the types of cards will not be limited to video. Any place a high bandwidth connection is needed local bus becomes an option. But video was the impetus for local bus and the reason for looking at it in a discussion of video.

Processors can manipulate data to draw most graphic screens quickly but when these images approach 4 megabytes in size even a 486DX-2/66 can be slowed down. Once processed, this data must be sent to the video card through some form of bus. It might be imagined that some of the newer designs that feature a video interface integrated into the motherboard circuitry would not be constrained by bus limitations. This is not so. Even if a VGA circuit is integrated into the motherboard all transfers must still be arbitrated by the bus. The ISA (Industry Standard Architecture) bus poses a serious bottleneck to video designers. ISA is limited to a top speed of 8.33 MHz, 16 bits at a time. The greater demands of true color video and higher VGA resolutions were not anticipated at the time of it's inception. The ISA bus has placed significant speed limits on video as well a~ other data transfers. EISA (Extended Industry Standard Architecture) doubles the bus width but although theoretically capable of 40MB/sec and faster transfers it provides only marginal improvements in video transfers. Much the same can be said of MCA (Micro Channel Architecture).

The first new bus to market has received the most press and advertising space. Called VL-Bus. The V in VL-Bus stands for VESA or Video Electronics Standards Association. The L stands for local, which is actually a misnomer due to VL-Bus not being a local bus in its purest sense because it is arbitrated. A true local bus is among other things is directly connected to the processor. If you have an old PC/XT hanging around inside it's case beats a true local bus abet a 4.77 MHz one. For lack of a more appropriate term, local bus has stuck for all of the full processor speed, full data width bus implementations. Some industry analysts are using the term, mezzanine bus to describe Intel's PCI, and the one step it is removed from the processor

The premise of local is to make a limited (# of slots) the full register width of the processor (32 bits in the DX386 & 486) running at the processor's full clock speed. Note that's a limited number of slots. You might wonder if VLB is such a good thing why not make all the slots VL-Bus compatible?

There are at least two good reasons for this. First, not all of a PC's slots need to run at full processor speed. The higher speed exacts a increased equipment cost that probably doesn't provide any additional benefit and lesser cards will not function at the higher speeds. This certainly would be the case in a printer or modem card for instance. ISA is plenty fast for those purposes. The local bus regardless of implementation is meant to co-exist with traditional ISA EISA and MCA bus designs. The second reason for limiting local bus slots is that when their number is increased, stray capacitance becomes a problem. Capacitance distorts the digital waveforms of high frequency circuits. To keep it under control, VESA stipulated a maximum three full speed VESA slots due to the fact that the greater the physical size of the bus the more difficult it is to limit capacitance. As the bus speed is increased these capacitance problems become exacerbated. In the original VL-Bus specification no speed upper or lower limit was set on clock speed but as a result of a concern for reliability a limit was set on the number of local bus devices interfaced (whether slot-mounted or integral to the board) with the system. The original (VL-Bus V 1.0) recommendation is dependent on speed: at 33MHz, 3 devices; at 40MHz, 2 devices; and at 50MHz only one device which must be integrated with the board. It was generally agreed that there were only three peripherals that could really benefit from the higher speed; the video display, disk I/O and a network card. Some PC's motherboards are being offered with only two VESA slots so be sure that you don't assume any particular number of slots regardless of processor speed are standard.
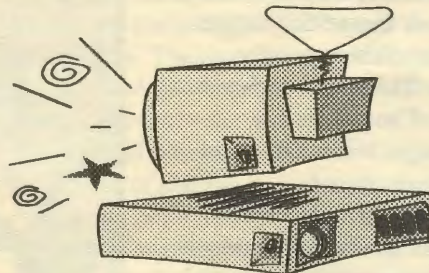
The new VL-Bus V2.0 standard redefined the number of slots permitted. The maximum number is 3 at 40 MHz and 2 at 50 MHz provided the boards are of a low capacitance design. Among the other improvements are widening the data bus to 64 bits, a new status signal to support a high-speed burst mode of data transfer and write-back caching in order to minimize the number of necessary disk updates.

On the heels of VESA, Intel is introducing PCI (Peripheral Component Interconnect). It represents a design that will incorporate many of the features of EISA and MCA such as bus mastering. The PCI 2.0 specification additionally provides for a 64 bit wide data path. PCI is technically more advanced than the VL-Bus which should make it a more enduring standard. In fact, PCI is so processor independent that it will work DEC's Alpha and other non-Intel chips. This doesn't mean you can plug any old chip into a PCI motherboard it just means the standard is flexible enough to be chip independent. Even Apple is looking at PCI with the intent to replace NuBus in their PowerPC-based Macs. By using PCI computer manufacturers will be able to offer a larger pool of adapter cards and the makers of those cards will have a larger audience.

Are you looking SCSI Lately?

Fred Townsend
Part 2 SCSI Overview

What is SCSI? SCSI is an acronym for Small Computer System Interface....but Interface to what?

Perhaps a better name would have been Computer Peripheral Interface for not all SCSI applications involve *SMALL* computers nor does the name *SYSTEM* necessarily apply. Today SCSI applications range from terabyte jukebox archival data storage systems to 2.5 inch laptop disk drives. CDROMS, tape drives, scanners, printers, disk drives and hundreds of custom applications use SCSI interfaces but tend to be sub-system building blocks rather than complete systems. These building blocks provide flexibility not seen at the system level. Let's look at the various SCSI building blocks starting with protocols.

Protocols Govern Information Transfer The SCSI architects started out by defining a feature rich SCSI command set of rules that could be used by smart peripherals of all kinds but were primarily aimed at hard disks. The protocols, sometimes referred to as the software side of SCSI, are a set of rules that govern the operation of the SCSI community of electronic devices. The rules are translated by the manufacturers into the firmware that controls their hardware, and were the focus of the original SCSI specification.

A SCSI circuit consists of a Master and one or more Targets. When two or more SCSI targets are accommodated, the interface is usually referred to as a SCSI bus. The term interface is sometimes used in place of bus when a non-expandable single target is connected and frequently refers to a *Proprietary* or *Non-Complaint* interface.

Maximum flexibility is achieved because SCSI devices can describe their capabilities and parameters to the master and the master's host. Using these descriptions the host can, statically and sometimes dynamically, configure the SCSI components for maximum performance or maximum capability. Static configuration begins at system boot-up with the bus master. Multiple masters can reside on the bus so the master with the highest address becomes the permanent bus master. Other masters, if present, are known as temporary busmasters. Temporary bus masters are also targets. At power-up or boot time the ranking SCSI master initiates the session by calling roll.

When an address is called by the master the target device answers with a short message equivalent to *PRESENT*. At this point the master knows only a device resides at that answering address. Then the master re-interrogates the answering address with a command equivalent to *TELL ME ABOUT YOURSELF*. In this way the master learns the characteristics of each target including whether that target has temporary bus mastering capability. There is no requirement for the targets to be similar so a hard disk and a printer can coexist on the same bus.

The master knows the characteristics of each device so it can request each target use or not use any of its features during the session. Multi-threaded operation is fully supported. If one target lacks a capability it does not prevent the master from using that capability with some other device. If the master itself lacks a capability it simply never requests that characteristic from the target.

What are the characteristics? Characteristics range from a device's physical parameters such as type of device, manufacturer, capacity, and serial number to the repertoire of commands or modes the target understands.

Fast Track

With attention from mainframe computer companies as well as Apple, SCSI was off to a fast start. There were some problems getting the hosts to always communicate correctly with the SCSI devices but with a defined set of protocols, the problems were soon ironed out.

The specification did not address any other aspects of SCSI in detail. The committee envisioned the mechanical, electrical, and timing aspects of SCSI would pretty much define themselves. Only at one point, the connector interface, was there any attempt at hardware standardization and this was somewhat ignored by the mainframe manufacturers. These manufacturers were accustomed to defining their own connectors and cabling so were not concerned with optional SCSI mechanical specifications.
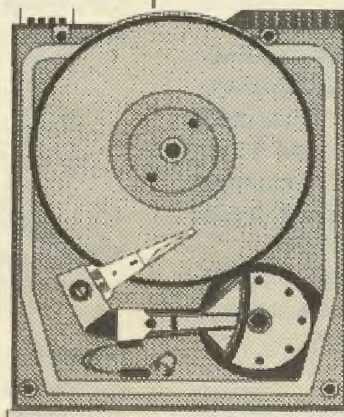
SCSI Cables Frequently a Source of Problems.

If is common practice in designing cables to use the odd numbered conductors as signal returns (grounds) while the even numbered conductors carry the signals. The alternation is a technique that transforms a ribbon cable into clustered transmission lines. High quality transmission lines are necessary to carry the high bandwidth SCSI signals. Failure to recognize this requirement was one source of cable problems.

The conductor assignments were sometimes a problem too. The original SCSI used nine data and nine control signals. With grounds, the total came to about forty. The original SCSI-I cable was extracted from the Shugart specification (SASI). It is not clear if the original specification envisioned future expansion, if it was just handy because it was currently used on eight inch floppy disk drives, or they just wanted a connector that could not be mistaken for the MFM hard disk connector. Whatever the reason, the result was the original recommendation of a fifty conductor connector and cable. The ten extra conductors were enough to tempt some manufactures to design custom applications but not enough pins to support *WIDE* or *DIFFERENTIAL* applications.

Optional pin-outs were a problem for the *DO it yourselfers*. Non-mandatory connectors and pin-outs, allowed host adapter designers to copy the approach of the mainframers by using connectors and pin-outs that were convenient to their own boards rather than following the optional recommended

Building intelligence into your computer

by Paul Maritz, Senior Vice President, Systems Division, Microsoft Corp.

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Use Plug and Play to make setting up your personal computer as easy as plugging a telephone into the wall.

Plug and Play is a standard that lets personal computers, peripherals, and software "talk to" each other and configure themselves. With Plug and Play, you do not have to know about COM ports or IRQs to add a modem or connect to a network. Your computer, software, and peripherals do the work for you.

Plug and Play lets you use computer hardware as easily as you use a telephone. You just plug a telephone into the wall and it works. When you move to another office, you can take your phone with you and plug it in. To add an answering machine, you simply connect it to a phone and plug it into the wall. You are not required to set switches or configure the unit to place or receive calls.

Plug and Play makes it just as easy to add new internal and external hardware devices --such as a modem or CD-ROM drive--to your computer. You simply plug them in and the computer automatically makes them work. Plug and Play also makes it easy to work away from your office. You can plug your laptop computer--while it's running-- into a docking station at another company and immediately connect to its network, play a CD, or print documents. Your computer automatically sets up the needed drivers and protocols to work with the other company's network.

Plug and Play requires that hardware devices identify themselves and describe their requirements and functions to the Microsoft Windows operating system. Whenever you add or remove a Plug and Play hardware device from your Plug and Play computer, Windows uses the device's information to automatically configure the device and load or unload the required driver. Your word-processing, spreadsheet, and other applications also take advantage of Plug and Play to know when they can print or send electronic mail that you prepared while away from your network connection.

We are excited to bring this new ease-of-use technology to Microsoft Windows "Chicago," the next major release of Microsoft Windows, and later to Windows NT "Cairo ' the next major release of Windows NT. If you have ever hesitated to upgrade your personal computer because of setup headaches or spent too much time trying to get your computer to work with someone else's equipment, you'll appreciate Plug and Play. It makes upgrading easy and automatic.

Vidio Basics from Page 3

How does all this apply to video speed? Well directly due to the fact that the main reason for the introduction of local bus was video speed. Unfortunately the numbers do not quite add up. While it is generally held that one of the key bottlenecks to faster video was the ISA bus. The implementation of local bus does not provide a proportional increase in speed. The ISA bus claims a peak throughput of approximately 8 megabytes per second as opposed to 132 megabytes per second for the VL-Bus 1.0. Once the claims of the salesmen die down and real life returns for tests under actual conditions a more reliable number is around 44Mbps. Under actual conditions the speed increase is about 30 per cent. In fact under Windows, the best accelerator cards on an ISA bus are faster than the slowest local bus cards. Combining the two technologies provides about an additional 10 per cent in performance over accelerator technology alone. What is important to remember is that local bus will improve throughput without the need for special drivers. A lack of purpose written drivers limited the improvements MCA and EISA could offer. Because local bus does not depend on changing the transfer mode but instead speeds all transfers any application will benefit from local bus.

Hard numbers as to bus throughputs are very difficult to come by because the conditions of the test are as important as any other factor. The theoretical maximums are easy to arrive at but practical absolutes are not. Software, the number a wait states imposed by the architecture of ROM memory, the efficiency of internal and external cache in addition to utilization of real life 2 clock cycle transfers as opposed to "best case" burst transfer speeds all have a hand in reducing theoretical maximums to real life speeds. In researching this article I found much contradiction that can only be attributed to the aforementioned factors rather than any breach in the experts knowledge. All in all local bus provides very real improvements in speed with little or no price penalty. PCI however may carry a premium price when first introduced until other chip set manufacturers (such as OPTi and VLSI Technology) start producing PCI chipsets.

The two buses were designed around different requirements. VL-Bus was a quick and inexpensive implementation designed around the 486 chip. PCI is far more robust, offering auto configuration and a tightly defined specification. The looser VL-Bus can cause compatibility problems with particular motherboards and other VL-Bus adapter cards. VL-Bus is not yet plug and play but must wait for the developing ISA plug and play standard. Aside these factors there should be little or no performance difference with either standard using a 486 chip. PCI is a more forward looking design intended for chips more powerful than the 486. In any case a great commitment has been made to both so either is a good bet to improve video (and other) throughput in the near term.

Installation Blues

by William Mero

Diablo Valley PC User's Group

Who really enjoys the frustration of tweaking a brand new computer? Normally things go well but I've never managed to completely avoid the unexpected. While installing some new programs recently I stumbled across a couple of problems that briefly raised my pulse rate and caused a pounding within the right sinus cavity. After running QEMM 7.01 on my new 486,1 decided to do my wife "a favor" and install it on her older 386. Of course like all good, politically correct PC devotees I immediately rushed out to purchase another copy of Q7.01.

After following the installation instructions, the machine was rebooted and the opening screen went "bananas" swirling into an endless loop of flashing error messages. I was locked out of my wife's computer. What was even worse, her computer was working just fine until I started messing with it. I sat stupefied realizing that I would have to face one of my greatest phobias - - I would have to open the despised manual to solve the problem (and do it before she discovered that there was a problem). Hitting the off switch turned this crazed miracle of 20th Century technology into a dead beastie. I went downstairs and poured myself a glass of wine from a cardboard, aluminum foil lined box. It tasted like a very good year.

I turned the little devil back on and waited anxiously for its first tentative beep. Then by pressing the ALT key and hitting ESC I broke out of the QEMM induced loop and was presented with a black, blank screen with a tiny, blinking white C> (no colon). I seized the opportunity to pull up PC Tools and examined my digital debacle. I had guesstimated from some of the more arcane error messages that the problem was probably caused by scraps of setup files left over from the ancient QEMM 5.01 memory manager. Blindly installing over the old program turned out to be a rotten idea. Since Stacker had worked its magic on the hard disk, I discovered that I had to find and delete files scattered across both the stacked and unstacked drives, a challenging, sobering and educational experience. After about three reboots, my selection of deleted files finally proved complete and non-fatal. Learning from experience, I disabled a DOS menu program from my wife's AUTOEXEC.BAT file and started Q7.01. Now QEMM ran as advertised and additional gobs of conventional memory were my reward. The next move was to wander downstairs and casually mention to the wife one or two carefully selected details surrounding this minor triumph. Certainly it was a perfect time to celebrate with another glass of fine Costco wine.

Now on to the next crisis. Under Windows my 486 refused to print readable text. It first spewed out reams of garbage and then went totally nuts. Paper began sucking into the printer and disgorging in some mad, robotic attempt to bury me in my own office. I was much too smart to die that easily. I pressed the printer off switch and stared hard at the 486, its hard disk softly humming contentedly. I hummed back for a while and began the deductive exercise we all have learned is the price we pay for enjoying the "user-friendly" character of Windows. And yes, there was one little factor that I have neglected to mention.

Both computers are hooked up to one printer through a small parallel auto switch. It was a cheap product from our friendly neighbor to the west, Taiwan. Could this be the cause of my difficulty? Nope--possible but unlikely. I really couldn't blame our Asian friends for this one. All my DOS programs printed like champs but garbage continued to issue from the Windows' programs. Somewhere stashed in my disorganized office were my Windows disks. Could I find them? Lack of organizational hygiene was my greatest enemy. Eventually the floppy disk search was successful (but that is another story) and I reinstalled the print drivers for my default and secondary printers.

I could scarcely contain my excitement. With trembling fingers I gripped my mouse and issued a print command to an Ami Pro file. A moment of silence while my machine thoughtfully considered my request. It roared into action. Strange looking characters erupted over the pages. There was an ominous pause. Then the printer sprang to life again and began spewing blank paper across my desk and on to the floor. This was very, very tiresome. Clearly time for another glass of wine.
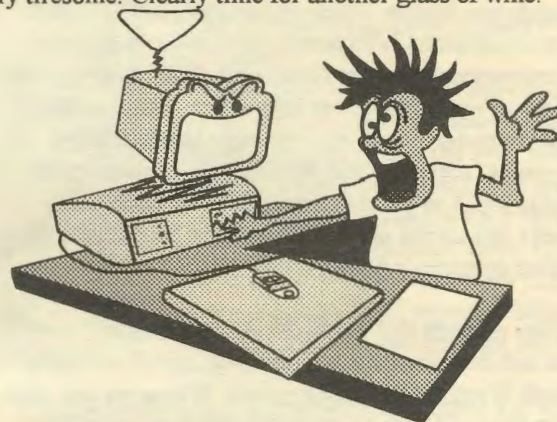
Now I had relaxed sufficiently for my powers of deductive reasoning to blossom. Perhaps the fault lay in selection of the printer port? Clicking through the irritating layers of Windows icons and dialog boxes, I at last arrived at the printer port selection window. Yes, I was properly connected to **LPT1**. However, a little down arrow beckoned invitingly. Clicking brought up several new items for my consideration. Here was a choice that looked intriguing, "printer port **LPT1.DOS.**" Nothing to lose. I selected it and returned to my Ami Pro file. By now I wasn't expecting too much but what the heck--it was nearly time for another glass of wine. I issued the print command and it printed perfectly! The acid test was coming up. Would the print job end at the same time as the file or would it continue to spew forth recycled cellulose products? It worked! A long Saturday afternoon was successfully concluded. Certainly justification for another glass of wine.

TRIAL SEPARATION

BY ALICE J. MARSHALL

Reprinted with permission from *WordPerfect Magazine*

I have perfect hindsight. I see now that the day we brought the new computer home was the beginning of the end. Gingerly, we unpacked components from their cardboard cases and carefully placed the crisp new manuals on a shelf where they could be safely ignored.

"This system is going to be perfect for you," my husband, David, proclaimed. "With this new laser printer, your proposals and articles will look *really* professional. Think of all the work you'll get done!"

I was calculating how many productive hours I could jam into the day when I noticed a joystick and soundboard poking out of a shopping bag.

David shrugged sheepishly. "We can use it for fun, too. It won't cut into your work, I promise."
Skeptically, I dug into the bag and came up with educational games for children and a flight simulator.

"Don't worry," David insisted. "We won't let the games take over the system. We'll just set a few ground rules."

"Work always takes precedence over games," I started.
"Of course, of course!"

"No food or drinks in the office. I don't want a sticky keyboard or a gunked-up monitor."

"Not even a cup of coffee?" When David turned his big, sad eyes on me I was helpless.

"Oh, all right—but only adult drinks."

I had high hopes for the new computer. We had more memory than a panel of *Jeopardy* contestants, a fast disc drive and a really cool graphics monitor. More than enough power to go around.

David was at the office all day. I could get some writing done while my young son, Tom, puttered with his blocks.

At first, things went well. I got a few hours of work accomplished during the day, and Tom got to play dinosaur games for an hour in the afternoon. David occasionally fiddled with the flight simulator in the evening, but nothing excessive.

Then one morning I walked into the office and discovered a half-eaten burrito on a plate and a glass of water hovering dangerously close to the keyboard. That evening I confronted the culprit.

"Well, it didn't hurt anything," was his only defense. He finally agreed to clean up after himself, but insisted he would still eat in the office. Carefully.

Once I walked in on my son as he was crunching an apple in one hand and maneuvering the mouse with the other. This was not an isolated incident. I know I should have taken a firm

stance, but other than prying raisins from between the k and l keys and scolding Tom, I never pressed the issue.

My domination of the computer has been slowly eroding. Tomorrow wants half the afternoon for math and reading games. It's hard to discourage him— after all, isn't this something like homework?

My WordPerfect files started out as the largest directory on the system, but my work has been slowly shoved to the side by spreadsheets, financial planners, educational programs and the latest in super graphics-enhanced war games.

Things took a sudden, ugly turn last week. One night when I needed to run off a quick draft of a story, I found David in the middle of a combat helicopter game.

"I'll get to you between missions," he promised. Two hours later, I was still cooling my heels while Commander Cosmo furiously worked the joystick and made explosive sound effects by buzzing his lips.

It was time for drastic action. I walked into the office, leaned over David and hit *esc*. "Hey, hey!" He jumped up angrily.

"Now that I have your attention, we have to talk." Pulling no punches, I laid it on the line. I had tried rules, I had tried reason. Now I saw no other choice. "David, I want separate computers."

"But honey, we can make it work, I know we Can." He pleaded.

"Too little, too late," I said firmly. "Trust me—in a few years, we'll look back and realize that this was the best decision we could make."

Taking steps to independence can be frightening, yet such challenges can actually strengthen a relationship. Together, we decided no matter what the personal pain or the cost, we must move ahead. I'm looking forward to a nonsticky keyboard.

What Future Has the ASCII-Coded File?

by Richard Mobbs
Computer Centre Bulletin of the University of
Leicester, Leicester LEl 7RH, England
Permission to reprint granted by the author.

Introduction

Most users will be aware of what an ASCII file is. It is the text file that can be produced from information that you create with a word processing program. Currently, if you want to exchange information between different word processing programs, you can only accomplish this by converting the first word processing file into an ASCII file and then transferring it into the other system. Anyone who has followed the above procedure will be aware of its limitations: the loss of attributes (such as underlining, etc.) but more importantly, certain, commonly used European characters, e.g. A circumflex (^) or a grave accent (') are not converted and are replaced by what seems random characters, e.g., ~, @~, x, etc. ASCII code is not the only coding system available.

Data Codes: EBCDIC & ASCII

As data processing machines became more readily available, new codes were developed. Early adding machines required only numerical data (the digits ~9), that can be represented by a bit pattern of four Os and ls. Thus, 0001, 0010, 0011 represent 1, 2 and 3 respectively. This code was called Binary Coded Decimal (BCD). As data processing requirements changed and text processing was required, this four-bit pattern was extended to eight bits, allowing a maximum of 256 characters to be represented. This code was called the Extended Binary Coded Decimal Interchange Code (EBCDIC) and is used extensively by IBM on their mainframe computers.

An early problem faced by communication engineers was one of error checking—I sent a letter "a;" have you received a letter "a?" The EBCDIC code mentioned above had no facility for error checking so a new 7-bit code was developed in 1967, allowing one bit to be used for error handling. Although the Americans are often credited with this code, it is based on early work by British computer scientists.

In 1956, a BSI (British Standards Institute) committee was set up to standardize codes for 7-track paper tape. Since the committee had strong representation from British computer companies, they wanted anything but the IBM *de facto* codes. Most of this new code was developed by Ivan Idelson, then working for Ferranti. Born in the U.K. of Russian parents, Idelson's code has been adopted by the whole computer industry and is called the American Standard Code for Information Interchange or more commonly, ASCII—pronounced As-key; not Ask II or Ask eye-eye! ASCII is the code that underlies all communication with computer software and hardware—even the IBM PC!

Problems with the ASCII Code

ASCII is a 7-bit code that allows for the representation of up to a maximum of 128 characters (2^7). The first thirty two character codes are special control characters used for controlling peripherals, such as terminals and printers. The remaining ninety six codes represent the capital letters (AZ), the lower case letters (a-z), the digits (~9) and the various punctuation and mathematical characters. Those users that have produced an ASCII file from their favorite word processing package will know that, along with other attributes, such as bolding or underlining, any foreign letter such as A (circumflex] or ' (grave accent), will be lost in the conversion to an ASCII file.

In 1977, ISO adopted the ASCII code, calling it the ISO 646 standard. ISO later added the extra bit, making it an 8-bit code, which allowed for another 128 characters. This new code, called Latin 1, included European characters: French, German, etc. What about Polish, or Russian characters? What about Middle Eastern characters, Hebrew and Arabic, and the very problematic Far Eastern languages? These countries have generally adopted the ISO code but with localized native character sets. In conclusion, the ASCII code system is inadequate for the modern computer industry.
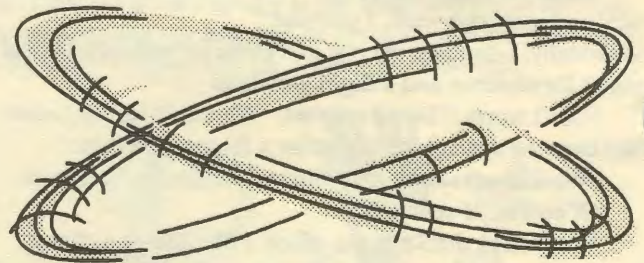
Beyond ASCII

In 1983, ISO began developing a new coding standard, based not on a single byte, the ISO 8-bit code, but on two bytes, giving a character coding system that can support 65,536 characters [2A 16], the first 128 being the ASCII characters.

Is this big enough? Nowhere near, if the new coding system is going to be all-embracing. The major problem is the very large number of Eastern character sets. These languages use "picture writing," using pictographic or ideographic characters, or more accurately, "word writing," using logographic characters. The Japanese use three different types of writing: kanji (characters), kaukana (single word) and hiragana (several words), that are all represented by single characters. Many Japanese and Korean characters are derived from Chinese and they share many similar characters traceable back to the Chinese Han dynasty.

The ISO 10646 committee, as it was called, tried to rationalize these character sets so that repeated similar characters only appeared once. This was called a Unified Han set. The Chinese agreed but the Japanese and Koreans objected.

When Should You Register And Upgrade Your Software?

by Yves Barbero

When you register your software, you get technical support. That is your main benefit, but ....

The software company gets to bombard you with ads for its other products. They get to sell your name to other vendors, some of whom will call you at the dinner hour. If you fill out their forms, they get to do a marketing survey at little or no cost to them. You get the "opportunity" to upgrade the software as "improvements" are made. Under current federal law, you don't actually own the software you've paid all that money for You merely license it. This means you can't sell it when you're through with it as you can with a book or record you've read, or got tired of listening to. This law is so notorious that some of the more ethical software companies specify that you *can* sell it in their license agreement, if you hand over all disks and manuals to the buyer.

There is no hard or fast rule, but here are some pointers.

Register the software if...:

• It is the main software, such as a word processor or spread sheet, that your business uses (and you don't ever   intend to sell it).
• You need technical support on a regular basis. Don't be shy about trying out the technical support first. (The   phone just keeps ringing at a lot of places, and you never speak to a human being despite their claims to give   technical support. Take the software back if you can't get technical support reasonably quickly (within a   half-hour) and you bought it with the idea that you're going to need it. It's one of the reasons you've paid all that   money.)

It's important to remember that you are under no obligation to register software, that there are a lot of third-party books available for help, and that it's okay to talk to knowledgeable people about your problems with a particular piece of software, especially if they *don't work for the software company.* By the way, it's always a good idea to check out software with others, and with reviews, before you tackle it. Lotus 1-2-3 may be wonderful for a very large company, but QuickenBill could be what you need for your tiny outfit.

Don't register your software if...:

• You plan on using it for a limited amount of time and then selling it, but do sell everything when you do;   manuals, registration cards, and disks. The buyer may have a different agenda.

• It is frivolous software, such as games and screen savers. Why get on a mailing list over nonsense? Most software registration only gets you on a mailing list.
• You're technically competent, and rarely, or never call a technical support line, or you have access to a technically competent person.

If you register software, you don't have to put in your phone number, or completely fill out a questionnaire (one actually asked how much I make a year). They only need to know that your computer will run the software, and that is implied when you buy the software. One outfit, a fax software company, forces a registration by not letting you use the software until you fax its headquarters with the registration form. The software was included *free* with a fax/modem. I could only conclude they wanted me for a mailing list of some sort, so I lied on the registration form.

Your privacy is important. By all means, include a note that you don't want your name to be sold, or be contacted by the software company itself except to be notified by mail only of upgrades.

There are ranges of upgrades. Genuine upgrades, showing real improvements, are at one extreme. These upgrades are readily noticed by an ordinary user. WordPerfect 5.1 to WordPerfect 6.0 is an example. There is the major addition of a graphical interface.

Somewhere in the middle are upgrades designed to enhance use by sophisticated users. Quicken 5.0 to Quicken 6.0 is an example. Most users will hardly notice the difference, but this is still a legitimate upgrade. There is also a class of upgrades, DOS 6.0 to DOS 6.2 for instance, that are simply bug fixes, or cosmetic face-lifts. No doubt, you will be charged for them, although you shouldn't be; the marketing department at Microsoft didn't wait for the product to be completely developed. Now, they're making you pay for the fix.

The point about upgrades is that it's often a good idea to skip a few of them. Quicken seems to have an upgrade about every six months. My professional clients don't buy each upgrade. They skip some. One bookkeeper asked me if she should go from version four to seven. "Only if version four can't do something you know version seven can, and you have a need or desire to do that thing", was my reply. Despite the fact that I like WP 6.0, I've advised clients not to switch over unless they plan to do a lot of graphics. WP 5.1 is a class act and still functions well for law and medical offices. In addition, it'll be awhile before it comes into widespread use, meaning that you'll have to bear the cost of training. Remember...

• Upgrades cost money.
• Upgrades have a learning curve.
• Upgrades have bugs.

If you're the first on the block to have a program, you'll pay in time and money. I am currently running both WP 5.1 and WP 6.0. Why not? I haven't gotten around to switching
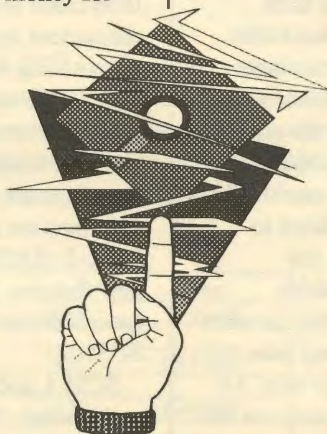
Looking SCSI from Page 4

pin-outs. Unfortunately, this forced the use of adapter cables that, because of their custom pin-outs, were expensive and hard to get. One manufacturer used a DB-25 connector for their external interface, the same connector already used for the XT' s serial and parallel ports. This provided endless possibilities for errors.

IBM BIOS not friendly to SCSI
The biggest SCSI problems were seen in placing SCSI within the IBM box. The IBM BIOS was not friendly to any hard drives, particularly SCSI hard drives. The IBM XT hard disk interface was awkward at best. To overcome its deficiencies, IBM tried a different approach on the AT. It seemed that some of IBM's utilities such as FORMAT needed to know the size of the disk. Rather than trust the user to enter the disk capacity directly, the BIOS wanted the drive parameters so it could compute drive capacity. But, drive parameters were hard to obtain and sometimes confusing. IBM chose to treat the symptom rather than the problem by placing drive tables containing drive parameters within the AT BIOS. This decision would bite IBM and its camp followers at almost every turn.

For example, take just one drive parameter, sector size. All modern drives are soft sectored meaning that sector size can be a variable. What is the benefit of having a SCSI drive that can format eight different sector sizes if the BIOS only understands one size?

Work Around to the Work Around
The apparent solutions to the hard disk problem with the IBM BIOS were to either use a device driver or replace the BIOS. To a host manufacturer this is like being asked, *Do you want to be hung or shot?* Device drivers must be installed from the hard disk and if the hard disk is not booted, where does the driver come from? Changing the BIOS directly, is equally impossible since the BIOS resides in ROM.

Lies, Lies, Damned Lies
The realizable solution was to patch the BIOS using a technique known as a run time patch or an Overlaid BIOS. At boot-up, after the BIOS has been moved from ROM to RAM and before the hard disk is accessed, the BIOS searches its address space for peripheral devices. At this time the host adapter interrupts the boot process to install a patch contained within its own ROM. The patch redirects the BIOS hard disk processes to those contained within the overlay BIOS. The overlay interprets and filters information going and coming from the standard BIOS. If necessary, it alters the information and in effect lies to the standard BIOS.

For instance if there are *three physical hard drives* the BIOS would become confused

because it only understands a maximum of two physical hard drives. In this case the overlay tells the BIOS there are three *logical drives* and since the BIOS understands up to twenty-six logical drives everything proceeds normally.

A New Beginning
The SCSI architects knew they could not anticipate all requirements in the original specification so they installed the hooks for future adaptation and invited the expansion of the command set to serve the needs of other devices. The tape industry was one the first to take advantage of this process by adding over 100 commands.

There were others that argued that just adding commands was not enough. SCSI needed some fixing too. As the mix or match IBM clone market emerged, it became clear that better connectors and cables were needed. Also, specifications for terminating those cables and perhaps a way of making SCSI faster were needed. In turn, a faster SCSI would mean more cable problems.

In 1991, almost six years after release of the original specification, SCSI-2 was released. (The original SCSI specification was renamed SCSI-I to distinguish it from SCSI-2.) Differential and serial variants were part of the many new features. The specification, actually a collection of specifications, totals over 400 pages. Over twice the size of SCSI- 1.

SCSI 1 and 2 versions vary significantly in their approach and content. SCSI-1 addressed software issues while almost totally ignoring the physical side. SCSI-2 attempted to correct this deficiency by adding cable and connector specifications. It also added the SCSI-WIDE capability with 16 and 32 bit buses.

SCSI-1 did suggest a maximum cable length of 6 meters. Six meters (almost 20 feet) is plenty of cable for desk top machines but a little short for the mainframes where the disk bays are sometimes 50 feet away from the CPUs. To provide longer cable lengths, differential cable specifications were added. Differential signals are much more robust and therefore may be used at much longer distances.

Membership on a SCSI committee is a difficult and expensive ordeal. It is not something most individuals can do without sponsorship. It should not surprise anyone that big companies are more heavily represented on the committee. It also should not surprise anyone that politics plays a role in the decision making.

One of the criticisms of SCSI- I was the overly permissive nature of its optional specifications. SCSI-2 did little to change permissiveness. Six options were removed and four requirements were added. In deference to the large companies already using their own connectors and pin-outs, those pin-outs became the recommended pin-outs. In deference to the smaller companies *doing their own thing,* the pin-outs were made optional. SCSI-2 did little to fix the known problems of SCSI-I. There is reason to ask why was SCSI-2 even released. The apparent answer was after six years, it was time to release something.
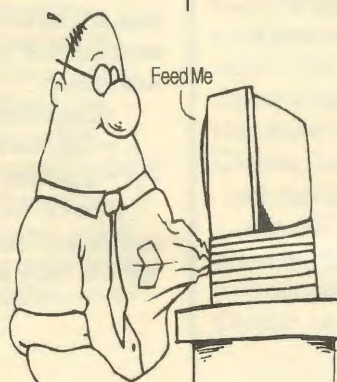
Bus Speed & Clock Speed
by Bill Plein, D VPC
Diablo Blue

The following is a list of typical PC bus speeds and their relationship to your computer's clock speed.

ISA bus must run at a sub-multiple of the processor. In PCs the simplest way to derive this frequency is to divide the clock. For example, 25MHz clocks are divided by 3 and 33MHz clocks are divided by 4 to yield the bus frequency .

EISA bus stipulates a fixed frequency between 6 & 8.33 MHz. It operates nominally as a synchronous bus but does not necessarily need to operate synchronously. MCA bus operates asynchronously at 10MHz but is not necessarily limited to that speed.

V-LB and PCI operate at processor speed. PCI can slow down to zero Hz to take advantage of "green" power saving computers that slow or stop the clock for that purpose.

DX2 "clock doubler" chips muddy the waters a bit. DX2s work at two speeds. A 486DX2/66 processor runs at 66MHz internally except for the BIU (bus interface unit) which runs at 33MHz. This is also the speed at which the motherboard operates (e.g., RAM, External Cache, DMA etc.). The only difference between the two chips from the motherboard's perspective is a greater power requirement for the faster DX2, correspondingly more heat and some ROM BIOS changes required due timing dependencies in the straight DX chip. And "clock *tripler*" chips will be announced and available soon - a 486DX2/100 will run at 100MHz internally and at 33MHz on the bus.

Bus Type	CPU	CPU Freq.	Bus Freq.	Ratio	**Bus** in Sync?
ISA	PC	4 77MHz	4 77MHz	1:1	IN SYNC
ISA	XT	6 00MHz	6 00MHz	1:1	IN SYNC
ISA	AT	8.00MHz	8 00MHz	1:1	IN SYNC
ISA	386/486	25.00MHz	8.33MHz	3:1	IN SYNC
ISA	386/486	33 00MHz	8 25MHz	4:1	1~ SYNC
EISA	386/486	25 00MHz	8.33MHz	3:1	IN SYNC
EISA	386/486	33 00MHz	8 25MHz	4:1	IN SYNC
MCA	XXX	XX.XXMHz	10.00MHz	None	ASYNC
V-L8	XXX	XX XXMHz	At clock	1:1	IN SYNC
PCI	XXX	XX XXMHz	At Clock	1:1	IN SYNC

XXX - Does not matter

Bus	Width
ISA PC	8 blts
ISA AT	16 blts
EISA	32 bits
MCA	3Z blts
V-LB v 1	32 bits
V-UB v 2	64 blts
PCI v 1	32 blts
PCI v.2	64 bits

Processor	Register Width	I/O Width
8088	16	3
8086	16	16
802B6	16	16
Bo3865X	32	16
80386	32	32
80486sx	32	32
80486	32	32
PENTIUM	64	128

* Math Coprocessor disabled

Update on Sound Cards
by Rob O'Daniel
The DOS Umbrella

A year ago, I published an article, "Sound Card Buyers' Guide" in Computing and Software Newsletter. In that article, I mentioned that the sound card industry had exploded and become much more competitive. I noted that there were many more choices and a wide variety of options to be found amongst the array of available sound cards. Well, forget all of that!

In the past year, the PC audio industry has surpassed the previous two or three years incredibly. Last year, buying a sound card meant choosing between Creative Labs' Sound Blaster Pro (SB Pro), Media Vision's Pro AudioSpectrum-16 (PAS-16), Advanced Gravis' UltraSound, Microsoft's Sound System, Turtle Beach's high-end MultiSound, or a small handful of others. But now, the choice is staggering!

This year's offerings include Creative Labs' newest offering, the Sound Blaster 16 ASP (in three different flavors!), Media Vision's revamped Pro Audio Studio-16, and more than a half dozen different cards based upon Sierra Semiconductor's Aria chip set. Add to this Microsoft's soon-to-be-released Sound System 2 and Roland's highly anticipated RAP10, and the

A RECIPE FOR CHIPS AND DIPS

by Milt hull, Sacra Blue, Sacramento, PCUG,

When Robert Noise designed the very earliest integrated circuit (IC), he had no idea how his technology would change things. His integrated circuits have expanded the scope of science, aided in medical research, enhanced communications, and given us the tools to create what we had only been able to imagine.

The microchip, which has hundreds of microscopic electronic circuits, transmits and receives thousands of electronic signals in a fraction of a second to detect, alter, and amplify any desired control signal. The microchip can control complex systems, simulate environments, recreate events, enhance knowledge, and expand our capabilities in ways we have not yet imagined.

When I was in San Jose, I had the chance to visit a small company called Lucas Labs (not affiliated with film-maker George Lucas). This is a research and development company that manufactures a machine that makes the microchips.

The microchip is nothing more than a shinny piece of crystalline material, which is smaller than a fingernail and is only .03" thick. It has patterns on its exterior that are hundreds of thousands of minute electronic components built onto the chip's surface.

Building a microchip is one of man's greatest achievements. It starts with silicon (sand), one of the most common elements found on the earth's surface. They melt the silicon into a large single crystal ingot in a carefully monitored state of purity, then cool it in a controlled environment. When the ingots are cool, they are sliced into wafers. These wafers are highly uniform in thickness and polished to a mirror-like finish. They can control the silicon's ability to conduct electricity by placing chemicals, called dopens, into its crystalline structure. By precisely placing these dopens on the water, They can create negative and positive regions that control the flow of current in the IC.

The semi-conductive nature of silicon gives us the ability to alter its electrical properties to create incredibly small electronic components (like transistors) on its surface.

Design engineers start with a schematic or symbolic layout of electronic components that will make up the IC. These schematics arc internally translated into the actual patterns of the chip's circuitry. A complex circuit could require fifteen or more layers of patterns on the chip's surface to create the final IC. When all of the layered patterns are stacked and registered precisely, they complete The circuitry for hundreds of thousands of miniature electronic components.

One layer can start out as a plotter printout as large as 10 feet square. It is exactly reproduced on a part of the wafer measuring as small as .125" square. Since many size wafers are available, they can put as many as a hundred or more ICs or dies on each wafer. The average size wafer is 6" round.

Transferring these layers onto the wafer itself is quite impressive. It used to be called wet processing. This is somewhat how a car battery works, with a lead plate and an active acid to etch away a pattern. Now, it is somewhat like developing film. They first heat the wafers in various gases to cast uniform layers of silicon dioxide and silicon nitride on the wafer's surface. Then, the first layers are covered by a light-sensitive chemical, called photo resist. Then, they create chrome-coated glass plates, called photo masks or radicals. These act as a negative to expose light-sensitive material on the surface of the wafer. Each radical holds the pattern for one layer.

Then, they expose a light through the photo mask and next through a special lens that reduces the photo image. This is done over and over all along the wafer, covering the first layer. Exposed areas of the photo resist are then removed with chemical developers, leaving accurate reproductions of the radical's pattern. The wafer is put back into an atmosphere of reactant gasses to etch away any areas that are not protected by photo resist.

The next step is to implant the opening in the etched pattern with ions from a plasma gas that is surrounded by electrons. These ions are also called electrically active chemical dopens. In the gas plasma, the ions are heavy, so they are basically still, while the electrons are light and moving all around the ions. Magnets are used to bombard the surface of the wafer and implant these ions to create "wells," which store the electrical charges and direct the flow of current.

Connecting the wells to the rest of the IC requires the formation of conductive metallic layers. Microscopic layers of metal are deposited on the surface through a plasma-deposition process. This is like taking metals, such as aluminum, which are energized to a gaseous state of ions, and electrons, called plasma, and covering the surface with a metallic film that coats every part of the wafer's exterior.

The wafer is again covered with another layer of photo resist, and the process starts over again. The result is a complex series of metal conductive pathways interconnecting the circuit components that form the IC. These pathways are a hundred times smaller than a human hair. Layer by layer, the process of deposition, exposing, etching, and dopening is repeated until the finished circuit is complete.
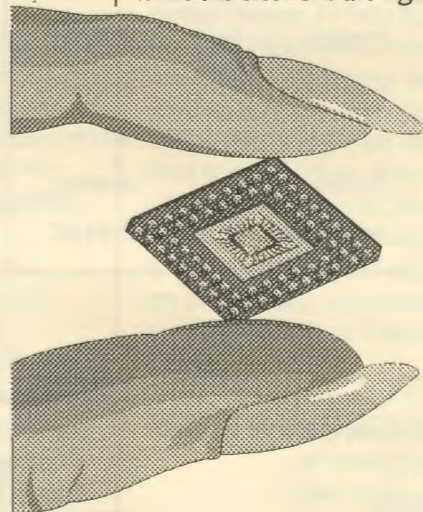
Sound Cards from Page 11

choice begins to get a bit tough. Complicate matters further by tossing Creative Labs' add-on daughter board called WaveBlaster and Turtle Beach's add-on called Maui, both designed to marry high-end wavetable synthesis with digital audio-capable sound cards, into the mix. What to do? Which one is best? Which should you choose?

Well, the decision making process is one thing that has remained unchanged in the past year. Last year, I advised that you set your goals and do research before jumping into the fray. This year, I can offer no more appropriate advice than that. You must have an idea—at least a general concept— of what you'd like to accomplish with your new sound hardware before you go shopping. So how do you define your goals when you may have never owned a sound card before?

Well, to evaluate your needs and goals for a sound card, you should ask yourself a few questions:

What do you want to use this card for?

If games are your bag, you will want to shy within the realm of Sound Blaster compatible music cards! If you are a serious game aficionado, you will no doubt want to consider a solution that combines both stereo digital audio for sound effects and high- quality MIDI capabilities for stunningly realistic orchestrated game sound tracks. In the past, you could only do both by combining a sound card and a separate MIDI synthesizer card. This year, you have the option of buying a wavetable add-on for your sound card—if you choose the right card. Also investigate Creative Labs' WaveBlaster and Turtle Beach's Maui add-ons first. Also keep a lookout for AVM Technology's soon-to-be-released wavetable product built around a Kurzweil chip set that was recently mentioned in Computer Shopper. Advanced Gravis' economical UltraSound is also well worth considering; the UltraSound now has more capable software to support MIDI within many games and is garnering more industry support this year.

If your primary concern is multimedia, Sound Blaster compatibility isn't a big issue. For multimedia, consider a card that has both Sound Blaster compatibility, is capable of handling multiple inputs, and supports stereo .WAV playback at rates up to 44 kHz. Media Vision's Pro AudioSpectrum-16, Logitech's SoundMan 16, and Microsoft's Sound System are well worth a look.

For MIDI sequencing, obviously you need not be as concerned with Sound Blaster compatibility. Take a look at wavetable-based cards such as Media Vision's new Pro AudioStudio-16XL, Advanced Gravis' UltraSound, one of the Aria-based cards (such as Diamond Computer System's Sonic

Sound), Orchid's SoundWave 32, or Turtle Beach's MultiSound. These cards, and many others, have MIDI muscle to make your compositions come to life.

On a budget? Consider Creative Labs' Sound Blaster Pro Deluxe, Aztech Labs' Sound Galaxy Pro NX16, Logitech's SoundMan 16, or Advanced Gravis' UltraSound. There are many vendors offering feature-packed sound cards in the $110-150 range.

How important is compatibility?

Again, if you are into games or rely more on DOS-based multimedia or education programs, Sound Blaster compatibility is a must. For gamers, the SB Pro Deluxe offers stereo music and sound and won't break your budget. Bear in mind that cards that only say they are Sound Blaster compatible are only offering monaural music and sound, whereas cards that offer SB Pro compatibility will take advantage of DOS-based programs that support stereo music and digital sound.

What about vendor support?

Even more so this year than last, you must consider how viable support will be when purchasing a sound card. the vendor be able to offer technical advice or provide you with the latest Windows drivers? The AudioPro Buster-16 sound card may seem like the hottest ticket in town, but if the manufacturer isn't around to provide support, you will probably have a difficult time finding any software that will work with your new card. Read message boards and magazine articles to try to determine what level of support you can expect from the company that is offering this oh-so-hot sound card. Chances are, if you are buying it from an electronics catalog, a department store, or from a computer shop you aren't very familiar with, there could be problems. Best to pay a few dollars more and get a well-known product produced by a reputable company.

How important is a 16-bit sound card?

In the context of computer audio, 16-bit refers to the sample resolution. While 16-bit digitized audio is being touted as a "must have" by most magazines, how much do you really need this? Consider that uncompressed digitized audio recorded in stereo at 44 kHz and 16-bit requires more than 10.5 megabytes of storage per minute and you'll see that, while the sound might be impeccable, the storage requirements make it unrealistic for most computer owners. (16-bit, 44 kHz, stereo digital audio is commonly referred to as "CD quality" since those are the sampling settings generally used by the compact disc recording industry.)

"But what about CD-ROMs?" you might ask. While it is true that 5 or 10 megs is a drop in the bucket on a 600+ megabyte
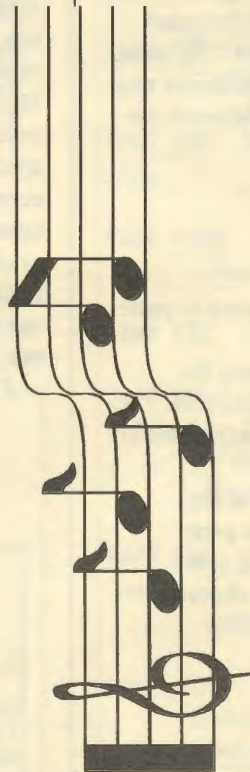
Add Your Own Comments to Windows Help Files

Author Unknown from Ridge Area CUG

Add text to current Help topic

You can add your own comments and notes to a Help topic and view this information later. When you annotate a Help topic, Help places a paper-clip icon to the left of the topic title to remind you that you have added text to this topic:

1. From the Edit menu in Help, choose Annotate.

2. In the Annotate dialog box, type the text you want to add. If you make a mistake, press BACKSPACE to remove any unwanted characters, and continue typing. Text wraps automatically, but you can end a line before it wraps by pressing ENTER.

3. Choose the Save button.

Copy an annotation

You can copy text from an annotation and paste it into another annotation in Help or into a document. You can also paste text from documents in to annotations. To copy:

1. Click the paper-clip icon to the left of the topic title. Or press TAB to select the paper-clip icon, and then press ENTER.

2. To copy the annotation to the Clipboard, choose the Copy button. If you want to copy only a portion of the annotation, select the text that you want to copy onto the Clipboard, and then choose the Copy button. You can drag the cursor over text to select it. Or press and hold dawn SHIFT while you use the arrow keys to select text.

3. Choose the Save Button.

To paste:

1. Copy onto the Clipboard the text you want to paste into the annotation.

2. In the Help topic where you want to paste the annotation, click the paper-clip icon to the left of the title.

Or press TAB to select the paper-clip icon, and then press ENTER.

3. To paste the contents of the Clipboard at the beginning of the topic, choose the Paste button. Or press SHIFT + INS. Or place the insertion point at the location you want to insert the new text, and then choose the Paste button.

4. Choose the Save button.

Viewing an Annotation.

If you have added comments to a Help topic, you can view them at any time:

1. Click the paper-clip icon to the left of the topic title. Or press TAB to select the paper-clip icon and then press ENTER.

2. When you finish viewing the annotation, choose the Cancel button.

Removing an Annotation

If you no longer need your comments about a Help topic, you can remove the annotation:

1. Click the paper-clip icon to the left of the topic title. Or press TAB to select the paper-clip icon, and then press ENTER.

2. Choose the Delete button.

Looking SCSI from Page 10

Work on SCSI-3 began almost immediately. As of this writing, SCSI-3 is an unapproved specification. Until it is approved, by the SCSI ASC[1] committee, the currently approved version remains at the SCSI-2 level. That does not stop companies from using the current working version of SCSI-3 as a design standard. However companies doing so, proceed at the risk the specification may change before final release.

SCSI-3's 600 plus pages break new ground. Unlike its predecessor it is a much more restrictive specification. Mandatory connectors and minimum and maximum cable lengths are specified. Also, the electrical characteristics of the cables and the signals driving the cables are specified. SCSI-3 appears to have solved many of SCSI's lingering problems while creating a few new problems. For instance it specifies a minimum of 0.3 meter (I foot) between cable connectors. This may cause some stuffing problems for small boxes. Also, the internal connectors are not retained by screws or clips. A slight vibration or torquing of the cables will cause them to pop out. Unless respecified, manufacturers will need to use supplemental restraints to keep the cables from bouncing out.

—*Fred Townsend*

Sound Cards from Page 13

storage medium, consider this: Why load a huge .WAV file into your memory and play it back, when you could simply play recorded sound information off of the CD-ROM just like your home stereo plays a standard audio CD? This approach frees the system of the tremendous load of having to process a potentially huge digitized sound.

With this in mind, it is highly unlikely that 16-bit digitized audio will be supported by mainstream software vendors until a compression standard is settled upon. So, to answer the question, the 16-bit feature of a sound card is probably not reason enough to warrant the additional $50-100 cost. However, this is not to say that a 16-bit sound card won't have some other, more usable, features that would suit your needs.

Once you've decided your needs, it's time to start reading reviews, talking to computer hardware dealers, investigating all the nit-picking details, and asking LOTS of questions! Be patient—chances are, you'll only be buying one sound card for the next two or three years, so you certainly aren't going to be happy if you rush out and buy a product that becomes obsolete before it is six months old. Don't try to be the first person on your block to get the newest whiz-bang sound card or you may get stuck with hardware that garners no third party support. While some of the new software innovations, such as surround sound and 3-D audio, certainly sound appealing, don't let that be the sole basis for your hardware decision because there may be no software companies supporting that feature for several months to come.

Rob O'Daniel is the PC Music & Sound Forum Leader for America On-Line and can be reached as PC RobO.

DISK OF THE MONTH INVENTORY - 8/94

Code: S=shareware, F=freeware, D= DOS, W=windows,

Prices: 1994 disks and later - $1.00, earlier than 1994 - $0.50   specials as noted

9207 SDW HyperDiskv4.32 Disk Cache,

9209 SD Scn, Clean, Vshield Virus protection

9306 SDW Cedar Island Link- great telecommunication program

9307 SD Procomm 2.43- popular communication and PKZ 2.04g compression standby

9401 SW Games (Craps v1.2 and Mima262) ; VBRun 100,200 and 300

9402 SW Games (15)- Poker, Checkers, Klotz, Taipei and more

9402 SD Internet Information plus games and utilities

9403 SW Xargon, Winsaw, Laugh, Quotes, Wowspill, Jm1s

9404 FDW CMOS_RAM, Screen capture, Winexit, Freemem, lots of freeware

9405 SW SPAUG BBS Windows file index

9406 SFW Selectins from Brian Livingston's "The Best in Windows Shareware" from Windows 3.1 Secrets
5 shareware, 7 freeware
2 DISKS - $1.00

9407 SW 11 Files from SPARC, SPACE and AOL(Merc Center)   blackout,ddp20,diskfac1,ezboot20,fish3,grped, toolqb20,windu12,windupe,winload,wnvel41

9408 FDW 12 Files - Mostly free
atcmos,cutpaste,hog,new,touch,whiz,findirq,checkirq whotocall,fuzion23,ss110,dialthat

Future of ASCII from Page 8

If a 2-byte code is too small to represent all the world's characters, would a 3- or 4-byte code work? A 4-byte code would hold over four billion characters [2A32]—that should do it. Finally the ISO 10646 Committee proposed a 32-bit (4-byte) coding system. If this code is adopted, the storage of a single character would increase by a factor of four. It is argued that this is not a problem, as memory and storage is getting cheaper. But what about communication between peripherals? A single character could take four times as long to send to a printer! The committee has suggested several compression schemes but these would mean another layer of understanding between the computer and its peripherals.

In 1987, Joe Becker and Lee Collins, from the Xerox Palo Alto Research Center and Mark Davis from Apple, began trying to develop a new code. It was similar to the ISO 10646 code but allowed for all the characters necessary for international computing. This code is called UNICODE (unique, universal and uniform character encoding) and is supported by many of the world's leading software and hardware manufacturers, including Microsoft, Sun, Adobe, Claris, Next, Alludes, Lotus, and Novell.

UNICODE is a 2-byte code utilizing the idea of the earlier ISO 646 localized codes. 16-bit code allows for a total of 65,536 characters and it is proposed that the first 8,192 places be assigned to the world's standard alphabetic characters, starting with the ASCII characters. The next 4,096 characters will be punctuation, mathematical and technical symbols. The next 4,0g6 will be the Chinese, Japanese and Korean alphabets. A large portion of the code, the next 43,000 places, will be partly occupied by the Unified Han characters (27,000), with the rest being reserved for future use. Of the total 65,536 UNICODE places, 5,632 are reserved for private use.

Conclusion

ASCII code has to go if we are to live in a true, international communicating community. ASCII is an incomplete code since it does not have a recognized character for "end-of-line" or "end-of-paragraph" and it does not handle international character sets. (Earlier users of WORD-1 1 will remember that we had to introduce SFK sequences to get multinational characters. This was because the ASCII code has twelve characters, #, ~, [, \,], ^, _, ', {, /, } and -, that can be substituted to give local character sets.)

However, again the computing community is split and is being asked to vote for one of two codes: the ISO 16046 or UNICODE. We shall just have to wait and see which way the community decides—so hold back those e-mail messages to Japan.

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Chips & Dips from Page 12

Extensive testing is then performed with minute probes. Any failed circuits are flagged for disposal. The wafer is then cut by a diamond-tipped saw, and each circuit is sent on for packaging. Most support chips and simple ICs (such as the workings of a clock or an amplifier circuit) have a simple plastic cover and a limited number of leads. A microprocessor will be covered by a high-impact ceramic covering and have hundreds of leads.

What is amazing is that the computing power, which used to occupy a multi-story building, is now in a form smaller than your palm, with a circuit element the size of your fingernail.

The people at Lucas are working on a 256-megabyte chip, with a gigabyte chip to follow by the year 2000. Intel puts over 1.2 million transistors in the 80486 chip, and the 80586 has over 3 million.

Who knows what's going to happen in the future in making chips. The goal is to be able to condense the circuitry into smaller areas. Remember, smaller makes faster processing, although it can cause heating problems. But, that's another challenge.

ASCII or Half ASCII
by Jim Taunt
South Mountain PCUG

For three years of my life I traveled every month to a standard meeting generating the ASCII code. I joined about fifty others who labored to generate the first American Standards Code for Information Interchange (ASCII). It is basis of almost all computer information interchange today.

Back in the sixties the Federal government was spending to 60% of its computer time resorting information from other computers. The computer makers caused this by customizing the BCD (Binary Coded Decimal) code established , IBM. The BCD code was an extension of the punch card code named Hollerith. Computers were in the same state as people; they spoke different languages.

The National Standards Society, later to become the American Standards Institute, started to develop a code based on an Army code used in eight bit paper tape transmission. For 75 years the standard route to send a printed message was from a keyboard to a paper tape to a distant paper tape to a printer. There were five or six different paper tape codes and five bit, six bit, and eight bit paper tapes. So those in the trade recognized the need to standardize.

IBM was promoting a version of the BCD code they call EBCD. (Extended Binary Coded Decimal) Everyone called Eb-C-Dick. EBCD was not a very good code because it was based on the BCD code and that was based on the Hollerith. It carried a hundred years of baggage from people of another era.

ASCII was a far superior code because it was developed by people with new understanding and it started from a clean sheet of paper. IBM was promoting their EBCD because their new line of machines was based on EBCD. (The IBMers in private admitted ASCII was a better code) This conflict lead to many battles in the standards committees.

The other major event in the development of ASCII was the interest of the world community. They were having similar problems and wanted a standard ISO (International Standards Organization) code. They copied ASCII and made it an International standard by leaving certain slots open. ANSI worked with them to modify ASCII to accommodate the ,IS0 needs. One problem was that some alphabets have more an 26 characters. Another problem was the need for a slot for their money symbol. They wanted to keep the "$" but wanted their own, too. Finally, nobody but the USA uses "@". There were other character problems, and there were some control problems also.

ASCII is divided into four sticks of 32 characters each in binary ascending order. The first stick is control characters, line feed, carriage return, etc. Next is the numeric and mathematical symbols stick. The upper and lower case sticks

followed. Paper tape advocates caused the last character in the lower case stick to be a control character "Delete." This character consisted of seven bits of "ls and "Os." In paper tape parlance all "ls" punches all holes in the tape and deletes everything that was there previously. These examples give you a hint of the battles that led to what we know as ASCII.

I was a soldier in battle, but I did have my moment of glory. Remember I told you that the government machines were spending up to 60% of their tome resorting data from other computers? at the last minute we found that IBM was planning to split ASCII in the eight bit environment. This would make every computer's sort sequence different, and lead to the same resorting and confusion that would allow IBM to come out on top. I proposed and had adopted something like the following. "When ASCII is imbedded in an eight bit environment, it will assume the least significant bits of that environment, and its sort sequence will be the natural binary sequence."

That was not much glory after forty years in the business, but it was the very best I could do.

Upgrading from Page 9

macros. Why should I not have both? My copy of WP 5.1, which I bought when it first came out, was never registered. My copy of WP 6.0 is registered because I bought it directly at a discount and had no choice. Just because a large corporation demands something does not make it a legal requirement, or a moral imperative. You're the customer. It's your needs which are paramount.

Before upgrading, read reviews, ask yourself questions about what you've been doing and what you want to do. Check with the local software store. Often, a new copy of a program is less than the upgrade price from the software publisher, when shipping and handling is figured in. Sometimes the price difference is offset by other factors. Quicken Seven was $30 plus $5 shipping from the company, and $40 from one of the chains. Typically, for a $5 difference, you don't have to wait three weeks; chase it at the post office, if the mailman doesn't find you at home; wind up on another unwanted mailing list, or register it (making it resellable if you decide there wasn't enough difference with the previous version to keep it).

A word about that favorite old program of yours. It will often not work with a modern operating system, and you think you have to upgrade or dump it for something less desirable.

Both DOS 5.0, and DOS 6.0, have something called SETVER. It means that you can tell DOS to behave as if it's an earlier version. At the command line, type: SETVER PROG.EXE 3.30, where PROG.EXE is the executable file of your favorite program and 330 is the DOS version you want to use. DOS 3.3 will work with most things. If not, try 2.21 or 3.10.

Another useful tool is LOADFIX, as in LOADFIX PROG

GREEN EGGS AND RAM
by Michelle Chorman

TODAY, YOU CAN FIND MANY CLASSIC stories and ancient volumes in electronic format. On a single CD-ROM you can bring up volumes of material by well-known authors.

Sometimes, though, I wonder how some of the books we read in literature class might have turned out if the computer had been around earlier. What effect would the earlier invention of the computer have had on the literary world?

I could have had an early start in computer literacy with the children's story *Green Eggs and RAM*. "My system crashed, oh Sam I Am, I only have One Meg of RAM." Or perhaps the inner workings of the CPU could have been clarified with nursery rhymes from *Motherboard Goose*. "Humpty Dumpty sat on a wall/Humpty made a system call/All the King's Nortons and all the King's men/Couldn't put his hard drive back together again." And so forth and so on.

Ancient philosophy would have changed. Plato's *Dialogues* would not have been a series of ethical conversations, but rather a description of his Windowing system. Dante's *Inferno* would have also contained a description of the awful tortures set aside for those who created the computer virus. And C.S. Lewis' *The Screwtape Letters* would have outlined what happens when your magnetic tape reader messes up.

Shakespeare would have written the tragic *ROMeo and Juliet,* a story about a love affair that can never be consummated due to the lovers residing on different network servers. Milton would have written about file corruption and entitled it *Pair of Bytes Lost.*

Of course, if you prefer reading poetry over prose, there would have been an entire collection dedicated to the computer. The collection might have included a great work like *The Raving,* by Edgar Allen Poe, a poem about his frustration with binary arithmetic.

It would also have included the classic *O Caption, My Caption,* a volume that deals with Whitman's experiences with his word processor. And Robert Frost's *The Path Not Taken,* detailing his journey into directories not listed in his PATH statement, would certainly have been part of the package.

Epic heroes of network administration would have been glorified in such books as *The Lord of the (Token) Rings,* the theater classic *A Man For All Sessions* and the dark *Lord of the Files.* The common man's story would have been told in *The Great Getsby,* the symbolic tale of a spendthrift who spends little or no money on his computer, so that he barely "gets by" with an 8088.

The tragedy would have taken a different slant with such titles as *The Old Man and the C++,* the story of an elderly man's struggle to learn a programming language. *Death of a Computer Salesman* would have been a timeless tragedy set in the 20th century. And the lengthy *The Rise and Fall of the ROM Empire* would have burdened many a nightstand. In intimate detail the story of the ROM chip and its eventual collapse due to corruption would have unfolded through several tedious and interminable volumes.

Historical novels would have been forever transformed. *Gone With the Wind* would have become a romantic description of how the heroine accidentally reformatted her hard drive during the Civil War. And the novel *Of Mice and Men* would have told the poignant tale of a slow pointing device during the Great Depression.
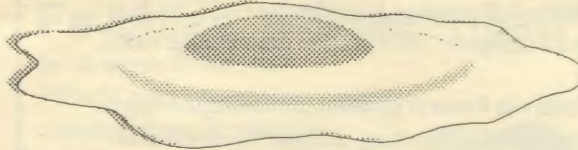
In science fiction and fantasy you might have seen such titles as *A Stranger in a Strange LAN.* The futuristic *Fahrenheit 692* would have been named after the temperature at which silicon wafers melt.

Of course, my favorite would have been *To Kill a Mocking Nerd,* a stern object lesson to those people who shamelessly flaunt their knowledge about computers. A satisfying way to end, don't you think?

Upgrading from Page 17

at the command line. This is for really old programs.

My favorite program is the old Ventura 3.0 for DOS. A very useful desk top publisher, it was abandoned for a Windows version (a true truck). I make good use of DOS 6.0's multiple configuration option to set the computer so it'll run smoothly. I have other configurations to play games (which make heavy conventional memory demands), and Windows, which assumes nothing else exists. Why not have your cake and eat it too.

Teach yourself some DOS. It is the one thing you can do to save yourself a lot of money and aggravation. Software companies have a first priority, making money. If, in the process, they make things a bit easier for you, it is usually an accident. Mostly, they make you dependent. Make yourself as independent as possible.

Software piracy is not a good idea. Software prices have dropped to a point where they are almost reasonable. A major application can be about $100 if you buy smart. I paid $99 for my copy of WP 6.0. Typically, it sells for $250. But having said this, it's important to understand that the rules about software use were influenced to a great extent by multi-billion dollar software conglomerates lobbying congress. You should have no moral qualms about looking for loopholes in the law, or in their marketing strategies.

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[1] *One man's throw-aways may be another man's treasures! —RM and LA*

[2] *Experienced, competent software-users do register their software! Most, probably all, new software releases have a bug or two. Manufacturers usually send bug fixes to dl registered users free of charge, and often offer upgrades at lower prices by direct mail. I prefer to have the option to get my bugs fixed and decide if an upgrade is worth while for me, myself, rather than depending on some "technically competent person" advising me. LA*

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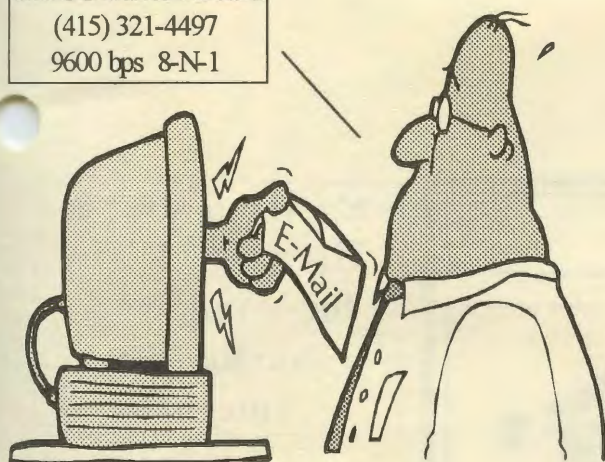
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checkirq	alternative to above
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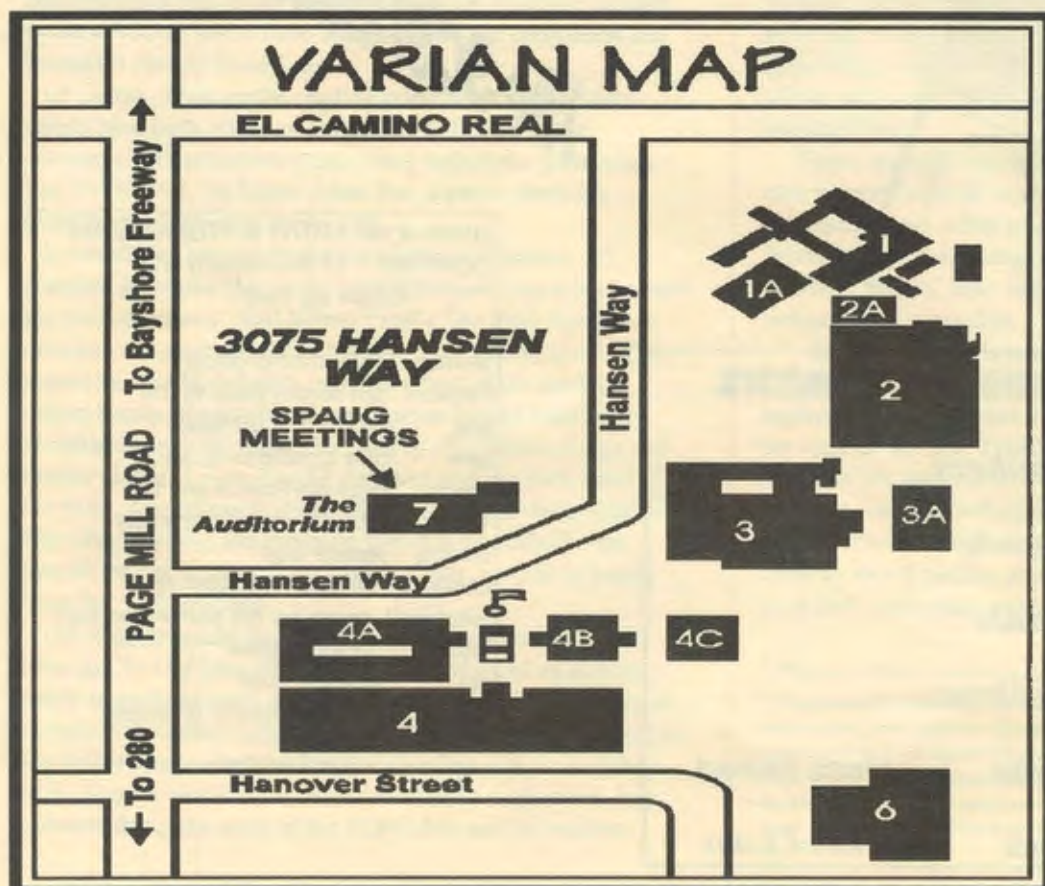
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