



SAN LUIS OBISPO PC USERS

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What's New

George Campbell started off this month's early meeting with his reflections on Comdex '91. According to George, the keywords at Comdex this year were Multi-media, Pen based computing, and, of course, PARTIES!!

George said that there was more "multi" than "media" at the show. Perhaps next year will be more inspiring.

George found the perfect pen based computing system. With this unit, you can do wordprocessing, calculations, graphics, and even, write programs. The unit is made up of a rectangular pulpy substance approximately eight and a half inches wide by eleven inches long. The unit also contains a long cylindrical device. An image appears when the cylindrical device is dragged across the pulpy substance. George hopes for more advancements in pen based computing in years to come.

Much discussion followed from Bob Ward, Bob Hunt, and other SLO Bytes members that also at-

By John Ewing

tended Comdex. All in all, it sounds like Comdex was a fun place to be this year.

The early meeting ended up with a hodgepodge of questions about word processors, printers, fonts, etc.

For the general meeting, Chuck Buelow from NBI, Inc. presented Legacy For Windows. This WYSIWYG program features advanced word processing, desk-top publishing, and integrated graphics. The word processor contains a grammar checker, a spelling checker, and a thesaurus. The desk-top publishing feature supports page composition, style sheets, and typography. The graphic attributes include full color support, bitmap images, drawing tools, and image processing. I hope to do an in-depth review of this product in the near future.

Continued on Page 2

Loading DOS 5 into the Upper Memory Area

by Gus Thomasson

SLO Bytes PCUC

Several people ask me about DOS 5.0 and some of the special problems they were having getting the new DOS 5.0 to load itself in the High Memory Area. Being a computer consultant is sort of like being a doctor, people are always asking questions and expecting free advice. I guess that's what the club is all about. In any event here is a rather in-depth paper drawn from several sources including a news letter I subscribe to called Dos Questions.

In order to load DOS 5 high (into the first 64K of extended memory, known as the high memory area, or HMA), your system must meet the following prerequisites:

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Club Officers

President George Campbell
 Vice President Sam Powers
 Treasurer Bernice Meador
 Secretary Bob Ward
 Editor John Ewing

Community Organizations Need Your Old Hardware

If you have old computers, hard drives, printers or other peripherals that you're not using anymore, you can donate them to any of a number of San Luis Obispo County non-profit social service organizations, helping a group in need and getting a tax deduction for yourself at the same time. As was announced at the November SLO BYTES meeting, we're trying to round up as much old equipment as possible and match it with groups who have specific needs. A lot of the groups in our area who

get along OK when the economy is good are having a rough time right now, and need to save literally every penny they can. Your donation of old computers and peripherals that you no longer need would be greatly appreciated, and you'll receive a letter documenting your gift to file with your income tax return. (Even if you think that the stuff you've got stashed away is too prehistoric for anyone to use anymore, keep in mind that many businesses still operate using XTs and 9-pin dot-matrix printers.) And if you don't have anything tangible to donate but would like to make a contribution of some sort, there are lots of organizations who would benefit greatly from an afternoon of your time, groups who can't afford to hire a consultant but who don't know the difference between a hard drive and a 4-wheel drive. If you'd be willing to serve in a

consulting capacity, we'd like to know about that, too. This is not a one-time, end-of-the-year effort; we'd like to keep this flow of knowledge and used equipment going, developing a bank of resources. If you have some time or equipment to donate, please leave a message on the BBS or drop a note to Kathy Yakal, 1472 Sixth St., Los Osos, CA 93402. Tell us what your areas of expertise are or describe the computers/peripherals you'd like to give away. Or leave a note up at the front desk during a club meeting. There is an immediate need for a 20-, 40-, or 80-megabyte hard drive. HOTLINE was recently given an XT by PG&E, but it only has 2 floppy drives, and some of their applications require hard disk storage. Please contact KY via the BBS or at 528-4087 as soon as possible if you have one.

What's New

Mark Taylor from XTree Corp., San Luis Obispo, stopped by looking for BETA testers for new XTree releases. Mark also brought by a copy of the latest release of XTreeGold 2.5 and two T-shirts with the Xtree logo to be given away as door prizes at the end of the meeting.

Speaking of door prizes, the general meeting ended with the drawing. Val Valiante and Ross Kongable were the lucky recipients of the XTree T-shirts, Doug Depue won XTreeGold 2.5, and the Grand Prize of Legacy Software went to Ken Stilts. Congratulations!! And a special thank you to XTree and NBI for the gifts. By the way, in case you were wondering, NBI stands for Nothing But Initials.

Don't miss the Meeting in December. George and Bob will be giving away all the goodies they've collected over the past year. If it turns out like last years, it will be nothing if not fun.

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PC Industry News Abstracts

The abstracts below were excerpted from recent issues of PC Week (call 609-461-2100 for subscription information) and InfoWorld (800-457-7866).

Quicken to Soon Become Available for Windows

Intuit is hoping to ship its Windows version of Quicken by the end of 1991.

-INF, 9/30/91, p 15

Northgate Unveils 3 Upgradable PCs, Cuts Prices

Northgate Computer Systems inc. recently announced three new 386- and 486-based PCs, and cut prices on its existing upgradeable machines. The new units range from \$2,399 to \$3,599; price cuts on the older PCs vary.

-PCwk, 9/23/91, p 29

Micrografx Tries Its Fast Draw on Corel

The \$149 Windows Draw, from Micrografx, may give \$695 CorelDraw some serious competition. While it lacks a few features found in high-end package, it includes many of them, and is extremely easy to use. Shipping in late October.

-INF, 9/30/91, p 1

Publish-It Update Rolls Out Better Text Flow and Text Wrap Shapes

Timeworks' Publish-It 2.0 is a major upgrade of the earlier version. New features of note include text autoflow and user-defined text wrap shapes, and increased font, memory, and custom page size support. Flaws include the lack of multicolumn frames, the awkwardness of autoflow merit correction, and text export only in ASCII format.

-INF, 10/7/91, p 59

Continued on Page 6

Shadow RAM Configuration

by Gus Thomasson

SLO Bytes PCUG

In continuation of the on going saga of memory configurations it might be useful to discuss the term "Shadow RAM."

The system BIOS, VGA/EGA ROM, and a variety of other programming is stored in one-time programmable devices called ROMs (Read-Only-Memory). Two important properties of ROMs which lend them to this use are:

(1) The data is protected, it cannot be changed by mistake, and (2) The data is retained when the power is shut off.

A notable deficiency in ROM technology is that its speed access time is typically two to three times slower than normal memory (RAM) access. To further exaggerate this difference, ROM data is generally accessible only in 8-bit quantities, whereas general purpose memory can be read in 16-bit or 32-bit quantities (286/386 respectively). A simple-minded scheme to improve the access speed is to copy data from slow ROMs to fast RAM and thereafter use the RAM image instead of the ROM. When RAM is dedicated to this purpose, it is called "shadow RAM".

The actual hardware implementation of the "shadow RAM is not as trivial as the simplicity of concept might suggest. These issues must be treated:

(1) Memory used for shadowing must be de-allocated from the general memory pool, to be dedicated to the shadow RAM use.
 (2) A technique must exist to make the ROM "disappear", and the shadow RAM "appear" in its place.

(3) To simulate the desirable 'Read-Only' property of the RAM the shadow RAM must have 'Write-Protect' provisions.

In some (but not all) computers offering this shadow RAM feature, there is a trade-off between maximum performance and available memory. When memory is used for shadowing it is unavailable for other purposes. The correct amount of memory subtracted from the general memory pool is at least equal to the amount of ROM space shadowed. It depends on the particular motherboard design, and may be as much as 384K.

Other systems are designed in expectation that shadowing will always be enabled, and a fixed amount (up to 384K) of the total system RAM is permanently dedicated to this purpose. None of it can be made available for general purpose usage. There is no decision regarding trade-offs, either "use it or lose it.

In nearly all cases, the shadowed regions should be configured as "Write-Protected". This will prevent the shadowed data from becoming corrupted should a programming error write data into that region. Although very unusual, several board products are known to possess Read/Write memory embedded in the same region as the ROM. Such "ROM", if shadowed, must be configured as "Read/Write" to function correctly.

The entire 384K ROM space is subdivided into ten regions depicted by the ten fields shown on the screen. The Video and Adapter ROM region is comprised of eight equal 16K segments, and the System and BIOS ROM region is divided into two 64K segments. This breakdown is generic, and may suggest a finer granularity of shadow capability than is actually available in a particular computer. When this is the case, enabling shadow in one region will automatically cause other regions to become

shadowed. The screen will be updated accordingly. A similar situation exists with the "Read/Write vs "Write-Protect" attribute assignment.

ROMs of varying capacities may be present in the computer, and a single one may (and often does) extend beyond a 16K boundary, and consequently resides in two adjacent segments even though it is smaller than 16K. Thus, the entire 384K ROM space must be scanned carefully, with areas assigned a number to each ROM found (beginning with ROM # 1). Each of the ten fields on the screen show the ROM #n found in the respective segment. If a single ROM spans two or more (adjacent) 16K segments, each associated field will display the identical ROM #n. This is a difficult thing to do with out a high memory utility with which to do it. This writer uses QEMM386.SYS (By Quaterdeck) to scan the memory between 640 and 1024. Other utilities exist. MEM MAX and DRDOS 6.0 both have several utilities including the ubiquitous MEM/A switch. The command MEM/A displays all memory locations and what's in them.

###

\$\$\$ -4-Sale - \$\$\$ -4-Sale - \$\$\$

IBM Clone (Jameco) 286 Computer

- * EGA Monitor
- * 1-1.2 floppy drive
- * 20 MEG hard drive
- * Modem; internal 1200 Baud
- * Ports; 1 serial, 2 parallel

Price \$600.00
 Contact L.S. More
 (Verne) @ 238-2950
 \$\$\$

Loading DOS 5

Your system must contain an 80286 or higher processor.
Your system must have extended memory.

DOS won't load into expanded memory. (You can use the MEM command to find out what type of memory your system contains). Your CONFIG.SYS file must contain a DEVICE command for HIMEM.SYS or an equivalent extended memory manager.

Your CONFIG.SYS file must contain either a DOS=HIGH or DOS=HIGH, UMB command. Additionally, the DOS command must appear after the command DEVICE=HIMEM.SYS, and before any other Device commands.

To find out whether DOS has loaded itself into the HMA, issue the command: "MEM". Immediately, DOS 5 will display information about your system's memory. If the last line of the display reads MSDOS resident in High Memory Area, DOS has successfully loaded into the HMA.

If DOS 5 fails to load into the HMA, follow these steps:

1. Verify that your system is equipped with an 80286 or higher processor and extended memory.
2. Use the DOS Editor to edit your CONFIG.SYS file by typing C:\edit c:\CONFIG.SYS.
3. Make sure your CONFIG.SYS file contains a DEVICE command for HIMEM.SYS. If no such command exists, at the beginning of the file insert the following line:
DEVICE = C:\DOS\HIMEM.SYS.
4. Make sure your CONFIG.SYS file contains a DOS=HIGH command or a DOS=HIGH, UMB command. If neither of these commands exist, insert the command DOS=HIGH immediately after the command
DEVICE=C:\DOS\HIMEM.SYS

5. Exit the editor and save the file changes.

6. Restart your system with the CTRL+ALT+DEL.

7. Use the MEM command to find out whether DOS has successfully loaded into the HMA. If it hasn't, continue with the next step.

8. Create a DOS 5 setup diskette by inserting a formatted disk into drive A and typing C:\SYS A:.

9. Use the DOS Editor to open your CONFIG.SYS file once more, and add the switch /CPUCLOCK:ON to your DEVICE=HIMEM.SYS command, like this:

```
DEVICE=C:\DOS\HIMEM.SYS
/CPUCLOCK:ON.
```

10. Save the changes to your CONFIG-SYS file.

11. Restart your computer by pressing CTRL+ALT+DEL.

12. Once again, use the MEM command to find out whether DOS has successfully loaded into the UMB. If it hasn't, continue with the next step.

13. Use the DOS Editor to reopen CONFIG.SYS, and add a switch to the DEVICE=HIMEM.SYS command that takes the form
DEVICE=HIMEM.SYS /MACHINE: machineType where machineType is a value derived from the following table corresponding to the type of machine you have. For instance, if your machine is an Acer 1100, you would enter the following DEVICE command into your CONFIG.SYS file: DEVICE=C:\DOS\HIMEM.SYS /CPUCLOCK:ON /MACHINE:6. If your machine is not listed in Table A, or if you have an IBM PC/AT, try the following machine numbers (in this order). 1, 11, 12, 13, 8, 2 through 10, 14 through 16.

14. Save the changes to your CONFIG.SYS file.

15. Restart your computer by pressing CONT+ALT+DEL.

16. If your computer fails when you restart it, or you see the message ERROR.- Cannot control A20 line, then you've specified a machine type value that's incorrect for your hardware. At this point, insert into drive A the start-up diskette you created and restart your system.

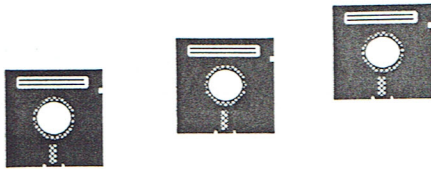
17. Edit your CONFIG.SYS file, specify a different machineType value, save your changes, and restart your system again. Continue trying different values for machineType until you find one that works. You might need to try several values for machineType before you identify the right one.

For related information on loading DOS high, refer to pages 282 and 610-613 of your Microsoft MS-DOS User's Guide and Reference.

Table A
Machine Types

Machine	TYPE
Acer 11006	
AT&T 6300 Plus	5
Bull Micral 60	16
COMPUADD 386 systems	1 or 8
CSS Labs	12
Datamedia 386/486	2
Hitaci HL500C	8
HP Vectra	14
HP Vectra (A & A+)	4
IBM/AT	1, 11, 12 or 13
IBM/PS2	2
Intel 301z or 302	8
JDR 3f6/33	1
Philips	13
Phoenix Cascade BIOS	3, 1 or 8
Toshiba 5100	7
Tulip SX	9
UNISYS PowerPort	2
Wyse 12.5 MHz 286	8
Zenith ZBIOS	10

Gus Thomasson is a SLO Bytes member and computer consultant versed in computer hardware, software, and Novell networks.



SLO Bytes Library

Here's a couple disks to add to your collection. Hope you like them.

#457 Programs from Blanchard Software: **WORDS** - a work game, **CRYPTO** - make your own cryptograms (not easy for a simple mind like mine), **CLOCK** - log time you spend of certain program. Good if you work for another person and you must keep track of computer time.

#458 **ANSIFONT** - create large ansi fonts on screen, **GRABB390** - screen capture program. **PP11** - Print Partner 1.1 - prints banners, flyers, etc. (good).

#459 **ABC-TALK** - here's one of the better educational programs for youngsters. Learn your ABC's by having the computer "talk" to you. **COINS** - learn to count coins. (Ages 5-8)

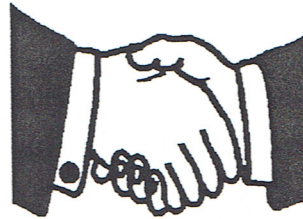
#460 - 461 **ROCK Utilities** - here's a set of better than average utilities for your computer. Set up like Norton Utilities. Use the RI (Rock Initiator) command for menu. Many utilities not found in Norton.

Updates:

- #311** - **BASSTOUR** updated to version 4.55
- #447** - **VPIC46** updated to version 4.6
- #266** - **TDRAW50** updated to version 5.0
- #082** - **LIST76B** updated to version 7.6B
- #071** - **ALMANAC** updated to 1991 version
- #084** - **GRAFWK61** updated to version 6.1 **BANAOID** moved to #444.

###

Welcome to the new



members of SLO Bytes who joined us in November

Linda Cade	481-1935
James & Sherie Childers	772-1373
Joseph & Sara Ferraro	434-2266
Bob Fisher	238-6812
Bob Leonard	773-5176
Anne Miranda	772-9504
Judith Neufeld	481-5871
Doug Regier	772-4039
John Steffan	481-9357
Rick Steinberger	489-3979
Thomas & Roslyn Wilcox	481-8641



Profile

Bringing People Together

- Special Interest/Support Groups
- Relationships •Resume Listings
- Computer Related Services

System Operator
Randy Poorman

Voice (805) 481-4887
BBS Data Line (805) 481-4661
Modem Settings 300/1200/2400/8/N/1

Bits n' Bytes

*** Several asked for the address of the street atlas on CD ROM. For \$99 you get a CD ROM disk with detailed, street-level maps of the entire United States! I saw it at Comdex and it works! Order Street Atlas USA from DeLorme Mapping, P.O. Box 298, Lower Main Street, Freeport, ME 04032. Call 207-865- 1234.

*** Many thanks to Tibor Beresky, Teri Sorgatz and others for donating their software as doorprizes at our December meeting. Also thanks to Computerland for the packages of SuperStor and other software packages for the same cause.

*** Remember the call from George and Kathy... Make you favorite recipe of goodies for the Christmas party. George has a preference for "grainy" fudge. Sounds like he's never had good fudge before; cook it too fast, it gets grainy.

*** El Coral bookstore on campus will be having their 20% off sale from December 9th through 13th. It's a great time to buy those computer books and brush up on some reading. All computer supplies, with the exception of books, are NOT part of the sale.

*** I will have copies of "The Only DOS Book You'll Ever Need" at the meeting for your viewing. Although the list price for this book is \$24.95, the publisher will offer it to our members for 40% off or \$14.97. I have discount cards.

*** To date we have 76 "goodies" to give away at our Christmas meeting. Perhaps you'll be one of the lucky ones.

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More Abstracts

Intel Suffers Soft Third-Quarter Sales

The weak economy and pressure from AMD are having negative impact on Intel's third quarter earnings; Wall Street's earlier prediction of \$1 per share in earnings have been revised to as low as 79 cents per share.

-INF, 9/23/91, p 100

Lotus' Stock Retreats After 1-2-3 Release

Lotus Development Corp.'s stock has dropped after soaring to more than \$40 per share during the release of 1-2-3 for Windows.

-PCwk, 9/23/91, p 119

IBM, Apple Ink Historic Deal

The first task of the new venture between Apple and IBM will be to keep customers from buying existing products. The companies have announced plans to tie Apple Macintoshes into IBM's enterprise network environment.

-INF, 10/7/91, p 1

IBM Drops Laptop Price; Bundles PS/2s, Software

For the second time this year, IBM has seriously cut the price of its Personal System/2 L40 SX laptop, from \$5,245 to \$3,995; the optional data fax/modem was lowered to \$459, and memory module pricetags have been cut. . The company has also announced promotions and rebates to buyers of various PS/2 systems.

-INF, 10/7/91, p 3

ButtonWare Ships Low-End Windows Contact Manager

ButtonWare Inc. has released *TakeNote*TM 1.0, a Windows-based contact manager with a Rolodex card-style interface. 17 card templates are provided, including business and personal contacts, a software library, and note cards. It also offers data sort and search functions, auto-dial, and the ability to print lists, mailing labels, and index cards. Cost is \$49.95 through January 15, and \$69.95 thereafter.

-PCwk, 9/23/91, p 33

(also: TakeNote's Database Eases Storage, Retrieval

-INF, 9/23/91, p 13)

Microsoft at Work on 'Windows dBase' Project

Microsoft Corp. Chairman and CEO Bill Gates has announced that Microsoft is working on a Windows "dBase-like" database manager for release in 1992. The product's code name is Cirrus. Gates also reiterated his company's continuing commitment to LAN Manager

-PCwk, 9/30/91, p 6

Psion Takes Wraps off Palmtop PC

Psion Inc. has announced the Series 3 Palmtop, an 11-ounce computer that comes with built-in Microsoft Word-compatible word processing software and an optional Microsoft Excel-compatible spreadsheet. A 128K RAM version retails for \$425; a 256K RAM unit costs \$495.

-PCwk, 9/23/91, p 17 (also: Psion Hand-Held Computer Runs on Two AA Batteries -INF, 9/30/91, p 22)

Acer to Roll Out 386SX Notebook, Upgradable PCs

Acer America Corp. will soon announce its 20MHz 386SX AcerAnyWare 386s notebook computer for \$2,895, and the \$1,595 AcerPower desktop (2Mb RAM, Ultra VGA, and a 1.44Mb or 1.2Mb floppy drive. Several other upgradable desktop and laptop PCs are being made available

-PCwk, 10/14/91, p 24

At Last: Peer-to-Peer NetWare Makes its Debut

A first look at Novell's NetWare Lite, due out later this month. This entry level LAN offers basic networking capabilities, with an easy upgrade path to more sophisticated NetWare. Easy to install and use, the product offers simple messaging capabilities file and printer sharing, with minimal security options. \$99 per user

-INF, 9/23/91, p 1

(also: Novell's NetWare Lite Targets Ease of Use

-PCwk, 9/23/91, p 47)

Northgate Adds PC LANs to its Mail-Order Lineup

Northgate Computer Systems Inc. will add shrink-wrapped LANs to its mail-order lineup, offering 24-hour phone support. 25-30 LAN specialists will staff the lines, and a higher level of on-site LAN support will be available. Prices have not yet been set.

-PCwk, 10/7/91, p 1

NetWare Lite Lacks Performance Edge

In this first look at Novell's new NetWare Lite, the low-cost peer-to-peer network does not measure up to competitors like LANtastic, and is not up to Novell NetWare's performance standards. It may still be a good choice for very small businesses and work groups.

-PCwk, 10/7/91, p 68

Testers Applaud Windows 3.1 Beta

Reports on the second beta release of *Windows* 3.1 are mixed. While it offers better crash protection for applications running under the user interface, it fails to address lockups under DOS applications and lost network connections. It also includes an extension of *Windows* 3.0's total resource limit of 64K.

-PCwk, 9/23/91, p 8

WinSpeed Speeds Display of Applications in Windows

Panacea Inc. has introduced *WinSpeed*TM, a software product that speeds the display performance of applications running under *Windows* 3.0 by two to five times. Suggested retail price is \$79.

-INF, 10/7/91, p 18

5 Programs Provide Lessons in Grammar

Reviews/comparisons of five grammar-checking programs, with accompanying features chart. Best overall is Artificial Linguistics inc.'s *PowerEdit* 1.1TM (\$295; \$495 for five users).

-PCwk, 10/14/91, p 141

How Compilers Work

by Lou Morgan

Madison PCUG

[Reprinted from pbug, Palm Beach Users Group Newsletter, July 1989]

What are compilers and how do they work? Many computer users ask this question after the programming bug has bitten them. To most people, a compiler appears to be a "black box program" that translates source code written in a high-level language (such as FORTRAN, BASIC, Pascal or C) into a language the computer can understand and execute.

Compilers vs. Interpreters

Computers cannot understand English words and grammar. They also cannot understand the highly structured words and sentences of programming languages. These languages must be translated by a compiler or interpreter before a computer can understand them. A compiler or interpreter is a program that looks up each "word" of your programming language in a kind of dictionary (or lexicon) and in a series of steps translates the program into machine code.

An interpreter translates one line of source code at a time into machine code and then executes it. Debugging and testing is relatively fast and easy in interpreted code since the entire program doesn't have to be reprocessed each time a change is made. The BASIC.COM and BASICA.COM programs are interpreters. Interpreted programs run much slower than compiled programs because they must be translated every time they are run. Programmers often test and debug their programs using an interpreter and then compile them for production use.

How Compilers Work

Compilers translate source code into virtual machine language. In the IBM

PC, this virtual language is 8088 machine code. Most compilers convert programs in three steps (each step is called a pass). A particular compiler may have one program per pass or may combine two or three steps in a single program. For a very complex language, a step may be so difficult that it is broken up into many smaller steps. Regardless of how many passes or programs are required, the compiler performs only three main functions - lexical analysis, syntax analysis and code generation. During each pass of the compiler, the source code moves closer to becoming virtual machine language (or whatever language the compiler is designed to generate).

Lexical Analysis

In the first pass of a compiler, the source code is passed through a lexical analyzer which converts the source code to a set of tokens. A token is generally a number representing some key word in the language. A compiler has a unique number for each key word (e.g., IF, WHILE, END) and each arithmetic or logical operator (e.g., =, -, *, AND, OR). Numbers are represented by a token which indicates that the next thing should be interpreted as a number. The tokens put the programming language into a form that can be checked for proper structure and order.

The other important task of the lexical analyzer is to build a symbol table. This is a table of all the identifiers (variable names, procedures and constants) used in the program. When an identifier is first recognized by the analyzer, it is inserted into the symbol table along with the information about its type, where it is to be stored and so forth. This information is used in subsequent passes of the compiler.

Syntax Analysis

After the lexical analyzer translates a program into tokens of key words, variables, constants, symbols, and

logical operators, the compiler makes its next pass. To describe what happens during this function, I will briefly explain grammar, parsing and semantic routines.

Like any language, programming languages have a set of rules governing the structure of the program. Each computer language has its own grammar that makes it unique. Some grammar is complex (e.g. PL/I), and others are relatively easy (e.g., Pascal). The programmer must observe all the structural rules to make logical sense to the computer.

Next come the parsing routines which check to see that the program obeys the language rules. The parser reads in the tokens generated by the lexical analyzer and compares them to the set grammar of the programming language. If the program has followed the rules of the language, it is syntactically correct. However, when the parser encounters an error, it issues a warning or error message and tries to continue. Some parsers try to correct a faulty program, others do not. When the parser reaches the end of the token stream, it will tell the compiler that the program is grammatically correct and compiling can continue; if the program contains too many errors, compiling must be aborted. If the program is grammatically correct, the parser will call for the semantic routines.

For grammatically correct programs, the next functions - the semantic routines - perform two tasks: checking to ensure that each series of tokens will be understood by the computer when it is fully translated to machine code, and converting the series of tokens one step closer to machine code. The first task takes a series of tokens, called a production, and checks to see if it makes sense. For example, a production may be correct as far as the parser is concerned, but the semantic routines check whether the variables have been declared and are of the right

Continued on Page 8

Compilers

type, etc. If the production makes sense, the semantic routine reduces the production for the next phase of compilation, code generation. Most of the code in the compiler is in the semantic routines which take up the majority of the compilation time.

To summarize: two major routines - the parsing routine and the semantic routine - comprise syntax analysis. The parser checks for the correct order of the tokens and then calls the semantic routines to check whether the series of tokens (a production) will make sense to the computer. The semantic routine reduces the production another step toward complete translation to machine code.

Code Generation

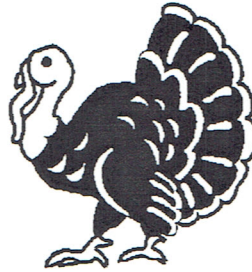
The code generation process determines how fast the code will run and how large it will be. The first part of code generation involves optimization and the second involves actual machine code generation. In the optimization step, the compiler tries to make the intermediate code generated by semantic routines more efficient. This process can be very slow and may not be able to improve the code much. Because of this, many compilers don't include optimizers, and if they do, they look for areas that are easy to optimize.

The machine code generation process takes the intermediate code produced by the optimizer (or semantic routines if the compiler has no optimizer) and generates virtual machine code, which in our case is 8088 machine code. It is this part of the compilation phase that is machine-dependent. Each type of computer has an operating system that processes virtual machine differently; therefore, the code generator is designed specifically for the computer and operating system on which the final code will run. At this point, based on the computer's operating

system, the compiler chooses instructions that will yield the fastest executing and smallest code size. If the program is free of syntactical errors, code generation should take place with no problem. When the code generator is finished, the code produced will be 8088 machine code, but the format of the code is not yet executable. It is in a format (an OBJ file in our case) that is ready to go to a linker which creates an executable *.EXE or *.COM file from the machine code generated by the compiler.

###

HAPPY THANKSGIVING TO ALL OF SLO BYTES



Calendar

December 1st	Our annual Christmas party and give-a-way. Also semi-annual swap meet and election of officers.
January 5th	Marty U'ren will show the Laser Master line of printer enhancements.
February 2nd	Borland International with John Montague will demonstrate Paradox
March '92	Instant Office by David Dilworth

The Sines of the Zerodiac Your Technical Horoscope ©

By Al Gorithm

Reproduced by permission of the author... The infamous and humorous Saint Silicon*

November 22nd to December 21st
Sign = SATELLITE

You are a Satellite, so you always aim high. Sometimes though, you tend to look down upon others when you should not. You have a photographic memory. This makes you an excellent story teller with many levels of meaning going on simultaneously. You have an appreciation for Eastern thought, but always come around to see the other point of view. Your fault is in putting yourself above others. You sometimes forget that: "What goes up must come down." You enjoy fast living but also have lofty ideals.

* ASCIIstrology comes from Jeffrey Armstrong's book The Binary Bible, King Job's Perversion. If you want over 200 pages of laughter, all computer related, this book may be purchased for \$16.95 (includes shipping).
Saint Silicon
1803 Mission ST., #174
Santa Cruz, CA 95060
(408)458-0213

A big happy birthday to the following individuals

Gary Bartell	12/02
Robert Boyd	12/16
Gaylord Chizek	12/02
Craig Corwin	12/10
Steve Dison	12/21
Norman Donaldson	12/23
Jerry Ferris	12/02
Norma Henderson	12/20
Ian Hughes	12/05
Ralph Jones	12/11
William Leonard	12/11
Edwin Montgomery	12/17
Mark Morrison	12/31
Shirley Smith	12/05
George Tway	12/10

Meeting Times

General meetings are held the 1st Sunday of every month, unless noted otherwise in the newsletter calendar, at 2:30 pm in the Cal Poly University Biology Department, Fisher Hall 286. Special Interest Groups (SIGS) meet at 1:00 - 2:15 pm.

New User's SIG - F.H. 286

Our Public Domain Library is in Fisher Hall 292. Hours 12 Noon till closing.

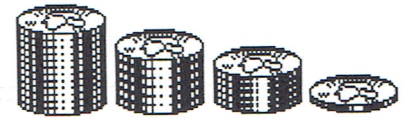
SLO BYTES BULLETIN BOARD

(805) 528-3753 2400/8/N/1

PC Files & Message Section

SYSOP: George Campbell

All Welcome - 24 Hours



Treasurer's Report

SLO Bytes PCUG Expenditures November, 1991

Beginning Balance:	+1976.81
Expenses:	
Newsletter 10/11/91	-155.94
Nat. Comp. Accessories 10/18/91	-131.57
Xerox duplication	-22.50
Power Supply BBS	-54.05
	=====
subtotal	364.06
Deposit 11/04/91	+625.00
Dividend 09/30/91	12.49
	=====
subtotal	+637.49
Balance 11/04/91	+2250.24

Club Information

The SLO BYTES Newsletter is a monthly publication of SLO BYTES PC User's Group located in San Luis Obispo, California. Information in this Newsletter is derived from both our own membership and other PC User Group Newsletters. The purpose of this publication is to inform our members of meetings and provide information related to the use of IBM PC's and compatible computers.

Membership: Dues are \$20 per year. Newsletter only is \$12 per year. Full membership entitles you to our monthly newsletter, full use of the public domain software library and discounts at local computer stores.

Article Submission: Deadline for submission of articles is the 15th of each month. Articles should be provided in ASCII format without any type of formatting from your wordprocessor including tabs, indents, extra spaces, or highlighting. We prefer articles on disk but will accept hardcopies if necessary.

Disclaimer: Neither SLO BYTES PC User's Group, its officers, editor, or contributors to this newsletter assume liability for damages arising out of this publication of any article, including but not limited to the listing of programming code, batch files and other helpful hints.

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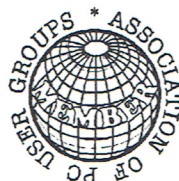
Direct all correspondence to Bob Ward, 2100 Andre Ave., Los Osos, CA. 93402. Call (805)756-2164 M-F 7:30am - 5pm and (805)528-0121 all other times.

Editor: John Ewing, 1710 15th Street, Los Osos, Ca. 93402. Phone 528-7196.

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WITCO Computers 3563 Sueldo, Blvd. B San Luis Obsipo 549-0811	10%	Off list - all computers, software, computer peripherals, and products. Contact Bruce, Paul or Dave for discount.
Los Cerros Computers 466-4402	15% 20%	Above cost on computers and computer peripherals. Above cost on software & supplies (Cost includes shipping & handling)
Computerland of San Luis Obispo 1422 Monterey St. San Luis Obispo, Ca 93401 (805) 541-4884	15% 10%	Above cost on all regularly priced computers, software, computer peripherals, and products. Contact Marilyn for discount. Off service labor

To receive any of the above discounts you must show your current SLO Bytes Membership Card.



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