August 1980

$2.00

Personal Computing

For Your Home and Business

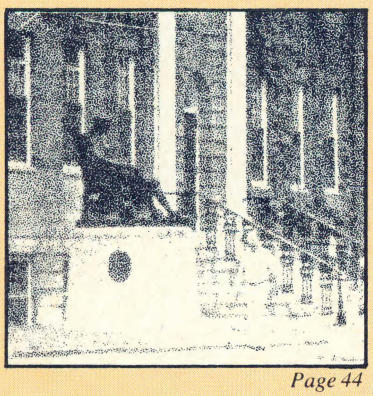
Computers in Education

Also:
Apple III
Installment Sales
Stock Option Analysis
Genealogy
Personal Finance
Novice's Notebook

August 1980 Vol. IV, No. 8

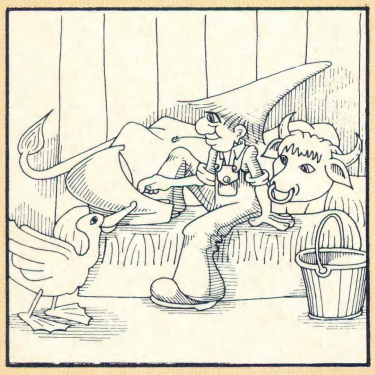
Personal Computing

For Your Home and Business



Page 44

Page 50



Page 65

Cover design by Stephen C. Fischer
Cover photograph by Jon Buchbinder
Frame by Peter Walsh

DEPARTMENTS

FEEDBACK 6
RANDOM ACCESS 11
COMPUTER CHESS 71
COMPUTER BRIDGE 83
FUTURE COMPUTING ..87
WHAT'S COMING UP 88
AD INDEX 102

SPECIAL REPORT: COMPUTERS IN EDUCATION

Grow old along with me! The best is yet to be 38
An exciting look at the impact of computers on education, now and in the future. *by Ken Mazur*

Personal Computing Goes to College 44
This professor's approach to teaching emphasizes computers as problem-solving tools. *by John P. Walters, PhD*

A Teacher for Your Apple 48
Use your computer to improve your vocabulary; you can study new words, then test yourself. *by Robert R. Derner*

Living Off the Land 50
This agricultural business simulation teaches children basic economic principles. *by Robert K. Fink*

A Gradebook for Teacher 53
An electronic grade book and administrative aid, geared for science but easily adaptable to other subjects. *by Eric Geoffrey Vann*

LAUNCHING PAD

Saga of the Nervous Computer 32
This man's Sargon will never play the same. *by Boyd Z. Palmer*

Family Forest 34
Here's a simple genealogy program for the Pet without a disk. *by Thomas Edworthy*

Novice's Notebook: How to Save Memory, Time and Your Fingers.....64
Clever algorithms can condense programs. *by David Lubar*

Apple III Unveiled at NCC 65
Apple's latest computer, designed for professional and managerial people, incorporates many new features.

NCC Report 68
Discussion on some of the most significant products introduced at NCC '80.

IN THE MONEY

Stock Option Analysis 22
Analyzing stock option positions with your micro can decrease your risk of loss. *by William Lappen*

Personal Finance Management 25
Use your check numbers as data statement numbers for maintaining your personal finances. *by E.E. Comstock*

Installment Sales 28
Selling property will no longer mean aggravation at tax time. *by W.B. Goldsmith, Jr.*

Turn Your Hobby Into A Business 36
Our Future Computing columnist offers tips on making computing profitable. *by William R. Parks*

© Copyright 1980, Benwill Publishing Corp., A Morgan-Grampian Co.

Publication Number ISSN 0192-5490

Apple III Unveiled at NCC

Apple Computer's newest system, the Apple III, is a fully integrated computer system with built-in disk drive, up to 128K bytes of memory, color and black/white video and the ability to accommodate a wide range of peripheral devices.

"The Apple III is a natural extension of the Apple II personal computer and we have enhanced its power and capability while keeping many of the important aspects of the Apple II," said Steven Jobs, Apple cofounder and vice president of marketing. "For example, it offers high-resolution color graphics, sound capability and system modularity for easy expansion. In addition, a special emulation capability in effect lets users convert an Apple III to an Apple II to permit the use of programs developed for the Apple II."

The new Apple III, introduced during the National Computer Conference (NCC) in May, is for use by professional and managerial people. Its features include: an Apple-designed central processor, a self-contained floppy disk drive, a port which supports up to three additional disk drives, a new keyboard design, a larger CRT data display (80 columns), the Sophisticated Operating System (SOS) and minimal RFI emission.

"It brings greatly expanded data manipulation and word processing capability to the personal computer market," Mr. Jobs said.

Two new application packages are offered for use on the Apple III. One, The Information Analyst, is a business tool for planning, forecasting, modeling, pricing, costing, scheduling and budgeting. Apple III Word Processor software, available in late summer, can be used for preparing memos, letters and general typing, long documents, form letters and legal documents.

Many of the benefits of the Apple III are made possible by the new central processor which features a superset of the 6502 instruction set plus other improvements.

Peripheral devices request machine attention by interrupting the CPU which optimizes speed or the CPU may poll peripherals to determine which need attention, minimizing the software required for peripheral control. The new computer also has a built-in, 6-bit, digital-to-analog (d/a) converter which gives high-quality sound for voice or music generation.

The New Keyboard

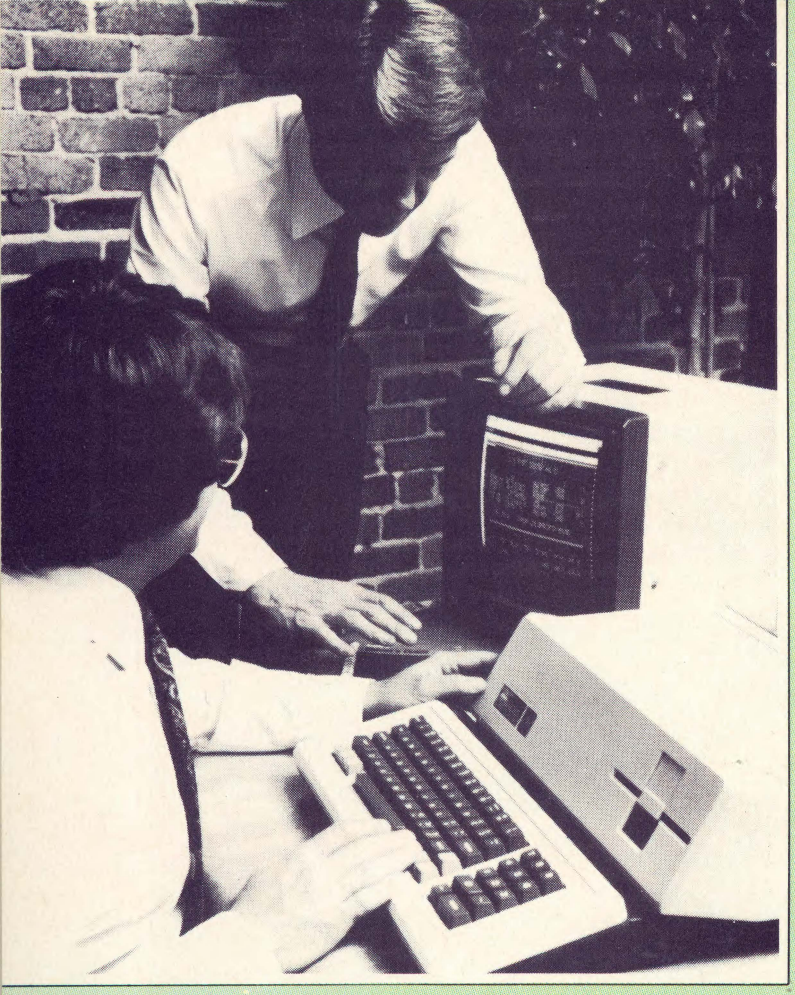
The keyboard has 74 keys and is laid out like a standard typewriter with sculptured key caps which provide a better feel and also reduce glare. Studs on the "D", "K" and "5" keys help orient users. The keyboard includes a 13-key numeric pad for entering numerical data faster and more easily as well as reducing keystrokes when handling tasks requiring intricate commands. This keypad changes function for use with the Word Processor software system. A second set of keycaps is supplied so commands can be initiated with one keystroke.

The system utilizes a lookup table to define what each letter, number or symbol should be specified as each keyboard code comes into the CPU. This permits redefinition of key meanings for handling foreign languages or programming functions into the numeric keypad.

Two Apple function keys are included as well. When pressed before another key, they act as programmable function keys. When pressed after another key, the solid Apple key acts as a high-speed repeat key. An alpha lock key locks only the alphabetical keys into their upper-case modes for compatibility with the Basic programming and the terminal requirements of other computers. Numbers and punctuation marks are not put into upper case with this key but only with the normal shift key.

An auto repeat feature is provided on all keys. Holding a key down makes that letter or number repeat and pressing the solid Apple key will increase the repeat speed. In addition,

Photo Courtesy of Apple Computer, Inc.



four cursor control keys simplify editing.

A number of items which were optional on the Apple II computer have been incorporated as standard equipment in the Apple III. For example, the built-in disk controller handles interaction with the built-in 5-1/4-inch floppy disk drive and has a connector for adding up to three additional disk drives. With the Word Processor system, the second disk drive is included as standard equipment.

Built-in connectors for adding printers are also available on the Apple III. One is a serial port for use with Apple's Silentype thermal printer and the other is an RS-232C port for adding a letter-quality, daisy wheel-type of printer or a modem.

The computer's integral clock and calendar are maintained by their own internal battery to retain time and date references even when the computer is turned off. Apple III can automatically time and data stamp file entries as well.

A built-in 6-bit d/a converter used to generate sound can synthesize simple music and voice sounds for use in alerting the operator to errors in other sound applications.

Graphics

Graphics capabilities provide flexible color graphic data handling on the monitor screen, including color text foreground and background modes useful for highlighting as well as for high-resolution plotting and graphing. The Apple III uses 128 configurable characters and symbols, all RAM-based so they can be loaded from diskettes for changing to different type fonts or to foreign languages.

Three different text modes are provided. One supports 80-character, upper/lower case text with true descenders on lower case characters such as q, p, g and j, which extend below the line for word processing applications. The second supports 40-character color-on-color text, providing the capability to use different foreground and background colors for each character. This mode allows you to emphasize certain parts of texts for error conditions or highlighting. In addition, the Apple III supports a 40 character black-and-white text mode for use in the Apple II emulation mode.

Several graphics modes are also supported, including an ultra-high resolution black-and-white mode offering a resolution of 560 × 192. Another is a high-resolution, 16-color mode offering a 280 × 192 resolution. This mode permits 16 shades of grey on a black-and-white monitor.

In addition to the built-in peripheral interfaces, the Apple III offers four I/O slots for additional expansion. Optional I/O cards, which will soon be available, include a parallel printer card, an analog interface card and an engineering development card.

The unit's heavy-duty switching power supply permits it to handle several peripherals. The reset key is located behind the main keyboard to prevent accidental system reset and the entire unit has been designed to comply with new FCC standards on radiated interference.

First Two Packages

The Information Analyst consists of an Apple III with 96K bytes of random access memory (RAM). It comes with a built-in 5-1/4-inch floppy disk drive, a new integrated keyboard with a 13-key numeric keypad, two built-in printer interfaces and a 12-inch black-and-white video monitor. Its software includes Apple's Sophisticated Operating System (SOS) as well as management-oriented tools such as Visicalc III, Mail List Manager and Apple Business Basic. The system price is $4340.

The Word Processor system consists of an Apple III with 96K bytes of memory, integrated keyboard, printer interfaces, a 12-inch black-and-white monitor, and two disk drives — one built-in and one external. The disk drives provide the capacity to store about sixty pages of text per removable floppy diskette.

The Word Processor comes with a choice of printers: either an Apple Silentype draft-quality thermal printer ($5330) or a letter-quality, daisy-wheel printer ($7800). Software for the system includes Apple's SOS operating system, word processing application software and a training course.

Options for the two systems packages include up to 32K bytes of additional RAM memory, bringing the maximum to 128K bytes total; additional 5-1/4-inch floppy disk drives, to a maximum of four per system; either the Silentype or a letter-quality printer; the use of a standard NTSC color video monitor, an RGB (red/green/blue) color monitor or even a standard TV set; input/output cards for interfacing other peripheral devices; and a vinyl carrying case.

"The Information Analyst system should be of great value to the manager, engineer, scientist or financial real-world problem solver," Mr. Jobs said. "In addition, research indicates that once word processing systems descend blow $8000, that market will grow explosively. In the Apple III, we have a system that can process both data and words at a price below what one of those functions would cost."

Sophisticated Operating System

The purpose of the Sophisticated Operating System (SOS) used with the Apple III is to make all system operations transparent to the user. SOS ties together the hardware and software features of the computer while isolating users from details of system operation. The operating system relieves programmers and operators of many tasks by acting as a resource manager for the total computer system and by serv-

ing as a foundation for all other software development done on the Apple III.

SOS is composed of five major elements: a system manager, a file system, a device module, an event management interface and a memory manager.

The primary application interface to SOS is through the system call manager which receives and processes SOS calls from the applications running on the Apple III. The calls are decoded and the relevant information is collected and passed to the proper SOS module.

The file system is device independent, byte-oriented, interrupt-driven and controls storage elements of the computer. Every device or source of data in the system is given a file name and is placed in a hierarchy. This allows the system to perform read, write and read/write operations with all devices or data sources, no matter what type they are. In effect, SOS is an interface to all elements of the system. It makes "peeks" and "pokes" unnecessary and permits the use of Apple III as either an interrupt-driven or a polled system.

SOS's device module handles different devices according to their type: block-oriented devices such as disk memories and character-oriented devices such as keyboards. It handles blocks of data to and from block-oriented devices and one characer at a time when dealing with character-oriented devices. SOS is a device-management interface, reading and writing exactly as much data as each device is capable of handling.

The event management interface associates any interrupt or polled event with data arriving from an outside source.

Memory manager makes memory use transparent to the user by permitting programs to be run anywhere in memory where there is space available, handling bank switching from one segment of memory to another without operator intervention. This frees you from concerns about memory configuration, which can be important in larger size systems up to 128K.

Apple II emulation modes do not interface with SOS, but go directly into Apple III hardware. Once the Apple III is in the emulation mode, it is locked in. The system must be booted to go into another mode.

SOS also has a system configuration feature used to configure each user's operating system to his or her specific hardware configuration. SOS comes preconfigured to handle the most common peripheral devices so most users will only have to use the System Generation Program when they add a new peripheral.

Apple's Sophisticated Operating System overlays directly on the system hardware, providing an interface to all system elements and isolating their operating details from the user. This transparency means that no consideration has to be given to how the system hardware works in order to use all of its powerful features.

SOS acts as a foundation on which the language development modules are set so users can employ Pascal, Basic and Fortran interchangeably when appropriate. Application packages can run either on top of the language system or directly on top of SOS, thus providing the utmost in flexibility and power.

Apple III prices range from $4340 to $7800. At press time, systems were scheduled to be on display at Apple dealers beginning in June and customer shipments to begin in July. The Apple II and II Plus remain in the company's product line as entry level personal computers starting at $1195. For more information see your local dealer or contact Apple Computer, Inc., 10260 Bandley Dr., Cupertino, CA 95014; (408) 996-1010. □

RACET SORTS — RACET UTILITIES — RACET computes — RACET SORTS — RACET UTILITIES — RACET computes — RACET SORTS — RACET UTILITIES — RACET computes —

MOD II UTILITY PACKAGE

Replacement Debug (DEBUG)
35 basic functions + 8 edit commands! Single step or Multiple step. Automatic trace of logic flow with printing of trace, trace of instructions greater than stack pointer values, and rapid trace. Subroutine calling. Automatic program looping. Dynamic disassembly of instructions!!!

Directory Catalog System (XDIR)
Build directory of directories!! Sorts by disk or by program. Abbreviated or full form — full form includes dates of creation and last update, and other directory data.
Wild card select options with masks. Build consolidated directory of all GL#?/BAS files. Select on filename and extension.
Save or load XDIR catalog files.
Concatenate new data with loaded file.

Extended Copy (XCOPY)
Copies multiple files with a single command using masked select options! Source disk may be non-operating system disk. Single drive capability. Recover bad files — invalid sectors itemized but copy continues.
Merge files with or without replacement.

Superzap (SZAP)
Display or print and modify standard TRSDOS diskette track and sector data. Full screen edit mode. Automatic repeat scan and print. Copy disk sectors — any number of sectors to same or other drive.

Directory Fix (DFIX)
Automatic repair of HIT tables! List and flag directory errors.

Disk Identification (DISKID) Change diskette names!

Extended Create (XCREATE) Creates and initializes file to end.

DOCUMENTATION
Complete documentation of above utilities including a full discussion on recovery of lost data on diskettes!!!

Mod II Utility Package $150 Manual only $20 refundable

MOD II BASIC CROSS REFERENCE UTILITY

SEEK and FIND functions for:
Variables, Line Numbers, Strings, Keywords
'All' options available for line numbers and variables.
Load from BASIC - Call with <CTRL> R
Output to screen or printer.

BASIC CROSS REFERENCE UTILITY $50

INFINITE BASIC for MOD I TRS-80™Tape and Disk System Extensions to Level II and Disk BASIC $49.95
Full MATRIX functions — 30 BASIC commands!
50 more STRING functions as BASIC commands!
Includes RACET in-memory sorts. Load only functions you want — where you want in memory! More than you expect!

∞ BUSINESS (Requires Infinite BASIC) $29.95
Automatic printer pagination. Packed decimal arithmetic - 127 digit accuracy. Binary array searches. Hash code.

COMPROC Command Processor for Disk Systems $19.95
Auto your disk to perform any sequence of commands.

GSF (Specify 16, 32 or 48K Memory) $24.95
18 machine language routines including RACET sorts.

DISK SORT MERGE (DSM) for MOD I and MOD II
Random file disk sort merge — multi-diskette files. All machine language stand alone package. Sort on up to 15 fields — ascending or descending. Provides optional output field deletion, rearrangement, and padding. Sort an 85K diskette in less than 3 minutes!

DSM for Mod I (Minimum 32K, 2-drives) **$75 on Disk**

DSM for Mod II (Minimum 64K, 1 drive) **$150 on Disk**

Mod II Development Package $100
Machine language Superzap — Editor Assembler, Disassembler Patches.

Mod II Generalized Subroutine Facility $50
Sort 1000 elements in 6 seconds!

CHECK, VISA, M/C, C.O.D.
Calif. Residents add 6%
Telephone Orders Accepted (714) 637-5016

RACET COMPUTES
702 Palmdale, Orange, CA 92665

DEALER INQUIRIES INVITED

WHEN ORDERING PLEASE ADVISE PUBLICATION SOURCE

TRS-80 IS A REGISTERED TRADEMARK OF TANDY CORPORATION

RACET SORTS — RACET UTILITIES — RACET computes — RACET SORTS — RACET UTILITIES — RACET computes — RACET SORTS — RACET UTILITIES — RACET computes —

CIRCLE 28