

Personal Computer News Letter

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ABSTRACT

This document is an IBM Internal newsletter dealing with matters of interest to users of personal computers for business reasons. It contains articles, written by the user community within IBM, that

- announce programs and techniques relating to personal computers
- query for existence of a program or process
- describe current Work In Progress(WIP)
- give early warning of problems
- express an individual's point of view (letter to the editor)

Articles may be submitted by anyone within IBM as long as they address one of the above areas and are not:

- confidential
- more than two pages in length
- anonymous

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This document is published on the first working day of each month. Please submit your input to the editor as early as possible for editing, but not later than five working days before the end of the prior month.

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EDITORIAL

INTERNAL - YES, EXTERNAL - NO

Right up front I need to address security in this issue. I have discovered that not everyone understands the meaning of "IBM Internal Use Only". This is a security classification of IBM property. It is to be treated no more lightly than any other classification. Keeping IBM property within IBM is a condition of employment. The few people that have given this newsletter away outside the company would be well advised to discontinue this practice.

WHEEE, THEY'RE HERE

Many of the sites have now received their first shipment of IBM Personal Computers. GPD's experiences have been very good; very few machines have had problems. The problems we did have either went away with a little use or were easily correctable. We did not have to send any to Greencastle for repair.

Based upon the condition of the system unit's cartons when they arrived, I am surprised that we didn't have more problems. Our shipment looked like an elephant had sat on it. Part of the stack on the pallet was six inches shorter than when it left Boca Raton. Internally there was no visible damage and no correlation between a problem and the amount of box damage. Actually, these units are packed so well that perhaps they WERE designed to be used as elephant furniture during shipment.

SITE COORDINATORS

As a site coordinator (technical species), I have been receiving a steady flow of information from our hotline in Boca Raton. The hotline has been recording the questions sent in, adding answers, and returning it to the site coordinators as a document. Those of you that have received machines should know who your site coordinators are by now. Others who are planning on ordering a machine for business use should locate their site coordinator(s). They can give you the help you need. Again, please don't disturb these busy people with personal questions about the IBM PC.

DISTRIBUTION OF INTERNAL PROGRAMS

In this issue is an announcement of an internally developed program for the PC (near the end of the newsletter). This is the first of many programs that I expect to be announced here and I was very excited to see one so soon.

Because of the high personal interest in programs for the PC, the author of the first program and I are recommending the following to program developers:

1. Clearly label all documentation as to it's security classification.
2. Code the program to display to the user it's security classification. It should be at least "IBM Internal Use Only".
3. Announce the program through the PC newsletter if it is "Internal Use Only". Otherwise have your site coordinator announce it to all the other site coordinators.
4. Distribute all copies of the program through the site coordinators.

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The last point above is based upon a logistics problem. There will be a high demand for copies of programs announced in this newsletter and it will be unfeasible to send thousands of copies out. In the future we should be able to ship PC programs over the network, but for now it takes a diskette which is a real expense.

It will take a while for everyone to get a host connection up and running with the PC. Not only is the software not here yet, but there is the hardware aspect of getting modems installed and a port into the host machine. If you are a technical coordinator, I encourage you to start looking into making a host connection a reality.

ENTER THE THIRD PARTY OEM

The COMDEX81 show in Las Vegas in November brought the first announcement that I have heard of add-on hardware for the IBM PC. In particular, a company named TecMar announced 20 hardware products, some with supporting software, that are plug compatible with the PC. Included are a bus extender box with 7 slots, hardware clock, hard disk, 192K and 256K RAM cards, EPROM burner, IEEE 488 bus interface, D/A and A/D cards, parallel and serial ports, prototyping boards, and an extender card. No prices or delivery dates were given.

Details may be obtained from TecMar Inc., 23600 Mercantile Road, Cleveland, OH 44122, (216) 464-7410.

I do not plan to help the OEM's announce their products or try in any way to support them. But, a first is a first, plus you need to know what is available so that you can make an informed decision on whether to make or purchase an item.

THE EDITOR TAKES A BREAK

During the month of December I will either be in class or on vacation. Some one will be handling my mail and network messages, but it will help immensely if you wait until January to communicate with me. The major exception to this is if you have a contribution for the newsletter. Please DO send in your articles, letters, and also short blurbs on interesting items you have found in the external press. There will be a January issue, but it will be at least a week late.

HAVE A HAPPY

Wishing you and yours a joyous holiday season.

Keith Eckhardt

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EXTERNAL PRESS

THE IBM PERSONAL COMPUTER

From Creative Computing, December, 1981. p19

This article is an extensive review of the IBM PC by a reporter that visited the development lab in Boca Raton. It covers the hardware, BASIC, Graphics, DOS, VisiCalc, documentation, etc.

PC: THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS

A new Magazine Featuring IBM Personal Computers Will Debut in January. It will contain features on both hardware and software for the IBM PC, much like magazines for other micro-computers. It is an independent journal and is not in any way affiliated with IBM.

This announcement is included for your awareness only. Inquiries may be addressed to: PC, 1239 21st Avenue, San Francisco, CA 94122

IBM'S BILLION DOLLAR BABY: THE PERSONAL COMPUTER

From Computer Retailing, November, 1981, pp.24-27

This article was extracted from a new research report from Future Computing, Inc., written by Dr. Portia Isaacson and Dr. Egil Juliussen. The article summarizes the report, which is extremely favorable to the IBM PC. Included are graphs and projections on where the PC industry is going.

See the next quote for more details.

STUDY PUTS IBM PC ON TOP OF MARKET BY 1986

From Computer Business News, November 9, 1981. Page 9

"RICHARDSON, Texas -- The IBM Personal Computer (PC) crystallizes standards for the personal computer industry and may be the first machine to take a substantial bite out of the Apple Computer Inc. market, a study released here predicts."

"In the next few years, IBM will rapidly penetrate the market and by 1986, IBM will have the largest market share of any personal computer manufacturer," according to the study entitled "IBM's Billion Dollar Baby: The Personal Computer," by Dr. Portia Isaacson and Dr. Egil Juliussen of Future Computing Inc.

8 INCH DISKETTE IN 3741 FORMAT

From Computerworld, November 23, 1981, p 57

In lower left corner of INDEPTH page 10 (approx page 57), INSTOR Corp. announces an attachment for the IBMPC which reads and writes 8 inch diskettes in 3741 format. The product is called INSTOR/80.

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LETTERS TO THE EDITOR

EDITOR,

Just finished reading the second edition of the PC newsletter. You're doing a great job, keep up the good work. Guess I will be the first one to publicly ask about APL for the PC. I don't know if IBM will be coming out with its own offering in the future, but if this does not happen, do you know if any of the existing APL offerings will run on the PC?

I couldn't agree with you more about the PC being a very significant tool for off-loading APL work, BUT (heaven forbid) not using VISICALC or BASIC.

I would appreciate hearing from anyone looking into the APL question.

Lloyd Spiker, VM(STLVM3/SPIKE), Santa Teresa, 8+543-4859

(EDITOR: I understand how hard it must be for a confirmed APL'er to think of moving down to a BASIC or VISICALC. There are some hard facts to consider that may bring my prior comment more into focus:

1. There is NO APL announced for the IBM PC.
2. None of the prior IBM APL offerings will run on the IBM PC.
3. Many of the current users of APL programs are not programmers. They couldn't care less what language is used to provide the answers they need. BASIC and VisiCalc can both be used to good advantage.
4. Many of the applications I have heard about that are currently running in APL are simply data manipulators that do little or no computing. The exotic features of APL are unnecessary.

If there ever is an APL on the IBM PC, we can then take advantage of it's potential on this little beauty from Boca Raton also.)

EDITOR

I finally got an answer to my VISICALC question from the December, 1981, issue of Creative Computing. That issue of Creative Computing did an "in-depth" evaluation of the IBM Personal computer. Similar to the majority of other reviews we have all been seeing, this one was extremely favorable. It was a little different than other's I have seen in as much it went into the system in quite a bit of depth and had a considerable amount of tabular data.

The author's conclusion was, "I'm going to buy one as soon as I can."!!!!

For possible inclusion in your "Newsletter", I am submitting the following quote from that article. I think there may be quite a few people out there interested in this subject.

Once again, this is a quote from the December, 1981 issue of Creative Computing.

"This implementation of VisiCalc is disappointing in one respect. In a 64K system, VisiCalc leaves about 24K of workspace. If you add memory to the machine, the workspace can rise to about 36K, but not higher. IBM says the next release is in the works and will allow the workspace to be all of available memory. This would mean an 88K of workspace in a 128K system. IBM says that there will be a slight charge for the new version, even to people who paid for the original version. It seems silly for this not to be perfect on the first release".

The author also comments on a quick and dirty VisiCalc benchmark that he ran and the time was unexplainedly slightly slower than a TRS-80 Model II. (IBMPC time = 2.6 seconds, TRS-80 Model II time = 2.1 seconds)

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Hope this information is of some value to you. By the way, do get that issue of Creative Computing and read the evaluation. You will surely enjoy it.

Stan Berlin, VM(MSNVM2/BERLIN), Dallas

EDITOR

I have enjoyed both of your letters so far and look forward to more of the same. If you could get us on the distribution list, I would surely appreciate it.

Meanwhile, I am replying to query 8102-03, Steve Pattee's request for education ideas. I have recently purchased 2 books at a local store and love them. The first is a good primer, easy to get through for a beginner. The second is much deeper, lot's of programming examples, yet still very good for self-study.

"BASIC - SECOND EDITION" PRICE APPX.
AUTHOR: ROBERT L. ALBRECHT, LEROY FINKEL, JERALD R. BROWN
PUB: JOHN WILEY & SONS, INC.

"PROGRAMMING WITH BASIC" PRICE APPX.
(SCHAUM'S OUTLINE SERIES)
AUTHOR: BYRON S. GOTTFRIED
PUB: MCGRAW HILL BOOK COMPANY

Sam Gerber, B/O 326, Phila Finance and Insurance, DPD, VM(HONE6/B326A)

EDITOR,

May I suggest that you re-title your PC Newsletter as "Newsletter - Business Use of the Personal Computer"? My reasons are as follows:

1. It is easy to confuse the various newsletters;
2. People are quick to judge based on titles only;
3. The business uses will prove to be very important and will suffer from confusion with personal and hobbyist needs;
4. We will shortly see sensitivity in some IBM and customer locations because of data security, data proliferation, and other considerations. Because the overlap between business and personal interests will prove to be so valuable, it will BE DOUBLY HARD TO KEEP BUSINESS AND PERSONAL CONSIDERATIONS separated.
5. Re-titling emphasizes your current objectives.

Bob Pfaff, VM(FRK5VM1/FRK5CE1), Franklin Lakes, 8-731-3883

BOB,

Thank you for your suggestions about the name of the newsletter. I have been having the same kinds of thoughts about it, but I don't know yet what I will do. Boca Raton has chosen to call the IBM machine a personal computer. Their orientation is to emphasize the personal aspect of the machine.

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SECOND NOTE FROM BOB PFAFF

Referencing past discussions, the terms "personal" and "business" may not be mutually exclusive. APPLE takes pride in multiple machine sales to banks, businesses, and schools. Each banker uses HIS or HER machine to suit their task.

I believe the bulk of the Boca market forecast comes from markets other than the home or hobbyist. Look at the initial software, the price, and the ergonomic keyboard and monochrome display. IBM internal users have been given an ordering "edge" perhaps to point the way towards successful, economic uses in large organizations. Large organizations have the same problems we do with data control, data security, internal sharing of programs, and training. Customers have some of the same opportunities involving reduced costs, much greater function to the user, and a form of introductory education to accountants, for example, who benefit from learning an alternate to green eyeshades, they say.

The hobbyist type of PC newsletter is filled, really filled, with discussions on how to do all kinds of tricky things for under \$100. That's good fun and the work will ultimately contribute to internal business objectives.

Since we have not yet received actual PC's here I have no experiences to report. We gave a four-hour hands-on VISICALC demo to three financial types using our IBM-owned Apple II. They were ecstatic! I hear this is also the case in Tuscon.

Good luck with your business oriented newsletter.

Bob Pfaff, VM(FRKVM1/FRK5CE1), Franklin Lakes, 8+731-3883

(EDITOR: Anyone else have ideas on a more appropriate name for this newsletter that will eliminate confusion about it's business orientation?)

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CONTRIBUTIONS

8103-01 EXPERIENCES CONNECTING A PRINTER TO THE RS232C ADAPTER

I recently spent a considerable amount of time getting a Diablo Printer with an RS-232 Serial Interface to operate with the IBM Personal Computer. It sounds like an easy job, but it wound up taking three weeks and at least 50 phone calls to get the first piece of intelligible information from the PC to the Printer. I have listed below some recommendations which will be of help to anyone attempting to attach a Serial Interface Printer to the IBM Personal Computer.

- SERIAL INTERFACE CARD - First of all, make sure that the jumper block on the Serial Interface Card is plugged properly. Some of the early Serial Card installation manuals had the pictures that showed how to install the jumper REVERSED! The Technical Manual shows the jumper in the proper position. That is, for a Voltage Interface the dot on the jumper block should be UP. For a Current Loop Interface the dot should be DOWN.
- PRINTER CABLE - When getting started, keep the cable as simple as possible. You probably won't need to attach the handshaking lines until after you get the printer working. For my initial setup I connected only two wires between the PC and the printer. For the Diablo, I connected PC pin-7 (logic ground) to Diablo pin-7 (logic ground), and PC pin-2 (data out) to Diablo pin-3 (data in). All other lines were just left floating.
- BAUD RATE - If you have a choice of BAUD rates, start out with something low like 300.
- DRIVER PROGRAM - For initial testing, the printer driver program should be kept very simple, don't try to hook into BIOS until you are sure that the printer is working. Below is the simple BASIC test loop which I used to drive the Diablo.

```
100 REM
150 REM ----- SERIAL PRINTER TEST LOOP -----
200 REM
250 TEXT$ = "NOW IS THE TIME FOR THE PRINTER TO WORK!"
300 TRON
350 OPEN "COM1: 300,M,7,1," AS #2
400 FOR X = 1 TO 10
450 PRINT#2, TEXT$
500 PRINT#2, CHR$(13) CHR$(10)
550 NEXT X
600 TROFF
650 CLOSE
700 END
```

The above hints should be enough to get you started. If you are unable to get your printer working, Boca requests that you contact either the printer manufacturer or ComputerLand. Going thru ComputerLand is the best way because it will get your problem logged into the formal problem reporting system and will therefore aid others with similar problems.

Based on the fact that there is no easy way, such as a switch, to tell BASIC that the system printer is attached to the Serial Card, I recommend that when you buy a printer you buy one with a Centronics parallel interface. If you already have a Serial Printer, I recommend that you purchase one of the printer cables with built-in logic. These cables allow an RS-232 printer to be attached to the IBM parallel printer card. One manufacturer of an IBM-Diablo cable is Renaissance at phone 415-930-7707.

John Bernauer, VM(SJEVM1/CUTTRAS), San Jose, 8+276-7186

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8103-02 FIRST TRY AT USING CASSETTE CONNECTION TO IBM PC

I have experimented with a cassette on the PC. There is an interesting startup problem. The planar board has a P4 jumper (cf. logic 10 of 12 pg D-9) to select either MIC or AUX output to the cassette recorder. The Tech ref logics indicate it is normally jumpered for MIC. Nowhere else is there a positive statement which connection should be made. Now, the voltage is markedly different for MIC and AUX. In the Tech Ref they warn you about making the wrong connection because you might burn out your recorder. A Tandy cassette cable can fit into either MIC or AUX. (Cf. pg2-21 for voltage).

So, I suggest connecting to the cassette recorder AUX jack first and if that works, leave it alone. AUX is safest since it takes the largest input voltage. If the planar board puts out the max voltage (Aux=.68 V) then you're ok. If the planar is in fact connected for mic (75mV) then you get a weak signal.

Ron Frank, VM(CAMBRIDG/RONFRANK), Cambridge Scientific Center,
8+249-9232

8103-03 THE INTEL 8087 CO-PROCESSOR

The Intel 8088 microprocessor is capable of attaching to the Intel 8087 numeric data processor which provides high speed integer and real arithmetic. The 8087 is commonly termed a co-processor, not a multi-processor, because there is only a single instruction stream that is shared by the co-processors.

The chief advantage of the 8087 is speed of execution. In general, the 8087 will perform numeric calculations a hundred times faster than 8088 simulation of those functions. This is illustrated in the following table.

Instruction	Instructions per second	
	8087	8086
Add/Subtract Magnitude	62,500	625
Multiply - Short Real	55,556	625
Multiply - Long Real	37,037	476
Divide	25,641	313
Square Root	27,778	51
Tangent	9,091	77
x**y	7,692	58

Note: These timings are for the 8086 which is faster than the 8088 because the 8086 has a 16 bit wide data path. The 8088 has an 8 bit wide data path.

The 8088 and 8087 work together by examining the same instruction stream, both executing their own set of instructions. The 8088 ESCAPE instruction has six bits which encode the 8087 operation code. The 8087 uses the 8088 to calculate memory operands. Once the 8087 has obtained the memory operand, if necessary, the 8088 is free to execute its own instructions in parallel. The 8088 WAIT instruction is used to determine when the 8087 is available for the next instruction.

The 8087 consists of a stack of eight 80 bit registers (each with a two bit tag), a 16 bit status word and a 16 bit control word.

The 8087 supports seven data types:

- Integer Word - 16 bits - 2's complement
- Short Integer - 32 bits - 2's complement
- Long Integer - 64 bits - 2's complement
- Packed Binary Coded Integer - 80 bits - Sign and 18 digits

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Short Real - 32 bits - 8 bit biased exponent

Long Real - 64 bits - 11 bit biased exponent

Temporary Real - 80 bits - 15 bit biased exponent

When memory operands are loaded into an 8087 register, they are all converted into the temporary real format. When an 8087's register is stored into memory, they are converted into the desired data format. This allows for easy conversion between data types.

The 8087 includes the following classes of instructions:

Data Transfer - Load and Store for all data types, Exchange and Free

Arithmetic - Add, Subtract, Multiply, Divide, Subtract Reversed, Divide Reversed, Square Root, Scale, Increment, Decrement, Use Remainder, Round to Integer, Change Sign, Absolute Value and Extract Mantissa or Exponent

Logical - Compare, Examine and Test

Transcendental - Tangent, Arctangent and others which can be combined to calculate all common trigonometric, hyperbolic, logarithmic and power functions.

Constants - 0, 1, pi, log 2 base 10, log 2 base e, log 10 base 2 and log 2 base e

Processor Control - Load/Store Control Word, Store Status Word, Load/Store Environment, Save, Restore, Set/Clear Interrupt-Enable, Clear Errors and Initialize

In general, the instructions can operate on the top of the stack or on any specific entry in the stack. Some instructions, like TANGENT, require input data within a well-defined range to produce a valid result. Thus, certain data screening will have to be performed for some instructions.

The Status Word consists of the following:

Busy - the 8087 is processing an instruction

Top of Stack (3 bits) - the register (0-7) which is the top of the stack

Z,C,A and S - these are condition code bits.

N - pending interrupt

P - inexact precision

U - underflow

O - overflow

Q - division of nonzero by zero

D - denormalized operand

I - invalid operation

The P bit is set when the calculation does not yield an exact result. This is important for many applications, both scientific and business, and permits the 8087 to treat all data types as real during calculations.

The Control Word consists of the following:

Infinity Control (IC) - controls the type of infinity to use

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affine - there is a number less than all other numbers and there is a number greater than all other numbers.

projective - there is only one infinity which closes the number system.

Rounding Control (RC) - controls the type of rounding to be performed

Round to nearest

Round up

Round down

Round towards zero

Precision Control (PC) - controls precision during rounding

Short Real - 24 bits

Long Real - 53 bits

Temporary Real - 64 bits

Mask (M) - enable/disable all 8087 interrupts

Masks - individually enable/disable the P, U, O, Q, D and I interrupts (see Status Word).

Using RC, interval calculations can be performed. That is, by adjusting the RC to round up the first time and to round down the second time, the maximum interval for the result is obtained. Without being able to control the rounding (always round to nearest) such calculations are very difficult for the general case.

It is not possible to fully describe the 8087 in such a short article. I have attempted to give you a taste for a very impressive chip which will greatly complement the 8088.

If you would like more information, you should contact the Intel Literature Department whose address was given in the last PC Newsletter. In addition, the following articles are excellent:

"The Intel 8087 Numeric Data Processor", John Palmer, CONFERENCE PROCEEDINGS - The 7th Annual Symposium on COMPUTER ARCHITECTURE, May 6-8, 1980.

"Making Mainframe Mathematical", John Palmer, et. al., Electronics, May 8, 1980.

James H. Gilliam, Jr., VM(PLKSK/K58PJHGC), 58P/603, Kingston

8103-04 QUERY FOR MANUFACTURING APPLICATIONS FOR THE IBM PC

I am teaching Microcomputers at the IBM Manufacturing Technology Institute. I am interested in any applications of the IBM PC in Manufacturing. These can include direct control of processes or machines as well as control of the logistics or line management. Integration of PC's in a hierarchy of control would be of special interest. Please let me know of any plans or committed projects.

Jake Ever, Manufacturing Technology Institute, New York, VM(YKTVMV/EVER), 8+444-7287

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8103-05 QUERY FOR IBMPC CONNECTION TO 3270 CONTROL UNIT

Is anyone doing any work to plug a PC onto the end of a 3277 cable? I am looking for an ANR interface that will make the PC appear to a 3270 control unit as though it were a 3277.

Earl Franklin, VM(AUSVM2/A132449), Austin, 8+678-9825

8103-06 QUERY FOR WIRE WRAPPED PROTOTYPE CARD

I am planning to design a general purpose circuit card which will plug into one of the I/O slots. It will have a grid of plated thru holes on 0.1 x 0.3 inch centers to accept standard DIP sockets. Ground and +5 traces will be provided between rows. The plan is to have a local vendor to produce this card for sale to anyone. The negatives (or positives) could also be made available. If anyone has already done this (or is working on it) please let me know.

Tom Lowery, VM(LEXCJN1/CARROLLR), Lexington, 8+445+2251

8103-07 WORK IN PROGRESS -- TNE (THE NAMELESS EDITOR)

I am currently writing a full-screen, full-duplex editor for the IBM Personal Computer. The editor is written in BASIC (with some very small machine-language assists); it is currently limited to editing files with a record length of 79 characters (or less) which fit entirely in BASIC's data segment. The editor reads and writes standard DOS files. Note: The editor is not particularly suitable for BASIC programs, since it doesn't know about line numbers.

When I am ready to make copies of the prototype available, I will put another note in the PC Newsletter and I will also put a notice on the IBMPC userid at Yorktown.

David Singer, VM(BCRVM1/VM883623), Boca Raton, 8+443-7908
Keith:

We just got our first PC here in Fishkill. We got a Panasonic color monitor out of the pool, (they are used with video recorders) hooked it up, and D.I.S.A.S.T.E.R... The video signal strength from the PC totally overwhelmed the monitor. We ended up sticking a pot in series with the monitor and cranked the resistance up until reasonable results were obtained.

This leads to three questions:

1. Is this a common occurrence?
2. Is there any adjustment on the color adapter card?
3. What is the recommended solution for this problem?

Any info in this would be appreciated.

Dave Ballard, MVS(FSHNET1/DLB47B), East Fishkill, 8+532-3611

(EDITOR: There is no signal strength adjustment on the color adapter.)

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8103-08 8087 UPDATE

I received an information package from Intel Publications which contained various info on the 8086, 8087, and 8088. One of the documents contained a comparison of execution times of several 8087 instructions with equivalent operations executed in software on a 5-MHZ 8086.

The following table gives the results for operations on floating point numbers. All values are in micro-seconds.

Operation	8087	8088 Software
Multiply (single precision)	19	1600
Multiply (double precision)	27	2100
Add	17	1600
Divide (single precision)	39	3200
Compare	9	1300
Load (single precision)	9	1700
Store (single precision)	18	1200
Square Root	36	19600
Tangent	90	13000
Exponentiation	100	17100

Looks like purchasing the 8087 option, if it ever arrives, is well worth the cost.

John Bernauer, VM(SJEVM1/CUTTRAS), San Jose, 8+276-7168

8103-09 PC PROGRAM DEVELOPMENT TOOLS ON S/370

There is an extensive set of program development tools available for those who may need to develop large modules of code in PC assembler language, and who want to work in a VM or MVS environment.

The tools were developed to support the Displaywriter, which is driven by an 8086 microprocessor. (The 8088 used in the PC is software compatible with the 8086.)

Items available include:

- an H-type assembler and macro processor
- a linkage editor
- a system builder (for building Displaywriter diskettes) (these run under both MVS and VM)
- utility for reading and writing diskettes on a Series/1 (runs on a Series/1)
- a fullscreen debug tool for the Displaywriter (runs on a Displaywriter)

Abstracts from documentation:

1. 8086 MICROPROCESSOR SOFTWARE SYSTEMS MANUAL (355 pages) This is a description and user guide for an 8086 microprocessor assembler and linkage editor. These development tools are hosted on S/370 under MVS or CMS and are incompatible with Intel supplied tools. The assembler is an optimizing assembler, and is a modification of Assembler H. The linkage editor is a modification of the OS linkage editor.
2. 8086 PRINCIPLES OF OPERATION (230 pages) This document lists and discusses the 8086 instruction set using the mnemonics used by the 8086 assembler (i.e., not Intel's mnemonics). The instructions are grouped according to function.

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3. 8086 REFERENCE CARD This is a summary of the Software Systems and Principles of Operation manuals.
4. SERIES/1 DISKETTE UTILITIES FOR THE IBM DISPLAYWRITER (41 pages) This manual describes utility programs for the Series/1 computer under the EDX operating system, which support a diskette interface between the IBM Displaywriter and a S/370 host. The primary functions of these utility programs are to create program IPL diskettes for the Displaywriter and to read and transmit Displaywriter dump diskettes.
5. DEVELOPMENT NATIVE DEBUG TOOL - IBM DISPLAYWRITER (53 pages) This debug tool is used in IBM Displaywriter software development. It executes on the IBM Displaywriter processor and uses the Displaywriter keyboard/display to interface with the programmer. It can be adapted to run on other 8086 systems.

For copies of documentation and code (all distributed by VNET), site coordinators should contact:

Earl Franklin, VM(AUSVM2/A132449), Austin, 8+678-9825

8103-10 SPL COMPILER FOR THE IBM PC ON S/370

A version of the SPL compiler is available as a program development tool on a VM or MVS system. The compiler is a subset of the 370 PL/S compiler and uses the assembler developed in Austin. The assembler is also described in this newsletter.

The Structured Programming Language is patterned after the S/370 PL/S compiler. The goal of SPL is to provide a simple high level language that supports the structured programming constructs but with less complicated function than PL/S. The compiler is relatively small and can be maintained and modified easily. Several language extensions have been added in order to take advantage of the 8088 architecture. The output of the compiler is an assembler language source program. Assembler language can be intermixed with SPL statements.

The compiler was developed for a single disk testing application in San Jose but is compatible with the PC. It has been in use for approximately two years. There is no committed long range support for locations other than San Jose or for applications other than disk test.

Some of the SPL restrictions are:

- Only one array dimension.
- Single level of pointer.
- Expressions not allowed as subscript.
- No Declare.

Some of the SPL extensions are:

- Extended pointer notation.
- Use of stack for data.
- Use of compiler register names.
- Simpler reentrant code generation.

Items available include:

- Users guide. (117 pages)
- SPL compiler object.
- PC/IS format utility.

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The compiler and users guide will be available only from technical coordinators who should contact me for copies.

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8103-11 ESPF/PC FULL SCREEN EDITOR FOR THE IBM/PC.

ESPF/PC is an implementation of a subset of the SPF editor for the IBM Personal Computer. ESPF is written in PASCAL and the first release is available NOW. It supports the IBM monochrome display (80 character color display support is coming soon) and edits DOS ASCII files.

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8103-12 SOME COMMENTS ON PASCAL.

I have just written my first PASCAL program, a text editor of about 900 source lines and have a few comments to make from the viewpoint of an experienced PL/S and PL/I programmer:

- I love PASCAL. I was able to implement a fairly complex program AND learn PASCAL in a week and half part-time.
- PASCAL is fairly easy to for a programmer experienced in medium-level languages to pick up. (I don't consider PL/S or PL/I high-level any more.)
- PASCAL is an extremely powerful language IF AND ONLY IF you use its capabilities. For example, in PL/S or PL/I, a record type code is ususally implemented as a CHAR(1). In PASCAL, use an enumerated type which will be more self_documenting and allow the compiler to do its range checking act.
- PASCAL runs MUCH faster (perhaps 10:1 faster) and creates much smaller object modules (perhaps 4:1 smaller) when \$LINE- and \$DEBUG- are used. For instance, in my editor I use the DEL key to delete a character like DEL on a 3277. With \$LINE+ and \$DEBUG+ you watch the field shift left one character at a time. With \$LINE- and \$DEBUG- the field seems to shift instantaneously.

\$LINE+ and \$DEBUG+ are necessary for debugging but can be turned off for production. It may make sense to turn them off only in the areas of your code where performance is critical.

- The manual states that large programs may run out of space on the diskette. It's idea of large is a lot smaller than my idea of large. A 200 line program requires you to NUL the source code listing (which is not very useful anyway). A 500 line program requires you play some fancier games. They recommend erasing the source to make room. That scares me so I copy PASIBF.SYM and PASIBF.BIN to a blank diskette after PAS1 and use the new diskette as input to PAS2 and LINK.

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8103-13 HINTS, KINKS AND APPLICATION REQUESTS

Here is a another collection of miscellaneous items on the IBM PC.

If you are short on memory, pay particular attention to the BASIC command (Basic manual, page 2-4). You may, for instance, disable RS232 support, thereby eliminating not just the buffer space, but the communications support code as well.

I tested the clock for accuracy one night. Set TIME\$ by the telephone recording in the evening and checked it in the morning. GOOD news! It was right on the second (I hadn't set the hundredth of second position)

For those of you who haven't seen the Creative Computing article on the PC, it is worth reading. (Dec. issue).

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Those of you who need more Visicalc workspace (more than 36k) will be able to have it in the next release.

I was glad when I was informed that target Pascal machines don't need licenses. Also Microsoft products (DOS, Pascal, Basic) may be copied for internal IBM business use.

STR\$ is O.K.! There have been a few people "fooled" by the ways STR\$ behaves in a statement such as LEN(STR\$(123)), where 4 is returned. The result is 4 since a space is inserted for the sign position (+123).

If you are switching between the IBM mono display and the color graphics card, have switched to the color card using the "C" program and have issued SYSTEM to get to DOS, you will lose the display on the color display. The "fix" is to "flip the dip" to indicate only 80x25 display. (Dipswitch number 1 position 5 on, position 6 off.) (EDITOR: If you don't want to flip the switch, you can enter the DOS command "MODE 40" while the screen is disoriented and it will be re-initialized.)

When installing your 16k memory kit, be very careful to insert the RAMs in the correct direction, or not only will you wipe out the chip that is installed backwards, but if several chips are misinstalled, the system board may go as well!!

Caution...if color/graphics card is installed in slots 4 or 5 it may touch components on the system board. Use 2 or 3 while engineering is looking at the problem.

When running the diagnostics, (not advanced) they appear to stop with no indication of what's happening. This occurs if you have the color/graphics card but don't have a tube connected at the time. The diagnostics don't recognize that the monitor isn't there and is putting instructions out into the ether! Fix is to either run the advanced diagnostics which will ask you what tests you want run, or to keep responding with a "Y return" sequence until the display reappears on the mono display.

I have received several application requests for an IEEE hookup and one offer to construct one. Elsewhere in this issue is the coverage of Tecmar Inc. and its multitude of announcements for the PC. Lo, among them IS an IEEE interface.

I have a request which I have not yet been able to satisfy for a direct channel connect to a 370 (block multiplexer). Can anyone help?

Another request is for a rough draft high speed output device which can handle oversize documents (such as FE logic diagrams) (to attach to the PC of course).

More next month....Stan

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