The IBM Personal Computer Newsletter
For On-the-Job Computing

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Entry Systems

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PREFACE

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EDITORIAL SECTION

EDITORIAL

With this issue of the newsletter come many significant changes. The biggest one from my perspective is that future issues will be handled by a new editor. I am just too busy with my new responsibilities to stay up with both jobs. However, I will continue to be involved with the newsletter in a consulting capacity.

I have thoroughly enjoyed working with all of you and appreciate the many positive comments I have received about the newsletter. If you give the new editor the same level of support you gave me, it will assure the success of future issues.

With that I will close since the real editorial this month is by my manager, Joe Potts. He is a second-line manager responsible for User Group Support, Employee Sales, and System Support. He will describe the changes we are making and introduce the new editor to you.

> Keith Eckhardt
> Personal Computer Newsletter Editor,
> Retired

GUEST EDITORIAL

First, I would like to extend my thanks to Keith for starting this newsletter. He deserves a lot of credit for taking the initiative and creating a very useful and well received document. It filled a significant gap and allowed us to defer the time when we would have to move into this area.

Beginning with the next issue, the chief editor will be Mike Engelberg. Mike is transferring from the General Products Division in San Jose and will be resident here soon. It will be his responsibility to coordinate the input, validation, review, and approval aspects of the newsletter as well as to plan and implement the future direction of the newsletter. You may submit items to Mike for publication at the address or VNET ID shown in the preface. Mike's manager is Hal Hanesworth who is also moving east from GPD, Santa Teresa. He replaces Dennis Andrews as manager of the User Group Support department.

I see this first "official" newsletter from Entry Systems as being just a step in an evolutionary process. There will be more changes in the future and we welcome your suggestions for improvement.

A major change we have already made is the addition of a general information section which includes usage tips and techniques, publication errata, and descriptions of recent product announcements. This section has been reviewed by the ES staff for accuracy and we hope it will be useful to you. In this issue we have also included an appendix which describes the update to the employee sales plan.

A number of people from outside the Entry Systems organization have helped us recently in putting this issue together. Dick Dievendorff from Los Angeles, Jim Schumacher from Burlington, Stan Rosenfeld from Santa Teresa, and Chuck Tribolet from Santa Teresa have all been "on loan" to us for 2 to 3 weeks at a time over the past two months.

Their efforts are greatly appreciated and I thank them for coming and their management for making them available.

I would like to also thank Stan Rosenfeld for tipping me off to the West Coast Computer Faire. I was very impressed by the vast array of products available to the microcomputer user and by the amount of interest and product development concerning the IBM Personal Computer. Because IBM did not have a booth at the Faire, I was wondering if the IBM PC would get sufficient exposure. WOW! Our PC was the star of the show; about 50 to 60 IBM PC's were on display. Many software and hardware products were being displayed and demonstrated to the crowds which seemed to congregate at every PC.

Finally, I would like to thank Mr. Larry Rosen of the Chicago Midtown Branch Office for the suggestion he sent on improving diskette performance. Larry's branch manager presented him with a plaque recently that had a personal note of thanks on it from P. D. Estridge, SPD Vice President and General Manager, Entry Systems.

Thanks for your interest in the newsletter and keep your input coming.

<div style="margin-left: 40%;">

Joe Potts
Manager, User Group and System Support
Entry Systems
</div>

INTERNAL CONTRIBUTIONS SECTION

The articles in this section were submitted by individuals outside of the Entry Systems Organization. These articles have not been reviewed by Entry Systems for accuracy and are not official statements of either Entry Systems or the IBM Corporation.

IBM PC programs described in this section were developed using IBM resources and are the property of IBM. These programs are provided to improve the capability and productivity of IBM employees on the job. They are not be be discussed with non-IBM employees. There is no commitment to release as IBM products any programs described in this section.

Articles for this section can be submitted by anyone within IBM. They must not be IBM Confidential, more than two pages in length, or anonymous. They should address one of the following areas:

- Announcement of programs and techniques for the IBM Personal Computer.
- Query for the existence of a program or process.
- Describe current work-in-progress (not IBM Confidential).
- Express an individual's point of view (letter to the editor).

The editor reserves the right to not publish articles received and to perform editing as required.

LETTERS TO THE EDITOR

8204-01   LETTER - LOCAL AREA NETWORKING

The PC Newsletter is a very useful document and I hope that you can keep up the quantity and quality of the work in the hectic pace of your work here in Boca.

I did want to comment on the letter from Ken Aaker in the last issue (PCN8203 3/1/82) concerning Local Area Networks and, specifically, correct some information concerning the IEEE Project 802 standardization activity. Ken describes the 802 proposal as being a baseband CSMA/CD (Carrier Sense Multiple Access with Collision Detect) broadcast network, which he states is "otherwise known as Ethernet". He also states that the only IBM local area network is LCC for Series/1. Both of these statements require some clarification.

Concerning LCC, this is not a local area network in the same sense as that of Project 802. The functional requirements for 802 state that over 200 devices (stations or nodes) should be accommodated on a transmission cable of several kilometers in length. If I recall correctly, LCC is currently limited to 16 Series/1s and the distance is measured in meters, not kilometers. In addition, the LAN requirements anticipate being able to connect a variety of equipment (not just processors) and LCC cannot currently do this.

With regard to 802 itself, it is true that one of the several options is a CSMA/CD broadcast network which is similar, but not identical, to that jointly announced by DEC, Intel, and Xerox. There are some minor differ-

ences as the result of the negotiation process which is inherent in a voluntary standards activity.

Secondly, the 802 proposal is not limited to CSMA/CD baseband broadcast but also includes CSMA/CD broadband, and both broadband and baseband token passing protocols for broadcast (bus) and sequential (ring) media. These token passing protocols are similar in concept to that used in LCC and the Zurich Z-ring activity, as well as a number of IBM and non-IBM commercial products.

IBM has been very active on the 802 committee and has been making substantial contributions to the token work. Our representatives are from Raleigh and the Raleigh development groups are well aware of the activity. That is about all I can say without getting into confidential material.

I have been associated with the 802 work indirectly since its inception and am presently preparing three external papers reporting on the committee's activity. Two of these will be completed and one will be presented at the SHARE meeting by the time your next newsletter is available. I would be happy to VNET the papers to anyone interested in more detail about the proposed standard or its status.

This is an update of the above note concerning the IEEE 802 activity on Local Area Networks (LANs).

The committee met in Phoenix on March 8-12, 1982 and made some major changes to the so-called Draft B document which was circulated late in 1981. Some of the changes relating to the ring token-passing network were prompted by an series of four "white papers" presented to the committee by IBM Raleigh. The papers are very well done and were received, I think, very positively.

The major changes were as follows:

• In the CSMA/CD access method, start frame and end frame delimiters were agreed upon. These are not the same as for Ethernet (RTM). In addition, the committee agreed to add a Length Count (LC) field to solve the short frame problem. The LC contains the number of octets in the "meaningful" part of the frame, excluding padding characters added at the end of the information field.

• For the bus token-passing access method, start and end frame delimiters were chosen. Of more importance, the committee decided to accept an optional "bandwidth allocation" scheme which essentially establishes three classes of service -- synchronous, asynchronous1 and asynchronous 2. The scheme essentially guarantees synchronous stations the use of the token on every token rotation, even if it means starving the async1 and async2 stations. It is not preemptive, however, so the async stations occasionally get a shot at the token, even under heavy load.

• The ring token-passing access method adopted the same start and end frame delimiters as in bus token-passing. In addition, they adopted a preemptive priority scheme providing for 8 priority and reservation levels. These will be contained, along with the token indicator, in an unprotected Access Control Field (AC1) at the beginning of the frame. It was also agreed to add an octet after the end frame delimiter, also unprotected, so that an addressed station can indicate "address recognized" and/or "frame copied." IBM considers this to be important information for the sending station.

- The last major change was to agree for all methods that the source and destination addresses will be either 2 or 6 octets in length. There will be no extension bits (a'la Ethernet and HDLC) and all stations on the LAN will either operate in 2 or 6 octet mode, not dynamically alterable.

I have prepared a couple of external papers on the 802 effort which are current as of the end of the March meeting. I will be happy to provide them to anyone who is interested. They are both fundamentally the same in content but one has additional material on the voluntary standards system and the OSI reference models.

T. J. Harrison, VM(BCRVM1/VM040544), TL 443-2734

8204-02 LETTER - DISTRIBUTED VIRTUAL MEMORY

In your February editorial, you mentioned three topics of interest to us: data storage capacity, data storage backup, and software distribution. Let me define a context in which to comment:

While there will be informal groups of PC users who use a TP link to exchange programs and data, there will also be organized groups who find that they need identical versions of programs and data in order to do their work: with some applications, it can be important to provide version/level control to ensure that updates reach all members of a group at the "same" time. It is this context, of controlled software distribution, that I have in mind.

Consider a "distributed virtual memory" system, where a program library, a read-only data base, and spare storage are provided by a mainframe CPU, and where the data most used at each work station is paged out from the centre, and kept in a local non-volatile store under LRU control: when data is updated at the centre, "INVALIDATE SEGMENT" commands are broadcast (on well-understood virtual memory principles) to force the work stations to get up to date. Some of us have modelled such a "distributed virtual memory" system in Hursley, using UC-0's at first but M6800 micros more recently: called "VMT", it had fairly wide publicity through ITL meetings.

This modelling leads me to think that there could be a general solution to the problems of "data storage capacity, data storage back-up, and data distribution" in the PC, based on the demand paging of data between a group of PC's and a mainframe:

- It needs a segmented system of addressing (for which the INTEL architecture is helpful), using segment-identifiers which are invariant when segments are moved between RAM and non-volatile storage

- It supports demand paging of segments of both procedure and variables, where "page" = "segment": this implies an arbitrary limit on the extent of dynamically pageable segments, for performance reasons, but then you get an indefinitely large number of segments

- It requires compiler-assisted address resolution: the problem here is that both the binding of an invariant segment-id to a real memory address (which happens when a data segment is referenced, or when a procedure segment is called or returned-to), and the unbinding process (which happens when a program moves on to reference another data segment, or

when a procedure segment makes a call or return) have to be tightly syn-
chronised with the application program logic. The PLI68 compiler (built
by my friend Brian Marks) generated calls to the VMT control program to
mark the ideal binding and unbinding points. (The same idea of
compiler/control-program cooperation comes over strongly in the Xerox
Smalltalk-80 system: see "Virtual Memory for an Object-Oriented Lan-
guage" in BYTE magazine, August 1981).

A "distributed virtual memory" for the PC would (as far as I can see) impact
the compilers and the link editor, but it should not affect the BIOS inter-
face, and it would continue to run all pre-relocate object programs un-
changed. Is anybody thinking of doing something like this for the PC, and
if yes, would they like to talk to us about it?

Martin Pinnell, VM(WINH6/HDS11), Hursley

8204-03   LETTER - OVERPRINTING ON THE IBM 80 CPS MATRIX PRINTER

I re-entered your BASIC program as defined on page 29 of the latest newslet-
ter. I had previously found the missing double quote. However, this time I
made sure I entered the program as stated in the newsletter, adding only the
double quote ("LPT1:"). I have tried the program on 4 PC's here, in Char-
lotte, and all give a <CR> at the end of each line; (must be the weather).
Again, I must refer to the statement on page 4-254 of the BASIC manual which
states the PC automatically adds a carriage return. Just as a point of in-
terest, 3 of our 4 CPU serial numbers are as follows: 114787, 118143, and
118353. I am using BASIC level "D1.00" in a 128K PC (61384 free bytes); I al-
so tried BASICA level "A1.00" (61103 free bytes) with the same results.
Please let me know if you make any startling discoveries.

By-the-way, I tried your ED change for f7 and f8 (I used s-f9 and s-f10 be-
cause they were already defined as insert functions as f9 and f10). I just
wanted to let you know "I tried it and I like it". Have a happy.

Ray Blackmore, VM(PLKSC/C56ESRBC), Charlotte, TL 474-2304

(EDITOR: At this point I realized I needed to do some home work. After a
some digging, I sent a note to Ray asking him to check the state of the DIP
switches inside his printer. In particular, switch 1, position 3 should be
on. The TRM has the correct setting for the two DIP switches. Ray's re-
sponse follows.)

Good morning Keith,

A little feedback. I took the cover off the printer and sure enough, the
switch 1 pin 3 was set to "off". I moved it to "on" as the TRM recommends
and, guess what ????? Your overstrike works fine. (some cute symbols there
Keith, Ha.). Again, thanks. Have a Happy.

Thank You, Ray

(EDITOR: Now that we know that it works that way, I have to tell you that I
went the wrong direction. With this switch set on, you may have overstrikes
that you didn't want. The correct position for this switch is OFF, as you
will read in an article later in this issue.

One of the programmers here in Entry Systems brought me a tip on overstrike that works with the switch off. The BASIC interpreter does not detect a carriage return character if a value of 128 is added to it. This means that you can insert a CHR$(13+128) in the middle of a line and the following data will start in column 1 on the same line. You don't need the blanks to fill out the line as in my example.)

READER CONTRIBUTIONS

8204-04   IBMPC/ADVENT INTERFACE BOX

The ARCTURUS Company, West Concord, Ma., is marketing an IBMPC/ADVENT RGB interface box. We had tried to build such a device and ran into two sticky problems: the color is digitized out of the IBM PC and must be converted, plus the VERTICAL SYNCH is hard to make work. The result is ARCTURUS has solved both of these problems and the result is advertised as excellent in color and crispness. At this time, a total of 12 have been ordered by IBM (2 by Owego). Address technical questions to ARCTURAS.

Bob Watson, VM(OWGVM1/O863RAW), OWEGO INFORMATION CENTER, TL 662-3489

8204-05   CAUTION USING THE COMM PROGRAM

The COMM program does not truly support use of 4 to 6 data bits (option 6) although there is no indication of error when the program is run. In order to support the use of less than 7 data bits, the ASCII code must be trans- lated into another code which does not need the high-order bits, since they are discarded before transmission. Note also that Basic may be too slow to perform character set translation at communications speeds unless great care is taken in the design of the code.

Jack Botner, VM(TOROLAB/BOTNER), Toronto, TL 942-2364

8204-06   QUERY FOR PC TOOLS

I am trying to find out if anyone has available, or is working on any of the following programs.

1. A print spooler which intercepts any DOS, BASIC or PASCAL printer out- put.

2. A fast (machine language?) sort for BASIC numeric or character data.

3. A fast sort for diskette data files.

4. A program to display numeric data in some graphic form (barchart?) and allow printing of this data.

5. A 2741 emulator which will allow the PC to communicate to MVS systems via existing 2741 ports. A file up/down load feature would be super.

Ed Skorynko, VM(FSHNET1/EAS761), East Fishkill, TL 532-4623

8204-07   EAST FISHKILL IBM PERSONAL COMPUTER TRAINING UNDERWAY

In February, IBM East Fishkill implemented its Personal Computer education plans.

Classes are now in process for BASIC, Advanced BASIC, VisiCalc and Easy-Writer. All classes are in heavy demand and a schedule of 62 courses has been projected for 1982.

Class details are as follows:

1. BASIC- 24 hours of six, four-hour segments.

   Class materials - PC Newsletters, PC by example handout borrowed from Art Appel and Dave Chess from Yorktown, IBM BASIC Manual, Operations Manual, DOS Manual, Heathkit (classroom version) BASIC text and workbooks.

   The Heathkit books are used for class structuring. To save time, all class examples in the books are pre-entered onto disks given to each student.

2. ADVANCED BASIC- 20 hours of five, four-hour segments.

   Class materials - IBM BASIC and DOS Manuals.

   Class assignments include writing programs such as student rosters etc.

3. VisiCalc - 12 hour class of three, four-hour segments.

   Class materials - VisiCalc manual, DOS, Scratch disks, PC by example handout and appropriate foils. Students are given instruction on the PC(approx. 2 hour segment) examples of programs executed during class are budgets, tax tables, manpower planning, limited inventory, operation worksheets and IBM stock compute.
   4. EasyWriter - 12 hour class of three, four hour segments.

   Class materials - EasyWriter and scratch disks. Instruction includes 2-hour segment on overall use of the PC.

Questions should be directed to Bob Shafer IBM East Fishkill, Tie line 533-7145

Classes are conducted in a special classroom equipped with 7 PC's and color video monitors that allow the students to see the display keyed on the instructors unit. Six PC's are for student use (two per unit).

Note: We utilize two monitors by Video Tek that have Trinitron picture tubes. The vertical mask in the Trinitron allows for greater definition than standard video monitors

Ed Skorynko, VM(FSHNET1/EAS761), East Fishkill, TL 532-4623

8204-08   WIP - FULIST FOR THE IBM PERSONAL COMPUTER

I am developing a FULIST capability for PCDOS; the development is currently at an interim stage. I will have an initial FULIST capability by the end of APRIL. It will be put on the IBMPC disk at Yorktown as soon as it is ready. Another interim output is an enhanced DIR command which allows display of the files listed in any of 4 sorted sequences (by: name+ext (/sn), ext+name (/se), date (/sd), size (/ss)). In addition, the output does not scroll off the screen since the command pauses when 25 lines have been output and waits for a key depression. The command also indicates the state of space on the listed disk, giving the total allocation units, free allocation units, % free, and the allocation unit specification.

I also have a macro set which was developed for use in this effort. It contains macros to access all DOS function calls, a few BIOS functions, and mapping structures for the DOS program prefix, FCB, and directory entry. These are undocumented, but are reasonably obvious to an assembler programmer.

I plan to extend the FULIST as time is available. Both it and the enhanced DIR command will available on a "where is/as is" basis on the Yorktown PC disk as a B3101 hex files. The extended DIR command is available under the name EDIR B3101HEX. The FULIST will be available as FULIST B3101HEX when it is ready. The macros can be obtained via VNET from the address below.

Glenn Huff, VM(RALVMC/HUFF), Raleigh

8204-09   CREATING COM FILES WITH PC ASSEMBLER

One of the undescribed things about the PC is how one creates a COM type module. The DOS manual describes the entry criteria for COM type files, as well as for other type files. The assembler manual evades the issue altogether, but the examples are coded for EXE type files. The description of the LINK in the DOS manual says that the only extension output by LINK is EXE.

To explore further, one might ask why a COM type file is desirable. First, COMMAND.COM attempts to load a command first with an extension of COM, then with an extension of EXE, and last with an extension of BAT. Thus EXE files are guaranteed to cause COMMAND.COM to fail in the search of the directory for the COM extension, a minor performance difference. Second, EXE files are larger, since the first sector(s) contain information used by the loader in COMMAND.COM to relocate segment addresses in the module and to load the CS, IP, SS and SP registers. Obviously this relocation requires reading the extra sectors as well as processing the information.

How then does one create a COM file? Reference to the appendix in the DOS book will describe the entry conditions for a COM file. They are that CS, DS, ES, and SS are set to the beginning of the program prefix area. SP is set to the end of the segment or the lower end of the transient portion of COMMAND.COM, IP is set to x'100', and a word of zero is pushed onto the

stack. In order to create a COM file, the original assembler source module must assume these entry conditions. This implies that the first x'100' of the module be assembled as the if it were the DOS program prefix area. It also implies that the entry point for the module be at offset x'100'. It is usually easiest to make this a jump to the executable code, since it is advantageous to define variable names before they are used in the PC assembler. Last it implies that a no stack area need be assembled in the module.

Since for a COM file all four segment registers are preloaded with the origin of the program prefix area, it is usually easiest to map the data, stack, extra, and current segments onto a common address space origined on the program prefix area. This is accomplished by defining a single segment pseudo-op and issuing an ASSUME state which maps all four segment registers to this single segment. If this is done, no special entry code is required, since all segment registers plus IP and SP are properly set up by COMMAND.COM. Also, since the stack contains a word of zero and CS points to the program prefix, exit to DOS can be accomplished by an intra-segment return. This will be the type generated for a procedure coded with the NEAR attribute.

The program is assembled using the PC assembler, and then linked using the LINK program, accepting the defaults. Ignore the error message that no stack segment was specified. The resulting EXE file is then converted to a COM file using DEBUG. To accomplish this, note the size of the resulting segment in the LINK map. Now execute the DEBUG utility specifying the resulting EXE file as a parameter to debug. This will cause the EXE program to be loaded by DEBUG. Now modify the CX register to the size noted above less x'100'. Next modify the CS register to the same contents as the DS register. Next use the "N" command to specify the filespec for the COM file. Now issue a "W CS:200" command to write new COM file. The 200 offset deletes the program prefix created when DEBUG loaded the EXE file and the program assembled into the program. When the COM file is loaded for execution a program prefix will be created by COMMAND.COM. This is the one addressed by the COM file.

Glenn Huff, VM(RALVMC/HUFF), Raleigh

8204-10   SCROLL ROUTINE FOR BASIC PROGRAMS.

I have found the editing of large BASIC programs to be somewhat awkward without a scroll function. The following BASIC subroutine can be MERGEd into any program, and on the initial call it will set up the F7 and F8 keys to act somewhat like scroll keys.

```
   5 gosub 9000         'initial invocation

9000 REM scroll routine for basic
9010 SINC% = 10     'statement increment
9020 DEF SEG=0:POKE &H4F0,0:DEF SEG     'reset current location
9030 SSTMT% = PEEK(&H2E)+256*PEEK(&H2F) 'current statement number
9040 SUP$ = "GOSUB "+STR$(SSTMT%+SINC%*6)+CHR$(13) 'gosub 9030+60
9050 SDN$ = "GOSUB "+STR$(SSTMT%+SINC%*8)+CHR$(13) 'gosub 9030+80
9060 KEY 7,SUP$            'set key 7 to scroll up
9070 KEY 8,SDN$            'set key 8 to scroll down
9080 RETURN
9090 REM scroll up
9100 SDIR% = -1   : GOTO 9130 'indicate direction up
9110 REM scroll down
9120 SDIR% = +1   'indicate direction down
9130 DEF SEG=0
9140 SCT% = PEEK(&H4F0)    'Get count from APPLICATION COMM AREA
9150 SCT% = SCT% + SDIR%     'go up or down
9160 IF SCT% < 1 THEN SCT% = 1
9170 POKE &H4F0,SCT%       'save count in APPLICATION COMM AREA
9180 DEF SEG
9190 ON SCT% GOTO 9210,9220,9230,9240,9250,9260,
     9270,9280,9290,9300,  ..... AS MANY AS YOU NEED
9195 SCT% = 1 : GOTO 9170
9200 RETURN
9210 LIST 10-100 : GOTO 9200
9220 LIST 100-200 : GOTO 9200
9230 LIST 200-300 : GOTO 9200
9240 LIST 300-400 : GOTO 9200
9250 LIST 400-500 : GOTO 9200
9260 LIST 500-600 : GOTO 9200
9270 LIST 600-700 : GOTO 9200
9280 LIST 700-800 : GOTO 9200
9290 LIST 800-900 : GOTO 9200
9300 LIST 900-1000 : GOTO 9200
     etc
```

You can either add a "GOSUB 9000" at the start of your program or issue the GOSUB 9000 yourself after loading the program. The routine is setup for a default increment of 10, however this could be easily changed. If you RENUM your program you can either delete the routine and then remerge it after the RENUM or just reinvoke the routine after you renumber it to reset the function keys.

The POKE and PEEK for value of SCT% could be removed but every time you changed a statement the scroll would start from the top. Location 0:4F0 is said to be an "inter-application communication area" so it should be safe for most programs.

John Thomas, MVS(SJRLVS1/JTHOMAS), K03/281, San Jose Research, TL 276-5068

8204-11   IBM COMMUNITY BULLETIN BOARD PROPOSAL

In the general category of "wouldn't it be nice"....

The Yorktown disconnected virtual machine provides a very nice bucket for PC info in general, but there is a growing library of programs that are executable only on Personal Computers, that some of us can't get to, as we have no dial access to VNET connected systems.

I envision a personal computer, with substantial disk capacity, that is connected to the IBM dial network with an auto-answer 300 BPS modem, such as the D.C. Hayes "Smart Modem". IBM PC users with access to a tie-line could then dial this machine, and cause software to be downloaded by PC to PC communication.

Dick Dievendorff, DEM014(DIEVEN)

8204-12   QUERY FOR BISYNC ON THE IBM PC

Does anyone plan to implement bi-sync on the PC? We have a need here for bi-sync. Our plan is to purchase a card that has hardware to support bisync, but I'd rather not have to do the required programming if someone else is doing it. Isn't that always the way? Any information would certainly be welcome.

Doug Colquitt, VM(RE76DDCE/RALVM8), TL 441-4956

8204-13   WORK IN PROGRESS - 3277 GRAPHIC ATTACHMENT

In response to a question in last month's newsletter about whether any work is being done on a P. C. 3277 Graphics Attachment Emulator using the ANR card, the answer is yes. Our department is currently sponsoring production of the first prototype ANR cards, which we expect to receive by the end of March for testing and evaluation. Another cycle of minor engineering changes will probably occur, before the design is is final, and cards are manufactured for broader internal distribution. The ANR/GA emulator software should therefore be available when the ANR cards themselves become generally available.

The program I am developing is intended to provide full functional equivalence to a 3277/GA workstation, within the inherent limitations of a lower resolution raster display, 64K of memory, and the necessity of choosing between a joystick version, or a light-pen based RS232 communicating version. Three beam-intensity simulating colors will be used against a colored background, with scrolling and zooming in several discrete steps through a virtual 3072 by 4096 pixel space. The fifteen line types, pattern generator, and internal tracking register will be modeled. Monochrome output will be produced at 900 by 720 dots in a 7.5 by 10 inch area using the EPSON 80 GRAFTRAX option. There will probably be an option to generate 8-color hardcopy on a Hewlett Packard 7221 plotter directly from the internal display list, as well as by host-generated RS232 commands. In the joystick-equipped version, RS232 output commands will be dumped to a diskette for deferred execution on another P. C.

Werner F. Meyer, VM(YKTVMV/WERNER), Yorktown, TL 862-1664

8204-14   QUERY FOR BUILDING LAYOUT APPLICATIONS

We wish to develop a graphics program to configure the communications wiring layout of buildings. I would like to hear from anyone who has information or experience along this line.

Al Friedrich, VM(RALVM6/RG54AAFE), G54/B060, Raleigh, TL 441-6090

8204-15   HANDOUTS FOR PC DEMOS

Endicott has in hand about 4000 copies of two handouts suitable for a site-wide PC demonstration. They are:

"IBM Personal Computer Hardware Fact Sheet" (form no. 6936328) - a pocket-sized handout describing the main features of the hardware; 2 illustrations.

"IBM Personal Computer - Some Questions and Answers" A 6-page handout containing extracts from Dick Dievendorff's latest "Q and A" document, including descriptions of the software, key questions on hardware (not mentioned in the Hardware Fact Sheet), employee purchase plan, and prices.

If you can use these, please call me.

Pat Glasspool, Endicott, TL 252-8455.

8204-16   FILE UPLOAD/DOWNLOAD NOTE

As I noted last month, due to differences in the host translate tables, files uploaded on VM and downloaded on MVS may be different after downloading. This applies to to both the Asynchronous Communication Support product and Edgar Swank's 3101 emulator. I now have the fix.

The problem is caused by VM and MVS using different translate tables - MVS follows the IBM standard for translation of EBCDIC to ASCII, VM does not. The characters that are handled differently are:

ASCII character	MVS EBCDIC character	VM EBCDIC character
exclamation mark	solid vertical bar	exclamation mark
left sq bracket	cent sign	left sq bkt
right sq bracket	exclamation mark	right sq bkt
vertical bar	broken vertical bar	solid vertical bar

The IBM standard is not as absurd as it seems when it is viewed in the light of the fact that the characters involved are national use characters (International is IBM's first name after all). At any rate, the problem can be circumvented by issuing the following TSO commands (worked out by Edgar Swank) prior to any upload/download on TSO:

```
PROFILE CHAR(BS) NOINTERCOM
TERMINAL LINESIZE(255) NOCHAR
TERMINAL CHAR((X'4F',X'5A'),(X'4A',X'AD'),              X
         (X'5A',X'BD'),(X'6A',X'4F'))
```

Chuck Tribolet, MVS(STLMVS1/T811329), Santa Teresa, TL 543-3337

8204-17   QUERY FOR PC ENHANCEMENTS

I would like to know if anyone is working on any of the following:

*   An EPROM for the PC printer to make the graphic character set on the display compatible with the character set on the printer?

*   A sort routine for BASIC that uses an assembler language routine.

*   A file string search routine that uses an assembler language routine.

*   A dynamic printer toggle for BASIC that works via setting the BIOS flags or......?

G.Hollenbeck, VM(GDLS2/HOLLENG), 952/40-4, Endicott, TL 252-6248

8204-18   QUERY FOR ASYNCHRONOUS COMMUNICATIONS PROGRAM ENHANCEMENT

I'm looking for information from anyone who has modified the asynchronous communications program to print out terminal output from a host system directly on the IBM PC printer (other than using the PRT SCR key). I want to print reports generated on a VM timesharing system on the IBM PC printer as they are generated. I would appreciate hearing from anyone who has done this. Thank you

Liz Rozwod, VM(ARMVM/CSA02), 10/690, TC-05, Armonk, TL 251-6554

8204-19   PROGRAM TO PRINT ALL 12 FONTS ON THE IBM MATRIX PRINTER

The following program demonstrates all 12 fonts on the IBM 80 CPS Matrix Printer:

```
1000 REM "PRDEMO" Demonstrates 12 fonts
1100 REM of the IBM 80 CPS Matrix Printer
1200 REM
1300 REM Dick Dievendorff, 2/10/82
1400 REM
1500 ESC$ = CHR$(27)     'Escape character
1600 REM Build strings containing character set
1700 REM
1800 FOR I = 0 TO 31
1900    S1$ = S1$ + CHR$(I+32)
2000    S2$ = S2$ + CHR$(I+64)
2100    S3$ = S3$ + CHR$(I+96)
2200 NEXT I
2300 S3$ = LEFT$(S3$,31)+" "
2400 GOSUB 9300 'Turn everything off
2500 TITLE$ = "Normal mode"
2600 GOSUB 6300
2700 'Emphasized
2800 GOSUB 7700 : GOSUB 6300
2900 'Double strike
3000 GOSUB 8100 : GOSUB 6300
3100 'Emphasized Double strike
3200 GOSUB 7700 : GOSUB 8100 : GOSUB 6300
3300 'Compressed
3400 GOSUB 8900 : GOSUB 6300
3500 'Emphasized Compressed is not permitted
3600 'Compressed Double Strike
3700 GOSUB 8900 : GOSUB 8100 : GOSUB 6300
3800 'Compressed Emphasized Double Strike
3900 '   is not permitted
4000 'Double Width
4100 GOSUB 8500 : GOSUB 7100
4200 'Double Width Emphasized
4300 GOSUB 8500 : GOSUB 7700 : GOSUB 7100
4400 'Double Width Double Strike
4500 GOSUB 8500 : GOSUB 8100 : GOSUB 7100
4600 'Double Width Emphasized Double Strike
4700 GOSUB 8500 : GOSUB 7700
4800 GOSUB 8100 : GOSUB 7100
4900 'Double Width comprssed
5000 GOSUB 8500 : GOSUB 8900 : GOSUB 7100
5100 'Double Width Compressed Emphasized
5200 ' is not permitted
5300 'Double Width Compressed Double strike
5400 GOSUB 8500 : GOSUB 8900
5500 GOSUB 8100 : GOSUB 7100
5600 'Double Width Compressed Emphasized
5700 ' and Double strike is not permitted
5800 '
5900 LPRINT CHR$(12) 'Form feed
6000 END
6100 REM print character set
6200 REM
6300 LPRINT PREFIX$; TITLE$
6400 LPRINT PREFIX$; S1$; S2$
6500 LPRINT PREFIX$; S3$
6600 GOSUB 9300
6700 RETURN
6800 REM
```

```
6900 REM print double width character set
7000 REM
7100 LPRINT PREFIX$; TITLE$
7200 LPRINT PREFIX$; S1$
7300 LPRINT PREFIX$; S2$
7400 LPRINT PREFIX$; S3$
7500 GOSUB 9300
7600 RETURN
7700 TITLE$ = TITLE$ + "Emphasized "
7800 LPRINT ESC$; "E";: RETURN
7900 LPRINT ESC$; "F";: RETURN 'Turn OFF Emphasized
8000 '
8100 TITLE$ = TITLE$ + "Double strike "
8200 LPRINT ESC$; "G";: RETURN
8300 LPRINT ESC$; "H";: RETURN 'Turn OFF Double strike
8400 '
8500 TITLE$ = TITLE$ + "Double width "
8600 PREFIX$ = CHR$(14): RETURN
8700 PREFIX$ = ""        : RETURN 'Turn OFF Double width
8800 '
8900 TITLE$ = TITLE$ + "Compressed "
9000 LPRINT CHR$(15); : RETURN
9100 LPRINT CHR$(18); : RETURN 'Turn OFF Compressed
9200 REM Initialize to normal mode
9300 TITLE$ = ""
9400 LPRINT
9500 GOSUB 7900 : GOSUB 8300
9600 GOSUB 8700 : GOSUB 9100
9700 RETURN
```

Dick Dievendorff, DEMO14(DIEVEN), Los Angeles

8204-20 IBM TEST COMMUNITY INTEREST IN IBM PC

The T E Forum (Test Equipment Forum) concluded at its recent meeting in Poughkeepsie, that much interest exists in applying the PC as a test and/or control vehicle within IBM manufacturing and laboratory operations.

These applications will likely cause many people to work on such things as expansion chassis, DI/DO cards, AI/AO cards, IEEE 488 and RS422 interfaces etc. Much of this effort will be wasted by duplication around the company.

Information pertaining to Quality, Manufacturing, Development, Product Test, etc., groups that may be planning an application or actually have one in progress is requested. The information needed is the application itself (brief), and its required support hardware, software, and speed and timing considerations.

The last page of this section is the questionnaire. If you are involved with a planning and/or implementation effort in this category, please take a few minutes to fill it out and send it in before April 30, 1982.

Bill Picker, Boulder

Lyle Solem, Rochester

MAIL TO : Dave Heussmann
Dept. 965 /010-3
Boulder, Co.

PC APPLICATION QUESTIONNAIRE

____ IBM CONFIDENTIAL   ____ IBM INTERNAL USE ONLY

____ APPLICATION IN PROGRESS   ____ PROPOSED APPLICATION

BRIEF DESCRIPTION OF APPLICATION

UNIQUE HARDWARE REQUIRED

SOFTWARE AND SPEED CONSIDERATIONS

Add pages as required to provide a complete description.

NAME :   DEPT. NAME OR FUNCTION :

PHONE :   -   -   LOCATION :   DATE :

IBM INTERNAL USE ONLY PROGRAMS

These programs are listed for your information only. Use at your own risk. Entry Systems has not validated them nor do we necessarily endorse them by listing them. Problems/questions should be addressed to the authors, not ES.

8204-21   ESPF/PC FULL SCREEN EDITOR RELEASE 1.2.3 NOW AVAILABLE.

ESPF/PC Release 1.2.3 is now available. By the time this is published, I will have sent it via the network to all those to whom I have networked ESPF in the past. I will also be putting it on the IBMPC disk in Yorktown. ESPF consists of the following three files:

- ESPF.SCRIPT - Documentation for ESPF in SCRIPT input format.
- ESPF.EXE - Load module for ESPF in B3101 binary format.
- ESPF.EXP - Load module for ESPF in EXPORT V2 format.

I no longer distribute the source code. If you have a need for it, send me a message and I will get you a copy.

If you absolutely have got to have it on a diskette, send a diskette and a self addressed envelope to me at the following address:

Chuck Tribolet
D93/H21
IBM Santa Teresa Laboratory
555 Bailey Ave.
San Jose, CA 95150

Changes in Release 1.2.3

- Substantially improved performance when reading and writing files.
- LOCATE primary command to position to a specific line number.
- TABS OUT primary command to remove tab characters and replace them with the appropriate number of blanks.
- Improved cursor location when first editing a file.
- One-shot scroll amount may be entered in the primary command area. Numeric scroll amounts are now supported in this area.
- Insert now acts like 370 SPF -- it keeps giving you new blank lines as long as you enter something.
- Line commands may be entered anywhere in the line number. The repetition factor after the line number may now be greater than 9.

Changes in Release 1.2.2

- This was a testing release with limited distribution.

Changes in Release 1.2.1 (distributed in mid-March).

- Function key assignments changed to match SPF 3270 assignments in a physical way rather than a numeric way. END is now F2 (upper right corner) instead of F3.
- Color Adapter card supported in 80 character mode.
- Cursor positioning is improved.
- Added Edit option menu to allow editing more than one dataset without reloading the ESPF module.
- Alarm sounded when typing into a protected field and when an error message is issued.
- Architecture added to support primary commands.
- Added SAVE primary command.
- Added CANCEL primary command. F13 has been removed as exit without save.
- Added FIND primary command.
- Added CHANGE primary command.
- Added RESET primary command.
- Added COPY primary command.
- The primary command area is now titled 'COMMAND' instead of 'COMMAND INPUT'.
- Fixed miscellaneous bugs.

Chuck Tribolet, MVS(STLMVS1/T811329), Santa Teresa, TL 543-3337

8204-22 VERSION 0.3 OF ED FULL SCREEN EDITOR AVAILABLE

Version 0.3 of the ED full screen editor is now available. New features include:

- Block operations on three types of marked areas

- Files no longer limited to 500 lines

- Tab characters expanded on input and automatically inserted on output

- Maximum macro size doubled

- Commands may be entered in mixed case

The user's guide for ED may be retrieved from the IBMPC machine at YKTVMV using the name 'ED SCRIPT'. There is also a file there called 'ED MAIL' which contains comments, criticisms, bug reports, etc. You are invited to add your comments using the APPEND function of the IBMPC exec. The procedure for accessing the IBMPC machine was described in PC Newsletter item 8102-05.

The object code for version 0.3 of ED also resides on the Yorktown IBMPC machine. There are two procedures for obtaining ED over the network, one more complex than the other but requiring somewhat less data transfer. Either procedure requires that you first obtain and generate version 2.0 or higher of the IMPORT/EXPORT programs from IBMPC. The procedure for generating IMPORT/EXPORT is documented in file 'EXPORT SCRIPT'. Since

IMPORT and EXPORT are written in Pascal and distributed in source form, you will need a 128K PC with Pascal to generate them.

The less complicated procedure to generate ED consists of the following steps:

1. Retrieve, download, and generate the IMPORT program as described above.

2. Retrieve the following files from the IBMPC machine and download them to your PC, renaming them as shown in parentheses:

> ED PRO (ed.pro),
> ED KEY (ed.key), and
> ED EXPORT (ed.exp).

> It takes close to an hour to download ED EXPORT at 300 baud. Remember to set LINEDIT, MSG, WNG, and SMSG off before starting a file transfer (messages from the operator make poor object code).

3. Run the command 'import ed.exp ed.exe' to recreate the executable ED module.

The more complicated, but shorter ED generation procedure is:

1. Retrieve, download, and generate the IMPORT program as described above.

2. Retrieve the following files from the IBMPC machine and download them to your PC, renaming them as shown in parentheses:

> ED PRO (ed.pro),
> ED KEY (ed.key),
> EDGEN BAT (edgen.bat),
> EDLINK ARF (edlink.arf),
> EDMAIN EXPORT (edmain.exp),
> EDZAP EXPORT (edzap.exp),
> EDM1 EXPORT (edm1.exp),
> EDM2 EXPORT (edm2.exp),
> EDM3 EXPORT (edm3.exp),
> EDM4 EXPORT (edm4.exp),
> EDM5 EXPORT (edm5.exp),
> EDM6 EXPORT (edm6.exp), and
> EDM7 EXPORT (edm7.exp).

3. Run the file edgen.bat to decode the object files and then link them together to form ed.exe. This step requires the Pascal runtime library disk and a blank diskette. The edgen procedure includes comments that tell you which files to put on which disks before starting.

If your local computer and phone lines are sufficiently reliable, I recommend the first procedure. The second procedure has the advantage that the code transfer is broken into several pieces, each of which can be independently restarted if something goes wrong.

Despite my earlier requests that people make every effort to obtain ED by the procedure outlined above before sending me a diskette, I have been swamped with diskettes, including as many as four from a single site. Because of this lack of coordination and because I suspect that many of the requests I am receiving are for personal use of ED, I am going to insist

that future ED distribution other than across VNET be handled through site coordinators. If you need a copy of ED version 0.3 for IBM internal use and cannot obtain it from the IBMPC service machine as described above, please have your site coordinator send a formatted diskette to Dion Johnson, who is the site coordinator for San Jose Research. He may be reached at userid JOHNSOND at node SJRLVM1. His internal and external addresses are:

Dion Johnson
K03/282
IBM Research
San Jose

and

Dion Johnson
K03/282
IBM Research
5600 Cottle Road
San Jose, Calif. 95193

Jim Wyllie, VM(WYLLIE), K61/282, San Jose Research, TL 276-2844

8204-23   PCEDIT FULL SCREEN EDITOR PROGRAM

This contribution is to announce that the initial version of the PCEDIT Full Screen Editor program for the IBM Personal Computer is now available to internal IBM users.

The IBM Personal Computer Full Screen Editor (PCEDIT) is a program which operates on the IBM Personal Computer under the IBM Personal Computer Disk Operating System (PC-DOS). The program has been developed using the IBM Personal Computer Macro Assembler.

The editor program utilizes the extensive functions available in the IBM Personal Computer keyboard and displays to permit the user to create and modify text files stored on disk. These files may contain any type of data in ASCII code and PC-DOS format with line lengths which do not exceed 140 bytes such as program source code, document text, program data, etc.

Program Features

The program is a full screen editor in that it displays 24 lines of data on the screen and allows the user to directly modify the data in any portion of the screen from the keyboard. The editor program supports the monochrome display option and the color graphics display option operating in the 80 character black and white or color modes. Some of the more significant features of the program are:

- Menus are used to provide easy selection of files and program options.

- All data present on the screen may be directly modified from the keyboard.

- In addition to moving the cursor on the screen, the cursor control keys can be used in alternate modes to perform additional functions such as skipping words and positioning to the beginning or end of the line.

- Characters may be inserted and deleted within any line using the INS and DEL keys.

- Program function keys are used extensively to simplify editing operations. Row 25 is used to display function key labels which show the user the function performed by each key.

- Lines may be inserted and deleted.

- There are extensive scrolling facilities which permit the user to scroll forward and backward over the file, left and right over the lines in the screen window, and to the top and bottom of the text. The range of scrolling operations may be controlled by commands.

- Optional automatic scrolling repositions the text window when the cursor is moved out of the current window.

- Optional input masking allows the user to preset lines being inserted to a prescribed character string.

- There are extensive search and change facilities. The scope of search and change operations may be restricted by user defined boundaries.

- Line commands allow single lines or groups of consecutive lines to be manipulated. Operations such as move, copy, delete, translate, etc. may be performed.

- Text from another file may be merged into the file being edited.

- Portions of text from the file being edited may be extracted into another file.

- Files which are too large to fit into available memory may be processed in segments.

- Variable TABS are supported and may be redefined during the editing session.

- A command stack is provided so that previously entered commands may be recalled and reused with or without modification.

- A profile facility allows editor options to be preserved for different types of data and recalled during future editing sessions.

- Both monochrome and color displays are supported in 80 column mode. The program allows switching between display modes during editing.

System Requirements

The editor program may be used with the following IBM Personal Computer configurations:

- A minimum of 64K bytes of RAM is required. 128K of RAM is desirable in order to edit a reasonable sized file in a single segment.

- At least one disk drive is required. A second drive is highly recommended.

- The IBM Monochrome Display is recommended because of it's higher resolution and readability. The Color Display adapter may also be used in both black and white and color 80 column modes. The use of the 40 column modes is NOT supported. When using the color adapter, an RGB monitor must be used in order to obtain sufficient resolution in 80 character mode.

- The editor program supports the use of BOTH display adapters and allows switching between display modes while editing.

The editor program requires the IBM Personal Computer Disk Operating System (PC-DOS).

Program Distribution

The editor program and documentation are restricted to IBM INTERNAL USE for BUSINESS PURPOSES ONLY and will be distributed to IBM internal locations accordingly.

To order the editor program, please send a written request for the program along with a 5 1/4" diskette in a REUSABLE protective mailer via IBM internal mail to:

Walt Paul, D72/H20
IBM Santa Teresa Laboratory
San Jose, Ca.

The request may be sent via the network to the node/ID listed below if it is more convenient. The diskette will be returned with the copy of the program module along with two copies of the user's guide document. In the near future, these items will be available via the network using IMPORT/EXPORT or Edgar Swank's 3101 Emulator and file transfer programs. Please note that the program source will not be distributed at this time.

To install the program, copy the file "PCEDIT.EXE" from the distribution disk to the system or work disk.

Walt Paul, MVS(STLMVS1/P472627), IBM Santa Teresa Lab, TL 543-3827

8204-24   UNERASE -- BY READING DISKETTE SECTORS (IN PASCAL)

I have written a program, optimistically titled UNERASE, to recover a source file which "disappeared" from a diskette.

The program looks at each sector of a specified diskette to determine if it is part of an ASCII structured file.

(Most PC "source" files are ASCII structured files. An ASCII structured file is a file which has record boundaries identified by ASCII "carriage return" and "line feed characters", and UNERASE decides that a sector is ASCII structured if it has no records longer than a maximum which the user specifies.)

If the sector seems to be part of an ASCII structured file, UNERASE displays the sector and asks you if you want it copied to another file. When the program ends, you can then edit the resulting file, and recover all of the "wiped out" file which remained on the diskette, by moving groups of lines, and by joining lines which were split over sectors.

UNERASE is written in Pascal, and uses Tom Sawyer's very useful CALLSVC routine to invoke the diskette I/O routines of the BIOS. (CALLSVC is available from Yorktown via the IBMPC EXEC).

To get a copy of the source code via the CJN network, NETMAIL a note to my VM signon (below).

Doug Lorch, VM(STLVM7/LORCH), Santa Teresa

8204-25   SORTED DIRECTORY DISPLAY (SDIR)

SDIR provides a directory display, much like the DIR command supplied with IBM DOS. The display differs from the DIR display as follows:

1.   The directory entries are sorted into alphabetic order

2.   The screen is cleared before the display starts

3.   The entries are displayed two-up, like a telephone book page, to avoid scrolling the display off the screen

4.   The amount of free space available on the diskette is shown

The syntax is the same as the DIR command of DOS.

Examples:

SDIR   Displays all files on the default drive.

SDIR B: Displays all files on drive B.

SDIR *.BAS   Displays all files with extension BAS on the default drive.

Installation

To get the distribution diskette, contact me by VNET. Please don't call me on the phone! If you don't have VNET access, drop me a note.

I'll need a diskette and an internal and external mailing address. Try to send the diskette in such a form that I can easily package it to return it to you.

I'd like to send it only once to any particular site. Please contact me first, there may be someone else at your site that can get it to you faster than I can. Also, if I give you the product, you agree to reproduce it locally for employees at your site. The program is intended for IBM Internal Use only.

The diskette is currently available at the following sites:

Yorktown Research

Santa Teresa

Boca Raton

Endicott

The executable load module is also on the IBMPC virtual machine in Yorktown as file SDIR TBH. I'm trying to arrange for the source to be made available there also.

The distribution diskette contains all source code, an executable module and a listing file, in case you don't have an assembler yet.

The only module you need to run the program is SDIR.EXE.

Dick Dievendorff, VM(DEMO14/DIEVEN), IBM NAD BO 05L, 3550 Wilshire Blvd, Los Angeles, CA 90010

8204-26   B3101 TERMINAL SUPPORT PROGRAM VERSION 3 NOW AVAILABLE

This is to announce the third release of the B3101 terminal support program with the following revisions and enhancements:

- Insert mode will allow you to insert characters into fields which have no null characters if a blank is the last character of the field.

- If the TC command finds no changes in the ASCII file, then special processing is done which saves host and PC execution time and avoids unnecessary fragmentation of a base file PDS on TSO/VTAM.

Previous users of this package will NOT be automatically sent the new version. The latest version of this package is maintained on the Yorktown IBMPC disk. Non-STL VM users should obtain updates there. Other users should send requests by NETMAIL to the ID below. You can order the PC code sent over the network in either EXPORT or HEX format. EXPORT format can be downloaded with the Cambridge Terminal program and converted to binary by IMPORT version 2. HEX format can be downloaded directly to binary by any previous version of the B3101/C3101 program. If neither of these is available, send a blank diskette in a self-addressed mailer to the internal mail address below. Upload/Download HOST support for either VM or TSO/VTAM will be sent over the network. New HOST support (HRCV) is required to support the no-change TC feature properly. Documentation can be sent over the network as SCRIPT/GML input. You can get a hard copy of documentation by sending a self-addressed large envelope to the internal address below.

Edgar W. Swank, MVS(STLVMS1/S788281), D71/H20, Santa Teresa, TL 463-3828

8204-27   GML/SCRIPT/VS FOR THE IBM PC

PCSCRIPT is a version of GML and SCRIPT/VS that has been written for the IBM PC. The commands supported do not exactly duplicate the format that you would receive using SCRIPT/VS and a 3800 printer but the format of the commands are the same and upward compatible. The PCSCRIPT program reads a DOS file created with the EDLIN facility or the ED/ESPF full screen editor programs.

The following commands are currently supported by PCSCRIPT;

```
S1,OL,UL,LI,P.,PREFACE,TITLEP,TITLE.,DATE,AUTHOR
ETITLEP,TOC,GDOC,ADDRESS,ALINE,EADDRESS,Hn (1-6),
APPENDIX,ESL,EOL,EUL,PL,LL,PP,SP,BR,PA,SK,
US,Hn (1-6),DD,IM,FO,IN,&Nx (5 levels),&B..
```

The program is written in BASIC and requires 64K of memory, one disk drive, and the IBM Matrix Printer. Output may be directed to the "SCRN:" or "LPT1:". If you are interested in PCSCRIPT please send me a blank diskette and I will send you the program and documentation. If enough interest is shown, I will place the program and documentation on the IBMPC machine at YKTVMV.

Wes Smith, MVS(LEXMVS1/ISS2114), D942/B200-3,Lexington, Ky., TL 445-60854

8204-28   SUBSET SCRIPT AND GML PROCESSOR FOR THE IBM PC

This program processes a subset of SCRIPT and GML tags. It is written in IBM PASCAL and will run in a 64KB IBM Personal Computer. The following tags have been implemented:

- Normal SCRIPT tags: "."BR, "."FO ON/OFF, "."CP, "."IM, "."PA<n>, "."PT, "."RC, "."SK, "."SP, "."TE, "."TY, "."PN ON/OFF.
- Normal GML tags: :Hn, :LI, :OL, :EUL, :P.
- Extended tags for IBM Personal Computer support: "."COMP ON/OFF (puts printer in 132 character mode), "."EM ON/OFF (puts printer in emphasized mode), :VS6 (puts printer in 6 LPI mode), :VS8 (puts printer in 8 LPI mode), "."DFN ON/OFF (Display file names - displays current DOS file each time a heading is printed).
- Extended tags for marking security classification of each paragraph, list item, and heading, as required by Department of Defense.

If you would like a copy, please give me a call.

Art Law, 101C/L55, Owego, TL 662-5132

GENERAL INFORMATION SECTION

This section will be used to convey information about IBM Personal Computer hardware and software products marketed by IBM. Each product will have one or more of the following types of information:

- Tips. These are tips on how to use the product.

- Publication Errata. These are changes to the documentation.

HARDWARE INFORMATION

SYSTEM UNIT

Tips

1. We recommended that you retain the packing cartons for your system in case you must return a system for service. The Guide to Operations contains a RELOCATE section, describing how to pack your system.

2. Diskette drive installation is normally a dealer task, but some employees may elect to perform the installation themselves.

   If you aren't certain about how to do this, we suggest that you get help from an authorized dealer.

   When installing a diskette drive, maintain a spacing of approximately 0.040 inch between the rear surface of the diskette drive's front panel and the System Unit frame to prevent damage to the front panel during subsequent shipment (e.g., for service).

3. When using a home TV set with the IBM Personal Computer, position the TV set away from the system unit if you encounter diskette read errors. Some TV sets emit signals that find their way into the diskette read circuitry, resulting in data transfer errors.

4. If the IBM Monochrome Display is placed on top of the System Unit and is turned 90 degrees so it faces to the operator's left, diskette I/O errors can occur due to noise from the display's power supply.

Publication Errata - Guide to Operations

1. Page 3-14 of the Printer section of the Guide to Operation, Example 3, text reads:

   followed by ASCII number 27

   Change to read:

preceded by ASCII number 27

2. Page 3-15 of the Printer section of the Guide to Operations reads:

* These ASCII numbers may require the addition of 128 to make them work reliably. If in doubt, add 128.

** These ASCII numbers must be preceded by the Escape Code.

The asterisk and double asterisk are reversed. Change the page to read:

** These ASCII numbers may require the addition of 128 to make them work reliably. If in doubt, add 128.

* These ASCII numbers must be preceded by the Escape Code.

3. The printer shipping screws may be in a different location on the bottom cover of the printer than shown on Page 5-4 of the Matrix Printer Option Installation section of the Guide to Operations. The only screws readily accessible are the shipping screws. These screws should be removed from all installed printers.

4. Page 5-23 of the Asynchronous Communications Adapter option installation section has incorrectly shown the position of the Programmed Shunt module. The diagram on page 2-146 of the Technical Reference Manual is correct. With the Asynchronous Communications Adapter viewed from the component side with the bus connector down, the Programmed Shunt module should be installed as follows:

- RS-232 interface -- dot in upper left corner
- Current loop interface -- dot in lower right corner

Publication Errata - Technical Reference Manual

1. Table 8 on page 2-72 shows the functions and conditions of DIP Switch 1 inside the IBM 80 CPS Matrix Printer. The correct setting for DIP Switch 1, pin 3 is OFF, not ON as shown in Table 8.

2. Page 2-78 describes the printer ASCII coding table. The characters at hexadecimal CA and CB are incorrectly drawn. To use the chart, find C on the top, and A or B down the left to locate the characters. The following direct BASIC statement can be used to print the correct graphic characters:

    LPRINT CHR$(&HCA), CHR$(&HCB)

3. Page 3-23 describes the BASIC workspace variables. Replace the line

    Offset into of start of variables

with the following:

    Offset into segment of start of variables

4. Page A-42, the BIOS listing, describes the printer status information incorrectly. On program listing line number 3023, the busy bit, bit 7 of the printer status, should indicate OFF if the printer is busy and ON if the printer is not busy.

5. Page C-12 has a Quick Reference of characters. The character at hexadecimal A7 is a lower case "z", not a lower case "x" as shown in the manual.

KEYBOARD

Tips

1. Care should be exercised in handling the keyboard with the cover removed. **Do not touch circuitry on the circuit board.** Handle the unit by the large steel base plate only. Static electricity, often existing on a person, could cause damage to components on the circuit board.

DISPLAY ADAPTERS

Tips

1. If you have one display adapter, we recommend that it be installed in slot 2. If you have both adapters, use slots 2 and 3. If you use slot 2 for monochrome and slot 3 for color, the color card is nearer the cable opening for an RF modulator, which can make installation of an RF modulator easier.

2. To shift between the Color/Graphics Monitor Adapter and IBM Monochrome Display, use the following BASIC program segments:

```
100 REM SWITCH OUTPUT TO THE COLOR/GRAPHICS ADAPTER
110 KEY OFF              'Turn off soft key display
120 CLS                  'Clear Monochrome screen
130 LOCATE ,,0           'Remove monochrome cursor
140 DEF SEG=0            'BIOS communications area segment
145 REM Set equipment determination flags for Color 40
150 POKE &H410,(PEEK(&H410) AND &HCF) OR &H10
160 DEF SEG              'Re-address BASIC segment
165 SCREEN 1             'Put into graphics mode
166 SCREEN 0             'And go back to be sure
170 WIDTH 80             'Init color adapter to 80 char mode
171 WIDTH 40             'and go back to be sure.
180 LOCATE ,,1,6,7       'Set cursor size
190 SYSTEM               'Return to IBM DOS
```

```
100 REM SWITCH OUTPUT TO THE IBM MONOCHROME DISPLAY
110 KEY OFF              'Turn off soft key display
120 CLS                  'Clear color display
130 LOCATE ,,0           'Remove color cursor
140 DEF SEG=0            'Address BIOS communications area
145 REM Set equipment determination flags for monochrome
150 POKE &H410,PEEK(&H410) OR &H30
160 DEF SEG              'Re-address BASIC segment
165 SCREEN 1             'Put into graphics mode
167 SCREEN 0             'and go back to be sure
170 WIDTH 40             'Clear and set mono 40 mode
172 WIDTH 80             'and go back to 80 mode to be sure
180 LOCATE ,,1,12,13     'Turn on monochrome cursor
190 SYSTEM               'Return to IBM DOS
```

If the screen width is changed from while in BASIC, it must either be changed back again before exiting BASIC, or a MODE command must be issued immediately upon return from BASIC to DOS to keep the screen in the new width. You may wish to do this in a batch exec that invokes the appropriate BASIC program and then issues the MODE command.

3. Another way to switch between the two types of displays is to use the following two IBM Personal Computer Macro Assembler programs. These are the output listings of the two programs as assembled by the Macro Assembler.

```
                                    TITLE Convert to Monochrome Display
                                    PAGE      ,132
     0000               DATA       SEGMENT AT 40H
     0010                          ORG      10H
     0010  ????        EQUIPFLAG    DW       ?
     0012               DATA       ENDS
     0000               STACK      SEGMENT STACK
     0000      40 [                DW       64 DUP(?)
     0080               STACK      ENDS
     0000               CODE       SEGMENT
                                   ASSUME   CS:CODE,DS:DATA
     0000               MONOCHRM    PROC      FAR
     0000  1E                      PUSH     DS               ; Establish return vector
     0001  2B C0                   SUB      AX,AX
     0003  50                      PUSH     AX
     0004  B8 ---- R               MOV      AX,DATA
     0007  8E D8                   MOV      DS,AX            ; Set up segment register
     0009  81 0E 0010 R 0030 OR    EQUIPFLAG,00110000B      ; Turn ON Monochrome

     000F  B8 0003                 MOV      AX,3             ; Do a 80x25 mode set
     0012  CD 10                   INT      10H              ;   to the video interrupt
     0014  CB                      RET                       ; Return to DOS
     0015               MONOCHRM    ENDP
     0015               CODE       ENDS
                                   END


                                    TITLE Convert to Color Display
                                    PAGE      ,132
     0000               DATA       SEGMENT AT 40H
     0010                          ORG      10H
     0010  ????        EQUIPFLAG    DW       ?
     0012               DATA       ENDS
     0000               STACK      SEGMENT STACK
     0000      40 [                DW       64 DUP(?)
     0080               STACK      ENDS
     0000               CODE       SEGMENT
                                   ASSUME   CS:CODE,DS:DATA
     0000               COLOR      PROC     FAR
     0000  1E                      PUSH     DS               ; Establish return vector
     0001  2B C0                   SUB      AX,AX
     0003  50                      PUSH     AX
     0004  B8 ---- R               MOV      AX,DATA
     0007  8E D8                   MOV      DS,AX            ; Set up segment register
     0009  A1 0010 R               MOV      AX,EQUIPFLAG     ; Get equipment flag
     000C  24 CF                   AND      AL,11001111B     ; Turn off Monochrome flags
     000E  0C 20                   OR       AL,00100000B     ; Turn on 80x25 color
     0010  A3 0010 R               MOV      EQUIPFLAG,AX     ; Restore equipment flag
     0013  B8 0003                 MOV      AX,3             ; Do a 80x25 mode set
     0016  CD 10                   INT      10H              ;   to the video interrupt
     0018  CB                      RET                       ; Return to DOS
     0019               COLOR      ENDP
     0019               CODE       ENDS
                                   END
```

4. If you have both display adapters installed, set DIP Switch 1, positions 5 and 6, both OFF. **Do not set DIP Switch 1 position 5 or 6 ON with a monochrome adapter installed.** Failure to observe this precaution may result in damage to the IBM Monochrome Display, which is not field-repairable.

The positions of these DIP switches are shown on page 5-12 of the IBM Monochrome Display and Parallel Printer Adapter Option Installation insert in the Guide to Operations.

IBM 80 CPS MATRIX PRINTER

Tips

1. The tab stops are interpreted by the IBM 80 CPS Matrix Printer differently than on the display. If the printer is at a tab stop when a tab is issued, no tabbing takes place.

2. The following example places the printer in 8LPI mode and sets the page length to 24 lines. It then prints 2 pages, each 3 inches long, and returns to 6-lines-per-inch mode at 11 inches per page.

```
100 LPI8$=CHR$(27)+"A"+CHR$(9) '9/72 nds = 1/8 th inch
110 LPI6$=CHR$(27)+"A"+CHR$(12) '12/72 = 1/6 INCH
120 PL3INCH$=CHR$(27)+"C"+CHR$(24) '24/8 = 3 INCHES
130 PL11INCH$=CHR$(27)+"C"+CHR$(66) '66/6 = 11 INCH
135 SETLPI$=CHR$(27)+"2"
140 NEWPAGE$=CHR$(12)
150 LPRINT LPI8$+SETLPI$+PL3INCH$
160 FOR I = 1 TO 2 'PRINT 2 PAGES
170   FOR J = 1 TO 16
180     LPRINT "----- 8 LINES PER INCH -----"
230   NEXT J
240 LPRINT NEWPAGE$
250 NEXT I
260 LPRINT LPI6$+SETLPI$+PL11INCH$
270 FOR I = 1 TO 2
280   FOR J = 1 TO 16
290     LPRINT "----- 6 LINES PER INCH -----"
300   NEXT J
310   LPRINT NEWPAGE$
320   NEXT I
330 LPRINT "THAT'S ALL FOLKS"
```

3. DIP Switch 1, position 3, in the IBM 80 CPS Matrix Printer should be positioned OFF. This permits the user to perform underlining and overprinting under program control. This change is scheduled to be performed by the factory beginning with printer serial number 0710159.

    To access these switches, the printer bottom cover must be removed. The four screws in the extreme corners of the IBM 80 CPS Matrix Printer must be removed, and the platen feed knob pulled straight off.

ASYNCHRONOUS COMMUNICATIONS ADAPTER

Tips

1. If you want to install two Asynchronous Communications Adapters, one must be altered to change its I/O address. Authorized dealers can perform this modification without affecting the warranty. They have received Service Procedure G008 which describes the modification. If the user performs the modification, the adapter may not qualify for warranty service.

2. To connect the Asynchronous Communications Adapter to most modems, acquire a RS-232 cable with one male and one female 25-pin connector. Pins 2 through 8 and 20 on the male connector should be connected to the same numbered pins on the female connector. Additional pins may be connected, if desired, with no effect.

3. To connect one IBM Personal Computer to another, a cable with two female connectors should be wired as follows:

Connector 1	Connector 2
Pin 2 (Transmitted Data)	to Pin 3 (Received Data)
Pin 3 (Received Data)	to Pin 2 (Transmitted Data)
Pin 5 (Clear To Send) Pin 6 (Data Set Ready) Pin 8 (Data Carrier Detect)	to Pin 20 (Data Terminal Ready)
Pin 7 (Signal Ground)	to Pin 7 (Signal Ground).
Pin 20 (Data Terminal Ready)	to Pin 5 (Clear To Send) Pin 6 (Data Set Ready) Pin 8 (Data Carrier Detect)

Note that pins 5, 6, and 8 are jumpered together on each connector. The cable is symmetrical; either end can be connected to either computer.

4. To send a "break" signal to a host computer, a short BASIC sequence similar to the example below can be incorporated into user-written "terminal" programs:

```
10 IC% = INP(&H3FB)        'Get MODEM control register
20 IZ% = IC% OR &H40       'Turn Set Break bit ON
30 OUT &H3FB,IZ%           'Send to MODEM control register
40 FOR I=1 TO 500:NEXT I   'Delay approximately 1/2 second
50 OUT %H3FB,IC%           'Turn Set Break Bit OFF
```

Please note that this sample uses the first asynch adapter.

SOFTWARE INFORMATION

FROM THE ENTRY SYSTEMS CHIEF PROGRAMMER

I want to take this opportunity to tell you how pleased I am that we are publishing this newsletter. Many of you have contacted me and told me that you would like the latest scoop on the IBM Personal Computer. Well, this is it. The success of the newsletter depends on you, since for every one of us working on the Personal Computer, there are hundreds of you using it -- which brings me to another point:

Please -- submit your comments, questions, tips, etc. through VNET as described in the editorial by Joe Potts. We'd like to talk to each one of you personally, but you'd get a busy signal and we couldn't do our jobs. We appreciate your input, but will only be able to contact you if we have questions.

This column will be devoted to software tips and techniques. Each submission will be checked to make sure it works, and those of general interest will be published.

One hint: Many of the questions that we have received relate to hardware, device drivers, video cards, etc. Answers to most of these questions can be found in the Technical Reference Manual. I encourage you to get a copy.

Many of the tips and techniques will be shown in BASIC. Converting them to Assembler will be an exercise left to the reader.

Now, the first batch of tips and techniques.

> Mel Hallerman
> ES Programming and Publishing

1. Hardware Scrolling on the Color/Graphics Adapter

    The video adapter controller (6845) contains two 8 bit registers (12 and 13) that point to the start of the page in the video buffer that is currently being displayed. When pointing at page 0, registers 12 and 13 are set to zero. To move to the next page, registers 12 and 13 are incremented by 1024 in 40 column mode and by 2048 in 80 column mode (remember that register 12 has the high order part of the offset, register 13 the low order part).

    However, there is no reason you are limited to 'page' scrolling. For example, by adding 80 to registers 12 and 13 while in 80 column mode, you will scroll up one line (add 40 in 40 column mode). Therefore, you can fill up the 16KB video buffer with 101 lines in 80 column mode or 202 lines in 40 column mode and do very effective hardware scrolling. The offset in registers 12,13 are calculated modulo 16,192 and will wrap back to zero, so you will need special code to handle end of buffer. See pages 2-55 and 2-56 in the Technical Reference Manual.

    Example in Basic

    ```
    OUT 980,12: OUT 981,0: OUT 980,13: OUT 981,0    'Point to start of buffer
    OUT 980,12: OUT 980,0: OUT 980,13: OUT 981,80   'Scroll up one line"
    ```

2. Screen Dump From Within a Program

When you press SHIFT-PRTSC to dump the screen to the printer, the ROM keyboard routine issues an "INT 5" instruction to invoke the screen dump routine. You can do the same thing from within a program, for example:

```
100 DIM S%(2)
110 S%(1)=&H05CD     'CD 05      INT 5
120 S%(2)=&H00CB     'CB         RET
130 SUBRT%=VARPTR(S%(1))
140 CALL SUBRT%
```

3. To Get 16 Background Colors in Text Mode

In text mode, you normally have 8 background colors, 16 foreground colors and a blink option. You can cause the blink option to give you 16 background colors instead, as follows:

```
40 column color mode - OUT &H3D8,8   'GO TO 16 BKGND COLORS
80 column color mode - OUT &H3D8,9   'GO TO 16 BKGND COLORS
```

Return to blink:

```
40 column mode - OUT &H3D8,40
80 column mode - OUT &H3D8,41
```

IBM DISK OPERATING SYSTEM V1.00

Tips

1. CP/M to IBM Personal Computer DOS migration.

   CP/M programs, in source format, may be transmitted to an IBM Personal Computer DOS system via a communications link. Language syntax changes (e.g., MBASIC 5.0 to IBM Personal Computer BASIC) will be necessary in most cases. Assembler language program conversion should not differ much from a CP/M-80 to CP/M-86 conversion, since DOS and CP/M follow similar programming conventions.

2. The following two BATch files provide a technique for mechanizing the listing of directories of multiple diskettes.

   To use this procedure, the user must place a file on each diskette with an extension of "LBL". The filename of this file is the user assigned "volume name". The content of "volume".LBL is up to the user, but the following is recommended:

Col	Contents
1-8	Volume identifier
9-9	blank
10-20	Owner name
21-21	blank
22-80	General description of contents

   ```
   DISKTOC.BAT
      PAUSE press CTRL-PRTSC
      REM Table of Contents of Diskettes
      DATE
      REM Contents of System Diskette
      COPY *.LBL LPT1:
      DIR
      CHKDSK
      DISK2TOC
   ```

   ```
   DISK2TOC.BAT
      REM insert any diskette in drive b: or
      PAUSE press CTRL-BREAK to exit
      COPY B:*.LBL LPT1:
      DIR B:
      CHKDSK B:
      DISK2TOC
   ```

3. The F3 key can be very convenient during EDLIN sessions. To copy a line (in our example, line 10) to another position in the file (in our example, line 20), use the following procedure:

   10 and ENTER

   Positions EDLIN to line 10 in the file, in EDIT mode, and copies the content of the line into a DOS "template".

   F3 and ENTER

Copies the line from the "template" back into the file at line 10. The text remains in the DOS "template".

20i and ENTER

Positions EDLIN to insert a line BEFORE line 20. The DOS "template" is not disturbed.

F3 and ENTER

Copies the line from the "template" into the file before line 20.

CTRL-BREAK

Leaves "insert" mode.

4. Liberal use of the TAB key, rather than multiple spaces, to line up columns of program source text can reduce the diskette space required for the source program text in Pascal and Macro Assembler.

5. The COPY command can be used instead of an editor to enter short text files, such as BATch files. For example,

```
copy con: print.bat
REM BAT file to print a file
COPY %1 LPT1:
```

Use CTRL-Z or function key F6 to end the operation.

6. DOS OPEN is issued for each line of a BATch file. This is necessary to verify that the diskette containing the BATch file has not been removed.

Publication Errata

1. On page 2-34, the FORMAT command is improperly described on the **Format:** line. Replace the semicolon after the first operand with a colon.

2. On page 2-36, the MODE command is improperly described in three places. There should be no comma between LPT#: and the number of characters per line. For example, to set the IBM 80 CPS Matrix Printer to 132 character mode, enter:

```
MODE LPT1:132
```

3. On page X-5, the index entry for "error messages" refers to page 4-17. This should read page 4-14.

BASIC V1.05

All Authorized IBM Personal Computer Dealers were recently sent a diskette containing V1.05 of BASIC and BASICA. The diskette is identical to the DOS V1.00 diskette except:

1. BASIC and BASICA have been updated to fix reported problems.

2. The MUSIC sample program has had its songs incorporated into the main program so that it now requires a 48KB system to execute.

3. The text file INF01.05 has been included. This file may be listed to give the user information about Version 1.05.

The dealers have been encouraged to reproduce and disseminate the material to satisfy the needs of their customers. Not all users of BASIC will experience these problems and you should only request the package if you have problems with BASIC or BASICA.

BASIC and BASICA V1.05 solutions to reported problems in V1.00.

1. In isolated situations a decimal point was misplaced by one position during output -- not during calculations.

   The decimal point was misplaced by one position if all four of the following conditions applied.

   a. The program was written in BASIC; and

   b. Numbers in double precision were involved; and

   c. The numbers involved were less than 1, and were close to, and very slightly smaller than, a power of 10 (e.g., 0.099999999999999995); and

   d. The number was converted from internal machine notation to an external, readable form, but the user did not or could not specify a format in which to represent the answer.

   To show how isolated the situation was, less than 200 out of approximately 18.5 million-trillion double precision binary numbers were displayed inaccurately.

   No IBM Application Programs were affected by this situation.

2. CHR$(7) can now be sent to a file or any device and will 'beep' the 'bell' correctly.

3. DATE$ and TIME$ can now be followed by a blank before the comment or multiple statements separator.

4. The LOC function, when used with a random file, has been fixed. BASIC V1.00 returned the physical record with LOC. BASIC V1.05 returns the logical record with LOC.

5. Variable initialization problems are now fixed. In BASIC V1.00, variables sometimes did not compare = 0 unless explicitly assigned.

6. Copyright notice and soft keys will not be displayed in BASIC V1.05 if the BASIC command line is used to load and execute a BASIC program. (enhancement)

7. The DRAW statement now clips lines at the edges of the screen rather than wrapping them around to the other side of the screen.

8. Graphics PUT of objects less than 8 bits wide has been fixed to work correctly with the PSET and PRESET action parameters.

9. BASIC V1.05 allows the PLAY and DRAW statements to use 'execute string' commands within 'execute string' commands. In other words, the executed string may contain 'execute string' commands.

10. BASIC V1.05 resets PEN/STRIG to OFF and PLAY/SOUND to "MF" when RUN/CLEAR commands are executed.

11. CIRCLE (x,y), r, start, -end now draws a line from the correct endpoint to the center of the circle.

12. The INKEY$ function has been corrected so that it does not hang after the last character of a 'soft key'. The documented circumvention in the BASIC Reference Manual (POKE 106,0) is not necessary in V1.05, though it will not affect existing code.

13. The WRITE# statement now pads to end-of-record with blanks.

14. BASIC V1.05 now supports the "ignore out of paper" mode on the IBM 80 CPS Matrix Printer. This mode is selected by executing the following statement:

    LPRINT CHR$(27);"8";

    See the IBM Personal Computer Technical Reference Manual for more details on how the printer handles this command.

15. The SYSTEM command will now restore the correct information for the video display that was active when BASIC was loaded. This is important only for systems with both the Monochrome Display and Printer Adapter and the Color/Graphics Monitor Adapter on them.

16. The TAB function now works correctly in all cases in the LPRINT statement. In BASIC V1.00, it did not work correctly after executing a

    WIDTH "LPT1:",255

    statement

17. OPEN "LPT1:" FOR OUTPUT AS #1 followed by PRINT#1,CHR$(10) now works correctly.

18. The POINT function now longer changes the "last point referenced." Only graphics statements can change the "last point referenced". (See pate 3-39 of BASIC Reference Manual)

DOS itself has **NOT** been modified in any way.

BASIC V1.00

Tips

1. Some BASIC commands, including SYSTEM, can appear in a program as well as their obvious "direct" mode use. For example, a BASIC program can be used to issue a "welcome to DOS" display and then exit.

   ```
   100 REM SAMPLE PROGRAM "WELCOME"
   110 CLS
   120 PRINT "Welcome to the wonderful world of IBM DOS"
   130 PRINT "Please set date and time"
   140 SYSTEM
   ```

   This program can be automatically executed at system startup with other commands in a file called AUTOEXEC.BAT.

   ```
   basic welcome
   date
   time
   dir
   ```

2. Don't issue CLEAR within a subroutine. The GOSUB return information is removed by CLEAR, and you'll get a "RETURN without GOSUB" error message when you attempt to return from the subroutine.

   CLEAR will also discard all variables, defined functions, DEFINT, DEFDBL, DEFSTR, and DEFSNG.

3. Try to define all simple (undimensioned) variables before any DIM statements are issued. Each declaration of a simple variable moves the entire set of dimensioned arrays up in storage. If the program uses the VARPTR function, and a simple variable declaration causes variables to be moved, existing VARPTR results may no longer be current. For example:

   ```
   10 CLEAR
   20 A = 0
   30 B = A
   40 DIM X(10)
   50 A = VARPTR(X(1))
   60 B = VARPTR(X(1))
   70 PRINT A; B
   80 END
   RUN
    3326   3326
   Ok
   DELETE 20-30
   RUN
    3298   3306
   Ok
   ```

4. Floating point comparisons for equality may lead to unexpected results.

   ```
   IF A = B THEN do something
   IF C = 0 THEN do something else
   ```

   may have to be recoded as:

```
EPSILON = .00001 'Some small number
IF ABS(A - B) < EPSILON THEN do something
IF ABS(C) < EPSILON THEN do something else
```

5. EDLIN can be used with BASIC source programs for such functions as locating and changing all occurrences of a variable name.

    While in BASIC, save the program with the ASCII option. EDLIN cannot be used with a BASIC program stored in its internally compressed form.

6. Performance tips

    •   Integer variables occupy 2 bytes, short floating point variables occupy 4 bytes, and double precision floating point variables occupy 8 bytes. In the following example, over 20,000 bytes of storage are saved by the presence of line 10.

        ```
        10 DEFINT A
        20 DIM A(100,100)
        30 A(100,100)=99
        40 PRINT FRE(0)
        50 END
        ```

    •   Use integer variables where they are appropriate, rather than floating point variables (the default). In the following example, the presence of line 10 improves the execution time considerably.

        ```
        10 DEFINT I, J
        20 TIME$ = "00:00:00"
        30 FOR I = 1 TO 100
        40   FOR J = 1 to 500
        50   NEXT J
        60 NEXT I
        70 PRINT TIME$
        80 END
        ```

    •   Use of DEFINT, DEFSNG, DEFDBL, and DEFSTR, rather than suffixing each variable name, can reduce the amount of storage your program takes, if the variable name appears many times in the program. It is also easier to key in variable names without suffixes.

    •   BASIC searches an internal table sequentially whenever a variable name is referenced. Therefore, a BASIC program's execution speed can be improved by defining the most frequently referenced variables first. This is also a convenient place to put a comment describing the variable's use.

        ```
        10 I%=0        'Index register
        20 X%=0        'work area
        ```

    •   Each line number uses at least 5 bytes. Therefore, if you need to conserve program space, pack multiple statements on a line. However, this can adversely affect readability of the resulting program.

    •   When issuing GOSUB to a subroutine, GOSUB to the first executable line in the subroutine, not to the REM statements that describe the subroutine's function.

    •   All remarks take both program space and time to execute. If you really have a performance problem, remove them.

7. To stop an LLIST, you must turn the printer off.

Publication Errata

1. Page 3-33 incorrectly describes the characters permitted in a DOS filename and extension. The correct list can be found on page 2-8 of the IBM Disk Operating System manual.

2. On the bottom third of page 4-100, the IF-THEN-ELSE statement is incorrectly described as not allowing a colon between the THEN and ELSE clauses. A colon (:) can be coded immediately ahead of the ELSE statement, but it is not needed.

   Also, if an ELSE statement is improperly coded on a separate line after an IF-THEN statement, no error message is produced.

3. Pages 4-65 and 4-246 indicate that VARPTR returns the offset into the current segment (defined by DEF SEG). Actually, the value returned by VARPTR is the offset into BASIC's DS (the default segment), regardless of the setting of DEF SEG.

   Delete the word "VARPTR" from the "Purpose" paragraph on page 4-65, and add note that the second sentence in the first paragraph under "Remarks" on page 4-247 is incorrect.

4. Page 4-180 indicates that notes A-G with optional $\#$, +, or - after each note is permitted. It should point out that notes B$\#$, C-, E$\#$, and F- result in an "Illegal function call" message because this is not correct musical notation.

5. The BASIC manual description of the VAL function on page 4-246 indicates that VAL will return 0 if the argument string contains non-numeric characters.

       PRINT VAL('5junk')

   will print 5, not 0.

   If the string has leading numeric characters, followed by non-numeric characters, VAL will return the value of the leading numeric characters and ignore the remainder of the string.

6. The manual does not indicate on page 4-234 that the STR$ function returns a leading blank with positive numbers. This is the place reserved for the plus sign.

7. Page 4-91 of the BASIC manual says:

       You might want to use FRE(" ") periodically to get shorter delays for each housecleaning.

   The time required to do a housecleaning is not significantly affected by the frequency of housecleaning, therefore you should not follow the suggestion above unless you need to control when the pauses occur.

IBM MACRO ASSEMBLER V1.00

Tips

1. To direct the list output of the Macro Assembler to the printer, rather than to a listing file, direct the listing to file USER and use the CTRL-PRTSC function. This will cause the printer to receive a copy of everything sent to the display. The tabs will be correctly expanded this way.

    Here is a sample BATch file that shows this technique:

    ```
    REM Assemble program with Macro Assembler
    PAUSE Press CTRL-PRTSC for listing, then ENTER
    B:
    A:MODE LPT1:132
    A:MASM %1,,USER,;
    A:
    REM CTRL-BREAK to cancel CREF, otherwise ENTER
    B:
    A:CREF %1,USER
    ERASE %1.CRF
    A:
    ```

2. Be careful of syntax problems that can lead to unexpected results. For example,

    ```
    MOV AX,BX        ;moves contents of BX register
                     ;  to AX register

    MOV AX,[BX]      ;moves word addressed by BX
                     ;  into AX

    MOV AX,[BX]+4    ;moves word 4 bytes offset
                     ;  from register BX into AX

    MOV AX,BX+4      ;moves contents of register
                     ;  number 7 (DI register)
                     ;  into register AX

    MOV AX,DI        ;generates the same object code as above
    ```

3. Page 5-33 of the Macro Assembler manual describes the PUBLIC pseudo operation. If you wish to declare a PUBLIC symbol that is a number, declare it outside of all segments. The linker can't match up the corresponding EXTRN symbol of type ABS unless the corresponding declaration, "PUBLIC symbol", is defined outside of all segments.

Publication Errata

1. Page 5-26 indicates nested INCLUDEs are not permitted and an error message will result.

    Nested INCLUDEs are in fact permitted. The level of nesting permitted is limited only by the amount of memory available.

2. Page 5-75 incorrectly describes the syntax of the PAGE pseudo operation. Items [operand-1] and [operand-2] must be separated by a comma.

   For example:

   "PAGE 56,132" sets page length to 56 and line length to 132.

   "PAGE ,132" sets line length to 132 and leaves the page length at its default value.

   Never specify PAGE 66, which is the default length. Only specify the first parameter (page length) when overriding the default.

IBM PASCAL COMPILER V1.00

Tips

1. Pascal compilation can be greatly assisted by use of predefined BATch and Linker Automatic Response files.

   - The following file, PASCAL.BAT, should be placed on the B: diskette, with the Pascal source program:

     ```
     REM Compile and Link Pascal source program %1.PAS
     REM Code listing file is %2
     CHKDSK B:
     PAUSE Insert PAS1 in Drive A:
     A:PAS1 %1,,,%2;
     PAUSE Insert PAS2 in Drive A: or CTRL-BREAK to cancel
     A:PAS2
     PAUSE Insert PASCAL.LIB in Drive A: or CTRL-BREAK to cancel
     ERASE %1.EXE
     ERASE %1.MAP
     RENAME %1.OBJ PASCTEMP.OBJ
     A:LINK A:PASCAL.ARF
     RENAME PASCTEMP.OBJ %1.OBJ
     RENAME PASCTEMP.EXE %1.EXE
     RENAME PASCTEMP.MAP %1.MAP
     ```

   - File PASCAL.ARF should be placed on the A: diskette drive, PASCAL.LIB, with the PASCAL library and LINK.EXE:

     ```
     PASCTEMP
     PASCTEMP
     PASCTEMP.MAP
     A:PASCAL.LIB
     N
     N
     0
     Y
     N
     ```

To use this BATch file, place the diskette containing the Pascal source pro-
gram (in our sample, SAMPLE.PAS) in the B: diskette drive, and the PAS1 disk-
ette in drive A. Then type:

    PASCAL sample NUL

if a code listing (machine object code) is not desired, or

    PASCAL sample sample.cod

if a code listing is desired.

VISICALC V1.00

Tips

1. VisiCalc has been updated - Version 1.10 is now available. It is extremely important that VisiCalc users send the VisiCalc Warranty Registration Card to Personal Software in order to be eligible for the updated version. There will be no charge to registered purchasers of IBM VisiCalc Version 1.00.

Publication Errata

1. Page 2-19, second paragraph: The default drive is always A unless explicitly specified.

2. Pages 2-91 and 3-33 describe the @COUNT function as the number of non-blank entries in the list. @COUNT returns the number of non-blank value fields in a list. Labels are not counted by the @COUNT function.

3. Page B-8 describes the End of Data Record as "BOT". It should read "EOD".

4. Page 3-106: There is no create catalog command.

5. Page B-10: Line 100 of the BASIC program should read:

   100 DIM WORKSHEET$(50,50)

ASYNCHRONOUS COMMUNICATIONS SUPPORT V1.00

Tips

1. When DOWNLOADing a file from VM/370, the left brace character can be improperly transmitted. To circumvent the problem, which normally occurs with Pascal source programs, use the (* *) comment notation.

    We've narrowed this problem to the parameters used to generate the IBM 3705 Emulation Program (EP). Similar problems have occurred with the IBM 3101 Display Terminal. Here is what the IBM 3101 Display Terminal Description manual (GA18-2033) says:

    > If the 3101 is attached via 3704/3705 that is running EP 3.0, the 3101 must be operated in even-parity mode for the 95 character set support. If operated in any other parity mode, the left brace character (ASCII 7/11) or the language dependent graphic character at position 7/11 in ISO code table in the outbound data stream is lost.

    Although the problem usually occurs on VM, the problem is not VM, it is EP. It will occur both any TP subsystem that uses EP if the EP is genned as described above. This means it will occur under VM, MVT/TSO, SVS/TSO, and MVS/TSO/TCAM if EP is being used. It will not occur under MVS/TSO/VTAM.

2. If a file is uploaded on one type of system (VM or TSO), moved over VNET to another type of system, and downloaded there, the downloaded file can be different from the original. The problem is that VM does not follow the IBM standard for the translation of EBCDIC to ASCII. The simplest circumvention is to issue the following commands on TSO (it's easier to do the translation on TSO) prior to any upload or download:

    ```
    PROFILE CHAR(BS)
    TERMINAL LINESIZE(255) NOCHAR
    TERMINAL CHAR((X'45',X'5A'),(X'4A',X'AD'),          X
            (X'5A',X'BD'),(X'6A',X'4F'))
    ```

EASYWRITER V1.00

Tips

1. When initially starting your text, or when adding to the end of your text, you need not use insert mode. However, once text has been created and you desire to make corrections within the body of the text, you should use insert mode.

2. If you are replacing information on a character-by-character basis, you can simply type over the existing text and not use the insert mode. If you want to enter additional characters on a line, you must use the insert mode! Failure to do so can mean data loss and recovery problems.

3. When adding several words or lines of text, it is recommended that you create blank lines as needed (using the F3 key), enter insert mode, and type in the information.

4. Pressing the enter key has two functions:

   - Exit the insert mode (normal cursor comes back into view).
   - Denote the end of a paragraph (a music symbol appears).

5. The align function will align paragraphs to the margins and justification you have specified. It will arrange all the text in your paragraph so that minimum spacing exists between words. This can present problems if you have done some special arrangement of your text, i.e., indentations, columns, etc. To protect your special arrangement, you have two options:

   - Treat each of your special lines as paragraphs.
   - Use alignment protection markers (insert,F9,return,return) above and below the areas that you do not want disturbed by the align operation. Note that alignment markers cannot be the first entry in your text file.

6. When first starting your text, leave some blank lines at the top for future imbedded commands. The easiest way to do this is to press the return key several times when you start with your blank edit screen.

UCSD P-SYSTEM V1.00

Tips

1. UCSD p-System program migration:

    IBM offers two compilers for the UCSD p-System, FORTRAN and Pascal, which compile source code down to an intermediate "p-code" format which runs under a p-machine emulator. This code is portable between systems running version IV of the p-System. A program must be written to exchange the p-code between computers via the Asynchronous Communications Adapter.

    The p-System also provides a Native Code Generator which converts p-code into machine-specific code for improved performance. This format cannot be exchanged between unlike systems.

    An 8086/87/88 Macro Assembler is also included in version IV. Since the Assembler is processor-dependent (8088, 8085, Z80, etc.), only programs written for the same processor, regardless of p-System version, may be exchanged.

    Programs written for earlier (versions II, III) p-Systems may be sent to the IBM Personal Computer p-System only in their original source format. Once exchanged, they must be recompiled down to p-code (or native code) on version IV.

    While p-System source code may be sent to non-p-System computers, attention must be given to differences in syntax. The documentation for the UCSD p-System should be consulted for details.

IBM CP/M-86 V1.00

Tips

1. CP/M-80 to CP/M-86 migration:

   The purchase of CP/M-86 does not automatically provide support for existing CP/M-80 application programs running on 8-bit CPUs. Once the data and program files have been converted to the diskette format used by the IBM Personal Computer, and machine-specific code is changed, CP/M-86 programs that run on a non-IBM 16-bit processor will run on an IBM Personal Computer.

   The design philosophy of CP/M-86 follows that of CP/M-80 for the 8080, 8085, and Z-80 microprocessors, with additional facilities to account for the increased address space of the 8086 or 8088 processors. Utility programs, such as ED, PIP, and STAT, operate in the same manner as their CP/M-80 counterparts, while ASM and DDT provide the basic tools for assembly language development.

   Application software running on CP/M-80 systems today must be migrated, sometimes modified, and always recompiled in order to run under CP/M-86 on the IBM Personal Computer. First, the program source code must be transferred between systems. Since source code is usually available only to the original programmer, and is not distributed to users, a conversion must be performed by the programmer. This may be done by establishing a communications "link" between two computers (using the Asynchronous Communications Adapter on the IBM Personal Computer), and transferring the source code, line by line.

   Once the source file is present on a CP/M-86 diskette, it must be recompiled. The IBM Personal Computer version of CP/M-86 includes an assembler but no language compilers. A program written using the CP/M-80 assembler (designed for an 8-bit processor) must be modified before it is ready for the CP/M-86 (16-bit) version. This must be done by the programmer, by hand, or by using a translation program written for that purpose. Machine-specific code (ROM or low RAM addressing, I/O ports, etc.) must always be changed.

   Conversion of a program already running on another (non-IBM) CP/M-86 system is much easier. In this case the object form of the program may be transferred between computers. Since diskette formats are usually incompatible, a communications link is still the most likely means of performing the transfer. The communications programs, designed to handle only source (ASCII) data, may have to be modified to permit the sending and receiving of the object (binary) data. Once this is accomplished, the application program should be ready to run. Machine-specific code is always an exception, and must be changed in its source form, and then reassembled or recompiled.

IBM PERSONAL COMPUTER SOFTWARE PRODUCT PREREQUISITES

ACCOUNTS PAYABLE V1.00, BY PEACHTREE SOFTWARE, INC.

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - No support in product.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Required.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

ACCOUNTS RECEIVABLE V1.00, BY PEACHTREE SOFTWARE, INC.

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - No support in product.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Required.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

ARITHMETIC GAMES SET 1 V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - No support in product.
  - Color/Graphics Adapter, 80 character text - No support in product.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Required.
- Printer - No support in product.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

ARITHMETIC GAMES SET 2 V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - No support in product.
  - Color/Graphics Adapter, 80 character text - No support in product.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Required.
- Printer - No support in product.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

ASYNCHRONOUS COMMUNICATIONS SUPPORT V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - Required.
- Game Control Adapter - No support in product.

BASIC V1.00

- Minimum memory - 16KB.
  - Cassette BASIC requires a minimum of 16KB.
  - Diskette BASIC requires a minimum of 32KB.
- Minimum diskette drives - 1 (for Diskette BASIC).
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Supported.
- Printer - Supported.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - Supported.

IBM PERSONAL COMPUTER MACRO ASSEMBLER V1.00

- Minimum memory - 96KB.
  - A subset without macro capability may be run in 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Supported.
- Printer - Preferred.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - Supported.

IBM PERSONAL COMPUTER PASCAL COMPILER V1.00

- Minimum memory - 128KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Preferred.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

INVENTORY CONTROL V1.00, BY PEACHTREE SOFTWARE, INC.

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - No support in product.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Required.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

GENERAL LEDGER V1.00, BY PEACHTREE SOFTWARE, INC.

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - No support in product.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Required.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

IBM PERSONAL COMPUTER COBOL COMPILER V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Preferred.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - No support in product.

IBM PERSONAL COMPUTER FORTRAN COMPILER V1.00

- Minimum memory - 128KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Preferred.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

EASYWRITER V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - No support in product.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Preferred.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - No support in product.

FACT TRACK V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - No support in product.
  - Color/Graphics Adapter, 80 character text - No support in product.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Required.
- Printer - No support in product.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

GENERAL ACCOUNTING V1.00, BY BPI SYSTEMS, INC.

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Required.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

CP/M-86 OPERATING SYSTEM V1.00

- Minimum memory - 32KB.
  - The DDT86 debugging program requires 48KB.
  - The ASM86 assembler requires 64KB.
- Minimum diskette drives - 1.
- Operating system - CP/M-86.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - No support in product.

IBM DOS AND BASIC LANGUAGE EXTENSIONS V1.00

- Minimum memory - 32KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - No support in product.

DOW JONES REPORTER V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - Required.
- Game Control Adapter - No support in product.

MICROSOFT ADVENTURE V1.00

- Minimum memory - 32KB.
- Minimum diskette drives - 1.
- Operating system - None required.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - No support in product.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - No support in product.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

TIME MANAGER V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

TYPING TUTOR V1.00

- Minimum memory - 48KB.
  - The cassette version requires 32KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - No support in product.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - No support in product.
- Game Control Adapter - No support in product.

UCSD P-SYSTEM V1.00

- Minimum memory - 64KB.
- Minimum diskette drives - 2.
- Operating system - p-System.
- Displays:
  - IBM Monochrome Display - Preferred.
  - Color/Graphics Adapter, 80 character text - Preferred.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - Supported.
  - Color/Graphics Adapter, APA graphics - Supported.
- Printer - Supported.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - Supported.

VISICALC V1.00, V1.10

- Minimum memory - 64KB.
- Minimum diskette drives - 1.
- Operating system - DOS.
- Displays:
  - IBM Monochrome Display - Supported.
  - Color/Graphics Adapter, 80 character text - Supported.
  - Color/Graphics Adapter, 40 character text - Supported.
  - Color/Graphics Adapter, color - No support in product.
  - Color/Graphics Adapter, APA graphics - No support in product.
- Printer - Supported.
- Asynchronous Communications Adapter - Supported.
- Game Control Adapter - No support in product.

RECENT PRODUCT ANNOUNCEMENTS

ANNOUNCEMENTS MADE DECEMBER 1, 1981

The following announcements were made December 1, 1981 and are now available in most IBM authorized dealers.

IBM MACRO ASSEMBLER

The Macro Assembler operates with the IBM Personal Computer Disk Operating System (DOS). As on larger computers, programs written in Assembler language are assembled into executable machine code that may run several times faster than equivalent high level language routines. Additionally, the Assembler permits the programmer to design detailed program functions that are often impossible in a higher level language. Assembler produced programs, called object files, may be called from IBM Personal Computer BASIC, Pascal, and FORTRAN programs.

Highlights:

* Relocatable object modules
* Definition of Macros to generate commonly used instruction sequences
* Two versions: 96KB Macro and 64KB subset
* Listing provided for each module:
    - Machine language of each instruction
    - Start and end addresses
    - Name, length, class of each segment
    - Public and local names and their attributes
    - Line numbers
    - Alphabetic cross reference of variables
* Compatible with IBM Personal Computer BASIC, Pascal, and FORTRAN programs

IBM FORTRAN COMPILER

The FORTRAN Compiler operates with the IBM Personal Computer Disk Operating System (DOS). Programs may be written in a version of FORTRAN-77. These programs are then compiled to native object code for execution on the IBM Personal Computer.

Highlights:

* Standard ANSI X3.9-1978 (Subset Level)
* Features from ANSI X3.9-1978 (Full Level)
* Enhancements to ease conversion of FORTRAN-66 programs
* Object modules may be combined with subroutines written in IBM Personal Computer Pascal or Macro Assembler
* Two pass compilations
* Separate compilation of large program segments
* Compiler metacommands
* Edit control

TYPING TUTOR

Typing Tutor is an interactive typing instruction and drill program designed to run on the IBM Personal Computer. Typing Tutor provides immediate and summary feedback on the keying errors the user has made and on the typing speed achieved in words per minute. Beginning typists can start with easier keys and work up to harder keys as their typing skills improve.

Highlights:

* Diskette and cassette versions
* Menu driven
* Adjusts to user's skill level
* Drills for learning keyboard
* Maintains list of keys learned
* Practice paragraphs for improving speed and accuracy
* Password protection for teacher mode
* Entry of custom paragraphs
* Stores up to 39 student records (diskette version)
* Monitors keyboard 100 times per second

UCSD P-SYSTEM

The UCSD p-System consists of an operating system and either one or two languages for the IBM Personal Computer. The p-System provides the programmer with an extended Version IV.0 of the operating system, including a full screen editor, program debugger, graphics support, an assembler, file handler, native code generator, and a print spooler. The system is available with either UCSD Pascal, FORTRAN-77, or both languages.

Highlights:

* The p-System provides an excellent environment for program development.
* The language compilers generate p-code, a portable machine-independent format.
* A Native Code Generator may be used to convert p-code to efficient machine level code for better performance.
* Machine level reference and tutorial documentation are provided.
* FORTRAN-77 is ANSI-1977 level, supporting a wide range of engineering and scientific applications.
* The p-System provides extensions to UCSD Pascal for development and commercial programming.
* Structured programming produces programs that are more efficient and easier to maintain.

FACT TRACK

The FACT TRACK program is designed to help students master the arithmetic facts: addition, subtraction, multiplication, and division. Because the program is organized by levels of difficulty, it can be used by young children, older children, and adults who need practice.

All computational skills depend on the arithmetic facts: the sums and products of one digit numbers and the corresponding subtraction and division combinations (for example, 6 + 8 = 14 and 14 - 8 = 6).

Mastery of the arithmetic facts has two parts: (1) knowledge of the correct answer and (2) rapid rate of response. The final goal is instantaneous recall of the answers to all 390 facts.

Highlights:

- 390 arithmetic facts stored on diskette
- Facts displayed in random order
- Students enter answers from the keyboard or write them on paper
- Selectable methods of timing
- Set performance goals
- Race format -- student races against a rocket

ARITHMETIC GAMES

- **Arithmetic Games Set 1** consists of two educational games: BEANO and ROCKETS.

  BEANO can be played by one or two players. The object of the game is to fill up a row, column, or diagonal on a card with 25 numbered squares by matching the numbers from a roll of the dice.

  ROCKETS can also be played by one person against the computer or by two people. Players use the roll of the dice to move their rockets on a grid of 225 squares and to fire at their opponent's rocket.

- **Arithmetic Games Set 2** consists of two educational games: DISCOVERY MACHINE and NUMBER CHASE.

  DISCOVERY MACHINE can be played by one or two players. It is a number discovering game in which the computer generates an input number and displays it upon the screen. The computer then generates an output number, which is derived from one of six special rules. It then generates another input number, and the player tries to discover what the resulting output number will be. In one game, the rule being used by the computer may be: multiply the input number by 3, then add 2. If the player can guess the output number correctly three times in succession, then the player wins. When two play, each tries to discover a different rule.

  NUMBER CHASE can be played by one or two players. The object of the game is to guess correctly a secret number the computer has chosen. The computer gives clues about the number based upon a player's response. For example, the computer indicates how many digits of the player's response are in the correct place, how many are correct but not in the correct place, and the sum (or product) of the digits not guessed.

  In the one-player version of NUMBER CHASE, the player chooses a number for the computer to guess, then both the player and the computer try to guess each other's secret number. In the two-player game, each player is assigned a unique secret number to be guessed. At the beginning of each game, a player can set the number of tries allowed (up to 15). The computer will allow a player to ask for hints, beginning with the fourth turn.

Highlights:

- One or two players
- Three levels of difficulty
- Computer always plays at hardest level of difficulty

GENERAL ACCOUNTING, BY BPI SYSTEMS, INC.

General Accounting by BPI Systems, Inc. is a complete accounting system for a small business or a professional person. All bookkeeping entries are made into customized journals that eliminate much of the normal key entry effort. General Accounting, by BPI Systems, Inc. combines the capabilities normally found in general ledger packages (i.e., balance sheet and income statements) with the capability to generate accounts payable, accounts receivable, and payroll registers, as well as the ability to print checks. The cash sales journal has been designed to speed up the entry of daily cash sales. The system allows the operator to execute multiple requests for reports with a single entry. By automatically completing each task in sequence, the program eliminates many potential operator errors.

Highlights:

- Chart of accounts
- Up to ten separate departments or branches
- Streamlined data entry through six specialized journals
- All reports can be displayed or printed
- 40 or 80 column monitor support
- Check register and invoice register
- Cash sales journal, merchandise purchased journal, and cash receipts journal
- Ledgers for accounts receivable, accounts payable, and payroll
- Menu queues allow multiple requests with a single entry
- Check writing capability
- Sample data and tutorial example provide fast start up and learning
- Optional backup of data at any time

ANNOUNCEMENTS MADE APRIL 5, 1982

These products were announced on Monday, April 5, 1982 and were available at most IBM authorized dealers that day.

INVENTORY CONTROL, BY PEACHTREE SOFTWARE, INC.

This product is designed to assist a small business to improve its merchandise control, reduce inventory investment, and improve customer service and response. It can be used alone or with the previously announced Peachtree General Ledger, Accounts Receivable, and Accounts Payable software products.

A record of each inventory item may contain a department code, the current inventory balance, cost and vendor information, three pricing levels for sales, reorder levels, and historical sales information.

Inventory Control requires two diskette drives, an 80 character display, a printer, 64KB of user memory, and the IBM Personal Computer Disk Operating System.

DOW JONES REPORTER

This product enables the IBM Personal Computer user to gain access to the following:

- Headlines and news stories from the pages of the Wall Street Journal, Barrons, and the Dow Jones News Wire Service.
- Current day market quotes for stocks, bonds, options, and U. S. Treasury issues from the Exchanges.
- Historical stock quotes for the most recent 12 days or on a monthly or quarterly basis.
- Company profiles and S.E.C. form 10K extracts on over 6,000 companies, and detailed financial statistics on 3,200 companies and 180 industries.

The Dow Jones Reporter requires one diskette drive, either a 40 or 80 column display, 64KB of user memory, an Asynchronous Communications Adapter, and the IBM Personal Computer Disk Operating System. Users are responsible for obtaining the necessary modems and cables for attaching the IBM Personal Computer to their communications equipment.

TIME MANAGER

This product can be a personal calendar and a "to-do" list. It also has totalling and accounting capabilities.

- As a personal calendar, it can keep track of daily appointments, deadlines, expenses, purchases, birthdays, and other special dates. Appointments are automatically sorted and displayed in chronological order.
- As a "to-do" list, it can remind the user of important commitments. Memos, details, and appointments may be recorded and automatically organized by priority. High-priority items scheduled to be completed today, but not completed today, will head the list tomorrow.

- Totalling and accounting features provide accurate totals for income received, hours worked, money and time expended. Separate account totals for a day, a month, or any time period within the current year may be obtained. For example, with a few keystrokes a user could obtain the year-to-date totals for all business expenses charged to credit cards or paid by cash or check.

Time Manager requires one diskette drive, either a 40 or 80 column display, 64KB of user memory, and the IBM Personal Computer Disk Operating System.

IBM PERSONAL COMPUTER COBOL COMPILER

This product enables the user to write programs in a version of the Standard ANSI X3.23 1974 (Low-Intermediate level of Federal Standard COBOL). These programs are then translated to an interpretive object code for use on the IBM Personal Computer.

Among the capabilities provided are: color, ACCEPT and DISPLAY extensions for formatted screen handling, CALL or CHAIN to other programs, ability to combine object modules with those from the IBM Personal Computer Macro Assembler, and segmentation -- the ability to run programs larger than the user memory.

The IBM Personal Computer COBOL Compiler requires a two diskette drive system, and an 80 column display is recommended. Although programs written with the compiler may be executed on a smaller system, 64KB of user memory is required for compiling. The IBM Personal Computer Disk Operating System provides the I/O routines and the text editor (EDLIN) necessary for writing programs.

CP/M-86 OPERATING SYSTEM

This product is a single-user operating system for the IBM Personal Computer. It manages information stored on diskettes and also provides an interface between a program and the IBM Personal Computer. Up to 2 physical drives or 4 logical drives are supported by utility programs that perform the following tasks: formatting diskettes, copying files to other devices, and providing data about diskette files. Also supported by CP/M-86 are the IBM 80 CPS Matrix Printer, the Asynchronous Communications Adapter, the IBM Monochrome Display, and the Color/Graphics Monitor Adapter, including Light Pen. Dynamic memory management controls the allocation of memory and assigns specific memory areas to application programs. Program development utilities include an editor, an assembler, a debugging program, and a program to produce command files.

CP/M-86 requires at least one diskette drive and 32KB of user memory. The DDT86 debugger requires 48KB of user memory, while the ASM86 assembler requires 64KB of user memory. CP/M-86 is not compatible with either the IBM Personal Computer Disk Operating System or the UCSD p-System. Existing CP/M-86 programs running on other computers must be converted to run on the IBM Personal Computer. This is normally performed by the program author as part of the development activity.

APPENDIX A. IBM PERSONAL COMPUTER EMPLOYEE PURCHASE UPDATE

DELIVERY DATE CLARIFICATION

The following information should be helpful in understanding shipment and delivery schedules for employee orders for the IBM Personal Computer.

Once it has been verified that your complete order has been shipped from IBM, you will be mailed the Employee Payment Agreement/Retail Installation Contract -- usually in the week following shipment.

Employee orders are bulk-shipped -- generally on the last Friday of the month -- to dealer distribution centers (for example, ComputerLand headquarters in California, or the IBM Product Center Distribution Center in Kentucky). Once there, orders are prepared and shipped to individual pick-up locations. On arrival, dealers set up and test the hardware prior to contacting employees to arrange for pick-up and orientation.

The shipping, distribution, and set-up process usually takes from 40 to 50 calendar days. For example, a scheduled shipment date in April implies a mid-June delivery date. If a store or Product Center receives a significant number of employee systems at one time, it may take several weeks to set up, test, and deliver orders to all employees.

Please remember: You must be an IBM employee to pick up your order under the provisions of the Employee Purchase Plan. Be sure to take your IBM id card or badge.

ABOUT CHANGING YOUR ORDER

Changes to your order can now be accepted, provided an Employee Order Change form is received in Boca Raton at least 60 days prior to the first day of the scheduled shipment month. For example, changes in July shipments must be received by May 1, 1982.

Employee Order Change forms may be obtained by calling the Employee Sales Response Line at the number below.

Software Offerings: Employees with IBM Personal Computers on order may add the following software packages to their order by following the procedure and schedule outlined above:

- Typing Tutor (diskette version)
- Fact Track
- Arithmetic Games Set 1
- Arithmetic Games Set 2
- IBM Macro Assembler
- General Accounting, by BPI Systems, Inc.
- IBM FORTRAN Compiler
- UCSD p-System with UCSD PASCAL (includes compiler)
- UCSD p-System with FORTRAN-77 (includes compiler)
- UCSD PASCAL Compiler
- UCSD FORTRAN Compiler

And of course employees may also add the recently announced software offerings (subject to the lead time above):

* Inventory Control, by Peachtree Software, Inc.
* Dow Jones Reporter
* Time Manager
* IBM Personal Computer COBOL Compiler
* CP/M-86 Operating System

Employee Transfers: Employees who are changing locations may request a new pick-up location, provided the request is received in writing at least 30 days prior to the first day of the scheduled shipment month.

In addition to your serial number, order number, and shipment date, requests must also include the new pick-up location code, new home or office address and business phone, and any necessary changes to personnel and payroll information (division, location, changes in pay frequency for payroll deduction). Requests should be mailed to the Employee Sales department at the address below.

WHERE TO WRITE OR CALL

IBM Personal Computer Employee Sales
P. O. Box 1328-E
Boca Raton FL 33432

IBM Personal Computer Employee Sales Response Line
Tie Line: 8-443-6075
Outside: 305-998-6075

Cancellations: We would appreciate orders being canceled in writing and the cancellations received by the Employee Sales department at least 60 days prior to the first day of the scheduled shipment month.

Changes to Ship Dates: Unfortunately, requests to improve or defer individual ship dates cannot be accommodated.

POST NOVEMBER 1 ORDER SCHEDULING

In late April 1982, shipment schedules will be determined for valid orders submitted after November 1, 1981, and received by March 31, 1982. You will receive notification of your scheduled shipment date by mail after the orders are scheduled.

DEALER SUPPORT SERVICES FOR EMPLOYEES

The dealer network makes it possible to have an IBM Personal Computer Employee Purchase Plan since the PC Group in Boca Raton has no distrubution center for end users. Each dealer has the option of participating in the employee program.

The services provided by the dealer are:

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- Configuration assistance if requested.
- Handling
- Transportation
- System set-up and check-out
- Operational assistance
- Warranty service

While we believe that the IBM Personal Computer sets new standards for product quality, ease of use, and clarity of documentation, you may still have a requirement for post-delivery support. The dealer is the focal point for this support.

CONFIGURING FOR EASYWRITER

A reminder that EasyWriter requires a 64KB system, DOS (6024001), and printer supported by the IBM Personal Computer, PLUS one of the following:

- The IBM Monochrome Display (5151001) and Monochrome Display and Printer Adapter (1504900).
- A user-owned, high-resolution monitor which supports 80 columns, the IBM Color/Graphics Adapter (1504910), and the Printer Adapter (1505200).
- A user-owned, high-resolution monitor which supports 80 columns, the IBM Color/Graphics Adapter (1504910), and the Asynchronous Communications Adapter (1502074) for use with a serial printer.

A standard television set will not support EasyWriter.

Please also note that the IBM Monochrome Display will not support all-points-addressable graphics.

Please review your order, and if a change is required, follow the procedure outlined above for changing your order.

NEW MINIMUM 64KB SYSTEM UNIT

Beginning in April, IBM will no longer manufacture the IBM Personal Computer 48KB System Unit (5150013). Orders for this item and the 16KB Memory Expansion Kit (1501001) cannot be accepted after April 15, 1982. The replacement is the 64KB System Unit (5150014), which includes keyboard, diskette adapter, and 160KB diskette drive.

The employee price for the new system unit is $1,562.00, which is the sum of the employee price for the 48KB System Unit plus the 16KB Memory Expansion Kit.

Existing Orders: Existing orders for the 48KB System Unit will be filled; existing orders which also include the 16KB Memory Expansion Kit will automatically be filled with the new 64KB unit beginning with May shipments.

New Orders: Orders received after April 15, 1982 will automatically be changed to the 64KB System Unit (5150014), which will add $45.00 to the employee price. Orders for the 16KB Memory Expansion Kit will be deleted, since it will no longer be available through the employee plan.

PRICE LIST

This is the composite price list for IBM employees. The IBM Employee price applies to components purchased with a system unit.

Item Number	Product Description	IBM Employee Price
5150014	System Unit (64KB) w/keyboard, 160KB diskette drive, & Diskette Drive Adapter	1562
5151001	IBM Monochrome Display	227
5152001	IBM 80 CPS Matrix Printer	555
1501011	32KB Memory Expansion Option	212
1501012	64KB Memory Expansion Option	344
1501300	Game Control Adapter	39
1502074	Asynchronous Communications Adapter	96
1503800	5-1/4 inch 160KB Diskette Drive (second drive)	366
1504900	Monochrome Display and Printer Adapter	207
1504910	Color/Graphics Monitor Adapter	223
1505200	Printer Adapter	89
1525612	Printer Cable	37
1525614	Printer Stand	37
6024001	IBM DOS and BASIC Language Extensions	20
6024002	IBM Macro Assembler	50
6024004	VisiCalc	135
6024005	EasyWriter	91
6024006	Microsoft Adventure	18
6024007	Accounts Payable, by Peachtree Software, Inc.	300
6024008	General Ledger, by Peachtree Software, Inc.	300
6024009	Accounts Receivable, by Peachtree Software, Inc.	300
6024010	IBM Pascal Compiler	150
6024011	IBM COBOL Compiler	400
6024012	IBM FORTRAN Compiler	200
6024013	Typing Tutor (diskette version)	15
6024015	Inventory Control, by Peachtree Software, Inc.	300
6024016	UCSD p-System with UCSD Pascal	375
6024017	UCSD p-System with FORTRAN-77	375
6024019	Time Manager	60
6024023	FACT TRACK	55
6024024	Arithmetic Games Set 1	35
6024025	Arithmetic Games Set 2	35
6024026	General Accounting by BPI Systems, Inc.	240
6024031	DOW JONES Reporter	60
6024032	Asynchronous Communications Support	25
6024033	UCSD Pascal Compiler alone	105
6024034	UCSD FORTRAN-77 Compiler alone	105
6024035	CP/M-86 Operating System	140
6025005	Technical Reference Manual	21.50
6025072	Hardware Maintenance & Service (Manual and Advanced Diagnostic Diskette)	93