

Jr Newsletter

January, 1992

Is Big Brother Watching You? More Questions About Prodigy

Although the Prodigy service has been popular among PCjr owners, many questions have been raised about the service. At first the issues concerned increased rates and limits on use. When users tried to use the message center as a forum for complaints about the new policies, Prodigy made it clear that militant, public gripes about the program would not be allowed on-line.

The service did not want to provide a forum for its critics; but some members (and outsiders as well) felt Prodigy's refusal to post these messages was a denial of free speech. The controversy was reminiscent of Ben Franklin's comment: "The Freedom of the Press belongs to he who owns one."

Although the controversy largely disappeared from the on-line service, some angry people remained. Many independent local bulletin boards were happy to give the critics a chance to "sound off". Most of these boards are run by individuals or groups on a volunteer or non-profit basis, but a few charge fees and intend to operate at a profit.

A file called PRODIGY.NOT began making its appearance on computer bulletin boards across the country. It was recommended that users of the Prodigy service download and read the file.

The STAGE.DAT file: Sinister or Benign?

The file suggested readers look in their Prodigy directory for a file named STAGE.DAT. When readers did, they discovered segments of files from their disks in a file which was often

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PCjr Lives!



Should I Upgrade my PCjr... Or Buy Another Computer?

By Pat Calabria, PC Enterprises

Each year thousands of new PCjr users call us for the first time and ask us the same questions. Should I upgrade my PCjr or should I buy another computer? If I upgrade my PCjr, will I be able to run important software packages? Will it run Lotus? Will the PCjr run dBase? And will it run WordPerfect? The answer, of course, is yes!

The fact is that the PCjr uses the very same microprocessor and Disk Operating System (DOS) as the IBM PC and PC-XT. As a result, the PCjr can run just about any PC compatible program -- as long as the PCjr has been expanded to include any hardware that the program requires. Most programs written for PC Compatibles require at least 512K of memory. Consequently, additional memory is the first thing, and often the only thing, that most PCjr users need to run PC programs.

The second most important product that you could add is a second drive. While a second drive is not often required, it is usually purchased as a convenience to avoid constant diskette swapping. The drive you select may be a second floppy drive or a hard drive. Hard drives are preferred because they permit you to copy diskettes into the computer's permanent memory -- therefore storing your software inside your computer (instead of on floppy diskettes). And because computers access hard drives much faster than floppy drives, you'll see a night-and-day performance improvement when you run programs.

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Picking Junior's Brain

By John E. Wilson

The brains of your PCjr are in a silicon chip named the Intel 8088 microprocessor, and in this article we'll take a look at that microprocessor. We'll learn about buses and microcode, what clock rate is all about, and we'll see how the 8088 differs from the V20.

In the early days of main frame computers, when they occupied at least an entire room, computers had a subsystem called the central processing unit (CPU). The CPU was further divided into a control unit and an arithmetic-logic unit (ALU). The control unit had the task of stepping through a program; processing the instructions, placing and fetching memory data, and assigning work to other components of the computer. The ALU contained electronic circuits to perform basic arithmetic and simple AND/OR type logic operations.

In the early 1970's a semiconductor device was developed which could perform all of the functions of the CPU. What formerly required thousands of transistors and an immense amount of wire was all contained in a single chip. This device

was the microprocessor. The Intel Corporation invented the microprocessor and coined the name; but soon other companies, such as Motorola and Zilog, also began to produce them.

At first, microprocessors were not very powerful: the first one Intel developed was for a hand-held calculator. But in 1974 Intel introduced the 8080 which was used in many of the early personal computers. Four years later Intel came out with the 8086 and a year later the 8088. These two chips, especially the 8088, are probably used in more computers than any other microprocessor. The current crop of Intel microprocessors are more powerful than mainframe CPU's were just a dozen years ago. Table 1 is a list of most of Intel's microprocessors.

TABLE 1.

Intel Corporation Microprocessors

Chip	Year	Comments
8080	1974	Used in some early personal computers.
8086	1978	Used as recently as 1987 in IBM PS/2 computers.
8088	1979	Used in the IBM PC, XT and PCjr.
80186	1983	Never a popular chip. Used in the Tandy 2000.
80286	1983	First appeared in the IBM AT. Still used.
80386	1986	Still a very popular microprocessor.
80386SX	1988	A cheaper version of the 80386.
80486	1989	Current top of the line.
80486SX	1990	A cheaper version of the 80486.
80586	1992?	Future king of the microprocessors.

Semiconductor manufacturers assign numbers as names for their chips in much the same way that airplane manufacturers do for their airplanes. The numbers just indicate a family of chips. The 8080 had 8 bit registers and an 8 bit data path (we'll explain these shortly), so perhaps the digits selected for

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Questions and Answers

By Rene Waldron



EDITOR'S NOTE: jr Newsletter gets questions in the mail from PCjr owners every day. So many, in fact, that we apologize for not being able to answer them personally. This Questions and Answers column is our way of responding to the questions readers ask about their PCjrs. We can't answer all of the questions we receive, but we try to answer those that are either asked by several readers or those we feel will be of interest to PCjr owners in general. If you have a question that you do not see answered here, or elsewhere in this newsletter, please feel free to write to us at jr Newsletter, Box 163, Southbury, CT 06488.

Q. This has me baffled. I have a Racore drive and 640k and the config.sys is simply: device=ramdrive.sys/200 and device=pceextra.sys The autoexec.bat is:
keyfake"color 14,13,3"13"keyoff"13'
load "mpstocks""13"cls"13"run"13"

B:

copy mpstocks.bas c:

copy mpfiler c:

copy mpsale c:

copy mpfilex c:

copy %1 c:

c:

basic

All of the files are random access. Initially, the program (in BASIC) ran very well. After a while strange things began to happen. The only way I could get this program to run properly was to re-write the program using sequential file access and now everything is OK again. Can you give me a clue as to what's going on?

R.E. Swanson, Poway, CA

A. Here's how Sherlock works it out with the clues you've given: The ".BAS" extension of the above MPSTOCKS.BAS program indicates that it is one of the interpreted BASICs. File size is limited to 64k total size for an individual file and you have probably increased the size of the file(s) as time passed, and probably wrote over some other program space in RAM. Dig into your manual on BASIC to see the amount of RAM needed for program, string data, numeric data and stack space. Check these all out with the FRE() command in BASIC. Interpreters as you'll find out, are really limited!

Random access files are larger (longer?) than sequential files. There is ALWAYS some wasted space in random

access files. Remember, there are fields which may not always be filled or even used, but are padded to size and take up memory. Sequential files, on the other hand, use and write ONLY what RAM is actually needed and used by the program. You have discovered that you are at the limit of file size for this program. If you continue to add records, even sequential, you will soon run into the same problem.

The long term solution? The one given so many times before in this column for other BASIC problems... Change to one of the BASIC Compilers or acquire a copy of QBasic which is supplied with DOS 5.0. All of these will have much larger limits, in some cases up to the maximum RAM in your system. The new QBasic will run on some earlier versions of DOS so if you have a problem with 5.0 on your jr. just use QBasic and its affiliated files such as the .hlp and editor files to take advantage of the wonderful improvements it contains.

You could also get the Book/Disk combination called "Learn BASIC Now" a Microsoft Press publication available at B. Dalton and Waldenbooks for about \$35 to \$39. The included disk is a limited version of QuickBASIC 4.5 except that it will NOT compile and link to make .EXE programs, but it WILL run BASIC programs on any version of DOS. This version may seem like a clone of QBasic but do not confuse the two even though they are close relatives. Your Jr Cartridge BASIC (with adjusted SCREEN statements if graphics modes are used), GWBASIC or IBM BASICA interpreted programs can be used as is without a hitch with both of the above "Q" versions above.

There is even a nice little BASIC program included to remove the unnecessary line numbers if you choose to do so. The numbers which are needed for GOTO, GOSUB, RETURN etc. targets are left in so the program runs properly after conversion. The program is called REMLINE.BAS, what else?

You'll love writing programs using the "Q" editors with features such as de-buggers, instant help screens and more.

Q. Out of curiosity I bought the cable which attaches the jr to a cassette recorder. There was no information with it. Even the Tech. Ref. Manual only mentions that it is controlled "through software." Is there any way to use this thing?

P. Bonday, Maywood, NJ

A. If you do any Basic compiling, C, MASM or Machine language, here's the scoop: (assuming you have plugged

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Questions and Answers

(Continued from page 3)

in the jacks as per the "installation" directions which come with the cable)

The Cassette Service I/O BIOS Function for the jr is INT 15H (21 decimal) and prepare with the following:

set AH to 0 to turn cassette motor ON

set AH to 1 to turn cassette motor OFF

set AH to 2 to READ data FROM the tape (get 256 byte blocks)

set AH to 3 to WRITE data TO the tape (put 256 byte blocks)
CX is number of bytes to be read/written (does not have to be a multiple of 256)

ES:BS points to memory where data is to be read/written

DX will contain actual number of bytes at end of operation (the blocks are padded out to 256)

If there is some kind of error AH has the status.

(1) for CRC,

(2) for lost or scrambled data and

(3) for no data found.

For other programmers, the best place to look is in an early PC BASICA manual or the jr's Cartridge BASIC manual. Don't expect to find any reference to the connecting cable or cassette recorder commands in any recent MS-DOS GWBASIC versions or BASIC for the PC-AT or later. Cartridge BASIC, however, does have some explicit directions about using the cassette recorder as an input-output storage device, but it will be kinda slo-o-ow. The commands you want to hunt for in the BASIC manual are: MOTOR (for ON or OFF), OPEN "CAS1:" (for input, read, output, write etc. much like a disk) AS #1 and so on.

Read the information carefully, there are some differences from disk drive operations. You'll not only have to rewind the tape by hand (no "reverse" command) but you'll appreciate the real meaning of the word "sequential" as the tape MUST be read from the beginning to the record you want EVERY time, unless you load the whole file in with one for-next loop. Forget random access, unless you load the entire file into memory first! The same goes for writing back to the tape. Still, it might be fun to see how the old fashioned way works once again. You might want to try backing up a disk or two to "tape" as an experiment! Let it run overnight if necessary...

Q. I have a print spooler called QSPOOL1.SYS which came with my QUADMASTER ver 1.03 1985. If I use this spooler my printer will print the text with randomly injected and doubled characters. The problem shows up in Q&A Write, Leading Edge, Twin, Sideways and Design Cad. Any help would be greatly

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Reader Feedback



Help Needed With On-Line Bible

Thank you so much for your newsletter and sticking with the PCjr. My subscription ran out in April, and have I ever missed it. Enclosed is a check to renew my subscription and to order two disks from your Software Store.

My father gave me my Jr. to buy a different brand. (He misses the Jr.) My second 5 1/4" - 360K drive is a Legacy. 736K via Captain & Cadet (Tecmar) sidecars and the 192 internal card. I have the Tandy mod & Pb2 mod done by PC Enterprises.

I have a question for you. I picked up a shareware program called **On-Line-Bible**. It says it will run on 2 drives, but it locks up when I run the go.bat. When I enter the Bible.exe command, it reads, pauses, reads again, then takes me back to Dos and gives me a message:

```
End of file (0),
File:SYSWORK=SCREEN.OPT;
Traceback:SP=0DD7,F3AA,7B0C,2602,FCDB.
```

```
My Config.Sys file reads:
DEVICE = JRCONFIG.DSK -D2 -T3 -G893
DEVICE = PCJRXTRA.SYS
FILES = 20
BUFFERS = 20
```

From the doc file it looks like a good program. I have tried different boot configurations but can't get it to work. A friend of mine had no problem on his 486. Help! Thank you

Tim St. John, Fond du Lac, WI

Editor's Note: We have no information on this program, but include the letter here, in the hope that some reader may be able to supply an answer.

Reader Wants Use a Kran Controller Card with a RIM Hard Drive System.

I have a technical question. I have a RIM hard drive system from Paul Rau. The system uses a Shugart 1610-4 controller card. The controller has gone bad but I was able to reformat my 29 MEG hard drive using a 3 1/2 Konan controller card (a Xebec 1410 clone).

However, the device driver (SCSIJRF.D.SYS) doesn't match the controller card. Do you know of anyone who has modified the device driver to cause it to work with the Xebec 1410? A Steve Monteith left a message on Paul Rau's bulletin

board 15-Nov-90 stating he had solved the problem but did not specify what he did other than to say that he used debug to modify a couple of areas.

Finally, is there any modification needed to use an IBM 128K sidecar to increase memory to 736K? I have a 512 One Card from Legacy Technology.

Glenn Johnson, Modesto, CA

Editor's Note: Perhaps a phone call to Paul Rau, asking for information on the question, would help. If he has no answers on the technical question, perhaps he might be able to track down the person who placed the message on his board. Clearly you aren't the first person to face the problem. If any of our readers can supply information, we will be pleased to pass it on.

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Art & Music

JR MUSIC MACHINE. If you want to write and play music on your PCjr, this program allows you to do it. Displays music as you write it using jr's 16 colors, and plays music back in three voice harmony. Features allow you to adjust key, tempo, note values, etc. Color Display required. 128K ok. (Disk #62)

PCJR MUSIC SAMPLER. A collection of classical music "concerts" performed with great precision to produce the highest quality sound you've ever heard on your PCjr. Disk includes a separate program to activate Junior's sound generator before running game software to get highest quality sound. 128K ok (Disk #119)

ORIGAMI. Learn the art of Japanese paper folding. This program shows you how, step-by-step, to create amazing animals and other objects just by folding paper. Fun for kids and adults, too. 128K. Requires Basic Cartridge. (Disk #39)

PC-KEY DRAW. A powerful graphics program that allows you to draw, paint, produce slide shows, store and print your work. 256K, two drives. (Disk #37)

PC-KEY DRAW DEMO. Contains a slide show demonstration which allows you to see the amazing results you can get with PC-KEY DRAW. Helps to learn the many graphic capabilities of PC-KEY DRAW. (Disk #38)

PCJR MUSIC SAMPLER. A collection of classical music "concerts" performed with great precision to produce the highest quality sound you've ever heard on your PCjr. Disk includes a separate program to activate Junior's sound generator before running game software to get highest quality sound. 128K ok (Disk #119)

PIANOMAN. A great music program! Allows you to write your own music, store it and play it on jr's terrific sound system. 128K. (Disk #36)

PRINTMASTER LIBRARY. Two disk set full of graphic images for use with PrintMaster. (Disk Set #3 - 2 disks, \$10)

Telecommunications

BOYAN. Selected Best of the Year by PC Magazine, this outstanding telecommunications program will astound you with its smooth functioning and innovative features. Supports all protocols. Need 384K. (Disk #61)

JRTELE V2.1. Excellent, easy-to-use telecommunications software made especially for PCjrs, and the PCjr modem. Ideal for beginners, but has enough power and features for most users. Supports 300 and 1200 baud. PCjr internal or Hayes compatible external modems. 128K ok. (Disk #86)

(More Software on page 8)

Reader Feedback

(Continued from page 5)

Reader Suggests Cheaper Repairs

I have a Jr: 1 FD, 640K Tecmar, NCR printer 6411 Model 8510, speech synthesizer but no software (do you carry any?). The printer will not work when I use Printmaster. It writes lines with letters and feeds paper intermittently; what's wrong? I bought a 128K Tecmar sidecar (cheap) and it stopped working. I called them to find out how much it would cost to fix and they quoted \$100. Too much! Any suggestions for a more reasonable price?

I would like to make a suggestion regarding your classifieds; I like MANY other Jr. users, have Jr items that I would like to sell at a reasonable price (or trade), but with your \$12 charge per ad, many people just won't spend that much when they may only want to charge \$10 or \$20 for their Jr goodies, so these items will just remain in storage until...? WHEN SOMEONE COULD BE ENJOYING THEIR USE. Why not create a section: WANT-TRADE-\$75. OR LESS, or include THEM in your classified ads for FREE?

I think the above suggestion will increase the TIME OF SURVIVAL of this great little giant, and of your Jr Newsletter. Have you noticed the prices of 286's and 386's lately?

German L. Toledo, Miami, FL

Editor's Note: Your letter says the printer does not work with PrintMaster. If we can assume it works with your word processor or other software, perhaps the problem is not the printer, but in the software configuration. We suggest you verify if it works with other programs before you decide to seek service on it.

Regarding your suggestion for cheaper classifieds, we think the idea has merit and accept classified ads from individuals (not dealers) for trade or sale for less than \$75, at half the usual rate, or \$6.00. Thanks for suggesting it.

Learn Origami By Watching Jr

Origami is a great program -- fun for both kids and adults. Origami is the ancient Japanese art of paperfolding, which has been perfected to such a degree that fantastically intricate shapes and amazingly real looking animals and other things can be created just by folding paper!

The Origami software program teaches you how to make these paper wonders -- by giving you a demonstration showing exactly what to do. In a way, it's better than taking a class in Origami because you can review each step of the process before going on to the next step, thus proceeding at your own pace.

Origami is Disk #39 in the jr Newsletter Software Store.

Reader Prefers Older Version of ShareSpell

About a month or so ago after I read the flowing praise of **ShareSpell** (SS V2.2) in your Software Store, I ordered it. It must have been transition time from V1.3 to V2.2 because I got V1.3. I didn't realize it for awhile and enjoyed using V1.3. My neighbor noticed I didn't have V2.2 so I returned 1.3 and you sent me 2.2.

In my opinion V1.3 is much more "user friendly". Is V2.2 primarily intended for those with the luxury of a hard disk? I have a 2 disk system and if the file to be checked and the dictionary aren't on the same disk, it gives me a message "can't find dictionary" and returns to DOS. It's a pain to have to either put the dictionary on the data disk (leaves little room for letters, etc.) or put the file to be checked on the program disk.

If the program is in "A" and the file to be checked is in "B", a depression of the "Home" key will enable one to access a file in "B", but unless the dictionary is also there, you're thrown off because it can't find the dictionary. If you do copy the dictionary to disk "B", it will check the file, but then it leaves "B" as the default disk. Also, if an error in spelling is found it takes beaucoup disk access while it is searching for an alternate word because it didn't copy the dictionary into memory as V1.3 did. Terribly slow on the floppy disk. Perhaps it would be much faster if one had a hard disk.

The dictionary on V2.2 is not compatible with V1.3. I think you should retain V1.3 for those who do not have a hard disk.

Better yet, perhaps you should encourage people to buy and use PC-Write V3.02, which is what I have returned to. Perhaps the dictionary isn't as sophisticated as SS, but the program is much more satisfactory in its operation.

Howard Chilton, Union Hall, VA

Editor's Note: We're printing your suggestion in this issue. If we hear from enough readers who agree with you, we will follow up on the idea.

Help, Help, Help!

I have the Jr 128K enhanced and I added the Racore Expansion 384K w/o DMA to bring it up to 512K (two disk drives). I would like to take it to 640K but I have been told different procedures. I need some advice.

Can I make changes to the 384K Racore chip board to take it to 640K or can I use a 128K sidecar? What is the least expensive way?

Bernard K. Smith, Richmond, VA

Editor's Note: We suggest you contact our advertisers and ask them for technical advice on how this should be done and what they would charge to do the work or for the needed parts.

Updated Version of Scout Is Colorful, Adaptable

The Software Store now offers an upgraded version of **SCOUT** on Disk #81. Version 4.4 of the popular File Manager can be run as a memory resident TSR or as a stand-alone program.

The directory manager allows you to sort, move, copy, rename, or delete files. You can also create and remove directories or volume labels. The program allows you to search an entire disk for a file a specific text string. The program installation allows you to assign a variety of programs to hot keys and directories to function keys. The program also works in conjunction with your printer. It prints directories and sends control codes to your printer.

The Version 4.4 has a more colorful display than earlier versions. An important new feature allows viewing of ZIP and ZIP-executable files. It also supports extended keyboards.

The amount of memory Scout requires depends on the configuration selected in the configuration process. You can specify up to 500 directories, but the lower the number of directories and files to be handled by Scout, the lesser the memory requirements of Scout. So, if you have limited memory, be sure to configure it to cover only the amount of files and directories you need.

For those watching memory limitations, the program can remove itself from memory after use. Scout was designed to accomplish three goals:

- * be accessible from any program or from the DOS command line,
- * to limit the keystrokes needed to perform disk maintenance tasks,
- * to make Scout as compatible as possible with other programs and TSR's.

Scout is Disk #81 in the Jr Software Store, page 23.

New Classified Ads, starting in February:

**Classified ads by individuals
for items for trade or
items selling for \$75 or less
will be accepted at
half the usual cost,
or \$6.00**



PROCOMM PLUS TEST DRIVE. This is the upgrade of the already powerful and popular Procomm V2.42. It's got many new features including an improved host mode, context sensitive help screens, more powerful scripting. In addition to its power, it's very easy to use. (Reviewed 3/90) 256K (Disk #108)

PROCOMM. This powerful, yet easy to use telecommunications program has become the one favored by more PCjr users than any other. Dialing directory, auto redial, XMODEM, Kermit and other file transfer protocols, auto log-on, DOS gateway, keyboard macros, exploding windows and many other features. The editor of PC Magazine called Procomm "competitive with the best comm programs on the market." Manual on disk. 256K (Disk #15)

TELIX V3.12. Powerful, yet easy-to-use telecommunications program, with variety of built-in transfer protocols. Features Z-Modem--one of the most efficient and reliable transfers available. If you're disconnected while downloading, Z-Modem will pick up where it left off when you next log-on, thus saving connect time and telephone toll charges. Need 180K free memory after loading DOS and either two floppy disks or a floppy disk and a hard drive. (Reviewed 7/91) (Disk Set #4)

Data Bases

3 X 5. An information management program that works just like a 3 x 5 card file. It offers speed, versatility and simplicity in entering, indexing and retrieving data. Has an integrated word processor, powerful search commands, multiple windows so you can edit in one and search in another, etc. Requires 256K. (Disk #19)

FILE EXPRESS. (V4.22) Very easy to use database manager. Extensive menus and prompts to guide you. Excellent choice for maintaining mailing lists, etc. Many powerful features. 256K (Disks #83 and #84)

MR. LABEL. Extremely versatile, this software enables you to make labels ranging from the very simple to the very sophisticated. It's the best of many we've tried. 128K ok. (Disk #97)

NAMEPAL. An excellent utility program for maintaining and printing name and address lists, address books or mailing labels. Keeps business and personal references and allows user to maintain free-form notes as well. Requires 128K Memory. (Disk #70)

PC-FILE III. This excellent database manager will handle up to 9,999 records, such as names and addresses, notes, product descriptions, etc. Uses generic, embedded, soundex and wildcard searches. Global updates and deletes. Sorts on any field. Too many features to mention. (Disk #3 runs on 128K, Disk #4 needs 256K)

(More Software on page 9)

Should I Upgrade my PCjr... Or Buy Another Computer?

(Continued from page 1)

Unfortunately, some PCjr owners never call PC Enterprises. Instead, they go to local computer stores and ask people who know very little about the PCjr what they need to upgrade a PCjr. The computer retailer tells them they need a new computer. Is this true? Of course not. But you can't blame your hometown computer store. After all, they don't sell add-on products for the PCjr -- but often they do sell other computers!

At one time the PCjr had a bad reputation -- primarily because it only came with 128K of memory, one diskette drive, a chicklet style keyboard, and couldn't be expanded. As a result, the PCjr could not run most PC programs. This is absolutely no longer the case! Today the PCjr can be expanded to include just about all the hardware that you might ever need.

Today, the PCjr can be expanded to include over 1.8 million bytes of RAM (memory), up to seven 377-MB hard disk drives, a CD-ROM player, tape backup, plus up to two additional 360K or 720K floppy diskette drives, a 1024K (self booting) solid state disk drive, VGA, Super VGA, and Extended VGA capabilities -- and it can operate at 9.54 MHz. You can also add a full-size 101-key keyboard, a mouse, a light pen, and two joysticks -- and you can do so without first buying a game controller or other interface card. Unfortunately, most PCjr critics simply haven't kept up with the PCjr. In fact, most are often surprised to hear the expanded PCjr actually runs more software than any other IBM personal computer ever made. But it's true!

Each time IBM introduces a new computer, our staff looks to see what's new. Almost immediately we start to develop new add-on products that will permit the PCjr to take advantage of the latest enhancements. As a result, 1991 has already proved to be a great year for PCjr enthusiasts as more new PCjr products were introduced than ever before -- but 1992 promises to be even better! More than half a dozen new PCjr products are already under development, including products which will provide Adlib Sound, FAX, and full 386 capabilities, plus more!

Seven years ago PC Enterprises pledged we would remain dedicated to the support of the IBM PCjr for as long as the need would exist. Today, as in the beginning, PC Enterprises still has no plans to become involved with any other computer. Instead, PC Enterprises will continue to develop all the add-on products that permit PCjr users to keep pace with IBM's newest computers.

Sources have reported over 650,000 PCjr systems were manufactured, with over 150,000 PCjrs already expanded -- and thousands more PCjr users continue to expand each year. After all, why not? As long as the PCjr can be expanded

to include the latest computer hardware, and as long as the PCjr can run the latest software, isn't there very little reason to buy any other computer? When you expand your PCjr, you add what you want when you want, without tying up a lot of money in a new computer. That's why each year thousands of PCjr owners upgrade their PCjr for the very first time. Once upgraded, PCjr owners become extremely happy with their PCjr and almost always continue to expand. Now stop to realize there are still half a million PCjrs waiting to be expanded. And that's why PC Enterprises will be in the PCjr add-on business for a long, long time.

How to Install DOS On A Hard Disk

By Walt Sherrill

When installing DOS on an SPC hard disk for the PCjr, the following approach seems to "fool" the system into thinking DOS is on the hard disk. It never looks to the floppy for DOS after the boot. Here are the steps:

1) Use the SPC SHDFMT.COM program to start the hard disk format, using it to INIT the disk.

2) Use any of several free-ware utility programs to remove the "hidden" file attributes from the DOS IBMBIO.COM and IBMDOS.COM files on your DOS (or a copy) disk. (I used ALTER.EXE to change the file attributes; both ALTER.EXE and the Forbin File Manager, called FFM.EXE or FFM.ARC can do the job and are available on many BBSs around the country.)

3) Copy IBMBIO.COM to the hard disk, followed by IBMDOS.COM and COMMAND.COM in that order. (This is their order on the DOS disk.)

4) Change the file attributes back to "hidden" on the hard disk and your source DOS diskette.

5) Include the following lines in the AUTOEXEC.BAT file on the floppy disk used to boot the system. (The SET COMSPEC command below, because of DOS bugs, will only work in DOS versions greater than 2.1.)

```
set comspec=c:\command.com    {greater than  
DOS 2.1 only}
```

```
c:  
{make c: the default drive}
```

While the DOS SYS C: command won't work, these steps do essentially the same thing; if you perform them as listed, the system should act as though DOS is installed on the hard disk -- and it is! No more floppies until you have to power-up again.



Educational

ARE YOU READY FOR CALCULUS? Excellent review of Algebra and Trigonometry skills you'll need before taking Calculus. Provides help in needed areas. Designed by professor in University of Arizona's Math Department. 128K ok (Reviewed 8/90)(Disk #117)

BIBLE QUIZ. Excellent quiz game tests knowledge of both the Old and New Testaments. Provides answers and biblical references for each question. For one to three players. 128K OK. (Disk #85)

BRAIN BOOSTER. Includes IQ Builder, a program that both teaches and tests your ability to solve number, analogy, synonym and antonym problems like those on IQ and SAT tests. Also includes Algebra and Chemistry programs. For high school and up. 128K (Disk #43)

COMPUTER TEACHER. For those who want to learn how to use DOS commands and to understand basic computer hardware terms, this interactive software will help you become computer literate. Helps you better understand those manuals and computer magazines, as well as how to do more with your computer. 128k (Disk #77)

CROSSWORD CREATOR V3.30. Make your own puzzles up to 36 columns by 22 rows. Many helpful sorting and placement features. Prints out on virtually any printer. 256K (Disk #71)

EARLY LEARNING. A collection of colorful educational games for ages 6-8. Sing-along alphabet, letter match, counting game, maze, pattern matching and more. 128K, need Cartridge Basic. (Disk #48)

EQUATOR. An excellent way to learn and review 35 basic equations used in math, finance and science. Learn to compute the volume of a cylinder, compound interest, or average velocity and much more. Manual on disk. 128K (Disk #20)

GAMES FOR EARLY LEARNERS. Young children like Teach Tot's alphabet and counting games. Other activities teach spelling and telling time. For Preschool through grade 3. Cartridge BASIC, 128K. (Disk #63)

HAPPY GAMES. Written by a mother to help her own preschoolers learn on their PCjr, this set of colorful educational games makes learning fun. Teaches colors, shapes, logic, eye-hand skills. 256K and joystick required. (Disk #88)

LANGUAGE TEACHER. Helpful exercises for both French and Spanish language students. Hundreds of vocabulary words and verb conjugations. 128K ok. (Disk #72)

(More Software on page 10)



MATH FUN! A great way to get kids learning how to add, subtract, multiply and divide. Includes a program called Math Tutor which has cleverly designed exercises for kids in Grades 1-6. Also Funnels and Buckets, a nifty math game that makes learning math fun. 128K. Need Cartridge BASIC (Disk #42)

PLAY AND LEARN. Educational games for kids 5-12. Word match games, find-a-word puzzles, word scrambles, and many more made by teachers. 128K, need Cartridge Basic. (Disk #32)

SPEED READ. If you'd like to double or triple your reading speed, and increase comprehension as well, Speed Read can help you do it. It provides instruction and exercises designed to break bad habits and improve reading efficiency. 256K (Disk #90)

SPELLING BEE. A game that builds spelling skills from Grade 3 level to adult. You are an Olympic athlete representing your country. Excellent color graphics. Four skill levels from very easy to very difficult words. Fun way to become a spelling champ! 256K ok (Disk #82)

STUDY AIDS. Three great programs to help students. PHLASH - a computerized version of flashcards which you make and use for any subject. Multiple choice, true/false, and/or fill in blanks. FRACTIONS - a series of interactive exercises in fractions (many levels). And PHRASE - a program that picks out examples of bad writing in any document and suggests improvements. 128K ok (Disk #92)

THE WORLD V.2.6. Fascinating way to see the world on your PCjr! Just use the pointer to move over full screen map of world and press Enter to zoom in on any region, country or city. Many features. Even shows you hurricane tracks by year. 256K Reviewed 2/90 (Disk #105)

TIME TRAVEL IN HISTORY. A maze adventure game in which you have to answer questions about different periods of American History in order to get gold pieces--and save your life! 128K (Disk #21)

TYPING INSTRUCTOR. Disk contains both PC-Touch, a great typing exercise and speed testing program, and Touch Typing Tutor, a combination of lessons, including finger positions, speed tests and a typing game. 128K ok. (Disk #18)

WIZQUIZ. The Wizard keeps track of your progress in solving math problems that range from elementary level through fractions and negative numbers. Extensive exercises, with scores and times recorded under each "player's" name. Compete against your personal best as you improve your skills. Grades 4 through adult. 128K ok. (Disk #95)

WORD PROCESSING FOR KIDS. Simple, fun and easy-to-use word processor designed especially for beginning writers. Allows children to express their ideas easily and then print them out in large type on your printer. Colorful opening menus make learning the simple commands very easy. Parents/teachers manual is on the disk. 128K. (Disk #41)

(More Software on page 12)

Another PCjr Parts Source

If you need PCjr parts, or have something PCjr related that needs fixing, one source you may want to check is Elmer Hungate. He has a storehouse of new and used PCjr parts (some rather hard to find) and also works on Jrs. For his "catalog" send a SASE to Elmer Hungate, RR#1 Box 324, Dodge Center, MN 55927.

If You REALLY Want To Know What's Wrong With Your jr...

Our PCjrs have a very nice, very colorful self test procedure than can be started by pressing and holding Ctrl and Alt, then pressing Ins. Very colorful and interesting, perhaps the first time you try it -- but not truly informative.

The test menu screens that come up during the test give you a chance to test just about everything-- disk drive, monitor, light pen, joystick, sound, keyboard, modem and printer. And it is useful to some extent. It can help you figure out where your problem is. But that's about all.

As your PCjr Guide to Operations will tell you, if your jr fails any one of the tests, "Have your IBM PCjr serviced." That's not a lot of help, but it's about all the bad news most people need to have. Because even if the self test gave you more technical information, you probably wouldn't know what to do with it.

For the Technician

However, if you are inclined to be good about technical matters, you might want to consider purchasing the Hardware Maintenance and Service Manual. It comes with four service plugs that go in the joystick ports, the serial port and the parallel port.

These plugs add a new dimension to the diagnostic tests. When the plugs are in and the test is run, you will not only get an indication of where the problem is located, but you will see on your monitor a four digit figure that corresponds to a list in the manual.

When you look up the code, the manual provides a detailed description of what is wrong and how to go about fixing it. Sometimes the problem will be something that any reasonably ambitious do-it-yourselfer can handle. Other times you will have to cart your jr to the service center. But at least you will be able to tell the technician what is wrong and you will know if a technician tries to expand the repair bill beyond the real problem.

The Hardware Maintenance and Service Manual can be obtained from IBM dealers. It can also be obtained from Computer Reset, P.O. Box 461782, Garland, TX 75046 for \$55, which is about \$20 below the retail price. Or, we have heard that Sears stores still have some for an even lower price.

PIVOT! Lets You Print Spreadsheets Sideways

Our newest addition to the Software Store, PIVOT! is a print and view utility for spreadsheets. PIVOT! operates through menus familiar to spreadsheet users and works with any *.WKS or *.WK1 spreadsheet file created by AS-EASY-AS (Disk #136 in the Software Store) and other spreadsheet programs, such as Lotus 123. Depending on the memory of your computer, PIVOT! prints spreadsheets up to 8192 rows x 256 columns.

A common problem spreadsheet users face is that spreadsheets are often wider than the print area of their printer. PIVOT! will print in either portrait (regular) or landscape (sideways) direction using a wide variety of print control options.

The program offers six high definition character fonts (3 Portrait + 3 Landscape)--They are Courier, San serif and Tiny. Other special fonts are included as special binary *.TRP (Portrait) or *.TRL (Landscape) fonts that can be edited with a companion program: GCHAR (Graphics Character Editor). This lets you customize any character or create a new character set with a variety of editing commands.

Characters go to the printer as binary graphics information and NOT as ASCII codes, so text combinations are available. You can instruct your printer to print with one pass, two passes, three passes or even four passes over the same text. The more passes made, the higher the quality of the text output, but the slower the job of printing. PIVOT! works a 9-pin MX/RX Epson printer, a 24-pin LQ-2500 Epson printer or any printer compatible with one of these printers.

Use PIVOT! Alone or as a Spreadsheet Add-In

The program is invoked from the DOS command line with several switches, which can take advantage of different monitor types, enable a panel menu system, or pull down menus. If you are using AS EASY AS (And there's no reason you shouldn't have ordered it by now), you can install PIVOT! as an add-on directly within the AS-EASY-AS program.

First copy the PIVOT! files to the same disk or subdirectory as the spreadsheet program. Load AS-EASY-AS and follow the menus through /Wsheet, General, Install, Add-in, Create PIVOT! Save the configuration, and PIVOT! will be available through the /USER menu whenever the spreadsheet is running. (NOTE: you need to have at least 150K of memory remaining in the spreadsheet to use PIVOT!)

Once PIVOT! is an add-in program, you can go through the printer setup and configuration menus and set up headers, footers, margins, and choice of fonts. You can specify the various codes for graphics density, line feed spacing, etc. When you have a set-up you like, save it as the print default, and it will be there whenever you want it.

Since As-Easy-As is a 1-2-3 imitation, and since Lotus bundled SIDEWAYS with their spreadsheets, comparisons

between the product sets are inevitable. The products operate similarly and both achieve good results. If you write a spreadsheet in one program, you can easily load and edit the file in the other program. If you have a spreadsheet file created in either spreadsheet program, you can print it out with either printing utility.

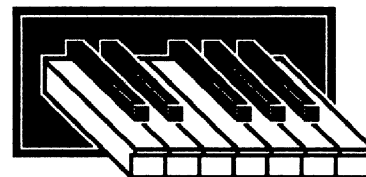
There are several important differences:

- * The Lotus Products cost more.
- * The Lotus programs take up more disk space.
- * The Lotus programs require more memory.
- * The newer versions of Lotus do more advanced graphics.
- * The Lotus programs can produce larger spreadsheets.

However, unless you routinely do large extremely spreadsheets, AS-EASY-AS and PIVOT! may be just what you need. PIVOT! requires a minimum of 256K RAM to operate, and either a two-diskette configuration or a hard disk. It is Disk #136 in the Jr Newsletter Software Store on page 23.

Using Jr Music Machine

By John E. Wilson



Disk #62, Jr Music Machine, in the Jr Newsletter Software Store has a very good program for both composing and playing music with your PCjr. The program on this disk fully utilizes Junior's TI Sound Generator chip. You don't need BASIC and the program will work on any Junior - in fact, the program is designed to run with a 40 column screen and doesn't work properly in the 80 column mode.

Entering the music is especially easy. The music treble and base staves are shown on the screen, and you use the up and down keys to move the screen cursor to locate the note at the position you want. When you press <Enter> the note is played for you as it is entered. You can set the note's value, modify it as a sharp or flat or dotted, change the volume, and just about anything else that conforms to standard music practice. As you enter your music, a piano keyboard also shows the position of your note. Furthermore, the program keeps track of measures and it won't let you end a measure with a note value that doesn't conform to the timing. It also won't let you sharp or flat a note that doesn't have a sharp or flat. Of course, the program allows for editing the music and saves it on a disk.

The disk contains 16 sample songs, including America. It is a very unusual version of America. Actually, their version of America is the worst thing you can say about this disk, but you can easily use the music notation information to make an improved version of the song.



WORDCRAZE. Create your own word search puzzles and print them out for friends and family. Just make the list of words you want in the puzzle and it's printed out for you. Or try Quotefall, a unique type of scrambled word puzzle. And then there's a high-level version of Hangman. Just try escaping from the noose in this one! 256K (Update review 8/90) (Disk #87)

WORD GALLERY. Help your child learn to read with this colorful program that presents pictures and words to match. It's fun to use, has four levels, the last with a missing letter for the child to fill in for beginning spelling. 256K (Reviewed 4/91) (Disk #125).

MATH & LOGIC GAMES. Designed for kids in Grades K-6, but fun for kids of all ages. Six different games can be played against the computer, or with another human. Each game teaches a different logic and/or math skill. (Reviewed 5/91) 256K required. (Disk #126)

Games

ADVENTUREWARE. Six different text adventures with titles like "Island of Mystery," "Terror in the Ice Caverns," and "Moon Mountain Adventure," all test your wits and take you to strange mysterious places. 128K (disk #14)

ARCADE GAMES. Includes Kong, Pango, PC-Golf, Pyramid and other exciting, colorful games for hours of fun. 128K. (Disk #30)

BOARD GAMES. Eleven different games on one disk! Hours of fun with Monopoly, Yahtzee, Cribbage, Backgammon, Othello, and others. All run great on your PCjr! 128K. Need Cartridge BASIC (Disk #31)

BUSHIDO. Test your skills in martial arts combat. Fighters kick, spin, duck, punch, etc. Requires 256K and keyboard with function keys (Disk #16)

CASTAWAY/S. AMERICAN TREK. Test your survival skills as the survivor of a shipwreck in the South Pacific. Or as an explorer of South America. Two novice text adventures from Jim Button. Ages 12 and up. 128K. (Disk #53)

COMPUTER JOKER. Disk full of jokes, wisdom, and visual tricks to play on your computing friends. 128K ok (Disk #64)

DOUBLE TROUBLE. Two of the most challenging, highest quality arcade style games we've seen -- Amazing Mazes and Willy the Worm. Ten different mazes and five levels of play will tie your brain in knots. And Willy, who is the fastest, jumpingest worm you'll ever see, will beat you for sure! You can even modify Willy to give yourself more (or less) trouble. 128K ok. (Disk #68)

DUNGEONS & WARS. In Dungeon Quest you can choose to be a dwarf, elf, magic-user, fighter or other type of character. You select your strengths and weapons, too. Then you enter the dangerous dungeons on your Quest. Thermonuclear War pits the US vs. the Soviets in a very real demonstration of what a nuclear war might be like. Combat is a strategic battle on the ground. 128K ok. (Disk #9)

(More Software on page 13)

Is Big Brother Prodigy Watching You?

(Continued from page 1)

nearly a MEG in size. Some concluded that Prodigy is prying at their systems and possibly downloading information while their computers were logged onto Prodigy.

When a letter appeared in PC/Computing in August about the file, the magazine responded that "While its true that the STAGE.DAT file takes over space on the hard disk, evidence to date suggests that the information of yours that you see in the STAGE.DAT file is data that has been erased...."

However, he concluded, "The bottom line is this: Any on-line service vendor that controls both ends of the connection between your PC and their service can, if they choose, do any number of things to your computer without your knowledge. To control both ends of the connection means that you use a piece of software that the vendor provides, like the Prodigy software, to access the service. Note that Prodigy is not the only vendor that provides software to use their service. For example, CompuServe and Genie provide optional software that takes advantage of the intelligence in your local PC to more efficiently transfer data between your computer and the host. Other vendors, like America On-line, require you to use their software to access their service."

"To date, the claim that Prodigy is taking data from your PC or looking around has not been substantiated," he concluded.

A Closer Look

Such varying opinions merit a closer look. We asked several Prodigy users to check their directories for STAGE.DAT. Each found a file slightly smaller than a MEG in size which contained a variety of characters which appeared to have come from erased files.

We purchased an installation kit for ourselves and began experimenting with it. When we installed it on our hard drive, the setup routine says:

"There are a number of factors which influence how fast the PRODIGY service runs. Other than the speed of your modem and computer, you can make the service faster by letting the PRODIGY software use more space on your hard disk (about 1.5 megabytes total).

"Should PRODIGY software use more disk space to run faster?"

If you choose "YES," the installation setup will create a STAGE.DAT file which is more than 900,000 bytes. If you choose "NO," the software makes a file of the same name, but only 241,904 bytes in size, a savings of more than half a MEG in hard disk space.

We tried connecting our computer on-line with the various installations. It appears that each on-line session modifies the larger STAGE.DAT file, but the smaller STAGE.DAT file shows less changes with use than the larger configuration.

So what's going on? Frankly, it's impossible to be certain,

but the changes in the larger configuration of the STAGE.DAT don't appear to be anything out of the ordinary. To put this in perspective, consider other programs which set up a dummy disk file. Windows 3.0, for example, allows the user to set up a permanent swap file in 386 mode. This is a permanent file, which speeds up operations by swapping information from memory to the permanent file whenever the memory gets low. To study what happens with a swap file when it is used, we did the follow comparison procedure:

1. Created a permanent swap file for windows
2. Copied that file to test1.fil
3. Ran a file comparison by typing at the DOS prompt:
COMP SWAPpart.386 test1.fil
4. Files compared as 100% identical.
5. Loaded Windows, ran a few short programs, and exited.
6. Ran a file comparison again:
COMP SWAPPART.386 test1.fil
5. The files did NOT match!

We did the same procedure with the swap file created by last month's new software store addition, MEMSIM, and got the same results. Legitimate use of the file as a memory swapping program changed the contents of the file.

Then we installed Prodigy on a hard disk which had just been compressed and all unused sectors cleared with PC Tools. We installed the program choosing to allow Prodigy to use the extra disk space for greater speed. After running the comparison procedure outlined above, the SWAP.DAT was changed.

Next, we removed the Prodigy subdirectory, compressed the hard disk and again cleared the unused clusters. Then we installed Prodigy using the minimum configuration. After running our comparison procedure, we determined that the smaller version of SWAP.DAT also changes after use of Prodigy.

The material which appears in the SWAP.DAT file appears to be information which was in the computer's memory at times when Prodigy was not running. For example, one Prodigy user found many parts of her PC-Tools menu listings in her SWAP.DAT file. Also found were two listings of the CONFIG.SYS and AUTOEXEC.BAT files. These were found in both the large and small versions of SWAP.DAT

Clearly, not all the data in the SWAP.DAT file is data which has been erased. However, there is no sign that Prodigy is systematically snooping about the computers on its service. It seems more likely that the file is picking up bits of data from two sources--files that have been erased, and programs or data that has been in the computer between the time it was booted up and the time the Prodigy service was logged on.

If you do not have a hard disk and run Prodigy from floppies, you probably have a small SWAP.DAT file of about 200K in your personal disk #2. This file appears to be updated after most uses of Prodigy, in that the time/date stamp will be changed. However, if your floppy with the Prodigy Personal Disk #1 is the disk you boot on, there appears to be no

(Continues on page 14)



DUOTRIS. Two great Tetris-like games on one disk. Similar to the popular Russian strategy game, both of the versions add new twists of their own. Written in Turbo Pascal, both are high quality games. 128K ok (Reviewed 8/90) (Disk #116)

GALAXY. One of the easiest to use word processors we've ever seen, Galaxy has all the features you need to write letters and do most word processing. It has many, but not all, advanced features. Its strength is its simplicity, with help menus always ready to assist you. You probably won't even have to read the manual. 128K ok. (Disk #69)

GAMES I. An assortment of games for hours of fun and excitement. Includes Spacewar, Airtrax, Life, Wumpus, Wizard and more. All good with 128K. Need Cartridge BASIC (Disk #8)

GAMES II. A wild bunch of games to test your wits and skills. Includes Slither, Xwing, Torpedo, ABM2 and Overreact, where you are in charge of a nuclear plant. 128K. Need Cartridge BASIC (Disk #34)

GAMES III. Kingdom of Kroz, an award-winning arcade action game. Go-Moku, a challenging Japanese strategy game, also known as Pente. Zigsaw, the first really good on screen simulation of a jigsaw puzzle. All three on one disk. 256K Reviewed 12/89 (Disk #101)

GAMES IV. Turbo-Car tests your skills at driving a fast car on a two lane highway. Can you keep from crashing? Return to Kroz is a colorful, exciting arcade-strategy sequel to Kingdom of Kroz on Games III. Trek Trivia tests and expands your knowledge of Star Trek. Three great games on one disk! 256K Reviewed 2/90 (Disk #106)

GOLF/SAILING. Two great games! The golf game has three courses, user definable club ranges and a swing control that determines whether you hit a slice, hook or straight shot. Three nine hole courses (Novice, Pro, and Sadistic). In the other game, you try to sail the three legs of the Bermuda Triangle avoiding, if you can, the creeping mists, alien crystals, vortexes and storms. Your boat is equipped with radar, rudder and sail (all of which you control) and an engine foremergencies. 128K ok for sailing. Need 256K for golf. (Disk #47)

MEAN 18 GOLF COURSES. Three excellently designed courses for those who play "Mean 18," the commercial golf game. Disk #79 has Boca Woods North, Boca Woods South, both with especially challenging water holes, and Kearsage Valley, with fall foliage in full color. Disk #80 has TPC of Avenel, TPC of Sawgrass, with massive sand traps and a tough 17th green on an island, and TPC of Woodlands, which may be the most challenging of all. (Disk #79 and #80)

(More Software on page 15)

Picking Junior's Brain

(Continued from page 2)

the name were a reflection of this. With Intel's latest microprocessors there doesn't appear to be much relationship, and they also often now drop the 80 from the names.

Inside the 8088

Figure 1 shows a simplified schematic of the 8088 in your PCjr. We'll explain this schematic in detail later, but for now note that the microprocessor communicates with the rest of the computer by means of buses. A bus is just a set of wires, or traces in a silicon chip, on which bits of information can travel in parallel. There is an address bus and there is a data bus. The address bus is 20 bits wide, so the 8088 can access

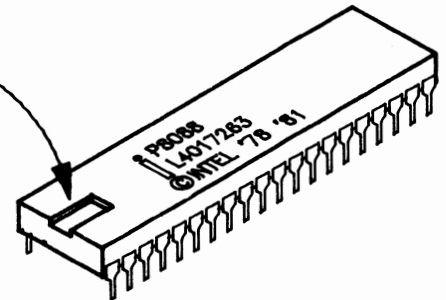


Figure 2
Intel 8088 Microprocessor

Is Big Brother Prodigy Watching You?

(Continued from page 13)

significant changes to the SWAP.DAT file over time.

Although I prefer running Prodigy with the hard drive because of quicker performance, I configured a set of Prodigy Personal Diskettes, booting off DOS 2.0. As long as I boot on that floppy, go directly into Prodigy and after exiting Prodigy remove the diskettes, no traces of data from my hard drive ever appear on the floppy diskettes.

One surmises that any sinister plan to spy on computer users and look into their data would go directly for the most significant source of data—the hard drive. Prodigy's SWAP.DAT clearly does not go looking for the hard drive, so it's probably a safe assumption the SWAP.DAT file is not really a "peeping port" for big brother.

However, if you are concerned about data being read from your hard drive, you could set up the personal Prodigy floppy disks and boot on a floppy diskette. This strategy will make Prodigy run slower but give you some piece of mind on the matter.

Readers are invited to look at their own SWAP.DAT files and make note of how the contents change over time and use of the Service. If you find any patterns or see anything surprising there, please let us know. We'll keep all our readers posted on what we learn.

up to 1,048,576 address locations. (Twenty on/off bits can be arranged in 1,048,576 ways.) The data bus, which for the most part carries information to and from the input/output devices, is 8 bits wide. This is how the 8088 differs from the 8086 microprocessor. The 8086 has a data bus that is 16 bits wide.

When IBM was designing their personal computer, the PC, there were not many components that would handle 16 bits at one time (and those that were available were expensive), so Intel made the 8088. The 8088 is identical to the 8086 except that it has an 8 bit data bus in place of the 16 bit data bus. This narrower data bus does not affect the performance of computers such as the IBM PC and PCjr since most of the other components can only handle one byte at a time anyway.

The relationship between the 386 (now often called the 836DX) and the 386SX is similar to that between the 8086 and the 8088. The 386 has an internal data bus (Continues on next page)

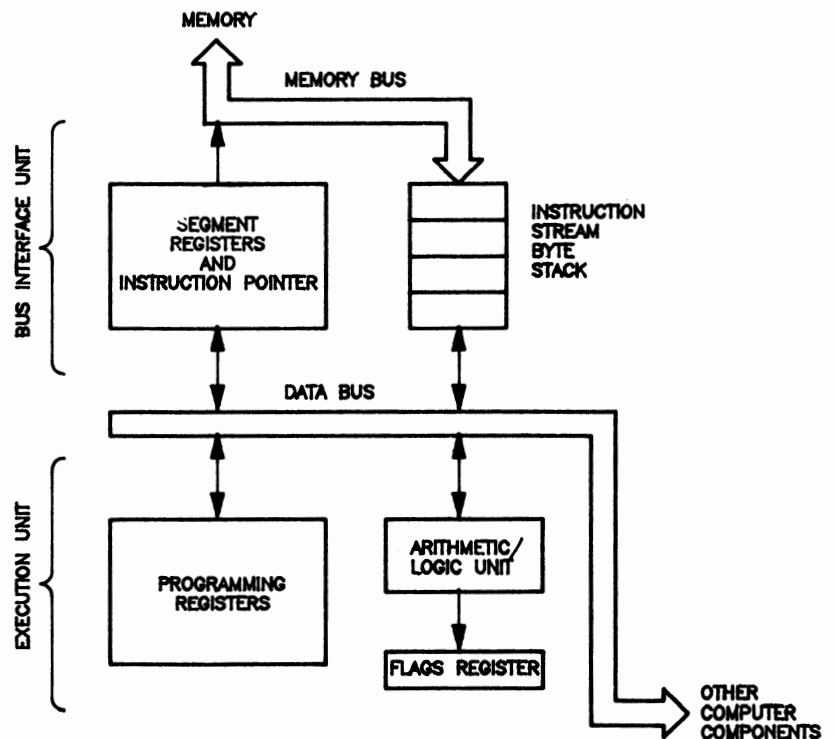


FIGURE 1
SIMPLIFIED SCHEMATIC OF 8088

that is 32 bits wide while the 386SX has a data bus that is only 16 bits wide. In fact, with Intel's current practice of naming microprocessors the 8088 would be named the 8086SX if it were introduced now.

The 8088 is shown in figure 2. It is a black chip about 1/2 inch wide and 2 inches long. There are 40 pins, 20 on each side, that plug into Junior's system board and are used to communicate with the rest of the computer. For example, to copy the contents from a particular address in memory to the 8088, a specific pin on the 8088 will signal that a read from memory is needed while the memory address is emitted from another pin. Support chips decode these signals and route the data from the appropriate memory chip to the 8088.

A computer program is a sequence of instructions which are first placed into memory and then fed into the microprocessor one byte (8 bits) at a time. Incoming instruction bytes are placed in the Instruction Stream Byte Stack. (See Figure 1). The Execution Unit takes these instruction bytes from the stack and processes them. At the same time, the Bus Interfacing Unit gets more instruction bytes and places them into the stack. Memory locations are kept track of by the segment registers, and the instruction pointer keeps up with the stream of incoming instructions. For programmers, the most visible and important part of the microprocessor are the registers in the execution unit. Almost all program data that is to be modified or processed eventually ends up in one of these registers. In the 8088 these registers can hold up to 16 bits (two bytes). This is the reason that the 8088 is often referred to as 16 bit microprocessor. In the 386 and 486 microprocessors many of the registers are 32 bits wide. There is an Arithmetic/Logic Unit in the execution unit just as there is in main frame CPU's.

The 8088 Instruction Set

To accommodate humans, the instructions are given short names, but from the microprocessor's view point they are strictly binary numbers - numbers made from a string of ones and zeros. For example, the human form of the instruction to add the contents of the BX register to the contents of the AX register and leave the result in AX is ADD AX, BX. The 8088 receives this instruction in two bytes. The first byte is 0000 0001, which signals the microprocessor to perform an addition. The second byte: 1100 1000 tells the microprocessor that the numbers to be added are in the AX and BX registers. The human form of the instructions is called Assembly Language, while the binary number form is called machine language. Actually the microprocessor transforms the machine language instruction bytes into an even lower set of instructions called microcode.

The 8088 is able to process almost 100 different instructions. It is able to move bytes from one location to another, compare bytes, loop through (repeat) a group of instructions, jump forward or backward in the stream of instructions, add,

(Continues on page 16)



PC-CHESS. Two great chess games on one disk! A full-color, many featured chess program with four levels of play, allows such things as switching sides, setting up the board yourself, validity checking, en passant, etc. The other works on color or monochrome, has window showing options it considers before moving, adjustable difficulty level -- but a powerful opponent at any level. 128K ok for one, 256K for other. (Disk #44)

PHRASE CRAZE. Based on the TV show Wheel of Fortune, you get to be the guest who guesses the mystery phrases and wins piles of money! The wheel spins to select the amount of money you win for correct guesses. It gets harder with each round you play. You can add your own phrases to this game or try to guess the ones provided on the disk. Lot of fun for adults as well as older kids. 128K. (Disk #46)

PINBALL RALLY. A colorful collection of amazingly realistic pinball games. Using the Shift keys as flippers, the games get more and more complex until you get to Twilight Zone, the hardest one of all. Runs on 128K. (Disk #10)

PLAYER'S CHOICE. Six different card games, some easy, some hard, but all excellent. Youngsters can have fun playing Memory or Even-Out, which are quite easy to master. Blackjack is hard to beat, and Poker, which has the ability to modify its play in response to your methods, is a real challenge. Also two fine versions of Solitaire, one with great graphics. Some need 256K. (Disk #78)

BRIDGE PLUS. Play Contract Bridge Or Mahjong. Realistic bridge practice in bidding and playing against the computer. Good way to practice the game, but need some knowledge of the game or a rule book. Mahjong rules are included on the disk. Requires 256K Reviewed 9/91 (Disk #131)

REFLEX POINT. Patterned on the TV show Robotech, this game follows the show's storyline, with the Freedom Fighters trying to reach the Reflex Point and destroy the evil Invid Prince. 128K ok. (Disk #12)

SCRABBLE. At last, an excellent Scrabble game that runs in 16 colors on PCjr's! Plays just like the board game. Expandable dictionary checks words. Keeps track of all premium score squares and scores for up to four players. Also contains WORDWHIZ, a nice vocabulary building game. 256K (Reviewed 5/90) (Disk #113)

STAY ALIVE !!! Three games that require all your wits to stay alive. Can you avoid the terrible nightmares and reach the highest level in Dr. Sleep? Or fight off the alien hordes on the Planet Iskib? Bet you can't shoot down the clever enemy pilots in Sopwith. If you can, you deserve a medal! 256K (Disk #89)

(More Software on page 16)



Picking Junior's Brain

(Continued from page 15)

SUPER BOARD GAMES. Excellent versions of two popular board games Monopoly and Risk. Very much like the board versions, except your computer keeps track of everything for you. All you have to do is make the right moves and have fun. 256K. Need Cartridge BASIC (Disk #55)

TOMMY'S TRIVIA. Excellent trivia game with 3 ways to play against computer, 2 against human opponent. 2,500 questions in many categories, from entertainment to history. More Q's available. 16 colors on PCjr. Need 256K. (Disk #98)

WAR ON THE SEA. Based on World War II naval battles, this game allows you to command a fleet in seven different campaigns in the Atlantic and Pacific. Not a joystick game, this one will allow you to see whether you have the strategic skills to be an Admiral. 256K (Disk #100)

ZAXXON/GALAXY TREK. Two exciting high tech shoot-em-up games. In Zaxxon you fly through an obstacle course, shooting while you go, up and over walls, and eventually through space. Galaxy Trek makes you the commander of a Star Ship which you maneuver through the universe seeking to destroy a fleet of Megaton warships before they conquer the planets. 128K. (Disk #45)

Home & Family Management

BITE BY BYTE. Let your PCjr design a sensible diet especially for you, and help you plan meals so you can lose weight without too much deprivation. It's fun to do--and it really works! 256K Reviewed 10/91 (Disk #134)

CALENDAR MATE V4.0 Design and print your own calendars with birthdays, meetings, events, appointments all listed for you. Many features. Easy to use with F1 help key available at all times. Need 512K. Reviewed 7/91 (Disk #115)

SKYGLOBE V2.5. View a map of the heavens customized for your location, date and time. Maps 10,000 stars, 300 with labels, 89 constellations. Many useful features such as brightness selection, zoom in and out, printing on dot matrix, a "find" feature, and an astounding on-screen demonstration of star and planet movement across the sky. 256K. Reviewed 7/91 (Disk #129)

CHECK PROCESSOR. Easy to use software for financial record keeping. Balance checkbook, print expenses by category, etc. 128K (Disk #59)

WILLS. Written by a lawyer, this software helps prepare wills that are appropriate for many different situations. Includes 18 basic types, with many clauses that can be combined to create "customized" wills for most families. 256K (Reviewed 4/91) (Disk #124).

EDNA'S COOKBOOK. Will organize your recipes by subject, allowing for quick retrieval. Print out sorted collection for your own cookbook. 128K, 2 drives. (Disk #96)

(More Software on page 19)

subtract, multiply, divide, and much more. Thousands of these instructions are needed to make a useful computer program. The string of instructions for a program is placed in memory; the instruction pointer in the 8088 is pointed to the first instruction, and then it steps through and processes the instructions, one byte at a time. Usually programmers use a program called an Assembler, or a compiler, to convert the human form of instructions into machine language.

Clock Rate

All of the different units in the microprocessor, as well as the other chips and components that make up the computer are coordinated and synchronized by timing from a quartz crystal clock located in a chip on the computer's system board. The microprocessor steps through program instructions at a regular beat set by this clock, but virtually all the instructions require more than one clockbeat to process. The addition of two numbers already located in registers, as in the example a couple of paragraphs ago, is relatively efficient and only takes three clockbeats. If one of the numbers was in a memory location, though, the addition could require as many as 28 clock beats. Multiplication instructions make the 8088 go to a lot of effort, and can take up to 150 clock beats to process.

On a stock PCjr the clock beats at 4,770,000 beats per second. Thus, even though it might take 150 beats to multiply two simple numbers, this is accomplished in only about .000032 seconds (150/4770000). Junior is pretty fast. The Apple IIc, introduced about the same time as Junior, and a competitor in the market place, had a clock rate of only 1,020,000 beats per second. Usually clock rates for computers are given in units of Mega-hertz. Thus, Junior's clock rate is usually listed as 4.77 MHz.

Obviously, one way to speed up a computer's processing speed is to speed up the clock rate. There are several vendors who sell kits that increase the clock rate of PCjrs, and if you want to get more performance from your computer, you might want to try one.

The V20 Microprocessor

In 1984 the Nippon Electric Corp. (NEC) decided to enter the microprocessor business by making chips that were compatible with the Intel Corp. chips, and were a little better. NEC started with a microprocessor named the V20 that could replace the Intel 8088, and with another chip, named the V30, that was a replacement for the Intel 8086. It turned out that NEC never became a major player in the microprocessor field, and I'm not sure that they even manufacture them any more. You can still purchase V20 chips, though, and because they offer a way to improve Junior's performance at a cost of less than \$20, many PCjr owners have replaced their 8088 with a

V20.

How does the V20 differ from the 8088, and in what ways is it better? First of all, the V20 operates on only about 1/5 of the power required to operate the 8088. This means there is less heat for the computer to get rid of, and less stress on the microprocessor and other components.

Another enhancement is that the V20 has an additional bus to move data about internally. The V20 chip also has about twice as many transistors as the 8088, and some additional registers (which cannot be accessed by programmers) to assist the additional bus. This extra internal hardware is especially beneficial for arithmetic operations. The V20 also has made some improvements in fetching instructions and in obtaining memory data, which helps run programs faster.

NEC expanded the instruction set of the V20 so that it conforms to the Intel 80186 instruction set. Not content with making the V20 compatible with a newer microprocessor, NEC also made the V20 backwards compatible with the Intel 8080 and the Zilog Z80, which were used in, now obsolete, C/PM-80 computers. Unfortunately, these expansions to the instruction set are of no value unless the computer program is written specifically to use them. The 80186 was never a widely used chip and there is no software available that was written specifically for it. In fact, programmers usually avoid even the 286 and 386 specific instructions in their programs. Most programs are still written for the 8088 instruction set (although this is beginning to change). There is not likely to be a reason to run C/PM-80 programs on a DOS computer, and differences in other computer components would likely cause the C/PM-80 program to be incompatible anyway.

Despite the internal enhancements of the V20 microprocessors, the actual performance gains are modest. Several years ago I ran a set of programs which used various types of arithmetic to determine how much faster my PCjr ran with V20. The results were that the V20 ran the programs 5% to 10% faster than the 8088. This is far below the improvement that is often claimed, but it is an inexpensive and easy modification to make (unless your 8088 is soldered in place).

This completes our look into Junior's microprocessor. The chip design is over 10 years old, which makes it ancient in computer circles. It isn't a dinosaur though, or even an antique. There are still programs being written for the 8088, and there are still tens of millions of computers being used that have the same microprocessor as your PCjr.

Uses for CLS Command

CLS will clear the screen of all information it may be currently displaying. The CLS command does not affect the memory, it only erases the active video display.

If you have set the foreground and background colors using ANSI control codes, they will still be in effect. If you haven't set them, the screen will revert to dark background with light characters. The cursor goes to the "home" position in the upper left corner of the screen after the screen has been cleared using CLS.

Questions and Answers

(Continued from page 4)

appreciated.

P. Mayer, Somerset, NJ

A. If you want speed when printing, you have to decide if what you want is faster printing or faster return to your keyboard while printing is going on.

The fastest printing is from a disk file to printer. The routine is to print from the word-processor to a disk file, then use any print program to print this file to the printer.

The fastest way to get back to an active keyboard is to use a spooler which catches files on the way from the word-processor to the printer and writes them to a disk then automatically "spools" them off to the printer. NOBEEP.COM is a great help here because it allows keyboard entry to an extended buffer while the disk drive is in use. With NOBEEP you can even use the DOS "PRINT" command efficiently!

The easiest and well-tested way to have a spooler on the jr is to use JRSPool.COM. This is the standard trouble-free jr spooler. You can get it by ordering the disk, Jr Power Pack, #52, from The Software Store. The other power utilities on this disk will bear looking into as well, but

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Questions and Answers

(Continued from page 17)

the spoolers are really great.

The other spooler, MSPOOL2.COM, on this disk allows spooling to more than one printer at a time, if you have two ports going, serial and/or parallel. Of course it also can be used for a single printer. This spooler does NOT slow down foreground activity so it may also be useful if you are a speedy typist and want to do a lot of background printing.

Q. Some of our friends have non-PCjr's (their loss) and are curious about some of the Software Store software. The big problem is that they only have 3.5" drives. No problem, I said, I'll just DISKCOPY the 5.25" to the 3.5" using our PS/2. Well, it reads the 5.25" all right then comes up with "Incompatible disk or drives, copy process ended." What am I doing wrong? Is there a patch or another way to do this job?

P. Leach, St. Paul, MN

A. Nothing at all wrong. DISKCOPY will attempt to make a "clone" of the disk being copied. To clone means to make an EXACT copy, not even a mirror image because one is the reverse of the other! Identical twins, for example, are mirror images, not clones. Think for a moment, is it possible for a 360k or 1.2M disk to be a clone to a 720k, 1.44M or 2.88M disk? The size doesn't matter; the format and capacity are the differences!

The solution? It's built right into the IBM DOS version of the PS/2. The command is XCOPY. It goes like this: XCOPY A: B: (or B: A:) then press Enter. That's it, no matter what the disk size. If there are sub-directories with files on the A: disk and they should also be copied, just do this: XCOPY A: B: /S then press Enter. The sub-directories will be made on the B: disk even if they do not already exist and the files will be copied properly into them! XCOPY doesn't bother copying empty sub-directories, however.

Remember, you will NOT copy the boot sector, and the two hidden/read only system files found on booting disks. For any Software Store disks which would work on other PCs, there is no reason to copy these files, even if they are on the disks. They would be specific to booting PCjr's only!

Q. Is there any way I can set up a program for a mouse? I want to use it in an existing program which does not already have mouse input.

P. Guay, Central Village, MA

A. If your mouse is really Microsoft compatible you should get the Microsoft Mouse Programmer's Reference from Microsoft Press, ISBN # 1-55615-191-8 with the two companion disks. This guide will show you how to make pop-up menus which even work at the DOS prompt! There

are simple ways use a batch file to drop the DOS menu, load a new menu specifically to fit any program and run the program with full mouse support. The book is \$29.95 and is money well spent. I use these custom menus all the time. Boy, is it neat to scroll like lightning through a text file in PC Write, press a button and have all the top menus at my beck and call.

A really easy program example sets up the mouse to simply emulate keyboard keys. For example; the four motions of the mouse feed up, down, left and right arrow keys to the program, so the cursor zips around. The left button can be the Enter key, the right button emulates the Esc key or whatever keys you choose, so you can see the usefulness in almost any program right away.

The menus are easy to program and compile as there is a menu maker compiler included, and it is foolproof. The menus are quite attractive, being double or single lined windows if you choose, and in any color. They pop up instantly are small and tight and work smoothly.

How to Merge Files Using DOS Commands

Believe it or not, jr Newsletter has recently received three letters from readers asking basically the same question: "Can I combine several files from one directory, or from different diskettes, into one file?"

The answer is, yes you can. And it's not hard.

Suppose you wrote a daily diary on your PCjr, writing about the exciting things that happened to you or the fascinating thoughts that occurred to you each day. After a year or two of this, you decided some of your experiences would make great magazine articles. So you want to combine several files on similar subjects in order to edit them.

The way to combine all your files about trainwrecks you've seen, would be as follows: At the A>, type

```
COPY TRNWREK.382+CARSFALL.185+OFFBRDGE.686  
WHTAMESS.ART
```

The above command will add the files in the order you name them so they become a new file, in this case a file called WHTAMESS.ART. This will be the file with the three entries from your diary about trainwrecks. You can now edit and rewrite those files into one blockbuster of an article for magazine publication.

The general principle here is that you put a plus sign between all the files you want to join and they will all be copied, in order, to a new file with the name you put after a space. There must be a space before the name of the file you want the others to combine into. Files from different drives can be joined in the same way by typing the drive

before the filename, with no space between the drive and the filename. You can also combine several files into an existing file by placing the name of that file after the space. In the above example, then, to get all your trainwreck entries into one existing file, you would substitute the name of that file for the new file in the example, WHTAMESS.ART.

Using Wildcards

If you have many files with the same prefix or extension, you can combine them using the * symbol. Let's say all your diary entries about trainwrecks over the years have the file extension .WRK. In order to combine them all into one file, you could type

```
COPY *.WRK WHTAMESS.ART
```

Once again, all your trainwreck entries would be combined into a file called WHTAMESS.ART, ready for you to polish up for submission to LIFE Magazine.

You can also use the ? as a wildcard to stand for any single character in a filename or extension. Let's say all your diary entries were in files called DIARY with the extension consisting of the number of the month and the number of the year. To combine all entries for the year 1986 you could type

```
COPY DIARY.?86 DIARY.ALL
```

Thus you would quickly have all months for 1986 combined into one file instead of having to type

```
COPY DIARY.186+DIARY.286+DIARY.386, etc.
```

Software Helps You Use DOS Commands

PC-DOS Help, Disk #24, offers on-screen help for 43 DOS commands. The disk also contains a batch file that will customize the help files for the jr keyboard. It can be used as a stand-alone disk for reference when you want to use a DOS command you aren't thoroughly familiar with. Or it can be installed as a resident DOS reminder, taking up about 16K of memory. Designed by Chris Bailey, the user-supported program provides two levels of help for each of 43 DOS commands. The first level consists of a summary of the function and how to use it. This level serves as a handy reminder to be accessed just before using the command. The second level of help provides more detail about the DOS command and often helpful references to other commands used in conjunction with the command being discussed. The author also includes handy notes on how to use the command and specific examples of what each command might be used to accomplish. The disk in the jr Newsletter Software Store is specifically for DOS 2.0 or 2.1 and can be configured for either, when it is being installed.



FAMILY TREE. Powerful genealogy program with easy to use menu system. Prints handy research forms, checks your accuracy, prints variety of charts and can make your family tree into a book! 256K (Reviewed 3/90) (Disk #109)

FAMILY HISTORY. Includes complete manual on disk with how-to info on tracing and setting up your family tree with detailed genealogical information. Easy to use and modify as you gather more data. New compiled version runs faster than previous version. 128K order Disk #33 alone. 256K order #33 and #33A.

HOME BUDGET MANAGEMENT SYSTEM. Easy-to-use system for keeping track of income and expenses. Create separate accounts for income tax categories and get a summary at end of year. Provides chart of accounts, transaction reports, sorted ledger entries, etc. 128 K. (Disk #57) Or v. 3.13 for improved screenwriting and disk access speed. 256K. (Disk #57A)

HOME INVENTORY. Taking an inventory of your home might even be fun with this easy-to-use software that takes you through the process step by step. Gives a complete record for insurance purposes. Also good for listing collections. 128K. Cartridge BASIC required (Disk #58)

RESUME SHOP. Makes preparing a professional looking resume easy. Guides you through all the steps of the process with a series of menus and suggestions. One page limit. 256K (Reviewed 12/90) (Disk #121)

PC-CHECK MANAGER. A menu-driven program that can handle multiple checkbooks, unlimited payees and ledger account assignments. Requires 256K. (Disk #25)

SAVE THE PLANET! If you want to do your part to stop destruction of the earth's environment, this disk can help you. Let your PCjr explore this extensive database of information on the major environmental issues as well as what you can do to help. Charts, graphs, background facts, games and demonstrations all related to saving the only planet we have. Need 512K. (Reviewed 1/91) (Disk #120)

Junior Music

PCJR MUSIC SAMPLER. A collection of classical music "concerts" performed with great precision to produce the highest quality sound you've ever heard on your PCjr. Disk includes a separate program to activate Junior's sound generator before running game software to get highest quality sound. 128K ok (Disk #119)

JR MUSIC MACHINE. If you want to write and play music on your PCjr, this program allows you to do it. Displays music as you write it using jr's 16 colors, and plays music back in three voice harmony. Features allow you to adjust key, tempo, note values, etc. Color Display required. 128K ok. (Disk #62)

A BASIC Calendar to Start the New Year!

The following BASIC program, from Codeworks, gives you a printed calendar. In case you're interested, it's good for the years 1753 through 3999.

```
10 ` source:codeworks, issue 2, p 12                               filename: CALENDAR
15 CLS:PRINT TAB(27) ``original source of program``:LOCATE 5,31:PRINT ``C O D E W O R K S``:LOCATE
   7,30:PRINT ``3838 South Warner St``:LOCATE 9,31:PRINT ``Tacoma, WA 98409``
17 KEY OFF:LOCATE 24,2,1:PRINT ``press any key to continue ``;:R$=INPUT$(1)
20 OPTION BASE 1:DIM MM$(12)
30 CLS:PRINT STRING$(79,``-``):LOCATE 3,1:PRINT STRING$(79,``-``)
40 LOCATE 23,1:PRINT STRING$(79,``-``):LOCATE 2,1
50 PRINT TAB(23) ``C A L E N D A R   P R I N T O U T``
60 LOCATE 5,8:PRINT``Prints the calendar for a selected year (valid for 1753 to 3999)``
70 FOR I=1 TO 12:READ MM$(I):NEXT I
80 DATA J A N U A R Y , F E B R U A R Y , M A R C H , A P R I L , M A Y , J U N E , J U L Y , A U G U S T , S E
   P T E M B E R , O C T O B E R , N O V E M B E R , D E C E M B E R ,
90 `   ....^.....1.....^.....2.....^.....3
100 D$=``           1 2 3 4 5 6 7 8 910111213141516171819202122232425262728293031``
110 M$=``312831303130313130313031``
120 FM$=``   &&``
130 FW$=``S   M   T   W   T   F   S``
140 LOCATE 8,45:PRINT SPC(4):LOCATE 8,30:INPUT ``Select a year: ``;Y
150 YR$=````:S1$=STR$(Y)
160 FOR I=2 TO 5:S2$=MID$(S1$,I,1):YR$=YR$+S2$+`` ``:NEXT I
170 LOCATE 24,1,0
180 `
190 FOR MB=1 TO 12 STEP 2
200   N1=16-(LEN(MM$(MB)))/2
210   N2=57-(LEN(MM$(MB+1)))/2
220   LPRINT TAB(N1) MM$(MB) `` `` YR$ TAB(N2) MM$(MB+1) `` `` YR$:LPRINT
230   LPRINT TAB(5) FW$ TAB(46) FW$
240   MC=MB: GOSUB 510:D1=DM:YC=Y:GOSUB 450:W1=W
250   MC=MB+1:GOSUB 510:D2=DM:YC=Y:GOSUB 450:W2=W
260   FOR I=1 TO 6
270     FOR J=1 TO 7:E1=((I-1)*7+J+6-W1)*2-1
280     IF ((I-1)*7+J)>D1+W1 THEN DY$=`` `` ELSE DY$=MID$(D$,E1,2)
290     LPRINT USING FM$;DY$;
300   NEXT J
310   LPRINT SPC(6);
320   FOR J=1 TO 7:E2=((I-1)*7+J+6-W2)*2-1
330   IF ((I-1)*7+J)>D2+W2 THEN DY$=`` `` ELSE DY$=MID$(D$,E2,2)
340   LPRINT USING FM$;DY$;
350   NEXT J
360   LPRINT
370 NEXT I
380 LPRINT
390 NEXT MB
400 LOCATE 24,1,1:INPUT``Select: Quit [Q] or Rerun [R] ``;R$
410 IF R$=``Q`` THEN KEY ON:END
420 LOCATE 24,1:PRINT SPC(36)
430 IF R$=``R`` THEN 140 ELSE 400
440 `
450 ` day of week
```

(Continues on page 21)

On the Lighter Side

Troubleshooter

By Bob Todd

"Hello Yes, I remember you, I got the xerox of your disk. Yes, both pages."

"Yes, I know it was doublesided. That was not quite what I meant when I asked you to copy your disk and send me a copy."

"That's O.K., let's try to solve the problem over the phone. Put the disk in the disk drive. Close the door..."

"Fine, now close the disk drive door." (I hope he doesn't use Windows.)

"No, no. You don't have to close the windows too -- or pull the blinds"

"Try striking the space bar. When we get the message 'Strike any key' on a machine which does not have an 'any' key, we generally find that the space bar seems to work just as well."

"What! Your monitor just went blank? Look in the back of the computer and the monitor to see if the cable has become disconnected."

"It's too dark? Oh, you've just had a power failure and the lights are all out and you are going to open the blinds to get light in your office."

"I'll tell you what, why don't you call me back after you get the power back in your office and we will try again, O.K.?"

"Sure, we are out of stock right now, but when the next shipment of cursors comes in, I'll personally see that one gets sent right over to you. Bye."

"Ms. Smith, I'm going for an extended lunch. When I get back I will be in conference all afternoon. Please hold all my calls."

*[Reprinted from the PC Report,
Newsletter of the Boston Computer Society Mar 90]*

Calendar

(Continued from page 20)

```
460 IF MC>2 THEN 470 ELSE MC=MC+12:YC=YC-1
470 W=3 + MC*2 + INT((MC+1)*.6) + YC + INT(YC/4) + INT(YC/400) - INT(YC/100)
480 W=W-INT(W/7)*7
490 W=W+6:W=W-INT(W/7)*7
500 RETURN
510 ` nr of days in month
520 DM=VAL(MID$(M$,2*MC-1,2))
530 IF MC<>2 THEN RETURN
540 IF(Y-INT(Y/4)*4)=0 THEN 550 ELSE RETURN
550 IF ((Y-INT(Y/100)*100)=0) AND ((Y-INT(Y/400)*400)<>0) THEN 560 ELSE DM=29
560 RETURN
```

*** PCjr CLASSIFIEDS ***

PCjr - 640K, 5 1/4 drive, cordless keyboard, DOS 2.1, IBM color monitor, WordStar, Bank Street Writer, King's Quest and other games, all manuals. \$200 or best offer. John Love (603) 868-7317 (evenings) or 1-800-258-0802 (daytime).

PCjr - 640K, Hotshot, V20 chip, two 5 1/4 drives, Configuration Plus cartridge, color monitor, clock, Power Book II, lots of Jr Newsletters, utilities and software included. DOS 2.1 (OOwl Software V.5.11). \$500 + shipping. Roger (207) 282-3614.

PC ENTERPRISES 2400 baud internal modem, with disks and manual. Works great. Prodigy in color by selection MCGA during install. Regretfully abandoning jr for upgrade. Shipped orig. carton prepaid for \$135.00 Outstanding upgrade for Jr. Bill Stewart, 4891 Brentridge Pl. N.E., Bremerton WA 98310 (206) 377-4852.

PCJR RACORE DRIVE3, bootable 20MB hard disk, 2360K floppies, Basic cartridge, IBM PC keyboard, 1200 modem, clock chip, mouse, V20 cpu, 640K RAM, DOS 2.1, (3.3 loaded), 2 parallel ports, other keyboards, software, manuals, \$450 + UPS shipping. Call Alfred Woelk (203) 431-0777 evenings.

PRINTER FOR SALE: Panasonic 1091. Motherboard no good. Good for all other parts, including new print head. \$100 plus \$10 UPS. Also have King's Quest Release 1.00 for PCjr for \$10 + \$1 UPS. Call Brad Smith, 1807 Rollins Drive, Alexandria, VA 22307, (703) 765-7524.

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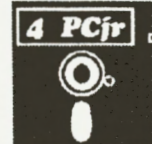
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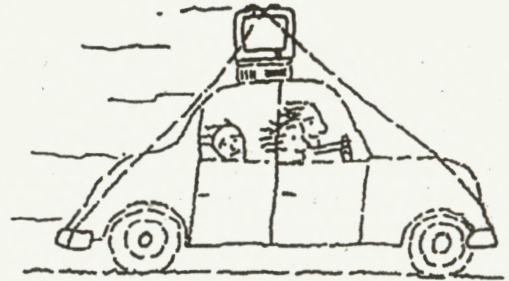
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