

Jr Newsletter

July, 1989

PCjr Compatibility Instructions Nearly Ready for Software Companies

Jr Newsletter's compatibility campaign is about to go into its next phase with the completion of detailed instructions for software companies showing how easy it is to include PCjr compatibility in their new products.

For the past few months we have been in contact with several programmers who are also PCjr enthusiasts and thus very knowledgeable about PCjr software requirements. One of them, Rick Campbell, of Wappinger Falls, NY, has taken the time necessary to compile the information from several sources into one document.

We are having that document checked by several other people to ensure its complete accuracy.

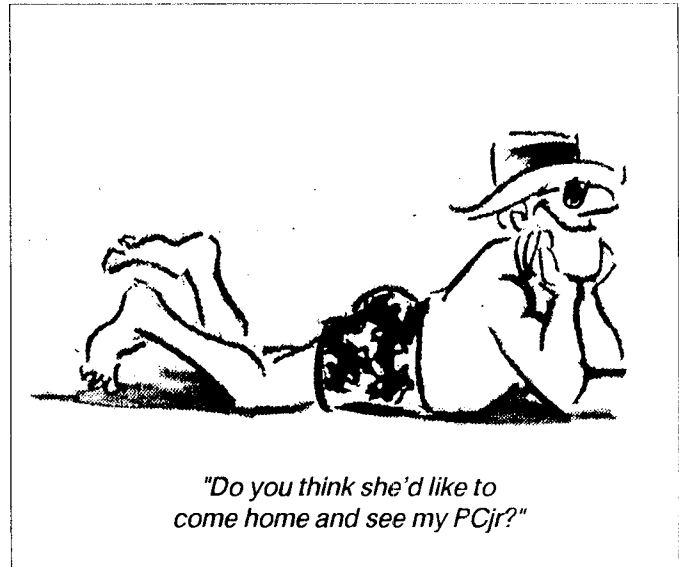
Once all comments and suggested changes are in, we plan to send the instructions to all major software publishers in the country. Even some not-so-major companies, if they express an interest in maintaining PCjr compatibility.

We have two things going for us in this campaign:

1. There are over 300,000 PCjrs in the world.
2. The Tandy 1000, a very popular computer which is currently supported by most software products, is very similar to the PCjr.

This means if software supports the Tandy 1000, it's very close to supporting PCjrs and would require only mi-

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Prodigy Will Work On PCjrs With Special Screen Driver

The Sears-IBM entry into the telecommunications service market, called Prodigy Interactive Personal Service, will work with PCjrs as long as you use a special screen driver not provided by Prodigy.

Officially, Prodigy does not support PCjrs, although representatives of the company say they may include PCjr support in the future. If you try to use the Start-Up Kit, provided free of charge as a promotion in some parts of the country, you will see a screen full of color interrupted by blank lines, and for the most part unreadable.

But after you copy the PCjr screen driver to the Prodigy disk, you can see all Prodigy has to offer in 16 colors.

[We have added this driver, along with a patch to operate the telecomm software Telix Version 3.x, to our PCjr Patches (Disk #56) this month. With these upgrades, we have raised the version number of PCjr Patches to Version 5.0.]

The Prodigy incompatibility problem appears to be another case of being "so near and yet so far." The PCjr screen driver is the Tandy screen driver with a very minor change -- just one byte.

We plan to include Prodigy on the list of companies who will receive our PCjr Compatibility Kit, designed to show software publishers how to include PCjr compatibility in their new products.

The Sears-IBM partnership is conducting a multi-mil-

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PCjr Lives!

Beginner's Corner:

I Just Got A Computer--Help!!

by Ima Beginr

After carrying the machine home, unpacking the parts, reading the assembly instructions, plugging some wires in parts that don't seem to match, re-reading the instructions, screwing more parts together, calling for help about what the instructions mean, wiring more parts together, and finally with sweat streaming down your brow you find the on/off switch of the computer and turn the computer on. Nothing happens! Egad, now what! I know ... call Mr Guru. He knows all about computers.

"Hello Mr Guru! This is Ima Beginr. I just bought a computer from my friendly neighborhood computer store, I put everything together just like the book said - I think - I turned the switch to on but the computer doesn't run."

"Hmmm. Ima, check to see if the power cord is plugged into the power strip."

"Yup, it's plugged into the power strip. I think it's called a surge protector or something."

"Well Ima, it's called a surge protector. It protects the computer from jumps of current that exist in all power lines to keep them from damaging the computer. Now let me ask you the next question. Did you plug the surge protector into the wall?"

"The instructions didn't say anything about plugging it into the wall."

"Trust me Ima. Plug it in."

The line goes dead for about a year

"Oh Mr Guru. It works! It works!"

"I knew you could do it Ima. While I have you on the phone tell me. Do you know what you should do next?"

"Turn it off I suppose. I don't know anything about these things."

"Well before you do that Ima lets do the following. First, do you have your DOS disk handy?"

"Yup, I used it to start the machine. I can throw it away now can't I?"

"Goodness no! You will need it each time you start the computer. DOS stands for Disk Operating System. Your computer needs the information on the disk to make it run. When you start your machine with the disk in the floppy drive it is what we call BOOTING it up."

"I thought that is what you did to the machine when it didn't do what you wanted it to."

"You might feel like you want to do that sometime Ima. But we don't really do that. The first thing you should do is to make a duplicate of the DOS disk."

"Why on earth would I want to do that? Isn't one DOS

disk enough? After all, I only have one computer!"

"That's a good question Ima. The reason you should make a duplicate of your DOS disk is to protect yourself in the event something should happen to it. Further, after you have made the duplicate put the original DOS disk away somewhere where moisture, heat, or magnets won't get to it."

"Would it be safe if I put it next to my stereo? It's always dry there, and it's nice and warm."

"Goodness no Ima. Stereos put out magnetic fields which can destroy the content on the disk. And, the heat could also harm it. Why don't you put it in a separate box and put it in the bottom of your clothes dresser drawer."

"OK Mr Guru. But how do I make a copy of the DOS disk?"

"Fair question Ima. Do you have some blank disks that have nothing on them?"

"Sure, I've got a whole box full. In fact I bought two boxes so I would have enough disks to last me forever. Do I have to use one of them now?"

"You've got it Ima. Now we will get started with duplicating it. Do you have one or two floppy drives on your machine?"

"I've got two."

"OK. Now the first thing we must do is to write protect the disk. In your package of blank disks you will find some black patches about 1/2 inch wide and one inch long. We call these write protect tabs."

"I've found something like that except the tabs are yellow. These must be the pretty ones. Are they OK?"

"NO ! There are some disks being sold that allow light

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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

A reader wrote in a short while ago that he was able to set up a 3 1/2" 720K drive as both drive A: and drive D: with DOS 3.xx but that it would only write 60K even though it would read 720K. If we remember correctly, he had installed it internally to replace his A: drive. A reminder for those of you who have done this, or are planning to do so: ONLY when this drive is actually accessed as D: will it both read and write (or format) 720K diskettes. Though it is the same physical drive, the DRIVER.SYS software of DOS 3.xx sets it up to write 720K only when it is accessed as D: and NOT A:. It will, however, read a 720K diskette when it is the A: drive. Try to find THAT clearly explained in the DOS manual! The jr's ROM BIOS always sets up A: to write 360K... Our apologies if we were only as enlightening as the DOS manual.

Q. If my disk drive breaks down, will ANY 5 1/4" drive replace it? Various readers.

A. Not quite. First, there are two physical fit problems, the same as in a standard PC. The face plate is slightly less from top to bottom and the (door) lever, if there is one, MUST be positioned low enough to be able to fit through the front opening of the jr. The flat cable connector SHOULD be on the top, RIGHT rear because the fan body may be in the way of the connector if it is on the left rear of the drive. Just ask your seller if the drive is a replacement for the standard PC and it should do. The smaller power cable is usually not a problem. Electronically, any double-side double-density 360K drive for IBM and compatibles works.

Q. What does a print spooler do? Various Readers.

A. There are slightly different ways spoolers do their

thing, but the results are pretty much the same. Here's a general routine: Instead of sending word-processor output to the printer, one uses the SAME output (NOT the regular save) and sends it to a disk file, just as if it were a printer. In other words, PRINT the text to a disk with a new name! Now comes the spooler's job... You simply command the spooler program to print the file you have just made. It drops into the background and returns you to the DOS prompt. It begins to print right away, if you told it to, and churns merrily along, even while you start another program from the DOS prompt. Spoolers even allow more than one file to be printed, you just tell them which files to print, and they line up in order and are printed one after the other, even if you are playing some game. It seems like a kind of primitive multi-tasking while it is operating. Some spoolers take up very little memory while operating, others have large buffers, so they don't interrupt your other work as often. There is a variety of them out there, so you can be choosy. Some can even hi-jack output intended for the printer and print it later, or in the background while you continue working.

Did you know that there is a simple spooler on one of your DOS disks? It is called PRINT.COM. Look in your DOS manual for details, but why not try it, using your present word-processor as outlined above. Write some text, print it to a disk (not the printer) with some new creative name like TEST.TXT, then get back to DOS. With PRINT.COM on available just type PRINT TEST.TXT <Enter>

The DOS prompt returns, the printer starts churning away and you can immediately go back to your word processing, or whatever. You will notice, however, that every time the spooler needs more stuff from the disk your keyboard will be interrupted and the program you are working on may slow down or "hiccup" occasionally. Ahh... well... so much for multi-tasking with the 8088 8086 CPU.

Q. I have recently acquired AUTOSKETCH Standard Version 1.04. It works fine. FLOORPLAN however (a \$25.00 addition will not finish loading and I get "BGI error: Graphics not initialized (Use InitGraph)." What do

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Questions and Answers

(Continued from page 3)

you suggest? Can you save FLOORPLAN for jr owners?
R. B. Eberle, Dallas TX.

BGI error is an internal error message. It can show up if certain portions of the program are not found on the default drive or if the graphics chip set is not one of the "standard" sets such as are in other IBM compatibles. This program examines the machine it is running in and tries to ascertain available graphics chips and modes. We called Easy Software in Tempe, Arizona and spoke to some wonderfully friendly, understanding and knowledgeable people about this problem. If you send your original diskette to them, (Attention of Robert) explaining that you are running a jr and want the "configuration menu" version (which will over-ride the inspection routines) he will send a replacement which should run on the jr. With this version, you will be able to select the graphics capability, etc. when you start the program. Call first though, as there will probably be a small mailing charge. Be warned that they have found some inconsistencies with a few memory-recognition CONFIG.SYS files, so you may have to make a booting disk other than the one you are now using. We have no details at the moment, but will try to compile a list of suggestions for jr users. We invite our readers to share their successes and failures with various CONFIG.SYS files and hardware for this program.

This company, Easy Software, also produces and sells a complete line of Educational and Game Software specifically for jr users. These run the gamut from primary school all the way to such learning levels as algebra, etc. Our readers may call 1-800-522-EASY (product support) or 1-800-999-9614 to find out more, or for orders. From our conversation, we believe that they are going to make an even more concerted effort to support the PCjr. We welcome them into the family!

Q. I am having a problem with my IBM Writing Assistant program. I can boot and start word-processing but when I try to print it, I get I/O errors. I've had the program for about four years now and have had no problems. My dealer says that a lot of jr owners are having the same problem and recommended that I try to get a patch from you. Denise B. Watson, Lincoln, AL.

A. If the program has been running for four years without a problem and you have not changed anything in the jr, you really are having I/O errors. The first thing to do is to make new working diskettes from the original-out-of-the-box diskettes. It is possible that the ones you are now using have worn surfaces and have become unreadable. (You are NOT using the originals, are you??!!) The disk drive heads may be dirty or in need of alignment and the

controller card should be checked for proper insertion in its slot.

Q. I have disks #52 and #65, both of which are supposed to allow one to set up a ramdisk. Needless to say I have been unable to partition my RAM. Your recent article reminded me to try again. You guessed it, no luck. Could you explain, step by step how to achieve a C: ramdisk? W. Mullin, Lincoln, RI.

A. Here's one of the routines available: First, be sure both RAMDRV.SYS AND SETRAM.EXE from disk #65 are copied to your booting diskette.

Second, add the command DEVICE=RAMDRV.SYS to your CONFIG.SYS file on the booting diskette. The existing CONFIG.SYS should already be set up to recognize any memory expansion.

Third, add the command SETRAM C: 100 to your AUTOEXEC.BAT file. (If you want a 100K ramdisk, for example.)

Fourth, you must re-boot. Now you'll have a memory drive called C: of 100K.

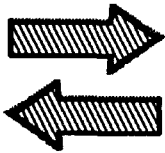
Remember, you must have enough memory to hold both the ramdisk and your programs!

There are other ways to make a ramdisk; the instructions on both #52 and #65 are correct, and they must be followed precisely.

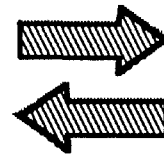
Q. I replaced my jr floppy drive less than a year ago with a Fujica M2551 drive. I'm experiencing read-write errors. A local computer center checked out the jr for me and said the jr controller was OK but the drive was going bad. My jr is not heavily used; can you recommend a brand for replacement? M. Olenski, Dayton, OH.

A. We don't know what "going bad" really means, but if the drive is less than a year old, and is not heavily used, it should simply be re-aligned and/or cleaned and lubed and all adjustments tightened firmly. Before doing anything else, be sure that the controller is properly pushed into its slot and that all the cable ends are clean and firmly seated. As we don't know which version of DOS you are using we can't say what the step rate of the heads are or should be. If you are using DOS 3.xx and the Fujica is a DIRECT replacement for the original, you should be using one of the step rate adjustment programs on disk #52 to adjust the drive head speed to the IBM specs. If you are using DOS 2.1, it might be necessary because the Fujica might need a faster (than IBM PC & PCjr) step rate to operate properly. One more thing; we have found that many "not heavily used" computers are also "not often cleaned" computers. Even if the computer is not heavily used for an extended period, we find that cleaning the drives monthly alleviates most read-write errors! Be sure to use a "wet and dry" system, not a "dry only" cleaning kit for this job.

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Reader Feedback



New PCjr User Recommends Software

Just a quick line to let you know how much I enjoy your newsletter. I bought my PCjr last August when a prep school in Bel Air "upgraded" their computer science department. So several young millionaires have used our little PCjr. For \$100 I got a 128K PCjr, a monochrome monitor, and a DOS disk. There were no manuals or operating instructions. It took days before I could puzzle out the procedure to run my first program. Since then I have added a Racore II expansion unit with 640K and a letter quality printer. With the help of the Jr Newsletter and some books from the public library I have progressed to the point where I am writing my own .BAT files.

I use my computer for word processing, to play chess, and to keep track of my meager finances. One program that I use often and can recommend for its simplicity and usefulness is **Instant Recall**, a free form data base. It can perform word searches and has cut and paste capabilities. I use it for a diary of events on my job and I can quickly call up my notes on some half forgotten situation. It would make a worthwhile addition to your software store.

Steven D. Long, Los Angeles, CA

A Way To Improve Sound Quality Provided By Reader

Thanks for making it easier for junior users to survive out there. I have a couple of questions and one suggestion. First of all, the internal "speaker" in the junior has always annoyed me. Some programs such as **Alley Cat** ask if you have an external speaker, which then disables the one inside the junior. Does anyone know how this is accomplished (aside from the command in BASIC)? It would be a useful routine to put on an AUTOEXEC.BAT file.

While I'm on the subject of sound, I know a way to greatly improve the sound capabilities of the junior. This can be accomplished by connecting the junior to a stereo or radio with aux/cd capabilities. First an audio line needs to be connected to the audio jack in the rear of the junior which is marked with an A. At the end of this line you need to attach a Y-signal splitter (which can be bought at Radio Shack). Attach these two plugs into the left and right line inputs on aux/cd option. Finally put the stereo on aux/cd

mode, turn up the volume and enjoy the sound from the junior. This works great with games like **Thexder** or any of the music programs on the market.

Finally I have a question concerning the 64K upright memory card in the PCjr. Would it be possible to replace the card with one with greater memory or to increase the memory on the card itself. If this is possible, maybe a PCjr support company could develop this. It would be an easy way to add extra memory especially if you have 640K and would like to upgrade to 732K without an additional sidecar. Thanks for a great newsletter!

Marc Ducret, Old Greenwich, CT

EDITOR'S NOTE: There is a program called `silenc.com` on Jr Power Pack (Disk #52) which turns the speaker off. As for your suggestion for adding memory on the 64K card, it would seem to be the best way to go, but unfortunately this is not possible, which is why most memory expansions are built into a sidecar.

Reader Reports "Thud Ridge" is PCjr Compatible

I am writing for two reasons. Please pass on to the readers that **Thud Ridge** by Three-Sixty Pacific will work on a Jr if you have 640K of memory and a full function keyboard (ie. one that has a full numeric keypad with the "+" and "-" keys). If you only have an IBM Jr type of keyboard, the throttle function doesn't work due to the missing numeric keypad keys. The separate function keys also make it easier to play the game. The box states that 512K are needed, but this isn't enough for the Jr; if you try and run it on a 512K machine you will get an "insufficient RAM" error message. Before I upgraded to 640K I tried using the default 16K video buffer and the software still wouldn't load into the machine. I use DOS 2.1 configured for a 96K video buffer with an IBM memory sidecar configured with 512K, along with a Datadesk PC 87000 Jr/XT keyboard and have had no problems running the program. I also ran it on a friend's 640K Jr using DOS 3.0 with only the above mentioned problems due to the IBM Jr keyboard. The only thing that I don't like is that it will only work in CGA on the Jr and I'm not fond of four color games.

Alex Hrapunov, Goldvein, VA

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Reader Feedback

(Continued from page 5)

Turbo Tax and Its 'Pro' Series Both Run Fine, Reader Reports

I thought my fellow PCjr readers would be interested in my experience with Turbo Tax. Especially Mr. Robert A. Van Orden of Herndon, VA, who in the April issue reported problems with TTAX version 6.01. I not only used TTAX 6.01 with only one disk drive and 640K on my junior, but have also used the Turbo Tax Pro Series (TT1040) which requires 3 disks, not just the two for the personal version that Mr. Van Orden used. This is because it is for tax professionals with many clients and many more complex tax issues.

I had no disk or print problems with either as reported by Mr. Van Orden. I did not utilize a RAM disk, and used DOS 2.01 without the graphic.com. I did get prompted to insert disk in drive A: or drive B:, and not knowing which one of the 3 disks to insert when first running the program can get confusing. But after the second booting the program becomes almost second nature which disk needs to be placed in the drive.

However, there were occasions that I inadvertently put in the wrong disk and got dumped out of the program! There is an emergency save feature so you don't lose the information you already inputted, but not all the time!

I found both versions of Turbo Tax to be excellent, easy to run, and very comprehensive. The Pro series at \$395 is expensive, however.

Philip Schwartz, Parsippany, NJ

Journalist Loves His PCjr And Teaches Others To Use XYWrite

More than half the fun of owning a PCjr, at least for me, has been learning about how it works. I'm convinced that if I had a "modern" system, I'd be bored with it and it'd just be gathering dust in the closet.

I bought my jr in 1986 without realizing it was already an orphan. It was only a game machine until I started reading about upgrades, tips and tricks that made it sail with the best of them. As has been said many times in the Jr Newsletter, memory is the most important upgrade a jr user can make. I have JrHotshot for a total of 640K.

Here's a story you might be interested in:

Our paper is in the process of installing PCs and new

reporters and editors' software. Most of the data processing people knew little about PCs, it seemed, so for a long time the machines and the reporters' software (XYWrite) just sat around waiting to all be hooked into the big Vax. In the meantime, I was testing XYWrite at home on my jr.

One day, at a meeting of the managing editor and editors and reporters from our desk, a reporter asked why we couldn't be using the PCs and phoning in stories with modems. The ME said he didn't know if it could be done, but I told him there was really no reason why it couldn't.

The next day I was called in to work early to attend a meeting with the paper's editor, managing editors and data processing officials. When the question of using the PCs with XYWrite and modems came up and doubt was expressed, I told them all it could be done and I could do it. I'd simply install a RAMdisk, automatically copy the necessary files to it, and have the program boot automatically so that inexperienced reporters were not strained. Greek to many of them, but thanks to what I'd learned from my jr, a snap to me.

I was put in charge of the project and accomplished it. I've given countless PC-XYWrite-DOS lessons to beginners since. And, I've also been placed on the lead committee to research and install new editing software, keyboards and terminals. It's been lots of work, but fun, and it may even lead to something career-wise someday.

Despite my success at work, I still consider myself nothing more than maybe an advanced beginner. I figure that's why I can't make Procomm 2.4.2 work on my system. It simply refuses to dial any numbers. I have no problems with PC-Talk III or JrTele (Disk #86 in the Software Store), which, by the way, is really outstanding. I must be missing something real basic. Any help?

One more thing: when using PC-Talk, I always get a lot of line noise indicators (<<<<<>>>>). That doesn't happen with JrTele. Uploads and downloads work fine, but sometimes my screen is a mess. Any ideas?

Rob Perschau, Grandview, MO

EDITOR'S NOTE: In answer to your question about dialing with Procomm, we assume you have tried switching the COM port number using either a utility like swapcom or by simply altering it in your Setup (Alt-S). We use Procomm almost daily with no problems, so you should be able to resolve your dialing problem. One other possibility might be if you are entering long distance codes directly as part of the number you are trying to dial. You should be storing your long distance codes in the codes part of the directory, not with the numbers themselves. When you want to dial a number using the # code, just put # before the number.

As for the line noise when using PC-Talk, there is no reason we can think of for one software program to be more susceptible to line noise than another. Certain mo-

dems are more susceptible, and sometimes using a faster baud rate picks up more, but not the software itself. Are you sure it's not coincidence that you've had more line noise with PC-Talk than JrTele?

A Turbo Pascal Reboot Provides Alternative to One In BASIC

I read Mr. Howard Griffin's letter in the May issue with interest, especially the part about the "reboot" program. It occurred to me that the same thing could be done in other languages and thus avoiding the use of BASIC. As it turns out the process is very simple using TURBO PASCAL. The approach that I used was to replace the vectors for the system clock tick interrupt with the vectors indicated in Mr. Griffin's letter. The first tick of the clock, after the program is executed, will cause the system to "reboot" and since the maximum time between ticks is about 56 milliseconds it seems to happen immediately. The code is as follows:

```
Program Boot;
Type
  address = ^integer;
Var
  vector : array [0..$FF] of address absolute $0000:$0000;
Begin
  vector[$1C] := ptr($F000,$E05B);
End.
```

On other systems, you might try using the "intr" call to interrupt Hex19 for the same function. I tried it on an AT at work and it was better than the one above because it skipped the memory check part of "bootup". When I tried it on Jr, however, it cleared the screen, went back to the 40

PCjr To Tandy Mod With Racore And A Question About Software Patches

My system includes a PCjr equipped with a 640K jrHot-shot expansion board and a Racore Drive II Plus (no DMA) for dual-drive capacity.

Like many of us, I am frustrated by manufacturers who configure their software for TANDY 16-color capability but who neglect to provide an equivalent mode for my system.

Here's my question; if I make the TANDY graphics modification described in your April issue, what effect would this change have on programs (mostly non-game software such as WordPerfect 5.0 and Quicken) that I currently run without problem in the PC four-color/CGA mode? My Racore unit, for example, includes the infamous

PCjr "compatibility" switch, and I'd like to know if this option would remain open to me should I decide in favor of making the TANDY change.

Alternately, if I decide not to make the modification, is there some way that neophytes such as I can learn how to design our own patch (similar to that available for Flight Simulator 3.0) for use with software that supports the TANDY but neglects the PCjr? I realize this challenge may be too complex for those of us, like me, who are not familiar with assembly language programming. But I also wonder whether in providing PCjr compatibility might also benefit PCjr users.

Finally, I'd like to report that Electronic Arts' splendid new 688 Attack Sub runs well on the PCjr, but (as usual) only in paltry four-color. Is anyone out there interested in putting together a patch for this program, as well as for Accolade's Rack 'em (another winner on the PC but inoperable on the PCjr)?

Your magazine is a continual source of help and support. Keep up the good work!

Bob Kienle, Chicago, IL

EDITOR'S NOTE: Although it's impossible to test all configurations in combination with all software, we have found no problems using the PCjr to Tandy modification with Racore units, either in PC or in PCjr mode.

As for designing patches, some are quite easy to do, while are others have proved more difficult. Our PCjr compatibility instructions are designed for use by experienced software designers, but they do include information useful to those who want to write patches. However, the writing of patches is best left to those with some programming experience. PCjr users can obtain new patches from Bulletin Board Systems or from the PCjr Patches Disk #56 in the Jr Newsletter Software Store, which we update regularly when new patches become available.

* Special Notice to Parents *

Did you know that, when a high school student was asked to identify Chernobyl, he answered that it was Cher's full name? If you don't want that kind of answer coming from your kid, you better start participating in his or her education. One way to help is to encourage the use of educational software on your PCjr. There are many excellent titles to choose from, for all grade levels and all subjects.

How Your PCjr Memory Works (Part 3)

By John King

This month we will examine some memory management utilities. These special programs are required before the PCjr can use more than 128K of RAM memory.

When your PCjr is first turned on, the ROM BIOS assigns the 16K bytes of memory from 112K to 128K for video information. Programs will load below 112K. However, programs cannot run in memory split into two pieces, so any memory above 128K is unusable at this point. Therefore, the PCjr ROM BIOS places the value of 112 (actually 0070 in hexadecimal notation) in the memory location that DOS checks to see how many K-bytes of memory are available for programs.

Since DOS will believe memory ends at 112K, the video area will be protected from being written over by any programs. This also will prevent any program from being divided across the video buffer and crashing.

Significantly, the ROM BIOS also stores the true amount of memory at another location. Memory management programs can read this value and write it to the address read by DOS after they have moved the video buffer area.

As mentioned last month, the Video Gate Array, VGA chip, can position the video buffer at any 16K boundary in the first 128K of RAM, i.e. 0, 16, 32, 48, etc. The memory management utilities allow a new position to be selected.

Of course, video cannot start at 0K because the ROM BIOS uses this area. It cannot start at 16K because IBMBIO.COM and IBMDOS.COM must be loaded before the computer knows how to load any other programs. So, the memory from 32K to 48K is really the first practical new location for video.

There are two major approaches to memory management. The first, used by IBM and Racore, is to create the video buffer before COMMAND.COM is loaded, as shown in Table 1. This is done by making the video buffer a device driver which is loaded from a CONFIG.SYS file. The IBM program which does this is PCJRMEM.COM. The Racore program is JRVIDEO.COM, or JRVIDMA2.SYS for their newest systems.

The second approach, used by Tecmar and Impulse, is to load COMMAND.COM and make the video buffer a "terminate but stay resident" program as shown in Table 2. This is done by Tecmar's CONPCJR.EXE and Impulse's EXTRARAM.EXE. Both of these programs are called from an AUTOEXEC.BAT file.

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Table 1. PCjr Memory Map with IBM or Racore Memory Management

| Memory Contents | Starting Address | |
|--|------------------|-------|
| | Bytes | Hex |
| ----- | ----- | ----- |
| ROM BIOS Image (data area) | 0K | 00000 |
| IBMBIO.COM | 1K | 00500 |
| IBMDOS.COM | 5K | 01500 |
| CONFIG.SYS Files | 20K | 05000 |
| | | |
| * * VIDEO DEVICE DRIVER | 32K | 08000 |
| PCJRMEM.COM (IBM) or JRVIDEO.COM (Racore) (16K video buffer) | | |
| BUFFERS | 48K | 0C000 |
| OTHER DEVICE DRIVERS | | |
| COMMAND.COM (resident portion) | 49K | 0C300 |
| | | |
| Program Area | 52K | 0D000 |
| Your program runs here. | | |
| Expansion Memory (512K added) | 128K | 20000 |
| COMMAND.COM (transient portion) | 526K | 83800 |
| Top of Program Space | 640K | 9FFFF |

In all cases, the memory management program reads the true amount of memory and compares it to the value to be used by DOS. If the true value is larger, the program copies the larger value to the address read by DOS and does a partial reboot of the computer.

This reboot, accomplished by Interrupt 19, causes IBMBIO and IBMDOS.COM to be reloaded from the boot disk. When they are reloaded, they read the new value of memory size written by the memory management program.

For example, a PCjr with 640K of RAM will initially have the value 0070 Hex (112) stored at address 00413 Hex for DOS and 0280 Hex (640) stored at address 00415 Hex. During the first pass, the memory management program will copy the 0280 Hex from address 00415 to 00413 Hex and reboot via Interrupt 19. The second time the memory management program is run (remember, we did a reboot so each step is repeated) the true value and the value for DOS are equal, so it doesn't repeat the booting. Instead, it goes on to re-position the video buffer, see Tables 1. and 2., and ends. Now memory up to 640K will be recognized by DOS and available for applications.

This reboot is very obvious with Tecmar and Impulse software because you see the first line of the AUTOEXEC file twice. IBM and Racore software are doing the same thing; it's just not so obvious.

Both methods of moving the video buffer down work well, but there are some differences worth noting. A comparison of Tables 1. and 2. shows that the key difference is the position of the video buffer in relation to the resident portion of COMMAND.COM.

Using Tecmar's CONPCJR and selecting the video buffer to start at 32K, there is only about 4K available for additional buffers or device drivers below COMMAND. This means that if you try to put any value greater than BUFFERS=7 into a CONFIG.SYS file, you will lock up your PCjr. You can start the video buffer higher, at 64K, but this wastes some memory. It is not possible to start a 16K video buffer at 48K with CONPCJR, even though the manual suggests it's possible.

The Impulse software is more limited since it always assigns the video buffer at 32-48K. Not only are more than seven buffers impossible, but DOS 3.1 cannot be used because it is larger than 32K.

IBM and Racore don't have these problems because the buffers are installed above the video buffer. Any number up to 99 can be used. Also, DOS 3.1 can be used because both programs automatically move the video buffer up to start at 48K.

Finally, the Tecmar ramdisk is installed from the DOS prompt, or an AUTOEXEC.BAT rather than from a CONFIG.SYS file as are all the others. This ramdisk, or MEMDISK, when used with CONPCJR.EXE is installed in high memory and works with PCjr BASIC while the others do not.

Table 2. PCjr Memory Map with Tecmar or Impulse Memory Management

| Memory Contents | Starting Bytes | Address Hex |
|---|----------------|-------------|
| ROM BIOS Image (data area) | 0K | 00000 |
| IBMBIO.COM | 1K | 00500 |
| IBMDOS.COM | 5K | 01500 |
| CONFIG.SYS Files | 20K | 05000 |
| BUFFERS | | |
| OTHER DEVICE DRIVERS | | |
| COMMAND.COM (resident portion) | 21K | 05400 |
| ** VIDEO BUFFER, 16K Resident program created by CONPCJR -a -p2 (Tecmar) or EXTRARAM (Impulse) | 32K | 08000 |
| Program Area Your program runs here. | 48K | 0C001 |
| Expansion Memory (512K added) | 128K | 20000 |
| COMMAND.COM (transient portion) | 526K | 83800 |
| Top of Program Space | 640K | 9FFFF |

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Racore User's Ramblings (Part 1)

By Herb Vrooman

I purchased my first junior in January of 1986. I got it for personal use. I learned 1-2-3 on my own. I wrote a pretty extensive BASIC program for check writing. During this time I also wrote a very simplistic BASIC program for my brother-in-law. He runs a sheltered workshop and was given a junior. He still does not want to know anything other how to press a button or two - so a simplistic program was appropriate for him and right up my inexperienced alley.

Many doctors and others in Maine still use that program to complete government health care claim forms. I found that I was still taking work home - I was a bank branch manager - but selecting work that could be done on my computer. So I purchased a second junior and took it to work. I figured that some day I could use this system for parts.

I hoped, however, I would either leave the bank or computers would be installed in the branches before I would need the system for parts. The best part was that I no longer carried a heavy briefcase. I carried a diskette holder with my 123 system disk and a working diskette.

As it turned out, I left the bank and am a staff/cost accountant for a manufacturer of fine papers. They purchased a PS/2 model 60 for my use. Which by the way, an article in the August, 1988 PC World calls it a PS/2 junior because of the new souped up model 50 and new model 80. An emulation board allows me to use the PC as a workstation of the main frame cpu. My printer is also a remote

unit for the mainframe. Using the program Softbytes allows me to access the remaining 384 K on the PS/2. This gives me 1024 K for programs such as Lotus 1-2-3.

As my backup system is still going I have three systems to work on.

Backup system:

- * IBM PC Junior (128 K) with Racore model 1200 drive 2 (384 K) and a P C Enterprises 256 k side car (224 K) for system total of 736 K. Legacy serial card in the internal modem slot. U S Robotics external modem - Sportster 1200. Cherry infrared PC keyboard - (P C Enterprises) with the function keys on the left side. (works with Keytronics keypad) Cartridges - BASIC and JrSyncro. The System is hooked up to my 19 inch color TV. This Sears unit has special computer monitor features.

- * An Epson Lx-86 printer, keytronic keypad and jr color monitor are in storage. I use this system for accessing Compuserve, Boston Computer Society's BBS, Paul Rau's BBS, and other bulletin boards. I would also use this system for games to entertain visitors.

Here's how I use the Racore unit:

- * Racore PC mode: Using Racore memory management programs (pc video & speeder) will recognize 640 K. However I can fill the first 128 K with TSR programs instead of using Speeder. If one of the newer versions of Larry Newcomb's Jrconfig is used in PC mode the only thing allowed in the first 128k is a ramdrive. (When I am in Lotus 1-2-3 and go to "system" the computer must be rebooted if I attempt to return to Lotus!) Furthermore, only 640 K is recognized by Jrconfig when the Racore unit is in PC mode.

- * Racore jr mode: Using Racore's memory management program, jr video, I can use the 16 color junior. In the Jr mode Newcomb's jrconfig will recognize the full 736 K. However, Lotus will still lock up (using newer versions of jrconfig) if anything other than the ramdrive or other drivers are in the first 128 K. Lotus will show the memory above 640 K as regular memory.

The main system:

- * IBM PC Junior (128 K) with Racore model 1200 drive 2 (512 K) and an IBM sidecar modified to (512 K) expanded memory by Paul Crumley. Certain programs, such as Lotus 1-2-3, can utilize this expanded memory (640 K to 1152K).

- * 20 Meg Seagate Hard Drive (Paul Rau System)

- * A PC Enterprises 3.5 inch drive is installed in the Racore (must use DOS 3.x) The Racore (3.5 drive) is drive A and E. The Junior (5.25 drive) is B and E. The Hard Drive is C., and F: is a ram drive.

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* A Nickel Express Turbo board was installed by Paul Rau (I had a junior with soldered instead of socketed chips, which made the job more complicated. Note: Most juniors have socketed chips.)

* Mouse by Mouse Systems.

* Cartridges - Hardbios (boots from hard drive) and JrSyncro. The JrVideo Cartridge also works with the Hardbios Cartridge.

* BASIC: I use the diskette version. Renamed it Basicr and used the DOS patch that overrides the search for the cartridge. Datadesk Turbo 101 keyboard. Had to get this. Matches the PS/2 keyboard at work. The function keys are at the top. I really prefer the Cherry board. But I was always looking for the Function keys in the wrong place.

* Epson LX-90. Some day I'll have to get a monster printer to go with this monster system. This \$ 200.00 printer may be slow but price was right.

A Fun To Use Word Processor That Helps Kids Learn To Write

Word Processing for Kids (Disk #41) is, as its name implies, designed especially for children who are just learning to write. Children will find it fun and easy to use. With it they can concentrate on expressing their ideas instead of perfecting their handwriting and/or erasing abilities. Here is what the author, Sidney Nolte, says about the software in the eight page instruction manual, which is included on the disk: "We developed this program because we feel that more than any other kind of program, a word processor can do much to help children learn to communicate through the written word. While those word processors developed for adults have the features required for professional writing, they do not serve children. They simply are much too complex.

"We undertook the task with the major design goals to be that of simplicity while serving the needs of the target age group, beginning writers. We think writing should be a fun experience for kids opening a whole new world of communicating in a new way. Everyone we have shown it to, including the children who have tested it, were enthusiastic about it.

"It can be used by very young children with but a brief training period, since it uses only a few keys. It uses the large type font typically taught in school rooms today and so will be familiar to the child." Word Processing for Kids uses the color capabilities of the PCjr to good advantage and will run on 128K. See page 23 for ordering information.

Owl Software

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PCjr JOYSTICKS - \$27.95 or 2 for \$54.00 plus \$4.00 shipping.

V20 CHIPS w/INSTRUCTIONS just \$15.00 plus \$3.00 shipping.

MOTHERBOARD MODIFICATION - Remove soldered in 8088 and replace with socket. \$29.95 plus \$6.00 shipping.

IBM SIDECAR MODIFICATION - Modify 128K sidecar to give memory to 736K. \$19.95 plus \$4.00 shipping.

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Scholastic Provides PCjr Listing

In response to an inquiry from jrNewsletter, Scholastic, Inc., one of the best publishers of educational software, sent us a list of its PCjr compatible programs.

As part of our campaign to encourage PCjr compatibility in future programs we will be providing Scholastic with instructions on how to include PCjr compatibility from now on.

The following list includes quite a few outstanding educational programs and we are printing it here for parents who may want to purchase to encourage their kids to learn on the family PCjr.

The most notable recent title on the list is Slide Shop, a program that allows you to produce slide shows on your computer for both teaching and learning (projects, demonstrations, etc.). Scholastic informs us that Slide Shop has been nominated for several awards.

Here is the list of PCjr compatible software from Scholastic:

I. PUBLISHING/MULTIMEDIA

| Product | Memory | Price |
|-------------|--------|---------|
| Super Print | 256K | \$32.95 |
| Slide Show | 256K | \$72.95 |

II. WRITING TOOLS

| | | |
|--|------|---------|
| Bank Street Writer III ** | 256K | \$79.95 |
| Writing Skills Bank for Bank Street Writer III ** | 256K | \$59.95 |
| First Draft | 128K | \$21.94 |
| Story Tree | 128K | \$32.95 |
| pfs:Write | 256K | \$32.95 |
| pfs:File/Report | 128K | \$32.95 |
| Success With Typing | 128K | \$16.95 |

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| Fractions Part 1 | 256K | \$21.95 |
| Fractions Part 2 | 256K | \$21.95 |
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IV. READING

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| | | |
|-------------------------|------|---------|
| The Tales of the Future | 128K | \$21.95 |
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| Tales of Daring | 128K | \$21.95 |
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| Tales of Suspense | 128K | \$21.95 |
| Tales of Adventure | 128K | \$21.95 |
| Tales of Discovery | 128K | \$21.95 |
| Tales of Mystery | 128K | \$21.95 |
| Agent USA | 128K | \$21.95 |
| Logo Robot | 128K | \$16.95 |
| | 128K | \$16.96 |

VI. OTHER PROGRAMS OF INTEREST

| | |
|---------------------|---------|
| pfs:U.S. History ** | \$79.95 |
| pfs:Plan ** | \$99.95 |
| pfs:graph ** | \$99.95 |

* All prices include shipping and handling.

** School Editions only. School editions are also available for all Scholastic Software programs. For information about school editions, please call toll free at 1-800-541-5513.

How to Boost Your Memory Beyond the 640K Limit

A simple modification to an IBM memory expansion sidecar can provide an extra 96K for a PCjr already expanded to 640K.

This modification works only with IBM sidecars, not with memory expansion units manufactured by Tecmar, Microsoft or others.

To perform the modification, lift pin 14 of the 16 pin dip module located directly below the four position switch. The chip will have the number SN74HC151 or something very similar on it.

Next, wire pin 14 to pin 16. That's all there is to it. All switches are left on and you don't have to reposition the jumper.

Since this modification requires wiring, we don't recommend doing it unless you have some experience. Those who lack experience can have this modification performed for them by Owl Software for \$19.95 plus \$4.00 shipping. Send your IBM sidecar to Owl Software, 1435 Burnley Square N., Columbus, OH 43229.

Once you have done this modification, you will need to use jrconfig to get DOS to utilize the memory above 640K. Jrconfig is on Jr Power Pack II, disk #65 in the jr Newsletter Software Store.

If Something Goes Wrong, Don't Panic

by David England

Computers are horrendously complicated devices. Just ask anyone who's taken a look inside one and come away scratching his head. And because of the intimidation factor, a lot of people wind up hauling their equipment down to the shop to be looked at by an expert, only to find out later that the problem was disgustingly easy to fix.

It isn't for humor that the troubleshooting routine in the Junior's Guide to Operations first asks you to be sure the equipment is plugged in. There's a real chance that a user may become so disconcerted at crash time that obvious things are overlooked. Even if a solution isn't so obvious, that doesn't necessarily mean it will take half a benchful of diagnostic equipment to put things in order. You may be able to do it all yourself if you keep your wits about you and use a little horse sense.

This was illustrated at an OK PCjr users group meeting in Donna Beck's talk about the Orphans' new hard disks. One of the drives wouldn't run, and they were able to find out where the trouble was by plugging in different components from it into a package that did work until that package wouldn't work either. The trouble was traced to a length of cable which was hammered on a bit until the right connections were made. This took some time and effort, but is much better than paying a shop \$50 an hour to find the same thing, or worse, mailing something back somewhere. The Orphans at least had the convenience of having a working unit on hand to check the faulty one against. But sometimes you have to just tear things apart and look.

This happened recently to Ramana Rao, who had been having system crashes. Ramana found that the crashes stopped when his jrCaptain was not attached, so he called Tecmar and found that the minimum charge for repairs was about \$80 plus parts. With this incentive, Ramana decided to look inside the sidecar before sending it in. He found that the problem was with the power supply connection, the plug didn't fully seat. It was easy to fix, and a lot cheaper than having an expert do a simple job.

The main thing is not to be afraid to poke around. You'll never find out if something is loose unless you tug at it or jiggle it, but this is a stumbling block that a lot of people never get past. Next, the main way to find out where the trouble is, is to find out where it isn't and, thus, narrow your search down. This takes some organization and requires a rather methodical turn of mind. It's a bit like using an algorithm to write a program; the procedure is seen in trouble shooting guides in statements like, "If the answer is No, proceed to Step 4 on page 35; if the answer is Yes, proceed..." If you can think like this, you can fix anything.

Last but far from least, don't throw in the towel when

When All You Need Is A Typewriter We've Found Just The Right Program

It's a simple little program, but oh, how handy!

The shareware program called Typerite allows you to turn your PCjr into a typewriter. Just type on your keyboard and it prints. What could be easier?

We see it as the perfect program for those who don't want to use a word processor. Either because you don't want to learn the complicated word processor commands, or, for people who do know how to use a word processor, but who once in a while just want to type something quickly and simply.

To use typerite, just put the disk in drive A: and type TYPERITE.

You will see a line across the top of your screen with the margin and tab settings (which can easily be changed, if you want.) All you have to do is make sure your printer is on and start typing. When you get to the end of a line, press Enter and the line will print. If, while typing, you make a mistake, just backspace back to it and type in the correction. This correction feature works truly like a typewriter, rather than a word processor. Backspacing will take you back over letters or words without erasing them. When you come to the mistakenly typed letter, just type the right letter and the correction is made.

You can set margins, tabs, single, double or triple spacing, and page size. You also have a choice of three sizes of type. All are set by pressing one of the 10 function keys (or Fn - Number combinations on the PCjr keyboard). And there's a nice little feature that we appreciate -- when you get to the end of a page using tractor feed paper, just press F5 and your printer will advance to the top of the next page.

The only thing we thought the program left out is the ability to print emphasized or double strike type with a dot matrix printer. So we include two versatile printer setting programs for you to use before starting Typerite in order to get higher quality output, when needed. These are also very easy to use and work with virtually all printers.

If you sometimes wish you had a typewriter in front of you instead of your computer, you'll find Typewriter (Disk #93) comes in very handy. See page 23 for ordering information.

you're tired. Set everything aside and try again later. If you decide the answer is beyond you, do it when your mind is fresh instead of after a long session of trouble shooting. If you aren't used to taking things apart, it's easy to get tired because of tension.

*(The above article was originally published
in the OKC Jr Orphans Chronicle.)*

Preschool Software

Don't Wait For Kids To Be "Old Enough"

By Mary LeCompte

I have had many parents tell me that they intend to buy a computer when their children are "old enough". I ask, "What age is that?" The answer is usually about a year older than their oldest child. One friend who had a child entering high school thought that sometime before the child entered college would be a good time to break her into the world of computers. Another friend with a preschooler thought the child should learn to read first. Another thought that her nine year old should learn to type first.

No child is too young to be exposed to computers. I composed letters and figured the family budget with our babies on my lap. As soon as they could press keys on the keyboard, they started playing alphabet recognition games. As early as three, one of my children could find her favorite program, put it in the disk drive, and turn on the computer. Everyone who uses a computer must go through a period of familiarization. Why not start it early?

Of the many programs aimed at the preschool level, *Early Games* by Springboard is the best. The "Match Letters" game presents large colorful letters and rewards the child with cute, animated graphics and music for keying the correct letter. Not only does this game teach letter recognition, it also exercises hand-to-eye coordination and fine motor skills. Beware, however, that sitting a child on your lap for this drill requires a large reserve of patience. *Early Games* grows with the child through recognizing letters to recognizing numbers, counting, adding, subtracting, ordering the alphabet, and identifying differences in shapes. There is a game that teaches a child how to type his name, or selected words. There is also an easy drawing game. The games menu is graphical so that a pre-reader can easily identify and select games. Once the games menu is on, my 30-month old son can pick out the game he likes and switch from one game to another easily.

There are other programs that teach essentially the same skills and offer some variety in presentation. *Kindercomp* by Spinnaker is a nice offering that teaches lower case letter identification and sequence recognition. This program also has a name-typing game, with letters that dance out to their place on the screen when typed. Children love dancing letters. *Amy's First Primer* is a shareware program available on the "Early Learning Disk" (Disk #48 in the *JR Newsletter Software Store*) that is quite imaginative. It has a nice maze for logic and hand-to-eye coordination exercise. Also, it has a cute sequence recognition game in which children load shapes onto a truck in a specified order.

Older preschoolers are ready to move on to computer-taught reading skills. The best pre-reading program I have found is Davidson's *Reading and Me*, with *Reader Rabbit* by The Learning Company a close second. *Reading and Me* is a very versatile program that progresses from concepts of difference and sameness up to the learning of reading skills. The first three games have the child identify objects that are the same, that are different, and that do not belong. The next three work with the alphabet from letter recognition up through ordering. The next set of three games supplement learning phonics from beginning and ending sounds through rhyming words. The last three are reading games that progress from identifying a picture that fits in a sentence to identifying the word that fits in the sentence. The program tests more than 100 words.

Reader Rabbit introduces the child to three letter words as combinations of letters of the alphabet. It teaches the child that some words begin with the same letter, some have the same middle vowel, and some have the same ending letter. It progresses in difficulty to having the child put the correct letters in the correct position of the word using pictorial clues. The graphics in both programs are delightful.

We will see long term effects from early computer use as the present generation grows up. Children are not only learning the basics but also gathering an assortment of subtle thinking skills from "playing" with a computer. The first program we bought for the our children was *Gertrude's Secrets* by The Learning Company, which was also my first exposure to the computer. My initial thought process as I explored this program, which delves into matrices and ordering, was that these concepts were much too hard for a child to grasp. My oldest child, then four and a half stood at my elbow and nagged me to let her have a turn. Being pregnant with our fourth child, my resistance and patience were low, so I turned the computer and program over to her. Four hours later I came back and found her happily putting objects into matrices!

Another "higher level" skill my preschoolers have picked up easily is graphing. Again, The Learning Company has come up with a very entertaining program called *Bumble Games* to teach adults that preschoolers can absorb what their parents struggled to learn in high school math. In *Bumble Games* the child finds the "Bumble" by guessing the position on a one dimensional line graph or, later, on a two dimensional grid. As the child progresses in skill he can play tic tac toe with mom or dad. Of course, this is "child's play" so be careful - your five year-old might beat you as did mine!

It's always advisable to make backups of program disks, but it's even more important with software being used by young children. I have been able to copy all of the

(Continued on page 15)

Accelerate Your Reading With "Speed Read"

Think of what you could accomplish if you could read twice as fast as you do now. Or three times as fast. Or four, or.....the sky's the limit!

The fact that you're reading this newsletter shows that you know you can get important, useful information by reading. You can educate yourself, find ways to advance your career, improve your grades in school, save or make money, learn new skills, or just broaden your knowledge of the world. All by reading. But do you have time to read everything you want to read? If not, how about reading more in the little time you have?

Most of us could read many times faster if we could learn to break some bad habits. These habits were learned early in our educations, so they're not easy to break. But Speed Read, Disk #90 in the jr Newsletter Software Store, can help you do it. Or, in the case of young people still in school, Speed Read can help change your reading technique so that you will continue to read at a high speed throughout your life.

Speed Read is really a short course on a computer disk. It takes you step by step through an analysis of your current reading speed and the bad habits you need to break, all the way through exercises designed to vastly enhance your reading speed. Along the way, if you're interested, you can learn some useful study skills, too.

"But if I read faster, I won't understand what I'm reading," you might say. Not so. In fact, the reading techniques presented in this course should help you increase your comprehension along with your speed. The theory behind this amazing fact is that slow readers - people who read one word at a time, or go back and reread almost everything -- are not using anywhere near the full ability their brains actually have. So, in effect, their brains tune out and do not absorb what they are reading. With a faster reading technique, the brain is being exercised, and tends to be more alert. So, both speed and comprehension can increase.

See page 23 for ordering information.

Preschool Software

(Continued from page 14.)

above games, some with the help of COPYII PC. Our children have always had free access to their computer and the backed-up copies of their software. With a few rules, such as no horseplay or food around the computer, we have had no problems. There are quite a few programs that I haven't tried, but these are a few of the best.

Adding A Second Drive Makes Computing A Lot Easier

Different people have different levels of ability and patience. But, for most people our advice would be not to rule out installing a second disk drive yourself unless you are the type of person who couldn't or wouldn't want to learn how to change the oil in your car or change the battery in your smoke alarm.

Many of the second drive kits available now are just about that simple. They require taking the top off your jr, plugging in some cables and an adapter card, putting the drive unit in place on top of your initial drive (if the unit is a so-called "internal second drive" with an enclosure that matches the design of the PCjr's casing), and copying some files to your DOS disk so that your jr will recognize the second drive.

Most makers of second drives for the PCjr supply you with step-by-step instructions which are quite easy (even for the non-technical person) to follow. If you already have added memory to your jr you will have to ask your supplier whether the second drive will interface with it, but that should not be a problem. If you have an internal modem, you may have to get a special adapter, since most second drive controller cards plug into the PCjr's internal modem slot. When selecting your new drive, you might want to consider a "direct drive", rather than a belt driven drive, since direct drives are quieter. It really is easy to add a second drive.

No tools, other than a wide blade screwdriver used to pop up jr's top cover are needed. And think of the amount of disk swapping you will save yourself by adding a second drive.

3.5 Inch Drive

A smart alternative to a 5 1/4 inch drive for your second drive is to add a 3.5 inch drive. These smaller in physical size, but larger in storage capacity disks are fast becoming more popular than the older floppies. Your PCjr is perfectly capable of handling either type of drive and the added storage a 3.5 inch drive provides can come in very handy. As for cost, the 3.5 inch drive complete with controller for your jr will run a little over \$300, while a 5 1/4 inch drive will be about \$100 less. Most of the advertisers in our newsletter carry both types of drives and can provide PCjr specific installation instructions as well.

It's Not Only AS EASY AS.....

If you need a powerful, easy-to-use spreadsheet that works just like you know what Lotus software, you need the shareware program As Easy As (Disk #86 in the jr Newsletter Software Store). It's not only "as easy as", it's just about as good as. And you can try it for \$5.95!

Prodigy Screen Driver

(Continued from page 1)

lion dollar national marketing campaign to introduce computer users to the wonders of Prodigy. Full of cute graphics and advertisements, all in color, Prodigy offers a variety of services. News, games, travel information, banking services, a vast "shopping mall", investment brokerage, magazine-like columns and features on many subjects, and on, and on. Every month brings additional features as Prodigy blossoms.

Unlike Compuserve, Genie and others that offer similar services, though not served up with the same glitziness, Prodigy offers usage based on a flat monthly fee. That means you pay \$9.95 a month no matter how much you use it, instead of a variable amount based on usage time, which how other services charge customers. Our guess is, the plentiful advertisements you encounter every step of the way through Prodigy make this fee structure possible.

Prodigy began last fall in several selected metropolitan areas, most of them in California, but is being made available in an increasing number of areas across the country.

We hope to report back in a month or two with the news that PCjr compatibility is part of the Prodigy system. But until then, potential PCjr Prodigy prowlers will have to use the unofficial PCjr Prodigy screen driver on our PCjr Patches Disk.

Compatibility Instructions

(Continued from page 1)

nor changes to do so.

By the time our next issue is published, we hope to report that the compatibility instructions are completed and sent out on their mission -- to make all software compatible

New Software Expands Size of Hard Drive Units

Bob Richards of SPC reports he now has software which allows users to install simple logical units on hard drives in excess of 32MB.

Previous software forced users of large capacity hard drives to partition them into smaller units. The new software allows you to have a whole drive on line at one time -- up to 512MB. That is not a misprint -- 512MB.

Of course, there aren't any hard drives that large (the largest Bob knows of is 160MB), but when drive sizes increase, which they are certain to do, this software will be ready. Until then, users with drives over 32MB will also benefit.

Prodigy, Telix, Cal Games Patches Added to PCjr Patches Upgrade

This month's new version of PCjr Patches (Disk #56), now version 5.0, includes a screen driver that enables PCjrs to run Prodigy, the Sears-IBM telecomm venture, as well as California Games and Telix V3.x.

The Prodigy driver, described more completely in an article on Page 1 of this issue, is essentially the screen driver provided for Tandy users, with a minor change. To use it, you simply copy it from the PCjr Patches disk to your Prodigy disk.

The California Games patch will enable you to run the popular game software in 16 colors. Without the patch it will only operate in four colors on PCjrs.

Telix, a powerful telecommunications program, operated well on PCjrs in earlier versions. But with versions 3.x it would hang. The patch consists of DEBUG instructions.

PCjr Owners

Everything you'll ever need!

- o Memory sidecars which increase memory to 736K
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- o 20 MB hard disk drives which are DOS compatible
- o ROM's which make your display easier to read
- o Upgrades which expand 128K sidecars to 512K
- o Speed up & pseudo DMA cartridges
- o Clock modules, printer ports & speech attachments
- o Joysticks, optical mice & light pens
- o Adaptors to use your PCjr monitor with a PC
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- o Keyboard, modem, printer & monitor cables
- o Basic manuals & other PCjr books
- o Game cartridges & other PCjr software

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Help--I'm a Beginner!

(Continued from page 2)

to go thru them. I would never use anything except black or aluminum foil write protect tabs. If you look at the side of the disk you will see a small notch. The computer disk drive shines an infrared light thru this notch. The light tells the computer that it's OK to write to the disk. When the light is blocked off the computer knows it shouldn't write on the disk. I had a person once who used scotch tape to write protect the disk. They learned the hard way that they had to block the light out. To be safe only use black or totally opaque write protect tabs."

"Wait a minute. The other box has black ones."

"Good. Use them to write protect the DOS master disk. Peel off one of the tabs and wrap it around the little notch you will see on the side of the DOS master disk. Be careful to not touch the smooth disk that is inside of the disk jacket."

"OK Mr Guru. I did that but why did I have to write protect it?"

"Ima that is what I call insurance. I write protect every master disk that I buy so that if I or someone accidentally tries to erase or destroy it, it won't be allowed to happen. Now put the write protected disk in Drive A. That's probably your bottom drive if you have a PCjr with two disk drives."

"I got it. Now what do I do?"

"Good. Now type the following: DISKCOPY A: B: " The way to interpret the command is "Copy the disk located in drive A to the disk located in drive B."

"If I only had one disk drive in my machine what would I type then?"

"Ima, you would type DISKCOPY A: A: . That would tell the machine to copy a disk from drive A to another disk you will put in drive A. Now type the command and tell me what you see."

"OK Mr Guru. I did that but now there is something that is saying to put my source disk in drive A and the target disk in drive B. I don't have any disks with targets on them."

"Ima, the target disk is the new blank disk that you are going to make the copy onto. Since you already have the DOS master in drive A with the write protect tab on it, put a new blank disk in the other drive and press the enter key."

"I don't have an enter key."

"The return key is the same thing."

"Oh, alright. Hey it looks like something is happening."

"Something sure is happening Ima. You are now making a duplicate of the original DOS disk. Get into the habit of always making a duplicate of your program disks. Then always use the copies and keep the originals in a safe place. If something happens to the copy you can always remake a working copy. If something happened to the original, and you didn't have a duplicate copy, you would

have lost your program and would have to repurchase it."

"Mr Guru. I have this friend that says he will give me all kinds of software. What kind should I get?"

"First of all Ima, I would strongly suggest you join a local User Group. There is the place to really learn in the quickest fashion the things you will have to learn and eventually other information you will want to learn more about. They usually have Public Domain and shareware library of all kinds of programs you can try inexpensively. Don't spend any money on expensive commercial software until you are familiar with what will fill your needs. Public Domain software and Shareware is legal to distribute freely. It is against the law to give away copies of commercial software."

"OK Mr Guru. Thanks. I have a number of someone who is a member of a users group. But what if it isn't a PCjr Users Group?"

"There aren't many PCjr users groups around, but you can still learn a lot in a group for IBM compatible computers. Your PCjr operates DOS just like PC compatibles do and your PCjr can run almost all the same software. And maybe you'll run into other PCjr users at a meeting. Then you can share PCjr tips with them."

"That sounds great. I'll call today."

"Ok Ima. I'll tell you what. When you go to the first meeting why don't you take some notes and write up an article on what you learned at the meeting from some of the members."

"That sounds like fun. I would be able to use my computer for that wouldn't I? What kind of software would you recommend I buy for writing articles?"

"Ima, I would suggest you purchase the shareware program called GALAXY. (Disk #69 in the jr Newsletter Software Store.) It is easy to use and works well."

"Thanks Mr Guru. Bye now."

(The above article is an edited version of one written by Lynn Kauer of the Saginaw Valley Computer Association.)

Send a Form Feed Fast!

Need a Form Feed in a hurry? Can't reach the switches easily? Try this, Bunkle...

Type the following; ECHO Ctrl-L>PRN <Enter> Voila , the printer feeds to top of form!

Alternatively the command can be in a .BAT file with a name such as FF.BAT. Then you can merely type FF <Enter> and the same thing happens. Why not do some experimenting, and find the other "magical" keys for printer control, or the beep, or anything else?

Questions and Answers

(Continued from page 4)

Q. One of my sons bought a keyboard for me at a flea market. It has a label on the bottom: AT&T Teletype Corp. Code 56K 420 ADA. Can this be connected to my jr? R. L. Toney, Williamsville, NY.

A. We can only give you some guidelines. Keyboards have micro-processors in them. These processors read the key switch information and translate it to an output signal, which is the input signal to the attached computer. Some keyboards send simple ASCII signals, others send proprietary data bits. Any computer shop (or AT&T) can tell you whether this keyboard is compatible with the input required by the IBM family. Make sure they have checked the parity requirements as well. (The jr is IBM PC-AT parity compatible.) If your keyboard passes, they probably won't know how to make up the cabling for the jr so here's the information. First; a keyboard adapter cord should be purchased from one of our advertisers. This will plug into the rear of the jr. The other end should be made up with a plug to attach to the AT&T keyboard.

Looking at the adapter cord jr Berg-type plug, the labels are (TOP) A3, A2, A1 and (BOTTOM) A3, A2, A1. The connector (a telephone jack type) for the keyboard end of this cord will probably have to be cut off, and a keyboard matching plug installed. Here's the pin-out: A1 no connection. A2 keyboard data. A3 +5 volts. B1 no connection B2 cable connect indicator. B3 Logic Ground. Note B2 must also be jumpered to B3. This causes a bypass of the cordless infra-red unit.

Don't be too optimistic about this keyboard because some dedicated "dumb terminals" and their keyboards have nothing in common with desk-top PCs of any brand!

Q. Why is it that my PCjr only runs in 4 colors for games that have 16 colors on other computers? Many PCjr users.

A. If you mean 16 colors on non-IBM compatibles, (Apple, Commodore, Atari, Amiga) forget it! There is NO correlation with processors, screens, colors, number of pixels, etc.

For Tandys, however there is some common ground. Certain models (1000 series) have video architecture similar to the jr. There is a hardware fix if the software displays alternate horizontal scan lines on your screen as black. This fix (one we have tested and covered previously) which adds one chip to the jr motherboard, will allow 16 color Tandy 1000 compatible software to run identically on your jr.

For those of you who don't yet know, here is the information for the EGA 16 color 200 x 320 differences. The jr

video graphics chips use sequential memory for ALL screens. This is a set of functions built-in to the Video Graphics Array and the CRT controller chips of the jr. An over-simplified explanation of the EGA chip combination is that it uses FOUR "stacked" memory banks for each screen and reads "down" through this two-dimensional array via a special register (which does not even exist in the jr) to establish the colors (attributes) of each pixel. So you see, the jr video graphics array chip in enhanced CGA mode controls the 16 color 200 x 320 display in a completely different way than the EGA right at the hardware level. The capability of the machines for these screens is the same but the implementation is totally different. Both the jr and the EGA equipped machines however, do read and execute software for CGA text and four-color graphics displays the same way. This is because the EGA also uses only one video memory bank (or page) per screen when in the CGA compatible modes.

For Your PCjr Reference Library -- One Year of jr News On Disk

The third volume of Best of jr Newsletter disks, this one containing articles from the June 1988 through May 1989 issues of jr Newsletter, is now available in the Software Store.

This disk contains as many of the most informative articles from the 12 monthly issues mentioned above as we could fit on one disk. We provide these disks at the end of every 12 month period as a service to those PCjr users who want a handy way to quickly find a variety of information on their computers.

Provided on this disk are two search programs to help you perform two levels of search for subjects you're interested in. One will search the table of contents, while the other will search every file (article) on the disk for a key word. So you can look up any subject fast.

Included on this disk are such things as compatibility tips, software reviews, news on new PCjr products, informative letters from PCjr users, beginner's columns, PCjr Questions and Answers, and more.....

For those who want the complete library of articles, Best of jr Newsletter I (Disk #54), with articles from June 1986 through May 1987, and Best of jr Newsletter II (Disk #66) June 1987 through May 1988, are available in the Software Store.

Best of jr Newsletter III is Disk #91. For ordering information, please turn to page 23.

Improve Your Learning Power With These Software Programs

Three great ways to improve your school work on one disk! One helps to improve your writing. Another teaches fractions. And the third can be used for any subject that requires memorization of facts.

Study Aids (Disk #92) will be useful for high school and college students, or anyone taking educational courses.

For those who need to study for tests requiring memorization of facts, Phlascards is an excellent study system. Based on the time-tested flashcard system of memorization, Phlascards allows you to create your own collection of cards (actually screens) of information on any subject you want to learn.

With Phlascards' editor program you can create a variety of questions using the true/false, multiple choice, or fill in the blank formats. Just creating the cards is a good exercise in itself. Then, once you have, say 100 "cards", you can ask Phlascards to shuffle them and present them to you one by one, beeping at you if you give an incorrect answer, and moving on to the next question when you get one right.

Phlascards also includes an option for creating a mnemonic, a memory-jogging word or nonsense word for any fact. These are very helpful.

Phlascards can be used by parents who want to help their children learn by creating the Plascard system on a subject and then asking their children to use it on their computer.

Fractions, the second program on this disk, is a helpful way to practice reducing, multiplying and dividing fractions. Interactive on-screen exercises provide the immediate feedback proven to help students to master mathematics. Menus, help screens and help prompts make Fractions easy to use.

It provides multiple levels of difficulty to choose from, so a student can move up through the levels as he or she becomes proficient. A progress record can be kept to evaluate the student's progress. The program also includes a method for creating a profile for each student using the system. This can be modified and tailored to each student's level of ability.

Phrase Watcher, the third program on this disk, is a program which analyzes writing for wordy or cumbersome phrases. It's not a grammar checker. It finds examples of "bad" writing and points them out to you, offering alternatives which generally improve the clarity of your writing. You do not have to accept the alternatives suggested by Phase Watcher, but usually they are good suggestions.

Phrase Watcher will be useful, not only for students but for anyone interested in making their writing clearer and therefore more effective. Used in conjunction with PC-Style

*** PCjr CLASSIFIEDS ***

FOR SALE - Racore Drive II Plus with DMA, (5 1/4' drive), 512K memory. Speech attachment. Original manuals. Cartridge Basic, Quicksilver and Racore PC ID cartridges. 2 IBM joysticks. Technical reference and hardware maintenance manuals. Power supply and cables. \$300 includes shipping. Call Bruce (407) 482-2383 before 2:30 pm. Boca Raton, FL (6)

TRADE - Have Okidata Microline 92 Printer (Plug n' Play - simulates IBM graphics printer, no printer cord) Good Condition. Want PCjr, 128K or higher with "black brick" in good operating condition. F.E. Johnson, S79 W22370 Pinecrest, Big Bend, WI 53103 (6)

PCjr w/RACORE EXPANSION - (640K, DMA, 2-5 1/4 drives), IBM CGA display, video speedup, DOS 2.01, various software, all for \$625. Also, 2 IBM 128K sidecars, \$50 ea.; IBM Power Expansion - \$30; IBM Parallel printer atch - \$50; IBM Joystick - \$10; Epson printer interface card for LX-90 or Homewriter - \$30. Or all for \$725. Ted Winther, 212 Wellman Ave., N. Chelmsford, MA (508) 251-3716. (6)

HARDWARE/SOFTWARE - for the jr. Too many to list. Please sent SASE to: Alfred G. Woelk, 28 Nutmeg Court, Ridgefield, CT 06877-3710 (6)

PCjr - The following additions: 640K Expansion, 2nd Drive, Monochrome monitor, 2 keyboards, thermal printer. Software: Printmaster, Writing Assistant, Signmaster, Chartmaster, Mind Probe, Home Budget Jr., Good Health, DOS 2.1 and more ... Great Deal ... Judy James, P.O.Box 588, Brazoria, TX 77422. (409) 798-2472 home, (409) 238-4485 work. (6)

IBM PCjr - 640K w/300 Baud Int. Modem, 2nd Drive (Racore), enhanced and chicklet keyboards, color monitor, Microsoft Mouse w/soft., 2 IBM joysticks, DOS 2.1, Basic Cartridge, MYM with manuals and much misc. software. \$750.00 Gene Lindstrom, 7577 Inskip Tr. S, Cottage Grove, MN 55016 (612) 459-8064 after 5:00 pm (6)

IBM PCjr - 640K, Color Display, Parallel Printer Interface, Modem, Clock, Joystick, 2 keyboards, all cables, DOS, Basic, excellent software, blank floppies, PCjr books, all manuals, Asking \$650. Printer optional - all in mint condition - Call Bill (615) 971-5820 in Knoxville, TN. (6)

(see also page 20)

(Disk #76), which analyzes writing in different ways, and a spelling checker, should help you produce excellent documents.

See page 23 for ordering information.

*** PCjr CLASSIFIEDS ***

WANTED - New PCjr owner wants to buy a PCjr color monitor, 1200 baud modem, a name brand dot matrix printer, manuals, software, or ? Leave a message for Steve at (213) 382-1557 (7)

IBM PCjr - 640K, Racore Drive II, extra 128K sidecar, PCjr Color Monitor, Keytronics 5151jr keyboard, several joysticks, vinyl covers, two new Fujitsu floppy drives, Quicksilver and speedup cartridges, DOS 2.1, many game cartridges, Koala Pad with software, many PCjr specific games, extra parts. \$1,000. Call Diana at (203) 792-3796 evenings (7)

IBM PCjr - 640K, jr Color monitor, two 5 1/4 and one 3 1/2 inch internal drives, 150w internal power supply, parallel port w/ clock/calendar, Datadesk 101 keyboard, two joysticks, Basic, Combo, and Configuration cartridges all w/ software and documentation. Excellent condition. \$850. Call Larry at (718) 761-7886 (7)

FOR SALE - IBM PCjr, Excellent Condition, includes; IBM color display, Improved PCjr keyboard, 128K mem, 360K disk drive, PCjr manuals, Cartridge Basic, Two joysticks, PCjr carry case, parallel printer port sidecar, computer dust covers, Adult used only, will ship UPS in original boxes. \$750. Epson LX90 Tractor feed dot matrix printer with PCjr Interface cable \$190. BOTH \$890. Call Bill at (615) 728-4697 (7)

WANTED TO BUY - RGB/CGA monitor for an IBM PCjr. Want to replace current composite monitor. Jay LeBlanc (504) 446-3640 (7)

IBM PCjr - 512K, Racore Drive II with DMA, Keytronics KB 5151jr, 2 IBM keyboards, IBM keyboard cable, IBM serial adapter cable, Racore PC ID cartridge (runs BASIC from disk), Taxan KX-12 amber monitor, Kensington Master-Piece, Sup R' Tree TV adapter, PC-DOS 3.0, Microsoft Word 3.1, Electric Desk, Jr. Power Pack II. \$2,400 invested in hardware alone. All for \$850 or best offer. Call Gabe (215) 483-4324; leave message. (7)

IBM PCjr - 640K w/PCjr Color display, two 360K floppy disk drives, 20MB external hard drive with built-in surge protector, AT-style keyboard, parallel port, Microsoft mouse, joystick, DOS 2.1, Cartridge Basic, all documentation plus Thousands of \$\$\$ worth of software. Call Nancy Blair at (916) 587-4821 eves and weekends. (7)

IBM PCjr COMPACT PRINTER - like new with 2 rolls of paper, original chicklet keyboard, PCjr keyboard, 300 baud

internal modem. Call Nancy Blair at (916) 587-4821 eves and weekends. (7)

WANTED - MS-DOS version of PERFECT WRITER (1.2 or 2.0) by Perfect Software. Have CPM version, but need MS-DOS working version. Please write Rollin Golden, 2232 Pyramid Way, Sacramento, CA 95821 (916) 920-1139 (7)

PCjr ITEMS - 300 baud Internal Modem - \$35; Serial Adapter Cable - \$12; BASIC Cartridge and Manual - \$35; Keyboard and Cable - \$35; Parallel Printer Sidecar - \$40. Will consider any offers. Call Terry Cutshall (606) 223-4618 evenings or (606) 232-5665 days. (6)

IBM PCjr - w/ Racore expansion. 2 drives, 640K, DMA, plus color monitor, joystick, BASIC & PC ID cartridges, manuals, DOS 2.1, blank diskettes, some software, clock/calendar and parallel printer port. \$750 + shipping. Larry Tuczynski, P.O. Box 12, Pleasant Valley, NY 12569 - (914) 635-2051 (6)

640K PCjr - Includes IBM Color Display - 2 Joysticks - Basic Cartridge - DOS 2.10 - PC Enterprises Video Cartridge - 1200 Baud Modem - Numerous Software (Spreadsheets - Databases - Utilities - Games & Many More) All Documentation & Manuals. CALL KEN (201) 334-3044. Asking \$550 (6)

PCjr 640K - via Hotshot expansion & jr Monitor with DOS 2.10, IBM: Writing Assistant, Technical Reference for jr, Basic Cartridge & Manual, IBM Guide to Operations for jr, and both keyboards. Asking \$750. Call Garrett (203) 696-8071 leave message. (6)

(see also page 19)

How to Submit Classified Ads:

Classified Ads are free to subscribers of jr Newsletter. Just send us your typewritten ad (no more than five lines on an 8 1/2 X 11 typed page) and we'll run it for you for two months. Ads are \$10 per issue for non-subscribers. Send to jr Newsletter, Box 163, Southbury, CT 06488

jr Newsletter Software Store

This software is the best public domain and user-supported software for the PCjr we've been able to find. All the programs in this collection have been tested on our PCjrs and are highly recommended. Some of these programs are equal to or better than commercial programs costing hundreds of dollars. The programs in this collection are available for \$5.95 per disk.

* **NEW * TYPEWRITER.** When you'd rather use a typewriter instead of a word processor, this is the one to use. Couldn't be simpler. Margins, tabs, type size all can be set. Disk includes two printer control programs for higher quality output. 128K ok (Disk #93)

* **NEW * 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. 128K ok (Disk #90)

* **NEW * 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)

* **NEW * THE BEST OF JR NEWSLETTER III.** Disk contains most of the major articles published in jr Newsletter from the June 1988 issue through May 1989. Articles on compatibility, PCjr hardware and software tips, regular columns, letters from PCjr users, and other informative articles. Utility to search for subjects included. (Disk #91)

* **NEW VERSION * PCjr PATCHES V.5.0** Patches to fix software that ordinarily won't run on PCjrs. V.5.0 adds patches for Prodigy, Telix V.3x, and California Games (16 colors). Also patches for Flight Simulator V.3.0, Loderunner (V-20 chip), Arctic Fox, Managing Your Money V.3, Autocad, King's Quest IV (early version), KQ II (PC version), Turbo C, Quick BASIC V3-4, Starflight, Advanced Flight Trainer, Double DOS, Bard's Tale, Turbo BASIC, and BASICA. (Disk #56)

* **NEW * 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)

* **NEW * WORDCRAZE.** Create your own word search puzzles and print them out for friends and family. Or tease their brains with 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! 128K ok (Disk #87)

* **NEW * 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 hords 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)

PCjr COMPATIBILITY DISK v2.0. Lists over 800 software titles, along with info on how they run (or don't run) on PCjrs. Also tips on how to make software PCjr compatible. 128K. Updated Feb. 1989. (Disk #60)

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)

PCJR PATCHES V4.0. Patches to fix software that ordinarily won't run on PCjrs. V.4.0 adds patches for the 512K version of King's Quest IV, for using Cartridge BASIC with expanded memory, and for running Loderunner with a V-20 chip. Also patches for Flight Simulator V.3, Arctic Fox, Managing Your Money V.3, Autocad, King's Quest II (PC version), Turbo C, Quick BASIC V.3.0 and 4.0, Starflight, Advanced Flight Trainer, Double DOS, Bard's Tale (16 colors), Turbo BASIC, and BASICA. (Disk #56)

GALAXY V2.4 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. 256K. (Disk #69)

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.

(Continued on page 22)

Fun for kids and adults, too. 128K. (Disk #39)

EDUCATIONAL SOFTWARE

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! 128K ok (Disk #82)

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)

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)

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)

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)

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)

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)

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)

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)

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

GAMES

GAMES. 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)

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)

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

GAMES, GAMES, GAMES. A wild assortment 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)

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. Th-ermonuclear 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)

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)

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. 128K ok. (Disk #78)

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)

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

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)

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)

GOLF/SAILING. Two great games for sailors and golfers! 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 for emergencies. 128K ok for sailing. Need 256K for golf. (Disk #47)

BOARD GAMES. Eleven different games on one disk! Hours of fun with Monopoly, Yahtzee, Cribbage, Back-

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CASTAWAYS/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)

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)

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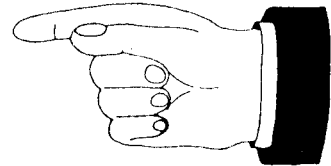
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