

# Jr Newsletter

November, 1990

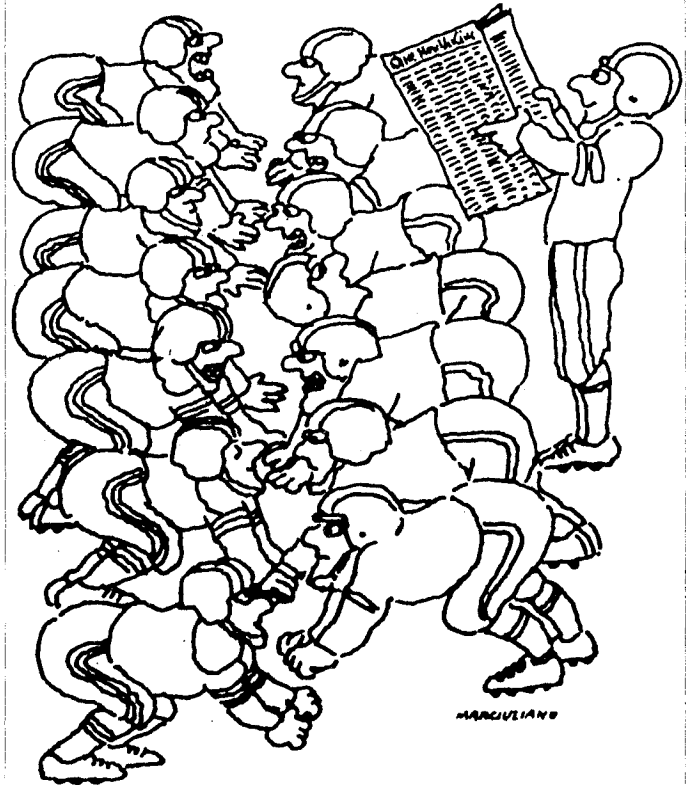
## How To Get Super Sound From Your PCjr

By John E. Wilson

IBM's PCjr is a great hobbyist computer. First of all, it is a computer that is easy to tinker with, to add to, and to modify. Almost all Junior owners have added another floppy disk drive and more memory to their computer, and quite a few have even added a hard disk drive. While these components are just about a necessity to run today's programs, it is also fun, and at the same time, something of a challenge to install these devices.

Those who really like a challenge, and also sometimes working with a soldering gun, have replaced 64K memory chips with 256K chips, replaced the ROM character generator chip in order to get skinny letters, or have modified Junior to look like a Tandy 1000 computer to game and educational programs. Owners try out V20 microprocessors, math co-processors, 80286 microprocessors, speed-up boards, and the list goes on and on. Some of these additions and modifications are probably difficult to justify in terms of practicality, but they are interesting projects which add to the enjoyment of owning the computer. Junior is really an easy computer to get into, to understand, and to change.

In addition to tinkering with the hardware, I have always enjoyed writing computer programs. The process of developing a list of instructions, and then seeing these instructions executed by the computer is fascinating - it is much like solving puzzles. Writing the program is the important thing to me, and I seldom use a program after I



"Quarterback Jerry Putz hunting for a good buy on a PCjr."

have developed it (Although a couple have come in handy, and the knowledge I have gained has helped in other areas.). Junior is a well documented computer, with several books devoted to it, so it is not difficult to find out how to control the computer on a very basic level; and Junior still has the ability to handle industrial strength computer languages like Borland's Turbo Pascal and Microsoft's Macro Assembler. Programming with Junior is a good hobby.

There is one area of Junior that has always been under utilized, and it is an area that you can examine and experiment with using both hardware and software. That area is Junior's sound capabilities. Your IBM PCjr probably has more power and potential for producing sound than any other stock computer in the PC-compatible world. Even the latest most powerful Compaq, Extended Industry Standard Architecture, 486 computer doesn't come close to Junior in built-in hardware to produce sound.

This is the first in a series of articles in which we will

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**PCjr Lives!**

## Beginner's Corner **Speed Up Your PCjr With a RAM Disk!**

By John King

Let's examine what a ramdisk is, how you can create one, and what it's good for.

A ramdisk is a portion of memory which acts like an additional disk drive. If you have only one drive, it can be the second drive that lets you use programs you couldn't run before. If you already have two drives, it will make your PCjr faster and more convenient. A ramdisk has a drive letter designation, typically C, just like the real disk drive A. You can copy files to it with commands such as "COPY A:MYFILE C:" where MYFILE is the name of the file to copy. You can read the directory of the ramdisk with the command "DIR C:", or check its size with the command "CHKDSK C:". In each case, the ramdisk responds like a regular disk. Of course, you can run programs which have been copied to the ramdisk just as if they were on a floppy in drive A.

### Installing a Ramdisk

As you would expect, a ramdisk is created by running a program. The most common approach is to use a device driver program which is named in your CONFIG.SYS file. (The CONFIG.SYS file is one you write yourself using EDLIN or any word processor which can save in ASCII format. Check the "Configuring your System" chapter in your DOS manual for more information.)

(NOTE: PCjr Autsetup Disk #99 will do this for you automatically.)

All memory expansion packages for the PCjr provide software to recognize the added memory and to create a ramdisk. If you use IBM memory expansion software, the memory management program is PCJRMEM.COM, and the ramdisk device driver is called RAMDISK.COM. Your CONFIG.SYS file needs to contain at least these two lines to recognize memory above 128K and to create a ramdisk C.

```
DEVICE=PCJRMEM.COM
DEVICE=RAMDISK.COM/nnn
```

Replace nnn with the size you want the ramdisk to be in Kbytes. Unlike real floppies, ramdisks can be almost any size from 10 to 500K. A good value for a 640K system is often 100 or 200.

If you use Larry Newcomb's JRCONFIG shareware program (which is the one jrNewsletter distributes on JR POWER PACK disks and on PCjr Autsetup, Disk #99), you need only one line in your CONFIG.SYS file to do both jobs. Here is the line to recognize added memory

```
and create a 200K ramdisk C.
DEVICE=JRCONFIG.DSK-s200
```

Check the documentation with your software for details of how to install a ramdisk, or get JRCONFIG from the Software Store - Disk #65. In this article, I'll always refer to the ramdisk as C, but it could be any letter depending upon your software. You can even have two or more ramdisks at the same time if you want.

As a final note on creating a ramdisk, all ramdisks for the PCjr are already formatted when they are created. You don't need to use FORMAT.COM to prepare them for use. Now we are ready to look at what ramdisks are good for.

I can think of three important reasons to use a ramdisk with your PCjr. First, installing a ramdisk can speed up your PCjr by about 40 percent. Second, it provides many of the functions of a second disk drive at no additional cost. Third, you can eliminate forever the "Insert COMMAND.COM disk in drive a:" message. Let's examine each of these points in greater detail.

### Speed Increase

All members of the IBM personal computer family except the PCjr have memory chips for the video display separate from the memory used to run programs. On the PCjr, the video buffer occupies part of the first 128K of RAM. About one third of the time, these memory chips are busy refreshing the monitor display instead of running programs. Consequently, programs which load in the first 128K, run significantly slower on a PCjr.

PCjr memory above 128K is not involved in video processing and is just as fast as on an IBM PC or XT. What we need to do is force programs to load only in the expansion memory, so they will run faster. This can be done by leaving all of the first 128K RAM not used by

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# Questions and Answers

By Rene Waldron



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

**Q. I have a game "Starflight" that is hard to use because I do not have a separate keypad which would allow diagonal movement of the cursor. This limitation makes it difficult to travel at an angle other than 90 or 180 degrees. Is there any way around this, short of getting another keyboard?** *D. Strandberg, Fullerton, CA*

A. Have you tried using the Home, PgDn, End and PgUp keys? Remember, to use these, just press (and in a few instances, hold) the Fn key first. The input from these keys is identical to the labelled keys on the numeric keypad of the standard PC.

If that doesn't work in this specific program, try holding the shift key and the same keys for the missing directional control. By the way, if the program activates Num-Lock on the Jr. then the number keys across the top will act as the numeric keypad of the standard PC. If you find you must get out of or into Num-Lock, hold down Alt, press Fn-N then release the Alt key. Try those combinations at the DOS prompt to see the action of your arrow keys. When you see numbers coming up with the arrow keys, you'll understand better how this all works. The PC numeric keypad is laid out with #1 at the BOTTOM LEFT and goes across in three rows, finally to #9 at the TOP RIGHT. You may want to use this information to make a little paper diagram to keep by the keyboard when you use Starflight.

**Q. I am 72 years old and have Parkinson's Disease so I am unable to write in longhand. I am using Andrew Tobias' Checkwrite Plus, an excellent program,**

**however I am having a problem using two parallel printers, a dot-matrix and a daisy wheel. It is difficult for me to unplug one printer and plug in the other as necessary. Is there such a device as a cable with two terminations at one end (for the printers) and a single one at the other, with perhaps a selector switch attached in some way?** *C. L. Foley, Pembroke Pines, FL*

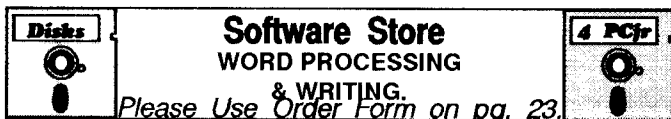
Can't say we've seen a cable such as you describe, but there sure is a solution for you. You will need the following: One Centronics Parallel A-B switch and three Centronics parallel printer cables. You already have one, so you need only two more. Connect one cable from the Jr. to the Common or Center of the A-B switch on the rear. Connect each of the other cables from the A and B connectors on the rear of the switch to each of your printers. This, in effect makes a "Y" with the A-B switch knob on the front selecting either of the printers. The doing is much simpler than the telling. When you order the switch and cables explain what you want to do. Order the cables and switch at the same time from the same place; they will send the correct cables that way. Be sure to tell them you now have a single printer properly connected to a PC. Do not mention that you are doing this to a PCjr, you may confuse them. Your existing serial cable adapter will be 100% IBM PC compatible, so don't worry.

Obviously, you should check with our advertisers first, they'll understand your needs quickly. If all else fails call Altex Electronics at 1-800-531-5369. They are a cable and switch-box hacker's heaven. Latest prices? 2-way Econo-switch at \$11.95, Cables at \$8.95 ea.

**Q. If I assign a float variable in Turbo C, when I run the programs after compiling I can't access one of my drives, I've tried this with and without the patches I downloaded from Compuserve. If I do a DIR I get a message of "sector not found". If I compile the same program with Power C it runs with no problem.** *L. Hutchinson, Holt, MI*

A. We have had good luck with Turbo C after the patches on disk #56 from the Software Store are applied and the INT9 bug patch (any version) is installed. We don't have your CONFIG.SYS or installed TSR information, so we don't know what driver(s) may be in conflict with the compiled Turbo C programs. One of these is

*(continues on page 4)*



## Questions and Answers

(Continued from page 3)

most likely your problem.

**Q. I would like to use Writing Assistant's spell checker but can't figure out any way to do it. Back in October of 1987 there was a similar question, but the answer seemed incomplete to me. Can you elaborate on that original answer? P. Bonday, Maywood, NJ**

**A.** We apologize. So, here it is:

The config.sys must have been previously set up for a ram disk. In a batch file of any kind have the DOS command, SET PATH=C:\;A:\ This will instruct DOS to look on A: if files or programs cannot be found on C: so you will in effect, have one long drive consisting of both A: and C: for DOS to search.

- (1) Set up a ram disk of at least 125k
- (2) Copy wordprf.wdl to this ram disk
- (3) With Writing Assistant in drive A: change to C: and this will be the default drive and directory.
- (4) Type A:WRITE <Enter> to invoke the word processor.

The rest should be normal except that you will have access to the word list on C: when it is needed by the WP spell checker. When you exit the word processor remember to SET PATH= <space> <Enter> so you will have the original, simpler DOS default path again if that's the way you started.

**Q. Is there any software you know of (Shareware or otherwise) that can create an 8 1/2 x 11 inch calendar? I've discovered a few, but either they specifically exclude the PC Jr. or cannot make the calendar the long-way, in horizontal format. I need all the space I can get for the daily boxes. O. Barnes, Federal Way, WA**

**A.** There are some really elaborate (read "expensive") calendar makers out there and even these may not be what you want. One which does do it all is from Selective Software, 903 Pacific Ave, Santa Cruz, CA 95060 Tel. 1-800-423-3556 and request info about "On Time" (\$69.95) or, better yet, ask for their catalog. It's a good one for inexpensive software. (Ed Note: Does anyone know who produces Create-A-Calendar?) Another suggestion would be to do your own in BASIC; any version from Disk BASIC to Cartridge. It isn't nearly as difficult as you might imagine. Here's all you have do: Be sure you have loaded GRAPHICS.COM from DOS before you start BASIC, and be sure you have boot-configured with 32k or more of video RAM.

Get into BASIC and start this way;  
10 SCREEN 2: KEY OFF: CLS <Enter>

Now you can print to this screen with the rest of your

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**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)

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

**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)

**SHARESPELL.** Spelling checker that works independently of your word processor. Can check spelling of any text file with its 52,000 word dictionary. Will also use custom word list you make. Works with all word processors. 384K ok (Disk #94)

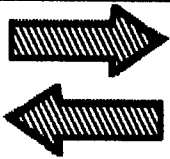
**PC-WRITE.** This extremely popular word processing software is both powerful and easy to use. A review in PC World said, "PC-Write may well be more versatile than WordStar, it's certainly more straightforward." Version 2.5 runs well on 128K. Version 2.7 has more features and needs 256K to run without the spell checker, which needs 384K. Version 3.02, the most powerful, needs 512K. (Order Disk #1 for 128K V2.5. Order Disks #2A and 2B for V2.7. Order Disk Set #1 (3 disks) \$12 for V3.02.)

**PC-STYLE.** Perhaps the best of many programs that help you make what you write more readable. Jim Button made this a very slick, useful tool for improving your writing. It reads and analyzes what you write, then gives you a detailed analysis based upon several useful standards. Fast, easy to use. 128k (Disk #76)

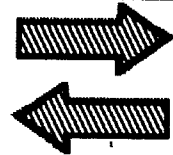
**PC-OUTLINE.** Organizes thoughts, notes, lists of just about anything. Powerful features create logical outlines, merge with your word processor, customizing allows you to rearrange and manipulate data. Outperforms many commercial programs, says PC Magazine. 128k. (Disk #17)

**MIND READER.** Experience the wonders of artificial intelligence! Use a full-featured word processor that guesses the words that you're about to type. Works like a charm! 128K ok. (Disk #74)

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



# READER FEEDBACK



## DEXXA Mouse Works on Junior

My Jr is enhanced with Racore 2nd drive 640K DMA and Tandy Mod. I use a borrowed DEXXA mouse for two programs: Sim City and IBM PCjr Colorpaint.

It seems to work fine. I'm not experienced with any other mice so I really don't know what to expect.

I'm looking forward to your report.

*Cindy Hoffman, Eugene OR*

## Kraft Micromouse Recommended by PCJR User

This is my contribution to your article on mice, and my first letter to jrNewsletter. I hope I'm not too late!

I chose the **Kraft Micromouse** for the following reasons:

1. It works off of the S (serial) port alone. At least one mouse that I know of that is designed for the PCjr uses both the S port and the LP (light pen port). I use my LP port for a light pen.
2. It is styled similar to the Kraft joysticks. Since the IBM joysticks are Kraft joysticks with an IBM nameplate on them, this means that the Kraft mouse matches the styling of the jr perfectly.
3. It is cheap. Cheap as in \$30 from Focus Electronics, 1303 46th Street, Brooklyn, NY 11219, (800) 223-3411.

The mouse comes with a nifty little program that allows you to create pop-up menus to go with any application that does not include mouse support. You can define the buttons, set the cursor movement speed, and define a pop-up menu with up to 23 selections, all controlled by the mouse. You can have as many different menus as you want. Each time you load one, it replaces the one previously in memory.

Although it states right in the manual that the Micromouse works with the PCjr, I found that the menu creating program (CREATOR.EXE) will not work on my Jr, unless I first run SAVENMI.COM (SAVENMI.COM is on PCjr Power Pack disk #52 - ED.) After that, it runs without a hitch, as do the menus created with the program. One more tip: when you enter BASIC, for some reason the mouse is disabled. Upon exiting BASIC, run the program called MMRESET.EXE that comes on the disk. If you want to use the mouse in BASIC, you must use the SHELL "MMRESET" command to re-enable the mouse. (Warning: SHELL will cause cartridge BASIC to

crash with some memory-management set-ups. It works fine with the regular disk BASIC.)

All in all, I am very pleased with the mouse. I use it a lot with Lotus, my editor, Autosketch, and a pop-up menu I created for frequently-used DOS commands.

*Martin Pinckney, Naples, FL*

## Reader Likes Autosketch, HUSH, and Wants Sound Chip Checker

I was wondering if anybody had actually come up with a short simple program to check the status of the sound on/sound off status. I recently had trouble with Fastkey doing a disable on the external audio. I remember that running some program that uses sound will leave the external audio active, but there must be something a little more direct.

While looking through my power programs floppies, I  
*(Continues on page 6)*

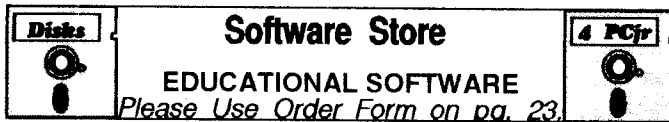
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## Reader Feedback

*Continued from page 5*

**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)

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

**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)

**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)

**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)

**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)

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

**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)

**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)

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

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

came across a very useful program I overlooked before. It's called HUSH. It sets the speed of the floppy drive so it doesn't make any noise. (It's on jr Power Pack Disk #52 - ED.) Other programs do it, but only as part of a larger program which leaves something in memory. Hush just does a write to somewhere in DOS and magic! It is the first program I run on my autoexec.bat and I have not had any problems since.

I attempted to use the AUTOCAD patch, but the one supplied works only for a specific version. I have a newer version, and there was no information on how to contact the author. Do you have any info?

Autosketch works just fine without any fooling around. Although made by the same company, obviously the Autosketch programmers use DOS calls to the video. There is a new version due out soon, Ver. 3.0. It is a major upgrade to the old version, according to AutoDesk. It will also cost a lot more, but is claimed to become the standard for 2D drafting type CAD.

For those who use the MSC PCjr mouse, the drive for PC Paint video.sys is very useful. It is my most PC compatible boot disk. With it I can run things I can't run any other way, such as Harvard Graphics.

*Joseph F. McLean, Worcester, MA*

**Editor's Note:** The patch on Jr. Patches, for Autocad was written for an early version of the software. We don't know who made the patch, so we just have to hope that he or she or someone else will write a patch for newer versions, or that the newest one will run on PCjrs.

## Adventures of a Clever PCjr Do-It-Himselfer

I am writing to share with you and your readers some of the experiences I have had with my PCjr since upgrading it to a 640K & 2 floppy drive machines (5.25 & 3.5) last year.

After modifying my machine to this extent I was left in a position of not knowing how much money I wanted to sink into my jr. I had no problem with the effort since upgrading my machine and being able to run the latest software is a great deal of fun and satisfying. I realized though that this machine did have some limitations. After all, IBM intentionally built some of them into it. Also, although I previously felt that the 8088 was good enough for the home, I must say that 286 power is definitely going to be the new home standard, just look at the new PS/2 series. I decided to take it slowly and reconsider the future of my PCjr in a year or so.

The first modification I made was none other than the

**Tandy Mod.** Why not? I successfully modified my 128 sidecar to 512K and also applied Paul Crumley's mod to my controller card so I should be able to do this in a cinch, right? Wrong! Maybe it was my attitude that it would be so easy that I was not careful enough or maybe just coincidence, but whatever the reason, the machine came back up and shortly went and remained white. After ordering schematic and having a friend put this beast on a scope, we discovered that the VGA chip was bad. I realized once again the vulnerability of this machine. Of all the chips that could have gone bad, one of the three that cannot be replaced did. I debated on whether it was the time to upgrade. After all, I had to replace the mother board and this would set me back a little over one hundred. Used AT's were selling at under \$1,000. I decided to keep it. For only \$100 I'd be back up and running again. I ordered the board from PC Enterprises and much to my surprise received a board that had the Tandy Mod installed. PC Enterprises uses unused circuits on existing chips to achieve the same result.

I had no question that I would continue to upgrade my jr but would only spend larger dollar amounts on items that could be transferred to other systems. I ordered the jr Toolkit (Disk# 110).

I was lucky to acquire a **63 watt original PC power supply** from work from an older PC that had been upgraded to 150 watts. I modified it with the instructions on your diskette and now run with almost twice my original power.

Next item to be added was a mouse. I knew that I would not want to get a very fancy one since I would not have that much need for it, but there were some things I could definitely use it for. I found a **Qtronix Model X-30S** at Software house for \$26.99. After installing it on my machine, I was unable to get it to track although its buttons did work. I had previously brought home a Microsoft Mouse from my work and had no problem with it so I assumed the Qtronix was defective. I returned it and purchased a second mouse and still had the same problem. I now knew that jr was acting up now and that a fix would probably be fairly easy. This mouse is opto-mechanical unlike the Microsoft which is mechanical so I deduced that the LEDs for its sensors were not getting power. I decided that, at \$26.99, it was worth the chance of opening it up and seeing what was going on. I quickly realized that the PCjr COM port did not have pin 22 ring indicator. I powered up the machine and went into the mouse test program. From my external power supply, I ran five volts inside the mouse at this pin and the mouse worked. I had wired this fix and rebooted the machine; nothing. I later discovered that I have to apply this power after all other connections are established. I wired the pin 22 to pin 20 DTR. This works fine unless my parallel sidecar is attached. I haven't discovered why, but can get around it by

putting a switch in the path somewhere. I don't worry about it since I don't currently have a printer and leave the sidecard off.

I intend to build a COM1 serial card from the instructions on your toolkit diskette and will attempt to include the pin 22 RI circuitry.

I recommend this mouse to anyone who doesn't mind performing this modification. It has a variable resolution of 200 to 6400 DPI and is comfortably contoured similar to a Microsoft Mouse. Also included in the package was a mouse holder and pad as well as a pop-up menu program which allows the mouse to be used with programs that do not support a mouse, such as Lotus 123. It also come with Dr. Halo Plus although I wasn't impressed with that package since I could only use CGA graphics.

I have added a **101 Keyboard** to jr connected by an adapter from Paul Rau Consulting which cost me a total of \$85. This is definitely worth it since the keyboard can be transferred over to any AT/XT class machine. I have also bought a **Microsync dClock II** for \$23 at Softwarehouse that connects to the disk drive at the cable end. It will not easily fit in a standard jr unless you have a card edge that is slightly lower than the original Qume or if you have a Racore expansion case. I have not yet got the software to work with the PCjr controller but I am still at-

## PCjr Owners!!

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tempting. I would like to get this clock to work since it is not necessary to remove your ROM to install it and you can replace the batteries unlike ROM clocks. If anyone has been able to get this item to run, please let me know.

Finally, I would like to talk perhaps about the most important potential mod for the PCjr; VGA! (not video gate array but video graphics adapter). I have recently seen what VGA graphics are capable of and have decided that this is the most important upgrade one could make to a jr to bring it closer to today's technology. I have decided for myself that any decision to add a MESA 286jr or 80 meg hard drive to my unit now hinges on the possibility of being able to add these graphics to my machine. I have kept my old mother board with the defective video system and have decided to use it as my Guinea Pig. I will attempt to totally disable the old graphics system and add a cheap CGA card. My logic is that if I can get CGA up and running for a very low cost, then it is worth pursuing with a VGA system. If anyone else has some information that may be useful, I would appreciate hearing it. Maybe a cartridge has to be developed or something like that to get around the old system. I may be all wrong but I think it is worth pursuing. I am hoping that other PCjr owners desire the same sort of capabilities from their machines and that VGA becomes a PCjr reality. VGA is quickly overtaking

EGA as the industry standard and to have these capabilities on the PCjr as well as eliminating its dependency on the unobtainable Video Gate Array chip would assure its future throughout the '90's.

In closing, I would like to thank jrNewsletter for your excellent support of the PCjr. I would never have had a jr as I have today had I not discovered your newsletter. In creating the jr I have now, I have learned a great deal. I have accomplished things I thought I never could have done before. I am grateful that I have made a commitment to my machine and enjoy it thoroughly. I guess I'm a PCjr junkie, but I love it anyhow. There is no 286 or 386 on the market that could have given me as much enjoyment as my junior has and I guess this is why I want to keep it going. My friends at work kid me about my jr but are equally amazed to see that I can run most of the same software that they have on their 286 machines. The junior really has a bad name around for itself to those who never understood it and it is great fun to shatter this misconception. As long as there are people around to support and devise ways to improve it, the PCjr will remain the ultimate home computer.

*Paul Eckert, Paoli, PA*

**EDITOR'S NOTE:** Congratulations on everything you've managed to figure out. It shows what can be done if you're willing to try.

About your disaster installing the Tandy Mod. Our instructions for doing this mod yourself on the latest version of jr Toolkit (Disk #110) now has detailed warnings for people who do not know how to avoid static electricity damage (which is what you seem to have had). Any reader attempting to do work on the motherboard should take every precaution to avoid this damage. As for VGA on the Junior, we know of several people who are trying to bring it off, but none has succeeded so far. We agree with you that if this great enhancement could be made, PCjrs would continue to be popular for many more years. If anyone has encouraging information on this subject, please let us know.

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## DOS Tip from the Hawaii PC Users' Group



### Cheer Up — Delete Can Be Undone

New computer users often panic at the thought of deleting an important file by accident, losing it forever. When you delete a file, DOS doesn't actually zap the file from the disk. It simply changes the first character of the file name, stored in the directory, to a question mark (?). The data making up the file is still on the disk, at least for awhile. ... As other files are written to the disk, DOS reclaims the space used by the deleted file. You can recover a deleted file by using an undeleting utility before anything new is written to the disk.



## Sticky Bear: Superior Early Learning

By James Prossick

This is the story of two bears, the twenty-six letters of the alphabet, the numbers one through nine, children having fun while learning, and what an upgraded PCjr can do.

Optima Resource, Inc., Publishers of Weekly Reader Software, market a full line of educational software for ages three through twelve. The majority of their software is presented by Weekly Reader's Computerized Spokesman, Stickybear.

*"Optima thought their programs would not run on PCjrs. Now they know!"*

The folks at Weekly Reader did not think Stickybear could make an appearance on the PCjr, but then they were unaware how much little junior has changed. Ms. Penny Hurley, Educational Representative for Weekly Reader, was willing to send me two titles The New Talking Stickybear Alphabet and Stickybear Numbers on a trial basis.

Her willingness to bear with junior, pun intended, produced some great results for Weekly Reader and the PCjr community. Both programs run fine on an upgraded junior. The key being enough memory, and, for full 16 colors, the Tandy modification. Penny assured me that numerous PCjr owners have purchased the Stickybear software in the past with unhappy results. Many of those purchasers being educators and schools, who no doubt obtained their PCjr's in IBM's fire sales and give-aways of a few years ago.

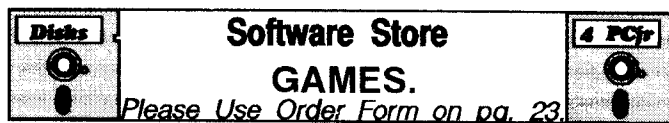
Now that the folks at Weekly Reader are aware of the possibility of increasing the PCjr's graphics compatibility through the Tandy modification, hopefully the word will reach those schools and extend the useful life of their PCjrs.

For those of us who already know the virtues of the PCjr, it is good to find some more good quality software that runs well on our machines. Stickybear Numbers and The New Stickybear Talking Alphabet are graphic learning tools aimed at the younger set, ages three to six.

The interface in both programs is similar and easy to use with a standard keyboard. The computer kid, or kid at the computer, chooses the right letter or number in the context of a game. Displayed on screen is the correct number or letter in upper and lower case. Of course there are graphics and sound to hold the players' attention and reward them for the right choice.

Stickybear Numbers teaches children to count and recognize numbers. The child randomly selects a number by using the number keys or by tapping the space bar, or

*(Continues on page 10)*



**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)

**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)

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

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

**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)

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

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

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

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



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

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

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

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

## UTILITIES.

**SCOUT.** Excellent memory resident (or not) file manager, DOS shell. Move, copy, rename, volume label, search, sort, printer control, view files, and more - fast and easy. Best we've seen. (Disk #81)

**TEXT UTILITIES.** Includes V7.0 of List.com, the powerful text viewing software, which adds many handy new features in this version. Also on disk: A versatile directory listing and disk labeler; the fastest text searcher we've seen; a handy copying utility with many features; a memory resident protection against overwriting precious files. 256K Reviewed 2/90 (Disk #103)

**SUPER UTILITIES.** The 15 utilities in this collection include Undo, to recover a mistakenly deleted file; a powerful command editor; a clock, notepad, time and calendar; another to redirect file contents from printer to disk...and many more useful utilities. Under 128K ok. (Disk #28)

**PRINT HANDLER.** Excellent printer setting utility allows you to set features from a menu. Other software on disk for banners, sideways printing, custom font generator (Epson), print spooler, count pages before printing and more! Will work with most dot matrix printers. (Disk #51)

**Print It!** Selection of programs allows you to print large banners as well as tiny (but quite readable) documents on most dot matrix printers. Compress four pages on one sheet with Docsmash, print on both sides of computer paper with Both, reformat into tiny columns with Microtext (many other options), make wall-length banners with Bannerific! 256K (Disk #111)

**PKZIP V.1.02** The new and increasingly popular file compression utility used by more and more BBSs. Includes PKUNZIP, the one you need to uncompress downloaded ZIP files, and many other features. 128K ok Reviewed 2/90 (Disk #104)

*(More Utilities on page 11)*

## Sticky Bear

*Continued from page 9*

a number can be purposefully selected by another player or adult. The screen fills-up with the same number fish, birds, satellites, or ice cream sundaes. Now the young player must choose the right number by again using the number keys or space bar. The number to be selected is displayed on screen in large text, and a graphics and music burst rewards the right choice. You can also add and subtract the number of graphics on screen by using the space bar to count. The graphics are visually interesting to children, although lacking color in the CGA format for PCjr's without the Tandy Modification, and the sound and music are adequate.

Along with the software comes some useful hard copy items. A poster featuring graphics used in the program in groups of one through nine, and a nifty counting book "one bear two bears" are included in the package. These items extend and expand the learning process and can be integrated with the software or used to reinforce the computer lesson afterwards.

The Stickybear Talking Alphabet teaches letter and word recognition through three learning games, but does not talk on junior, or any computer not equipped with the echo sound board. Alphabet, Letter Hunt, and Fast Letters are the three learning games. Alphabet allows the child to browse through the 26 letters freely displaying individual letters and their corresponding words and graphics. Letter Hunt puts a letter on screen first and asks the child to choose correctly before displaying the accompanying animation sequence and word. Fast letter places any letter the child selects on screen, along with a picture of our old buddy Stickybear. Fast letter's usefulness is diminished severely by the lack of the corresponding speech capabilities. The other two modules suffer less from the lack of speech, and the fine sixteen color animated graphics and musical sound track enhance the learning process greatly. There are two different animation and music sets for the alphabet. This helps alleviate boredom when reinforcing letter recognition, and offers 26 more words to add to the child's vocabulary.

Both programs are copy protected. Numbers requires 256K of memory and runs in CGA on Junior, and although it is boot- only, it recognizes the additional memory and runs without a hitch. The Alphabet requires 640K, runs in sixteen colors, and starts from the A prompt, so you can configure your memory and video buffer properly. I used the JrConfig driver with either -c -v32 or -v96, without the ram drive, to push the program into high memory and increase execution time. (If you don't know about using jrconfig, you need to get either JR POWER PACK II (Disk #65), or PCJR AUTOSETUP (Disk #99) from the jr News-

letter Software Store.

Sticky Bear's set mode does not run properly and is not necessary to access Tandy Graphics on Alphabet. Remember these programs are recommended only for those PCjr's with the Tandy modification.

Neither Stickybear Numbers or Alphabet are on the leading edge of software technology, but they do represent a comfortable entertaining package that instructs children well. They retail for \$39.95 and \$49.95 respectively. The lack of speech hurts the impact of both programs, as do the little things like not being able to exit either program without rebooting. Computer generated speech, without the assistance of a sound board, is becoming more commonplace and almost expected in educational programs like this. Also, I did notice a bug in Alphabet where the D graphics are occasionally displayed in place of the chosen letter. Another nicety that would enhance both programs would be the ability to print the graphics screens. This would allow children to hold the numbers or letters in their hands, and wreak a rainbow of havoc on the pictures with their trusty crayons.

Stickybear Numbers and Alphabet definitely make up for these minor deficiencies and the lack of bells and whistles by being very effective when it comes to actual learning. My daughter has used several other alphabet and number programs, and while she enjoyed them, and they did help with number and letter recognition, those programs did not have the immediate and recognizable effect that Numbers and Alphabet did. So the final grade for Stickybear Numbers and Alphabet is B- on entertainment value and A+ on educational value. Optima Resources is a software developer and marketer that now has a new awareness and appreciation for the compatibility of an upgraded PCjr. So if you have a little one who needs to learn his ABC's and 123's, I suggest you let old Stickybear give him a hand.

### PRODUCT - SYSTEM INFORMATION

Optima Resources, Inc.	Stickybear Numbers \$39.95
Weekly Reader Software	(256 K & Tandy Mod)
10 Station Place	
Norfolk, CT 06058	Stickybear Alphabet \$49.95
(800) 327-1473	(640K, 2 DD & Tandy Mod)

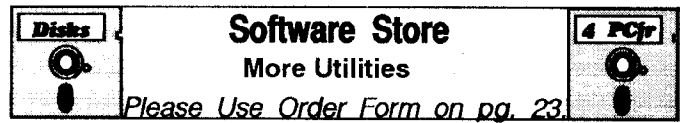
### DOS Tip

(from the Hawaii PC Users' Group)



### Save a Few Keystrokes

Next time you're copying or deleting a group of files using \*.\* , try using a single period instead. To DOS, a single period represents everything in the current directory. It sure beats having to hit Shift-8.Shift-8!



**LZEXE.** Cut down dramatically on the disk space required for software. LZEXE compresses EXE files into 2/3 to 1/2 their original size and allows them to be run from compressed form. Great for keeping RAM disks small and memory free. Utility will also convert COM files. 256K (Reviewed 5/90) (Disk #112)

**PC-DESKTEAM.** Provides memory resident notepad, alarm clock, appointment calendar, typewriter, calculator, phone book, auto-dialer. Some say better than Sidekick! Quick, easy, powerful. (Disk #22 V1.04)

**NEW KEY.** Powerful popular program that allows you to redefine keystrokes and assign series of keystrokes to one or two keys. Customize software to meet your needs. Many other useful features included. 128K. (Disk #35)

**MORE SUPER UTILITIES.** A collection of excellent screen and keyboard enhancements, useful file managers, color selectors, and more. Under 128K ok (Disk #29)

**BAKER'S DOZEN.** 13 powerful utilities by shareware star Jim Button. Recover zapped files, save screen to files, print sideways, sort files, file management, locate text, pop-up calendar, powerful one screen spreadsheet, set screen colors, and more. (Disk #73)

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# Let Jr Help You Get Christmas Under Control

By Dorothy A. DeBisschop

Do you both look forward to and dread the approaching Christmas holidays? The idea of family and friends enjoying the season together is so appealing. The amount of effort it takes is so exhausting. If you look forward to the celebrations then get so frazzled by all preparations, you wish it was over before it gets here: help is on the way!

You have an ally to make it easier. He can help you manage your gift list, budget your expenditures, create your own personalized Christmas cards, and make some wonderful special gifts for your family. Just pick up a few supplies from the jr Newsletter Software Store, and recruit Junior.

To get started, you'll need to make several lists: your Christmas card list, your gift giving list, and special lists of activities for the holidays. For addressing, use Junior. It's quicker to type the names into the program than it is to address the envelopes, and you can do it before the cards are ready.

The simplest program to address your Christmas cards is Mr. Label (Disk #97). This quick and simple label maker is so easy to operate you may be able to recruit some family members to help enter the data. It will accept information either from the keyboard or from ASCII files as input. It requires 128K of memory and one disk drive.

Another quick and simple label program to address your cards is Name Pal (Disk #70). It will save you time this year, and if you use the spaces for notes, you can keep a record of cards received. This will make the job even easier next year. In addition, the program allows you to print out a handy little name and address book. So, include phone numbers when setting up the list. When you're through, you'll have your own "Little PCjr Phone Book" that fits neatly into your pocket or purse. Name Pal requires one disk drive and 128K of memory.

A final choice for a simple database would be 3 x 5 (Disk #19), which offers speed and ease of entering. It's not as complete as our larger Database programs, but some will find its multiple windows handy. It requires 1 disk drive and 124K of memory.

Another choice for an address list would be File Express, Disks #83 and 84.

This is a more complete database program. However, it is easy to organize the database to make mailing labels. You can keep track of in-coming cards with this program also.

File Express is versatile enough to make a separate file for a gift list. Enter ideas of what each person might like as you think of them to make a handy shopping list. You can even budget your gift giving. Decide on a total expenditure and budget how much to spend for each recipient. File Express requires 256K of memory, but operates at its best (without disk swapping) when used on a 640K machine.

Another choice for a full-featured database would be PC-FILE III (Disk #3 or Disk #4.) This will handle all that File Express does and features excellent search facilities. This program will be useful to you throughout the coming year, as well as help you cope with Christmas. The version on Disk #3 operates on 128K. The version on Disk #4 requires 256K of memory. It's an expanded version, though just as easy to use. If you have the memory available, choose Disk #4 to get the most features.

Once you get your list management under control, you can make your own Christmas cards. There's help for Junior in the Software Store. You really don't have to own a commercial program to make nice-looking cards with your Junior and a dot-matrix printer. We recommend ImagePrint (Disk #50) for making near letter quality, impressive-looking text. It will allow you to type a short message (or a longer letter outlining the family's events of the past year, if you choose), in your regular word processor. You then save it as an ASCII file, and use ImagePrint to send it to your printer. It offers a variety of fonts, so you can be sure to find one that looks good with your message. ImagePrint requires only 256K of memory and works with practically all dot matrix printers, including IBM Graphics, Proprinters, Epsoms, and compatibles. Colorful Christmas stickers purchased at the stationary store will make the cards very attractive. Or, if you have the inclination, a little decoration with glue and glitter will make the cards really sparkle!

While you're playing with the printer, you might consider another program. Print Handler (Disk #51) is designed to allow you to set printer features from a menu, which is always handy. Preparing for Christmas, you'll appreciate the program to print banners and do sideways printing. Also, if you want to do something special for your Christmas Cards, this disk has on it a custom font generator for Epson Printers. If you enjoy that kind of challenge, you could make an alphabet out of Candy-Cane style let-



ters, for instance. It would make your cards unique and a real expression of your talents—something you'll never find on a commercial card, no matter how hard you shop or how much you spend.

Another feature on the Print Handler disk is a program to make banners. You can decorate your house for the holidays or create special messages for party banners.

An alternative program to produce banners is found on Print-It! (Disk #111). Bannerific makes large wall banners. It also contains useful utilities for printing on both side of computer paper and using tiny text. It requires 256K of memory and an Epson-compatible or HP printer.



**Gift  
Ideas  
From  
Junior**

You can make personalized gifts with programs from the Software Store, too. Check the software listings in the past few issues of jr Newsletter or in our catalog for gifts your computer-owning friends will enjoy. Even better, use Junior to help, and you can make special gifts as special and personal as the traditional hand-knit sweater.

It's important to share your family heritage with relatives. A compilation of whatever facts you know about the your family's history—whether it be one or seven generations back—will be appreciated for years to come. The Software Store has two programs for compiling genealogies. If your family includes others with PC-compatible computers, consider doing your history on Family History, (Disks 33 and 33A). Once you enter in your data, give a copy of the program and the data to your family. They can add whatever facts they discover about the family tree. This way you can pass information back and forth among the family.

If none of your family has a PC compatible, then consider using Family Tree (Disk #109). This program keeps family records, plus prints out a variety of charts and can publish your family tree into a book. You can give relatives an impressive hard copy of the family history you've gathered.

To run Family History, you can use Disk #33 alone with a 128 computer. If you have 256K available, get Disk #33A as well and use the expanded version. If your choice is Family Tree, you will need 256K.

Another way to share the family heritage is with those special recipes used by relatives over the years at various family gatherings. Edna's Cookbook (Disk #96) will allow you to compile family recipes. When you give a cookbook printed out with this software, you help preserve family traditions and memories.

If you have family and friends who enjoy crossword

puzzles, consider getting CrossWord Creator (Disk #71). You can design personalized crossword puzzles. You pick the words and design the clues. Use words and clues relating to your family or your community, or a place where you both work. It will make a unique puzzle which will delight the recipient. CrossWord Creator requires only 256K and a printer.

Another similar program which requires less work to create personalized puzzles is Wordsearch. Choose words which will make the puzzle interesting to the recipient. The program will ask for the words you want to include and then arrange the words into the puzzle for you.

Working on these projects may take some time, but you may find it more enjoyable than shopping for gifts or knitting sweaters. But, if you just don't have the time, consider giving software. There's lots of things in the Software Store to choose from. My personal favorite choice is Bible Quiz (Disk #85). This program can be played by one to three people. It asks questions on the Old Testament, the New Testament, Geography of the Holy Land and the Life of Jesus. It's a part of the Christian heritage that needs to be passed on and shared. Come to think of it, that's what the holiday is really all about. Enjoy!

**Using Racore Units With Other Units**

Although it has been said that you can't add Racore memory to PCjr systems with other memory expansions already installed, there are ways around the problem. Here is one way to use Racore Drive II with an IBM sidecar.

1. Always use the jr mode.
2. Set the switches on the IBM sidecar as follows: #1,2 and 3 OFF; #4 ON.

Also, make sure the Racore memory board is full before you use the sidecar.

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## Speed Up Jr with a RAM Disk!

(Continued from page 2)

DOS or video empty. This is the /C option with IBM's PCJRMEM.COM. It wastes about 80K of RAM with DOS 2.1 and a bit less with higher versions of DOS which are larger.

A better approach is to create a ramdisk to fill at least the first 128K of memory. This has the same speed up effect, but provides a useful ramdisk instead of just wasting memory.

Although you specify the size of the ramdisk when you create it, the actual size will vary depending upon the particular software you use. CHKDSK.COM can be used to obtain the exact size of the ramdisk and confirm that the first 128K is full. Here is the CHKDSK report on a ramdisk created by a "DEVICE=RAMDISK.COM/80" line in the CONFIG.SYS on a PCjr with 640K RAM running DOS 2.1.

76800 bytes total disk space  
 76800 bytes available on disk  
 655360 bytes total memory  
 519440 bytes free

Note that the total disk space is slightly less than the 80K specified. All the space is available because no files had been copied to the ramdisk.

The "bytes total memory" minus the "bytes free" is the amount of RAM used by DOS and the ramdisk. Here, 135,920 bytes, almost 133K, are used. Therefore, all programs will run in expansion RAM. As long as the difference between total and free memory is more than 131,072 bytes, the first 128K is full (1K = 1024, so 128K = 131,072 bytes).

### Second Disk Drive

The second reason to use a ramdisk is as a cheap, fast second drive. A second drive is particularly helpful when you have a lot of copying to do. With one floppy disk drive, copying files is an arduous sequence of swapping disks. To copy ten files from one disk to another requires typing the copy command, inserting the source disk, inserting the target disk, removing the target disk, and repeating it all ten times.

With two drives you put one disk in each drive, type the copy commands, remove both disks, and that's that. A ramdisk can make it almost as easy. Put the source disk in the drive, copy all ten of the files to the ramdisk C, remove the source disk, insert the target disk, and give the command "COPY C:\* \* A:" to transfer all the files from the ramdisk to the target disk.

On a PCjr with 128K RAM, there is generally not enough memory for a ramdisk while you are running applications. However, you can create a 70K ramdisk when you have a lot of copying to do. With more memory, you can have a ramdisk installed while you are running other programs.

My PCjr has lots of memory, so I install a 200K ramdisk even though I also have two floppy drives. I put instructions in my AUTOEXEC.BAT file to copy several utilities to the ramdisk. These utilities include TED.COM, a small editor, LIST.COM, for reading text files, DIRMAGIC.EXE, a disk manager, and the DOSCOMP.COM. After I remove the boot disk, these utilities are still available since they are on ramdisk. Furthermore, they load and are ready to use much faster than if they were on a floppy disk.

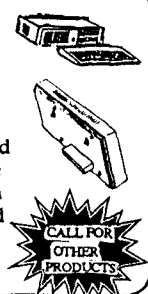
There's plenty of room on my ramdisk for other programs, but I load them manually when I need them rather than through the AUTOEXEC. At the moment, I am writing this article in Jr. WordPerfect. I have exited it several times to do other tasks and then reloaded JrWP from the ramdisk without having to put the program disk back in the drive. This is a very convenient and quick way to operate.

Some programs work better with two drives or even require two drives. Depending on the size of the program files and how much RAM the program requires to run, a

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ramdisk may be an alternative to purchasing a second floppy drive. With 640K RAM, you can create a 360K ramdisk and still have as much memory available for programs as a 256K PC. If you don't need a full 360K for program files, you can make the ramdisk smaller and have more RAM for running the program.

When using a ramdisk as your second disk drive, it is always better to copy the program files to the ramdisk and use the floppy disk for your data files. With this arrangement, a sudden power failure won't cause your hard work to evaporate. It will be safely saved on the real disk. If you have to use the ramdisk for data, remember to copy it to a real disk before you turn the computer off.

Some programs run better from a ramdisk than from a floppy. This is particularly true of programs that access the disk for overlay files such as WordStar and other programs which go back to the program disk for additional information such as PROCMM. These will operate much faster when the information is retrieved from a ramdisk. In addition, you won't have to worry about removing the program disk from the drive at the wrong time and causing the program to crash.

### Reloading COMMAND.COM

The third reason for using a ramdisk is to eliminate the "Insert COMMAND.COM disk in drive a:" message. This message from DOS is seen most frequently after you exit from a large program. It means that part of the DOS COMMAND.COM program at the top of the memory was wiped out by your last program. You must put the boot disk back in the drive so that COMMAND.COM can be reloaded into memory before you can continue.

If COMMAND.COM has been copied to a ramdisk, you can tell DOS to reload it from there, and you won't have to insert the boot disk into drive A. With DOS 3.0 and higher, give this command.

```
SET COMSPEC=C: COMMAND.COM
```

Unfortunately, there is a bug in DOS 2.1 which prevents this from working. However, there is a small utility in our library called COMSPEC.COM which provides the same function. Here is the command format.

```
COMSPEC C: COMMAND.COM
```

Since this is not the DOS function, you don't use the equal sign. COMSPEC.COM is also included with JRCONFIG.

### Warnings

We've covered the three big reasons to use a ramdisk. Now, we need to consider the negatives. First, the ramdisk evaporates when the computer is turned off. Just like any other program, if you lose power, it's gone along with everything on it. Second, if the computer locks up, you won't be able to copy anything from the ramdisk to a real disk. This is why you put programs and not data

files on the ramdisk.

Third, if a program which requires two disk drives is too large, it may not be possible to put it on a ramdisk and still have enough RAM to run the program. In that case, you'll just have to buy a second floppy.

Fourth, the PCjr cartridge version of BASIC insists on loading into low memory. If you have a ramdisk loaded there, you will get an "Out of memory" message, and your PCjr will have to be rebooted. Most BASIC programs run with standard IBM BASIC, so you can rename BASICA.COM from your DOS disk to PCBASICA.COM, or a more imaginative name, and run that. Since it will be running in expansion memory it will be about 40 percent faster than cartridge BASIC.

Finally, if you have a hard disk you may not want to use a ramdisk except to force programs to run in expansion memory. That's because hard disks are much bigger and faster than floppies, so there is never a disk swapping problem.

That's it for ramdisks. Perhaps they really should be called Easy Working Extra disks, or EWEdisk instead of RAMdisks. I feel really sheepish about the pun.

*(The above article was originally published in the San Francisco PCjr User Group Newsletter. John King, President, can be contacted at (415) 472-7035.)*

## Add Two Drives For 3 Drive Convenience

Owl Software is now offering a PCjr expansion unit that adds a second 5.25" and a 3.5" drive to a one drive PCjr. This unit gives your computer three drives so you can have convenience as well as compatibility with the popular 3.5" drive format.

Since 3.5" drive provide 720K of storage, as opposed to 360K for 5.25" drives, the addition of the third drive will also give your PCjr extra disk storage space.

The Owl drive unit is available for \$299 from Owl Software, 1435 Burnley Square North, Columbus, OH 43229 (800) 322-0219.

## Facts About PCjr's System Board

According to the IBM Technical Reference Manual, the PCjr system board "supports both read-only memory (ROM) and R/W memory (RAM). It has space for 64K bytes by \* bits of ROM. There are two module sockets that accept a 32K byte by 8 bit ROM module.

"ROM is aligned at the top of the 8088's address space. This ROM contains the Power-On Self-Test, cassette-BASIC interpreter, cassette-operating system, I/O drivers, dot patterns for 256 characters in graphics mode, a diskette bootstrap-loader and user-selectable diagnostic-routines."



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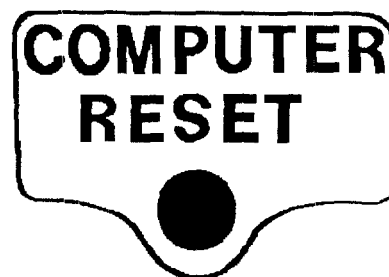
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## Questions and Answers

(Continued from page 5)

program to make the calendar you need. This includes lines, boxes, fancy graphics or anything. When the month on the screen looks just the way you want it, have your program wait for a keypress. Do not either END or STOP it. Use INPUT K\$ or some such thing as the last active line before the END statement.

If the Fn-PrtScr key combination is pressed at this point, whatever is on the screen will be printed out sideways! This is because you are "dumping" a high resolution graphics mode to the printer. Now you know what GRAPHICS.COM is all about... Give it a try, you'll have fun and learn some more about the Jr.!

Of course, all of the above suggestions assume you have a dot-matrix, graphics-compatible printer.

**Q. Cannot get dBase IV to run, though dBase III runs fine. Have tried lots of CONFIGS using DOS 3.3, jr.config, etc. Do you have any hints? M. S. Lewis, Albany, GA.**

A. Our best information, and it comes from our readers, goes this way: Boot with the LEAST amount of video RAM reserved and NO TSRs. Be sure you have at least FILES=20 and BUFFERS=20 in your CONFIG.SYS file, dBase and DOS need this many. You tell us you have 640k of RAM so this should work. The idea is to start with maximum clean memory to get up and running and only then try adding the TSRs you think can't live without. Remember, ANY utility or program which loads and stays in RAM (like graphics.com or even ansi.sys) can cause problems. We have reliable reports that dBase IV does run on PCjr's, so if the above doesn't work for you, you may have a version that's different from the ones reported to work (yes, there are often several versions of software, though not indicated on the packaging.)

**Q. What is most likely wrong if my printer cannot finish printing a file? I have to flip the power switch to get it going again once it hangs. H. Seto, Cherry Hill, NJ.**

A. Not much to work with here, but we must start with the assumption that you've tried with more than one software program to do the printing. Generally, this kind of glitch means that there is a connection somewhere which is acting up due either to heat or vibration. The connection could be just one leg of a chip into a socket somewhere in the printer or in the power switch itself. The vibration idea is likely to be the case if you don't have to wait to turn the printer on again. If you have to wait, then heat is the trigger to the problem. Set the system up to print a dummy file and while it is printing, tap (firmly! you won't hurt it...) the printer, the cable, the power switch, etc. and see what

results. Try to localize the fault physically. If you get erratic results, and still feel that it is the printer at fault, you'll have to get it to a repair shop.

**Q. I'm interested in knowing if any readers have been using Topspeed Modula-2. It would seem to me to be an alternative to QuickBASIC. L. L. Harper, Barstow, CA**

A. Here's our opportunity to ask our readers to let us know which languages they use and find successful on the Jr. In the above case we feel that Modula-2 is much more like Pascal with Object Oriented Prog. (OOP) extensions. It could certainly be an alternative to QuickBASIC. That is, until Microsoft comes out with QuickBASIC OOP, version 8.xx which would probably also work not only in Windows but UNIX, OS/2 and also do multi-tasking. Ahh well, we can dream... For "C" buffs or buffs-to-be, MIX C is another package which is a real bargain (\$29.00 complete) if one wants to keep expenses down. Are you using it? Let us know.

ASIC.ARC (which is almost BASIC) is a Shareware BASIC compiler, complete with built-in Editor, Debugger and documentation. This is for both beginners and the experienced. It is plenty powerful and directly makes small, tight .EXE files without any linking step. It can be found on GENie and other services. (We plan to publish a review of ASIC, and make it available through the Software Store next month - ED)

**Q. (1) Do I need to have the BASIC Cartridge to run BASIC programs?**

**(2) Do I need to have the Cartridge to write BASIC programs? A number of readers.**

A. No, on both counts. What you need to do is by-pass the Jr's ROM BIOS which looks for the BASIC Cartridge when you type any command which begins with the five characters "B, A, S, I, C" at the DOS prompt. On our Software Store disk #56, "PCjr Patches", is a patch set, with instructions, which will make the necessary changes to the Disk version of BASICA which you already have on your DOS Supplemental disk.

To simplify: The patch changes Disk BASICA to by-pass the built-in PCjr need for the Cartridge and sets itself up in combination with the ROM part of BASIC which ALL models of IBM already have installed. (This is what makes it IBM BASIC or IBM BASICA.) Once the patch is done, you re-name this disk version so DOS doesn't continue to look for the Cartridge. Be sure the first five characters of your chosen name do NOT spell out BASIC... I call my version DBASIC, for example. You will now be able to run BASIC programs, but NOT programs which require the special 16 color and/or hi res 4 color screens. You will have 16 color background colors, though! Strange isn't it? The other super color graphics screens

(Continued on page 18)

are not included in the disk version of BASIC; they are implemented only in the Cartridge or Tandy GWBASIC. You will have the exact same capabilities of the original PC XT, or AT. That really isn't too limiting for most purposes as most programs are written expressly for the standard PC. You will have 16 color text, med-res 4 color graphics and 2 color hi-res graphics. Once you have this disk version up and running you certainly can write your own programs. The above limitation about the screens for your own programs does apply so if you must do really fancy graphics, get the Cartridge. If you do want to start writing your own, be warned it IS addictive...

## Get Super Sound From Your PCjr

*(Continued from page 1)*

look at and try out Junior's sound capabilities. The information in these articles should be of interest to just about everyone - we will tell you about a few more components that you can add to your computer, and we will explain how to write short programs that will play tunes or make noises using Junior's sound generating chips. The information will be complete and intelligible enough for novices to follow, but we'll also include some information that advanced programmers can use. In this first article, we will go over the basic sound capabilities of Junior. In the next article we will cover music notation and show you how to turn Junior into a keyboard music machine. In follow-up articles we will tell how to control Junior's sound generating hardware, and we will take a look at some programs for Junior that create and use sound.

There are two distinct ways to internally generate sound on a PCjr. One way is to use a timer device to rapidly turn the speaker on and off. Usually the device that does this is a chip called the Intel 8253 programmable timer. If, for instance, the speaker is turned on and off 523 times a second, a sound corresponding to the Middle C music note is produced. For almost all computers, other than the PCjr, turning the speaker on and off is only way that sound can be produced without adding special expansion boards.

The second way that a PCjr can generate sound is through a special sound generating chip. Every PCjr has, on the system board, a Texas Instruments SN76496 sound chip which is capable of producing very sophisticated sounds. The SN76496 is able to generate sound of

various frequencies, in three different voices and at 15 different volume levels. It is also able to produce hissing noises and periodic noises which can be used as sound effects. In future articles we will completely cover this chip and show you how to get the most out of it.



To complement the two ways to generate sound, there are four possible ways to output sound from the PCjr. First, sound can come from a speaker inside the computer's case; second, sound can be sent out to a TV set; third, sound can be output through the color display; and fourth, sound can be sent to an external audio amplifier.

The first way, the internal speaker, is the most often used sound source but it produces the least satisfactory sounds. It is the most often used sound source because virtually every desk top PC type computer has a built-in speaker, and programmers know that they can count on it to be there for their programs to use. However, this built-in speaker was intended to serve only as a beeper to get your attention. It was never intended to be used as a sophisticated sound source, and Junior's TI sound generation chip will not even work with the built-in speaker. IBM included an internal speaker with Junior for compatibility purposes, but they also provided methods to disable this speaker so that it will not interfere with better-quality sound sources. We will explain how this is done later.

The second and third ways to output sound on the PCjr are similar to each other. Whenever a TV set is connected to the PCjr through a TV adapter cord attached to outlet "T" on the back of the computer, both a video signal and an audio signal is sent to the TV set. Sound signals generated by the TI sound chip can be transmitted to the TV set. Similarly, whenever a Red-Green-Blue display (such as the IBM PCjr Color Display) is attached to outlet "D", both video and audio signals are sent to the display. Most RGB displays have a speaker, and some, like the IBM PCjr Color Display also have a jack for a 1/8 inch (3.5 mm) mini audio plug. You can plug a headphone into this jack, or as explained in the July 1990 Jr Newsletter, you can connect an amplified speaker into it, and thereby get a better sounding speaker than the one in the display. Signals from the TI sound chip can be transmitted through this outlet.

### Amplified Sound

The fourth way to output sound from your PCjr is through an external audio amplifier connected to outlet "A" on the back of the computer. Sound signals from the TI sound chip will be output from this outlet. In fact, the main purpose of this outlet is to handle sound from the TI sound chip. Outlet "A" is a standard phono plug. As far as I know, just about any amplifier will work. The connection would probably be made from the computer to the



amplifier's auxiliary input, but you should read your amplifier's instructions before you try this. You can connect a speaker directly to outlet "A", but the audio signal from the computer is so weak that you can barely hear sounds from the speaker. The amplified speaker described in the July 1990 Jr Newsletter will undoubtedly also work when connected to outlet "A".

I have a Radio Shack 200mW audio amplifier connected to Junior's outlet "A". This is a small, electronic project type amplifier with Radio Shack's catalog number 277-1008, and it costs \$11.95. With this amplifier, you will also need a 9-volt battery, to power the amplifier; and an audio cable with a standard phono plug on one end and a 1/8 inch mini plug on the other end, to connect the amplifier to your computer. The cable is available also from Radio Shack (catalog number 42-2444) for \$2.19. This amplifier has a built-in speaker, but it is not a very good one. However, the amplifier does have a 1/8" mini plug socket to which you can connect a better speaker or earphones. Any low-power 8 ohm or higher impedance speaker should work with the amplifier. I use a small, book-shelf type speaker that I've had for years and sometimes use as a radio speaker. There are probably other inexpensive amplifiers around, if you don't already have a hi-fi amplifier available, that will work with Junior's audio output - searching around for the hardware is half of the fun.

---

*Your PCjr probably has more power and potential for producing sound than any other stock PC.*

---

CompuTel's book "Mapping the IBM PC and PCjr" says that you can also output sound through the composite video outlet - outlet "V" on the back of Junior -but I do not believe that you can really do this. The IBM Technical Reference Manual doesn't say anything about this as an audio output. My composite computer display doesn't have a speaker, so I've never been able to completely test this outlet for sound. The composite video outlet is a phono plug outlet and I have plugged the amplifier that I talked about in the previous paragraph into this outlet. I couldn't get any sound at all out of it.

When we spoke about producing sound signals, several paragraphs ago, we said that there were two ways to internally generate sound in a PCjr. We carefully used the word "internally", because there are also two ways to use external sound signals with Junior. One of the ways is to input audio signals with the cassette recorder connection (Outlet "C" on the back of the computer). This means that it is possible to route audio signals into the computer and then output them through another channel.

This has some possibilities for exploration, but I don't know of anyone who has done so. The second way to input audio signals is through the audio plug, that we discussed previously, located on the back of the computer. Again, I don't know of anyone who has tried this.

Which of these four possible sound sources is actually used is controlled by a chip called the Programmable Peripheral Interface. It is Intel Corporation chip number 8255, and often the chip is called the 8255 PPI or just the 8255. It isn't especially exciting, but we need to describe how the 8255 controls the sound source, because, in a future article, we'll want to program this chip. The 8255 is actually a general purpose chip that also handles keyboard input and information about peripheral devices, such as a modem and disk drives, that might be installed. Bits 5 and 6 of port number 97 (Which is 61 in the hexadecimal number base.) in the 8255 determine the sound source as shown in Figure 1.

Whenever Junior is turned on, power-on routines in Junior's read-Only-Memory Basic-Input/Output System (ROM BIOS) turn off both bits (Which means, in Figure 1, that they both have a value of zero.), so that the default sound source is the timer chip. If a program wants to use another sound source, it must appropriately set bits 5 and 6 of port 61h. To use the TI sound generator, for example, the program must first turn on both bits.

IBM established some very convenient routines in the ROM BIOS that programmers can use to control the video system, the disk drives and just about everything in the computer except the sound system. There are no ROM BIOS or DOS services that cover sound. To use Junior's powerful and elaborate sound system you must manipulate the hardware directly, and we'll show you how to do this in this series of articles.

This completes our examination of the sources of sound and of the output of sound in the PCjr. In the next article we will begin to use some of the sound capabilities we have covered in this article. In the process, we'll explain a little about sound and about music notation, and then use this knowledge to turn Junior into a keyboard music machine. In the meantime, you can search for an amplifier and speaker to hook up to your PCjr.

Figure 1		
PCjr SOUND SOURCE SELECTION		
Port 61h Bits		
Bit 6	Bit 5	Sound Source
0	0	Internal timer chip (8253)
1	0	Audio channel
0	1	Cassette recorder channel
1	1	TI SN76496 sound generator chip

# The PCjr — A Computer Worth Supporting

**EDITOR'S NOTE:** This letter from Joseph McLean, of Worcester, MA. to Microsoft Corporation, was intended to educate Microsoft about the capabilities of the PCjr and to support jr Newsletter's campaign to gain PCjr compatibility among software publishers. The letter contains so much information about PCjrs that we felt it would be useful to many PCjr users who have not learned as much about their computers as Joe has. So we decided to print the following excerpts from his letter. We hope you find it interesting, and we thank Joe for sending it to us.

My computer has 640K of RAM, 40 MBytes hard disk, 10 Mhz speed, Hayes 1200 modem, two serial ports, parallel port, HP DeskJet Plus printer, two joy sticks, mouse systems mouse designed to work specifically for my machine (Microsoft compatible), 5 1/4 inch drive and 3 1/2 inch drive, speech synthesizer, multiple system fonts, Tandy sound ability, expanded CGA and Tandy color graphics and a 101 key Datadesk keyboard.

There were over half a million of my computer model sold, an estimated three quarters still in use due to the high reliability design, and although the manufacturer stopped production in 1985, I can still get parts and support for four more years yet.

So far it sounds like I have a pretty good computer. I can run Lotus 123, DbaseIII+, AutoCAD, and most other software for MS-DOS machines. I can also run software other PCs can't, because they don't talk, play real music, use two joysticks, or allow multiple wireless keyboards for group games.

You may have guessed it by now. If I didn't tell you what it was you would think I had a nice computer. But once I mention it is an IBM PCjr, a prejudice dating back to the chicklet keyboard writes off the machine. By the way, my young son thinks the chicklet keyboard is great. He owns his own (indestructible) keyboard, and it has no wires.

Microsoft refuses to acknowledge the existence of this machine in the market. While it is a machine not heard of in years by business users, IBM still is supplying replacement parts for some years. The IBM PC, IBM XT, and the IBM AT probably have fewer active users than the IBM PCjr. With a 10 Mhz 286 upgrade available (socketed for 80287), the PCjr will be around into the early 1990's.

A 386SX 1990 version of the PCjr would certainly have more appeal to the home computer market than the PS/1 attempt. The Jr has a following much like the original Apple computers. I have heard Intel is working on the Genesis chip, most of a motherboard including disk con-

trollers & graphics driver on a single IC. Its target is the laptop market. What a shame not to specialize a version for home use.

## The Tandy Connection

Tandy based its line of home computers on the IBM PCjr. The very first Tandy 1000 with "enhanced CGA and sound" revealed the PCjr signature for system identification using Norton. It had a newer version number though. It was also quickly pulled off the shelves for "modifications." It is also the reason IBM PCjr's and Tandy computers use the exact same sound programming. They both drive the same TI sound chip with the same ROM BIOS. With \$5 worth of hardware (a chip soldered piggyback to the PCjr's unique VGA chip on the motherboard) the PCjr becomes fully Tandy graphics compatible as well as retains its standard CGA mode and special PCjr modes. Some Tandy software requires one annoying byte change with DEBUG, then runs fine. Most run fine without the change.

Let me briefly review Tandy mode for you. Tandy mode supplies the same graphics abilities as standard EGA. Tandy mode can be displayed on an RGB monitor. This has several distinct advantages. The most obvious is the user can purchase a less expensive monitor. Since most home users are lucky to buy a computer, few will every buy expensive MultiSync types of displays. Another advantage is less radiation and eye strain. If home computers become common like VCRs, safety will surely become more important. The most dramatic is that people who are spending lots of money on monitors are buying video monitors for their homes. The newer ones, such as the Sony, come with the ability to plug computer RGB (i.e. CGA) input to them. This has to be seen to be believed. It is the closest thing to a challenge to inane video game hardware. The PCjr also comes with a built in composite video output using an RCA phono plug, for those without RGB connections.

## Super Sound System

The sound from the sound chip can only be heard through an external amplifier/speaker system. An audio RCA phono plug is provided on the back for such. I have a small speaker with a built in amp for computer top use. When I go big screen with the video, I plug the audio into my stereo. This is great fun!! Sierra is particularly good with audio. They even have a keyboard player from SuperTramp compose some of the music. They market it

also with sound hardware that goes into expansion slots of "regular" PCs. I don't know how many people buy such hardware though. The TI sound chip used in the Tandy and PCjr computers is the same one used in the small Casio keyboards and is capable of three simultaneous music frequency voices with a fourth dedicated sound effects voice.

Microsoft software runs on the PCjr only by adding a simple patch. The patch has been sent to Microsoft to use at no charge, but had been ignored. It would in no way affect a standard PC, but apparently whoever received it couldn't be bothered to help that much.

When I use my QuickBASIC, I wonder how certain standard modes for video could just be left out. I also am concerned how I would possibly write code for a Tandy screen. More and more entertainment software is Tandy compatible, but there is no way to write code for it in Microsoft QuickBASIC.

### Cartridge BASIC Power

When the PCjr ROM cartridge BASIC came out, it had several bugs, (many were fixed by users on shareware, not IBM), but was an expanded BASIC which surpassed regular IBM BASIC and GWBASIC. Besides using commands to access the special CGA modes and play music, the Cartridge BASIC could do other things. It could access the two built in joysticks, the lightpen port, and other special hardware. It also had advanced commands for window, view port, paint, palette, and other graphic handling commands. But there is still no way to compile it. I know other junior users are in contact with Borland to work with TurboBASIC, but I don't know how far that is going.

It is my contention that changes in the Microsoft compiler to incorporate the PCjr Cartridge BASIC would probably sell more copies of the next version of QuickBASIC than any other single change.

My entire computer is either IBM or from a company called PC Enterprises. They guarantee compatibility across their product line. And they have a serious product line (SCSI disks, 2 meg ram boards, etc.). P C Enterprises also sells software. They guarantee the software works on their machines. If I buy PFS: First Choice for example (which I did, even though I really wanted Microsoft Works) I knew it would work. (Microsoft Works works, too — ED.) The programmers there will go into the master floppies and do little DEBUG things or add drivers as needed. I have bought a lot of software and hardware from them and so far, so good, everything works. There are also other similar firms who support the IBM PCjr. Perhaps Microsoft could work through one of them. Word would spread quickly through the PCjr net about new developments from Microsoft.

## \*\*\* PCjr CLASSIFIEDS \*\*\*

**PCJR 640K, Tecmar** sidecar w/new power supply, 5-1/4" & 3-1/2" drives, like new color monitor, adapter cable/ser devices, DOS 2.1 & Cartridge BASIC w/manuals, DOS 3.3, IBM manual, PC File db w/manuals, joystick, back issues of jr Newsletter from 10/86, many shareware programs. \$500 plus shipping. Carll Art Chinery (219) 942-0287.

**PCJR 640K, color monitor**, joysticks. BASIC, Configuration, Lotus 123, cartridges. Thin Font, V-20 chip, internal modem. Hardware Service & Maintenance Manual. Call Blair (813) 372-8960. 5 to 9 Mo, Tue, Th, Fr, EST. \$500 incl. shipping.

**For Sale - Lotus 1-2-3 Cartridge** Version #1A, 1 disk drive & 256 Ram, 2 cartridges and disks and manual (\*BM) Includes shipping. Like new. Phone (708) 837-4234 John or Viv

**PCjr - 128K, PCjr color monitor**, keyboard, PCjr Parallel Printer attachment, basic cartridge, MYM (ver 1.0), various games, manuals, joy-stick, excellent condition, \$350 plus shipping. Call Carroll (503) 928-3168.

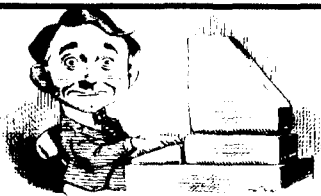
**PCjr 640K-Racore II** expansion unit, color display, new system board, Datadesk keyboard and cables, Also PCjr keyboard. Complete documentation, DOS 2.1, BASIC cartridge, V-20 chip, \$550. M. E. Dollar (213) 430-1569.

### How to Submit a Classified Ad

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Ads received by the 10th of the month will be printed in the following month's issue.

If you would like technical information for your engineering staff on programming for the PCjr, the various PCjr user groups have put together a specification list with lots of assembly code and documentation. This is also free for distribution and use by private companies. This may seem unusual, but it must be remembered, the PCjr is much like the Apple computer of Pre-Mac days. It is not a business machine and has a strong following of loyal users who share information.



# Need Help?

The following disks from the jr Newsletter Software Store can help you to get the most out of your junior. To order, see the coupon on page 23.

**PCJR AUTOSETUP.** A beginner's dream: Just select from a menu to make separate boot disks especially for each type of software you use. Automatically creates the right config.sys and autoexec.bat files for RAM disks, games, word processing, telecommunications and other software to run at maximum power and efficiency on your PCjr. Designed especially those who haven't mastered the art of customizing their computers. This one does it for you! 256K (Disk #99)

**JR TOOLKIT V2.0.** A collection of 30 upgrades, modifications and repairs. Some easy, some require experience. Includes adding second 5.25" drive (easy) or 3.5" drive (easy), PCjr to Tandy 1000 Mod (harder), power supply upgrade (harder), reset button (harder), V20 speedup chip (easy), how to quiet drives (easy), adjust monitors (easy), plus many others. (Reviewed 3/90 & 6/90) (Disk #110)

**JR POWER PACK.** A collection of particularly useful programs for PCjr owners. Set up RAM disks, address memory to 736K, turn a joystick into a mouse, set screen colors, keyboard click, scan and search text files, screenblinker, print spooler, and more. 128K. (Disk # 52)

**JR POWER PACK II.** Disk full of programs to make your PCjr more useful and powerful. Fix compatibility problems, set up ram disks, tiny word processor, set up 3.5" drives, use DOS easily, and more. Need 256K for some, 128K ok for most. (Disk #65)

**PCJR COMPATIBILITY DISK V3.5.** Lists hundreds of software titles, along with info on how they run (or don't run) on PCjrs. Includes many tips on how to make software PCjr compatible. Powerful search feature finds titles quickly and easily. 128k ok. Updated April, 1990. (Disk #60)

**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, Bard's Tale II, Maniac Mansion, Designasaurus, California Games, and F-19. Also patches for Flight Simulator V.3.0, Arctic Fox, Managing Your Money V.3, Autocad, King's Quest IV (early 512K version), KQ II (PC ver), Turbo C, Quick BASIC V3-4, Advanced Flight Trainer, Double DOS, Bard's Tale I, Turbo BASIC, and BASICA. (Disk #56)



## jr Newsletter Software Store



The software in the jrNewsletter Software Store is the best public domain and user-supported software for the PCjr we've been able to find. All software has been tested on our PCjrs and is highly recommended. Some of the programs are equal to or better than commercial programs costing hundred of dollars. These are offered for you to try at \$5.95 per disk. Some shareware requires additional payment if you continue to use it.

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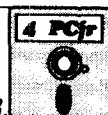
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\* **NEW** \* **SAVE THE PLANET!** If you want to do your part to stop destruction of the earth's environment, this disk can help you. Let your PCjr explore this extensive database of information on the major environmental issues as well as what you can do to help. Charts, graphs, background facts, games and demonstrations all related to saving the only planet we have. Need 512K. (Reviewed 11/90) (Disk #120)

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

\* **NEW** \* **BEST OF JR NEWSLETTER IV.** For your handy reference, disk has the most informative articles, columns, and tips published in Jr Newsletter from June 1989 through May 1990. Easy to use search utilities provide quick ways to find any subject of interest. 128K ok (Disk #118)

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