Kids Play and Learn Down on the Farm

By James Prossick

Sometimes the simple things in life can bring the most enjoyment. An ice cream cone on a hot August day, a hug from Mom, or building the first snowman of the year, are the memories a child keeps forever. McGee and Katie's Farm by Lawrence Productions, Inc. use that same down-to-earth strategy to provide an environment for your child to explore while gaining confidence in using the computer.

Fun learning is a nice trick when it works, and here is how McGee and Katie's Farm pull it off: Both programs use a window interface that can be manipulated by mouse or keyboard. The interface uses what I call the Big Crayon Approach. There are four window choices along the bottom of the screen, each about the size of one of those family photographs you keep in your wallet. The windows are big enough for your child to see what's going on, and plenty easy to position the pointer on to initiate an action. Like the king size crayons, they are the right size for little hands to use.

All the action on the main screen is controlled by the four windows. The boundaries of these computer worlds are small enough to be manageable, yet full of objects and characters that are readily recognizable to your child. McGee has seven places to visit and explore inside and

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In This Issue:

PCjr Lives!

"Pssst! PCjr lives!"

Updated Version of PCjr Compatibility Disk

Our annual update of Disk #60, PCjr Compatibility Disk, has been completed and is now available in the jr Newsletter Software Store.

Version 4.0 of the PCjr Compatibility Disk contains all software compatibility data we've been able to collect since we began publishing jr Newsletter in June 1986. This new version has been updated with information we've assembled since the last update April 1990.

The disk contains information on hundreds of software titles. It lists whether or not the software runs on PCjrs, how much memory it requires, and in many cases includes comments on the quality of the software. Tips on how to get each title to run well on your PCjr are also given, whenever we have been able to gather such information.

Also included on the disk are articles with information on PCjr compatibility as well as tips on how to set up your PCjr in order to get so-called "incompatible" software to run.

In our experience, most software made for PCs and

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Disk Operating System (DOS)
What is it?
(Part I)

By Dick Page

Some computers are made with all the programs you can use built into them. Some are designed to only use programs in cartridges which are plugged into the computer. Most Personal Computers (PCs for short), especially the IBM PC (and PS) family of computers, are intended to be more flexible, more adaptive. In order for that to be true, the computer needs more than just a set of built-in or plug-in operating instructions (programs). It needs the capability of writing down and reading the information made during the use of the computer so that information can be retrieved, altered, copied, or several other related tasks. How does the IBM PC family (as opposed to the IBM "Main Frame" family) do that? -- By reading from and writing to a 5 1/4 inch magnetic diskette (often called a "floppy disk" using a device called a "disk drive."

In order for the computer to know how and when to send and receive information to and from the disk drive, a set of instructions and a common language must exist between the computer and the disk drive. We call this set of instructions "D.O.S.," short for Disk Operating System.

Why We Usually Start Up Our jrs With the D.O.S. Diskette:

The main role of D.O.S. is to supervise the running of our Personal Computer, to allow it to be as flexible as possible. It relieves the rest of our programs--and us--from many tiresome chores. It takes care of a lot of behind-the-scenes details that are necessary to keep the computer running smoothly, but which are mostly hidden from our eyes.

This "setup" of the computer takes place when the machine is first turned on. The PCjr has enough information built into it so that when it is turned on it looks to see if the lever is turned on the disk drive. If it is "on" (in the down position) and has a diskette in place, it tries to start up the disk drive to look for instructions on the diskette on how to proceed to talk with and use the disk drive.

This first information is stored on two "hidden files"-- ones that aren't listed when we list all our files on our D.O.S. disk (with the DIR command). These files, IBMBIO.COM and IBMDOS.COM, are hidden so that they can't be altered or destroyed. The PCjr won't use the disk drive without these two start-up programs intact.

Once the PCjr has "read" these files, it looks for a third file called COMMAND.COM. As the name implies, COMMAND.COM contains programs of commands we can give the PCjr which jr will dutifully carry out whenever we "give the command." These programs are automatically transferred into the PCjr's computer memory as jr is started up and are therefore often referred to as "Internal Commands."

The D.O.S. disk contains many other files besides IBMBIO.COM, IBMDOS.COM and COMMAND.COM. The majority of these files are program to allow us to give the PCjr other commands, often referred to as "External

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. Cartridge BASIC still works fine but GWBASIC which came with my DOS 3.3 comes up with an unchangeable orange background color. If I give the command "COLOR 15, 1, 1" I get a blue border and some color other than white for the foreground and the background does not change. If I use "COLOR 7" the foreground does become white. I don't really need GWBASIC but I'd like to know how to use it — or at least why I can't.

O. Barnes, Federal Way WA

A. GWBASIC is a complete, on-the-disk version of a BASIC interpreter for machines OTHER than IBM... IBM BASIC and BASICA are already partially implemented in ROM on the motherboard of IBM machines and the disk based part is a superset of what's already in that ROM. Cartridge BASIC is completely ROM based, part in the cartridge and part in motherboard ROM.

In the jr. even if you have BASIC or BASICA available on disk and you type BASIC or BASICA <Enter> at the DOS prompt, you'll be running Cartridge BASIC in conjunction with the internal ROM part of it; the disk file won't even load. The cartridge is checked first and if it is connected it takes over. In order to run even genuine IBM disk BASIC or BASICA on the jr you must rename the disk file with something other than BASIC as the first five letters or else the cartridge takes over. If you pull the cartridge to try to prevent this, you'll have to patch the disk version to even get it to load and run. The patch is available from the Software Store for those of you without a cartridge who would like to use the disk version BASICA which came with your PC DOS.

Note that version of DOS above; it is PC DOS and not MS DOS and here's why:

Because other manufacturers do not have the ROM BASIC kernel in their machines, Microsoft developed and distributes GWBASIC with MS DOS which presumably includes or emulates whatever IBM has in ROM. For clones this is the ideal solution. How well this works in a genuine IBM is probably best demonstrated by the problems you are having with the COLOR command. That, added to the unique superset of color screens and video modes of the PCjr as compared to the AT, XT, or a clone and you see some of the possible complexities of trying to use GWBASIC. Sure, some versions of GWBASIC work, but not quite the way one expects. Make a big note to yourself here: Except for a few Compilers, Cartridge BASIC is the most advanced version of BASIC available for you!

Q. The jr Power Pack disk contains a program called KOLOR.COM which allows one to change screen colors. If the user runs this before running DOSAMATIC the cursor disappears. Any suggestions to solve this problem?

D. Hormuth, Newburgh IN

A. The case of the disappearing cursor... Sherlock is on the case... DOSAMATIC is not alone in this; a couple of other programs (video-intensive, such as CADD, paint or graphics) leave me in the same state.

Generally the reason you don't see the cursor is because it landed on a different video page than the one displayed. KOLOR.COM or other video utilities sometimes cause DOS to switch pages or leave DOS in such a condition that the NEXT application makes a page switch and DOS leaves the cursor behind or in no-man's-land.

In this case running MODE.COM (such as MODE CO80) either in a BATch file or typed in will activate and relocate the cursor to the displayed/active page. If that causes other undesirable effects, then another technique is indicated, so let's write a tiny program. I think we've written something like this before but it's worth doing again.

Put your disk with DEBUG.COM in a drive and type "DEBUG" <Enter>

The minus symbol (or hyphen) is the debug prompt so we won't repeat it here. It is important in line #3 below to check for something like: "7AF4:0100 -_" Ignore the hex number in front of the full colon but the second hex number MUST be 0100 to produce a .COM file. If this isn't so start over from DOS.

Questions and Answers
(Continued from page 3)

Carefully type the following, exactly as shown, but do not type the comments in parenthesis. You must press Enter immediately at end of each line. If you see "^error" just type the line again; debug did not accept it. Be careful; no spaces necessary at commas. If you know you've made a horrendous mistake and debug did accept it, just type Q, press Enter and start Debug again from DOS.

N curse.com	(Name it)
A	(Assemble mode, look for XXXX:0100 next line)
move cx,0607	(put 6th & 7th cursor lines in reg cx)
move ah,1	(set up op #1, scrn cursor, in reg ah)
int 10	(call interrupt #10, video, and do op #1)
int 20	(call interrupt #20, which is return to DOS)

(Blank line here, just press <Enter> to get out of Assemble mode)

RCX	(to set up length of file at next line ":")
9	(size of our little file in bytes)
W	(Write the 0009 bytes to disk)
Q	(Quit Debug and return to DOS)

You've just written a .COM program using an assembler!

On your disk you should find CURSE.COM, 9 bytes long. To make the cursor visible and/or to change an already visible one from some strange shape to the normal underline just type CURSE <Enter> and there you are! Of course you can use this .COM file in a BATch file as well.

The curious among you might want to experiment a little. If you change the 0607 in line 3 to 0107 you'll get a block shape for the cursor. Can you see why? Try some other numbers to see how the cursor is presented on the active screen.

Q. Is there anything better than the standard DOS Backup/Restore for a hard disk? Fastback Plus isn't currently compatible with the jr. Also, if you can help me understand another problem with my hard drive. Why do I have to power up the hard drive before the jr sometimes? If I don't I have to sometimes hit Ctrl-
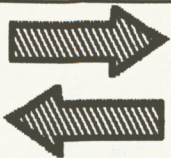
Reader Feedback
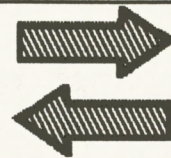
Reader Reports on Software

On my PCjr with 640K and two disk drives, I have been able to use the program **BattleTank** in four colors; Mindscape's **Covert Action** in four colors. The screen blanking routines are slow and it still requires flipping floppies.

I have used **TurboTax** Version 7 (1989) and was able to use the "G" switch to bring up graphics without a hard drive. This year's version 8 tells me I do not have enough memory to run that. (I have 557,040 under PCDOS 3.1). I reviewed the manual and it states you need 640K to run this feature and specifically references the MGA, EGA, and VGA monitors.

Last year's program required 385k and included the CGA as one of the monitor types for graphics capability.

I intend to let Chipsoft know about my disappointment with this redesign. It now also takes 7 360K floppies.

I have tried for several years to use **Defcon 5** by Cosmi. I get only four colors and the program blocks you out at different points. I've just about given up on it.

I have Mindscape's **Bank Street Music Writer.** By using the PC Enterprises ID cartridge I am able to compose in 6 voices when the ID switch is set to a PC. (It will not play the sound in that mode). The jr. mode only plays and composes in 3 voices.

I received **Word Perfect 5.1** as a gift. I was disappointed in Word Perfect 5.1 with its redesigned 600 bit file. That design not only keeps jrs from using it, but also other dual and singly floppy systems out there. And there are literally millions of them. Such is the marketing strategy of separating the home from the office.
(They offered me **Letter Perfect** in exchange).

I have been a reader of the newsletter since 1987. As a matter of fact, several days ago I was having a lot of trouble with my original IBM Qume drive. It was being overly noisy, then it would not read or write.

I had to disassemble the 2nd drive to make sure that wasn't causing the problem. I tried the diagnostics as a single drive system and it still was not working. (I received "B" as the result code). I pulled out my collection of the newsletter. Saw a reference which sent me back to the Sept/Oct. 88 Issue on drive maintenance. Followed the rather simple instructions and my drive was working again.

THANKS MUCH FOR BEING THERE.

Frank Gentile, Sunnyside, NY

Some Junior Tips Submitted by Several Members

Installing a 3 1/2" floppy? Remember, it will require DOS 3.2 from 1986 AND it uses up to 69.6K vs. 40.9K under version 2.1. Also note DOS 4.0 and higher are NOT compatible with the PCjr!

The fans for the Racore Drive II are P/N 3500.

There were two power adapters cards made for the PCjr. The earlier ones, P/N 8654399, were shorter, 7" versus 11", then the later production Juniors, P/N 6135986. Also the later ones were a little more powerful.

Do you need a replacement for the original Qume 142 PCjr floppy drive? The following Half Height 5 1/4" drive will fit right in your Junior:

Fujitsu	P/N 2551
Tandon	P/N 65-21
Alps	P/N ?

Do you remember how to:
- Perform the PCjr self test? It's <Cont'l> <Alt> <Ins>
- Adjust the display left or right? <Cont'l> <Alt> <Arrow>

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

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

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

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

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

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

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

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

Reader Feedback

- Echo each keyboard entry? <Cont'l> <Alt> <Caps Lock>
- The alternate way to get an asterisk on the PCjr? <Alt> <.>

(These tips were recently published in The Phoenix, newsletter of the PCjr SIG of the NYPC User Group.)

Junior User Helps Out At the Office
By Louise Lery

A friend at the University purchased a used two-floppy drive, AT&T 6300 computer and asked if I would help her bootup WordPerfect so she wouldn't have to keep swapping diskettes. I said, "Sure," and formatted a new disk on my Junior using the /s parameter to make it self-booting. Next, I made a config.sys file using her AT&T version of VDISK.COM to make a 128K RAM drive along with the necessary buffers= and file= entries. This made a 128K RAM drive C:. Next, I made an autoexec.bat file so COMMAND.COM would be copied to C:. Then, the autoexec.bat would boot WordPerfect. The last thing was to copy her WordPerfect files to this new boot disk. It worked like a charm.

The problem came when she asked if this disk would also work on her other computer at home; a PC clone. "Sure it will," I said. So, to show her that the new disk would work on any computer, I went over to the clone we have the in the department office that has a 20 meg hard drive and a menu system. I put the disk in A: drive and booted. Perfect! After entering the date, we were left with WordPerfect on the screen. (Okay, who's ahead of me?)

The phone call came early the next day from the department secretary: her computer failed to boot. It said "BAD OR MISSING COMMAND INTERPRETER" in one message and "WRONG DOS VERSION" in the next. Yep, when I had booted with the new disk the day before, I had copied my copy of DOS 2.1 COMMAND.COM to drive C:, the hard drive on the department's computer, over-writing the 3.2 COMMAND.COM file that had been there. The RAM created by VDISK.COM on the clone was actually drive D, not C as it already had a hard drive C. Luckily, all we had to do was reboot with the MS DOS disk that came with the clone and copy their original COMMAND.COM on their DOS disk to their hard drive, Drive C: and reboot once more.

Needless to say, this was a very educational experience for me and I learned much. Computing may have its moments, but I never have these kinds of problems with

Junior!

And, yes, it was WordPerfect 4.2. For the Junior, 4.2 is great! You can "import" the files into 5.0 or 5.1 at the office, and you can save your files from the office in 4.2 format to use at home on Junior. Just be careful taking your self-booting disks into work with you.

(This article was originally published in the Eugene PCjr Club Newsletter.)

Disk Operating System

(Continued from page 2)

Commands"--because we have to ask for them to be read from the D.O.S diskette into jr's memory each time we want to use them. They, therefore, are not kept in PCjr's internal memory, but are "external" to it. The D.O.S. supplemental Programs diskette also contains some sample programs written in BASIC program language---programs showing tasks you can perform on your jr.

The Three Main Uses for D.O.S.

We can separate the functions of D.O.S. into three main categories: (1) accepting our commands, (2) running our programs, and (3) managing our diskettes.

(1) Accepting our Commands.

When the PCjr is started with D.O.S. installed in memory, D.O.S. takes on the job of asking us, "What do you want jr to do?" and then it responds by doing what we tell it. This works very simply. When D.O.S. is ready to accept a command from us, it us its COMMAND PROMPT, "A>".

A command to D.O.S. is the name of something that we can ask D.O.S. to do for us. In actuality D.O.S. is asking us to give it the name of some program we want it to start up for us.

(2) Running our programs

In computer-talk, starting a program is called executing it, or running it. So, when we type in a command for D.O.S. (such as FORMAT), we're really asking D.O.S. to run a program with that name (FORMAT.COM).

As long as that program is running, it is more or less in charge of the computer. Most well-written programs have built into them a way to stop the program from being in charge and help you return control back to D.O.S.. Sometimes they don't. Whenever they don't, your job is a bit harder because you then need to know how to get back to D.O.S., or you have to turn off the jr and start it up all over again.

The BASIC program is a good example of this proc-

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

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

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

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

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

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

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

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

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

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

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

Disk Operating System

(Continued from page 7)

ess. At the A>, typing the word BASIC changes the control of the computer over to the BASIC program stored in your BASIC cartridge. When you want to exit BASIC and return control to D.O.S., you type SYSTEM after BASIC's "OK" prompt, and A> will appear again.

(3) Managing Our Diskettes

The third of the three main jobs D.O.S. does for us is managing our diskettes. Our diskettes are like filing cabinets or storage drawers that are available to our old friend, the handy person (handyman). When we use the analogy of the computer as a handy-person and the memory as a workbench, we can think of diskettes as being like the toolbox that we can bring to the handy-person.

We can have many different diskettes, and so we can present many different "toolboxes" to the computer. Each diskette can have stored on it its own collection of programs--tools for the handy-person. When we place one diskette into the computer's diskette drive, any programs on that diskette become program commands that D.O.S. can carry out for us. If we take the diskette out, then D.O.S. can't use those command programs--those tools aren't available to our handy-person.

Toolboxes can be quite orderly, or they can be a jumbled mess. Its the same with diskettes. One of D.O.S.'s main jobs is keeping our diskettes orderly and supervising the use of the storage space that's on each diskette. D.O.S. not only lets our computer read programs and other information off our diskettes, D.O.S. also lets us write, or store , information on each diskette. Naturally, for everything to run smoothly, we need to be sure that all the programs and data stored on each diskette aren't jumbled together; that each item on the diskette has a name so we can identify it; and that we don't run out of room on the diskette. All these tasks, and more, are part of the diskette management function supervised by D.O.S..

The Three Uses of Diskettes:

There are three ways we can use diskettes. First, we use them to start up D.O.S. itself. To do this, we need to have what is called a "D.O.S. system-formatted diskette." That is a diskette which at least contains the two D.O.S. start-up programs mentioned earlier, IBMBIO. COM and IBMDOS.COM and often the third start-up program, COMMAND.COM. Second, we use diskettes to load programs into the computer so D.O.S. can find and execute them. Third, we use diskettes to hold any information, or data, our programs work with or generate.

We can, if we need to, use different diskettes for each of these three functions, and often we have to. (Lots of

"disk swapping.") That can be rather inconvenient. Most well-designed commercial software programs save room on their diskettes for you to install the particular D.O.S. start-up programs which work well with the specific computer you have. (D.O.S. version 2.1 for the PCjr). If the software also needs to store or write information to the diskette, it should have space on the diskette set aside for that purpose or tell you when to swap diskettes so that the information gets written to a "save diskette."

(To be continued next month. Originally published in the Eugene PCjr Club Newsletter.)

Questions and Answers

(Continued from page 4)

Alt-Del to get a good Boot-up. Do you know what power-on sequence should be used?
P. W. Shafer, St. Petersburg FL

A. The problem with most backup/restore programs is that they read and write simultaneously (read "DMA needed") and the jr can't take it. One program we've tested is the backup / restore utility of PC-Tools, either deluxe or standard. The program actually tests the hardware for DMA and other speed-ups or slow-downs and will configure itself for the best backup and restore speed the machine can handle! It works well on the jr.

Another nice feature is that it compresses the files on-the-fly while backing up and expands the same way during restore. It will also make a guess as to how much time and how many floppies will be needed right at the beginning of the procedure. If you happen not to have them formatted and ready to go it will format them as it backs up. Once the hard disk has been backed up, repeats take very little time, as the backup will only write changes since the last backup, if you choose this option. All in all, PC-Tools are a thoughtfully written group of utilities. The rest of the utilities of PC-Tools also run compatibly on the jr.

The second part of your query has to do with the speed at which the hard drive comes up to speed from a dead stop and the initialization of the electronics of the drive and boards. The jr's config.sys file (or the hard disk boot cartridge) is being read right away and the jr is trying to recognize the hard drive before it is ready to be recognized. Normally you shouldn't need more than about a five-second delay between turning on the hard drive power and the power to the jr. If this is causing erratic booting, the power supply to the jr or the drive should be changed to another wall outlet to spread the electrical current demands. Alternately, the bearings of the hard drive

may be at the end of their useful life (or dry) so the drive is really super slow at coming up to speed, but this seems like a long-shot. Hard drives today are remarkably well engineered and constructed. As for a power-on sequence, our only recommendation is; (1) Hard Drive, (2) CPU, (3) Monitor, and then (4) Modem or other peripherals.

None of this should be necessary if the wall duplexes and your surge suppressors are of sufficient electrical capacity. Be sure all the plugs (male) have enough friction when pushed in to hold without any play. If they don't, the proper way to get better (tight and electrical) connections is to twist the flats slightly so they look out of parallel when viewed end-on, like this; [/.\] or [\./] (illus. is very exaggerated) You need two pliers to do it correctly. With one set of pliers, hold the flat prong near the plastic or rubber and use the second set to put a slight twist angle for the rest of the length. They should not be progressively twisted like a propeller. Do not splay them in or out!

Note: We're still looking for information about IBM Cluster cards and/or any other network systems our readers may be using. Our own experience is that Lap-Link is pretty slooow... unless the parallel port is dedicated to this program.

Q. I have been using Writing Assistant v. 1.01 as my word processor for many years. Now I need something a little more powerful. I saw the Leading Edge Word Processing program running on another computer and tried it on my jr. Every key I touched, no matter how quickly or lightly, showed up doubled on my screen. Is there a cure for this problem? If not, is there some other word processor you know which will run properly on the jr?

K. Bolton, Bakersfield CA

A. This is the classic symptom which indicates that your jr requires the INT9 (keyboard) processing fix. This patch, (it really isn't a patch, it's more like a tiny TSR or device driver) or some version of it, is included on many of the disks from the Software Store. Choose one of the disks which will also give you some other desired utilities and/or patches. The fix is utterly simple to install. It is merely the addition of a statement in your CONFIG.SYS or AUTOEXEC.BAT file, and a copy of either INT9.SYS or INT9.COM file in the path. This modification will make NO difference to any other application you run! Boot this way every time from now on.

Most of the straightforward text only word processors run fine on the jr. One, which can show a graphic preview of the page(s), which we like for the jr is PC-Write "Lite". The original PC-Write is heavy duty and is an excellent word processor but doesn't have the preview feature or the simplified box-drawing, columnar format, etc.

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

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

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

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

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

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)

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

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

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

Questions and Answers

The features of word processors are either well-liked or not and the users become much like "cult" followers of their favorites. For these reasons it is really difficult to recommend one program over another. As you are already familiar with Writing Assistant 1.01 you should be aware that many of our readers are having difficulties with the newer release(s). I must repeat here that copy-protected and key-disk programs are going to be a problem; avoid them if at all possible!

Kids Play and Learn Down on the Farm

outside of his home, and there are eight different places to investigate on Katie's Farm.

At Home, McGee is on his own. He tries to wake-up Mom, but she can't seem to shake the sand out of her eyes. So much for parental supervision. But there is no real trouble McGee can get into at home - Right? McGee can play with his toys in his room, journey downstairs to the living room for TV, or to the kitchen to play on the phone or feed the dog. He can also venture outside for a swing on the tire and to pick some dandelions. Of course there comes a time when nature calls and McGee must answer. Don't worry, a closed door policy is used, so as not to affect the G rating.

On Katie's Farm, McGee and Katie spend time outside collecting eggs, milking cows, fishing, riding horse, and picking berries. There is more interaction with other characters on the farm. McGee and Katie jump in the hay and play with the Scarecrow together, while Katie's Mom and Dad take turns helping them milk the cow and feed the horse.

Well, if all that sounds like kid stuff, then you are right. But that is the beauty of these two programs. All the action relates to the child's real life or wished for experiences. There are no tasks to perform or puzzles to solve. Just the simple enjoyment of a walk through the park, or in this case, a run through the house or visit to the farm, is what makes these two computer worlds work so well. The window interface lets the child move around freely without help from the parent, and the water-color-like graphics in the Tandy 16 mode are very appealing. The animation used for the action sequences comes in short bursts, and illustrates the desired effect well.

There is one problem and that is the sound. Junior's sound capabilities have been wasted again. The voices are unintelligible growls and the special effects sound like they were recorded on sand paper. The set-up menu allows you the option of going with an aftermarket sound card, internal speaker, Tandy sound chip, or no sound. Unfortunately, I couldn't get the Tandy sound chip to initialize, so that left me with bad sound or silence. But maybe the adult ear is more discriminatory, since my daughter still preferred bad sound to no sound.

The lack of good sound quality is a flaw, but far from crippling to either McGee or Katie's Farm. These are the

> *"These are the first two preschool software programs that can truly be used by children on their own without frustration."*

first two preschool software programs that can truly be used by children on their own without frustration. After installing either program on my dual 5 1/4 drive system, I can turn my four-year-old loose and not hear the word "Daddy" until she's through playing about an hour later. That fact alone moves McGee and Katie's Farm to the front of the class.

Both programs are just as easy to configure as they are to use. The box contains 5 1/4 and 3 1/2 inch disks. Neither are copy protected, and they both use a simple set-up menu for configuring your video, sound, and pointing device. There is no manual to speak of, but why would you need one.

Lawrence Production's advertise McGee and Katie's Farm, as "No Words Software" that teach your child object and shape recognition, spatial relationships, eye-hand coordination, cause and effect, and story-telling. Those are all basic skills we take for granted, but they provide the building blocks for all future learning. McGee and Katie's farm delivers on the promise with colorful graphics and a fun learning experience that your child can control - all by themselves.

PRODUCT - SYSTEM INFORMATION

Lawrence Productions	McGee
	512K - Two 5 1/4 DD
1800 South 35th Street	Katie's Farm
	640K - Two 5 1/4 DD
Galesburg, MI 49053	Tandy Mod Recommended
1-800-421-4157	Retail $39.95 each

Kids of All Ages Have Fun
With Math and Logic Games

Math and Logic Games, or new Disk #126, presents six programs which challenge a child's mathematics and thinking skills, and provide hours of fun.

The programs are aimed at grade levels K through 6, but can be enjoyed by all. All games can be played between two or more people, or between one player against the computer.

Two of the games, Target Math and Jelly Beans, teach numeric logic in deceptively simple ways. Both are fun, and both are based on a system that the computer knows already, but the child can figure out after playing for a while. In Target Math, you take turns adding numbers trying to reach a target number, while in Jelly Beans players take turns removing beans from a jar and the one who takes the last bean loses!

I Shot An Arrow is a simple simulation of an arrow flying through the air; the program introduces the concept of increasing and decreasing angles and their effects on the arc of an arrow aiming at a target. Again, a deceptively simple concept. The program's author says this game teaches "estimation and answer refinement skills," which may mean something to teachers, but to us it's just an enjoyable way to exercise the brain.

Leaky Tub has a colorful animated simulation of hot and cold water filling a leaky bath tub. Players adjust temperature and flow and watch how their decisions affect the simulation. This program helps teach logical thinking and is interesting for kids to manipulate.

In Math Race, up to four players take turns answering flash card arithmetic problems. The faster you answer your problem, the further down the track your car travels. Each player can race at a skill level appropriate to his or her grade level. Finally, Math As Art draws pretty pictures using the ideas of fractal math. This is not a game, but a demonstration of how a pair of numbers produces different diagrams based upon the fractal principle. It's not necessary to know this principle, only to enjoy the colorful demonstration.

Math and Logic Games requires 256K. It is Disk #126 in the jr Newsletter Software Store, order form is on Page 23.

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* Special Notice to Parents *

Did you know that, when a high school student was asked to identify Chernobyl, he answered that it was Cher's full name?

If you don't want that kind of answer coming from your kid, you better start participating in his or her education. One way to help is to encourage the use of educational software on your PCjr. There are many excellent titles to choose from, for all grade levels and all subjects.

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

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

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

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

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

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

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

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

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

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

How To Understand and Use The PCjr Sound System

(Conclusion)

By James E. Wilson

One complication of working with DEBUG is that the program uses hexadecimal numbers only. Actually it's a little easier to manipulate individual bits and to split up bytes when they in the hexadecimal base anyway, so you will find it useful to convert count values to hex. To help you with this, Table 1 lists the count values, in both decimal and hex numbers, for all of the notes in the middle octave of the musical scale.

TABLE 1

Musical Note	Frequency	Count Value Decimal	Hex
A	440 Hz	2712	A97
A#	466	2560	A00
B	494	2415	96F
C middle	523	2281	8E9
C#	554	2154	869
D	587	2033	7F0
D#	622	1918	77E
E	659	1811	712
F	698	1709	6AD
F#	740	1612	64C
G	784	1522	5F1
G#	831	1436	59B
A	880	1356	54B

Port number 66 (42 hex) is used to load the count value into the latch register of channel two. The latch registers hold up to 16 bits but the access port is only 8 bits wide, so any count values larger than one byte in size are placed into the latch register with two accesses to the port. One advantage of working with hex numbers is that you can split them in half and then put them back together without affecting the final value. In computer jargon a two byte sized number (called a "word") has a LEAST SIGNIFICANT BYTE, which is made up of the two right hand digits; and a MOST SIGNIFICANT BYTE, the two left hand digits. Referring back to our middle C note, the count value is 08E9, of which the least significant byte is E9 and the most significant byte is 08. These terms come from the fact that digits on the left side of a number have more value - more significance - than digits on the right.

For example, in the decimal number 17, the 1 represents a value of 10 and therefore has more significance than the 7. One possible point of confusion in this is that the Intel microprocessor instruction codes use the term "High" for the most significant byte and the term "Low" for the least significant byte. Thus, the AX register is often divided into two sub- registers - the AH register and the AL register.

The 8253 interval timer chip is programmed by writing to a command register at port address 67 (43 hex). A diagram of this register is shown in Figure 2. The only feature of this register that we haven't covered is bit number 0, which determines whether the counter register is to be decremented in Binary or in Binary Coded Decimal format. We will always use the Binary format.

This completes our detailed look at the two chips which are often used for making sounds. In our next article we'll use our knowledge to create a short music program. After that we will go on to the 76496 sound generator and make some real music with Junior.

Now we'll put our knowledge to work by creating a short musical program.

Our program will be a stand alone program that will run by simply invoking, or by typing in, the name of the program. It will be a short program which produces only three musical notes, but our real objective in developing the program is to learn more about the PCjr, and how to control it. Never-the- less, it will be a handy little program that can add a friendly musical greeting to your PCjr's AUTOEXEC.BAT file.

We will use DEBUG to create our program because it can assemble small, tight programs that have a .COM filename extension. Our program will end up being only 95 bytes long. If we used C or Pascal, with their lengthy support routines, a program that does no more than ours would be at least 5000 bytes long. DEBUG is also easy to use (for short programs) and every PCjr owner has the program since it comes with PC-DOS. We will write our program in Assembly Language because that is the only language that DEBUG can handle. Assembly Language sounds intimidating, but I think that you will find that what we will do it isn't difficult at all.

DEBUG is suitable only for very short programs, so if you want to create a program that makes more than about three notes you most likely will need to use an assembler or compiler that is more sophisticated than DEBUG. The technique that we use and the program that we end up with could very easily be adapted into C, or just about any other language that supports calls to ports.

AN OUTLINE OF THE PROGRAM

Our last article provides us with all of the information we need to make an outline of our program. Refer to Fig-

ures 1 and 2 for port allocations of the 8255 and 8253. Since DEBUG works only with hexadecimal, we'll list all of the port numbers in that number base. The basic program steps will be:

1. Set up the 8255 PPI
   Read the contents of port 61
   Use 8253 channel 2 signal - Bit 0 to 1
   Enable Speaker - Bit 1 to 1
   Do not change the other bits in this register

2. Set up the 8253 Timer:
   Binary Decrement Format - Bit zero to 0
   Mode 3 - Bit 1 to 1, bit 2 to 1, bit 3 to 0
   Read/Write LSB then MSB - Bit 4 to 1 and Bit 5 to 1
   Use Channel 2 - Bit 6 to 0 and bit 7 to 1
   The bit settings will be: 1011 0110
   Which is hexadecimal: B6
   We'll place this value in AL and issue an OUT 43

3. Load the desired count value for the note's frequency into the 8253's Channel 2 latch register.
   Place the count value into the 8088's BX register.
   Load the LSB, i.e. the BL half, into AL and then OUT 42
   Load the MSB, i.e. the BH half, into AL and then OUT 42

4. Allow the note to sound for a while.
   Keep repeating a no operation instruction (NOP) with a LOOP instruction. The number of loops in placed in CX.
   LOOP

5. Turn off the speaker by setting Port 61 bits 0 and 1 to 0.

6 Repeat steps 1 through 5 two times for the three notes. To make the last note longer than the first two, use two no operation loops in step 4.

7. Reset the timer as in step 2 to make sure we don't unintentionally program another of the timer's channels.

8. End the program with an INT 20 instruction. This is a standard way for .COM programs to end.

SETTING UP THE PPI AND TIMER

We need to elaborate a little about the first step in our outline. Our objective in this step is to set bits 0 and 1 of Port 61 both to 1, but not disturb the other bits. We will do this in three sub-steps. First we will read the contents of the PPI's port number 61. Then we will perform a logical OR on the data to set only the first two bits to 1. Finally, we will write that revised data back to port number 61. We can read the contents of port 61 with the assembly lan-

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

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

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

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

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

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

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

Understanding and Using The PCjr Sound System

(Continued from page 13)

guage instruction:

IN AL,61

The IN is the instruction to get a copy of the port's contents, 61 is the port number, and the AL instructs the computer where to place the copy. You will recall that we discussed the 8088's registers, such as AX and AL, in our last article. We also explained that all operations with ports must use the AX or AL registers. Since Port 61 is a one byte port we have to specify AL.

A logical OR is one of several operations that work on two sets of binary numbers, and are useful for manipulating individual bits. In the OR operation each bit of one binary number is compared to the corresponding bit of a second binary number. If either bit is a 1, the result

is 1. You could also explain it by saying: if the first bit is a 1 OR if the second bit is a 1 then the result is 1.

As we learned in our last article, the default setting of Port 61 in a PCjr is hex 0D. This means that the value of each of the eight bits is: 0000 1101. We want the right hand two bits to be both be equal to 1 without changing the other six bits. The following OR operation will do the trick:

Original:
0000 1101
OR
0000 0011
Result:
0000 1111

An OR operation using 0000 0011 will always set the first two bits (Remember that bits are numbered from the right starting with 0.) to 1 without disturbing the other six bits. The a copy of the data from Port 61 is in AL, and the binary number 0000 0011 is 03 in hex, so the assembly language instruction to do this is:

OR AL,03

Our last little sub-step in setting up the PPI is to send this result back to Port 61. The instruction to do this is simply:

OUT 61,AL

Since we already know what the contents of Port 61 are for a PCjr, we could have skipped reading the contents of the port and doing the OR. We could have just sent the value 0F (which is what binary 0000 1111 is) to the port. This would work OK on a PCjr, but it would have unpredictable and perhaps disastrous results on any other computer.

The command register of the 8253 Programmable Timer, Port 43, is the same in all computers - even 386 PC/2 type computers - so we don't have to worry about any unexpected adverse affects when we change the bits. We'll just set it as we have shown in Step 2 of our program outline. Remember from our last article that we can use the timer's Channel 2 in Mode 3 for sound generation, and that we will place a count value for the sound's frequency in Channel Two.

TURNING OFF THE SOUND

After we start sounding the note by loading the count value of the frequency into port number 42, one byte at a time, we will let it sound a while and then we have to turn it off. We'll, sort of primitively, set the duration of the note by just looping back through a NOP instruction with a LOOP. The NOP instruction does just what you think it does - nothing at all. The LOOP instruction in Assembly Language is similar to BASIC's FOR/NEXT loop. It performs a specific number of loops through a set of instructions. The number of loops is always placed in the CX register. Using this method to set the duration of notes has a disadvantage in that the duration is dependent upon the speed of the computer. On a 386 computer the three notes in this program sound like a single very quick "bleep". A

BIT NUMBERS: [7][6][5][4][3][2][1][0]

SPEAKER INPUT GATE
0=DIRECT SPEAKER CONTROL
1=8253 CHANNEL 2

0=SPEAKER OFF
1=SPEAKER ON

DISPLAY MODE
0=GRAPHICS
1=TEXT

0=CASSETTE MOTOR ON (IF BIT 4=0 ALSO)
1=CASSETTE MOTOR OFF

0=ENABLE INTERNAL SPEAKER & CASSETTE MOTOR
1=DISABLE INTERNAL SPEAKER & CASSETTE MOTOR

Port Number:
Decimal 97
Hex   61

SELECT SOUND SOURCE
0 0 = 8253 CHANNEL 2
0 1 = CASSETTE AUDIO INPUT
1 0 = I/O CHANNEL AUDIO
1 1 = 76496 SOUND GENERATOR

UNUSED

FIGURE 1

8255 PROGRAMMABLE PERIPHERAL INTERFACE
PORT 97 BIT ALLOCATIONS

much more sophisticated method for setting the note's duration would be to use the 8253 Timer. This would result in durations established by the steady 1.193 MHz timer clock used by all computers. It would also make our program much more complicated. As textbooks often say: "We will leave that as an exercise for the student." To turn the sound off we will set bits 0 and 1 of port 61 both to zero by using the opposite logical operation to OR. After retrieving the current setting of Port 61 into the AL register, we will use the logical AND operation. In the AND operation, if the first bit is a 1 AND the second bit is a 1, the result is 1. Otherwise the result is 0. This will work as follows on the bits in port 61:

                Original:
                0000 1111
                AND
                1111 1100
                Result:
                0000 1100

As you can see the first two bits are turned off, and the other six bits are not affected. In Assembly Language this instruction is: AND AL,FC. Of course, we could just sent the value 0D to Port 61, but this would only work on the PCjr.

THE PROGRAM

The program that we end up with is shown in LISTING 1. This listing is a result of the DEBUG command u (Which stands for "un-assemble".), and for the sake of completeness we have shown you everything. There are four columns shown in this listing, but you only have to worry with typing in the two right hand columns.

The left hand column, composed of four hex digits, a colon, and four more hex digits is the memory location, or address, of each instruction in the program. You will notice that the first four digits are the same on all of the lines. This is the "segment" part of the address. The last four digits are the "offset" part of the address. The segment part of the addresses will

probably be different on your computer, but the offset addresses will be, in fact they must be, exactly the same. As is true for all COM programs, the offset address always starts at hex 100.

The second column is the machine language instructions of the program. Intel calls them "Op Codes", and they don't make a lot of sense to most of us.

The two columns on the right make up the assembly language program - or, if you want to sound like a programmer: the "source code" - that we need to type up. One column contains the 8088 instruction, and the other column has the data that the instruction needs - they're called the "operand". I believe that you will be able to follow this short program along using our outline as a guide. This program plays three notes in the middle octave - an E, a C, and an A. The timer count values for these notes are loaded into the BX register

with a MOV instruction at offset addresses 10A, 125, and 140. Of course you can easily substitute other notes in these locations. The frequency/count value table in our last article may be of help to you.

About the only other thing that may need explanation is the number that follows each LOOP instruction. This number is the offset address that the program is to loop back to. On disadvantage of DEBUG is that you must use addresses instead of labels - it is similar to line numbers in BASIC. The number of loops, and hence the note's duration, are the numbers placed in the CX register at offset addresses 115, 130, 14B and 151. These are also places in the program that you can substitute other values.

The easiest way to make up this program is to make a script file using a text editor or word processor that saves in the ASCII text format. Most word processors will do this. You can name your script file anything you
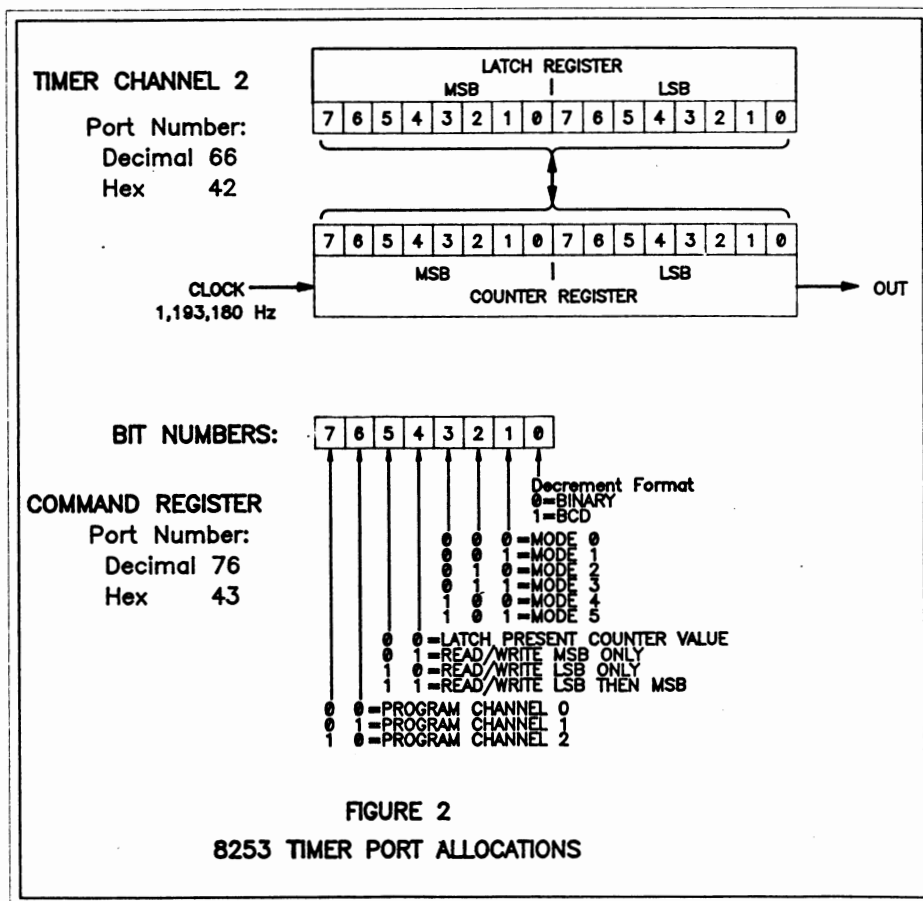

FIGURE 2
8253 TIMER PORT ALLOCATIONS

How To Understand and Use The PCjr Sound System

(Continued from page 15)

want, but for illustration purposes say you name it 3NOTES.SCR. Then place the following in your script file:

```
a 100
in  AL,61
or  AL,03
.
.
.
```

etc. - these are the assembly language instructions contained in the two right hand columns of LISTING 1

```
.
.
out  61,AL
int 20

rcx
5F
n 3notes.com
w
q
```

It doesn't make any difference whether you use upper or lower case letters, and the spacing between the assembly language instruction and the operands is not important either. Be certain to have a blank line between the last instruction (the INT 20) and the line that has "rcx", and to have an <Enter> after the "q". Of course you can name the program anything you want.

This script file tells DEBUG to start assembling at offset address 100. Then DEBUG reads the assembly language code. The blank line ends the assembly process. The rcx followed by a 5F places the length of the program, in bytes, into the 8088's CX register (the Count register). Next, the n names the program. The w, for "write" instructs DEBUG to save the number of bytes, beginning at offset 100, that are in the CX register. Finally, the q quits DEBUG.

Then, with DEBUG and your script file on the same disk, type in:

DEBUG < 3NOTES.SCR

Be certain the arrow points towards DEBUG. After you press <Enter> DEBUG acts just as if you were typing in the commands. You will see your commands and DEBUG's responses on the screen. As the assembly language code is entered you will see the memory address DEBUG assigns to each instruction on the left side of the screen. After the w command, DEBUG will display the message "Writing 005F bytes". Then DEBUG will quit.

Virtually all programs that make sound for the PC-compatible family of computers use the very same technique that we have just used, and our program should work on any of those computers. In our next article we will start examining Junior's Complex Sound Generator Chip and we will begin to find out how to control this hardware to make sounds that very few computers can equal.

LISTING 1

Address	Op Codes	Instructions	Operands
25AB:0100	E461	IN	AL,61
25AB:0102	0C03	OR	AL,03
25AB:0104	E661	OUT	61,AL
25AB:0106	B0B6	MOV	AL,B6
25AB:0108	E643	OUT	43,AL
25AB:010A	BB1207	MOV	BX,0712
25AB:010D	88D8	MOV	AL,BL
25AB:010F	E642	OUT	42,AL
25AB:0111	88F8	MOV	AL,BH
25AB:0113	E642	OUT	42,AL
25AB:0115	B90090	MOV	CX,9000
25AB:0118	90	NOP	
25AB:0119	E2FD	LOOP	0118
25AB:011B	E461	IN	AL,61
25AB:011D	24FC	AND	AL,FC
25AB:011F	E661	OUT	61,AL
25AB:0121	0C03	OR	AL,03
25AB:0123	E661	OUT	61,AL
25AB:0125	BBE908	MOV	BX,08E9
25AB:0128	88D8	MOV	AL,BL
25AB:012A	E642	OUT	42,AL
25AB:012C	88F8	MOV	AL,BH
25AB:012E	E642	OUT	42,AL
25AB:0130	B90070	MOV	CX,7000
25AB:0133	90	NOP	
25AB:0134	E2FD	LOOP	0133
25AB:0136	E461	IN	AL,61
25AB:0138	24FC	AND	AL,FC
25AB:013A	E661	OUT	61,AL
25AB:013C	0C03	OR	AL,03
25AB:013E	E661	OUT	61,AL
25AB:0140	BB4B05	MOV	BX,054B
25AB:0143	88D8	MOV	AL,BL
25AB:0145	E642	OUT	42,AL
25AB:0147	88F8	MOV	AL,BH
25AB:0149	E642	OUT	42,AL
25AB:014B	B90090	MOV	CX,9000
25AB:014E	90	NOP	
25AB:014F	E2FD	LOOP	014E
25AB:0151	B90090	MOV	CX,9000
25AB:0154	90	NOP	
25AB:0155	E2FD	LOOP	0154
25AB:0157	E461	IN	AL,61
25AB:0159	24FC	AND	AL,FC
25AB:015B	E661	OUT	61,AL
25AB:015D	CD20	INT	20

Newest Disks in jr Software Store

For Your convenience, we are providing a list of new and updated disks that have been added to our software store since our last catalogue was printed. The catalogue, along with this list, provides a complete descripiton of all software available from *jr News-letter*.

New Disks Added to Software Store

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)

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

SPEECH. Make your Junior talk! With this software you can make your PCjrÆs internal speaker say anything you want. Very easy to use. No additional hardware required. (Reviewed 7/90) 128K ok. (Disk #114)

CALENDAR KEEPER V2.1. Keep track of important dates, birthdays, club meetings, etc. and print monthly calendars with these dates clearly noted in the proper squares. Prints wall calendars on standard size computer paper. Easy to use, menu driven, can keep up to 10 databases of events and reminders. Many features. Need 256K. (Reviewed 7/90) (Disk #115)

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)

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

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)

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

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

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

ASIC. Excellent BASIC compiler turns your BASIC programs into executable COM or EXE files. A shareware alternative to costly compilers. 128K (Reviewed 12/90) (Disk #122)

AUTOMENU V4.7 Make your own menu system to greet you every time you start up your trusty Junior (or PC,XT,AT,PS/2). This is perhaps the easiest menu system to set up, and yet it has advanced features if you want them. Uses only 32k. (Disk #123)

Other New Software includes Disks # 124, 125, & 126, Please see What's New in the Software Store, Page 22, for these listings!

MAJOR UPGRADES:

PCJR PATCHES V6.0 Patches to fix software to run on PCjrs. Most enable 16 colors. V6.0 adds patches for 1 on 1, 688 Attack Sub, Battle Chess, Battle Tech, Boxing II, Genius Mouse, Grand Prix, Indiana Jones, Jack Nicklaus, Knight Games, Paperboy, Prodigy (thru V3.1),Shanghai, Silpheed, Sim City, Space Rogue, Steel Thunder, Strip PokerII, Test Drive II, Tetris, The Games (Summer), Ultima IV, plus new patch to stop disk drive spin. Dozens of older patches, too. (Reviewed 2/91) (Disk #56)

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)

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 itÆs printed out for you. Or try Quotefall, a unique type of scrambled word puzzle. And then thereÆs a high-level version of Hangman. Just try escaping from the noose in this one! 256K (Update review 8/90) (Disk #87)

Creating Special Characters on Your PCjr

By Larry Kaja

Before I get into this topic, take out your PCjr BASIC book and look in Appendix G (pages G-2 through G-5).

Every character you type on your computer is assigned an "ASCII Value," sometimes called an ASCII code. ASCII codes 000 through 031 are used for control characters. For example, look at codes 028 through 031. These codes are used for cursor control. Every time you press a "cursor up" key, ASCII code "030" is generated and sent to your display. the result moves the cursor "up" one line. Look at ASCII codes 065 through 090. These are the upper case characters. codes 097 through 122 are the lower case characters, and so forth.

Now turn to pages G-4 and G-5. Where are **these** characters on your keyboard? The answer is simple: they aren't! If they were, you'd need a keyboard three feet long and two feet high! Notice that the ASCII value for these characters starts at 128. In order to get those characters to appear on your display you need to manually enter the ASCII value for each one. This brings us to the question of **how** to do this on the PCjr. You can do this next exercise at the DOS prompt.

First you must get your PCjr keyboard in "alternate" mode:
* Press and hold the "Alt" key down.
* Press and release the "Fn" key.
* Press and release the "N" key.
* Now release the "Alt" key.

Your keyboard is now locked in "alternate" mode. While you're in alternate mode try this little exercise: **Press and hold** the Alt key down and, using the number keys at the top of your keyboard, press 080. Now release the Alt key and watch the letter "P" appear on your display. Note that the character will not appear on your display until **after** you release the Alt key. Now, using this same method, enter the following codes one at a time: 067 106 114. You should have "PCjr" displayed on your screen (without the quotes). Now enter 171. Did you get a 1/2 on your display? If not, then go back to the beginning of this paragraph and try it again.

To get **out** of alternate mode:
* Press and hold the "Alt" key down,
* Press and release "Fn",
* Press and release "N",
* Now release the "Alt" key.

This will put your PCjr keyboard back to normal again. If your forget to get out of alternate mode, then you'll get "strange" results when you start typing at your keyboard. Take a moment and practice getting in and out of alternate mode. Also try a few more characters. You might want to try drawing a box using ASCII codes 191 through 218. However, you'll need to be in a word processor. The following procedure does not work with Writing Assistant for some reason. Here's what you do to create a tiny box:
* Get into alternate mode
* Key in 218, then 191
* Get out of alternate mode
* Press cursor down once, press cursor left twice
* Get back into alternate mode
* Key in 192 and 217
* Get out of alternate move.

This should give you a tiny box on display. This is the same method I use to draw boxes for some documents.

What Is A File Manager?
A File Manager is a very handy type of software for copying, moving, deleting, renaming and doing other useful things to files without having to use DOS commands. Scout, Disk #81 in the jr Newsletter Software Store, is one of the best we know of. It can be "memory resident," which means it'll pop up any time you need it by just pressing two keys.

Design Your Own Car or Town!

By James Prossick

The two biggest purchases you'll probably make in your lifetime are the house you live in and the automobile you drive. Farther down the list, but still important, at least if your reading this article, is your computer.

Well, now with Hometown, USA from Publishing International, and Car Builder from Weekly Reader Software, you can design your own house or car with Junior. Even though you can't live in the houses you make or drive the cars you build, it's certain you'll have a fun learning experience during construction.

Both Hometown and Car Builder are specialized drawing programs with minimal hardware requirements - 256K, one 5 1/4 Drive, and an optional mouse on Hometown. The Tandy Mod is required for Car Builder to make Junior compatible with Weekly Reader's graphic instructions.

Hometown really puts the home into the home computer. With a menu screen reminiscent of commercial painting or desktop publishing programs, the user uses a simplified set of top down commands to construct a model of Small Town America. Each paper model you create literally pops to life off the printed page.

The drawing commands are those basic to any good painting program: line, draw, zoom, text, undo, wipe and fill, and they're just as easy to use. You have two screens to work with, like some desktop publishing programs, so you can grab a house, church, or store on one screen, and select its windows, doors and other accessories from the other screen.

Whatever you grab is temporarily stored in a clipboard. A part of an image can be grabbed, and an image can be flipped on its horizontal or vertical axis to change its size or design. There is enough canned art to build a whole village, and enough window dressing to make it appear to be from the Old West or the Midwest. The controls are either keyboard alone or a combination of keyboard and mouse. The mouse comes in handy for moving around the two composing screens and for freehand drawing, but there is no real advantage since accessing the command line and selecting files requires the keyboard.

Once you piece together a building or design your own the fun begins. You can print out the structure and paste it together to get a three dimensional paper model of your creation. A whole town can be created to display or for play, or you can make banks, cut out greeting cards, gift boxes, or holiday decorations. The two manuals that accompany Hometown are informative, easy to read, and loaded with construction tips and a variety of uses for the buildings you create.

A layout of each of the different buildings and a print of the accessory images can also be found in the manu-

als. The paper models are easy to put together with a glue stick or white glue, and the print quality on a basic 9 pin printer is quite good.

Want to Build A Car?

Car Builder let's you design, test, and drive your own prototype automobile. Most certainly this program conforms to the General Motors' philosophy of car design, since all your components, outside of the car's exterior sheet metal, come directly from the parts bin. You get to choose the basic body and mechanical parts for your auto

Software Store Games

Please Use Order Form on pg. 23.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DOS 2.1 FIX. Patches to fix the bugs in DOS 2.1. Cures most problems encountered when running memory intensive programs. Also patches to run BASIC and BASICA on DOS 2.1 without having Cartridge BASIC installed. 128K ok. (Disk #40)

Design Your Own Car or Town!

including the chassis, engine, transmission, fuel tank, suspension, steering, tires, brakes, and the basic body panels.

In addition you can modify the body exterior with a simple drawing program and add windows and custom decals. Along the way, you can save the mechanics or body separately, or as a completed design. Once you have your auto perfected, it's time to check the wind tunnel and take a spin on the test track. This is where you find out what your design's drag coefficient is, and if the car's performance is up to expectations. One trip around the test track tells you if you have the right combination of mechanicals under the sheet metal.

If it's a successful design, then a report, similar to what you see in Road and Track, can be printed to screen or paper. The report includes a side view of the car and a detailed mechanical and performance analysis.

Car Builder is a design program that teaches elementary engineering concepts, so don't expect a lot of flash and chrome from the graphics or the test drive sequence. What you do get is the solid fundamentals of how a car is put together from an intuitive program that runs on simple keyboard commands. After designing a few cars, one gains an understanding of aerodynamics, weight distribution, the basics of how the power-train works, and the value of the right combination of brakes, shocks, steering, and tires. In a nutshell Car Builder is fun and enlightening.

Both HOMETOWN, USA and Car Builder are a solid value for those who like software that lets you play and think at the same time. They don't make great use of color or sound. Hometown comes up in monochrome, and Car Builder in 4 color CGA. Nor will you need lightning reflexes, a passion for puzzles, or even great artistic ability to enjoy them. All you will need is the desire to create something on your own. That desire is something every child and adult has, and with these programs' minimal hardware requirements, Junior Owners up and down the scale can satisfy that creative urge.

PRODUCT - SYSTEM INFORMATION

HOMETOWN, USA

Publishing International	$39.95 - Retail Price
1209 W Knickerbocker Drive	256K and one 5 1/4 DD
Sunnyvale, CA 94087	Mouse optional
408-738-4311	Monochrome only

CAR BUILDER

Optima Resources, Inc.	$49.95 - Retail Price
10 Station Place	256K and one 5 1/4 DD
Norfolk, CT 06058	Tandy Mod Required
800-327-1473	

PCjr 640K (jr Hotshot), V20 chip, IBM color monitor, clock/calendar, IBM joystick, IBM PC Keyboard, Parallel port. Software (with documentation) includes DOS 2.1, Lotus 1-2-3, and IBM BASIC. Adult use only. $385, including UPS shipping. Call Mike, evenings (516) 549-5035.

PCjr - 640K (jr Hotshot). IBM color monitor, cartridge BASIC, new PCjr printer, 2 joysticks, Mouse Systems PCjr optical mouse, lots of graphics, education, business, and game programs, full system documentation and books on jr operation and programming. Best offer, cash or swap. Will pack/ship UPS. Call Joel (516) 867-0899.

PCjr - Original 360k disk drive & Racore (Model 1200) 360K disc drive; 640K memory; PCjr color display & keyboard; 384K memory expansion board; IBM cartridge BASIC; PC Enterprises Configuration Cartridge & Combo Cartridge; DOS 2.1; Writing Assistant 1.01; All manuals; $500; John (605) 624-8536.

IBM PCjr 640K - Racore Drive 2 Plus with DMA, 1200 baud internal modem (IRA-2 by MOCROCOM), jrcolor monitor, PCjr keyboard, joystick, DOS 2.1, cartridge BASIC, Lotus 1-2-3 version 1A less Print Graph. $600 + shipping. Olivetti PR2300 Ink Jet Printer, $100 + shipping. Call Eberle (214) 351-3961.

PCjr 640K w/two 5.25" disk drives, PCjr color monitor, keyboard, parallel port, BASIC cartridge and manual, speedup cartridge, manuals, several game cartridges, MYM, WordStar for Jr., Jr Mouse, two IBM joysticks, $550 or offer plus shipping, David Bond, home (301) 977-3708 or office (202) 457-7844.

For Sale: PCjr-256K, color monitor, 5.25 drive, 300 bd jr modem & keyboard, $325.00 + shipping. Unused 300 bd jr internal modem, $35.00; BASIC Cartridge without manual, $50,00. Unused software: IBMjr Graphing Assistant, Filing Assistant, Reporting Assistant, Assistant Accounting Solutions, Multiplan, Wordproof, Personal Communications Manager, Electric Poet, $25.00 per. Linda Dudick, (614) 365-6501 during day, (614) 476-2937 from 4:30-9 pm EST.

IBM PCjr 736K (one sidecar), color monitor, 16 color Tandy modification, parallel port, 3 joysticks, jr keyboard, DOS 2.1, BASIC, all manuals, original boxes, Adult used, much software, IBM Compact printer, all cables, jr Newsletters from 1988. Call Johnny with best offer. (704) 389-8179.

Wanted: I am interested in purchasing one or more of the following: PCE Megaboard, Nickel Express turbo board, jr87 coprocessor board, Mesa 286j, Tecmar jrCadet, IBM 128K, IBM joystick. Martin Pinckney, P.O. Box 1700, Marco Island FL 33969. (813) 394-1697 8-5 EST M-F.

PCjr 736K, two 360K floppy drives, 20 meg external hard drive, IBM CGA Color Monitor, Keytronics KB5151jr keyboard, plus original & enhanced keyboards, Brother HR15XL Daisy Wheel Printer, DOS 2.2 3.30, BASIC, Writing Assistant, Personal Editor, Filing Assistant, Visi-Calc, Games, Manuals, etc. $950 (802) 295-3481.

IBM PCjr, Racore Two plus upgrade to 640K with 2 5 1/4" drives, cartridge BASIC & DOS 2.1. IBM PCjr color monitor, 2 jr keyboards, chicklet and standard, joystick and all manuals. Compatability & Jr Patches disks $600 + shipping (813) 238-7204.

PCjr Color Monitors used, reconditioned, $150 each, Satisfaction guaranteed. Hank Kennedy (512) 255-2812, 813 Chisholm Valley Dr., Round Rock,TX 78681.

Update of PCjr Compatibility Disk

Continued from page 1

compatibles will run on PCjrs, if you have the required memory. Unfortunately, some software developers have chosen to ignore hundreds of thousands of PCjr users by allowing their software to be difficult, if not impossible, to run on PCjrs.

We have been waging a campaign for several years now to convince those companies to include PCjr compatibility in future titles and we hope this has reduced the number of incompatible titles produced. But the fact is, PCjrs are orphaned computers and those of us who own them, though WE know they are excellent computers, have to be aware of the fact that some software companies do not have our interests in mind.

The list on this new version is updated with information supplied by readers of jr Newsletter as well as by our own testing. We are not able to test all new software titles, but we do try to include all reliable information we can obtain.

The PCjr Compatibility Disk V4.0 is Disk #60 in the jr Newsletter Software Store, page 23.
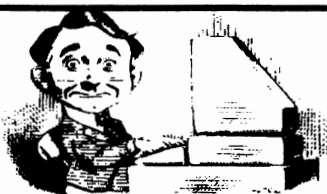
Need Help?

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, screenblanker, 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 V4.0. Annually updated list of hundreds of software titles, includes PCjr compatibility info, tips on running software, and how to make some "incompatible" software operate. Powerful search feature finds titles quickly and easily. 128K ok. Updated April 1991. (Disk #60)

PCJR PATCHES V6.0 Patches to fix software to run on PCjrs. Most enable 16 colors. V6.0 adds patches for 1 on 1, 688 Attack Sub, Battle Chess, Battle Tech, Boxing II, Genius Mouse, Grand Prix, Indiana Jones, Jack Nicklaus, Knight Games, Paperboy, Prodigy (thru V3.1),Shanghai, Silpheed, Sim City, Space Rogue, Steel Thunder, Strip PokerII, Test Drive II, Tetris, The Games (Summer), Ultima IV, plus new patch to stop disk drive spin. Dozens of older patches, too. (Reviewed 2/91) (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.

Software Listings In This Issue:
Telecommunications, Page 6.
Educational, 6, 7, & 9.
Games, 9, 11, 13, 19.
Especially for jr, 20

Software Store New Releases
Please Use Order Form on pg. 23.

* UPDATE * PCJR COMPATIBILITY DISK V4.0. Annually updated list of hundreds of software titles, includes PCjr compatibility info, tips on running software, and how to make some "incompatible" software operate. Powerful search feature finds titles quickly and easily. 128K ok. Updated April 1991. (Disk #60)

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

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

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

* NEW * AUTOMENU V4.7 Make your own menu system to greet you every time you start up your trusty Junior (or PC,XT,AT,PS/2). This is perhaps the easiest menu system to set up, and yet it has advanced features if you want them. Uses only 32k. (Reviewed 3/91) (Disk #123)

See also Software Listing on Page 17 for Titles added to Store Since Our Catalog Was Published

jr Newsletter Software Store

Please circle the diskette #'s of your choice

SET DISK SETS
1   PC WRITE V3.02 (3 disks-$12)
2   PC CALC PLUS. 512K (2 disks-$10)
3   PRINTMASTER LIBRARY. (2 disks-$10)

#	TITLE
1	PC-WRITE V2.5 (128K)
2a	PC-WRITE V2.7 (256K), Disk 1
2b	PC-WRITE V2.7 (256K), Disk 2
3	PC-FILE III. 128K
4	PC-FILE III. 256K
5	PC-CALC. 128K
6	PC-CALC. 320K
8	GAMES I
9	DUNGEONS & WARS
10	PINBALL RALLY
12	REFLEX POINT
14	ADVENTUREWARE
15	PROCOMM
16	BUSHIDO
17	PC-OUTLINE
18	TYPING INSTRUCTOR
19	3 X 5
20	EQUATOR
21	TIME TRAVEL IN HISTORY
22	PC-DESKTEAM
23	PC-PROMPT
24	PC DOS HELP
25	PC-CHECK MANAGER
26	BATCH FILE UTILITIES
27	MINICALC
28	SUPER UTILITIES
29	MORE SUPER UTILITIES

30   ARCADE GAMES
31   BOARD GAMES
32   PLAY AND LEARN
33   FAMILY HISTORY (128K), single
33A FAMILY HISTORY (256K), need both
34   GAMES II
35   NEW KEY
36   PIANOMAN
37   PC-KEY DRAW
38   PC-KEY DRAW DEMO
39   ORIGAMI
40   DOS 2.1 FIX
41   WORD PROCESSING FOR KIDS
42   MATH FUN!
43   BRAIN BOOSTER
44   PC-CHESS
45   ZAXXON/GALAXY TREK
46   PHRASE CRAZE
47   GOLF/SAILING
48   EARLY LEARNING
49   DOSAMATIC
50   IMAGEPRINT V3
51   PRINT HANDLER
52   JR POWER PACK
53   CASTAWAY/S. AMERICA TREK
54   THE BEST OF JR NEWSLETTER I
55   SUPER BOARD GAMES
56   PCjr PATCHES V.5.0
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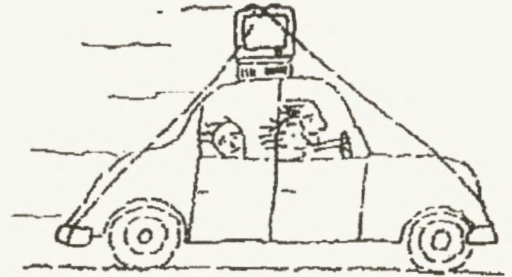Address _____

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