

SCMAN.DOC 10/05/84

THE SIDECAR™
128K MEMORY CARTRIDGE
FOR THE
NEC PC-8201A*

USER MANUAL
FROM
PURPLE COMPUTING

(C) Copyright Purple Computing 1984, 1985

All rights reserved. No part of the product covered by the copyrights hereon may be reproduced or copied in any form or by any means -- graphic, electronic, or mechanical, including photocopying, recording, taping or information and retrieval systems -- without prior written permission of Purple Computing.

* NEC Home Electronics (U.S.A.), Inc., Personal Computer Division, a division of NEC Corporation, Tokyo, Japan

STATEMENT OF LIMITED WARRANTY

Purple Computing ("Purple") warrants that its products, except software, will be free from defects in materials and workmanship for 180 days after shipment by Purple to a Distributor or for 90 days after shipment by Purple to an end-user customer ("Customer"). Purple will repair or replace, at its option, any equipment or parts that Purple determines were defective when shipped by Purple. A Distributor may pass along to its initial Customer the balance of the limited warranty coverage on the terms and conditions stated herein, up to a maximum of 90 days beginning on the date of shipment to said Customer. Purple may, from time to time, offer warranty on designated products other than as stated herein without effecting this general warranty.

If service is required under this warranty, Distributor or Customer must: (1) notify Purple in writing or by telephone of the defect; (2) obtain a Return Material Authorization ("RMA") number from Purple which must be shown on the outside of all shipping containers and in all correspondence; and (3) send the product to Purple delivery charges prepaid unless otherwise instructed by Purple. In making repairs, Purple will replace parts as needed on an exchange basis. Purple reserves the right to alter the appearance or physical specifications of the product or to change its manner of functioning without notice to Customer or Distributor. After repair, Purple will prepay return delivery charges.

This limited warranty does not cover losses or damage which occur due to, but not limited to: (1) shipment to or from Distributor or Customer; (2) neglect, misuse, or any cause other than ordinary use; (3) adjustment, repair, or modifications by other than Purple-authorized personnel; (4) improper environment, excessive or inadequate heating or air conditioning, and electrical power failures, surges, or other irregularities; (5) other causes beyond the control of Purple, including but not limited to natural causes or disasters, war, insurrection, civil disturbances, labor disputes, or the requirements of domestic or foreign governments; (6) shortage or allocation of materials, utilities or other resources.

Purple Computing does not warrant that its products are merchantable or fit for any particular purpose whatsoever. This limited warranty is in lieu of all other warranties, express, implied, or statutory. Purple Computing makes no warranty whatsoever concerning any software products which are sold "as is" and "with all faults".

Purple's liability, whether based on contract, tort, warranty, strict liability, or any other theory, shall not exceed the price of the individual product whose defect or damage is the basis of the claim. In no event shall Purple be liable for any loss or profits, loss of use of facilities or equipment, or other indirect, incidental, or consequential damages. The foregoing limited warranty is the exclusive remedy provided to Distributor and to Customer alike where no other written warranty exists.

SIDECAR™ OPERATING INSTRUCTIONS

Please read through this manual first, especially the INSTALLATION section before using your SideCar.

```
*****
*           I M P O R T A N T   N O T I C E           *
*
*   DO NOT CHANGE THE SIDECAR BANK SELECT SWITCH WHILE *
*   A SIDECAR BANK IS ACTIVE! DO NOT REMOVE OR INSERT *
*   THE SIDECAR WHILE THE MAIN SYSTEM POWER IS ON!    *
*   (see the INSTALLATION section for details)        *
*
*****
```

INSTALLATION:

Like the NEC 32K cartridge, the SideCar should only be installed or removed when the main power switch of the NEC PC-8201 is in the OFF position. We have never experienced any problems installing or removing the SideCar with the power on, however, it is not good practice.

Your SideCar comes from the factory completely assembled and tested. To install your SideCar simply plug it into the left hand side of your NEC PC-8201A computer. With your left hand on the left end of the SideCar and your right hand on the right end of your NEC PC-8201A, pick up both and apply enough pressure to fully insert the SideCar into the socket in the NEC PC-8201A. The SideCar should fit tight. It may take a bit of practice to discover how hard to push and how to quickly install and remove the SideCar.

Select SideCar bank -A- with the 4 position slide switch located in the center area of the SideCar. The switch is pushed all the way to the top position for selecting bank -A-. Bank -A- is the first of 4 banks (32K each) the SideCar may contain.

Turn on the main power of the NEC PC-8201A. The on-off switch is located on the lower right side. The normal display should appear with all your files listed. Now hold down the SHIFT key and press function key f.5. This should cause a bank switch either to bank #2 or bank #3 depending on whether you have any internal memory in bank #2. The currently active bank is indicated by a "#" and a number in the upper right corner of the screen. If you have switched to bank #2, repeat the SHIFT + f.5 operation to switch to bank #3. You now have bank #3-A selected and you should see 2 files in the menu/directory named BANK3A.DO and MEMT.BAS. If you cannot get bank #3 selected see the IN CASE OF TROUBLE section below.

The file BANK3A.DO serves 2 purposes. It contains the date (MM/DD/YY) the SideCar batteries were installed which serves as a reminder for battery replacement. It also helps identify the bank currently selected by virtue of its name. The file MEMT.BAS is a memory test program that can be used to insure everything is operational in the SideCar. See the MEMORY TESTING section for details on running the memory test program.

Banks 3-A, 3-B, 3-C, and 3-D can be used like any other 32K bank in the NEC PC-8201A. The file transfer programs that are provided free with the purchase of the NEC PC-8201A allow the copying of files to or from any of the 3 banks. The program XFILES.CO is especially handy because it can copy individual files from any bank to any bank. See the FILE XFERS section for hints on how to best use the file transfer software.

Switching SideCar banks can be accomplished 2 ways. The fastest is to turn off the main power switch, flip the SideCar bank switch to the desired bank, and turn the main power back on. Optionally, you may use SHIFT + f.5 to switch to bank #1 or bank #2, then change the SideCar bank to -A, -B, -C, or -D, then use SHIFT + f.5 function key to switch to bank #3. **Never switch SideCar banks when bank #3 is active!** It will not work, and it may cause a lockup or garbage the directory requiring a reset and possibly losing bank #3 files. The SideCar bank select switch can be changed at any other time; when the SideCar is removed, with the system power off, or when some other bank (#1 or #2) is active. **But at no time should the SideCar switch be changed while a SideCar bank is in use.** If you should have a "lock-up" condition in a bank, there is a way to recover without losing the data in the other banks --- see the BANK COLD-START section of this manual.

We recommend running the memory test before using the SideCar to store important data the first time. It's a very fast assembly language test program that checks the memory. When this test passes, you can be confident your SideCar is functioning correctly.

MEMORY TESTING:

```
*****
*
*           - NOTICE -
*
*   ALL YOUR FILES MAY BE DESTROYED IN THE BANK
*   THE MEMORY TEST RUNS.  THE MOST EFFECTIVE
*   MEMORY TESTING REQUIRES WRITING INTO ALL THE
*   MEMORY TO BE TESTED.  BE SURE TO BACKUP ALL
*   YOUR FILES IN THE BANK BEING TESTED!
*
*****
```

Included with your SideCar is a memory test program called MEMT. A copy of this program is located in each of your SideCar's banks. It's operation is simple and fast. It's purpose is to insure that your SideCar memory is functioning properly after shipment to you. Each SideCar is thoroughly tested prior to shipment.

Before testing the memory in a particular bank, backup all the files you added to the bank being tested. Once the test begins, all the files in the bank being tested, except MEMT.BAS and BANK3x, will be destroyed. The files in other banks are unaffected.

To test the memory in a SideCar bank, select the bank (see instructions above in section INSTALLATION), position the cursor over the test program (MEMT.BAS) and press return key. In a few seconds MEMT will ask for the size of the bank. Since a bank can be less than 32K you must tell MEMT how much memory to test. Enter 32 for 32K and press enter. The test will begin. If an error occurs see section IN CASE OF TROUBLE. Otherwise the program will BEEP and automatically turn off the power. MEMT leaves a special pattern in memory and automatically turns off the power (using the POWER OFF command in BASIC) so the standby power circuit can be tested. Wait at least 5 minutes, then turn the main power switch off and then back on. MEMT will continue and check the special pattern it left in memory. If it checks O.K., a "PASSED" message is displayed. If you wish, you may extend the 5 minute power-down test to days or weeks with the SideCar plugged in or sitting on the shelf. If the "life" test doesn't pass, an error message will be displayed --- see section IN CASE OF TROUBLE if this happens.

If testing a new bank of memory that you installed, it is important to copy or load the test program MEMT.BAS into the newly installed bank first. If you must load it later, be sure to delete all other files first so MEMT.BAS is loaded in the correct place.

BANK COLD START:

You should never have to do a "cold-start". However, sometimes a program wipes out part of the operating system, or you were unlucky when changing a SideCar bank while using the bank. Since the NEC user manual isn't real clear on the subject, here is some information intended as a supplement to the NEC user manual.

COLD START is the term used to describe a process where a computer is initialized from the ground up. In the case of the NEC PC-8201A a cold-start causes the machine to initialize all memory and directory area. It determines how much memory is in the machine with some simple tests and sets up default string areas for BASIC and builds a new (and empty) directory of files. The directory is what you see on the screen. All files that are not in ROM will be gone.

A "warm-start" is almost the same, however no files are lost and the directory stays the same. In the NEC PC-8201A a "warm-start" is the same as a "reset" and is performed when the reset button is pushed, when the power is turned on, and when a new bank is switched to.

A reset will almost always free up a "hung-up" machine. However, sometimes it is so "hung-up" even a reset won't work, so you must do a "cold-start". To do a "cold-start" simply hold down the SHIFT and CTRL keys at the same time while you cause a reset. As stated above a reset is caused by one of 3 things; power-on, reset button, or bank switch.

Each bank is "cold-start"-ed individually. If you wish to "cold-start" bank #2, go to bank #1 depress the CTRL + SHIFT and hold them down while you press function key f.5. This will initialize bank #2 and clear out all the bank #2 files. To "cold-start" bank #3, go to the next lower bank (#2 or #1 if #2 doesn't exist) and follow the same procedure. To "cold-start" bank #1, go the the highest bank and follow the same procedure, or if already in bank #1, simply hold down SHIFT + CTRL and press the reset button. Be sure the bank you are switching to is the one you want to cold-start. CTRL+SHIFT+RESET will always cold-start bank #1.

When a program runs wild in bank #3 and reset doesn't work and you must perform a cold-start, turn off the power, remove the bank #3 cartridge, and turn on the power. You should be in bank #1 now. Turn off the power, install the bank #3 cartridge, turn on the power and bank switch to bank #3. The screen should be restored to the pre-hang-up condition and hang-up again. Repeat the procedure above but this time when switching to bank #3 perform a cold-start using the CTRL+SHIFT while bank switching to bank #3. Bank #3 will be cold-started, and all your other banks should be intact.

REPLACING BATTERIES:

Please read this entire section before beginning work.

```
*****  
*                                     *  
*               - NOTICE -          *  
*                                     *  
* ALL THE CHIPS IN THE SIDECAR ARE CONSTRUCTED USING *  
* VERY LOW POWER 'CMOS' COMPONENTS.  CMOS COMPONENTS *  
* CAN BE DAMAGED BY THE ENERGY PRESENT IN STATIC *  
* ELECTRICITY. *  
*                                     *  
* A work area should be prepared in an area without *  
* carpets or rugs, such as in a kitchen, by *  
* spreading a SLIGHTLY DAMP terry cloth towel onto a *  
* table to protect your SideCar from being scratched *  
* and to reduce static electricity. *  
*                                     *  
* Place both the SideCar and the NEC PC-8201A on the *  
* towel and touch the towel with both hands to bleed *  
* off any static electricity. At this point you may *  
* begin work on the internals of the SideCar. If *  
* you get up and leave the work area to walk across *  
* a carpet and pet the cat, then on return bleed off *  
* any built up static electricity before touching *  
* any of the internal components of the SideCar, by *  
* first touching the towel and then the case of both *  
* the SideCar and the NEC. *  
*                                     *  
*****
```

The SideCar carries two size AA Alkaline batteries. The batteries provide the SideCar power when the NEC PC-8201As power switch is off and when unplugged. The power required is very small and is only used to keep the memory alive. The batteries should keep your SideCar's memory alive for more than one year based on calculations of the electrical current it uses. It can vary, however, based on usage and temperature. If you have very important data and you don't use the SideCar very often and you want to play it very safe, you may want to replace the batteries every 6 months or so.

Remove the SideCar from the NEC PC-8201A. Remove the small plastic pin on the left hand side of the case, (it simply pulls out). Remove the two phillips screws located on the top right hand side of the SideCar. Separate the top half of the case and open it up to the left as if opening a book. In the top half of the case are the batteries.

Carefully insert the lower half of the SideCar back into the NEC PC-8201A being careful not to over stress the wires that connect the two halves of the case.

The batteries are taped into the holder for shipping purposes only. The tape is to be cut off and is not required under normal handling environment. Use a small sharp knife to cut the tape between the batteries. DO NOT REMOVE THE BATTERIES YET and be careful not to touch anything inside the sidecar with your fingers or the knife.

Before removing the batteries, turn on the the main power switch of NEC PC-8201A. It doesn't matter which bank is selected. With the SideCar installed and the power on, all the power required by the SideCar is supplied by the NEC PC-8201A. This is why you can replace the batteries without losing any data in the SideCar.

If you don't think you can complete the battery exchange within 15 minutes, enter BASIC and type 'POWER CONT' so the NEC won't power down while you are working. If you think your NEC batteries are low, replace them first or install the AC adaptor to insure a good supply of power during the operation. If you doubt your ability to change the batteries using this procedure, then backup everything in your SideCar you wish to save. Its good practice to have all your important files backed up at all times anyway, in any situation, with any computer no matter how reliable it is supposed to be.

You may now remove the batteries with your fingers and replace them. Avoid touching any of the chips or circuitry. Be very sure the batteries are installed with the correct orientation. A small diagram is embossed on the plastic battery holder showing the correct orientation. If you put the batteries in backwards you may destroy all the memory in the SideCar. There is some protective circuitry built in the SideCar to protect against this error. However, no one has yet risked a \$38 memory chip to find out if it works! Don't you be the first.

Remove the SideCar from the NEC PC-8201A and replace the top half of the case. The top half left side of the case is interlocked with the bottom. The bottom half of the case (left side) should fit snugly in the slot in the top half. Replace the screws and plastic pin.

Edit file BANK3A.DO using TEXT and change the date found there to reflect the date the new batteries were installed.

STEP BY STEP BATTERY REPLACEMENT

1. Backup all your files, if everything goes right you won't need the backups, but you should always have backups anyway.
2. Setup your work area (see notice above) and Dis-assemble the SideCar.
3. Plug lower half of SideCar into the NEC and turn on power.
4. Cut off the shipping tape from the batteries. Remove and replace the batteries.
5. Turn off the main power, remove the SideCar, and re-assemble the case.

EXPANDING THE SIDECAR:

Please read the cautions about static electricity in the REPLACING BATTERIES section of this manual.

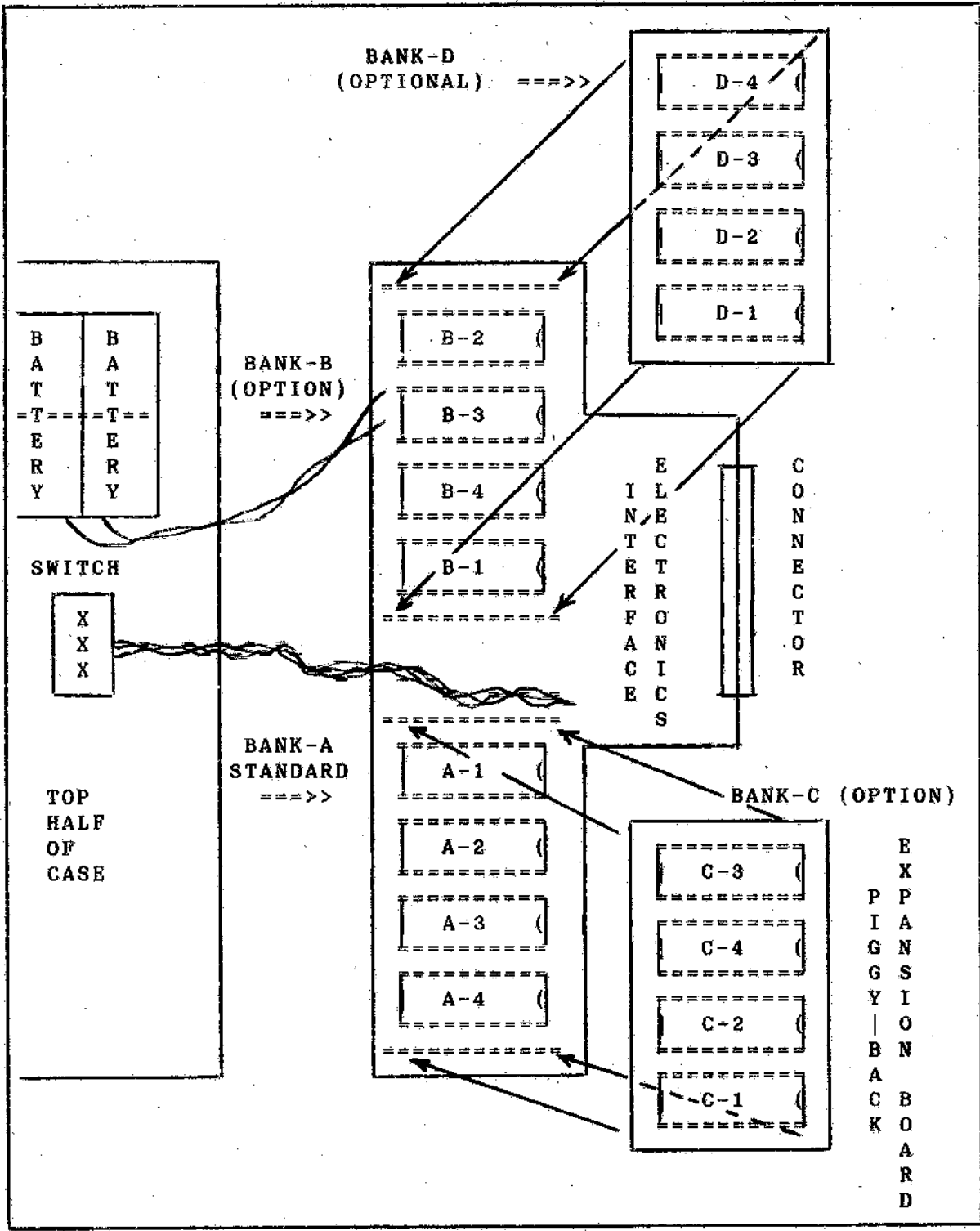
Please read this entire section before beginning the installation.

The SideCar can be expanded to a limit of 128K bytes of memory consisting of 4 32K banks. Each bank consists of 4 8K chips (part # HM6264xP-xx or equivalent). The memory banks do not have to contain a full 32K each. They may have any multiple of 8K up to 32K (see the NOTE below). Because the operating system of the NEC PC-8201A takes away about 4K from each bank (for directories, variables and things for BASIC) it is most economical to fully expand each bank verses partially expanding several banks.

NOTE:

If expanding a bank to less than 32K (4 chips) then use up the lowest sub-numbered sockets in the bank first. (eg. if installing only 2 chips in bank C, then put the 2 chips in sockets identified as C-1 and C-2 in the diagram below). Figure 1 is not in error, the order of the chips is different in each bank. So if only 3 chips are to be in bank D, they should be put in the 2 top most sockets (D-1, D2) and the bottom most socket (D-3) leaving the next to the bottom socket empty (D-4).

- FIGURE 1 -



-- FIGURE 1 --

With extreme care it is possible to add an additional bank to the SideCar without losing the data in the other banks of the SideCar. However, it is highly recommended that all files you wish to save be backed-up. The backup can be on cassette tape, or use one of the bank-to-bank transfer programs to copy the files to bank #1 or #2 in the NEC PC8201A (see FILE XFERS section of this manual).

See Figure 1 for the location of the bank to be expanded. Each chip must be installed with the proper orientation. A notch at one end of the chip identifies the top of the chip. All memory chips are to be oriented such that the notch is closest to the plug-in connector of the SideCar.

If you are installing chips into bank -A- or -B- then all you do is plug the chips into their respective socket. Be sure the chip is oriented correctly and the pins are straight. After pushing the chip in, check that a pin didn't fold under or miss its hole.

If you are not completely sure that the chip is installed correctly, remove it gently using a screwdriver to pry it up alternately from each end, check each pin, then reinstall the chip. When removing a chip, be careful not to scratch the circuit board with the screwdriver. It would take a significant amount of force to break a trace on the circuit board, however --- a word to the wise should be sufficient.

If you are installing a "piggy-back" 32K memory board for bank #C or #D, then determine the location of the bank and the orientation of the board.

STEP BY STEP MEMORY EXPANSION:

1. Backup all the files you wish to save onto cassette tape or in another bank of the NEC.
2. Remove the SideCar from the NEC and place it on your work area (see the NOTE under the REPLACING BATTERIES section).
3. Remove the top half of the SideCar by removing the 2 screws and the one plastic pin in the side.
4. Place the memory chips or the piggy-back module on the damp towel while still in the black foam to normalize the electrical potential and avoid any static shocks. Remove the memory device from its protective foam, and place on the towel next to the SideCar.

5. Determine the position and orientation of the memory device then insert it into the socket, insuring each pin enters its respective socket hole. Press firmly enough to install the device all the way in its socket. The piggy-back boards may take a significant amount of pressure.
6. Visually check each pin. If not completely sure each pin is fully inserted into its respective hole, remove the device and check the pins. Straighten if necessary and reinstall.
7. Reassemble the SideCar case. Details can be found in the REPLACING BATTERIES section of this manual.
8. Insert the SideCar into the NEC, select the bank you wish (A,B,C, or D) and using the SHIFT + f.5 function, switch to bank #3. It may be necessary to perform a cold-start on the new bank.
9. Create a file using TEXT in the new bank with an appropriate name (eg. BANK3C) and transfer or load a copy of MEMT.BAS. Follow the directions in section MEMORY TESTING to test the new memory.

FILE XFERS:

This section is intended to supplement the PC-8201A PERSONAL APPLICATION KIT GUIDE supplied by NEC with your computer. Assuming you have read the BANK BACKUP and BANK TRANSFER chapters in the manual, here are some helpful hints on using the programs with the SideCar.

With the bank-to-bank transfer programs XFILES.CO and BACKUP.CO you can copy program and data files quickly and easily between the selected SideCar bank, and bank #1 or #2 in the PC-8201A. With 4 banks in the SideCar you can store both bank #1 and bank #2 in bank 3A and 3B, then copy everything from bank #3C and #3D to bank #1 and #2 in seconds. Use bank#2 in the NEC to copy entire banks from one SideCar to another SideCar. Organize your data and programs by moving individual files into different banks for the most efficient use of storage.

The BACKUP.BA and XFILES.BA programs are not needed once the BACKUP.CO and XFILES.CO are loaded from cassette. Deleting them, rather KILLING them, may avoid confusion and save some memory.

Using the XFILES.CO program requires that both the "from" and "to" banks have some memory space reserved. The memory is reserved using the BASIC command CLEAR 0,-7552 which allocates the size of the string area and the top of memory known to BASIC. I have trouble remembering the number -7552, but -7600 is easy and it's also patriotic, and it works. The first parameter (0) is the space reserved for BASIC strings (eg. "ACBDEF"). Zero isn't too good for BASIC programs that wish to create a string. What you get is "?OS ERROR" which means (out-of-string-space). What I could not find in the book was the default setting of the CLEAR on cold-start. It's CLEAR 256,62336. So the -7552 hides 4K from basic, and the 0 gives back 256.

So if you want to restore your memory allocation to what it was when you got your new NEC, just enter BASIC and type CLEAR 256,62336. If you want to keep the string area the same and make room for bank-to-bank transfers, type CLEAR 256,-7552. Or, if you don't mind wasting some memory and you can't remember the numbers, like me, type CLEAR 300,-7600.

NECs manual explains the transfer programs fairly well. They didn't mention that when in the 'source' bank selecting a file, you can take a look at the 'destination' bank by pressing the STOP key (which generates a CTRL C code) without transferring a file. I found this handy, especially if you want to quit right then or you want to check the destination bank first. By pressing STOP then Y then STOP ... you can quickly flip back and forth between banks without leaving the transfer program.

The memory test program MEMT.BAS will do a CLEAR 256,62336 which puts the memory allocation back to the default. So after running the memory test you must do the CLEAR 0,-7600 before a bank-to-bank transfer will work.

IN CASE OF TROUBLE:

1. Be sure the SideCar's switch is selecting a bank that has memory in it. A partially expanded SideCar may have 1, 2, or 3 banks of memory. The basic 32K SideCar always has bank -A- installed, so be sure the switch is selecting bank -A-. If you expanded other banks, be sure the bank # corresponds to the one you expanded.
2. Check to see the SideCar is inserted all the way into the slot of the PC-8201A. If not sure, remove it and reinstall it (with the power off).

3. If you just expanded the SideCar's memory, double check your work. Try the COLD BOOT procedure on bank 3. Be sure you cold-boot bank 3 and not bank 1 by mistake. You can always use the backup you made, right? If necessary, remove the expansion devices restoring the SideCar to its original condition, and then test it again. If it still fails, return for warranty service. If it works, try the expansion procedure again.

MEMORY TEST ERROR:

When an error is found by MEMT.BAS a report is displayed. The report looks like this:

```
ERROR PHASE=0
AT 33596
GOT 187
WROTE 186
```

The ERROR PHASE is 0=low byte address test, 1=high byte address test, 2=pattern test (one of 4 patterns), and 10=bit test. The 'AT' part is the address where the error occurred and 'GOT' is what was read at that address, and 'WROTE' is what was put at that address prior to reading it back. All values are decimal.

If after reading this manual and checking everything twice you still have trouble, please give us a call or write. We have spent many many months developing and testing this product and will stand behind it and support it. Technical help can be reached at (805)987-1742 or write to Purple Computing Co.
420 Constitution Ave. Camarillo, CA 93010

You are a valued customer. We want you to be completely satisfied with the products we make, so please let us know what you think and what we can do to make our products and/or service better.

Sincerely yours,



Larry Berg
Purple Computing Co.
(805)987-1742

