

ATARI®  
1090 / 1" XL" 64K RAM CARD  
OWNER'S GUIDE

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## THE ATARI 1090/1 XL 64K RAM CARD

The ATARI 1090/1 XL RAM Card and your ATARI 1090™ XL™ Expansion System open up a new and exciting world of memory-enhanced computing with your ATARI Home Computer.

Larger RAM (Random Access Memory) capacity means more computer power. Using software compatible with the ATARI 1090/1 XL 64K RAM Card, you can manipulate elaborate databases, run long programs, perform extended-length word processing, and execute a host of other applications requiring large blocks of memory. Using multiple 1090/1 XL RAM Cards you can increase the memory of your ATARI 600XL™, 800XL™, or 1450XLD™ Home Computer up to 192K. Enough memory to accomplish most any task.

Just follow the simple step-by-step instructions of this guide. You'll soon enjoy the power, sophistication, and versatility of expanded memory capacity with your 1090/1 XL 64K RAM Card.

[Photograph: 1090/1 RAM Card; 1090 XL Expansion System]

INSERTING THE CARD

1. Turn off all parts of your ATARI Home Computer System.

[Photograph step 2: top cover removal]

Callouts:

TOP COVER

TOP COVER SCREWS

2. Remove the 1090 XL Expansion System's top cover (see Step 2 of the 1090 XL Expansion System Owner's Guide).

[Photograph Step 3: slot cover removal]

Callouts:

SLOT COVER

TOP SLOT COVER SCREW

BOTTOM SLOT COVER SCREW

3. Remove the slot cover for the card slot you want to use. With a phillips screwdriver, remove the top screw that holds down the slot cover. Loosen the slot cover's bottom screw. Now lift off the slot cover, then remove the bottom slot

cover screw. Be sure to save the two screws.

[Photograph Step 4: card insertion]

Callouts:

RAM CARD

CARD EDGE CONNECTOR

CARD INSERTION GUIDES

HOST PRINTED CIRCUIT BOARD

HOST PRINTED CIRCUIT BOARD CONNECTOR

4. Insert your RAM Card into the printed circuit board connector whose slot cover you've just removed. Firmly press the card's edge connector into the host printed circuit board connector until it snaps in. Use the card insertion guides as you insert the card.

[Photograph Step 5: card bracket/slot cover installation]

Callouts:

CARD BRACKET/SLOT COVER

TOP SCREW

BOTTOM SCREW

5. In place of the slot cover you removed, install the bracket/slot cover attached to the RAM Card. Use the top and bottom slot cover screws from before. Be sure to turn down the screws tightly.

[Photograph Step 6: Bank Select/1064 switch]

Callout:

BANK SELECT/1064 SWITCH

6. Move the switch, located on the top border of the RAM Card, to either the Bank Select or 1064 position. You can use the Bank Select Mode with a 600XL, 800XL or 1450XLD Computer. You can use the 1064 Mode only with a 600XL Computer. (Please see pages \_\_\_--\_\_\_ of this guide for more information about the 1064 and Bank Select Modes).

[Photograph Step 7: top cover replacement and data cable connection]

Callouts:

TOP COVER

PARALLEL BUS PORT (Computer)

PARALLEL BUS PORT (Expansion Box)

PARALLEL BUS DATA CABLE

AC POWER ADAPTER

7. Replace the top cover, and connect the parallel bus data cable and the AC power adapter (see Steps 6, 7 and 8 of the 1090 XL Expansion System Owner's Guide).

[Photograph Step 8: power-on]

Callouts:

POWER-ON LIGHT

ON/OFF SWITCH

8. Turn on your 1090 XL Expansion System, then your computer.

HELPFUL HINTS

- \* Never insert or remove an the RAM Card when the power is on.
  
- \* If you have problems accessing the 1090/1 64K RAM Card once it's installed, check to make sure the parallel bus data cable is connected properly, and that the card itself is installed correctly.

USING THE ATARI 1090/1 XL 64K RAM CARD

There are two ways to use your 1090/1 XL 64K RAM Card: 1) in the 1064 Mode, for use with a 600XL Computer only; or 2) in the Bank Select Mode, for use with a 600XL, 800XL, or 1450XLD Computer.

1064 Mode (for 600XL Computers only)

You can use your RAM Card in the 1064 Mode with an ATARI 600XL Computer only. In the 1064 Mode, your 600XL memory increases to 64K. No special procedure is required to access the 64K--it's there, ready for use. To put the RAM Card into the 1064 Mode, simply move the switch, located on the top border of the RAM Card, to the 1064 position.

With one RAM Card in the 1064 Mode, you can insert another RAM Card into your Expansion System. This second RAM Card must be in the Bank Select Mode. (Please see the Bank Select section of this guide for information on how to access the available RAM in the Bank Select Mode).

A third RAM Card can be installed.\* The third RAM Card must also operate in the Bank Select Mode, and additionally requires a slight board modification. (Please see page \_\_\_ of this guide for information on how to modify the third RAM Card).



\*Note: You can install a maximum of three 1090/1 64K RAM Cards using a 600XL Computer. One and only one RAM Card can operate in the 1064 Mode, and a maximum of two cards can operate in the Bank Select Mode.

### Bank Select Mode

You can use your RAM Card in the Bank Select Mode with either a 600XL, 800XL or 1450XLD Computer. To put the RAM Card in the Bank Select Mode, simply move the switch, located on the top border of the RAM Card, to the Bank Select position. (Please see the Customer Support section of this guide for information on how to obtain an updated list of available software designed to take advantage of bank switching with your 1090/1 XL RAM Card.)

Note: The following discussion is intended for those who want to incorporate bank switching in their own programs. The discussion employs decimal addresses and assumes that the language used is BASIC. For more advanced programmers using machine language, consult the Bank Select/Deselect Table in this guide for hexadecimal address equivalents.

When in the Bank Select Mode, your 1090/1 XL 64K RAM Card is divided into four RAM "banks" of 16K RAM each. These banks are numbered 0, 1, 2 and 3. Each bank occupies the same address space: 16384 to 32767.

Without your 1090 XL Expansion System connected or turned on, the address space 16384--32767 is a 16K block of RAM which resides as a part of the "home"

RAM, that is, as a part of the RAM built into your computer. But with your Expansion System connected and turned on, this address space must be shared between that home block of 16K RAM and the four banks of 16K RAM available on the RAM Card.

[Illustration (line art): flow chart; computer RAM at address 16387--32767; RAM Card banks numbered 0-3 and at address 16384--32767]

When you turn on your Expansion System with the RAM Card installed, you automatically have Bank 0 available on the RAM card at address 16384--32767. Anything you write to this address will now be stored in Bank 0.

To select another bank of 16K Ram on the RAM Card, you need only write the bank number to address 53758. For example, suppose you want to access Bank 2. You'd type:

```
POKE 53758, 2
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Now anything you write to address 16384--32767 will be stored in Bank 2 of your RAM Card. You may select any of the four 16K RAM banks (numbered 0-3) on your RAM Card in this way.

You may deselect any bank on the RAM Card and have available the home 16K at address 16384--32767. Suppose you've selected Bank 2 as above and now want to deselect that bank. You simply type:

POKE 53758, 128

You have deselected Bank 2, and the 16K of home RAM is available to you at address 16384--32767. You may deselect any of the four banks (0-3) on the RAM Card in this way.

Once you've deselected a bank, whatever you have stored there will remain until you turn off your Expansion System or your computer. If you want again to access that bank, or any other bank on the RAM Card, simply POKE 53758 and the bank number.

If you have two 1090/1 XL 64K RAM Cards operating in the Bank Select Mode, then the second RAM Card requires a slight modification.\* (Please see the next section of this guide for information about how to modify the second RAM Card.)

\*Note: You can install a maximum of two 1090/1 XL 64K RAM Cards (Bank Select) using a 600XL, 800XL or 1450XL Computer.

Bank Select/Deselect Table

|               | Decimal     | Hexadecimal |
|---------------|-------------|-------------|
| Bank Address  | 16384-32767 | 4000-7FFF   |
| Select Bank   | 53758, BN*  | D1FE, BN    |
| Deselect Bank | 53758, 128  | D1FE, 80    |

\*BN stands for Bank Number: 0-3 with one RAM Card (Bank Select); 0-3 and 16-19 with two RAM Cards (Bank Select).

How To Use Two Bank Select RAM Cards

If you want to use two RAM Cards in the Bank Select Mode, then you must set your second Bank Select RAM Card to the Card 2 position. This is a simple procedure, requiring you to remove then reconnect a jumper connector on the RAM Card itself.

As you can see, the jumper connector is located between the intergrated circuits U16 (74LS04) and U17 (74S51). The circuits are housed in those small rectangular plastic boxes. U16 (74LS04) and U17 (74S51) are clearly marked in white letters on the RAM Card. The markings 74LS04 (U16) and 74S51 (U17) appear on the circuit housings themselves.

[Illustration, line art or photograph: full view of RAM Card with jumper in the Card 1 position, affected PCB area clearly and graphically called out]

Callouts:

U16 (74LS04)

U17 (74S51)

JUMPER CONNECTOR

CARD 1 POSITION

CARD 2 POSITION

The jumper connector is shown here in the Card 1 position. Gently pull up on the jumper connector. You will see three pins sticking out upright on the RAM Card. In the Card 1 position, the jumper connector fits over the top and middle pins.

[Illustration, line art or photograph: close-up of U16 and 17 area with jumper in Card 1 position]

The Card 2 position requires that the middle pin and the bottom pin are covered. To put the RAM Card in the Card 2 position, simply fit the jumper connector over the middle and bottom pins. This is the Card 2 position.

[Illustration, line art or photograph: Close-up of U16 and U17 area with jumper in Card 2 position]

Remember: With two Bank Select RAM Cards, only the second Bank Select RAM Card should be in the Card 2 position.

Once you set the second RAM Card to the Card 2 position, the four additional 16K RAM banks are numbered 16, 17, 18, and 19.

The following chart shows all allowable system configurations with the 1090/1 XL 64K RAM Card, the amount of memory obtained with each configuration, and when you must set the second Bank Select RAM Card to the Card 2 position.

#### System Configurations

| Your System   | K of RAM | Set Second Bank Select Card To The Card 2 Position |
|---|----------|--|
| 600XL, Expansion System, one RAM Card (1064)                              | 64K      | NO   |
| 600XL, Expansion System, one RAM Card (Bank Select)                       | 80K      | NO   |
| 600XL, Expansion System, one RAM Card (1064), one RAM Card (Bank Select)  | 128K     | NO   |
| 600XL, Expansion System, one RAM Card (1064), two RAM Cards (Bank Select) | 192K     | YES  |
| 600XL, Expansion System, two RAM Cards (Bank Select)                      | 144K     | YES  |
| 800XL or 1450XLD, Expansion System, one RAM Card (Bank Select)            | 128K     | NO   |
| 800XL or 1450XLD, Expansion System, two RAM Cards (Bank Select)           | 192K     | YES  |

CUSTOMER SUPPORT

We at ATARI welcome any questions you might have about your 1090/1 XL 64K RAM Card, or any other product in the ATARI line. We'll be happy to provide an updated list of available software designed to take advantage of bank switching with your 1090/1 XL 64K RAM Card.

Inside the U.S. and Canada:

Within the Continental U.S. (except California), please call toll-free: (800) 538-8543

Within California, please call toll-free: (800) 672-1404

From Alaska, Hawaii, or Canada please call 800 Directory Assistance, (800) 555-1212, for the ATARI toll-free 800 number.

Or you may write: ATARI Customer Relations  
P.O. Box 61657  
Sunnyvale, CA 94088

Outside North America:

You may write: ATARI Customer Service  
Intercity House  
Railway Terrace  
Slough, Berkshire England SL2 5BZ

IMPORTANT INFORMATION:

Like any electrical appliance, this ATARI Home Computer equipment uses and produces radio frequency energy. If it's not installed and used properly according to the instructions in this guide, the equipment may cause interference with your radio and television reception.

It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the FCC rules. These rules are designed to provide reasonable protection against such interference when the equipment is used in a residential setting. However, there is no guarantee that interference will not occur in a particular home or residence.

If a cable is connected to the expansion interface connector, it must be a shielded cable (Atari part number CA025615-001) in order to ensure FCC compliance. Use of a non-shielded cable will void FCC certification.

If you believe this equipment is causing interference with your radio or television reception, try turning the equipment off and on. If the interference problem stops when the equipment is turned off, then the equipment is probably causing the interference. With the equipment turned on, you may be able to correct the problem by trying one or more of the following measures:

\*Adjust the position of the radio or television antenna.



- \*Reposition the equipment in relation to the radio or television set.
- \*Move the equipment away from the radio or television.
- \*Plug the equipment into a different wall outlet so the equipment and radio or television are on different branch circuits.

If necessary, consult your ATARI Computer retailer or an experienced radio-television technician for additional suggestions.

You may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock No. 004-000-00345-4.

PLEASE NOTE:

Every effort has been made to ensure the accuracy of the product documentation in this guide. However, because Atari, Inc. is constantly improving and updating the computer software and hardware, we are unable to guarantee the accuracy of the printed material after the date of publication and disclaim liability for changes, errors or omissions.

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