

In April of 1992 Marpet purchased the rights to the complete range of products previously manufactured and marketed by Frontier Software. Any references within this manual to Frontier Software should be taken as reference to Marpet Developments.

Marpet

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XTRA-RAM Deluxe Installation Manual

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IMPORTANT: If you cannot
 find the Xtra-RAM
 upgrade instructions
 to contact Marpet Support
 423712600 or FAX 423712601

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Marpet
DEVELOPMENTS

IMPORTANT If you encounter any problems during the fitting of the XTRA-RAM *Doluxe* and require assistance, please contact Marpet Developments between the hours of 9am and 5pm, Monday to Friday. Telephone 0423 712600 or FAX 0423 712601. International Code 44.

Copyright Notice

This manual, any non-Public Domain software supplied and the XTRA-RAM *Deluxe* upgrade itself are all copyright © Frontier Software 1991. Frontier Software will take vigorous action against any violation of its copyrights.

Disclaimer

Frontier Software does not assume any liability for any consequential damage caused by the use of the XTRA-RAM *Deluxe* upgrade or included software. Frontier Software also does not assume any liability for any damages caused during or as a result of installing the XTRA-RAM *Deluxe* upgrade, or resulting from parts not supplied by Frontier Software.

Ten Day Money Back Guarantee

The Frontier XTRA-RAM *Deluxe* upgrade is covered by a ten day money back guarantee. (Participating resellers only.) This means that if the XTRA-RAM *Deluxe* upgrade (including ALL circuit boards, software, disk, box, manual and other items supplied with the XTRA-RAM *Deluxe* upgrade) are returned to the supplier in their original saleable condition then the supplier will offer a full refund on the purchase price. In no way will Frontier Software, or its dealers and stockists, accept the return of items for refund under the ten day money back guarantee if they are not in their original condition (this includes all items supplied in the outer packaging and the packaging itself). Any soldering or other electronic changes made to any circuit board will immediately void the ten day money back guarantee, unless written permission has been granted directly by Frontier Software.

Guarantee

Frontier Software guarantee the XTRA-RAM *Deluxe* Atari ST upgrade to be free from defects in materials and workmanship for a period of Two Years from the date of purchase by the user. If any parts or equipment becomes defective during this period Frontier Software will repair or replace them without any charge. If it is deemed by Frontier Software that the part(s) are defective through misuse, neglect or accident, then the repair or replacement will be undertaken at normal repair charges for materials and labour. The guarantee is held by Frontier Software and is effective on a 'return to base' basis. Consequently, any claim under the guarantee necessitates the user returning the product in the first instance to the supplier. If the product was purchased directly from Frontier Software, the owner is responsible for paying for any postal or delivery charges incurred in the return of the part(s) to Frontier Software in Harrogate.

All prices mentioned in this guide are subject to change with or without notice.

It is not intended that the 10 Day Money Back Warranty or the Two Year Guarantee take from the user any rights assigned to him/her by the applicable legislation of his/her country of residence.

WHAT IS INCLUDED

In the XTRA-RAM *Deluxe* box you should have found:

- This manual
- The XTRA-RAM *Deluxe* main RAM board in an anti-static bag
- The XTRA-RAM *Deluxe* MMU adaptor board with ribbon cable attached
- The XTRA-RAM *Deluxe* Video Shifter adaptor board with ribbon cable attached
- A disk contained the copyright memory testing utility and public domain programs
- Four jumper wires with clips (only two required with 1/2MB version of the XTRA-RAM *Deluxe*)

IMPORTANT - You must read this manual before starting the upgrade!

INTRODUCTION

Congratulations on buying the XTRA-RAM *Deluxe* upgrade for your Atari ST. We are the largest United Kingdom manufacturer and exporter of memory expansions for the Atari ST range, and with many 1000s of satisfied customers we have the knowledge and experience to really support YOU!

Although the principles used in the assembly of the Atari STF/STFM and MEGA ST models are similar, there are some differences. As we go through the installation of the XTRA-RAM *Deluxe* board look for the MENU boxes at the left hand edge of the page. If present, these indicate which machine the specific paragraph refers to.

Machine
✓ 520STFM
1040STF
1040STFM
Mega 1ST
Mega 2ST

Sample Menu

Once you have installed the XTRA-RAM *Deluxe*, you can have a total system memory of 1MB; 2MB; 2 1/2MB; or 4MB. You cannot have a 1 1/2MB or 3MB system. If you have purchased an unpopulated; 1/2MB or 2MB XTRA-RAM *Deluxe*, you can make use of low priced industry standard SIMM boards to upgrade your system to the full 4MB at a later date.

Your Atari ST and any peripherals that you might have will operate in exactly the same way as they have before, but you will have the added benefit of extra memory for your business programs, word processors, DTP packages, print spoolers, RAM disks and other programs. If you have upgraded from a 1/2MB Atari

ST, games and most leisure titles have been written to take advantage of extra memory to reduce tiresome disk swapping and in some cases to provide greater graphic details.

This manual might look very complicated as you commence the installation process, but don't worry. The manual has been made purposefully long so that it includes every detail that you will need to install the XTRA-RAM *Deluxe* successfully. This new version of the manual, specially written for the XTRA-RAM *Deluxe*, incorporates many new diagrams and pictures, together with facts and information gained from the successful supply and installation of 1000s of memory expansion boards!

You should read the instructions at least once before you start this project. No soldering is necessary for most users and so installation should be suitable for a beginner - provided that the instructions contained in the following pages are followed very carefully. Be warned, however, that the fitting of the XTRA-RAM *Deluxe* into an Atari ST will void any remaining guarantee on that particular machine. You should not attempt the fitting of the XTRA-RAM *Deluxe* on an untested computer. You will require about one hour to complete the fitting of the XTRA-RAM *Deluxe* upgrade. It is best to try and complete the fitting in one session to avoid losing any components from either the XTRA-RAM *Deluxe* package or your Atari ST.

Don't worry! If you have read this instruction manual and find the task of fitting the XTRA-RAM *Deluxe* product too daunting, you can take advantage of our low cost fitting service. For only £40, fully inclusive of VAT at 17½% (UK mainland residents), Frontier Software can collect your computer from your home or place of work, install the XTRA-RAM *Deluxe* product and return the unit to you - with carriage each way via an overnight insured courier service! This will normally take three working days. For further information on this service please turn to page 29.

IMPORTANT If you encounter any problems during the fitting of the XTRA-RAM *Deluxe* and require assistance, please contact Marnet Developments between 9am and 5pm, Monday to Friday. Telephone 0423 712600 / 712601 or FAX 0423 712601. International Code 44.

HOW THE XTRA-RAM *Deluxe* WORKS

The XTRA-RAM *Deluxe* has been designed in such a way as to provide the owner of an Atari ST system with an easy and inexpensive upgrade path right through to the Atari ST's maximum of 4MB of memory. Designed and manufactured here in England

by Frontier Software, it offers quality at an affordable price. The key to the simplicity of the XTRA-RAM *Deluxe* is its use of industry standard Single In Line Memory Module (SIMM) boards. The XTRA-RAM *Deluxe* can use only two ¼MB SIMMs; or two 1MB SIMMs; or four 1MB SIMMs. It is not possible to mix the lower capacity ¼MB SIMM boards with the higher capacity 1MB SIMM boards.

The Atari ST range of computers has been designed to use a maximum of two banks of memory. The Memory Management Unit (MMU) chip in your ST can handle either one ¼MB bank of memory; two ½MB banks of memory (total 1MB); one 2MB bank of memory; or two 2MB banks of memory (total 4MB). With the exception of MMU chips marked with the digits 100109, the Atari ST range can also handle one ½MB bank and one 2MB bank (total 2½MB). The XTRA-RAM *Deluxe* board supports ALL of these memory variants.

The MMU chip, designed by Atari, has over the years been manufactured by different suppliers and so can be one of three types. The rectangular MMU chips are surface mounted and numbered 101601, that is, they are soldered directly to the green motherboard and consequently are not in a socket. The more common square type MMU chips are numbered 25912 or 100109 and can be either socketed or surface mounted.

XTRA-RAM *Deluxe* Memory Bank Allocation

Bank 1	Bank 2	Total Memory	Notes
½MB	0MB	½MB	
½MB	½MB	1MB	
2MB	0MB	2MB	
2MB	½MB	2½MB	(1)
2MB	2MB	4MB	

(1) This combination is impossible with the 100109 MMU since this MMU cannot support banks of different sizes.

Machine

520S11M
1040S11F
1040S11FM
Mega 151
✓ Mega 25T

The Mega 2 ST has one 2MB bank of memory only. With the XTRA-RAM *Deluxe* installed, the machine simply looks at the original 2MB of RAM and at the two 1MB SIMMs on the XTRA-RAM *Deluxe* (making up a 2MB bank of memory), so providing a total of 4MB of system memory.

Machine

520S11FM
1040S11F
1040S11FM
✓ Mega 15T
Mega 151

If you own an Atari Mega 1 ST (with the original 1MB of RAM) it will be necessary to disable the upper ½MB bank of memory making up its 1MB.

Machine

520STFM
1040STFM
Mega 1ST
Mega 2ST

Continued. This enables the machine to look at the XTRA-RAM *'Jehave'* fitted with two 1MB SIMMs (making up a 2MB bank of memory), so providing a total of 2 1/2 MB of system memory. If the XTRA-RAM *'Jehave'* contains four 1MB SIMMs (two 2MB banks of memory) then it will be necessary to disable both of the Atari Mega 1 ST's internal 1/2 MB banks of memory. The total system memory would then be 4MB. It is also necessary to disable BOTH of the internal 1/2 MB banks of memory when the Atari Mega 1 ST computer contains a 100109 type MMU chip - even if the XTRA-RAM *'Jehave'* contains only two 1MB SIMMs. Since Atari STs containing 100109 type MMU chips can only use memory banks of the same capacity, the available options would therefore be 1MB; 2MB and 4MB. If the 100109 type MMU chip is socketed then a replacement is available, if required, for approximately £30 inclusive of VAT. (This is only required if you desire a 2 1/2 MB system.)

also necessary to disable the internal 1/2 MB bank of memory when the Atari ST computer contains a 100109 type MMU chip and you wish to fit the XTRA-RAM *'Jehave'* board containing two 1MB SIMMs. If the 100109 type MMU chip is socketed then a replacement is available, if required, for approximately £30 inclusive of VAT. (This is only required if you desire a 2 1/2 MB system.)

Early Atari ST Models

The first Atari ST machines featured an external power supply unit (PSU) and external floppy disk drive(s). The very first were 520STs and did not have an internal modulator enabling connection to a domestic TV. The later ones were 520STMs which were fitted with an internal modulator. Both Atari 520ST and STM variants had socketed MMU & Video Shifter chips so making the installation of a memory expansion board a straightforward process. The XTRA-RAM *'Jehave'* cannot fit inside the Atari 520ST and STM models. However, we are still able to supply the top-selling XTRA-RAM and XTRA-RAM+2 memory expansion boards to upgrade these two machine types to their maximum of 4MB of system memory. Contact Frontier Software for further information and assistance.

Machine

520STFM
1040STFM
Mega 1ST
Mega 2ST

If you own an Atari ST with 1MB of RAM it will be necessary to disable one of the 1/2 MB banks of memory making up this 1MB. This enables the machine to look at the XTRA-RAM

'Jehave' fitted with two 1MB SIMMs (making up a 2MB bank of memory), so providing a total of 2 1/2 MB of system memory. If the XTRA-RAM *'Jehave'* contains four 1MB SIMMs (two 2MB banks of memory) then it will be necessary to disable both of the Atari ST's internal 1/2 MB banks of memory. The total system memory would then be 4MB. It is also necessary to disable BOTH of the internal 1/2 MB banks of memory when the Atari ST computer contains a 100109 type MMU chip - even if the XTRA-RAM *'Jehave'* contains only two 1MB SIMMs. Since Atari STs containing 100109 type MMU chips can only use memory banks of the same capacity, the available options would be 1MB; 2MB and 4MB. If the 100109 type MMU chip is socketed then a replacement is available, if required, for approximately £30 inclusive of VAT. (This is only required if you desire a 2 1/2 MB system.)

Machine

520STFM
1040STFM
Mega 1ST
Mega 2ST

If you own an Atari STFM with 1/2 MB of RAM you can fit the XTRA-RAM *'Jehave'* board containing any of the following SIMM boards: two 1/4 MB SIMM boards (one 1/2 MB bank of

memory); two 1MB SIMM boards (one 2MB bank of memory); or four 1MB SIMM boards (two 2MB banks of memory). If you fit the XTRA-RAM *'Jehave'* containing four 1MB SIMMs then it will be necessary to disable the internal 1/2 MB bank of memory. It is

Important
!

HOW TO AVOID STATIC

Why bother? Static electricity is generated by certain floor coverings, footwear and clothing. It can be potentially destructive to most electronic components, particularly those such as the Atari ST's MMU chip, Video Shifter chip and the SIMM boards used on the XTRA-RAM *'Jehave'* board. You can avoid static problems by following these simple steps.

- Every time you move your feet, stand up or sit down during the fitting of the XTRA-RAM *'Jehave'*, touch something metallic such as a table leg or metal lamp. This will dissipate the static. Better still, if available use an earth strap worn on the wrist and work on an anti-static surface.
- Wherever possible do not touch the legs of any chips.
- Never touch any components that you are not expressly told to touch in these instructions.
- Do not unpack any contents making up the XTRA-RAM *'Jehave'* package until you are told to do so in these instructions. This is particularly important if you have purchased the XTRA-RAM *'Jehave'* with memory fitted.

INSTALLATION

Disassembly of your Atari ST

Although the principles used in the assembly of the Atari STF/STFM and MEGA ST models are similar, there are some differences. As we go through the installation of the XTRA-RAM *Seluxe* board look for the MENU boxes at the left hand edge of the page. If present, these indicate which machine the specific paragraph refers to. You should read all the general paragraphs (those without menus).

1. You will need an area of table top approximately equal to two widths and two lengths of your keyboard model ST or Mega ST. You must not try to do the installation of the XTRA-RAM *Seluxe* board in the usual place that your Atari ST sits in. You will need a large area on which to spread everything out.

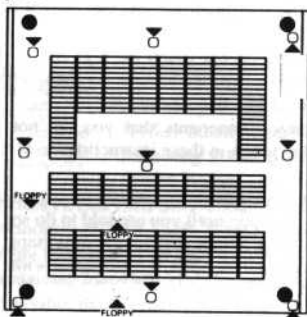
2. You will require the following tools:

- Small/medium Phillips screwdriver
- Small flat blade screwdriver
- Small long nosed pliers

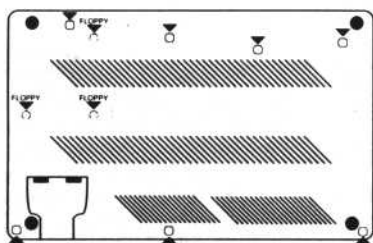
Despite the obvious benefits you must NOT use an electric screwdriver when disassembling or reassembling your Atari ST. This can damage your Atari ST's case.

3. When you have completely disassembled your Atari ST, there will be many screws all of different sizes and shapes. There are two good methods for keeping these in order. One is to use separate envelopes for each type of screw. You can then write on the envelope the location and use of the screws. The second method is to use mugs or glasses into which you place the screws. You can then use small pieces of paper placed in the mugs or glasses to mark the location and use of the screws. This is important because you can damage your Atari ST's case by using the wrong screws in the wrong location.

4. Disconnect the your Atari ST from the mains supply. Disconnect all peripheral devices. Turn the computer upside down so that the keyboard or Mega ST top is face down on the work surface in front of you.



5. Unscrew all of the screws on the base of the Atari ST (these are in square and round holes) using the Phillips screwdriver and place them in a mug or envelope. You may find that one of the screws is hidden under a small white label, or the suppliers' Warranty Seal.



Atari STF/STFM Bottom

There are 10 screws on an Atari STF/STFM unit and 14 on an Atari Mega ST. Keep the floppy disk screws separate (often brass coloured). Also keep the screws from the front of a keyboard Atari ST unit, which are slightly shorter than those from the rear, separate to the rear ones.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM

Mega 1ST
Mega 2ST

6. Holding the two halves of your Atari STF/STFM together, slowly turn the unit over and place it on your work top. Now remove the top and place it to one side.

Machine

- 520STFM
- 1040STF
- 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

6. Holding the two halves of your Atari Mega ST together, slowly turn the unit over and place it on your work top. Now partly remove the top and with great care unplug the power lead at the rear left connecting the clock batteries in the lid to the main circuit board. Completely remove the top and place to one side.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM

Mega 1ST
Mega 2ST

7. Lift up the keyboard from the left hand side and you will notice that it is attached to the Atari ST's main circuit board through a hole in the shielding by a connector on the right of the unit. Lay the keyboard to one side and, using the pliers, unplug the keyboard connector from the Atari ST. Lift the detached keyboard up and place it to one side.

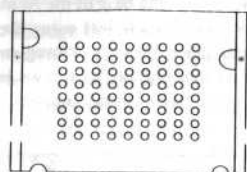
Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM

Mega 1ST
Mega 2ST

8. The STF and STFM models have a built-in power supply. This is housed in a small shielded box at the left hand rear of the unit. You must now remove this shielding. Undo the screws and straighten the twists shown overleaf. Now remove the shielding and place it to one side. You will now see the power supply circuit board. You must NOT touch the components on this board. You might

receive a small electric shock if you do. This is nothing to worry about - just be careful!



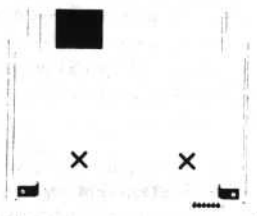
Power Supply Shield - Twists

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

8. The Mega ST models feature a built-in power supply. This is housed beneath the main shielding at the right hand rear of the board and is not yet visible. In the top shielding you will

see four holes towards the top right hand corner as you look at the Mega unit from the front. Looking through the two front holes, you will see two screws which hold the power supply board to the bottom of the case.



Power Supply Board - Legs

Using the Phillips screwdriver reach into these holes and undo the two screws. Remove the bottom plastic part of the case from the shielding and place it to one side.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

9. At either side of the front of the power board inside the shielding you will see a screw attaching the bottom of the power board leg to the main circuit board. See Diagram directly

above - 'Power Supply Board - Legs'. Unscrew both of these screws. Unscrew the screws along the front edge of the Atari ST's shielding. These fix the main circuit board to the bottom of its case.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

9. Using the pliers, straighten all of the small tabs around the edges of the shielding. Squeeze the sides of the small plastic connector in the top left

hand side of the top shielding (it was originally plugged into the clock battery compartment) and push it inside the case. Remove the top shielding. Take care with the floppy disk drive unit which is now secured only by its cabling.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

10. Lift the top and bottom halves of the shielding slightly forward and upward and remove them together from the bottom of the Atari ST's case. Place the case bottom to one side. Put the main circuit board (contained within its shielding) on your work top.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

11. Before the top shielding can be removed you must disconnect the internal floppy disk drive mechanism. There are two slightly different models of internal drive for the 520

STFMs, those with completely internal circuitry and those without. If you have the large middle shielding between the power supply unit on the left and the disk drive on the right, then your STFMs has an additional controller board. Contact Frontier Software for further support.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

12. Remove the small shielding in the middle by unscrewing the two screws which hold it on. Unplug the disk drive's 34 way ribbon cable and the 4 way power cable, taking care not to

pull the cables. Carefully remove the floppy disk drive unit and place it to one side.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

12. If your Atari 520 STFMs does not have a separate controller remove the small shielding in the middle by unscrewing the two screws which hold it on. Unplug the disk drive's 34

way ribbon cable and the 4 way power cable, taking care not to pull the cables. Carefully remove the floppy disk drive unit and place it to one side.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

13. You must now disconnect the top of the main shielding from its base. You can do this by straightening all of the twists in the metal top. Lift off the top of the shielding and put it to one side.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

14. You have now revealed the main circuit board. You should take care not to touch any of the chips or other circuits unless instructed to do so. If you have not already done so make sure you have carefully read the Static Precautions.

Machine

- 520STFM
- 1040STF
- 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

14. You have now revealed the main circuit board. You should take care not to touch any of the chips or other circuits unless instructed to do so. If you have not already done so make sure you have carefully read the Static Precautions.

Identifying Your Machine Type

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- Mega 1ST
- Mega 2ST

15. There are four main types of circuit boards in Atari STF/STFMs. You must now identify which of these types matches your Atari ST model. We refer to these circuit board types

as Type I; Type II; Type III; and Type IV throughout the remaining text of these instructions. Once you have identified your circuit board type make a note of the type in this box.

STF/STFM TYPE	
----------------------	--

TYPE I has one square chip to the left hand side and one to the right hand side as shown in below. Look at page 15 to confirm that your Atari ST model is not Type IV.



TYPE II has the two square MMU and Glue chips in the bottom right hand corner of the circuit board as shown in below. Look at Page 15 to confirm that your Atari ST model is not Type IV.



TYPE III has the square MMU chip to the front of the Video Shifter box and the Glue chip over to the right as shown in below.



TYPE IV Some Atari STF & STFMs have both square chips soldered directly to the circuit board, without the use of sockets, by a method called surface mounting. The following two diagrams show a socketed MMU chip and a surface mounted MMU chip. If your Atari STF/STFM's square chips are socketed like this, then you have a Type I; Type II or Type III circuit board. If your Atari STFM is indeed a Type IV, or if the Video Shifter is not in a socket, then you must contact the supplier of your XTRA-RAM *Deluxe*, or ourselves, for further instructions.

Surface Mounted MMU Chip - Side View



Socketed MMU Chip - Aerial View

Some Atari STFM units do not have a square MMU chip. Instead, a small rectangular surface mounted MMU chip is used. This chip is marked 101601. If your MMU chip is identified as the rectangular 101601 type please contact your supplier or ourselves for further assistance.

Fitting the MMU Adaptor

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- Mega 1ST
- Mega 2ST

16. The XTRA-RAM *Deluxe* board plugs into two places on your Atari ST's circuit board. The Video Shifter chip and the MMU (Memory Management Unit) chip. The MMU chip is always one of the

two (or three if your Atari ST model has a blitter chip fitted) large square chips and has 25912 or 100109 written on it. This chip will have further characters on it, for example, CO25912-38.

Some Atari STFM units do not have a square MMU chip. Instead, a small rectangular surface mounted MMU chip is used. This chip is marked 101601. If the square type MMU chip is in a socket it is likely to have either one or two diagonal brass coloured retaining clips across its surface and it will be noticeably raised up from the circuit board, fitted flush within a brown or black socket. If it is not socketed it will appear almost flush with the green circuit board and it will not have any retaining clips fitted. See Diagrams at top of this page. If your MMU chip is identified as the

rectangular 101601 type, or if you believe your square MMU chip is not socketed, please contact your supplier or Frontier Software for further assistance.

Machine
520STFM
✓ 1040STF
1040STFM
Mega 1ST
Mega 2ST

16. The XTRA-RAM *Deluxe* board plugs into two places on your Atari ST's circuit board. The Video Shifter chip and the MMU (Memory Management Unit) chip.

The MMU chip is one of the two large square chips and has 25912 or 100109 written on it. This chip will have further characters on it, for example, CO25912-38.



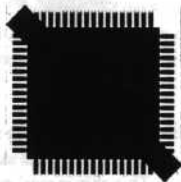
Surface Mounted MMU Chip - Side View

If the MMU chip is in a socket it is likely to have either one or two diagonal brass coloured retaining clips across its surface and it will be noticeably raised up from the circuit board, fitted flush within a brown or black socket. If it is not socketed it will appear almost flush with the green circuit board, as in the diagram above, and it will not have any retaining clips fitted. If you believe your MMU chip is not socketed please contact your supplier or Frontier Software for further assistance.

Machine
520STFM
1040STF
1040STFM
✓ Mega 1ST
✓ Mega 2ST

16. The XTRA-RAM *Deluxe* board plugs into two places on your circuit board. The Video Shifter chip and the MMU (Memory Management Unit) chip. The MMU chip is one of the two

(or three if your Atari Mega ST is a recent model with a Blitter chip fitted) large square chips and has 25912 or 100109 written onto it. This chip will have further characters on it, for example, CO25912-38. The MMU chip is located towards the middle of the front edge of the main circuit board.



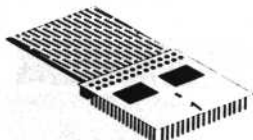
Socketed MMU Chip - Aerial View - Mega ST

The MMU chip on your Atari Mega ST will be in a socket. It is likely to have either one or two diagonal brass coloured retaining clips across its surface and it will be noticeably raised up from the circuit board, fitted flush within a brown or black socket.

17. After you have determined your Atari ST has a socketed square MMU chip, make a written note of its number in this box.

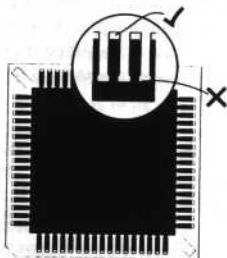
MMU TYPE	
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You must now seat the MMU adaptor onto the top of the MMU chip in its socket. Removal of the MMU chip from within its socket is NOT required. Along one side of the square MMU chip there is a small notch. This notch shows you which pin is pin 1. It should also correspond with a '1' written in white on the circuit board. If there is a metal clip over the top of your MMU chip, remove it now with the flat bladed screwdriver. **WARNING:** These clips are sprung steel so guard your face well!



MMU Adaptor

18. If you look at the XTRA-RAM *Deluxe* MMU adaptor you will see a large '1' written next to one of the pins on the top side of the adaptor. This lines up with the notch on the MMU chip. Lining up the '1' on the adaptor and the notch on the MMU carefully push the MMU adaptor down onto the MMU in its socket. The three rows of pins around the edges of the MMU adaptor should press into the gaps between the socket's pins and the sides of the socket as shown below.



Socketed MMU Chip - Close Up View

Press it down until there is a minimal gap, approximately 1mm, between the adaptor and the top of the MMU socket. If your MMU chip doesn't have a notch line up with the XTRA-RAM *Deluxe* MMU adaptor board with the small '1' on the circuit board. If you are upgrading a Type II ST unit then you will need to place a piece of thin insulating material, such as thin card, over the top of the MMU adaptor to stop the shielding shorting against it.

Fitting the Video Shifter Adaptor

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

19. The Video Shifter chip is the large 40 pin rectangular chip marked 25914 or 70713. It can be found inside the rectangular box with a hinged lid in the middle of the circuit

board, with two metal twists at the front of the lid securing it.



Video Shifter Shielding Box

Once the lid is open you will be able to observe whether the chip is in a socket or surface mounted. If it is in a socket it will be raised above the level of the circuit board.



Socketed Video Shifter Chip

If your Video Shifter chip is not socketed contact your supplier or Frontier Software for further assistance.



Surface Mounted Video Shifter Chip

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

19. The Video Shifter chip is the large 40 pin rectangular chip marked 25914 or 70713. If it is in a socket it will be raised above the level of the circuit board. See above two diagrams. If

your Video Shifter chip is not socketed contact your supplier or Frontier Software for further assistance. (Note that the orientation of the Video Shifter chip on a Mega ST circuit board is opposite to that of Atari STF/STFMs. Pin '1' is on the left on the chip as you look at it from the front of the Mega ST.)

20. Follow the Static Precautions outlined on page 9. It is important to note that there are several small tracks running beneath the Video Shifter socket so take great care in locating the screwdriver. Put the screwdriver between the Video Shifter chip and its socket and remove the Video Shifter chip by VERY gently prising one end of it upwards with the flat bladed screwdriver.



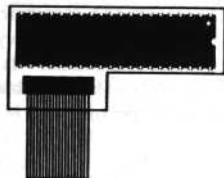
Removing Socketed Video Shifter Chip

When this end has risen slightly, work on the other end - swapping ends often, until the entire chip has risen out of the socket and is sitting on top of it. Make a written note of which end the small notch or dot on the Video Shifter chip is located.



Video Shifter Orientation
(One or two dots will be present)

21. Being very careful about static, pick the chip up (trying not to touch its legs) and place it into the socket of the XTRA-RAM (Frontier's Video Shifter adaptor, being very careful not to bend its legs and also being careful that all the legs are inserted correctly.



Video Shifter Chip Mounted on Adaptor Board

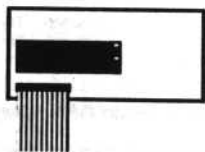
Be sure to place the chip in the socket with the notches and cutouts as shown above.

Machine

- ✓ 520STFM
- ✓ 1040STF
- ✓ 1040STFM
- ✓ Mega 1ST
- ✓ Mega 2ST

22. Place the XTRA-RAM (Frontier's Video Shifter Adaptor board into the now empty Video Shifter socket (so that the chip is the same way around as it originally was) on the main

circuit board, with the cable leading out to the front, being careful not to bend any of its legs in the process. Make sure that all of the legs are inserted correctly.



Video Shifter Adaptor Installed

Press the Video Shifter board down FIRMLY. Bend the left hand twist tag of the Video Shifter shielding box forward and downward. Take the ribbon cable out of the Video Shifter shielding box as shown overleaf and close the box lid by fastening the right hand twist with pliers.



Video Shifter Box and Adapter Cable

Machine
520STFM
1040STF
1040STFM
✓ Mega 1ST
✓ Mega 2ST

22. Place the XTRA-RAM *Deluxe* Video Shifter adaptor board into the now empty Video Shifter socket (so that the chip is the same way around as it originally was) on the main circuit

board, with the cable leading out to the back, being careful not to bend any of its legs in the process. Make sure that all of the legs are inserted correctly. Press the Video Shifter adaptor board FIRMLY down.

Turning Off Banks of Memory

The XTRA-RAM *Deluxe* contains one or both banks of memory for your upgraded ST. You therefore have to turn off one or both banks of memory inside the computer so that these do not conflict with the memory on the XTRA-RAM *Deluxe*. Use the following chart to decide which banks to turn off.

Total Memory	Total Memory On XTRA-RAM <i>Deluxe</i>	Memory In ST	Notes
1MB	1/2MB	1/2MB	No need to turn off any banks.
2MB	2MB	Zero MB	Turn off bank 1 and bank 2 in your ST. You must use this combination instead of 2 1/2 MB if your Atari ST has a 100109 MMU.
2 1/2 MB	2MB	1/2 MB	Turn off bank 2 in your Atari ST.
4MB	2MB	2MB	Mega 2ST. No need to turn off any banks.
4MB	4MB	Zero MB	Turn off bank 1 and bank 2 in your ST.

How To Turn Off Banks Of Memory

To turn off a bank of memory you must use the supplied red jumper wires to connect 5 volts into two places on the bank of memory that you wish to turn off.

Follow these steps:

23. Locate a large capacitor like the one shown below. One end of this large capacitor will be connected to 5 volts.



The 5 volt end is the one which has the arrows going away from it. You will need either 2 or all 4 red jumper wires depending on whether you are turning off one or two banks of memory - two red jumper wires per bank. Attach one end of all of the jumper wires to the 5 volt end of the large capacitor - the end with the arrows pointing away from it.

24. Using some small snipers or scissors cut the end nearest to the MMU chip of the following resistors for the bank(s) you wish to turn off:

	Bank 1	Bank 2
STFM Type I	R61 and R60	R71 and R72
STFM Type II	R90 and R91	R93 and R94
STFM Type III	R61 and R60	R71 and R72
Mega 1ST	R68 and R70	R148 and R149

These resistors will be located on the Atari ST's circuit board between the MMU chip and the ST's memory chips.

25. Bend up the cut end of each cut resistor and attach the other ends of the red jumper wires to the bent up portion of each resistor.

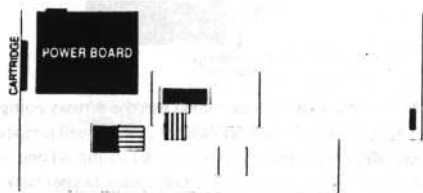


26. Place the jumpers as flat as possible against the ST's circuit board making sure that the cut resistors are not touching any other components (we recommend using insulation tape for this).

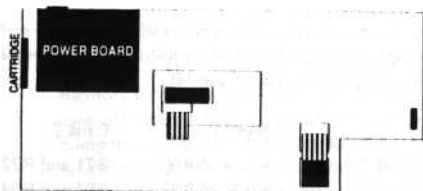
IMPORTANT If you encounter any problems during the fitting of the XTRA-RAM *Deluxe* and require assistance, please contact Marpet Developments between 9am and 5pm, Monday to Friday. Telephone 0423 712600 / 712601 or FAX 0423 712601. International Code 44.

Partial Reassembly

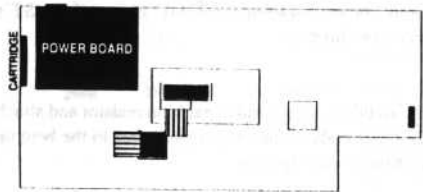
The following Diagrams illustrate the placement of the adaptor cables: Check to make sure before reassembly.



TYPE I



TYPE II



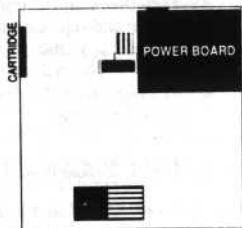
TYPE III

Machine
 ✓ 520STFM
 ✓ 1040STF
 ✓ 1040STFM
 Mega 1ST
 Mega 2ST

27. You will probably not have removed the power supply unit. If you have removed it, replace it at this stage making sure the two back 'legs' locate firmly and squarely in the two slots on the circuit board. Take the MMU adaptor's ribbon cable and the Video Shifter adaptor's cable and carefully route them out of the top of the shielding in the following way: Type I & III owners - route the MMU lead out from under the power board shielding and the video shifter adaptor cable out from the left edge of the floppy disk drive. Type II owners - route both adaptor cables out from the left edge of the floppy disk drive.

Machine
 520STFM
 1040STF
 1040STFM
 ✓ Mega 1ST
 ✓ Mega 2ST

28. Replace the two power supply screws into their holes on the power supply legs so that you can refasten them when you have replaced the top shielding. Position the floppy disk drive mechanism over its three hollow mounts and one brass coloured solid mount. Position the XTRA-RAM *Seluse* board in a favourable location.



Placement of Adaptor Cables - Mega STs

If you disconnected the 4 way power lead and 34 way data cable to the floppy disk drive mechanism, connect these now. Replace the top shielding, carefully plugging in the small plastic connector which you disconnected in Step 23. Tighten up all of the twist tabs.

Machine
 ✓ 520STFM
 ✓ 1040STF
 ✓ 1040STFM
 Mega 1ST
 Mega 2ST

29. Close up the top and bottom halves of the shielding and refasten all of the twists. Place the unit into the bottom half of the plastic case, making sure it has seated squarely. Position the floppy disk drive mechanism over its three hollow mounts and one brass coloured solid mount. If you disconnected the 4 way power lead and 34 way data cable to the floppy disk drive mechanism, connect these now.

Machine
 520STFM
 1040STF
 1040STFM
 ✓ Mega 1ST
 ✓ Mega 2ST

29. Place the top and bottom halves of the shielding (containing the circuit board) back into the bottom plastic case. Carefully screw into place the two small screws securing the power supply. These can be reached through the top shielding by using a Phillips screwdriver.

Machine
 ✓ 520STFM
 ✓ 1040STF
 ✓ 1040STFM
 Mega 1ST
 Mega 2ST

30. Screw down the front edge of the shielding. Replace and screw down the front two screws into the power supply units front two legs. Replace the power supply unit's top shielding with the two small screws and two twists.

Machine
520STFM
1040STF
1040STFM
✓ Mega 1ST
✓ Mega 2ST

31. Turn the Atari Mega ST carefully on its side and replace and screw in the three floppy disk drive screws. Once this has been done once again gently place down the Atari Mega ST the correct way up.

Machine
✓ 520STFM
✓ 1040STF
✓ 1040STFM
Mega 1ST
Mega 2ST

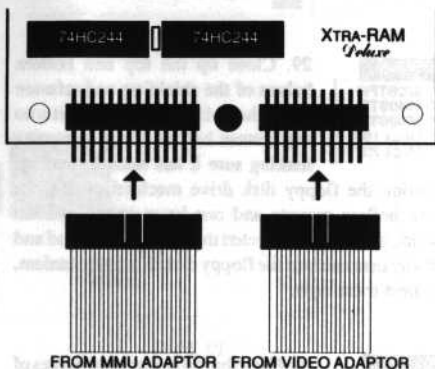
31. Turn the Atari ST unit carefully on its side and replace and screw in the three floppy disk drive screws. Once this has been done once again gently place down the Atari ST unit the correct way up.

Earthing the XTRA-RAM Deluxe Board

The XTRA-RAM Deluxe board is supplied with one earth wire which requires fixing to the Atari's shielding. This can be achieved by trapping the earth wire under either a shield screw or fixing tab.

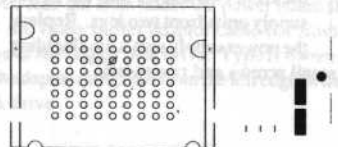
Plugging cables into the XTRA-RAM Deluxe

The XTRA-RAM Deluxe board has four SIMM sockets for the memory boards and two male IDC connectors.



The larger of these has 26 pins and this is for the MMU adaptor cable. The smaller has 20 pins and this is for the Video Shifter adaptor cable.

Both the cables have notched connectors and in each case the notch has to be uppermost when the cable plugs onto the XTRA-RAM Deluxe board. Once the connections have been made carefully fold flat the two ribbon cables making sure they are clear of any sharp shielding, positioning the XTRA-RAM Deluxe board as shown below:



Positioning of XTRA-RAM Deluxe Board - STF/STFMs

If it proves necessary to unplug either of these cables never pull the ribbon cable. Always gently work the black connector off the XTRA-RAM Deluxe board, using a small blunt screwdriver if necessary.

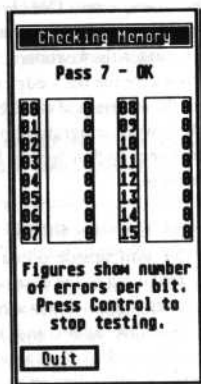
TESTING THE UPGRADE

If your ST fails to boot work through the troubleshooting section. The program called 'XTRA_RAM.PRG' on the XTRA-RAM Deluxe utilities disk will test your newly installed RAM upgrade. This program is not in the Public Domain and it is not for distribution.

Do not attempt to test the system until the power supply top shielding has been replaced. This is vital for your safety! Double click on the program's icon on the desktop. Click on the OK box and the testing program will tell you how much RAM the MMU's internal test routines found when you turned on your Atari ST system.

1MB	-	1024K
2MB	-	2048K
2 1/2 MB	-	2560K
4MB	-	4096K

If the expected RAM figure is displayed then click on TEST RAM to be taken to the main display.



Testing Program Screen Display

If the expected RAM figure is not displayed work through the section titled Troubleshooting. The program will now start testing the upgrade and will tell you if there are any errors. The number of runs through the total system memory (passes) is displayed at the top of the display with the number of errors found in each bit (an eight of a byte) displayed below this. You should leave this part of the program to test the memory for at least half an hour. Don't worry that at the end of each pass through the memory the screen sparkles slightly - this is perfectly normal. When you examine the screen display note whether any errors have been reported. If no errors have been found then the installation has been successful.

Final Reassembly

Machine
✓ 520STFM
✓ 1040STF
✓ 1040STFM
Mega 1ST
Mega 2ST

32. Once the system has been satisfactorily tested, final reassembly can be completed. Double check that the XTRA-RAM *Deluxe* board and the floppy disk drive unit are secure.

Replace the small metal shielding over the left hand side of the floppy disk drive unit, using the two screws. Take care to make sure this shielding does not cut into any of the XTRA-RAM *Deluxe* cables.

Machine
520STFM
1040STF
1040STFM
✓ Mega 1ST
✓ Mega 2ST

32. Once the system has been satisfactorily tested, replace the top plastic moulding. As you do this, plug the clock cable back into its connector in the top left hand corner

of the top shielding. Take care in positioning the front of the top plastic moulding around the floppy disk drive eject button.

Machine
✓ 520STFM
✓ 1040STF
✓ 1040STFM
Mega 1ST
Mega 2ST

33. Gently position the top plastic moulding taking great care around the floppy disk drive eject button. Carefully lift and turn the Atari ST unit upside down ready for the

replacing of the case screws. Double check that you are using the short self-tapping screws for the front edge of the unit, under the keyboard, and the longer self-tapping screws for the back edge of the unit. Do not over tighten these case screws. Test the machine again and if all is well, congratulations. Fill in the registration document so that we can keep you up to date on developments.

Machine
520STFM
1040STF
1040STFM
✓ Mega 1ST
✓ Mega 2ST

33. Carefully lift and turn the Mega ST unit upside down ready for the replacing of the case screws. Do not over tighten these screws. Test the machine again and if all is well,

congratulations. Fill in the registration document so that we can keep you up to date on developments.

TROUBLESHOOTING

Once you have installed the XTRA-RAM *Deluxe* into your Atari ST and have run the testing software you will know whether the XTRA-RAM *Deluxe* is operating properly or not. If the program reports errors or less memory than there ought to be, follow these simple steps.

❑ Make sure the SIMM boards are firmly and evenly located on the XTRA-RAM *Deluxe* board. It can require considerable pressure to locate them firmly home.

❑ Check that the MMU and Video Shifter adaptor boards are firmly in place and that their cables have not been 'nipped' or damaged in any way

❑ If after installation of the XTRA-RAM *Deluxe* board the Atari ST does not function correctly, work through the following.

Your Atari ST System Fails To Boot

❑ Black Screen With White Border

Make sure the monitor or TV is firmly connected to your Atari ST.

Check and double check the installation of the MMU Adaptor board, that it is the correct way round for your ST type, and that it is firmly and fully seated in the MMU socket.

If these do not solve the problem, remove the MMU Adaptor from the MMU chip and disconnect the Video Shifter Adaptor lead from the XTRA-RAM *Deluxe* board. Partially reassemble the Atari ST and test once again. If the Atari ST boots satisfactorily when the MMU Adaptor is not fitted contact Frontier for further assistance.

If the problem persists one or more pins within the MMU socket may have been damaged and these will require careful adjustment. A small needle is an ideal tool for adjusting MMU socket pins. Once the Atari ST functions correctly install the MMU Adaptor and test the complete system once again.

❑ No Display (Black Screen)

Make sure the monitor or TV is switched on and firmly connected to your Atari ST.

Check and double check that the installation of the MMU Adaptor board orientation is correct, and that it is firmly and fully seated in the MMU socket.

If these do not solve the problem, remove the MMU Adaptor from the MMU chip and disconnect the Video Shifter Adaptor lead from the XTRA-RAM *Deluxe* board. Partially reassemble the Atari ST and test once again. If the Atari ST boots satisfactorily when the MMU Adaptor is not fitted contact Frontier for further assistance.

If the problem persists one or more pins within the MMU socket may have been damaged and these will require careful adjustment. A small needle is an ideal tool for adjusting MMU socket pins. Once the Atari ST functions correctly install the MMU Adaptor and test the complete system once again.

❑ No Display (White Screen)

Make sure the monitor or TV is firmly connected to your Atari ST.

Check and double check that the installation of the MMU Adaptor board is correct, and that it is firmly and fully seated in the MMU socket.

If these do not solve the problem, remove the MMU Adaptor from the MMU chip and disconnect the Video Shifter Adaptor lead from the XTRA-RAM *Sehuse* board. Partially reassemble the Atari ST and test once again. If the Atari ST boots satisfactorily when the MMU Adaptor is not fitted contact Frontier for further assistance.

If the problem persists one or more pins within the MMU socket may have been damaged and these will require careful adjustment. A small needle is an ideal tool for adjusting MMU socket pins. Once the Atari ST functions correctly install the MMU Adaptor and test the complete system once again.

Your ST Boots But the Desktop Display is Streaked

Check and double check that the installation of the Video Shifter Adaptor board is correct, and that it is firmly and fully seated in the Video Shifter socket, with no bent pins. Check also that the Video Shifter chip is firmly and fully seated in the Video Shifter Adaptor board socket, with no bent legs or misaligned legs.

If the display problem persists, remove the MMU Adaptor from the MMU chip and disconnect the MMU Adaptor lead from the XTRA-RAM *Sehuse* board. Remove the Video Shifter chip from the adaptor board and insert it, correct way round, in the Atari ST's video shifter socket. Partially reassemble the Atari ST and test once again. If the Atari ST displays correctly when the Video Shifter Adaptor board is not fitted contact Frontier for further assistance.

If the Atari ST still shows a display problem when the Video Shifter Adaptor board has been removed, check and double check that the Video Shifter chip has been correctly replaced on the motherboard. Check for bent chip legs and alignment. Once the system is operational reinstall the XTRA-RAM *Sehuse* board taking great care throughout each stage.

Your Atari ST Boots But the Desktop Display is Coloured Wrongly

You have damaged one of the components in the Video Shifter box, contact Frontier Software for more details.

Your Atari ST Boots But No Desktop Icons Appear

Make sure the floppy disk drive 4 way power lead is correctly connected.

Make sure the 34 way ribbon cable is firmly connected.

Make sure the 34 way ribbon cable is correctly connected.

Note: On some internal drive upgrades the ribbon cable has to be twisted to make the correct connection!

Your Atari ST Boots but the Memory Testing Program Returns a Validation Error

If the following dialogue box is displayed when you run the testing program then the MMU has failed to properly find the upgrade and you should check the MMU Adaptor Board and its installation, the Video Shifter Adaptor Board and its installation and the earthing wire connection.

MMU has failed to validate memory(!) **Must Quit**

If problems persist make sure the SIMM boards are firmly and evenly located on the XTRA-RAM *Sehuse* board. It can require considerable pressure to locate them firmly home.

Your Atari ST Boots, Tests Okay, But Crashes After Some Use

Check the installation of the MMU Adaptor board. Make sure it is firmly located in the socket and seated as far down as possible. Make sure it is not shorting on any shielding. Insulate where necessary.

Check the installation of the Video Shifter Adaptor board. Make sure it is firmly located in the socket and seated as far down as possible. Do similar checks on the Video Shifter chip seated on the adaptor board. Make sure it does not short on the shielding as the lid is closed. (Atari STF & STFM models only.) Insulate where necessary.

Check the SIMMs are installed correctly.

Your ST Boots, Tests Okay, But Random Dots Appear

Check the earthing lead is correctly earthed.

Make sure you have not lengthened the earthing strap.

Make sure any necessary internal banks of memory have been turned off. For example, when upgrading a 520STFM to 4MB.

Check to see if you have the 100109 type MMU chip. If you have, read again the instructions for turning off any existing internal 1/2MB banks of memory. You may have forgotten to do this!

FRONTIER'S FITTING & UPGRADE SERVICE

We offer a speedy and reliable upgrade service available to any purchaser of an XTRA-RAM *Sehuse* board (whether direct from Frontier or through your dealer). Both the collection of your computer and its delivery back to you is undertaken by a fully insured overnight courier service, so minimising its time away from you. A typical turn around time is less than

a week which means, for example, a machine collected on a Monday is likely to be delivered back to you on the Friday. Collections and deliveries can be arranged for any weekday, Bank Holidays excluded, from any UK address. Prices are subject to change but at the time of publication £20 inclusive of VAT covers both the collection and delivery from a mainland address.

We presently charge £20 inclusive of VAT for installing an XTRA-RAM *Deluxe* board which, together with our workmanship, carries a full 12 months warranty. (This is NOT extended to the computer itself.) Upon receipt of a customer's computer, our technicians test the unit before it is opened and before work commences. This ensures that any faults such as floppy disk drive head misalignments or power supply failures are observed. Consequently it is vital that your computer is accompanied by a detailed covering letter.

If you wish to take advantage of this service please contact us either by telephone or Fax during office hours. Collections can be usually arranged on the day you call, provided it is before 2pm. There are one or two requirements which must be met if we are to collect your machine.

- Enclose payment **INSIDE** the package - **DO NOT** hand it to the courier's driver
- Always place a floppy disk in the internal disk drive to protect the heads
- Do NOT include any power leads, mice or software
- Do put the computer in an adequate package- the original Atari box is ideal
- Do remember to include a covering letter and return address
- Do advise us of any internal modifications which have been made, such as a Tweety Board or Drive Select Switch.

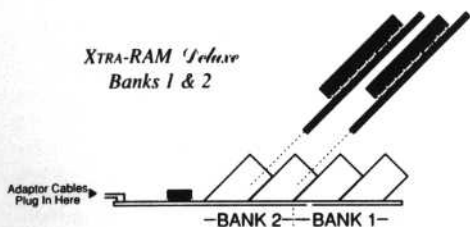
BUYING SIMMs

- Buy either 1/4MB or 1MB capacity SIMMs. These are advertised as 256Kx8 (or 9) and 1MBx8 (or 9).
- Always buy SIMMs in pairs
- Make sure you NEVER mix SIMM capacities. Do not install two 1/4MB capacity SIMMs together with two 1MB capacity SIMMs
- Both SIMMs in a pair must be of the same speed and if four 1MB SIMMs are fitted they must be all of the same speed. Some memory chips operate faster than others. This speed is measured in nanoseconds (billionths of a second) and 1/2MB SIMMs must be rated at 150 nanoseconds or faster; 1MB SIMMs at 120 nanoseconds or faster. Faster SIMMs do NOT mean a faster computer!
- When installing the SIMM boards always follow the Static Precautions and Installation Instructions.

INSERTING SIMMs

If you have purchased the unpopulated XTRA-RAM *Deluxe* or you wish to upgrade the XTRA-RAM *Deluxe* to give your ST more memory then you should read this section.

The four SIMM sockets on the XTRA-RAM *Deluxe* are arranged in two pairs as shown below. The pair of SIMM sockets nearest to the two gold connector pins (where the MMU and Video Shifter adaptors are plugged into) are bank 2 and the other pair are bank 1. The SIMM should be plugged into the sockets so that the chips on the SIMMs face the gold connectors on the XTRA-RAM *Deluxe* - as shown below.



To know where to install memory into the XTRA-RAM *Deluxe* use the following chart:

Total Memory	Total Memory On XTRA-RAM <i>Deluxe</i>	Memory In ST	Notes
1MB	1/2MB	1/2MB	Place two 1/4MB SIMMs in bank 2 on the XTRA-RAM <i>Deluxe</i> .
2MB	2MB	Zero MB	This total size is necessary with the 100109 MMU which cannot support banks of different sizes on the RAM board and in the ST. Place the two 1MB SIMMs on the XTRA-RAM <i>Deluxe</i> in bank 1.
2 1/2MB	2MB	1/2MB	Place two 1MB SIMMs in bank 2 on the XTRA-RAM <i>Deluxe</i> .
4MB	2MB	2MB	Place two 1MB SIMMs in banks 1 and 2. Total of 4 SIMMs.

When you insert a SIMM, push it gently into the slot on the SIMM socket and then push it home by pushing the SIMM into the socket with your thumbs. Then run your thumb along the top edge of the SIMM applying

pressure into the SIMM socket as you move your thumb.

Don't forget to read the section in this manual to see if you need to turn off any banks of memory in your ST.

IMPORTANT If you encounter any problems during the fitting of the XTRA-RAM *Deluxe* and require assistance, please contact Marpet Developments between 9am and 5pm, Monday to Friday. Telephone 0423 712600 / 712601 or FAX 0423 712601. International Code 44.

THE FORGET-ME-CLOCK II Cartridge

With the Forget-Me-Clock II plugged into your Atari ST or ST^e's cartridge port the system clock (used by the Control Panel) and keyboard clock will automatically be set at turn on or reset. No longer will you have to waste your time setting your Atari ST's clock.

Full Pass Through

Frontier's Forget-Me-Clock II is a clock cartridge unlike any other. All other clock cartridges for the Atari ST or ST^e will tie up the cartridge port. The Forget-Me-Clock II has a full cartridge pass through - any other cartridge for the ST can be plugged into it while it is plugged into your Atari ST. The Forget-Me-Clock II remains totally invisible so that the other cartridge can be used normally, but it still automatically sets the system and keyboard clocks in your Atari ST or ST^e.

No Need To Open Your ST

Installing some clock cards for the Atari ST means that you have to open your Atari ST's case and pry computer chips out of their sockets. The Forget-Me-Clock II is a cartridge which plugs into the port on the side of your Atari ST or ST^e which means that its installation couldn't be simpler - you just plug it in and turn on your Atari ST.

Contact your local dealer or Frontier Software for the latest pricing.

How To Install The XTRA-RAM *Upgrade* Into Atari STs With Soldered Down MMU And Video Shifter Chips

MARPET, while having every faith in these instructions, cannot and will not take any responsibility for their use. These instructions, if followed properly and carefully by a competent technician will enable the XTRA-RAM *Upgrade* to be fitted to Atari STs with surface mount MMU and/or Video Shifter chip(s).

Soldered-In Video Shifter

- We have found that the best method for fitting the XTRA-RAM's Video Shifter to a soldered-in Video Shifter chip is to solder a long legged (turned-pin) 40 pin socket to the top of the Video Shifter chip.
- This is done by first fitting the 40 pin socket (available from MARPET at a small extra cost) over the Video Shifter chip and making sure that is sitting tightly. Now solder pins 1-20, 21 and 40 (21 and 40 are just soldered to give strength to the installation). This is done by letting the solder run down each leg in turn, without heating up each leg too much.
- When the soldering is complete, check that no solder is joining any Video Shifter chip legs together and then test that the ST still functions normally before proceeding with the upgrade.
- Now fit the Video Shifter adaptor into the socket and bring out the ribbon cable as normal. You will also have to place a thin piece of card or a thick piece of paper over the adaptor to stop it shorting against the Video Shifter box's lid when it is closed.

Surface-Mounted MMUs

- There are three types of MMU which are soldered into STs - The 25912, 100109 and the smaller, rectangular 101601. We have a new MMU adaptor for the surface mount 25912 and 100109 MMUs. Contact MARPET for one of these adaptors. We require the return of the pinned MMU adaptor and a £3 payment for handling. The 101601 MMU requires the ribbon cable to be soldered to it to fit the XTRA-RAM *Upgrade*. You can also use these instructions to solder to a 25912 if you wish, but you must use the new adaptor with the 100109.
- Prepare a 26-way ribbon cable with a 13+13 IDC connector at one end (the easiest way to do this is to cut the MMU adaptor off the end of the cable. Cut very close to the MMU adaptor end). Separate the cable from the open end, making strands about 7-8cm long. Carefully strip about 2mm of the plastic off the end of each strand. You are now ready to start soldering the strands to their proper positions on the ST's motherboard. We recommend that you first prepare each solder site with a small amount of solder. When you solder each cable strand to its position make very sure that you have not left any small metal strands which can move and cause shorts. Time and care spent now will save time later by cutting down on the number of problems later on. Solder as listed over.

Where a resistor is given, you should solder to the end nearest to the MMU chip.

Strand Number	Connect To
26	R61
25	R60
24	GND

Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

23	R59
22	GND

Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

21	GND
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Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

20	R71
19	R72

18
Pin 19 of rectangular MMU (CO101601). Don't solder directly to the MMU, instead use the pad on the track from pin 19, about 5mm from pin 19.

Pin 23 of square MMU (CO25912). You must solder directly to the MMU chip's leg - be very careful and use as little solder as possible.

17	R73
16	5V+

Connect to any 5V+ line. We suggest one of the +ve ends of the ROM chip capacitors or the left end side of C116 if the MMU is CO101601.

15	5V+	As strand 16.
14	R62	

13
Pin 66 of rectangular MMU (CO101601). You must solder directly to the MMU chip's leg - be very careful and use as little solder as possible.

Pin 64 of square MMU (CO25912). You must solder directly to the MMU chip's leg - be very careful and use as little solder as possible.

12	GND
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Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

11	R63
10	GND

Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

9	GND
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Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

8	R64
7	GND

Any 0V Ground line. We suggest the 0V side of one of the ROM chips.

6	R66
5	R65
4	R68
3	R67
2	R70
1	R69

If you have any problems with these instructions, you should contact MARPET before continuing with the installation.

Special XTRA-RAM MMU Adaptor Instructions

If you have a surface mounted (in other words, soldered down) 25912 or 100109 MMU you can use a special MMU adaptor to upgrade your ST using the XTRA-RAM *Deluxe*.

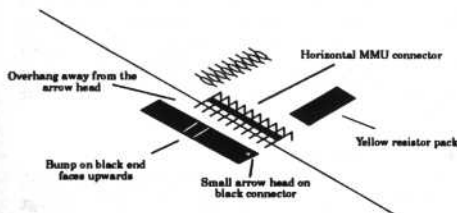
The installation of the special MMU adaptor is very straightforward.

1. Place the MMU adaptor over the surface mount MMU chip, carefully making sure that the adaptor is the correct way around. Pin 1 is on the left hand side of the computer. When the adaptor is placed over the chip, the ribbon cable should go out towards the right hand side of the computer. At this stage do **not** use any glue.
2. Push the MMU adaptor down firmly until it is down flush with the ST's circuit board. If the adaptor "pops" off, gently pry out the legs of the socket with a small pin. This will tighten the socket.
3. When you are certain that the adaptor is as far down as possible and that it will not "pop" off, place glue around the edges of the socket to glue it to the circuit board. If possible use hot glue from a hot glue gun.
4. Now glue a small square piece of card to the top of the adaptor to stop its pins shorting on the top shielding. Use card at least as thick as post-card card.
5. Turn off the banks of memory as required following the instructions in the XTRA-RAM or XTRA-RAM *Deluxe* manual as for a Type I computer.



Special XTRA-RAM MMU Adaptor Instructions Cont.

6. Now continue with the upgrade as detailed in the XTRA-RAM or XTRA-RAM *Deluxe* manual.
7. If you have an XTRA-RAM (as opposed to an XTRA-RAM *Deluxe*), then follow this diagram to plug the 26 way ribbon cable from the special MMU adaptor into your XTRA-RAM.



If you have any problems with the installation of the surface mount MMU adaptor, please contact MARPET directly.

Addendum

Whilst the greatest care has been taken in the preparation of the installation manual, one or two errors have been found - and these are listed below, prior to a revised manual.

Page 20 Turning Off Banks of Memory

For clarity, whether you own an Atari 520; Atari 1040 or Mega 1ST system, ALL existing memory needs turning OFF if you have a 100109 type MMU chip and are adding a *Pandemon* board populated to 2Mb; OR, regardless of MMU type, if you are adding a *Pandemon* board populated to 4Mb.

Consequently, the second entry in the Table shown on Page 20 should read 'Turn off Bank 1 if the machine is a 520 ... (and) has a 100109 MMU' and 'Turn off Bank 1 & 2 if the machine is a 1040 or Mega 1ST ... (and) has a 100109 MMU'.

Consequently, the third entry in the Table shown on Page 20 applies to both 520STFM owners with a 25912 or 101601 type MMU chip and so NO memory requires turning off; and to 1040STFM and Mega 1ST owners with a 25912 or 101601 type MMU chip where the upper 1/2 Mb bank of memory (Bank 2) does need turning off. So, basically, R71 & R72 might be missing - don't worry - just continue.

Page 23 Section 28

The final sentence of Section 28 on Page 23 refers to 'Step 23'. This should read **Step 9**, on Page 12 for Mega 1ST and Mega 2 ST owners.

Pages 29/30 Fitting Service

Marpet Developments have appointed two specialists as their upgrade installers. To discuss their competitive pricing and delivery please contact:

Northern England
PEAK ELECTRONICS
Attn: Eric Porritt
Tel: 0429 860821
Monday - Saturday

Southern England
ANALOGIC COMPUTERS
Attn: Raj
Tel: 081 546 9575
Monday - Saturday

Please Note: Telephone support continues to be provided by Marpet Developments and not through the installers.

Page 30 Buying SIMMs

Some of you may be considering purchasing two 1/4 Mb SIMMs previously removed from Atari ST[®]s. Please note that some of the 1/4 Mb SIMMs used by Atari (not all) have components on both sides of the SIMM board and so these have too deep a profile for use on the XTRA-RAM *Pandemon* board.
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Marpet Developments recently purchased all the rights to the complete range of products previously manufactured and distributed by Frontier Software - who are no longer trading.

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