MacEffects

JD MICRO

Xdrive 2c

Apple //c

Installation and User Guide

Revision 1.2 – April 2026

Contents

Thank You!

Firstly, thank you for supporting MacEffects and JD Micro by purchasing Xdrive2c - we hope that you enjoy using it as much as we enjoyed making it!

Xdrive2c was designed exclusively for MacEffects by Jeff Mazur and Dean Claxton at JD Micro.

Thank you to Unicorn Software for licensing the original firmware (which has been extensively modified for Xdrive2c).

Before removing your Xdrive2c components from the ESD compliant packaging, please study the following ESD Prevention section of this guide.

ESD Prevention

Whenever you open an Apple IIc or other electrical device, you are exposing its internal components to potential damage from the static electricity that builds up in your body through normal activity. Electrostatic discharge (ESD) occurs when static electricity is discharged from one conductor (such as your finger) to another conductor (such as an integrated circuit).

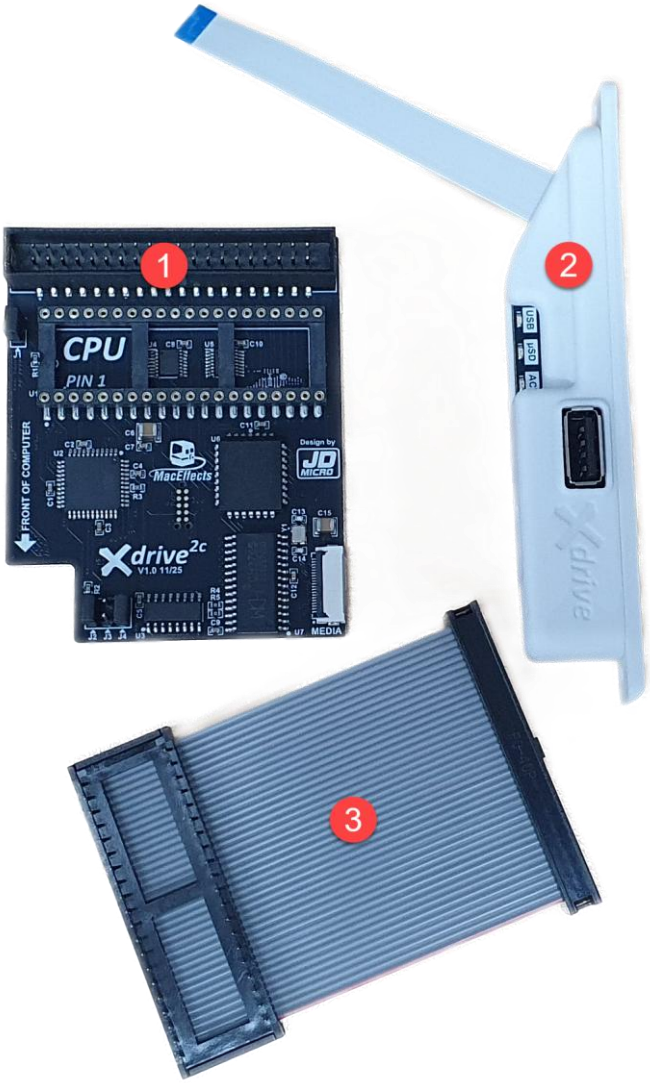
Ideally, installation should be carried out on a static-safe surface such as a grounded anti-static mat, while wearing an anti-static wristband. If you have these available, be sure to use them.

Following the guidelines below will reduce the risk of ESD damage to both your computer and the Xdrive2c components at installation time:

- Leave the Xdrive2c components in the ESD-compliant packaging until you are ready to install them.
- Ensure that the computer is turned off but leave the power cord connected to a grounded outlet. Even with the power turned off, the power cord acts as a ground for the computer system, protecting it from static electricity.
- Before removing the products from the ESD-compliant packaging, touch the metal case of the Apple IIc internal power supply to discharge static electricity that may have accumulated on your body.
- When handling Xdrive2c, avoid touching any components on the PCB, or the “fingers” of the flex cable.

Xdrive2c Hardware

With your Xdrive2c package, you should have received the following components :



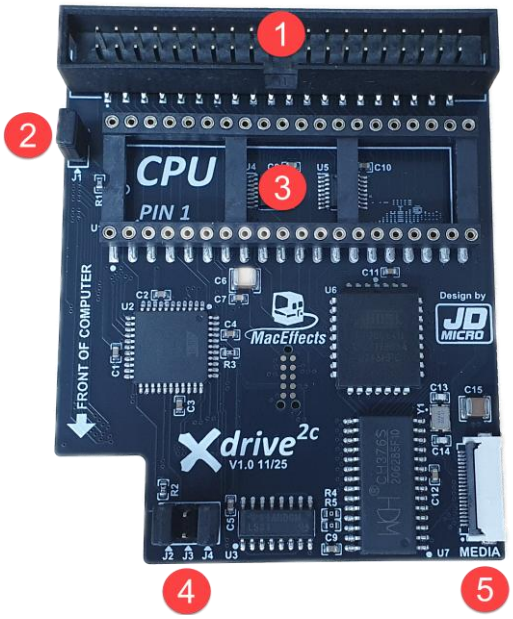
1. Xdrive2c Internal PCB
2. Xdrive2c Sidecar with flat flex cable (FFC)
3. CPU interconnect cable

Additionally, you may have received a USB thumb drive containing images and utilities.

If you have ordered an extended cable set for installation alongside Mockingboard IIc, please see Appendix 3 : Mockingboard Coexistence for additional installation requirements.

Xdrive2c Internal PCB

The Xdrive Internal PCB contains the following major features :

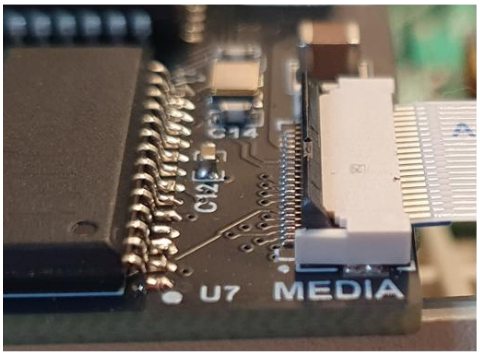


1. CPU Interconnect Socket
2. Xdrive2c hardware enable jumper J1 (remove to disable Xdrive2c).
3. CPU Socket
4. Jumper J2-J4
   a. J2 (default ON) – ROMXc compatibility mode. Required for ROMXc, but can also be left on without ROMXc present. See the section *Appendix 2 : ROMXc Compatibility*.
   b. J3 & J4 are internal delay options. Default position is J4 for Apple IIc, however Apple IIc+ requires moving the jumper to the J3 position. Do not populate both J3 ***and*** J4 positions.
5. Rear hinged sidecar flat flex cable connector

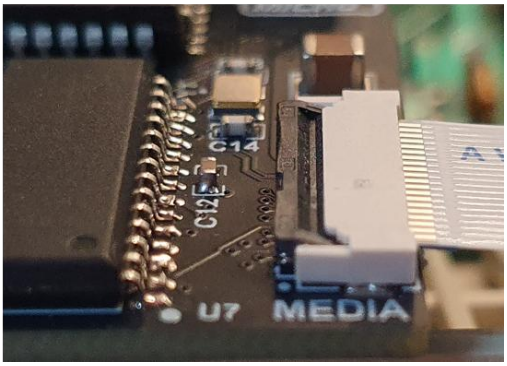
Xdrive2c is supplied with the jumpers pre-set as shown in the image above (jumpers on J1,J2,J4 only).

To install or remove a cable from the FFC connector, lift the black hinge on the rear of the connector and press it down again to close it, as shown below. Do not install the cable yet! This will be covered later in the installation section.

OPENED



CLOSED



Xdrive2c Sidecar

The sidecar connects to the internal PCB via a flat flex cable, and provides the media connectors (USB and Micro SD) as well as indicator LEDs :

1. Preinstalled flat flex cable (FFC)
2. Indicator LED’s (USB, MicroSD, Activity)
3. USB Socket
4. Micro SD Socket

Xdrive2c Installation

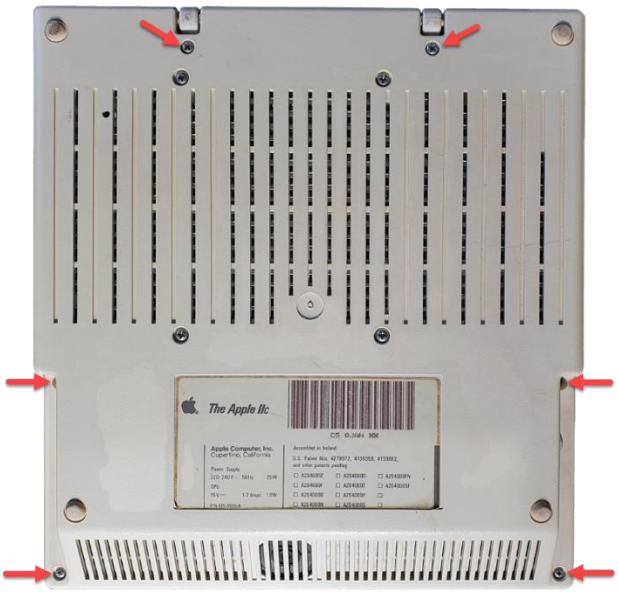
In order to install Xdrive2c, the top cover must be removed. Take your time and be careful not to apply too much force to the aging plastics!

Xdrive2c requires system ROM version ROM03 or better. Of course, ROMXc is also supported and allows you to select from many compatible ROM versions, however you will need to update some of the ROM images. See the section *Appendix 2 : ROMXc Compatibility*.

Note that if your Apple IIc is fitted with the original 16KB ROM (Apple part number 342-0272-A), then some minor modifications to the motherboard are required to support the larger 32KB ROMs such as ROM03 or ROM replacements such as ROMXc. See the section *Appendix 1 : 16KB to 32KB ROM Upgrade*.

If you are familiar with removing the top cover, please skip ahead to step 6.

1. Switch off the computer.
2. Turn it over and remove the 6 screws as shown below :

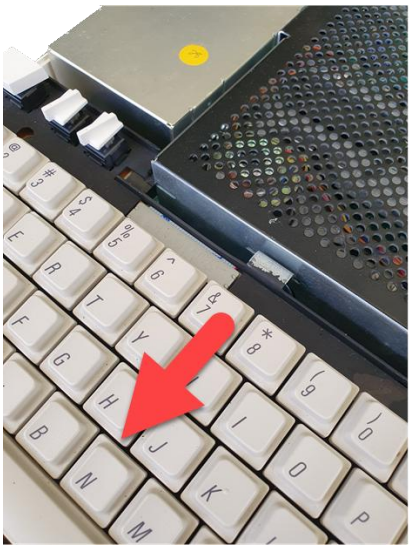


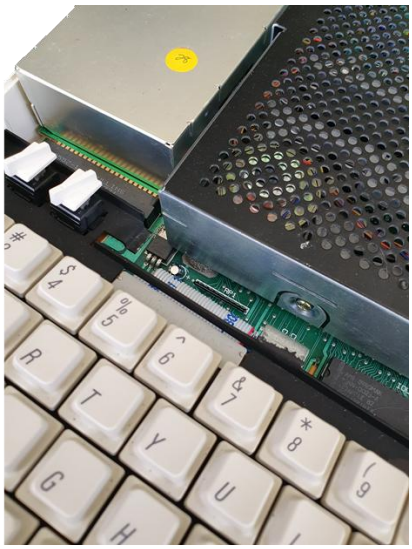
3. Flip it back onto its feet, and release the front clip that secures the top shell. This is located in the front seam, approximately in line with the N key on the keyboard. Take care not to damage the soft plastic:

4. Once the front clip is unfastened you can begin to loosen the top shell working from the keyboard back:

5. There is a clip on each side of the rear panel – once released the upper shell can be slid back and lifted away, giving us full access to the internals. Take care as you work the top shell away from the lower shell:

6. The rear of the keyboard frame is supported via tabs that slot into the disk drive. Lift the front of the keyboard and slide it forward to disengage the tabs from the slots:





7. Flip the keyboard up, giving full access to the cpu area of the motherboard. Optionally you can unplug the keyboard from the motherboard by pulling the connector up and out of the box header (you may want to take the opportunity to give the keyboard a good clean):

8. We now have access to the CPU which must be removed from the socket to install Xdrive2c.

9. Following ESD precautions, remove the 65C02 CPU at position E19 from the socket. If an IC extractor is not available, then this is easily accomplished using a small flat-bladed screwdriver. Starting at one end of the IC, carefully insert the screwdriver between the top of the IC socket, and the bottom of the IC. Gently lever the IC up just a little, then move to the other end of the IC and repeat the process. Continue levering the IC up a little at a time, alternating end to end until the chip is free of its socket. Do not try to lever it out in one go – doing so will likely bend the pins.

10. The CPU will be installed into the socket on the Xdrive2c internal PCB, however the CPU pins will require straightening to ensure that they align with the machined pin socket. A stock IC will have the leads splayed out which works for dual wipe IC sockets but we require them to be 90 degrees to the underside of the IC as below :

Pin straightening can be performed with a pin straightening tool if available.

Alternatively, you can straighten one side at a time by holding the IC at both ends and pressing one side of the pins against a flat surface while applying pressure. Repeat side to side until straight.

11. Once the pins are straight, the CPU can be positioned on the Xdrive2c CPU socket taking note of the PIN 1 position. Ensure all the pins line up – you might find it easier to insert one side into the socket and then insert the other side while carefully applying a little pressure. Straightening the pins should have helped with pin alignment:

12. Double check the pin alignment before fully seating the CPU into the socket:

13. Install the Xdrive2c CPU extension cable into the motherboard CPU socket as below, again taking care to ensure that all the pins are aligned properly before fully seating the header into the socket:

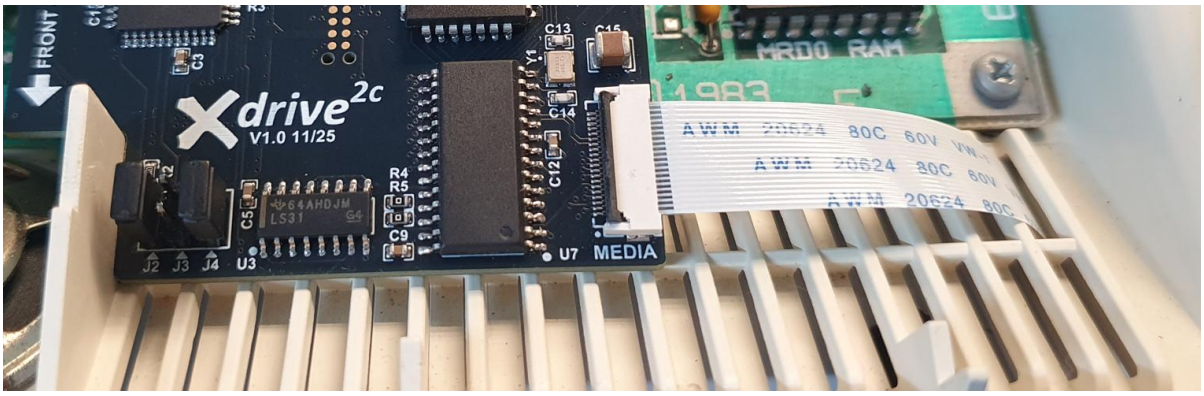
14. Attach the Xdrive2c CPU extension cable connector to the box header on the Xdrive2c internal PCB as shown below:

15. The plastic housing of the Xdrive2c external sidecar has a piece of double-sided tape to hold it in position. Carefully peel the backing paper off the tape ensuring that the adhesive pad is still attached to the plastic :

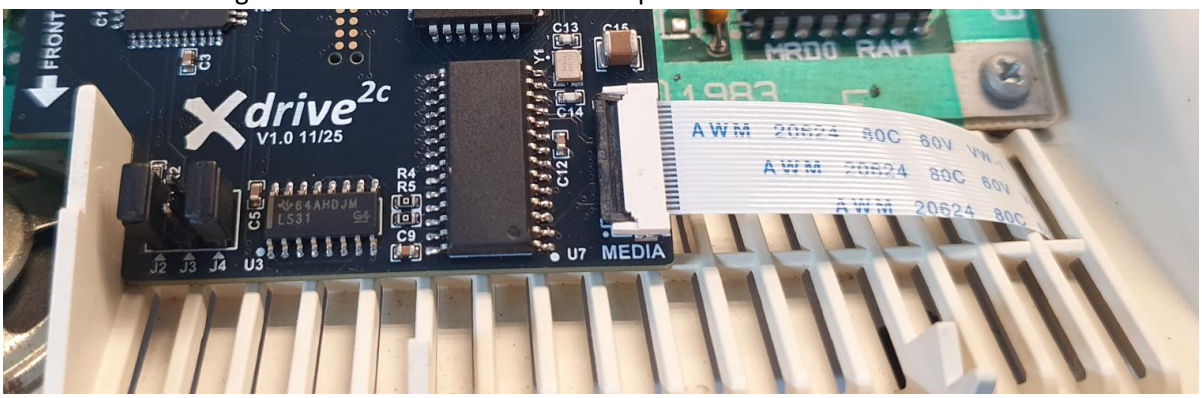
16. To ensure the adhesive doesn't grab immediately, angle the sidecar into position in the cutout under the right side of the computer, before fully seating it into position.

17. Feed the flat flex cable from the sidecar through the slots on the underside of the computer :

18. Switching focus back to the internal Xdrive2c PCB, carefully open the flat flex cable clamp on the connector by raising the rear of the hinge, and then slide the FFC cable into the connector ensuring the silver contacts are to the top:



19. Press the rear of the hinge back down to lock the cable in position:



20. Check the J3/J4 jumper to ensure it is in the correct position for your computer:

    - For Apple IIc+, move the J4 jumper to the J3 position.
    - For Apple IIc, leave the J4 jumper in the J4 position.

    NOTE: The Xdrive2c is not yet 100% compatible with the Apple IIc+ computer, however, it does work perfectly on *some* machines. The remaining issues we are working through only occur when the computer is running in FAST mode – in NORMAL mode (hitting esc key on reset) it should be fine.

    If you do try your board in a IIc+, please report your findings to support@jdmicro.com.

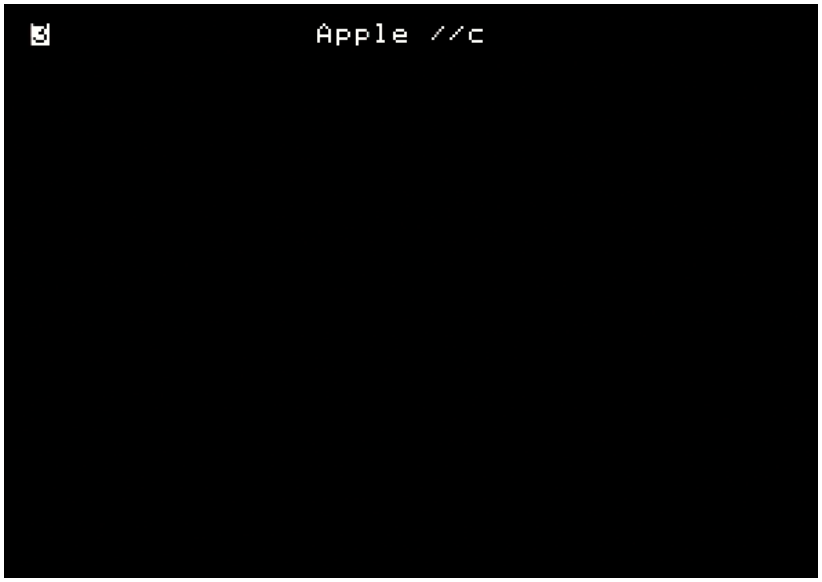
21. If removed, reinstall the keyboard, ensuring that the connectors are fully seated.
22. The keyboard support frame should be slotted back into the side/corner of the disk drive and the front of the keyboard should be supported on the screw posts in the chassis. Ensure the keyboard switch is in the off position (up).

    If you have Apple IIc model A2S4000, you may find it necessary to remove the stiffener brace from the underside of the keyboard so that the keyboard can be re-seated without hitting the Xdrive2c printed circuit board.

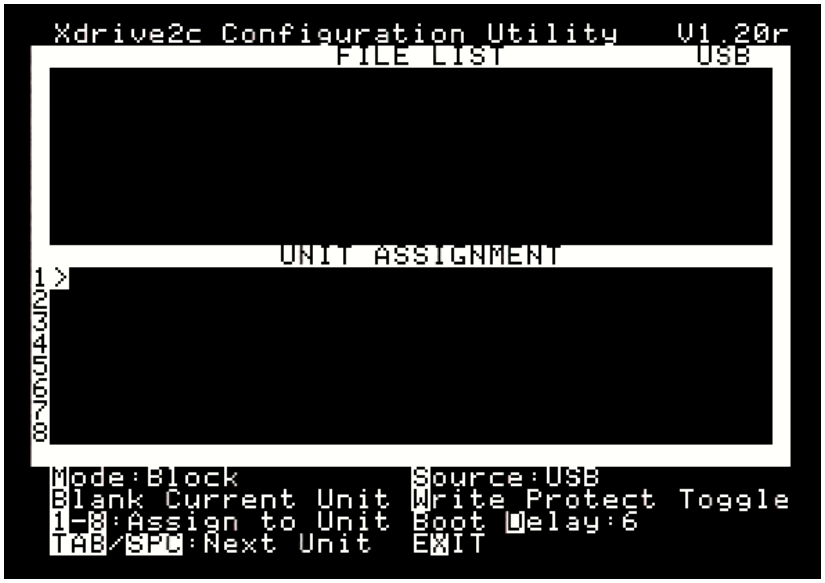
Testing

We can now perform a quick test to verify that Xdrive2c is correctly installed.

1. Insert a FAT32 formatted USB thumb drive into the USB slot on the Xdrive2c sidecar and power on your computer. You should be presented with Xdrive2c boot countdown timer.



2. Press the “C” key to display the Xdrive2c Configuration Utility UI. Note that without any media plugged into the sidecar there will be a long delay before the menu is displayed.



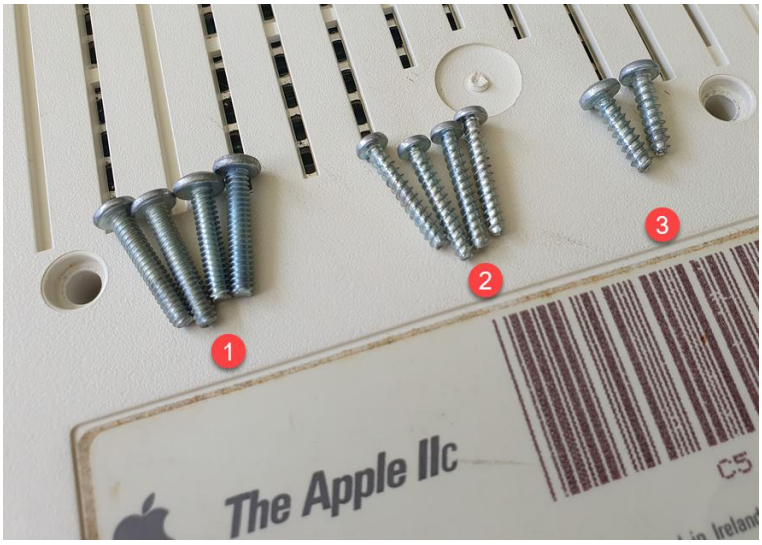
3. The above tests do not fully verify sidecar connectivity – for comprehensive testing we recommend you follow the walkthrough section in which images are mounted and booted from USB and SD card.

4. After successfully testing your Xdrive2c installation you may wish to reinstall the top of the case – working from the rear panel back to the front clip.

We intended to supply two screws of a suitable length such that they will pass through the sidecar and hold the right side of the machine together. Unfortunately these screws have not yet been sourced - the double sided tape should hold the sidecar in position under the right side of the machine until we can ship the screws out to you.

You may reinstall the other case screws if you wish.

For reference there are 3 different screw types used to secure the shell halves on a stock machine – these are shown below for reference (disk drive screws need not be removed for our installation):



- Type 1 : 4 x machine screws used to mount the disk drive
- Type 2 : 4 x long screws used on either side of the keyboard area
- Type 3 : 2 x short screws used at the rear

Operating Guide

Please note that the screen captures in the Operating Guide have been taken from the manual for the slotted Xdrive card, however the functionality versus Xdrive2c is the same except for the **M** (Mode) key which is not used on Xdrive2c – Xdrive2c operates exclusively in Smartport mode.

Inserting Media

The USB port and microSD card slots on the Xdrive2c sidecar are hot swapable, meaning that you don't have to turn off the computer to remove/insert USB flash drives or microSD cards.

To prepare USB and microSD cards for use in Xdrive2c, they should be formatted using the FAT32 file system with a maximum supported media size of 32GB. FAT16 is also supported. Image files must be copied to the root of the drive.

The microSD card socket is a push-push type, meaning that you push the SD card into the socket (it will latch in), and then push on the card again to eject it.

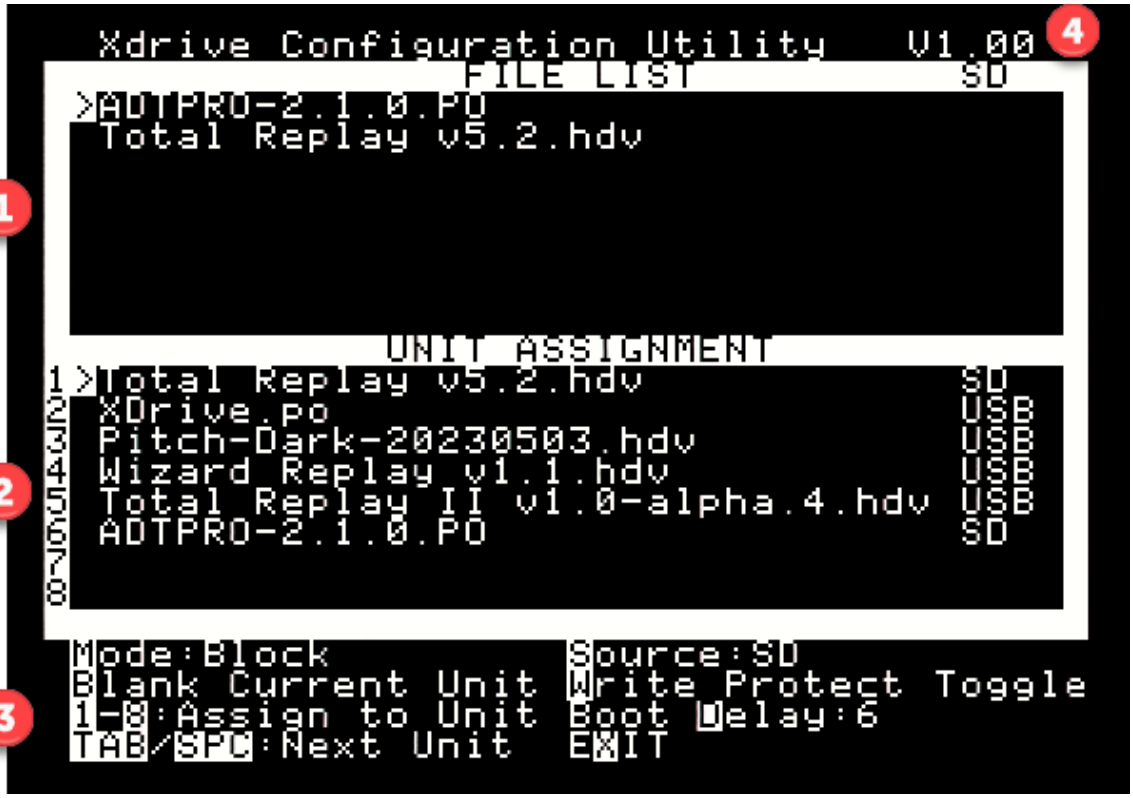
Take care when inserting/removing USB drives – if the drive is a little tight in the socket, then you would be advised to hold the Xdrive2c sidecar when removing the USB drive to ensure you don't accidentally pull the Xdrive2c sidecar away from the case – once the screws are installed this issue will be resolved!

Xdrive2c Configuration Utility

The Xdrive2c Configuration Utility is used to assign block device file images from USB and/or microSD card into a list of up to 8 device units which will then be available for use by the system.

It is invoked by pressing the **C** key when the Xdrive2c boot countdown is displayed, and will also be displayed automatically at the end of the boot delay if there is no media present, or if there is no image selected for unit 1.

The Xdrive2c Configuration Utility screen is shown below. It is divided into two panes - the FILE LIST pane and the UNIT ASSIGNMENT pane. There are some other items of interest however:



1. FILE LIST pane. This displays a list of valid block device image files from the selected source media. The source is displayed at the top right of this pane. E.g. In the image above, the FILE LIST shows valid image files from the SD card. Filenames are sorted alphabetically, and case is preserved for Apple //e and IIGS. Filenames longer than 32 characters are shortened to show just the first 22 and last 8 characters.
2. UNIT ASSIGNMENT pane. This displays the list of currently assigned device units. The source media for each image (USB or SD) is displayed to the far right of the file name.
3. Command Key list. A list of valid command keys. The key is highlighted. Eg. The **S** key is used to change the source media. Not shown here are the Arrows and V key (see Command Key section).
4. Firmware version. This is the version of Xdrive2c firmware currently installed. Keep an eye out at https://jdmicro.com for updates. The firmware is in-system programmable through a handy ProDOS image that you can boot directly from the Xdrive2c!

When booted from *any* device (even something other than Xdrive2c), all of the units in the UNIT ASSIGNMENT pane will be mounted and available to ProDOS.

You can also use programs like COPY][PLUS to manage files on both the SD and USB media along with any other drives in the system!

Command Keys

Source

Pressing **S** will toggle the media source between USB and micro SD card. The FILE LIST pane will be updated accordingly. The current source is displayed beside the **S** command text, and top right of the FILE LIST pane.

When media is inserted/removed for the respective source, the computer will emit a tone and the FILE LIST pane will update automatically. e.g. If USB source is selected and you remove the USB drive, a tone will be heard, and the FILE LIST will be blanked. When re-inserted a tone is heard and the FILE LIST refreshed with the contents of the current drive.

Arrow keys

Left/Right arrow keys are used to navigate the FILE LIST. The selected image file will be displayed with an inverse **>** sign to the left.

V (hidden option)

Press **V** to toggle between long and short (8.3) filenames.

1-8:Assign To Unit

Use the number keys **1** to **8** to assign the selected image file in the FILE LIST pane to the corresponding unit (1-8) in the UNIT ASSIGNMENT pane. Any setting change is saved immediately. There is no need to blank a unit before assigning an image to it – the new assignment will overwrite the previous.

Mode

On the slotted Xdrive card the **M** key toggles the device access mode between Block and SmartPort however Xdrive2c is locked in SmartPort mode. Up to 8 units are available to the operating system.

While ProDOS units are limited to 32 MB, in SmartPort mode the actual limit for a unit is 8GB.

Please note that the number of available units reported by the firmware is equal to the last non-empty unit number. If there are holes in the unit list, the firmware will report NO DEVICE CONNECTED for those units.

TAB/SPC:Next Unit

The **TAB** key and **Space** bar are used to select a unit in the UNIT ASSIGNMENT list. This is used in conjunction with the Blank Current Unit command below.

Blank Current Unit

The **B** key is used to blank the selected unit in the UNIT ASSIGNMENT list. Blank units will report a NO DEVICE CONNECTED status in ProDOS unless they are last in the list. Use **TAB** or **Space** to select a unit (see above).

Write Protect Toggle

Pressing **W** will toggle WRITE PROTECT for the currently selected unit. Write protected units will be displayed with a *W* to the far right of the corresponding unit.

Boot Delay

Use the **D** key to set the Xdrive2c boot delay. Valid range is 1 to 9 seconds, with default of 6 seconds. When the boot delay is higher than 1, a countdown is displayed in the upper left corner of the screen during boot. During the countdown you can use one of the boot keys discussed in the Boot Keys section of this document.

Copy File (new in firmware V1.10)

Press **CTRL-C** to copy a file from one media to the other. Start by selecting the image that you want to copy in the FILE LIST pane. Pressing **CTRL-C** will copy that image to the other media (e.g. from USB to SD or from SD to USB).

A progress counter will show the blocks copied (140K disk = 118 blocks, 800K = 640 blocks, and 32M image = FFFF blocks). You can also hit **CTRL-C** again to abort the copy.

NOTE: Although copying 140K images should only take about 20 seconds, a 32M image will take over 40 minutes to complete.

This is useful if you use the SD card for your main storage on the Xdrive. The USB port can be extended to outside the computer for easy access. When you want to add images, you can just copy from the USB to SD card.

Exit

Press **X** to exit the Xdrive2c Configuration Utility and reboot the system.

Boot Keys

The following keys are available for use whilst the Xdrive2c firmware is in the boot delay phase (when the boot delay countdown is displayed at the top left of the screen).

Pressing a key other than those shown below will stop the countdown and boot from unit 1 if available, else the Xdrive2c Configuration Utility will be displayed.

B - Boot to Applesoft BASIC

Press the **B** key to boot to Applesoft Basic.

C – Xdrive2c Configuration Utility

Press the **C** key to invoke the Xdrive2c Configuration Utility.

1-8 Boot Selected Unit

Press a key **1-8** to temporarily boot from the respective unit as assigned in the UNIT ASSIGNMENT units list. By default, Xdrive boots unit 1. The temporary boot unit is not preserved across reboots. From a technical point of view, the selected unit is swapped with unit 1. So, if you select 3 as a temporary boot device, unit 1 becomes unit 3 and unit 3 becomes unit 1.

N – Boot Next Slot

Press the **N** key to attempt to boot from the Disk][controller in “slot” 6.

Walkthrough

The following walkthrough details how to configure a new Xdrive2c to boot Total Replay in unit 1, ADTpro in unit 2, and an Xdrive2c firmware update image in unit 3.

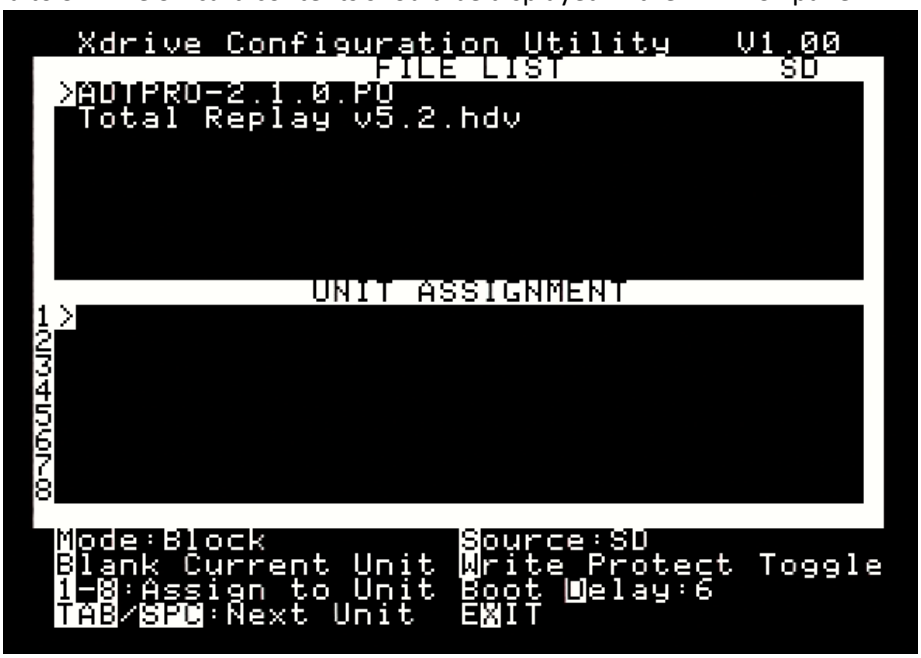
After following this walkthrough you should have a good understanding of how to go about setting up your Xdrive2c with other images.

Prerequisites

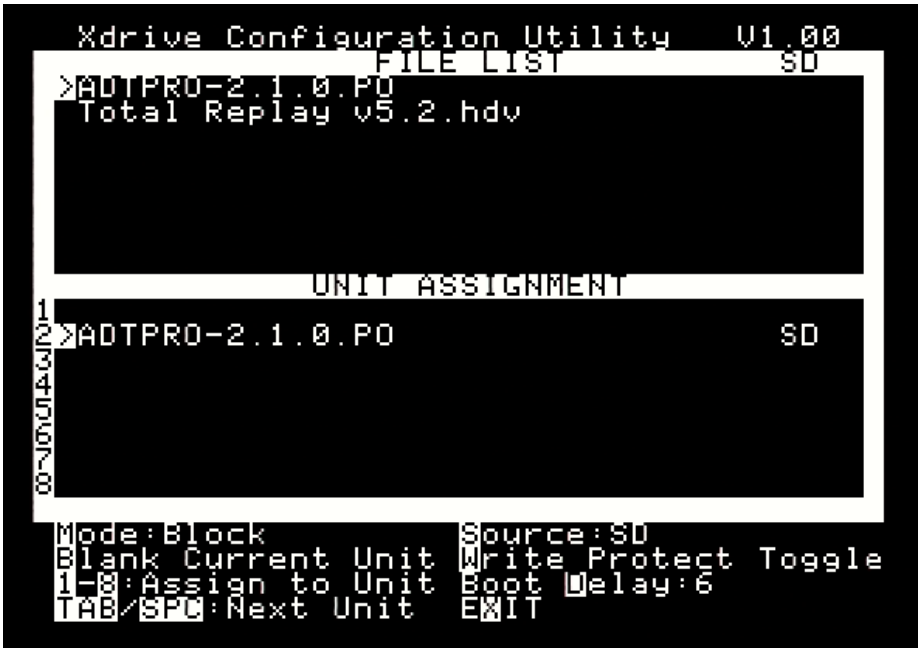
- Xdrive2c installed and working as per the installation section.
- USB drive and micro SD card – both formatted as FAT32 filesystem.
- Total Replay hard disk image file *Total Replay v5.2.hdv* from https://archive.org/details/TotalReplay
  Copy this image to the SD Card.
- ADTPro ProDOS image file *ADTPRO-2.1.0.PO* from https://adtpro.com/ (download and extract the zip file – the .PO disk image is in the *disks* folder).
  Copy this image to the SD Card.
- Xdrive2c Firmware V1.00 (Xdrive2c-FW-V1.20r.po) https://jdmicro.com
  Copy this image to the USB drive.

Assigning Units from SD Card

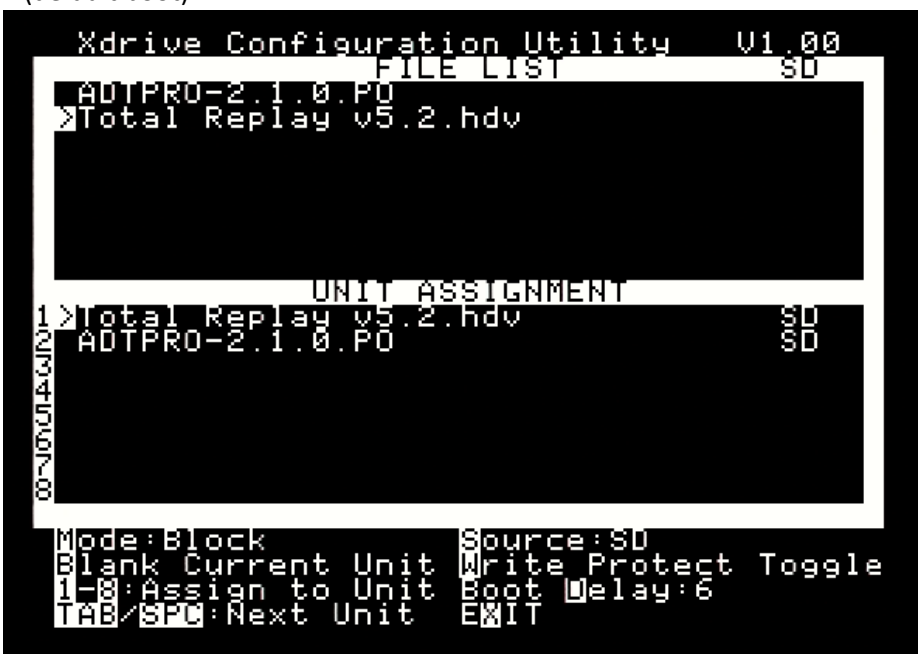
1. Boot the system and press the **C** key to invoke the Xdrive2c Configuration Utility.
2. Insert the microSD card into the Xdrive2c microSD card slot and press the **S** key to toggle the source media to SD. The SD card contents should be displayed in the FILE LIST pane:



3. Use the Arrow keys to move the selection (>) to the *ADTPRO-2.1.0.PO* image (it should be selected by default) and press the **2** key to assign this to unit 2.

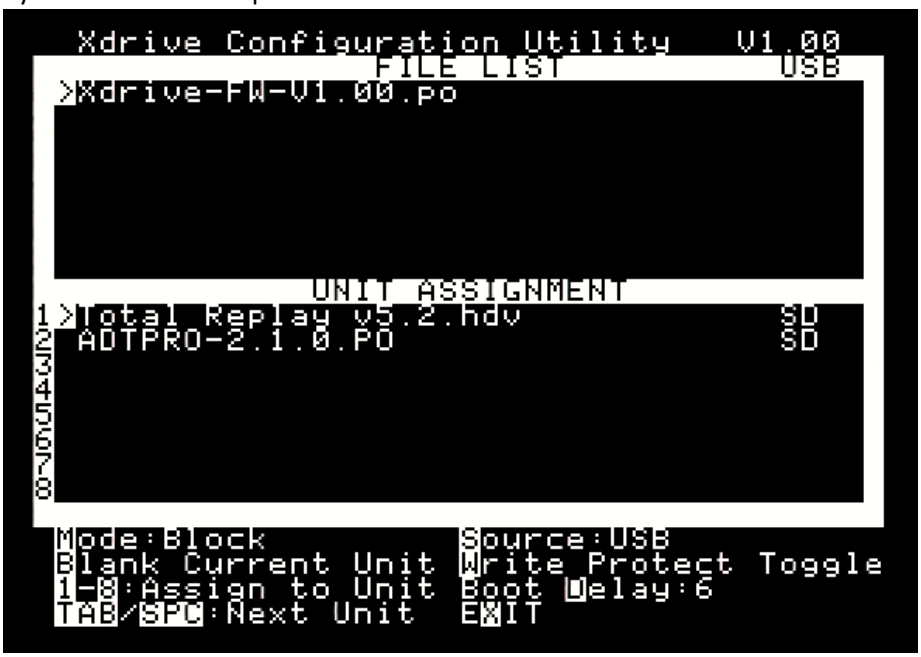


4. Use the arrow keys to select the *Total Replay v5.2.hdv* image and press the **1** key to assign this to unit 1 (default boot).

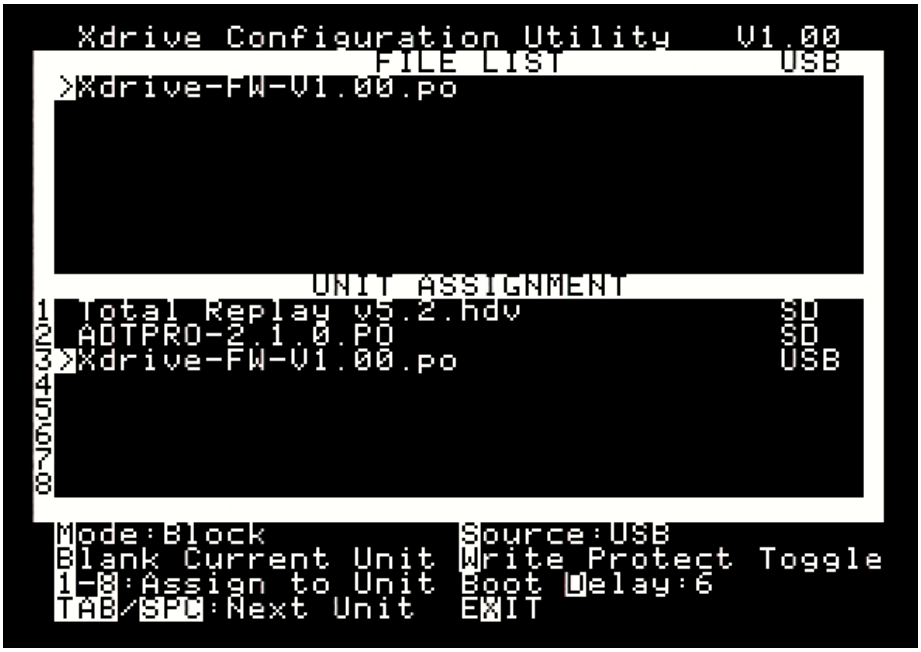


Assigning Units from USB

1. While still in the Xdrive2c Configuration Utility, insert the USB drive into the USB socket on the Xdrive2c sidecar and press the **S** key to set the source media to USB. The USB contents should be displayed in the FILE LIST pane:



2. Use the Arrow keys to select the Xdrive-FW-V1.00.po image (it should be selected by default) and press the **3** key to assign it to unit 3.



Testing Assigned Units

Once the unit assignment has been completed, we can test our handy work. Press **X** to exit the Xdrive2c Configuration Utility.

Boot Total Replay

After exiting the Xdrive2c Configuration Utility the system should automatically boot Total Replay once the boot delay timer reaches zero as Total Replay was loaded into Unit 1 – the default boot unit.

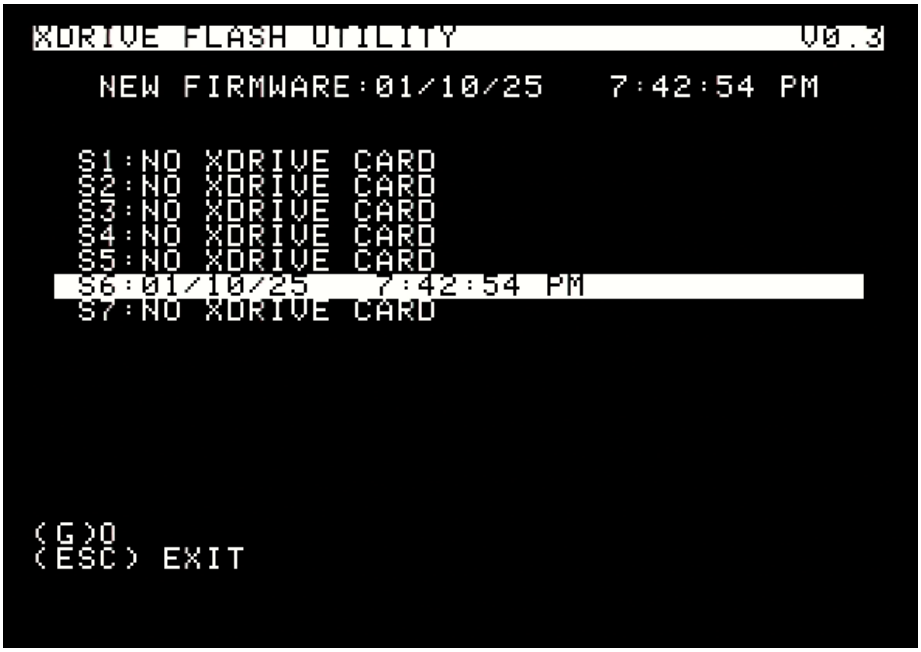
This should also be loaded if you reboot the computer and press **1** when the boot delay timer is displayed, or if you press a non-boot key (**space** bar for example).

Boot ADTPro

Reboot the machine, and during the boot delay press the **2** key – ADTPro should load.

Boot Firmware Utility

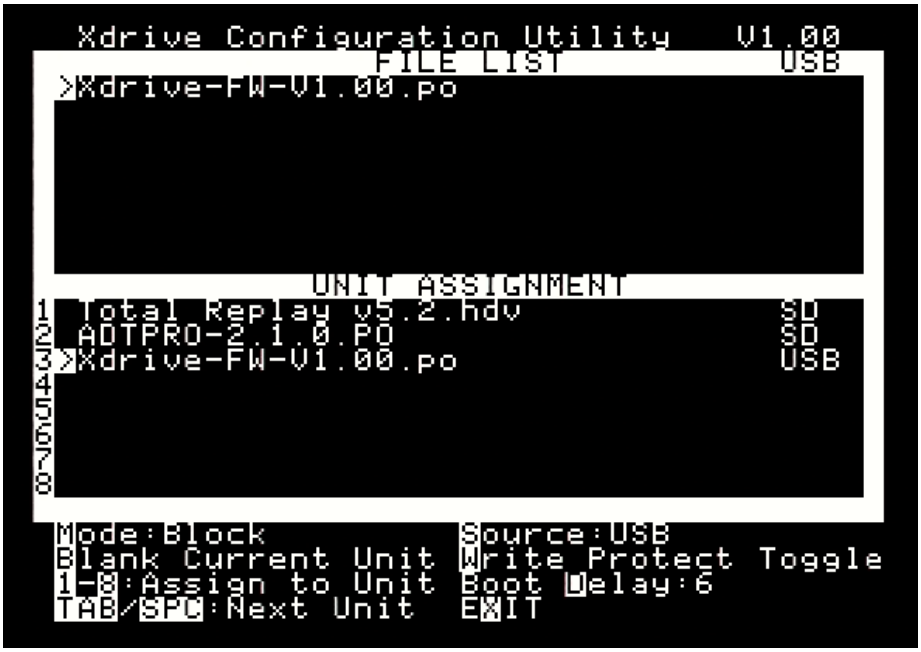
Reboot the machine, and during the boot delay press the **3** key – the Xdrive2c Firmware Update Utility should load.



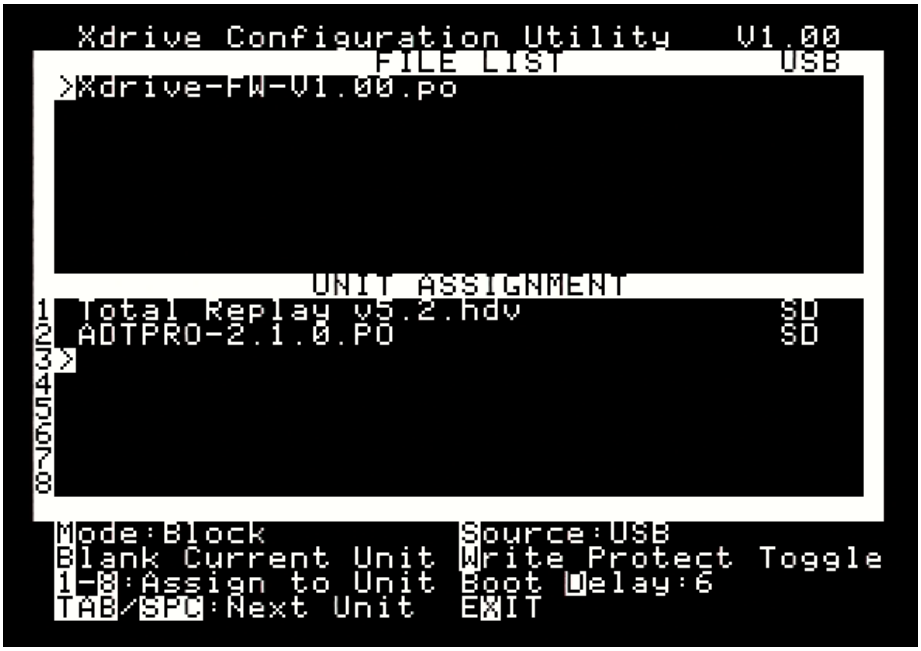
Unassigning Units

Let's unassign unit 3 to demonstrate how to clean up the UNIT ASSIGNMENT list.

1. Boot the computer and press the **C** key to invoke the Xdrive2c Configuration Utility.
2. Press the **TAB** key or **Space** bar to move the selected unit in the UNIT ASSIGNMENT pane to Unit 3 (the Xdrive-FW-V1.00.po image).



3. Press the **B** key to blank the unit.



Only units 1 and 2 will now be mounted and available for use by the system, or bootable via the 1-8 keys at system startup.

Updating the Firmware

Maintaining current firmware on Xdrive2c is important and it is quick and easy to do – firmware updates are distributed as ProDOS images that can be assigned as units on the Xdrive2c itself! Check https://jdmicro.com for the latest release.

The firmware update process is as follows:

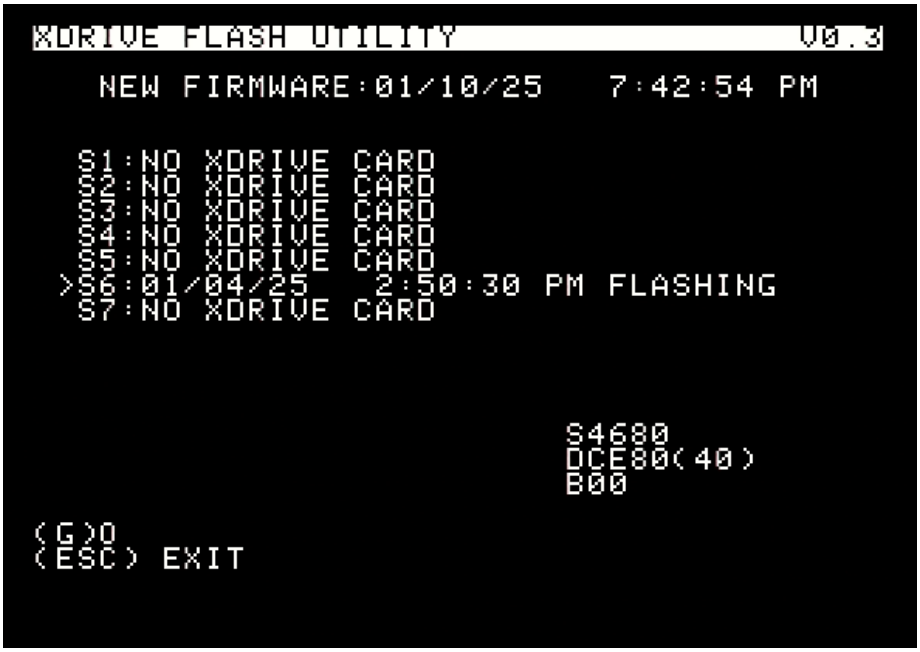
1. Copy the latest firmware .po file to the USB or microSD card and insert it into the Xdrive2c sidecar.
2. Assign the firmware file to a unit number as per the walkthrough above.
3. Boot the system and select the unit number that contains the firmware update image.
4. Once booted, the XDRIVE FLASH UTILITY will report the date/time of the NEW FIRMWARE and identify your Xdrive2c firmware date/time.

   If the NEW FIRMWARE is different to the current firmware, then the **>** symbol will appear to the left of the slot number, marking it for update. This mechanism also allows for firmware downgrade.

NOTE: If the NEW FIRMWARE date/time matches the firmware date/time of the Xdrive2c then it will not be selected for update – it will be displayed without the selection symbol **>** to the left.

To force a re-write of the firmware you can press the **Return** key to select it for update. It should then display with the **>** symbol.

5. To update the firmware simply press the **G** key to (G)O. The utility will cycle through the firmware banks with status FLASHING:



6. Once complete it should display status FLASH OK.

7. Press a key and the firmware date/time of the Xdrive2c should update to match the NEW FIRMWARE date/time:

8. Reboot your system and press **C** to invoke the Xdrive2c Configuration Utility to confirm the new firmware has been installed successfully.

Note : There may be previous firmware releases on the distribution disk. If you wish to downgrade the firmware to a previous release:

Press **ESC** to exit the Xdrive flash utility

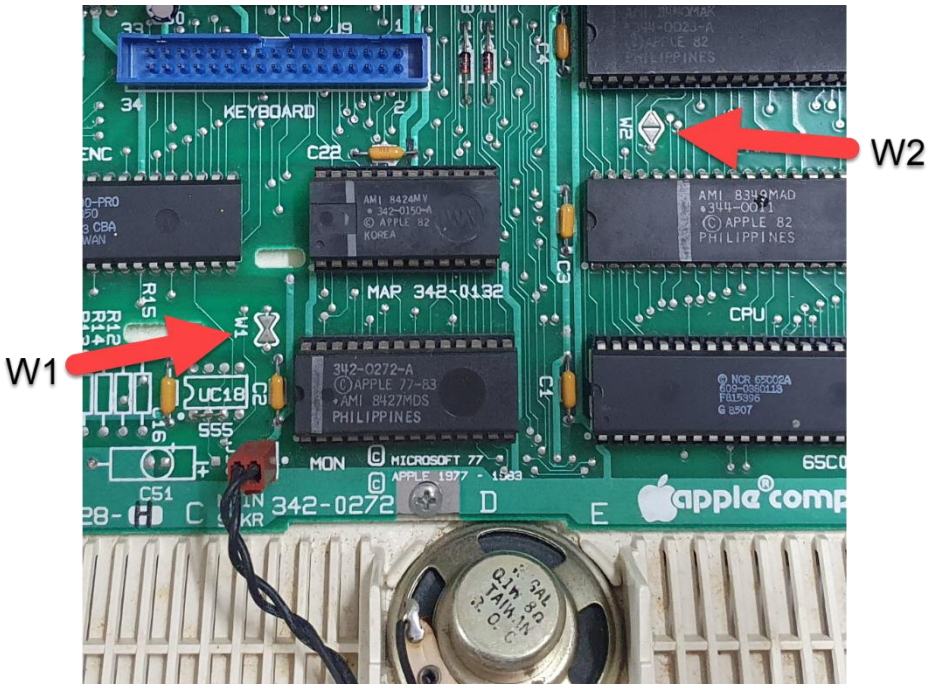
```
BLOAD <firmware file>
BSAVE FIRMWARE
- XDRIVEFLASH
```

Press the **G** key to (G)O.

Appendix 1 : 16KB to 32KB ROM Upgrade

If your Apple IIc was originally fitted with a 16KB ROM (Apple part number 342-0272-A), then you will need to modify the motherboard to enable 32KB ROM support so that a ROM03 or later ROM can be installed.

Fortunately, Apple built in future support for a 32KB ROM via two sets of jumper pads on the motherboard - W1, and W2:



To perform the modification we need to cut the jumper trace joining the two W1 pads, then bridge the two W2 Pads.

1. Using a sharp craft knife, slice through the copper between the two pads of the W1 jumper. Be sure to take a reasonable margin to ensure there is no connection between the two pads. If you have a multimeter you can perform a continuity test before and after, to ensure the connection has been severed:

2. Join the W2 pads with a solder blob. If you don't have a soldering iron available you could try using conductive paint such as the silver loaded paints used for automotive demister repair. If you have a multimeter, use the continuity test to ensure the pads are now joined:

Done! Your motherboard now supports 32KB ROMs including ROMXc. Install ROM03 or better in the ROM socket before installing Xdrive2c.

Appendix 2 : ROMXc Compatibility

If you have a ROMXc installed in your machine, you will need to update some of the ROM images to ensure compatibility with Xdrive2c.

The new images can be found in the ROMXc.Xdrive2c.po file included on the supplied media, and also available on the JD Micro website.

To update the images on ROMXc, perform the following:

- Take a picture of your current ROMXc menu screen (or copy down) to aid in preserving your current settings.
- Install ROMXc.Xdrive2c.po into Unit 1 of the Xdrive2c.
- Power cycle the computer to return to the ROMXc menu.
- Set Upload to use S4,D1 as its source (using ctrl-S).
- Select U to Upload and you should see a list of files to update.
- Update your existing images with the new ones (especially ROM4X). Make sure to keep your original &xx settings for each image.

NOTE: For these images to work you must have a jumper block on J2 of the Xdrive2c.

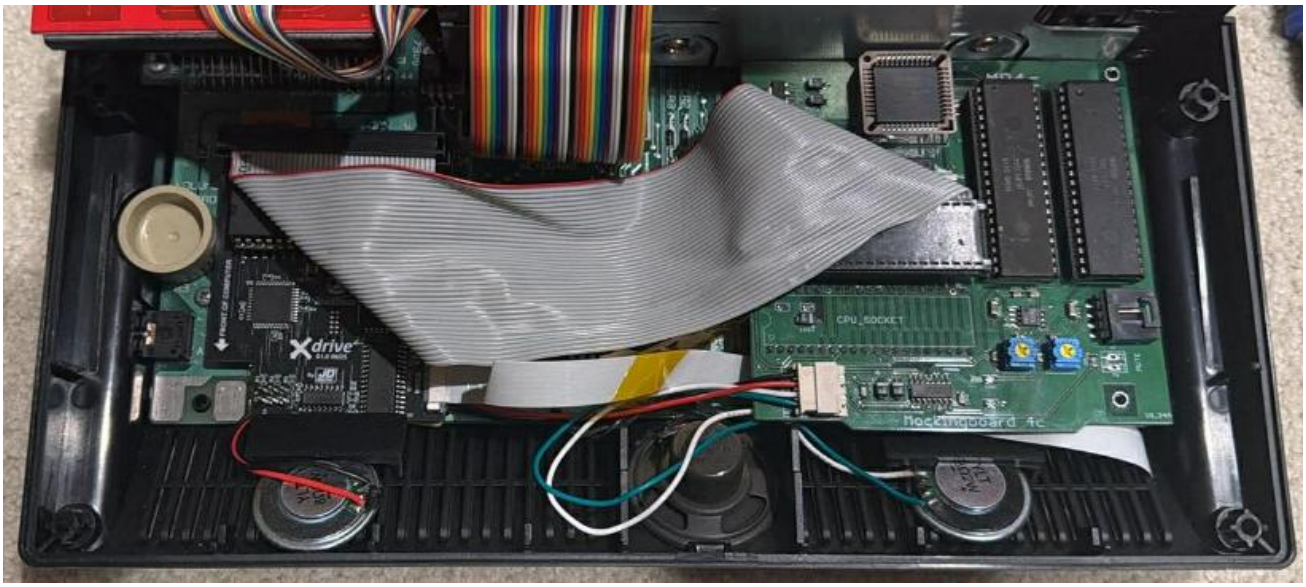
The new ROM4X/5X will automatically detect the presence of an Xdrive2c (and ROMXc) and present options to instantly launch the Xdrive2c or its Configuration Menu. With ROMXc installed, there is also an option 8 to launch the ROMX menu (no longer need to power cycle the machine). As always, the ROM4X/5X menu is easily accessed at any time by pressing closed-Apple-ctrl-reset.

Also included on the media - for those without a ROMXc - is a file called ROM4X.5X 2-14-2026. This image contains the updated ROM4X and ROM5X binary files that can be burned to EPROM for use in your //c or IIc Plus.

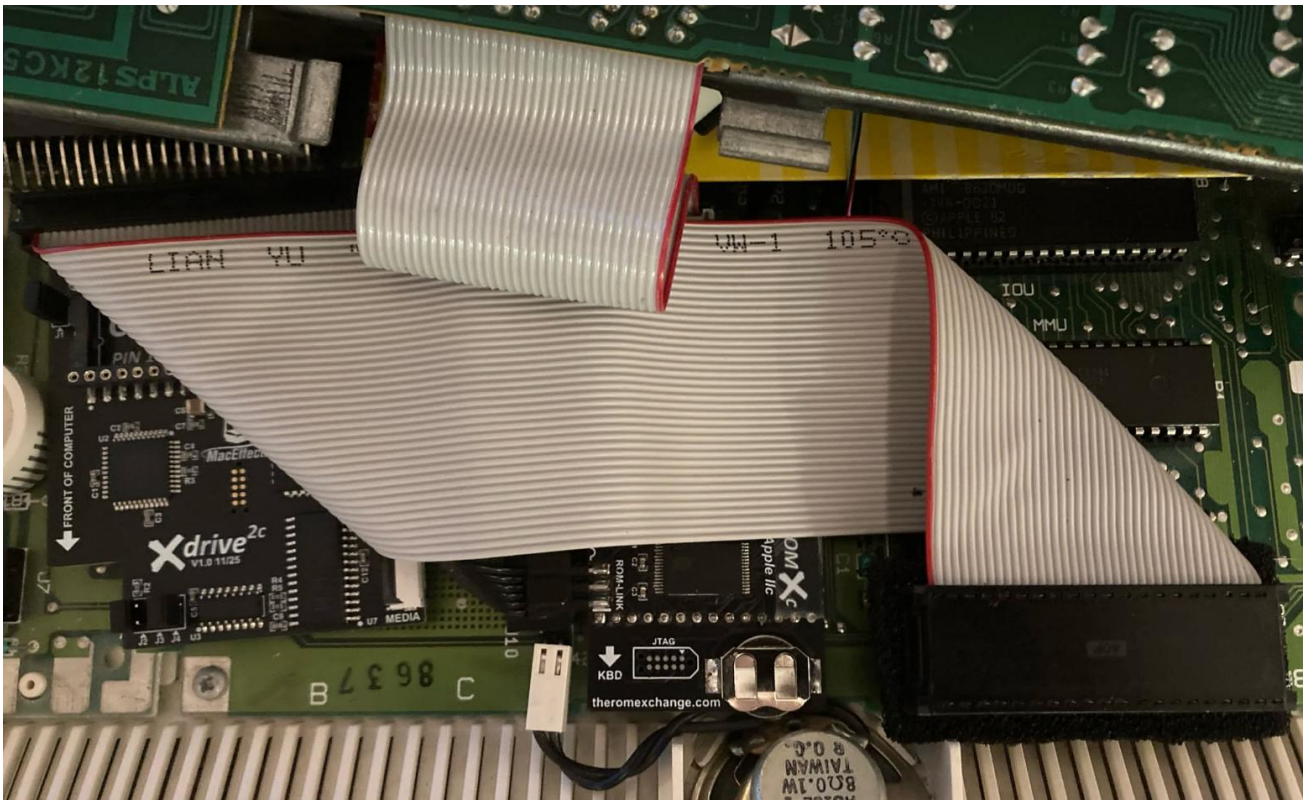
Appendix 3 : Mockingboard Coexistence

The images below show a couple of possible installation options for Xdrive2c in a machine that has a Mockingboard installed. This requires a long CPU ribbon cable and a long FFC sidecar cable to be used in place of the regular cables supplied.

You can order this extended cable set from MacEffects. The black case and replacement keyboard are also available for purchase.



An alternative way that the CPU cable could be folded is shown below.



Connecting Xdrive2c to the Mockingboard

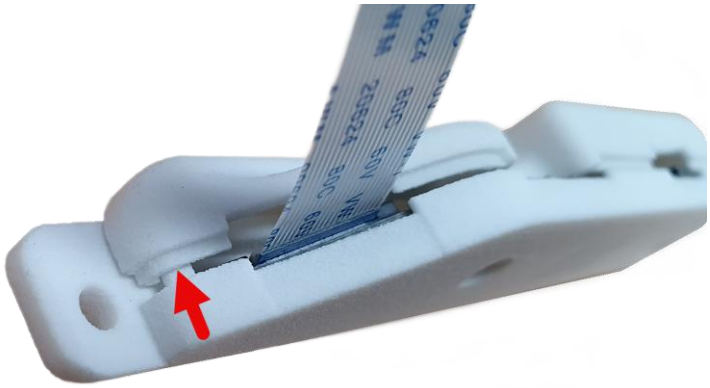
1. Remove the CPU from the Mockingboard CPU socket and install it in the CPU socket on the Xdrive2c (see steps 9-12 in the Xdrive2c Installation section).
2. Install the Xdrive2c extended CPU cable into the Mockingboard CPU socket as above, taking care to ensure that all the pins are aligned properly before fully seating the header into the socket.
3. Attach the Xdrive2c extended CPU cable connector to the box header on the Xdrive2c internal PCB.
4. Insulation tape may be required on any exposed solder joints on the underside of the Xdrive2c module, depending where you chose to position the module. Double sided tape can be used to anchor it in position.
5. Follow the section Appendix 4 : Replacing the Xdrive2c sidecar FFC Cable to replace the stock length FFC cable with the long one provided with the cable extension kit.

Appendix 4 : Replacing the Xdrive2c sidecar FFC Cable

To replace the FFC cable in the Xdrive2c sidecar :

1. Remove the 2 x M2 screws from the rear of the housing.

2. Carefully spread open the front end of the housing just a millimeter or two, levering from the point shown by the arrow.

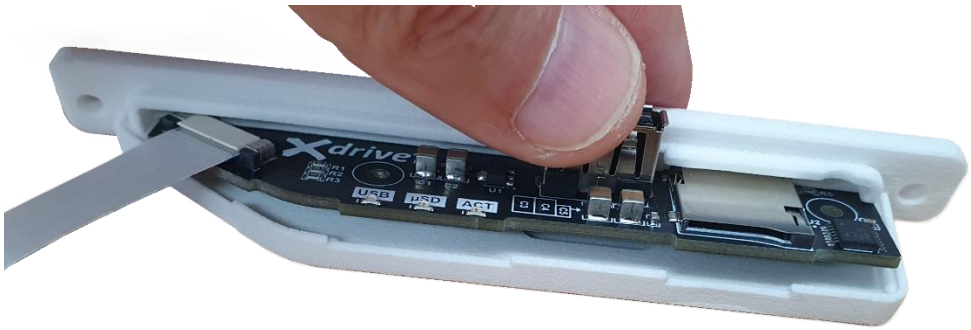


3. Carefully spread open the rear end of the housing, levering from the point shown by the arrow.

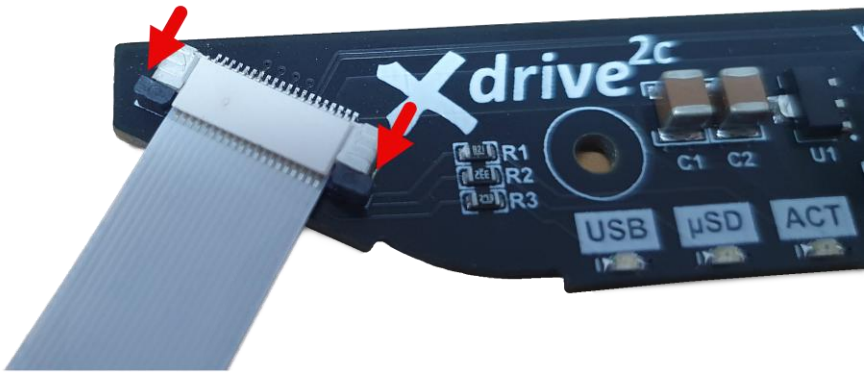
4. The front housing locates into slots on the rear housing – once loosened in the previous steps you should now be able to slide the front housing from the rear taking care to do so in such a way that they remain parallel as they are separated.

5. Once the front housing has been removed, the internals of the sidecar are revealed.

6. Remove the PCB from the rear housing by rocking it backward by the USB connector to raise the bottom of the board clear of the housing, then sliding it out.

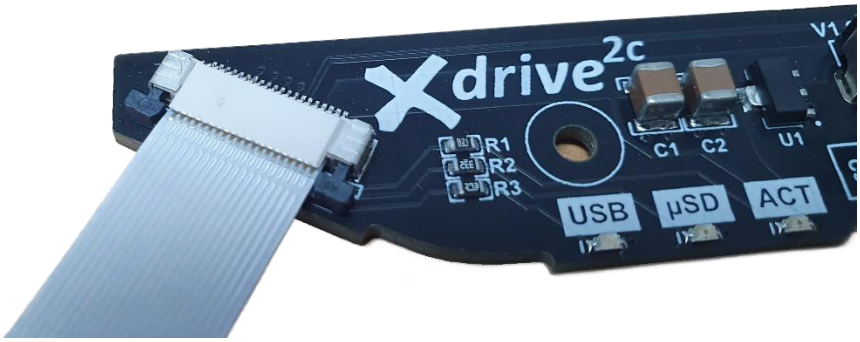


7. Unlock the FFC connector by carefully sliding the locking “ears” of the FFC connector in the direction of the arrows shown below.

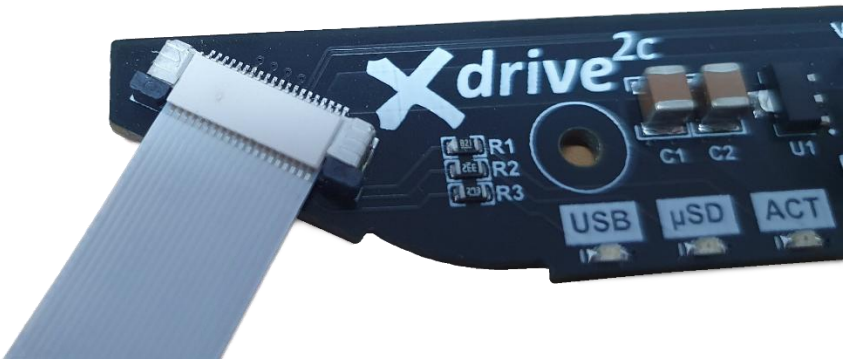


8. Once unlocked, the cable can be removed.

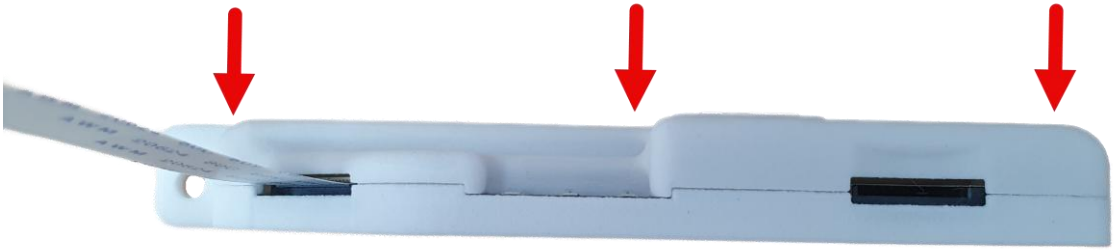
9. Install the replacement cable ensuring that both the plain white side of the cable and the silver contacts are to the top.



10. Ensure that the cable is lined up straight before locking the FFC connector by carefully pressing the ears at each side back into the locked position.



11. Reinstall the PCB into the rear housing – the rear edge of the PCB locates into a slot at rear. Ensure that the PCB sits down flat within the rear housing before placing the front housing over the top, and sliding it down back into position – again keep the front and rear faces parallel as you do so.



12. Check that the two halves are correctly aligned before reinstalling the rear screws. The Sidecar is now ready for installation (see steps 15-19 of the Xdrive2c Installation section).