

AmigaONE X1000



A1-X1000 Dual graphic card system

Setting up dual Graphics Cards on the AmigaONE X1000

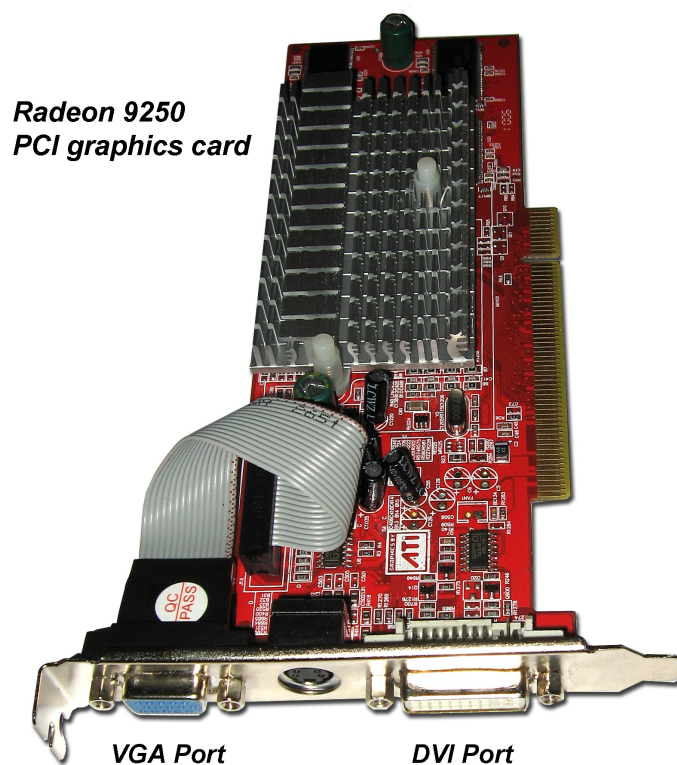
Version 1.2 June 2012 Hans de Ruitert/Trevor Dickinson

©2012 A-EON Technology - All Rights Reserved.



1.0 Introduction

This installation guide allows you to install and configure dual graphic cards on your AmigaONE X1000 system. This guide was created by AmigaOS graphics expert, Hans de Ruiter, with minor additions from Trevor Dickinson. At the time of writing, (June 2012) AmigaOS4.x supports the newer RadeonHD cards in 2D mode only. However, while 3D drivers are being completed, it is possible to install older Radeon 9250 PCI card to run for 3D games/applications, while still being able to use the more powerful Radeon HD card for 2D programs. Whilst the instructions are primarily written for the installation of a second 3D Radeon PCI graphics cards on AmigaONE X1000, the basic procedure should apply to any dual graphic card set-up under AmigaOS 4.x. The guide assumes you have a “First Contact” AmigaONE X1000 system with a RadeonHD4650 graphics card (or equivalent) pre-installed along with the latest boot firmware (see 1.6). The additional graphics card is assumed to be an ATI Radeon 9250 PCI 3D Video Card with 256MB memory and VGA, DVI connections, but any compatible PCI Radeon card should also work.



1.1 Step One: Creating the PCIGraphics monitor file

This is best done before you install the graphics card into your computer. Having the PCIGraphics monitor’s settings already installed greatly decreases the chance of ending up with no display (or a very low resolution display) should something go wrong. I’m sure that you’d rather not have to pull the graphics card out again.

AmigaOS 4.x loads graphics card configurations from “DEVS:Monitors/”. The settings for the primary graphics card are loaded by name, so if your graphics card is identified as a “Radeon HD 4650” (or maybe “Radeon RV730”), then the settings for that card are loaded from “DEVS:Monitors/Radeon HD 4650”. By contrast, the secondary graphics card’s settings are always loaded from “DEVS:Monitors/PCIGraphics”.

This is because the first card is initialised very early on by the Kickstart ROM, whereas the next card

is loaded during execution of the startup sequence. So, how should the PCIGraphics monitor be created? The easiest way is to copy and adapt your the monitor file for your original graphics card:

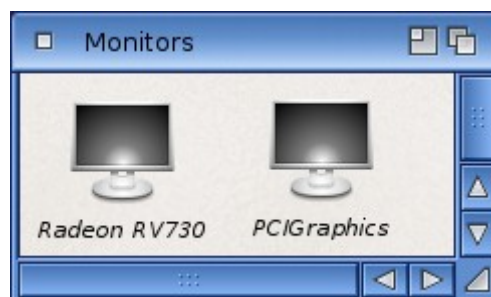
- In Workbench, open “DEVS:Monitors/”; Your current monitor file for your existing graphics card will be listed and will have a name which was created when AmigaOS4.x was first installed. In this example it is *Radeon RV730*. However, your monitor driver might have a different name. e.g. Radeon 4800 or Radeon 4950 etc.



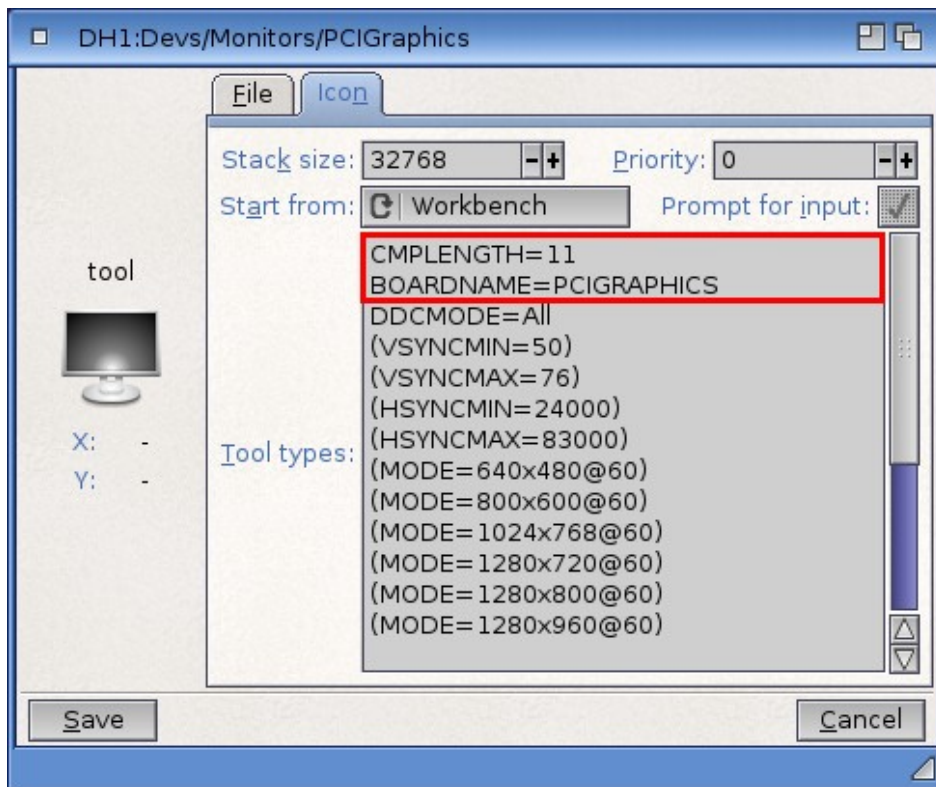
- Whatever your monitor driver is called create a copy of the existing monitor file (on a newly installed system this should be the only file in the “DEVS:Monitors/” drawer); this can be done by right-clicking on the file, and selecting copy (or duplicate depending on your version of AmigaOS4.x);



- Next, rename the resulting file “PCIGraphics” by right-clicking on the new file’s icon, and selecting "rename";



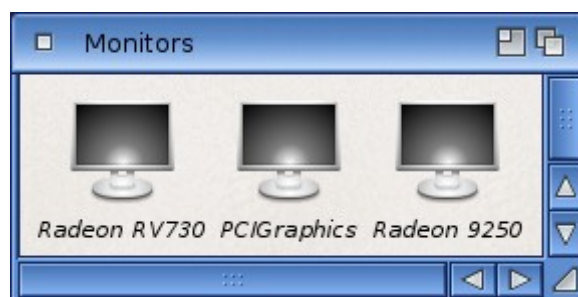
- A few tool-types need to be set correctly:
 - Right-click on the “PCIGraphics” icon, and select “Information...”;
 - Change the line starting with `CMPLength` to: `CMPLength=11` (without the quotation marks). This is the actual number of characters in the monitor driver name.
 - Change the “BOARDNAME” tool-type to: `BOARDNAME=PCIGRAPHICS` (also without the quotation marks); and



- Click on the “Save” button.

- At present, the AmigaONE X1000 will use the PCI graphics card as the primary graphics card if it is present. Consequently, it is best to also create a monitor file for the Radeon 9250 (assuming that this is what you are installing). So, repeat the instructions above, but replace “PCIGraphics” with “Radeon 9250”. It also has 11 characters in its name so there is no need to change “CMPLENGTH=11”.

That's it! All of the preparation is done, and your “DEVS:Monitors/” drawer should now look something like the following:



Final Notes:

- NOTE: If you are installing a different graphics card, then you may have to guess what it is called, and make sure that "CMPLENGTH" is set to equal the number of characters in the graphics card's name. Don't worry if you get it wrong; you can always correct it later.
- On other systems (e.g., those that use UBoot) there may be an option in the BIOS/firmware menus to select which graphics card to use as primary card. If so, then you can skip the last step, and set the system to boot with the original graphics card as the primary graphics card.

1.2 Step Two: Installing the second Graphics Card

At this point, turn off the computer, and install the second graphics card. There is nothing special to do here apart from:-

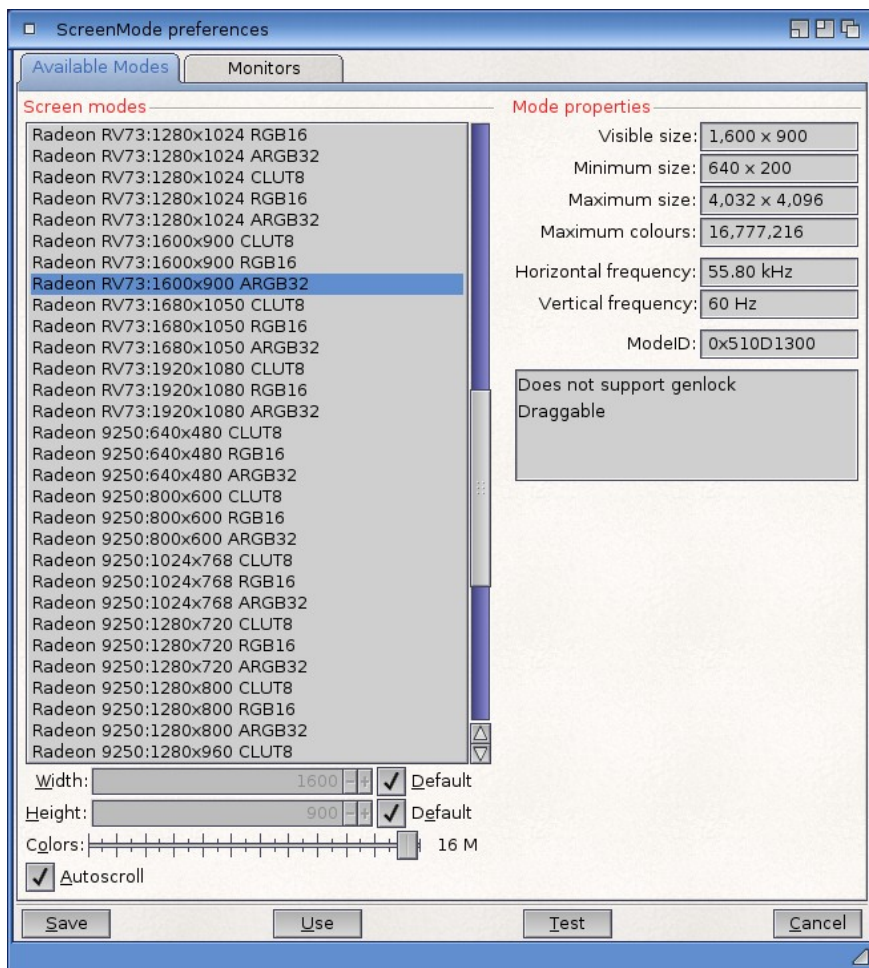
☠ Taking the usual anti-static precautions ☠

Make sure that the card is firmly inserted (but not forced, you do not want to damage anything), and the holding screw is fastened. Do not forget that the second graphics card also needs to be connected to a monitor. Most modern monitors have multiple inputs, so both graphics cards can be connected to a single monitor, if you wish. You can use either the VGA or DVI connector on your Radeon 9250, but see the note below about potential VGA issues.

1.3 Step Three: Checking the configuration

With the second graphics card installed, it is time to switch the machine on again. If you have done everything correctly, the computer will boot into Workbench. The AmigaOS boot logo may show via one graphics card, but Workbench on the other, so be sure to switch between the two cards if both are connected to the same monitor.

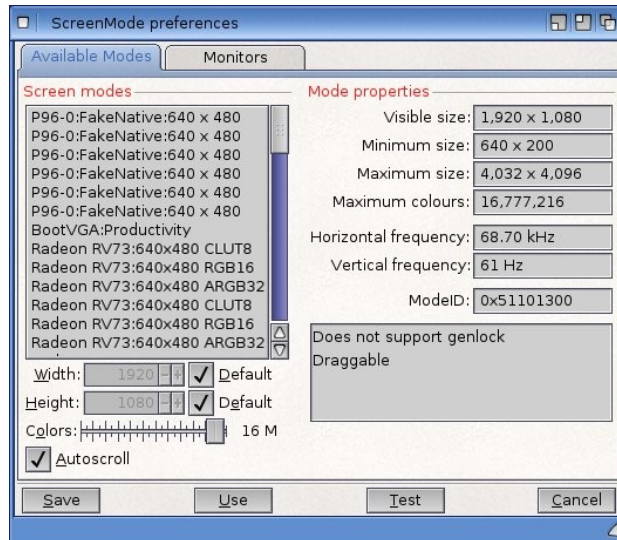
Next, check that screen-modes have been created for both graphics cards. If everything is working correctly, then the ScreenMode Preferences will look something like this, with screen-modes listed for both graphics cards:



If your ScreenMode Preferences looks like that shown above, then congratulations; you have a fully working dual-graphics card system. You can skip to Step Five. Otherwise, it is troubleshooting time.

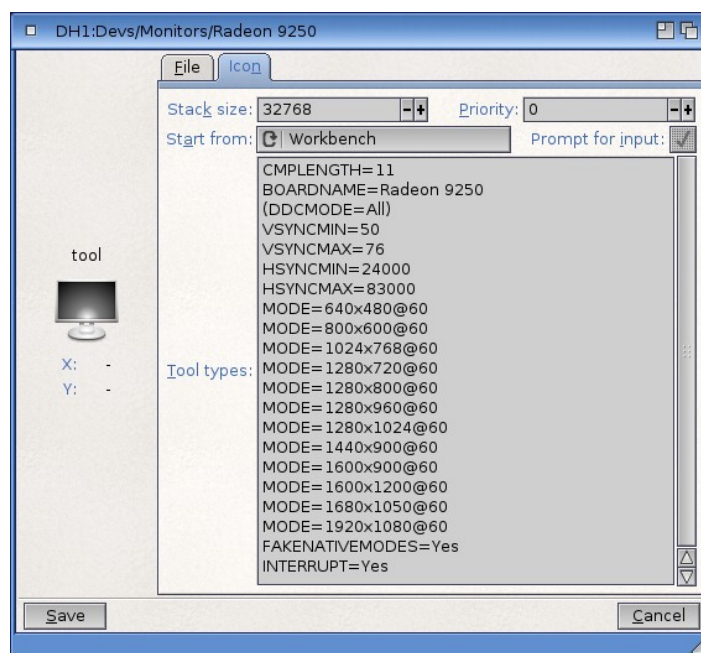
1.4 Step Four: Troubleshooting

If the ScreenMode Preferences shows only one graphics card and the BootVGA:Productivity screen-mode, then something is not quite configured right.

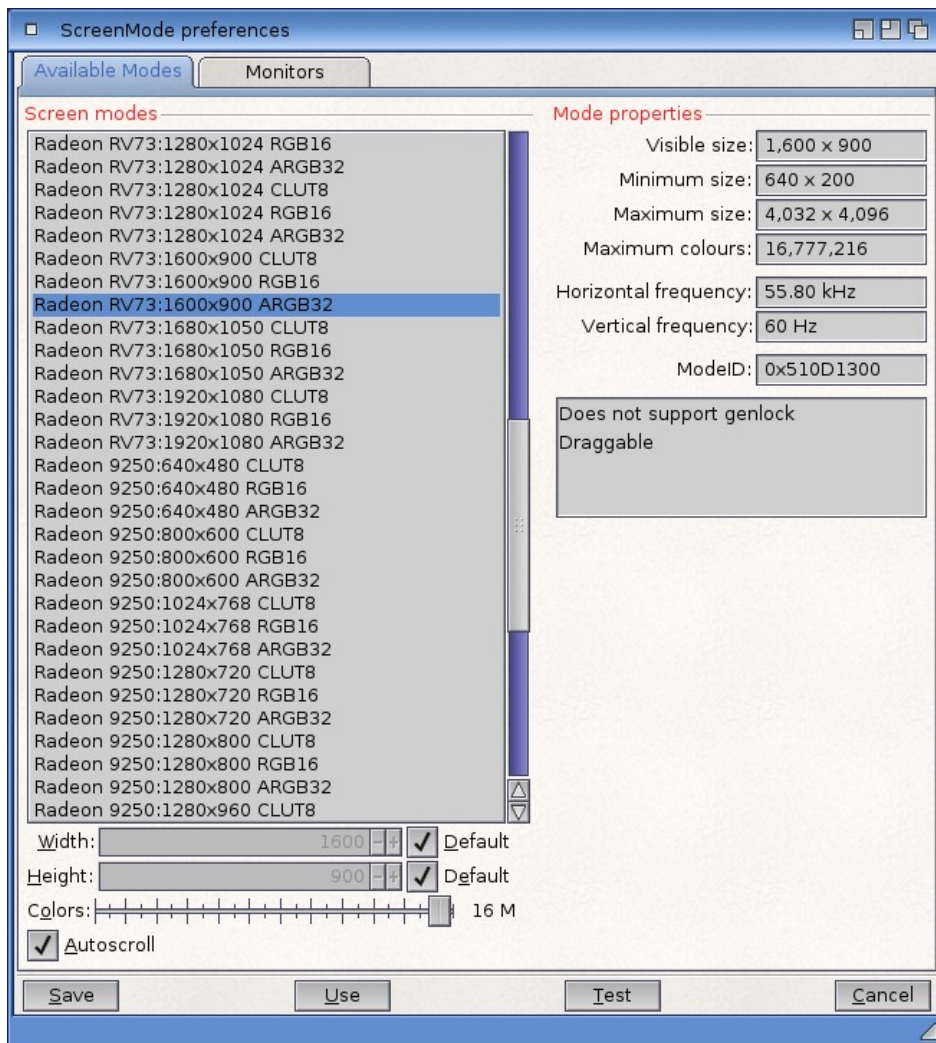


There are two possible causes, and both are relatively easy to solve:

1. **Picasso96 cannot find the settings for the new graphics card** – If this happens then a window should briefly show with a message saying: “Picasso96 could not create screen modes for '<<card name>>' !” Here, <<card name >> is the name of the primary graphics card. Make a note of the card name, and then create an appropriate monitor file for that card, using the instructions in Step One. However, it may be difficult, if not almost impossible to notice this message, especially if you have both cards connected to the same monitor.
2. **DDC isn't working on one of the graphics cards** – If DDC isn't working on one card, then that card will not have any screen modes listed in ScreenMode Preferences. If this is the case, then screen modes will have to be specified manually for that card. This can be achieved either by editing the modes in the “Monitors” tab of ScreenMode Preferences, or by editing the mode lines directly in that graphics card's monitor file in “DEVS:



After editing the monitor tab or graphics card's monitor file in "DEVS you should see all the screen-modes for the graphics card listed in ScreenMode Preferences after a clean reboot.



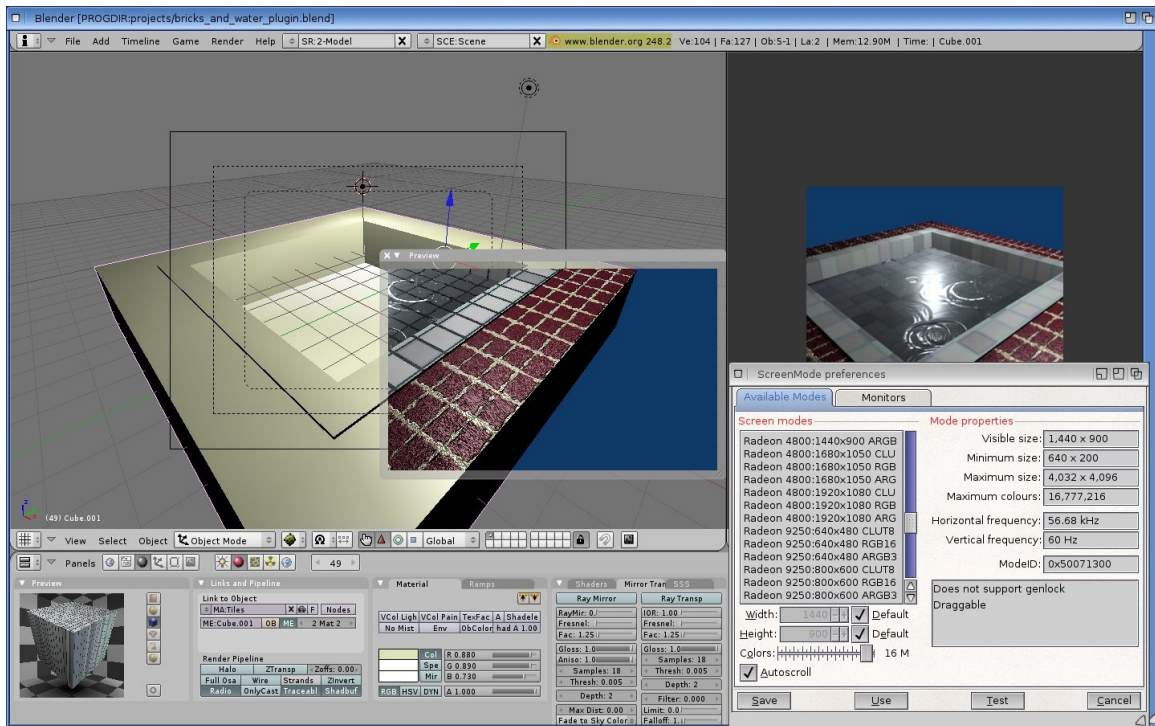
Notes: In this example:

- Radeon RV73 = RadeonHD4650 card
- Radeon 9250 = Radeon PCI card

Screen-modes: ARGB32=32-bit; RGB16=16-bit; CLUT8=8-bit

1.5 Step Five: Enjoy

Once the additional Radeon driver is correctly configured you will be able to switch between the two graphics cards. There is no problem running most 3D software. Full-screen 3D applications will automatically open on the Radeon 9250, while programs running in a window must be opened on a screen on the Radeon 9250 (e.g., temporarily set Workbench to display on the Radeon 9250). As a result of the A1-X1000 faster CPU some 3D applications even seem a little faster on the A1-X1000 despite the slower 9250. If you installed the second graphics cards in order to be able to play 3D games, or use 3D applications, then there is one caveat that you need to be aware of: some Warp3D applications/games (and by extension, MiniGL programs too) need a little help choosing the correct graphics card to open on. This is also true of full-screen programs. Fortunately, the solution is simple: set the Workbench screen to show on the Radeon 9250 graphics card (or whichever card you have installed) before running you application/game of choice.



1.6 Other issues and considerations

The automatic DDC screen-modes may not work with the Radeon 9250's VGA output and you will need to manually set-up screen-modes as described in Section 4. However, DDC should work with the 9250's DVI port. The VGA output isn't quite as sharp as DVI and when the Radeon 9250's GPU is working hard you get horizontal streaks appearing on the screen in high resolution HD screen-modes. The bitmaps themselves aren't corrupted. Each streak appears for a fraction of a second and then disappears. Lowering the screen resolution reduces/eliminates this issue and changing to 16-bit screen-modes should eliminate it altogether, even in higher resolution screen-modes.

Also on some Radeon 9250 cards the red colours on the early A1-X1000 boot screen may appear as blue. However, the AmigaOS 4.x splash screen should display the correct colours as normal. If you do not have the latest A1-X1000 boot firmware installed you will experience graphics glitches in



the early boot screen and will not be able to read the boot menu. If you DO have the latest firmware installed you will see this A-EON logo in the early boot screen graphic.

With these minor limitation, which are a reflection of the performance of the older Radeon PCI graphics cards, you should be able to enjoy 3D performance in a dual card installation on your AmigaONE X1000.

Hans de Ruiter / Trevor Dickinson

22/06/2102