

Homeworld 2 Hardpointing Tutorial v1

Definition:

“Hardpointing” is the addition of mount locations for weapon systems and external ship components on existing Homeworld 2 ship models. Where this term is used it usually implies doing so without access to modelling tools like Maya.

It can be a tedious process for those new to the modding trade and just why you would want to take the effort to do so depends. You may wish to

- Upgrade weapon and avionics systems on an existing vessel (ie, stock game ones)
- Simulate the presence of external or modular loadouts
- Complete ship outfitting on your own independent of the ship’s original modeller

Tools:

To do Hardpointing you will require a tool named HardEd which can be located in the Relic Entertainment Forums > Tanis Shipyards section. This tool itself requires the installation of the Microsoft .NET framework v1.1 to function.

Besides this you will also require a .big file extractor. This can be found in the same forums. Spooky’s HW2 Archive Extractor is an example of such a program – there are several to choose from. A LUA file decompiler for HW2 is also very useful if you want to modify the stock game’s datafiles. Decompile them after extraction from the .big file so you can edit them with notepad.

It is also useful to read up on ship modelling in documentation provided with the HW2 RDN package. It outlines the process of hardpoint configuration and positioning.

Starting off:

Let’s take this scenario – you for whatever reason wish to outfit the Hiigaran Battlecruiser with an additional heavy ion cannon turret, and two bow torpedo tubes.

The former addition uses a modular subsystem, and the latter is an integral hardpoint on the vessel much like the secondary weapon mounts on this particular ship.

For the ion cannon turret, you can use an existing subsystem provided in stock HW2 called “hgn_battlecruiserionbeamturret”, and for the torpedoes – likewise.

To start Hardpointing, extract the “hgn_Battlecruiser.hod” file from the Homeworld2.big archive located in #your HW2 directory#/Data – the specific ship model file you want is located in Data/Ship/hgn_Battlecruiser/

If you’re not modifying the subsystem or weapon file in question – you don’t need to extract them. You may also use script and model files from mods to try Hardpointing on.

Hardpoint Positioning:

So you have a fresh .HOD (HW2 model file format) and have a rough idea on what you wish to accomplish. We can now try out the hardpoint editor (HardEd.exe).

Execute the program and open the file you extracted (“hgn_Battlecruiser.hod”) – you’ll see a data tree pop up in the display window, that you can open. You’ll always start at the root of the model objects. Open up “Children” and you’ll see the ship’s existing hardpoints. Primary beams, secondary weapon locations, subsystem hardpoints, navlights and engine location.

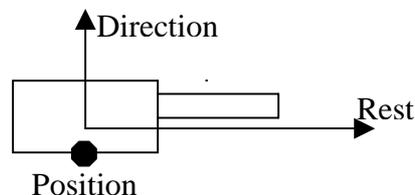
For this tutorial you will not be bothering with the above – but creating your own hardpoint.

Click on the “Children” field on the root of the model, and select Add Object from the menu bar at the top of the window. You will see a new entry at the end of the hardpoint list. Double click on it slowly and you can rename the entry.

Name it “NewlonCannon_Position” – then add two children to it. Open the children tree for this new position, name the children “NewlonCannon_Direction” and the second one “NewlonCannon_Rest”.

Now you will be wondering why are you naming them as such. Here’s why:

- _Position lets the HW2 engine know that this child is a hardpoint position
- _Direction is where the object’s (say, a turret) roof is pointed at
- _Rest is where the object (where a turret will point at) is facing by default



A simple diagram to illustrate hardpoint configuration

With this, you can start positioning the hardpoint and defining its orientation. For starters, observe that all the positioning is done in X, Y, Z coordinate format. X is port and starboard of a vessel (where 10 means 10 metres to

port), Y is up and down (-10 equals 10 metres below) and Z is fore and aft in HW2 ship models (-400 is the rear end of a large cruiser 800 metres long).

Now, assume you want the new primary beam as a dorsal mount pointed forwards when inactive. The “roof” of the weapon system will thus be pointed straight upwards, and the `_Rest` parameter you could imagine points straight ahead.

Set the `_Direction` parameter’s position to (0, 10, 0), and `_Rest` to (0, 0, 10). Do not touch the Orientation parameters anywhere (Orientation should always be zero) – Rest and Direction are the primary definers of hardpoint orientation if you’re not using a 3D modelling program.

The tedious part:

Getting the mount coordinates for a new hardpoint is the most time-consuming aspect of Hardpointing, besides testing out the new equipment in-game. If you’re Hardpointing a ship from scratch you will have to transit in and out of the game frequently to get the coordinates right – and this is actually the best way to learn. But takes time.

But here is a shortcut – you can save a lot of time by using an existing coordinate for reference, for instance by replacing the battlecruiser’s forward heavy railgun battery with a third primary beam mount (lets throw realism out the window for now).

So locate the hardpoint for the forward upper heavy railgun - take the time to get used to the coordinate reference for the model – what you want is a weapon system positioned very far forward on the ship, a high positive Z axis value, and one positioned above of the centerline, a positive Y value, and with a X value very close to zero.

Got it? Jot down the hardpoint’s Z and Y axis coordinates on paper. Ignore the X value as the hardpoint in question refers to a model-innate pair of barrels (one of them is the slave barrel).

You are going to remove both of these hardpoints – not by deleting them! The game won’t load successfully if you do – you need to delete them properly in a 3D program.

So do a filthy workaround – set the coordinates for both master and slave barrels of the bow upper RG turret to (0,0,0) which will make them effectively invisible in-game.

Now assign the `NewlonCannon_Position` to take up the space they filled. With the X value as zero, input the Z and Y values as they are.

To configure the ship’s weapons loadout to fit the hardpoint modification you will need the battlecruiser’s .ship file on hand. Having a file from a decompiled HW2 mod would save you the trouble of extracting the necessary files from `Homeworld2.big`.

At this stage you want to remove the weapon entry for the bow upper railgun turret, and add the third primary beam in its place. Weapons configuration is always found, by convention, at the end of a .ship file (a .ship file controls a HW2 ship's behaviour and outfitting, like a spec sheet).

Duplicate one entry of the existing primary beams and modify the parameter, which tells the primary beam subsystem what hardpoint to place itself in – type in “NewlonCannon” in the new custom entry in place of the original hardpoint.

Remember which railgun turret you removed – find its weapon assignment line in roughly the same area you're now at in the .ship file – and remove that line so the weapon doesn't continue operating from somewhere in the belly of the ship.

Now, test out the newly fitted primary beam in-game – but first you need to properly place the modified files.

Only two files you modified – “hgn_Battlecruiser.hod” and “hgn_Battlecruiser.ship” – and these are in a folder named “hgn_Battlecruiser”. Place this folder in HW2/Data/Ship

Go to your HW2 desktop shortcut – right click and open its properties box... add “-overridebigfile” without the quotes at the end of the Target field outside the quotations marks.

This will tell HW2 to load up custom configuration files instead of from Homeworld2.big and other game archives.

Build a Hiigarans Battlecruiser and you'll see the new heavy ion cannon battery on the bow. If it doesn't appear right, go to HardEd and modify the hardpoint as necessary.

(You can save time on this by extracting the startingfleets files from Homeworld2.big/Data/scripts/startingfleets – add a “hgn_Battlecruiser” to the Hiigarans startingfleets file and start up a Skirmish vs CPU game as the Hiigarans.)

After you get the new ion cannon working, use that as the coordinate reference for the positioning of two bow torpedo tubes beside it. Assign temporary subsystems (you can use the “hgn_battlecruiserionbeam turret”!) to see where the hardpoint is in-game. This again saves time.

When you're done positioning, add torpedo tubes – see what's relevant in the Homeworld2.big/Data/Weapon folder and observe how the battlecruiser's stock secondary weapons are configured – assign a weapon (say, the destroyer tube-launched torpedo) to each of the tubes.

If you're modifying a mod's ship – browse the HW2/Data folder to see what's available for both subsystem and weapon file selection.

This is the end of this tutorial and I will stress that self-learning (with necessary guidance from documentation be it user-created or official) is the best way to get to know the subject of game modding.

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Troubleshooting:

Game crashes:

If HW2 crashes, it means something is wrong. You misnamed a subsystem, weapon or hardpoint name, or you are pointing the game engine to an object that doesn't exist (like pointing something in the .ship file to a hardpoint that doesn't exist).

For such a case adding "-luatrace" to the HW2 shortcut would aid troubleshooting – let the game crash then visit HW2/Bin/Release/Hw2.log – which would tell you what you did wrong most of the time.

The turret doesn't look right (skewed or warped):

The Rest/Direction parameters are not defined properly. Try putting (20, 10, 5) in the Direction parameter for the tutorial hardpoint above and see how it appears in-game.