BAe Harrier and Sea Harrier AI AIRCRAFT

FOR FS9 and FSX (native code)

Note: <u>These aircraft are not designed for user-flyable use</u>

John Young
ACG Scenery Design Team and MAIW Contributor

FDE: Michael MacIntyre, MAIW
XML lift and Gear coding: Kevin Reed, MAIW
Sound (FSX): Military Sound Studios

INTRODUCTION

The inspiration for producing a series of AI Harriers is the wonderful retro scenery of RAF Gütersloh being released concurrently by my ACG colleagues, Manfred Schyma and Pete Beeby. Although the scenery is for FS9 only, I have as usual, produced the AI aircraft in both FS9 and FSX versions. These packs include a number of GR3 and T4 aircraft for 3 and 4 squadrons, circa 1989:

GR3s and T4s of 3 and 4 Squadrons on the flight line at my test airfield:

Here is an example of their operation at Gütersloh:

The packs also contains 3 T4s of the Gütersloh Station Flight. I have not produced a GR9 model because the excellent offering from Nick Black at MAIW is already available and I wanted to avoid duplicating effort. However, I have produced a series of Sea Harrier AI aircraft right up to the FA2 variant that was current until the aircraft were retired from service in 2006:

FRS1s of 800 RNAS in high visibility paint scheme:

FRS1s of 899 RNAS in low visibility paint scheme:

T8Ns and FA2s of 899 RNAS:

FA2s of 801 RNAS:

The packs are available at flightsim.com separately for FS9 and FSX. The file names are:

- ➢ **JYAI_RAF_Harriers_FS9_1.zip**
- ➢ **JYAI_RAF_Harriers_FSX_1.zip**
- ➢ **JYAI_Sea_Harriers_FS9_1.zip**
- ➢ **JYAI_Sea_Harriers_FSX_1.zip**

The ACG scenery of RAF Gütersloh for FS9 is also available at flightsim.com with the file name:

- • **RAF_GUTERSLOH_FS9_1.zip**

There are no operational flight plans and AFCAD files in the AI packs, but they are included in the RAF Gütersloh scenery download. However, so that users can see how the aircraft behave, I have included my AFCAD and test traffic files that display each aircraft variant at my test airfield at Crail in Scotland.

Users can of course create plans themselves for the specific airfields they want to utilise. To produce flight plans, a suitable program is needed. "AI Flight Planner" is a very versatile tool that will produce plans (traffic files) in both FS9 and FSX format. It is available as a free download from:

http://stuff4fs.com/newpage.asp?JS=True&Folder=AIFP

A paint kit is included for users to create further schemes or to create more serial number sequences and may be used subject to the conditions set out later in this manual.

A custom made AI sound package is included for FSX courtesy of Military Sound studios.

WHAT AIRCRAFT ARE INCLUDED?

The following aircraft are in each of the FS9 and FSX packs (paint schemes and weapons loads are interchangeable in the aircraft.cfg file:

GR3 (3 and 4 Sqns) Fuel tanks and Practice Bomb Carriers

GR3 (3 and 4 Sqns) Fuel tanks and Recce Pods

GR3 (3 and 4 Sqns) Fuel tanks and Recce Pods

GR3 (3 Sqn) white experimental tail

GR3 (3 Sqn) red experimental tail

GR3 (4 Sqn) anniversary tail.

T4 (3 and 4 Sqns) with gun pods

T4 (Station Flight) with under fuselage strakes

FRS1 800 RNAS with Sidewinders (also with strakes and refuelling probe)

FRS1 899 RNAS with strakes (also with gun pods and refuelling probe)

FRS1 899 RNAS in anniversary markings

FA2 801 RNAS with 6 x AMRAAMS

FA2 899 RNAS with gun pods and refuelling probe (also with under fuselage strakes)

T8N 899 RNAS with gun pods

T8N 899 RNAS with under fuselage strakes and anniversary markings

T8N 899 RNAS with gun pods and black reflective scheme

T8N 899 RNAS with under fuselage strakes and black reflective scheme

INSTALLATION – aircraft

Extract the contents of the zip file to a temporary folder on your hard drive. Ensure that the **"Use folder names"** check box is activated in the "Extract" screen of Winzip and the files in the archive will stay in the intended folders.
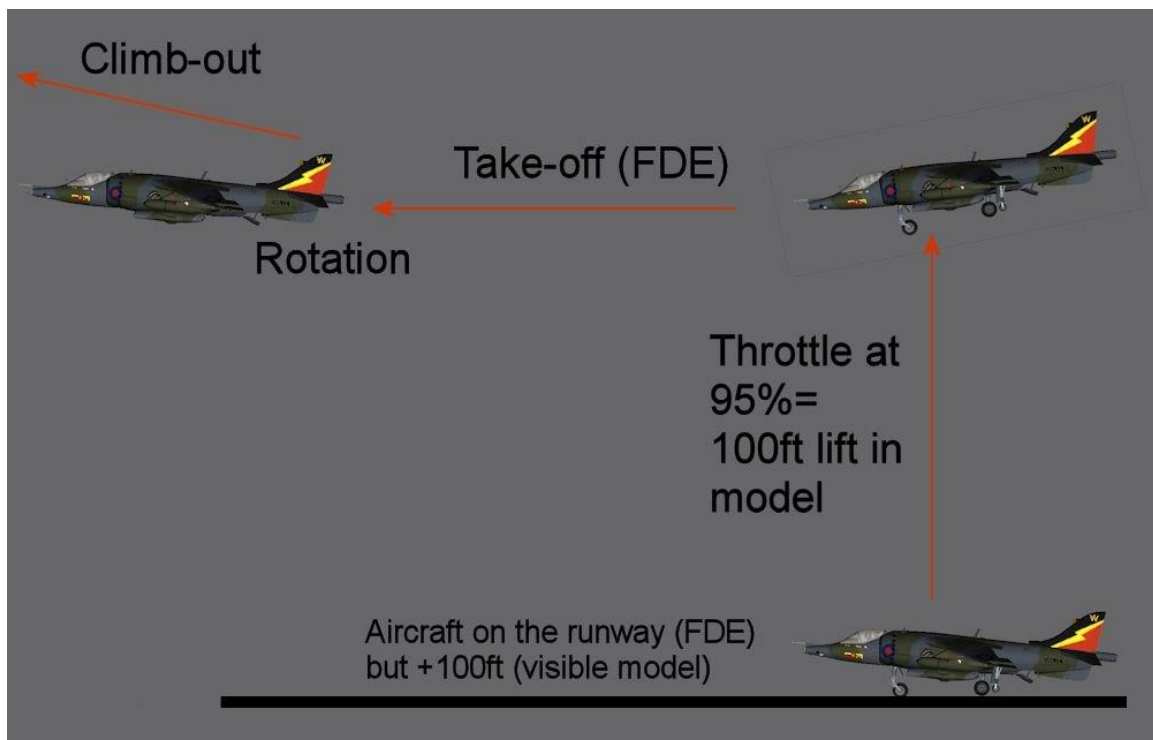
Step 1- Place the aircraft in your **FS9\aircraft or FSX\simobjects\airplanes** folder according to the version of MSFS in use.

Step 2 - Move the effects files to your FS9 or FSX\Effects folder. You may already have some of them.

The black T8Ns in the packs use reflective textures and these need to be switched on in the aircraft display settings in FS9. Reflection in FSX is set automatically.
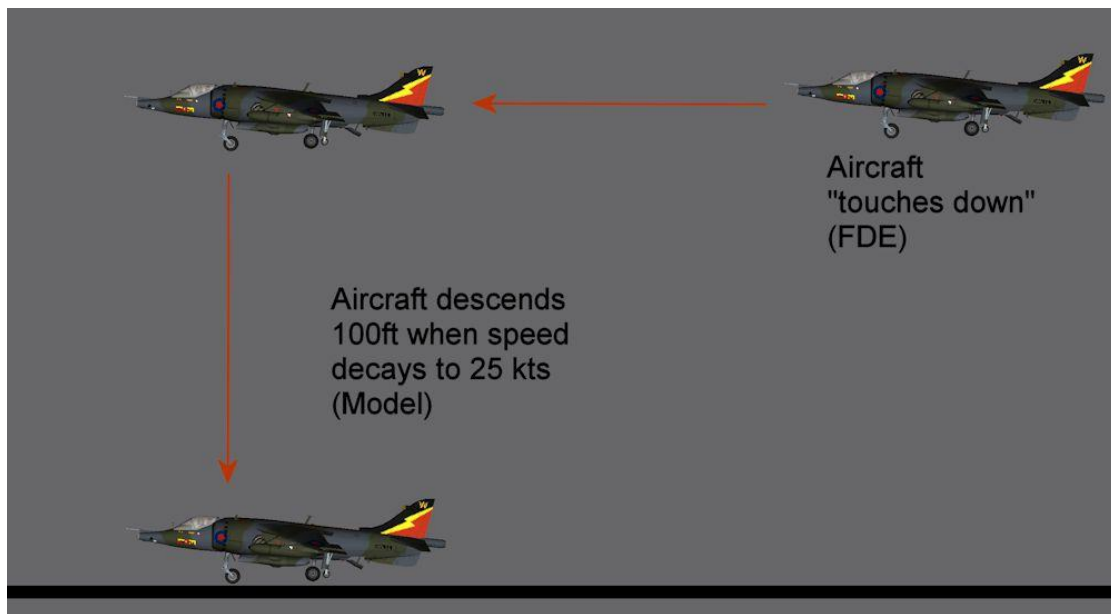
CHOICE OF CONVENTIONAL, SHORT OR VERTICAL TAKE-OFF and LANDING

Aircraft in the main folders have conventional short take-off and landing characteristics. The packs also include alternative "Vertical" aircraft folders that offer two further options: Vertical take-off/Landing (VTOL) and Short take-off/Vertical landing (STOVL). The lift features are not controlled by the aircraft flight dynamics in the aircraft.cfg and air files, but by blocks of custom XML code in the models. The code triggers animation in the model that causes the aircraft to rise 100ft into the air (VTOL model) when full power is applied by the AI engine. This obviously occurs at the start of the take-off run and the aircraft then accelerates down the "runway" but at 100 ft until it climbs away, controlled by the FDE in the usual way:

The undercarriage retraction is also not controlled by the AI engine, but by custom xml code that allows the action to take place at any specified time. In the VTOL case, it's at the top of the lift and in the STOVL version it's just after the Harrier leaves the runway.

On approach to land, the aircraft is still at +100ft in the model and it "touches down" at the runway threshold but at the elevated level. When the speed drops to 25 knots, the aircraft descends vertically to land on the runway and begins to taxi immediately:

Although a short take-off is achieved in about 7 seconds, a runway length of about 1150ft is still needed for when the aircraft is seen 100ft off the ground, but is actually still in "contact" with the runway as far as the FDE is concerned. It is possible to reduce the length of the "take-off and landing" runs by reducing the aircraft empty weight figure in the aircraft.cfg file. However because acceleration happens more quickly, the transition to a slightly nose down attitude at the top of the lift happens later and the effect is not as effective.

The other limitation with this method is in the use of lights and effects specified in the aircraft.cfg file. If present, navigation lights would stay on the ground, while the lift animation is playing. The same is true of tyre smoke on touchdown. However, I have left the tyre smoke active because it tends to simulate dust thrown up by the vectored thrust engines at 100 ft when the aircraft "touches down" and decelerates down the "runway".

I have spread the individual single-seat aircraft over the 3 take-off and landing options, but users can allocate a different mix by moving texture folders and aircraft entries/model allocation in the aircraft.cfg files. The 2-seat trainers are conventional take-off and land only. The load-outs for the VTOL and STOVL aircraft cannot however be changed.

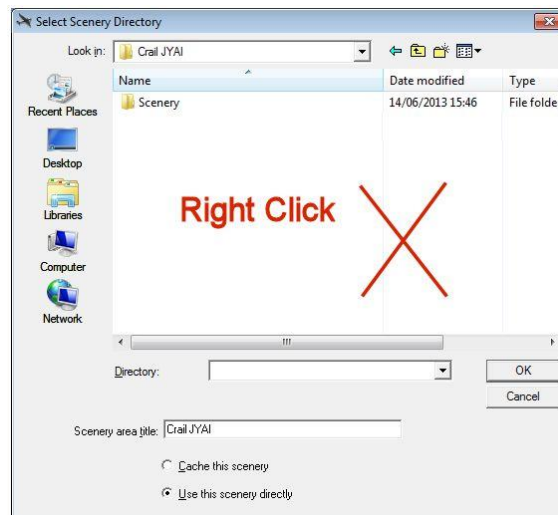The test traffic files in this zip contain 3 groups of aircraft that can be seen in my Crail test scenery:

➢ Conventional take-off/landing, single-seat aircraft, departing at 10:00 GMT every day.

➢ Conventional take-off and landing, two-seat aircraft, departing at 11:00 GMT every day

➢ VTOL and STOVL aircraft, departing at 14.00 GMT every day.

Each aircraft completes 1 VFR circuit of the airfield and returns to land about 15 minutes later.

Note that if you try and observe the VTOl and STOVL aircraft with an AI Viewer like the those that come with the FS9 and FSX "Traffic Toolbox", the aircraft will actually be 100 ft above the viewing window position and will not be seen unless the viewpoint is rotated upwards to view the underside.

INSTALLATION – TEST SCENERY

Move the folder "CRAIL JYAI" to your FS9 or FSX addon scenery folder according to your simulator version, or to the location where you normally install scenery. Add the scenery to the library - right click the white area of the selection screen if you are a Windows 7 or 8 user like this:

The same test scenery is in both the RAF and RN packs and you only need to install it once.

Two test traffic files are included, one RAF and the other Royal Navy. Place the folder in your FS9 or FSX scenery\world\scenery folder and then move the file to be used from this folder into the main world\scenery folder to join your other traffic files. Do not use both RAF and RN files together – there are only enough parking spots for one or the other.

CAN'T SEE THE AI AIRCRAFT?

Here's a checklist to help users with a problem to see the AI aircraft:

1. The scenery for the AI aircraft must be installed and activated in the scenery library.

2. The FS9\aircraft or FSX\sim objects\airplanes folder should contain the AI aircraft.

3. The FS9 or FSX\scenery\world\scenery folder should have the traffic files.

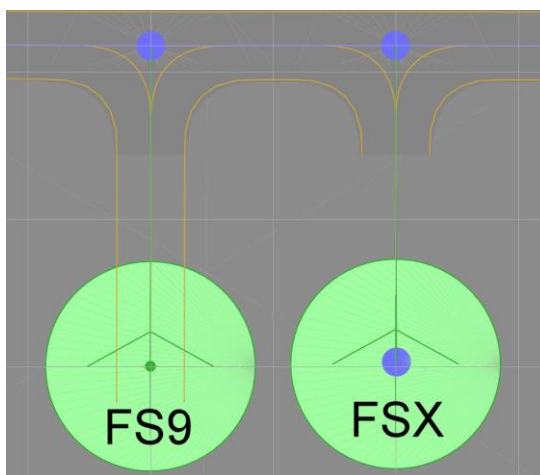4. AI should be switched on in the simulator and set to 100% initially.

For FSX, if the AI aircraft can't be seen after 1-3 then go to step 5:

5. **MOST IMPORTANT:** If you have any traffic files in FSX that were designed for FS9 and have not been converted to FSX format, they will generally kill all AI traffic in FSX. First temporarily remove any other traffic files found in your FSX\scenery\world\scenery folder while you check to see if the Crail AI is visible. If it is then you know you have a rogue file.

"AI Flight Planner" (see introduction) has a simple checking tool in the top drop down menu that scans for FS9 formatted files. It will then save a backup copy and convert the file to FSX format. It's a really quick and useful program to scan your FSX\scenery\world\scenery folder and other FSX scenery folders with.

INHIBITING PUSHBACK

Microsoft Flight Simulator (FS9 and FSX) is really geared to Commercial AI traffic and that will usually include a push back from the parking spot. AFCAD files control the layout of runways, taxiways and the parking for AI aircraft. Pushback can however be inhibited in these files. In FS9, it is generally only necessary to place the parking spot exit in the direction of travel. In the case of FSX an additional blue node is needed. This should be placed on the parking link and dragged to the centre of the parking spot and aligned precisely like this:

Several programs are available for producing ground layouts and parking spots, but Airport Design Editor is probably the most versatile of the freeware offerings. It can be downloaded from: http://www.airportdesigneditor.co.uk/

REPAINTING

Repainting is permitted, subject to the following conditions please:

1. There is no need to ask me before repainting, but I reserve the right to ask for uploaded files to be removed if I feel that the repaint, documentation or packaging is not appropriate. If in doubt please consult me first.

2. You may only upload the repainted textures, never the model itself. You will also need to provide a new section for users to be included in the aircraft.cfg file for the new aircraft and also provide a link to this package so that users can obtain the model.

3. Full credit is given to me for the original work.

4. The AI models in this zip must not be included in another scenery or AI package.

5. The repaint must remain as freeware with no charge whatsoever.

Example "paint kits" or rather my source files for the textures, are made available as is. Please do not ask me to re-map any surfaces, I don't have the time or interest to do that. The mapping of the textures to the Harrier models was particularly difficult because of the need to align top, side and bottom maps, particularly for the wrap around camouflage. No problems should be encountered when changing serial numbers and squadron identities using the provided overall colour schemes. However **alignment difficulties might be experienced when attempting something even more complicated like the DERA "Raspberry Ripple" paint scheme.**

The layered .psd files in the Paint Kit folder were produced with Paint Shop Pro X2 as .pspimage files. However files drawn with this version are not compatible with earlier PSP versions. I have therefore also saved the images as .psd (Photoshop) which is a format that Paint Shop Pro can open across the version history. The downside is that the vector data for the serial numbers and panel lines will be lost, making editing a bit more difficult. The .psd extension is also detected by Quicktime and if you encounter that problem either change the association in Windows or simply open the file from the program and not by double clicking in Windows Explorer.

ACKNOWLEDGEMENTS

Michael MacIntyre and Nick Black (MAIW) for the FDE and effects

Kevin Reed (MAIW) for some really innovative vertical lift and gear xml code triggers.

Steve Inny at Military Sound Studios for the FSX sound pack.

Lewis Gaylard for help with Royal Navy FRS1 serial numbers

Andy Ford at ACG for help with some great plans for modelling.

LEGAL

Copyright of this package is with John Young and other contributors mentioned in this manual and the archive may not be altered in any way without permission. The package is freeware. It has been designed for the benefit of the flight sim community world-wide with thanks for all the great downloads that I have obtained over time.

The package must not be used, uploaded or placed on any medium that may cause money to be made in any way.

The archive or must not be uploaded to any web site without permission from the author.

This software is provided "as is" with no guarantees or warranty of fitness and you use these files at your own risk.

FEEDBACK AND SUPPORT

I would be grateful for any feedback on the package and/or if you have any problems, please visit the ACG Forum at:

http://www.airfieldconstructiongroup.org/
Or the MAIW "Retro" Forum at:
http://www.militaryaiworks.com/

Or e-mail me at:
john.young@btinternet.com

John Young
August 2013