



**The 71<sup>st</sup> Anniversary  
of the  
617 Squadron RAF  
Dambuster Raid  
on the  
Moehne and Eder Dams  
16 – 17<sup>th</sup> May 1943**

**FLIGHT SIMULATOR X PROJECT**

by

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**INTRODUCING THE DB71 LANCASTERS  
CAPABLE OF LIVE UPKEEP ATTACKS  
ON THE RUHR DAM WALLS**

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**INTRODUCTION:**

**THIS DB71 PACKAGE WILL ONLY WORK IN WVA and is not suitable for Standard FSX.  
See Document #1 for instructions and installation details.**

**What is different in this package:** The Plane Design Lancaster's provided with the 70<sup>th</sup> Anniversary Celebration of the Dambuster Raid on the Ruhr Dams (DB70) in 2013 are capable of dropping an Upkeep object. However, the outcome will not be accurate and no explosion will occur at the wall if the pilot is lucky enough to adjust the release point and actually hit the wall.

In this package the two Plane Design Lancaster's AJA and AJZ have been commissioned with a pilot view cockpit rather than the Flight Engineers view of the previous DB70 upload. A better bombaimers view and revised bomb sight is added to accurately achieve a wall breach which is indicated by a BANG and explosion graphics at the wall. The live Upkeep is dropped 420 yards from the wall and then bounces ONCE (not three times) with a short splash and then runs towards the wall at water level. If speed and height at release are correct, a breach will be the outcome. A visual trim gauge has been added to provide easier tree top low flying and an easier and more accurate attack.

The Derwent and Ruhr Dam walls and Towers have been modified and scenery changed to allow any explosion at the wall to be visible. Flak effects are provided at the Moehne Dam and also enroute along the Wilhelmina Canal used for route guidance by the Dambusters in 1943.

**These documents do not describe all features available in the cockpits – refer DB70.**

**The reason for only being provided and working in WVA is that to achieve accuracy in standard FSX is far too complex to provide an upload for all video card resolutions and computer screen aspect ratios.**

**THE UPKEEP DROPPABLE OBJECT:** Designed by Koos van Menen of The Netherlands it is provided in two forms (1) an inert version for practice at the Derwent Dam where the outcome is a short "splash" and no running on towards the wall. (2) A **Live Upkeep** that provides the same "splash" but then continues towards the wall on the surface of the water and will explode on contact with the wall.

The dynamics of the **Live Upkeep** are such that in the run towards the wall the Upkeep **WILL STOP** and float at a distance controlled by speed and height of release. (a) if released too early, too slow or at a lower altitude than +60 feet (**true**) will result in the object stopping before the wall.

(b) when release is **too late or too fast** the Upkeep will travel thro' the wall and appear on the other side stopping a short distance from the wall on the downstream side. Explosions will also occur in this outcome but the result **IS NOT CONSIDERED TO BE A BREACH**. It is an obvious visual indication that the 1943 real time conditions of release **were not achieved**.

**This last outcome described in (b) is not by design but the result of FSX only allowing objects to be "hard" on the top surface. Contact on the side of an object allows the Upkeep to pass through WITHOUT an explosion..**

To achieve a suitable outcome Ross has designed a special "trench" into the scenery under the wall objects without which this project would not exist. The Upkeep, on entry, will drop down onto a hard surface and explode. It may also induce another explosion on the way out. This aspect is demonstrated and heard in the provided **movie** and whilst the outcome is visually perfect from the view angle **IT IS NOT A BREACH**. For the reasons given above the explosion may appear within the width of the wall and not at its upstream edge. Repeating: **IF the upkeep appears on the other side of the wall it is not a BREACH**. The image on the next page shows an outcome of the speed or height of release being wrong with the Upkeep exploding within the width of wall as it passes thro' and out the other side. **Attack failed**.

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## FLYING THE AIRCRAFT IN AN ATTACK

**OUT OF RESPECT FOR THOSE THAT FLEW THE REMARKABLE ATTACKS IN 1943**  
I request you do not fly these Lancaster's above the equivalent of tree top height or at +2000 feet when landing. They never ever flew where simmers might want to do so, ie with vapour trails in view. It simply never happened that way. AJA and AJK were flown on the raid as leaders of FLIGHT A (AJA, AJJ, AJL) and FLIGHT B (AJK, AJB, AJN)

**Neither of these aircraft, AJA or AJK and their crews survived the raid. ooo RIP ooo**  
The Wing Commanders Flight consisted of AJG, AJM and AJP.

**To achieve a droppable object outcome the simmer MUST fly using a saved flight.**

It is recommend you follow the following methods to becoming familiar with the Lancaster and flying it at low level to replicate the achievements of the Dambuster Crews of 1943.



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## LEARNING TO FLY the DAMBUSTER LANCASTER

Activate FSX and from the “Load” button list, fly the following flight:

0\_DB71-00 ---- 71st ANNIVERSARY DAMBUSTERS ----

[1] DB71 Lancaster AJA (S/L Young) will appear on pause full screen at the Derwent Dam.

[2] Now use F10 to activate and enter the 2D Cockpit as shown below:

Views shown are from AJZ (S/L Maudslay)



[a] is the added trim gauge.- use numpad key 1 to increase the setting to **+2** for flying an **attack** at 220 IAS. Set **+4** for cruising at **tree top level** flying at about 170 mph IAS.

[b] W/C Gibson requested an additional altitude gauge be added at dash level so the pilot did not have to look down whilst flying at low level. I am sure that in the modern world of today he would have requested a ground radar gauge and so it is in DB71. There is an error of 10 feet in the read out, so 70 feet on this gauge is **+60 feet true** above the terrain.

[c] This sim Lancaster is flown by “boost”, so **set +5** for an attack which will induce 220 mph on the clock. **You may need to adjust boost** slightly but in any event once setup the “**throttle**” **does not need to be juggled** at all. **Set -2** boost when cruising and for flying at tree top level.

[d] This sim Lancaster is also flown on RPM, so set close to **2850 RPM** with keys **[Ctrl F2 or F3]** and not greater for an attack. Set close to **2200 RPM** for cruising.

**Simply fly the aircraft with your ‘stick’ or control column without moving the throttle.**

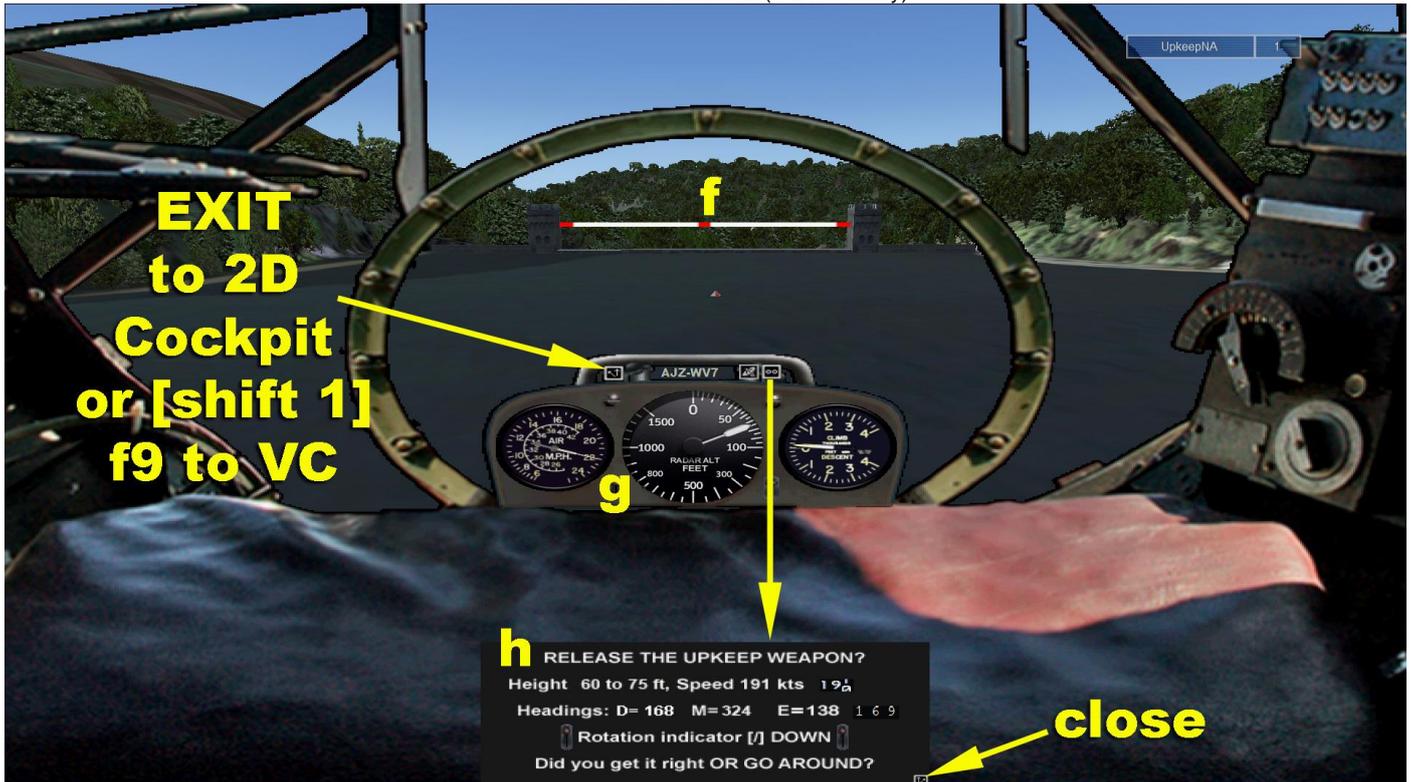
**NOTE:.** In very steep descents, the speed will increase and it should be controlled by first setting engine RPM to only 2200 with boost at +5 and later pushing it up to 2850. Flying the aircraft with both “stick” and juggled boost will not lead to the best outcome. Pre-setting boost & changing RPM will achieve far more. It’s the difference between **ACHIEVING** or **FAILING** and then being sent back to your original Squadron as a pilot who was not good enough to be part of 617 Squadron.

[e] Activating the icon OR using **[Shift +2]** will transfer to the Bomb aimers view as shown over.

**IRRESPECTIVE WHETHER YOU ARE A VC FLYER OR NOT, YOU MUST ACTIVATE THE BA VIEW. IF flying VC [F9] the BA view will then be available from [F10] AND NOT BY ACTIVATING VIA A KEY OR BY an ICON.**

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Views shown are from AJZ (S/L Maudslay)



[f] Activate the equivalent of the string and chinagraph marks used by some crews with **[Shift 3]** so as to get the release distance from the wall correct between 420 and 400 feet.. The view shows the ideal alignment of the bar with the inside edges of the towers on each dam. This is a grab from a practice run and shows the speed and height were correct at 220 IAS and +60 ft true, but read as 70 feet on the right side gauge marked as [g]. The release and impact markers have been left in the scenery as a guide to make the outcome easier.

**You must make sure in any attack approach you rotate the Upkeep Weapon with key [ / ].**

[h] is a window activated by the indicated icon, it reminds what the achieved height should be (+70 to 85 ft read on the "g" gauge) for success. The speed that should be achieved, 220 IAS, 191Kts, and what was really achieved. What the heading should be for all 3 dams and what the simmer achieved. It reminds you that the Upkeep should be rotating. **I FAILED on that.**

Closing the information window will also close the bombsight. You can exit the BA view directly back to the 2D cockpit by icon OR **[shift 1]** or as indicated in the image, **[F9]** back to the VC cockpit to continue FLYING.

**In the VC:** activate the dash level ground radar gauge with **[shift 5]**. Active the additional window, that provides the gauges covered by the steering column plus a trim gauge, with the lower icon in the 4 icon cluster. See image over page.

Check that trim is set to **+2**, close the additional gauges window with the provided icon.

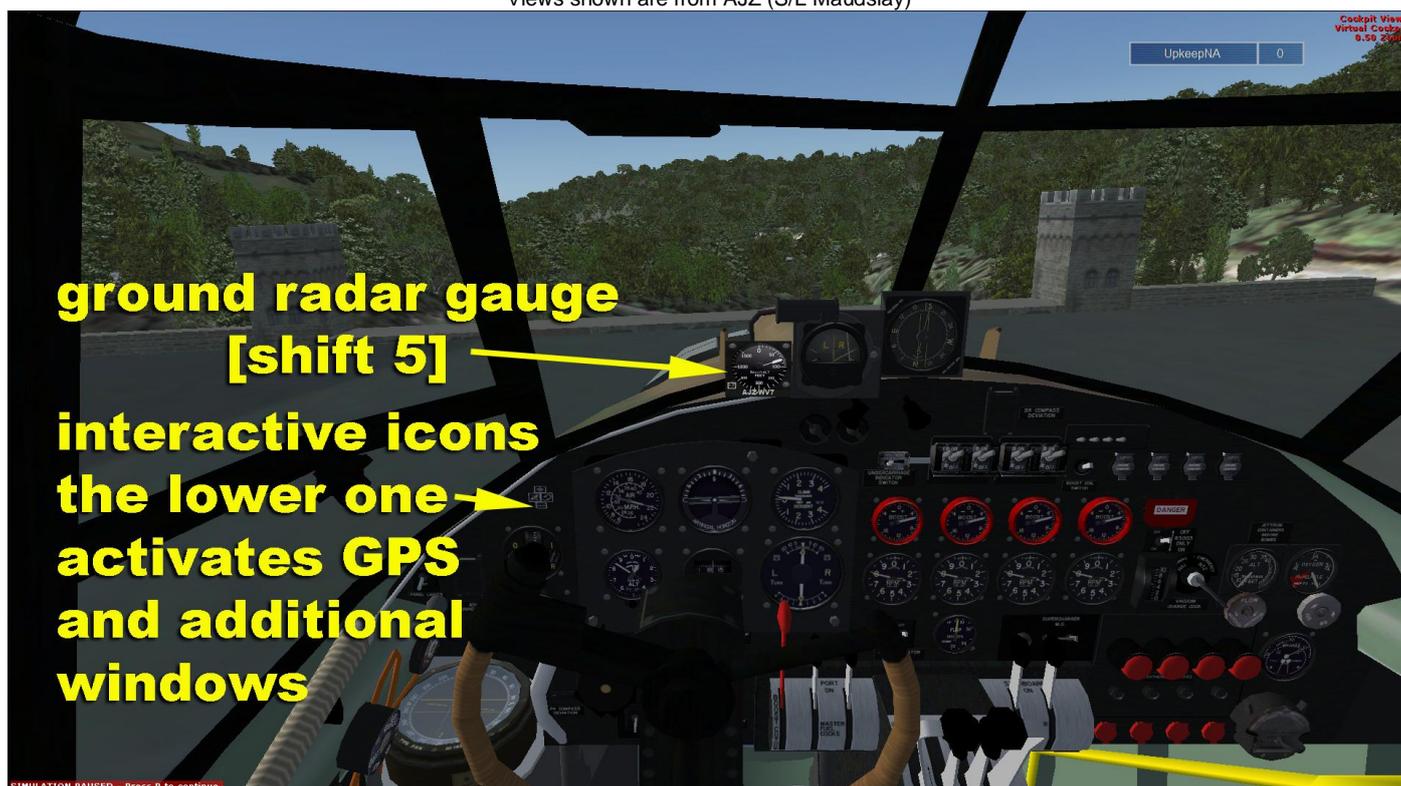
**In the 2D cockpit:** also check and set if necessary the trim to **+2** and ensure the rotating Upkeep is turned off with **[ / ]** and that the indicator is UP. Check with view 03 from the outside drop down views menu and then return to your chosen cockpit. With **[F10 or F9]**.

Because you are about to start flying from pause you should be aware that the achieved speed will not immediately be 220mph IAS. **Realistically** you should also **change the Upkeep payload entry** by setting 1000 lbs instead of the 10000 lbs indicated in the Fuel/Payload dialogue window.

The image over page illustrates the VC at this point in the learning curve.

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Views shown are from AJZ (S/L Maudslay)



To fly shift the throttle full forward, pull back slightly on the 'stick' and release pause.

Once over the wall shift the throttle back so as to set a boost of **-2** lbs.

Use **[shift F2]** to reduce engine RPM to **2200** and begin descending towards the reservoir water missing all objects, trees and hillsides. Re-trim the aircraft to **+4**.

Initially your speed will be high but in due course it will stabilize at about 170 mph IAS. This is the DB71 cruise speed. Do not change the throttle position UNLESS THE BOOST IS NOT **-2** lbs.

Follow the reservoir water until you come to the valley and then fly as low as possible just above tree top level. You should notice the trees will vary in height and you may find that the lowest height you can fly at is about **+150** feet when missing the tall ones. In cleared areas and in VFR, with no trees or autogen, you can fly at **+70** ft on the gauge. When low flying always look for areas of few trees and make use of the clear patches. You will probably fly lower than the trees around you so be prepared to climb up and over when required..

Fly for as long as you can as this is a very good introduction to low flying at tree top level.

Now increase Boost to **+7**, RPM close to **2850** and fly at approx 220mph on the clock. Adjust boost if necessary. Outcomes will depend on aircraft attitude. Do this so as to gain some experience in flying at attack speeds. Be sure to not always fly straight. Look for patches of no trees. The attacks involve flying high speed turns without losing or gaining too much height.

The reason that the Dambusters flew at this height was to ensure they could not be attacked by Luftwaffe fighters. It was also to limit the risk of being shot down by flak. The Brief For The Raid instructed that only the **flight leaders** could rise to 200 feet to check navigation OTHERWISE the Crews flew at **+60** feet all the way to the targets and back again to Scampton (approx 7 hours).

You will find it very much easier to FLY the Dambuster Lancaster if you define keys on your 'stick' to provide the outcomes for changing RPM up and down at the touch of a button.

## FLYING THE DB71 SAVED FLIGHTS

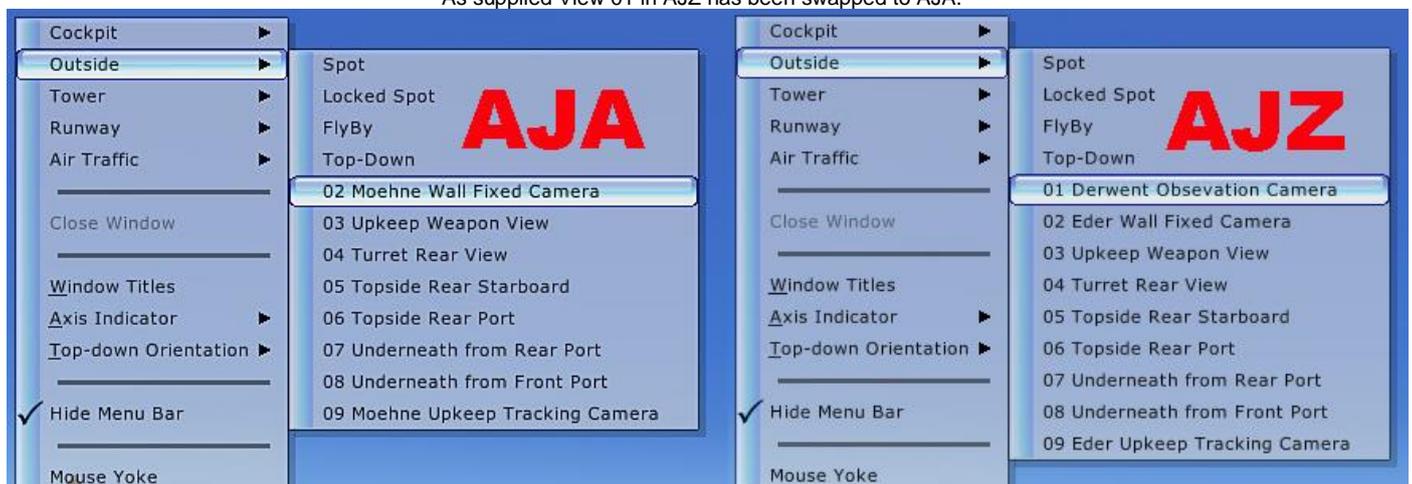
**Firstly:** please note **ALL** saved flights in this package **begin and end** in the **AIR**. Unlike DB70 there are no flights that involve taxi from a park to a runway, takeoff or landing and taxi-ing back to a park. There is no formation flying or flying with the Ai's. No flying on 3 engines. Indeed, RAF Scampton, RAF Spilsby & Dambuster Ai's are not involved at all in DB71.

In order to drop an object in FSX, **the logic is that the simmer must fly a saved flight** in which the object is called up. The default setup to release a droppable is the cumbersome key combination **[shift D]**. There is no key to arm the bomb release. You would be well advised to allocate one of your throttle buttons for this action.

**Although not realistic as a continuous attack would be, the following method should be adopted TO ATTACK the walls of each dam.** Once more experience is gained a **continuous attack** could be mounted or the option described in **DOCUMENT #3** adopted and flown.

- [a] with the aircraft stationary on pause at the start of a flight the simmer should just pull back the control column a little so as not to lose too much altitude whilst the aircraft builds up speed after pause is released.
- [b] the simmer will attack and fly the aircraft from the **Bombaimers View**, simmering does not have the luxury of Crew Members so the sim pilot does it all. The BA View has gauges fitted that make it possible to fly at the correct altitude, to fly at the correct speed and to fly the heading.
- [c] when it is time to release the weapon, having aligned the ends of the horizontal bar on the inside edges of the towers **OR** judged the sight to be the same width as between towers, **USE THE PAUSE BUTTON to stop the aircraft**. This action allows the use of the tools already described on **Page 5**, to check if the pilot got it right or must go-a-round. Views can be set up that will show the outcome visually.
- [d] most simmers will not go-a-round. **In 1943 there were 8 go-a-rounds at the Eder and three releases. The Moehne Dam no go-a-rounds with 5 releases before the walls were breached.**
- [e] release the Upkeep Weapon with the keys **[shift D]**. The counter will go to zero.
- [f] set up the fixed camera view provided on the wall of each dam from the Outside View Menu: Activate the view as follows: **Right click, not on the panel or VC but in the sky area of the view and select the appropriate view.** [01] for the Derwent Wall, [02] for the Moehne Wall or [02] for the Eder Wall. The image shows the **outside view** options for each aircraft. Note the aircraft are each allocated to a specific attack or practise. For example AJZ cannot fly the Derwent Practise but attacks the Eder Dam, AJA Derwent Dam & attacks the Moehne Dam.

As supplied View 01 in AJZ has been swapped to AJA.



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[g] now release PAUSE and pull back slightly on the stick so as to climb easily over the wall.

[h] **in the case of the Derwent Dam Practice Flight** it is necessary to add this extra procedure that is not required to attack the Ruhr Dams. The aircraft firstly will not be in the top down view. It will soon appear in the view heading for the wall. The Upkeep has dropped away and will impact on the water which will result in a white splash **THAT WILL VANISH IN ABOUT TWO SECONDS**. So hit the pause button again to stop the aircraft. Now use the keys **[shift 6]** to activate **a rectangular target area indicator**. If the splash is within the frame – **SUCCESS**. Even better if it hits the marker – that outcome may not be achieved very often.



**So you think that's an impost to do so? The real Dambusters used floating rectangular targets and dropped "practise" bombs on them in the same way. They also used a green dye to indicate the impact. In order to see the splash we use a much bigger Inert Upkeep so as to clearly see the result. Practise bombs do not bounce and run to the wall, nor does our inert Upkeep. The real targets were placed exactly where I have placed ours, at the first impact point.**

[j] The red frame has a clearance Icon on it OR use **[Shift 6]** again. Follow this with **[F10]** to return to the Bomb aimers view. Then exit to your chosen Cockpit as described – **END of Flight**.

[k] **Now fly saved flight 0\_DB71-01 WVA - Derwent Dam Practise AJA** from the FreeFlight Load List and see how you fair as a 617 Squadron Dambuster Pilot. **In 1943 low flying and dropping the Upkeep was a learned skill from practise. It will also be so in the sim**



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## DB71 OPERATION CHASTISE 16<sup>th</sup> & 17<sup>th</sup> May 1943

In DB71 we do not fly from Scampton to the Dutch Coast but begin by following the Wilhelmina Canal. This canal was an important navigation item because in the moonlight it was easily followed. The Canal passes two night fighter stations so it is best to fly as low as you can and thus avoid attack by Luftwaffe fighters.

Open and Fly saved flight **0\_DB71-02 WVA - Outbound WILHELMINA CANAL AJZ.**

This is an easy low level tree top flight. Set up the aircraft to cruise at Boost **-2** and RPM **2200**. Fly low missing high trees and power lines. **KEEP AS LOW AS POSSIBLE**. You will encounter two pockets of Flak here. In the real Flight of 1943 several Lancaster's were subjected to flak and gun fire, one crashed (AJB) and one flew to the Moehne on three engines (AJM), attacked and had another engine set on fire and crashed beyond the wall.

In the VC activate the dash level gauge with **[Shift 5]** and then using the bottom icon of the cluster, as previously indicated on Page 6, open the GPS and the extra gauge overlay. **Set +4 trim** and **close the window**. Come off Pause and FLY. In this flight you will have to reset boost and RPM (deliberate) so as to gain experience in doing so whilst flying.



Even though the GPS is not needed in this flight you should have it active in the view as you cannot attack the walls of the targets without using the GPS as a guide to the correct heading. It may be easier to fly lower to the side of the canal. **After all the Order was to "fly at +60ft"**.

Fly this flight at least past the 2<sup>nd</sup> concentration of flak. Further if you're a Dambuster enthusiast Flak & gun aiming is not good so it will be easy to survive in a way the Dambuster could have only wished for. **It would have been a revelation for the Dambusters of 1943 to have had such modern day equipment.**

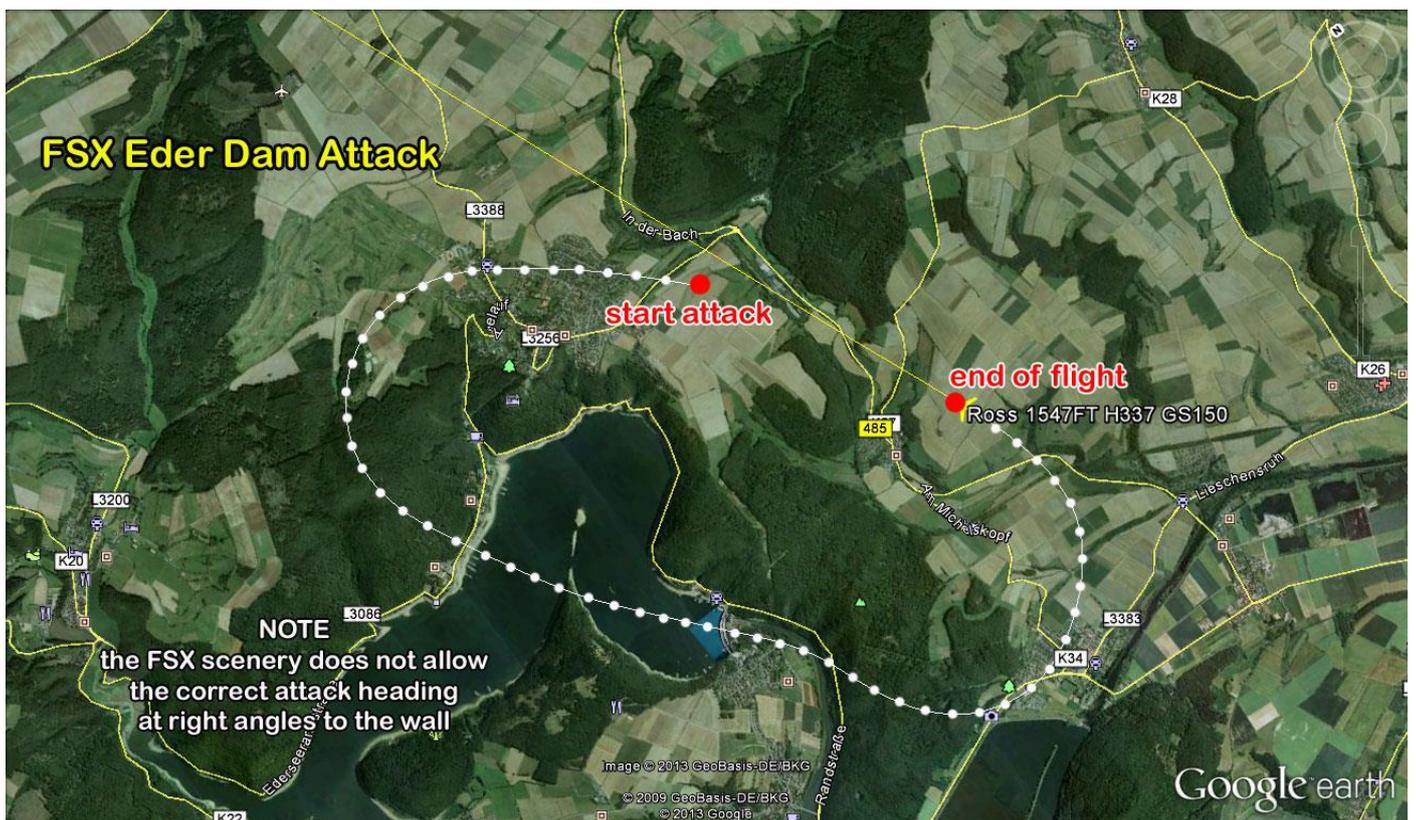
The next page shows what you're in for next, **the attacks on the Moehne and Eder Dams**. The routes shown are as near as possible to those of 1943, study the images and **GO FLY**.

## DB71 ATTACK ROUTES USED IN THE SAVEDFLIGHTS

The images on this page are from the program which connects Google Earth to FSX and will provide a white line trace of any flight flown by the simmer with start and end points.



At the Moehne Dam we chose to attack over the south arm of the Moehnesee. For 65 years it was considered the attack was via the north arm over the “Hever” which then involved a sharp turn to starboard. The “experts” now consider the attack was as per our image above.



## ATTACK THE MOEHNE DAM WALL – 17<sup>th</sup> MAY 1943

Open the saved flight: **0\_DB71-03 WVA - MOEHNE DAM ATTACK IN AJA**



AJA (S/L Young) will appear full screen with the dam wall and towers in the distance. Follow the instructions to fly this attack:

**The 1943 Dambuster Pilots all had difficulty maintaining the 220mph IAS in an attack, this was due to the steep descents down to water level. You will find this in the sim as well.**

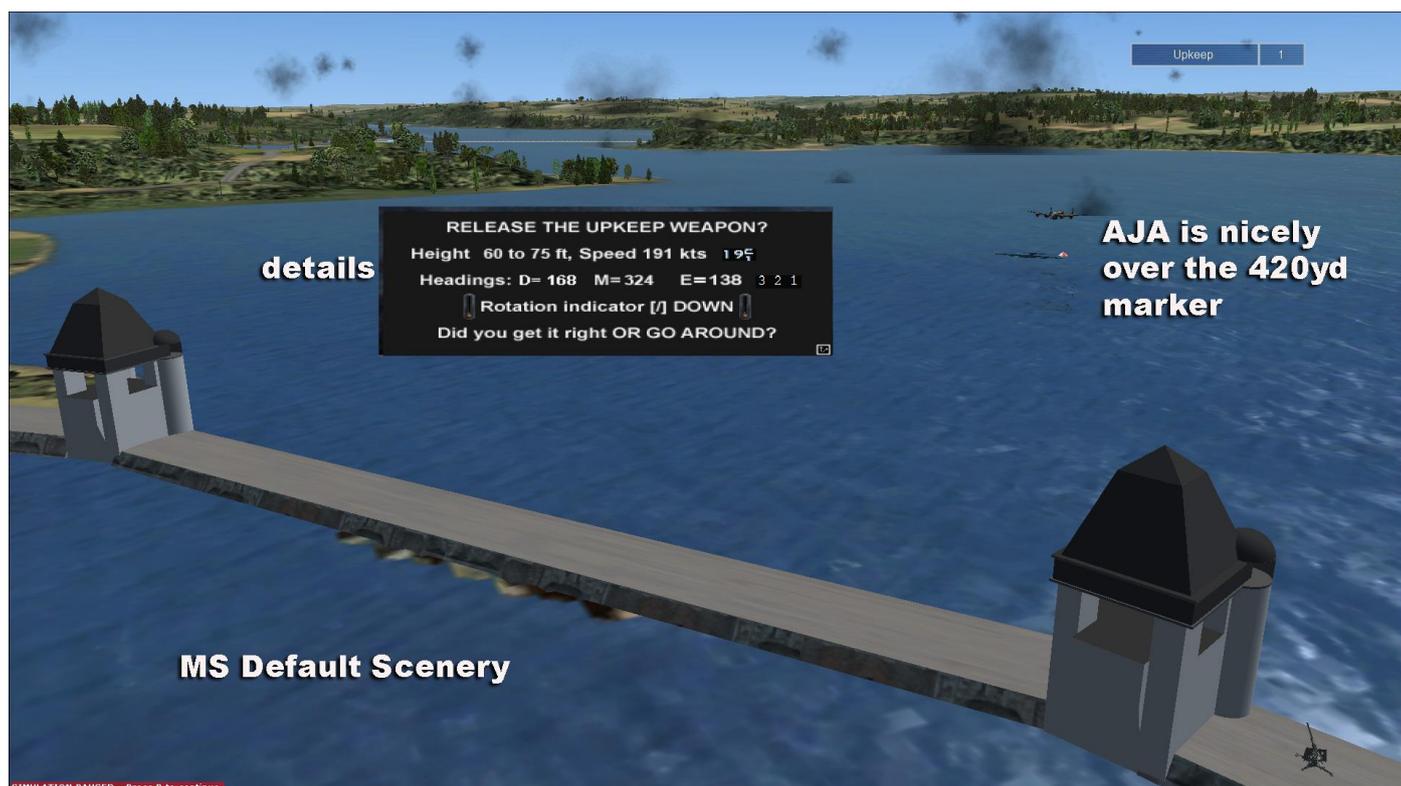
[a] Key **[F10]** to enter the 2D cockpit. Set Trim to **+2**. Enter the Bomb aimers view with the left Icon in the group under the direction gauge. OR **[shift 2]** then **[shift 3]**.

[b] **FLYING FROM VC:** Key **[F9]** to return to the Pilots cockpit. **[Shift 5]** to add the dash level ground radar gauge. Press the GPS Icon in the group of 4 icons previously indicated. OR the GPS can be activated with **[shift 4]**. Zoom the GPS three notches.

[c] **RELEASE PAUSE** to fly. Check and if necessary adjust Boost to near **+5**. set engine speed near 2650 RPM Fly the curving turn to Starboard. Check the GPS so as to come around onto the approximate heading for the walls. **Keep low but also keep the towers in view.**

[d] **Rotate the Upkeep** with Key **[ / ]** As you head down to +70 ft over the water the speed of the aircraft will increase. Reset engine speed to 2850 RPM then **[F10]** to go direct to the Bomb aimers view with sight active. Level out, and **when the sight is judged to be aligned** as described on Page 7c – **PAUSE**. Check the achieved details as also previously described.

[e] Activate the Moehne wall camera view #2 from the drop down menu and you should see this::



Note the aircraft shadow relative to the marker. The FLAK will disperse quickly

[f] **Drop the Upkeep with [shift D].** Pull the stick back slightly and **RELEASE PAUSE.** Watch AJA drop the Upkeep and begin the climb out over the wall. The Upkeep will drop, and splash at the 1<sup>st</sup> impact and then run towards the wall. Wait for the results of the attack, was there an explosion? Did the Upkeep pass thro' the wall and appear downstream? If not the **outcome is a BREACH** as shown below.



**Key [ / ] to stop the PD Upkeep Graphic from rotating.**



[g] Return to the VC cockpit with **[F9]** activate the gauges as described and fly the 180 degree turn to port. Boost **-2**, RPM **2200** Set trim to **+4**. If you had an explosion it will remain for as long as you are flying. Keep down at tree top level and perhaps fly around and have a look.

**A 2D attack is identical except for how you get from the cockpit to the BA view and back again to the 2D cockpit to fly the 180 degree turn [g]. Refer to appropriate previous pages.**



## ATTACK THE EDER DAM WALL – 17<sup>th</sup> MAY 1943

Open the saved flight: **0\_DB71-04 WVA - EDER DAM ATTACK IN AJZ**



For this attack by AJZ (S/L Maudslay) the process is similar to the Moehne attack and so there is no need for it to be repeated again. **This, by far, is the most difficult attack.** In 1943 they made **9 attempts** before AJN dropped the last Upkeep of 3 used to breach the wall.

**Good Luck with your attacks and may you become a 617 Squadron Pilot and Bomb aimer.**



### ACKNOWLEDGEMENTS

Koos van Menen for the Lancaster paints, Droppable Upkeep objects and positioning of Flak and Guns, Moehne Dam & Wilhelmina Canal

Plane-Design for permission to update their FS9 payware Dambuster Lancaster's for FSX for the DB70 project.

John Young for the Derwent Walls and Towers and the walls used on the Ruhr Dams.

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