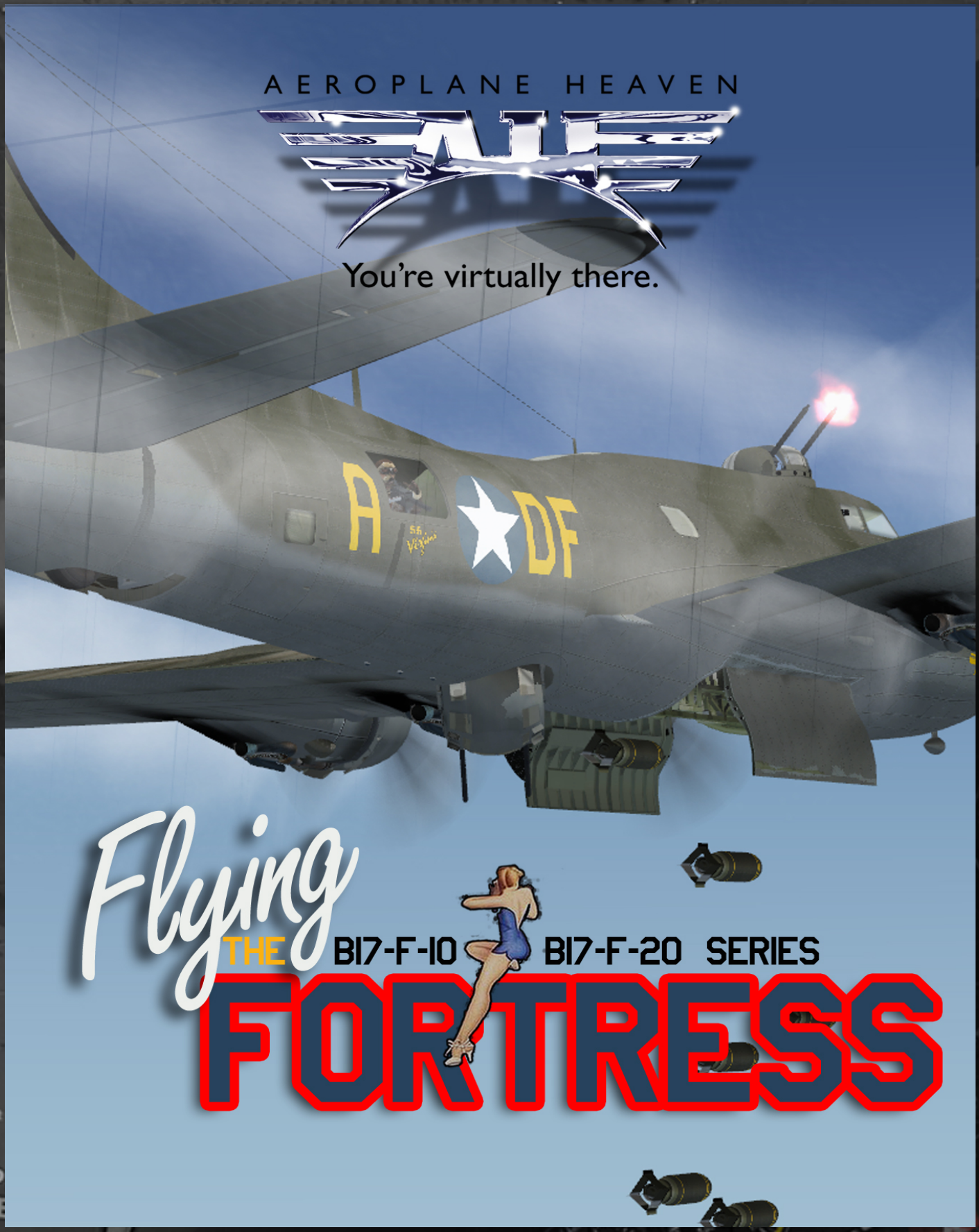
AEROPLANE HEAVEN

You're virtually there.



Flying THE B17-F-10 B17-F-20 SERIES FORTRESS

PILOT NOTES AND COCKPIT GUIDE

Introduction

It was a Seattle Times reporter who first used the name “Flying Fortress” when setting eyes on the Model 299 prototype. The Boeing Company liked the name so much it immediately registered it as the official company name for the bomber.

Unfortunately, with controls left in the locked position, this prototype was lost with all crew when it crashed on takeoff on October 30th, 1935.

However the top military brass had seen enough to convince them of the firepower and capabilities of the machine and orders were placed for 13 evaluation airframes. Being the 17th bomber type to be operated by the Army Air Corps, the “Fortress” was given the military designation B-17.

The most common was the later “G” model (8,680 built), typified by its remotely operated chin turret below the nose.

The “F” model preceded and this is the subject of our simulation.

Perhaps the most famous of the 3,405 B17Fs built is “Memphis Belle” which completed 25 missions and was returned to the USA for a War Bonds tour. Many believe that the “Belle” was the first to complete 25 missions but this was actually not the case. “Hell’s Angels” another “F” of the 303rd Bombardment Group achieved the distinction six days ahead of “Memphis Belle”.

But it was the “Belle” that was first returned to the USA and so became famous as a result. Many B-17s went on to record multiple mission completions including a B17F which recorded over 100.

The model F was built in a variety of configurations, mostly differing in the nose armament. “Memphis Belle” is a F-10-BO which had twin 30 calibre machine guns mounted in swivels in the plexiglass dome nose, in addition to its other 30 and 50 cal armament.

The F-20-BO series had a single 30 cal mounted in a recessed, booted frame in the dome’s centre.

Examples were produced where the pilot could fire this single gun from the cockpit on shipping attack duties.

Both types are simulated here.

There were 10 crew in a B-17. Pilot, Co-pilot, Engineer/Upper turret, Navigator/nose gunner, Bombardier/nose gunner, Radio Operator (sometimes used a ring mount machine gun in the upper mid position) Waist gunners x 2, Ball turret gunner, Tail gunner. Crew names became legends in their own right and several celebrities of the day were numbered among them. James Stewart, the movie actor, instructed on B-17s, Clark Gable flew as a waist gunner on 5 missions in the “Fortress” and Gene Roddenberry, creator of “Star Trek” flew B-17s in the Pacific theatre.

Pilots and crews received many commendations and awards for their courage and skill. Sadly, also, many, many crews were lost over enemy territory in the massed daylight missions which saw hundreds of machines in close formations in the same airspace to provide protection and get through in enough numbers to carry out their missions.

The middle of a close formation was no place for an enemy fighter to be for any length of time. The sheer amount of covering fire put up by the B-17 gunners was a pretty awesome deterrent and the B-17 crews became very successful at shooting down fighters. 10 – 13 heavy machine guns with a broad field of fire, combined with the same from surround-ding bombers in the formation, criss-crossed the skies with a lethal rain of bullets and tracer through which enemy fighters had to run the gauntlet.

The “Fortress” did not carry a particularly heavy bomb load, compared, that is, to say a British Avro Lancaster. Only 4,500 lbs carried on long missions because of fuel requirements, necessitating special tanks carried in the bomb bays. Short mission load was 8,000 lbs . But the sheer numbers and the use of the then top-secret Norden bombsight ensured high degrees of accuracy and coverage to get the job done.

Powered by 4 Wright Cyclone 9 cylinder turbocharged engines of 1200hp each, the B-17 was a robust, capable flyer rather than a speed machine. Immensely strong, the B-17 could withstand huge amounts of punishment and there are countless tales of machines returning to bases with large amounts of airframe missing, control surfaces shot away, engines gone, tails cut in half and more. These survivors were testament to the engineering incorporated into this amazing aeroplane and many crews owed their lives to the designers and builders.

B17s were used as pilotless drones, search and rescue aircraft and research airframes for aircraft of the future. They flew in every major theatre of the Second World War. Several went on to serve in the Korean conflict and the US Coast Guard operated B-17s up to 1959. Examples were captured by the Nazis, interned by the Swiss and Russians and 3 examples were captured and evaluated by the Japanese.

Over the years, to 1945, over 12,000 examples of their B-17 were built in a bewildering array of variants. Many survive today and several still fly. “Memphis Belle” is currently being restored by the US National Air Force Museum and will once again stand as a memorial to the valiant crews who flew and perished in the war-torn skies of Europe and the Pacific.

Aircraft included in this simulation

"Memphis Belle" Serial number 41-24485 91st Bomb Group

A B-17F-10-BO, the "Belle" is perhaps the most famous of all the B-17s. A subject of several movies, the aircraft and her crew made history when they became the first ship to record 25 missions over enemy territory and be repatriated to the U.S. In actual fact, it was another -10, "Hell's Angels" which was actually first to record 25 missions but it was the "Belle" who returned home first, for a War Bonds and recruiting tour. The "Memphis Belle" is now undergoing restoration.

"Hell's Angels" Serial number 41-24577 303rd Bomb Group

A B-17-F-20-BO, "Hell's Angels" was factually, the first B-17 to complete 25 missions. The name was eventually adopted by the entire 303rd. She was eventually repatriated for War-Bond duty, having chalked up 48 missions and once Stateside, all those involved in her build and maintenance wrote their names all over the airframe.

"Miami Clipper" Serial Number 12-29815 91st Bomb Group

B-17F-70-BO. She carries an example that is typical of the colourful nose-art that adorned nearly all B-17s. Completing her last mission on March 23rd 1944, she returned to the United States and was eventually sold for scrap in 1945.

"Blonde Bomber" Serial Number 42-3057 91st Bomb Group

A B17-F-20-BO, "Blonde Bomber" was lost in a raid over Oschersleben on its 28th mission. All but one crew member managed to bail out over western Germany but the Captain died when his parachute failed.

“Bare Metal”

This is an entirely fictional representation of an “F” in natural metal. We do not believe that the B-17F was ever produced in polished aluminium but as the aircraft looks great in this condition, we thought we would include it. Of course should you be successful in finding a bare metal scheme, you can replicate it using the paint kit and this model!

LEADING PARTICULARS

Length	74 ft. 8.9 ins.
Height	19ft. 1.0 ins.
WingSpan	103ft. 9.30 ins.
Wing Area	1,420 sq. Ft.
Empty Weight	36,135lbs
Maximum Gross Weight	65,500lbs
Powerplants	4 x Wright Cyclone R-1820-97 9-cylinder radial, air-cooled engines developing 1200hp per engine. Engines are Turbo-supercharged.
Propellers	Hamilton Standard 3-Blade metal 11ft.7ins. dia.
Crew	10 in stations.

Maximum speed	230 MPH @ Sea level
	295 MPH @ 25,000 ft.
Cruise Speed	175 MPH @ Sea level
	145 MPH @ 25,000 ft.
Takeoff Speed	115 MPH @ full load
Fuel	3,600 USgals (maximum loadout)
Range	2,000 miles (with short bombload)
Service Ceiling	35,600 ft.
Rate of climb	900ft. per min.
Armament	12 machine guns of .30 cal. and .50 cal. mixed
	8,000lb normal bomb load typical mission
Max Overload	17,600lb

The special Configuration Panel

We have devised a special configuration panel to assist with setting up your B-17, depending on game play. The panel allows you to select crew for the various positions throughout the aeroplane. For example, if you wish to begin your flight with just the pilots in place just click on the pilot figures in the drawing. The figures change from red to green when a particular crew is visible in the aircraft exterior views.

The turret crew will not appear in the turrets unless you are airborne. It was not usual for turrets to be manned until at combat stations at altitude. When the crew are selected, the turrets will begin to revolve and the guns elevate and depress.

Three switches at the bottom of the panel configure each turret and tail gun for firing. Up is on and when switched, the guns will fire using the “I” or “smoke” key. Muzzle flash and authentic 50 cal. sounds add to the effect.

You can drop the bombs in the B-17 by either using the release handle in the cockpit or the rotary switch on this configuration panel. BUT ONLY IF THE BOMB DOORS ARE OPEN FIRST! (Shift/E+4)

WALKAROUND

The B17 is an impressive aeroplane when viewed on the ground and in the air. Everything about the airframe shouts its immense strength and durability. Ten crew positions dictate a large number of windows and hatches for access and viewing.

The nose of a B-17 is typified by the large clear Perspex dome used by the bombardier/ nose gunner for an exceptional field of view. Unfortunately, this dome makes this crew position vulnerable under head-on attack so multiple machine guns are mounted here to provide maximum defence.

The navigator who sits at a table on the port side of the nose can fire two 50 cal machine guns mounted either side of the forward nose in large viewports.

The B-17-F-10 has twin 30 cals mounted in swivels built into the dome and the type 20 has a single gun mounted in a central frame with a flexible canvas boot.

The 20 model also has an additional astrodome mounted atop the nose section for sextant sightings.

The forward crew enter the aircraft by swinging up, feet first, through a small hatch on the port side of the nose section. Once inside they can access the pilot's cockpit via a "coal-hole" arrangement of steps and double doors opening onto the cockpit floor level. Or, they can move forward into the nose.

The bombardier sits well-forward in the nose dome behind the Norden bombsight. This sight was top-secret in the day and was highly prized for its accuracy. Axis forces went

to great lengths to try to acquire the secrets of this instrument and when the aircraft was on the ground, the Norden was always carefully covered over to keep it from prying eyes!

The nose is packed with bomb computer equipment and ammunition boxes for the machine guns, navigational instruments and fittings and numbers of bright yellow oxygen cylinders carried in racks right through the aircraft. Oxygen being necessary for all crew above 10,000 feet.

The pilots sit high up on the cockpit level with a good view of the engines and control surfaces. The cockpit has “eyebrow” window glazing for an upward view and big side windows slide back.

Immediately behind the cockpit is the upper turret. This is manned by the engineer in times of combat and he stands on a step bar which hangs below the turret into the cockpit area. The turret revolves and is equipped with twin 50 cal machine guns which elevate.

The stance is set solid by the immensely strong undercarriage with its simple yet powerful design. Single oleo struts are of large diameter and carry single wheels. The struts retract forwards into wells formed by the inner nacelles

One thing that is immediately obvious is the thickness of the wings. These illustrate the depth of the main spars, designed to withstand huge loads and forces applied under stress. Leading edges incorporate air intakes and also landing lights. There is a red passing light fitted into the port landing light well. The wings carry the fuel tanks and of course need to withstand the combined 4800 horsepower of the Wright radials. Turbochargers are

mounted into the lower body of the nacelles and the cowlings are fully flapped for cooling the big engines. De-icing boots are also fitted to the leading edges.

A myriad of access hatches fuel fillers and engine vents cover the wing surfaces. Large split flaps are fitted to the trailing edges of the wings and are operated by a series of powerful jacks, visible when the flaps are deployed. The long ailerons are fabric-covered.

Moving aft, the fuselage sides incorporate retractable glazed doors for the waist-gunners. These are retracted and the guns swung out for combat. The crew at this station would feel the cold most at high altitude, being exposed to the outside world. The need for heavy, heated flight jackets, gloves and over-trousers was essential for survival but must have made rapid movement difficult when using the machine guns.

Beneath the hull at this point is the all-important and infamous ball turret. A small stature was required for a crewman for this position. Folded up with his feet either side of the circular port, this was home to the ball-turret gunner. For obvious reasons, the turret remained unoccupied until at combat stations when the gunner would enter the ball through a door in the back of the turret, inside the fuselage. To access this door, the turret was rotated downward until the door was topmost.

You don't see the radio operator by the way, he is tucked into the mid-fuselage section forward of the waist gunners. The two windows either side of the fuselage at this point, are for his use, as is the top glazing area. On some aircraft this glazed area was removable and a ring-mounted machine gun could be fired from this position, usually by the radio operator.

On the starboard side near the tailplane is the crew door. The waist-gunners, ball-turret gunner and tail-gunner would usually use this door to gain access to the aircraft, although it was not uncommon for the entire crew to use it instead of the awkward crew hatch up front. Immediately aft of this door was the mounting and operating gear for the retractable tail wheel.

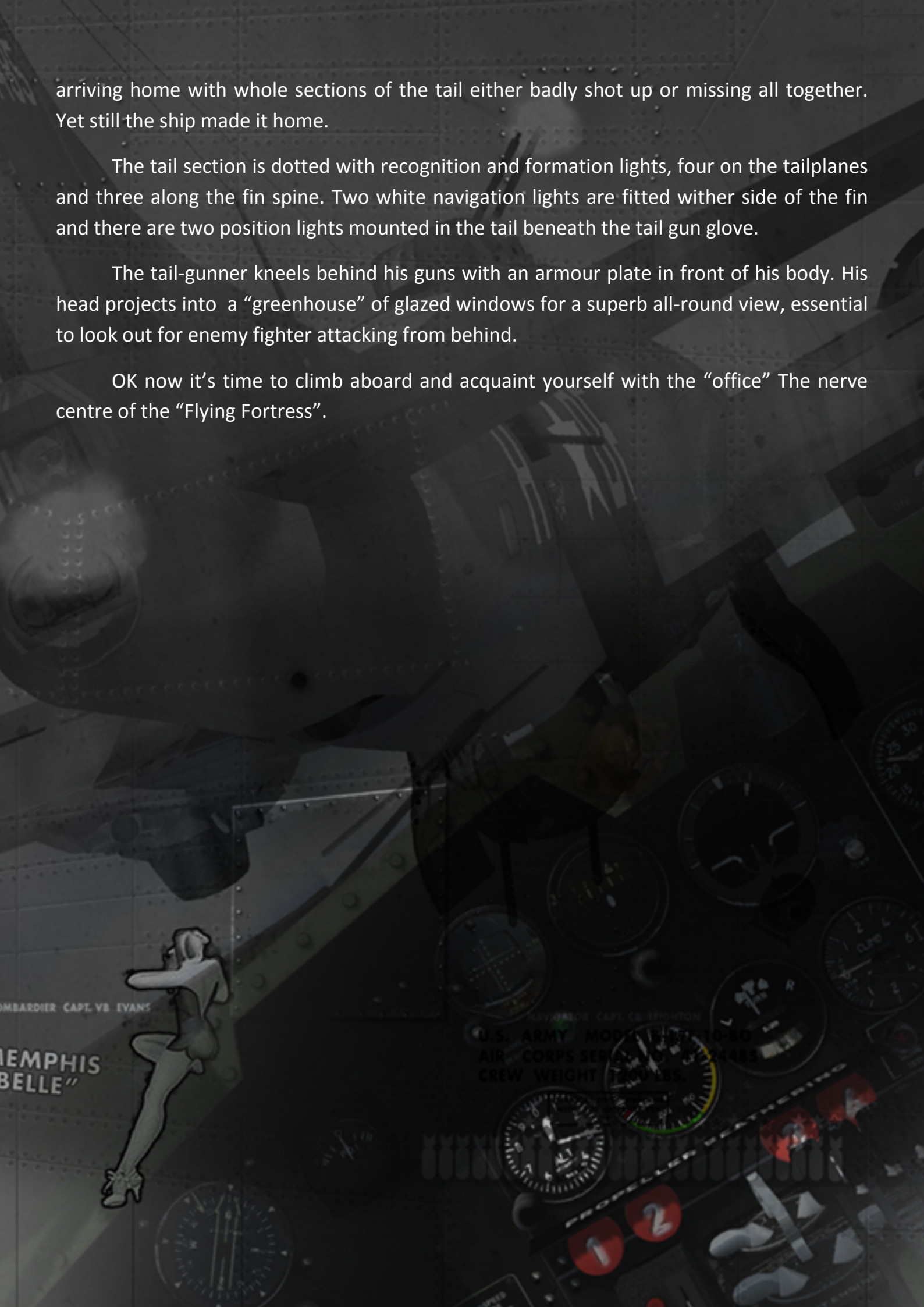
Everything about the B-17 is heavily engineered. This includes the giant fin and rudder and massive tailplanes and elevators. Quite often a “Fortress” would be seen

arriving home with whole sections of the tail either badly shot up or missing all together. Yet still the ship made it home.

The tail section is dotted with recognition and formation lights, four on the tailplanes and three along the fin spine. Two white navigation lights are fitted wither side of the fin and there are two position lights mounted in the tail beneath the tail gun glove.

The tail-gunner kneels behind his guns with an armour plate in front of his body. His head projects into a “greenhouse” of glazed windows for a superb all-round view, essential to look out for enemy fighter attacking from behind.

OK now it’s time to climb aboard and acquaint yourself with the “office” The nerve centre of the “Flying Fortress”.



COCKPIT GUIDE

The cockpit is laid out in a logical manner with everything immediately accessible and you should experience little difficulty getting to know where things are and what they do.

The cockpit is dominated by a large pedestal unit which contains everything for engine management for the four big radials. The electrics are in their own panel box to the left of the command pilot and the main panel contains all the gauges necessary for flight and monitoring systems.

So let's divide the cockpit up into digestible "chunks" and examine the major controls and fittings.

Main Panel.

There are three sections to the main panel. The Captain's panel, Co-pilot Panel and Engine start and Fire control panel.

The engine management is monitored from the co-pilot side to leave the Captain free to control the aircraft. Usually, the Engineer Officer would perch between the two pilots and leaning forward, monitor and adjust the engine controls and gauges. When in combat status, he would become the upper turret gunner.

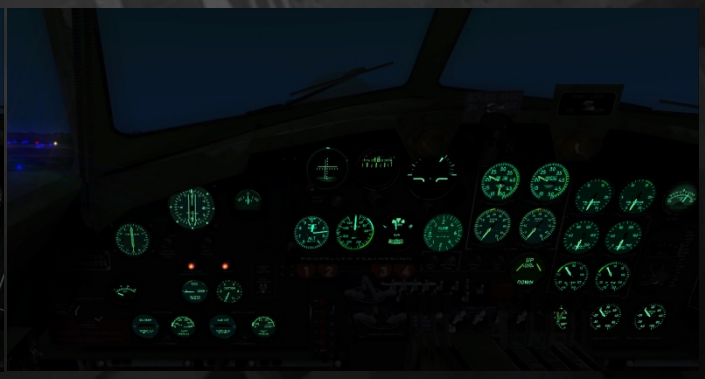
A special “yoke-hider” switch **19.** has been added to remove the control columns and yokes for a better view of the panels. It is the “Airspeed Tube Selector” switch on the Captain’s Panel.

Other points of interest are:

Navigation ADF and NAV 1 pointers are added to the Radio Compass to make it an RMDI useable for cross-country navigation using standard navigation VOR techniques. Technically not fitted to the B17, this will make life more enjoyable for the virtual pilot as you can access any airport with an ILS approach and make cross-country and long-range waypoint-based passages.

Night lighting is by conventional panel-light torch illumination or you have the choice of fluorescent UV lighting (green) for maximum night vision. This was standard on all B-17s.

PANEL TORCH LIGHTING



UV FLOURESCENT LIGHTING

Both the Pilot’s and Co-pilot’s side windows will slide back if clicked. Close before takeoff and of course at altitude to avoid frost-bite!

CAPTAIN'S PANEL

1. Gyro Directional Compass 2. PDI (commands received from Bombardier) 3. Altimeter

4. Airspeed 5. Turn/Slip Indicator 6. Vertical Speed Indicator 7. Artificial Horizon

8. Gyro Compass 9. RMI (ILS and Glideslope) 10. Marker Beacon Light

11. Radio Magnetic Direction Indicator 12. Bomb doors open light 13. Bomb release light

14.Low Oil Pressure 15. Low Vacuum 16.Volt Meter 17. Hydraulic Pressure 18. Vacuum

19. Yoke Hider Switch 20. Propeller Feather 21. Gear indicator light

22. SCR522 Comms Radio (INOP in this simulation) 23. Oxygen Contents Gauge

24. Oxygen flow "Blinker" gauge 25. UV lighting switch

CO-PILOT'S PANEL

1. Manifold Pressure (x4) 2. Tachometers (x4) 3. Fuel Pressure (x4)

4. Oil Pressure (x4) 5. Oil Temperature (x4) 6. Cylinder Head Temperature (x4)

7. Carburettor Air Temperature (air inlet)(x4) 8. Flap position indicator

9. Multi-Fuel Tank Contents Gauge and selector (separate section)

10. Outside Air Temperature (OAT) 11. Panel lights switch 12. Carburettor Filter panel

13. Oil dilution switches 14.Engine Starters (separate section)

15. Fire control panel (separate section) 16. Radios (separate section)

ELECTRICAL PANEL

The Electrical Panel contains the majority of electrical systems controls and switches for the aircraft. The B-17 has three batteries and an inverter circuit for the instrumentation. Each engine has its own generator and charging circuit with ammeters. The volt meter is a multi-scale instrument and a switch is provided for each circuit display.

The red lever marked “R” is the Emergency Bomb Release lever and if the bomb-doors are open, this can be pulled to release the bombs. A confirmation warning light will glow on the Captain’s Panel **15.** when the bombs have been released.

THE PEDESTAL

The pedestal can be divided into three main sections.

Forward segment

This section contains the ignition magnetos for each engine, the cowl flap controls, fuel pump switches, flap and landing gear switches and various light switches.

1. Master Ignition Switches (ganged) 2. Magneto switches (per engine)

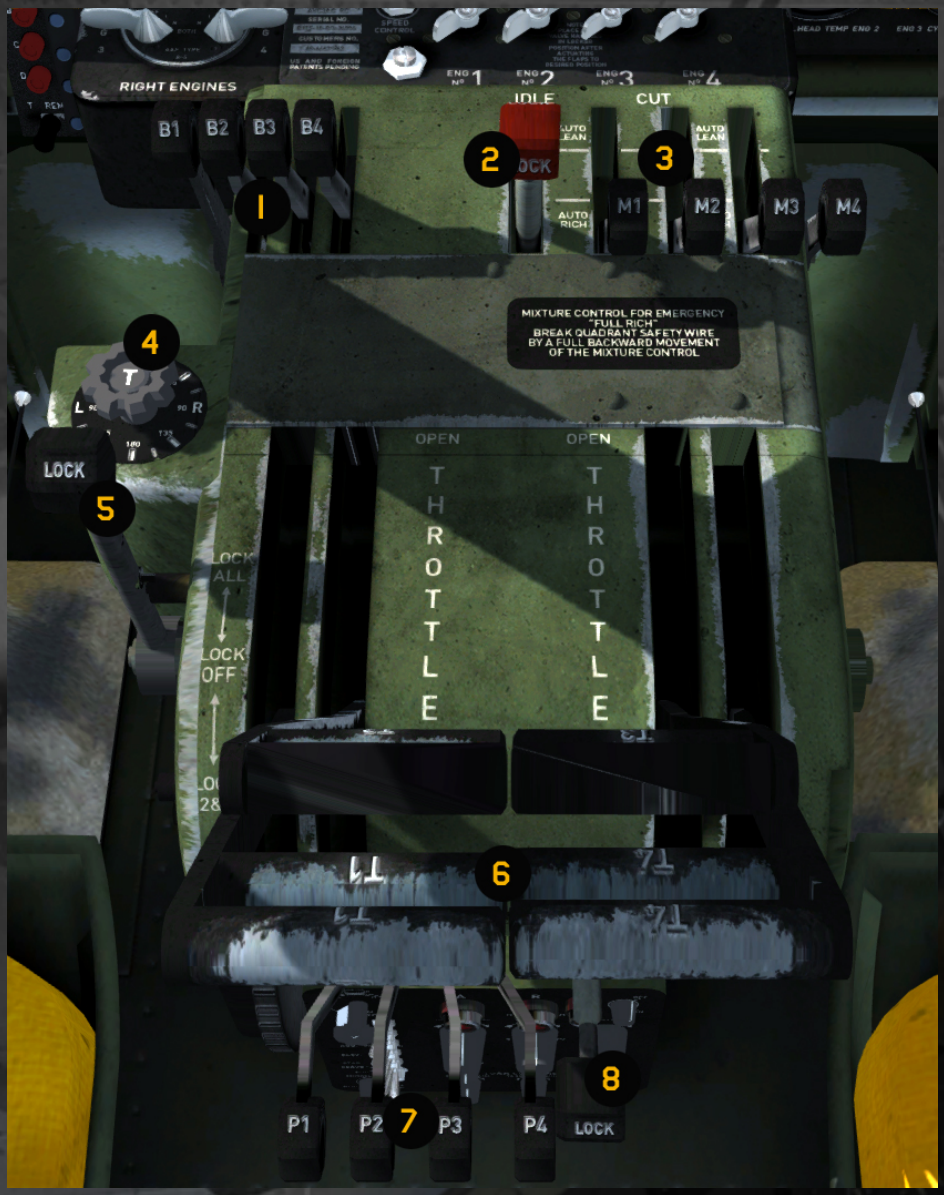
3. Fuel Cut-OFF(x4) 4. Fuel Boost Pumps (x4) 5. Cowl Flap levers (per engine)

6. Recognition light switches (RED,AMBER,GREEN,WHITE) 7. Landing Gear Switch

8. Landing Light switches 9. Flaps Switch

Main segment

Here you will find the main throttle quadrant, and controls for mixture and turbocharging. A large elevator trim wheel is mounted to the left of the quadrant near the floor.



1. Turbocharger Boost control levers 2. Mixture Lock 3. Mixture levers

4. Turn Control (slaved to autopilot) 5. Throttle lock 6. Throttles 7. Propeller controls

8. Landing Light switches 9. Flaps Switch

Rear segment

Mounted here are the controls for the propellers and a panel for the “autopilot”. Not strictly an autopilot by modern standards, it can be used as a “GyroPilot” for holding altitude, height and for basic course/heading adjustments.

1. Master Autopilot switch 2. Heading/Turn control 3. Heading Hold switch

4. Altitude Hold switch 5. Autopilot Pitch control (used in conjunction with Altitude Hold

6. Rudder trim control and indicator 7. Rudder and Elevator control lock

8. Tail Wheel Lock 9. Elevator trim wheel

NOTE: Before flying, ensure that the Rudder and Elevator control lock is OFF (Down) If you do not do this, you will have no flying controls for takeoff!

Unfortunately history records this as the reason for the fatal crash of the prototype in 1935 with the loss of all crew. The locks were in place during takeoff resulting in total loss of flying control.

Radios

The radio sets of the real B-17 were quite primitive and mounted in the roof panel. Used mainly for communications, there were no real navigational aids aboard, at least nothing like today's aircraft. This work was done by the navigator. However, we have installed a relatively modern radio set in your B-17 to make true cross-country and intercontinental flight possible. The stack contains a navigation radio for NAV1 and ADF reception. Additional ADF and NAV1 needles are installed in the Radio Compass on the Captain's Panel **11.** which will indicate direction to radials if the radios are tuned correctly. A localiser/ILS/Glideslope indicator RMI is also fitted to make ILS approaches possible.

1. ADF receiver 2. Large digit 3.Middle digit 4. Small digit

5. Comm1 Standby/Active 6. Comm2 Standby/Active

7. Nav 1 receiver 8. Nav tuner

Other Controls

The control columns and yokes can be “removed” using a special switch. This will aid with better visibility of the panel and controls.

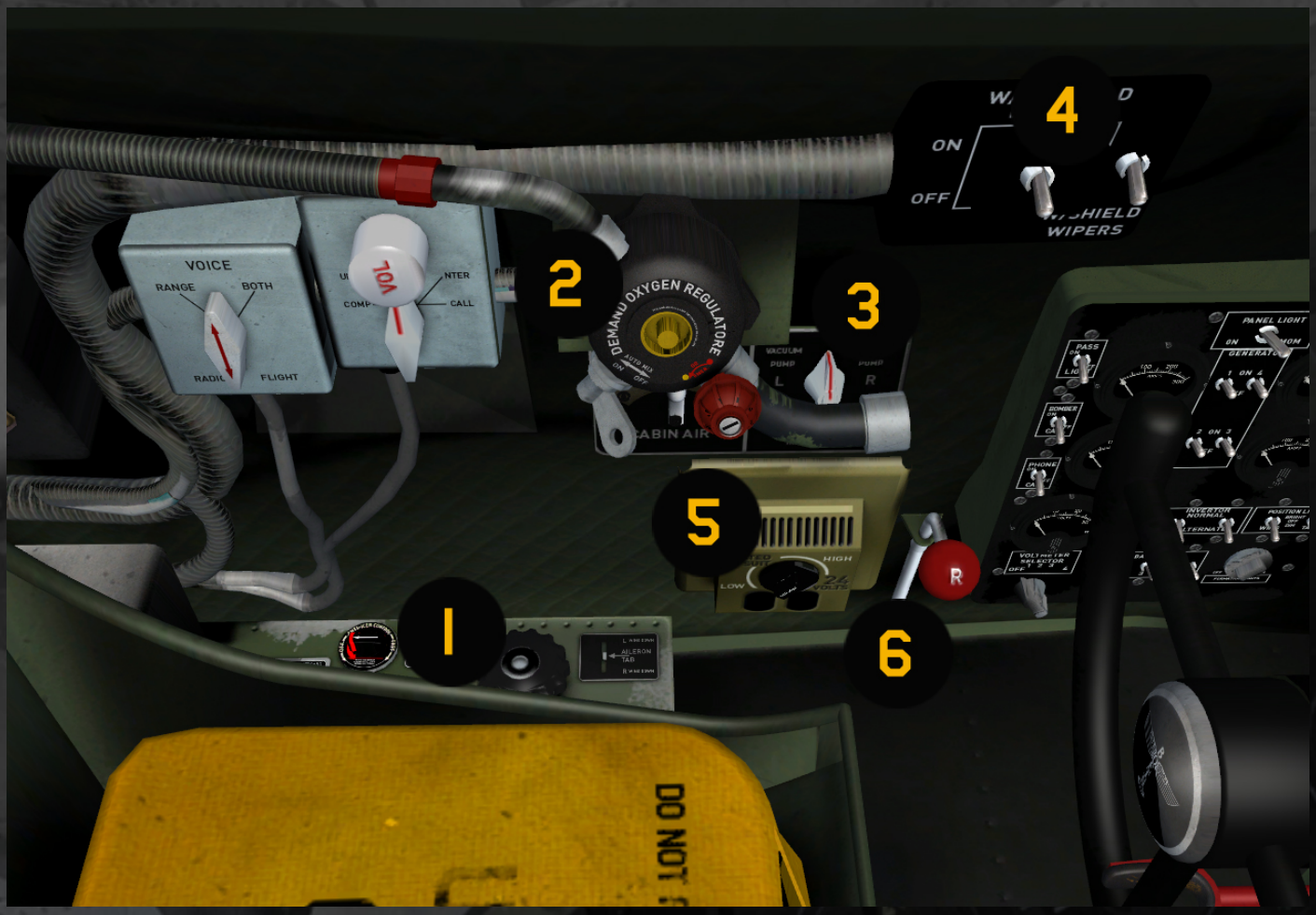
The real aircraft has a retractable lock mounted in the column to lock the yoke and therefore the flight control. This is simulated and if clicked, the lock will spring out and lock the spokes of the yoke, preventing aileron use. DO NOT USE THIS CONTROL IN FLIGHT!

Oxygen is essential at altitude (above 10,000 ft) so oxygen equipment and regulators are provided for each pilot and crew member. The crew put on their masks automatically above 10,000ft but for extra realism you should turn on the oxygen supply using the controls on the regulators. When you do, you can check oxygen flow by watching the “blinkers” flicker. Keep an eye on the oxygen contents gauges and don’t run out!

SIDEWALLS

The side cockpit walls contain an array of vital equipment including controls for oxygen and flying suit heating. The Captain also has controls for de-icing and windshield wipers the aileron trimtab control is low down at the side of the pilot seat. The Co-Pilot has the all important Turbocharger cooler levers and Engine Primer control.

CAPTAIN'S WALL



1. Aileron tab control 2. Pilot's oxygen controls 3. Vacuum Pump control

4. Windshield wiper switches 5. Suit heater (inop in this simulation) 6. Bomb release

CO-PILOT'S WALL

1. Turbocharger Intercooler levers (per engine) 2. Co- Pilot's oxygen controls

3. Suit heater (inop in this simulation) 4. Multi-Engine Primer control

5. Emergency Hydraulic lever (landing gear) USE ONCE-NON-RETURN

6. Park brake lever

ROOF

As already mentioned the real radios fitted to the early B17s were quite primitive and caused problems when used in European skies as the transmissions from this equipment were not secure against enemy interception. We have modelled the radio sets into the roof for an authentic look but the units are INOP for this simulation, being augmented by more modern equipment mounted on the Co-Pilot's side wall. Other items installed in the cockpit roof are a Dome light and switch for overall illumination of the flight deck and an Emergency Brake lever. This is a ONE-TIME operation – used only at times of emergency where the aircraft braking system has failed. Pull the handle ONCE and the brakes will be applied and locked

LIGHTS

The B-17F has no shortage of lights. The airframe is festooned with lights of different colours and intensity for a range of combinations and roles.

A. Starboard navigation light B. Port navigation light C. Starboard landing light

D. Port landing light E. Passing light (Red) F. Formation lights (Blue) G. Recognition lights

H. Navigation lights (White) I. Tail lights (White and Red)

All lighting except for Recognition lights and Landing lights are controlled from the Captain's sidewall-mounted Electrical Panel. Switches for the Landing and Recognition lights are mounted on the Forward Pedestal Panel.

Flying THE B17-F-10 AND B17-F-20 SERIES FORTRESS

The Checklists provided here are taken from official factory documents, namely the "Pilot's Notes for the B17F" and the "Guide to the B17F". By following these checklists you will soon get the hang of starting and flying your B-17 on a regular basis. The aircraft is not difficult to fly, once you have learned to follow the various protocols. Refer to the cockpit guide illustrations for the locations of the relevant controls and switches.

PRE-START CHECKS

Intercoolers	COLD (levers down)
Gyros (instruments)	UNCAGED
Fuel Cut-offs	OPEN (Ganged switch forward)
Gear Switch	CENTRE/NEUTRAL
Cowl Flaps	OPEN
Turbochargers	OFF
Throttles	CLOSED
Propellers	CHECKED
Autopilot	OFF
De-Icing	OFF
Cabin Heat	OFF
Generators	OFF
Batteries and inverters	ON

Parkbrake ON

The aircraft should now have power and we are ready to start engines.

The Master Ignition switches are ganged in pairs. Move the long gang lever forward to the ON position.

Turn on the fuel boost pumps and switch the carburettor filters to OPEN. The bank of red lights should glow to indicate that the filters are in operation. Also in cold weather, switch ON Oil Dilution for about 30 seconds, to make starting easier.

Now, check your fuel quantities using the multiple gauge. Turn the knob through the various tanks and check the reading for each.

Move the mixture levers to full rich position on the quadrant.

Switch the magneto switch for Engine No.1 through 1, 2 and “both”

Now use the starter switches over on the right side of the panel. First, selecting Engine 1, move the START switch to the ON “+” position. This is now energising the No.1 engine.

Rather like a clutch control in a car, the engine starter needs to spin up to high energy before the start gears are engaged. Whilst this switch is in this position, use the engine primer which is low down on the right wall next to the co-pilot seat. Turn the handle to the ENG. 1 position with left-click and right –click to prime the engine with **no more than 4 strokes**. This is important to not flood the engine with fuel. Return the primer to the off position. Now move the MESH switch to the ON "+"position and the engine should fire.

Wait for the engine to settle into an idle before returning both start switches to their neutral position. Repeat this procedure for the other engines.

Turn on the Vacuum pumps using the control on the left wall and check the vacuum/suction gauge. Gyro driven instruments such as the Artificial Horizon indicator should now be powered up.

ENGINE START CHECKS

Master ignition switches	ON Forward
Batteries and inverters	ON
Parking Brake	ON
Boost pumps	ON
Carburettor filters	OPEN
Fuel Quantities	CHECK (Cycle through indicators)
Mixtures	FULL RICH POSITION
Engine No.1 Magnetos	TO “BOTH”POSITION
Engine No1. Start switch	TO START + POSITION
Engine primer	TO ENGINE 1 POSITION THEN 4 STROKES.
Engine No1. Mesh switch	TO MESH + POSITION

After engine start, return switch to neutral position.

Repeat for other three engines.

Vacuum pump	ON
Instruments	CHECK NORMAL READINGS and VACUUM SHOWING

NOTE:

Most four-engined aircraft start their engines using inboards 2 or 3 first. The B-17 F starts “across the board” that is 1,2,3,4.

ENGINE RUN-UP

According to the official documentation, the following figures relate to ideal engine condition and should be checked against the gauges before going further.

OIL PRESSURES

DESIRED	**75 PSI**
MAXIMUM	**80 PSI**
MINIMUM	**70 PSI**

OIL TEMPERATURES

DESIRED	**70 ^{0}C**
MAXIMUM	**88 ^{0}C**
MINIMUM	**60 ^{0}C**

CYLINDER HEAD TEMPERATURES

DESIRED	**170 ^{0}C**
MAXIMUM	**205 ^{0}C**
MINIMUM	**125 ^{0}C**

FUEL PRESSURES

DESIRED	**12 - 16 PSI**

CARBURETTOR AIR TEMPERATURES

DESIRED	**15 ^{0}C**
MAXIMUM	**38 ^{0}C**

TACHOMETERS AND MANIFOLD PRESSURES STEADY

PRE-TAKEOFF/TAXY

Tailwheel	UNLOCK for taxy.
Gyros	SET
Generators	ON
Park Brake	ON AND LOCKED
Trimtabs	SET

ALL cowl-flaps should be open and remain open during takeoff but preferably closed in the climb.

Use your OUTBOARD ENGINES for taxying and turning. Run the inboards at no less than 500 RPM.

Taxy slowly, it takes quite a distance to slow a fully laden aircraft like the B-17 so do not taxy faster than a ground crew man can walk. The B-17 has a big nose and of course, is a tail-dragger making it hard to see for a forward view. Weave the aircraft in an “S” pattern using the outboards so that you can see forward. Make sure the tailwheel is unlocked.

When you reach the takeoff point and you are lined up, LOCK THE TAIL WHEEL.

Apply the park brake and carry out run-up checks.

Check props for pitch change and monitor the Tachometers for rises and falls in RPM.

Run up to 28 inches on the Manifold gauges and move each engine magneto to “1” for just a few seconds and then back to “both”. Observe a drop in RPM.

Move the Turbocharger levers back to FULL and check any rise in manifold pressure and RPM.

You should see around 2400 RPM

Reduce throttle to 1,000 RPM

You are now ready for takeoff.

TAKEOFF

Close all windows and hatches

Set all trims to neutral

Progressively open all throttles together.

Always takeoff from the two main wheels, do not attempt three wheel takeoffs.

Use stick pressure if necessary to bring up the tail to a low angle so that you are rolling on the main wheels before lifting off.

At 110 -115 MPH a small amount of back pressure on the yoke will see the aircraft lift off.

Once you have positive climb at a safe speed (above 110 MPH) raise the landing gear.

Once you have attained 140 MPH reduce power and reduce or shut off the Turbochargers.

CLIMB

For a normal climb configuration, you should use between 32 and 35 inches of manifold pressure and an RPM of 2300. Monitor cylinder head temperatures but try to have the cowl flaps closed as much as possible.

The numbers in the climb should be:

35 inches, 2300 RPM, 140 MPH indicated.

Use trimmers sparingly as required to maintain a steady angle of attack and positive climb.

Monitor cylinder head temperatures and attempt to keep them just below 205^0C by using cowl flaps.

Maintain the Carburettor Air temps between 15^0 and 38^0

As you climb higher, progressively raise the Turbo Intercooler shutter levers.

Turn OFF the Carburettor Air Filters above 8,000 feet.

ABOVE 10,000 FEET, TURN ON THE FUEL BOOSTER PUMPS.

As you climb higher it will be necessary to lean out the mixtures. As you do this monitor the RPM and Manifold pressure values.

CRUISE

Continue the climb for 200 – 300 ft above the desired flight level. Pitch the aircraft forward "onto the step" so that you approach the cruise altitude with good speed and power in hand. You can then reduce power to achieve you desired cruising speed without any unnecessary loss in altitude. Remember it is more "expensive" to climb than descend.

Depending on the length of flight and fuel quantity carried, the condition of the aircraft must ALWAYS be monitored with a view to economic and efficient operation. Continually check gauges and maintain required manifold, RPM and airspeed numbers for the flight.

USE OF THE AUTOPILOT

The B-17F is not fitted with a conventional autopilot, at least, not by modern standards.

It does however, have the ability to hold altitude and heading. Once you have acquired your cruise height turn on the Autopilot and use the ALTITUDE HOLD switch to maintain your current altitude automatically. To adjust, use the PITCH CONTROL KNOB on the Auto pilot, NOT THE MAIN ELEVATORTRIM WHEEL.

Once you are established on a desired heading, use the HEADING HOLD switch to maintain that heading automatically. Use the TURN knob(s) to adjust your heading.

USE OF THE NAVIGATION RADIOS

As already stated, your B-17 is fitted with ADF (Automatic Direction Finding) and VOR (VHF Omni-directional Range) equipment.

This makes it possible for the pilot to navigate by accessing the frequency of the ADF and/or VOR transmitting station and tuning in. The indicators on the RMDI (Radio Compass) will point in the direction of the radial from where the transmissions are coming. Thusly, it is possible to navigate across country (and oceans) by using waypoint and destination frequencies if known.

There is also an RMI Localiser/GLideslope instrument fitted which aids in ILS approaches at airfields that have the necessary equipment.

In the following example we are on approach to land having followed the direction of the radial using the NAV needle on the RMDI and cross-referencing with the ADF needle.

The RMI shows that we are a degree or two off course, the CDI (Course Deviation Indicator) shows we need to fly left a few more degrees before turning in and we appear to be OK on the glide slope for an accurate touchdown at the airfield.

The B17-F has a very benign stall which happens at speeds below 102 MPH and which requires only moderate diving to recover. There is only a very mild wing dipping and immediate forward stick pressure will recover in most situations.

Generally, the B17F is a joy to fly with no vices. It is heavy so don't go expecting high performance manoeuvres and fast climbs. Think ahead and plan your journeys carefully to conserve energy and fuel.

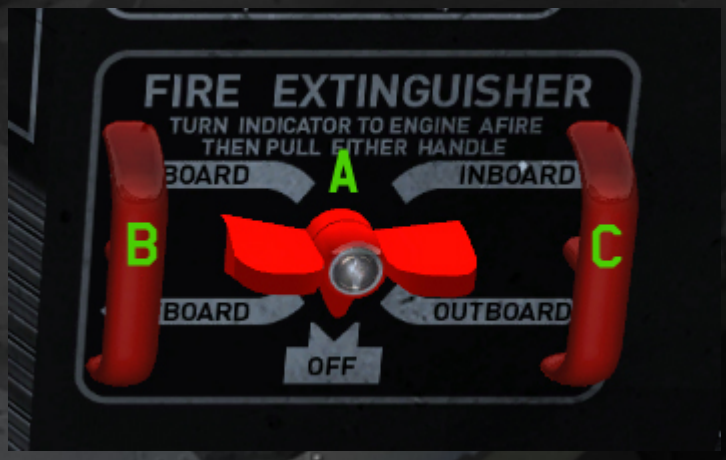
PROP FEATHERING

Feathering is the process of turning the pitch of the propeller blades to 90^0 or so, or edge on to the wind. This causes the least amount of drag on an affected engine and also reduces overall drag whilst flying forward. To feather a propeller, first cut the engine by closing the throttle and moving the mixture control to "CUT" . Also close the relevant Turbocharger boost control if being used . Once the propeller has stopped turning, push the feather button for that engine (red button marked with engine number on the main panel) and the propeller will move into the feathered position. Turn the magneto switch for that engine to the OFF position and re-trim the aircraft using power settings and trimtabs to account for the loss of one or more engines. There are tales of B17s coming home on one engine but do not be tempted to try it, it requires exceptional pilot skills to pull off.

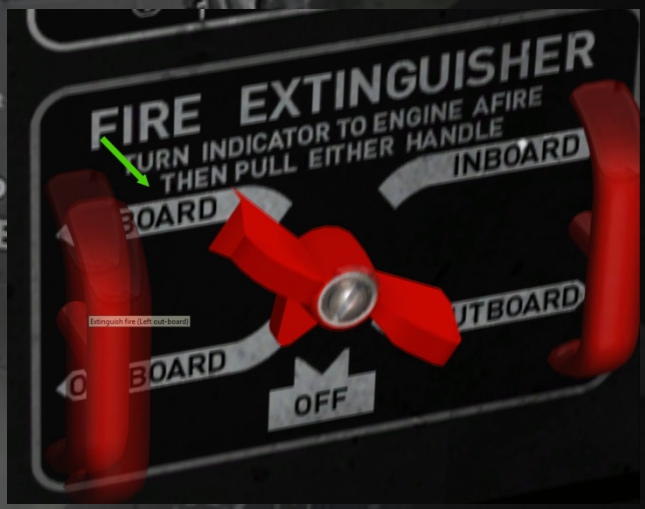
FIRE CONTROL

In the event of fire, cut the relevant engine and feather the prop.

There is a simple to use fire control panel mounted in front of the Co-Pilot on the wing extension of the main panel, below the engine starters.



To use it, turn the central knob “A” so that the pointed section points to the affected engine. This energises the fire extinguisher and the extinguisher operates when the handle “B” (for left side engines) is pulled out.



LANDING

Before making your final approach, turn off the Autopilot if it is on.

Move Turbo Intercooler levers to COLD position (down)

Check that fuel booster pumps are ON

Turn on Carburettor Filters – Red Lights

Maintain an airspeed of 130 -135 MPH

Lower the landing gear and check lights confirm down and locked.

Reduce manifold pressure to about 23 inches and move turbocharger boost levers to full ON.

Ensuring that your airspeed is below 142 MPH, lower the flaps one third by using the switch and check the position gauge.

Move propeller control levers to HIGH RPM

LOCK THE TAIL WHEEL!

Aim to arrive over the threshold at around 120 MPH and close the throttles and achieve a glide speed of 110 MPH before touch down on all three wheels.

Once the weight of the aircraft is firmly on the ground, apply braking to slow.

Raise the flaps for taxying and use just the outers to manoeuvre on the ground, UNLOCKING THE TAIL WHEEL when turning.

CONGRATULATIONS!

If you have followed the above guide correctly you have just finished your first test flight in the legendary B-17F.

Practice makes perfect and we know that within a short period you will be ready for your first long-distance mission.

GOOD LUCK!

CREDITS

Models, texturing, programming and sounds	AEROPLANE HEAVEN
Flight dynamics	WAYNE TUDOR

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