



B-1 B Lancer

USER Manual

Introduction

The Rockwell B-1B "Lancer", affectionately known as the "Bone" to its crews, is a key element of the American Strategic Long Range bomber fleet.

A development of the cancelled B-1A, the aircraft - while not technically stealth capable - still presents a fraction of the radar profile of the B-52 and incorporates extremely advanced navigation, weapons and avionics systems.

Its swing-wing technology, combined with four 30,000-lb thrust turbofan engines, creates a beautiful, fast and lethal package. The development of this successor to the B-52 began in the early 1960s and resulted in a contract being awarded to Rockwell in 1970. The B-1A first flew in 1974 but soon ran into political trouble.

The project was cancelled in 1977 when only 3 prototypes existed. However 1981 saw Ronald Reagan order a fleet of 100 B-1Bs, the last of which were delivered in May 1988. Designed for low-level, high-speed penetration, the B-1B saw action in the Kosovo conflict and second Gulf War.



Support

Should you experience difficulties or require extra information about the Virtavia B-1B Lancer, please e-mail our technical support on tech.support@virtavia.com

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Installation

The .msi installer puts the Virtavia model files into C:\Program Files (x86)\Virtavia. All Virtavia P3D aircraft will be put into this folder, as recommended by Lockheed Martin.

!! The files must be copied or moved into the P3D directory structure before the aircraft will appear in P3D !!

!! Note there are custom Effects (with Textures) and Custom Sounds which have to be moved/copied manually to their homes in P3D !!

Installation procedure

1) Open Windows Explorer in TWO windows.

2) In one Explorer window, locate and open the folder:

C:\Program Files (x86)\Virtavia (or Win8/10 equivalent)

Here you will find three sub-folders :

Virtavia B-1B Lancer v2 – ALCMs

Virtavia B-1B Lancer v2 – JDAMs

Virtavia B-1B Lancer v2 - Mk82s

3) In the other Explorer window, locate and open the folder:

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes

4) Position the two Explorer windows side-by-side.

DRAG and DROP the above three B-1B folders into :

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes

Once you have done that, check you now have this structure :

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes\
Virtavia B-1B Lancer v2 – ALCMs

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes\
Virtavia B-1B Lancer v2 – JDAMs

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes\
Virtavia B-1B Lancer v2 – Mk82s

*** Custom Effects ***

5) The model will run now but you should also copy the AB effects and custom sounds over to P3D too ! The AB effects files and their special textures are inside a folder called '_Effects' in any of the three B-1B folders (finding only one folder is sufficient, they all have the same effects), so look for, eg. :

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\Airplanes\
Virtavia B-1B Lancer v2 - ALCMs_Effects

Inside '_Effects' are three .fx files and a \Texture folder with five .bmp textures in it. Copy the three .fx files and the entire texture folder (ie. the Texture folder itself, not just the .bmps within it) into the main Effects folder in P3D, which is here :

C:\Program Files\Lockheed Martin\Prepar3D v4\Effects

NOTE: so you are copying 3 x .fx files and 1 x \Texture folder into P3D's main \Effects folder. P3D already has a Texture folder inside its Effects folder, so the B-1Bs AB textures will go in there using this method.

*** Custom Afterburner and Warning Sounds ***

Each B-1B folder has the same '_Custom sounds' folder, in there are two .wav files. Copy these into the main Sound folder in P3D, which is here :

C:\Program Files\Lockheed Martin\Prepar3D v4\Sound

NOTE: only copy the CONTENTS of the _Custom sounds folder, not the actual folder itself.

*** Aircraft Manual ***

The User Manual in PDF format can be found in any of the three B-1Bs' main folders, eg. :

C:\Program Files\Lockheed Martin\Prepar3D v4\SimObjects\
Airplanes\Virtavia B-1B Lancer v2 – ALCMs_Manual

Each manual is identical. The installer will create a shortcut to the original installation, so if you have moved or deleted that, you will need to re-create the shortcut to reflect the manual's new position in the P3D file structure.

If you experience any difficulties with this procedure, please e-mail tech.support@virtavia.com



Exterior Model

The exterior model has all the usual animations such as landing gear, elevators etc as well as some custom ones :

Fully animated swing wing with leading edge slats (automatic on load-in only, uses flap key variable).

Animated spoilerons and elevons (automatic, on stick left/right).

Wing spoilers (/key).

Opening cockpit hatch (shift-e), or click warning light.

Opening bomb bays on Exit commands (shift-e + 2, 3, and 4).

Togglable crew figures (ctrl-w).

Exterior Lighting

Pressing the L key will turn on all lights, you may however wish to turn them on using the appropriate switches in the cockpit, as the L key also puts all lights on simultaneously.

Shift-L will toggle the nav lights and the cockpit lights.

Crtl-L will toggle the landing lights.

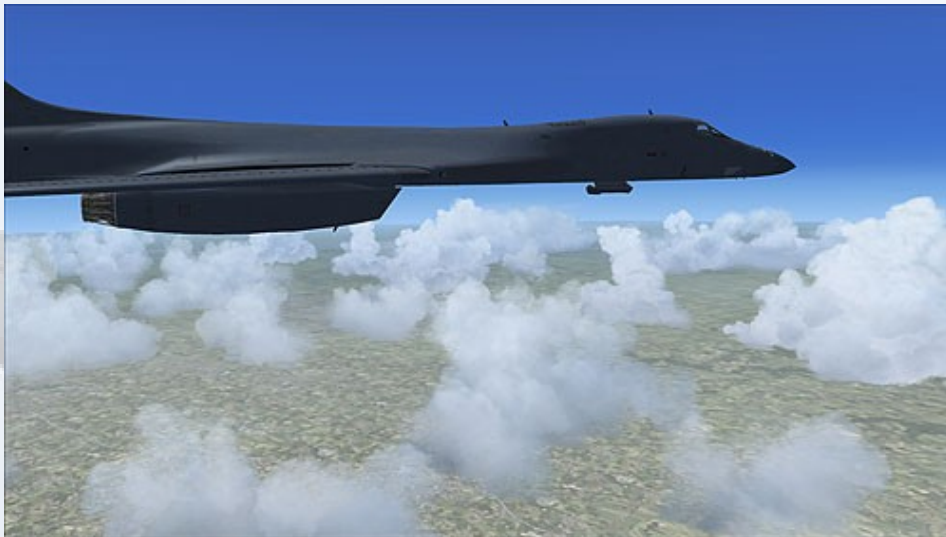
Please refer to the cockpit section of this manual for information regarding light switch location.

Alternative Viewpoints

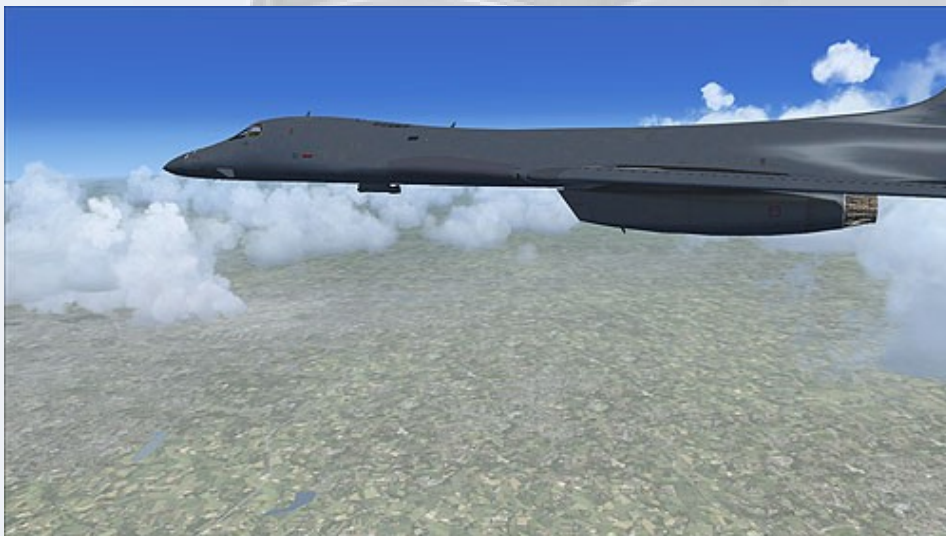
There are several different ways of looking at the aircraft and the cockpit, select these alternative views by right-clicking in an empty area and picking the 'Aircraft' menu for external views and the 'Cockpit' menu for views inside the cabin.

External View Options

Right Wing View



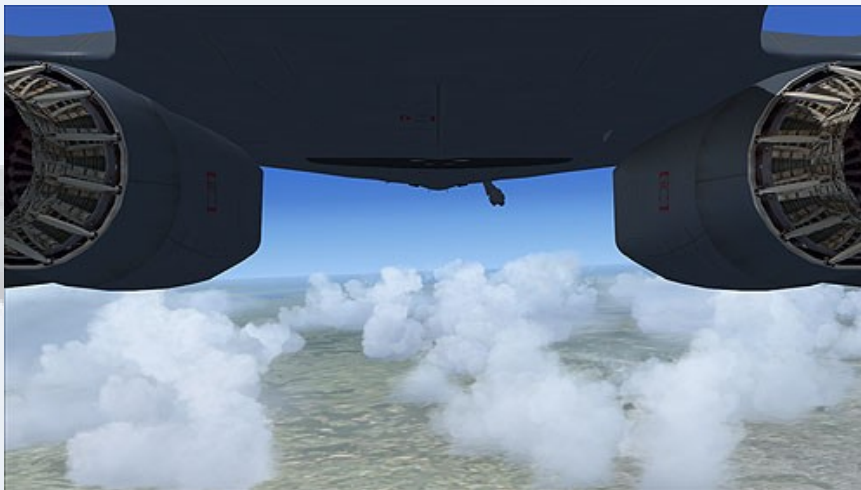
Left Wing View



Tail View



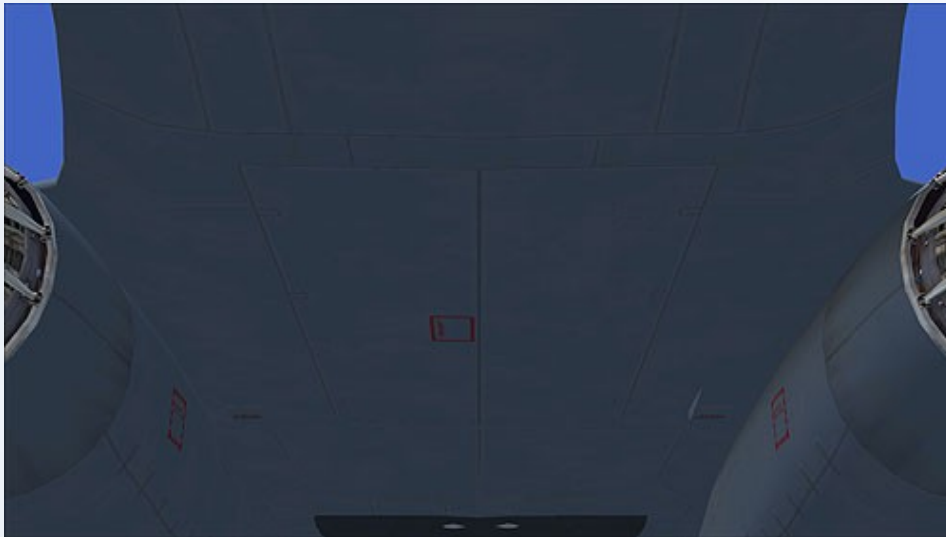
Landing Gear View



Forward Bomb Bay View



Aft Bomb Bay View



Refuelling Tanker View



Cockpit Views

Pilot's View (zoomed out)



Copilot's View



Center Console View View



Overhead Panel View



Cockpit Entrance View



Virtual Cockpit Functions

Over the next few pages are several diagrams designed to aid in cockpit familiarisation. Whilst the exterior aeroplane may differ in configuration, the cockpit is uniform throughout.

All systems that are labelled may be operated by clicking them with your mouse. Please read the descriptions carefully in order to fully understand what each switch, button, or lever, does.

Note that multi-selection 'selector knobs' require right mouse clicks to advance, and left mouse clicks to return.

Main Panel



- | | |
|---------------------------------|---|
| 1. Autopilot controls | 14. VDU mode selection control |
| 2. Mach adjuster | 15. RALT warning control |
| 3. Mach hold | 16. Kollsman adjustment knob |
| 4. Speed hold | 17. Altitude hold |
| 5. Speed adjuster | 18. Altitude selector |
| 6. Pitch trim control | 19. Marker lamp panel |
| 7. Warning lamp indicator panel | 20. Artificial Horizon cage button |
| 8. Engine out warning lamps | 21. TAS/ GS toggle |
| 9. NAV/GPS switch | 22. Kohlsman knob |
| 10. VSD contrast control | 23. Control surfaces position indicator |
| 11. Course selector control | 24. Bomb bay control switch |
| 12. Flight director switch | 25. Master audio warning mute |
| 13. AP Heading selector control | |

Center Panel



- | | |
|--|--|
| 1. Port fire bottle selector | 9. Fuel weight and tank selector control |
| 2. TAS/GS Toggle | 10. Fuel level indicators |
| 3. Control surfaces position indicator | 11. Total fuel weight indicator |
| 4. Fire extinguisher buttons | 12. Aircraft weight indicator |
| 5. Fire warning test lamps | 13. Total fuel flow rate indicator |
| 6. Starboard fire bottle selector | 14. Centre of Gravity Management |
| 7. Engine condition indicators | 15. Centre of Gravity Target Select (non-functional) |
| 8. Bomb bay control switch | 16. Fuel dump switch |

Left Side Panel



1. Seat height adjuster
2. Wing sweep control lever
3. Throttle levers
4. Elevator trim control switch
5. Rudder trim control switch

- 15

Overhead Console



- | | |
|-----------------------------|----------------------------|
| 1. Cabin altitude indicator | 6. Master battery switch |
| 2. Strobe lights switch | 7. Generator control panel |
| 3. Navigation lights switch | 8. Pitot heat switch |
| 4. Panel lights switch | |
| 5. Refuelling handle | |

Aircraft Systems and Operation

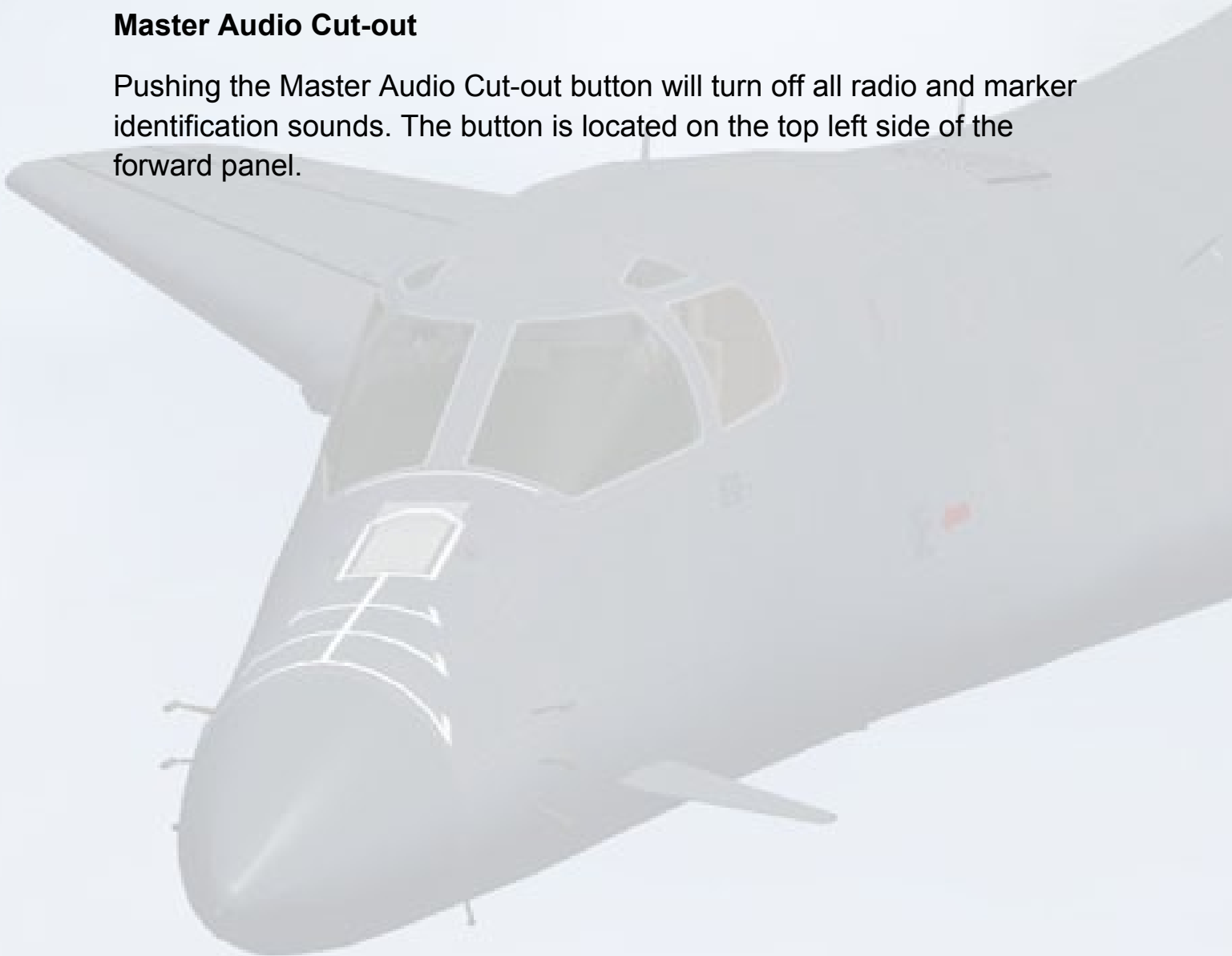
This section of the manual details individual systems and their operation.

Wing Sweep Inhibitor.

If the landing gear is deployed whilst airborne, the wings cannot be swept back past 30 degrees, as indicated by the wingsweep gauge. If, whilst airborne, the wings are already swept back past 30 degrees and the landing gear is deployed, the wings will automatically sweep forward to the 30 degree position.

Master Audio Cut-out

Pushing the Master Audio Cut-out button will turn off all radio and marker identification sounds. The button is located on the top left side of the forward panel.



Vertical Situation Display (VSD)

By default the VSD is turned OFF. Left clicking the mode knob will cycle backwards through modes. Right clicking will cycle forwards.



The VSD can be dimmed for night operation by using the contrast knob to the left of the turn and slip indicator. The default mode is ADI. This displays basic information. Central to the display is the pitch and roll ladder. This acts as an artificial horizon. Along the top of the display is a progressive gyro heading indicator, above which is a digital readout of the current exact heading.



When the flight director is activated, a target crosshair will appear over the pitch and roll ladder.



TER FLW mode builds on the ADI by adding a digital speed readout in the top left corner, and an altimeter readout in the top right corner. This is the best screen to use for normal operations.



TER AVD mode is like TER FLW mode, except the altimeter readout is from the radar altimeter rather than the usual indicated altitude.

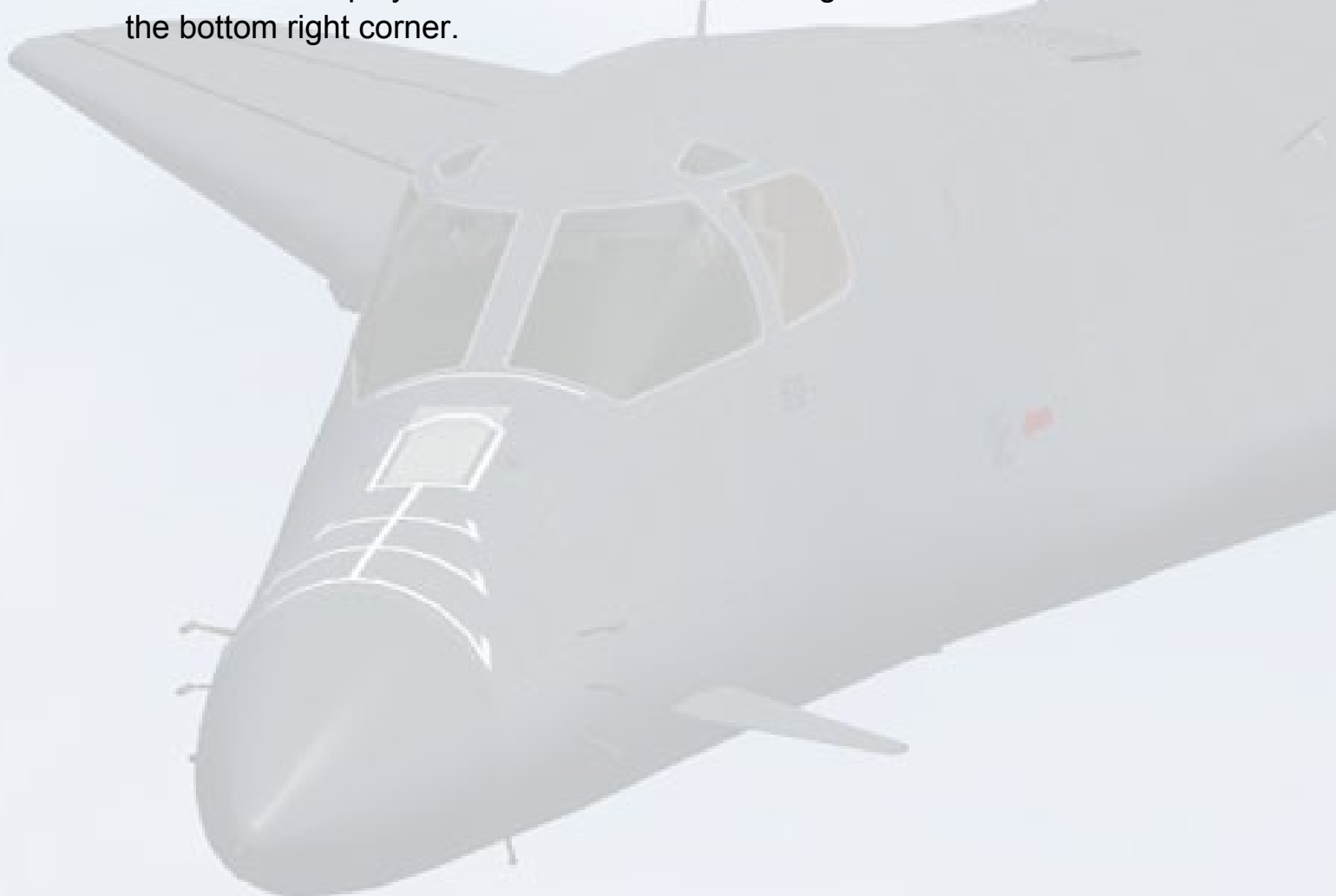


LS/AILA mode displays a digital course deviation indicator along the bottom of the ADI. If a glideslope is available, a similar glideslope deviation indicator will display along the left side of the ADI.

Altitude and airspeed indications are also visible in this mode.



TEST mode displays all available functions, along with the text 'TEST' in the bottom right corner.



Trim System



Left clicking trim switches will apply a negative value to the trim. Right clicking will apply a positive value.

In order to prepare for take-off, the Trim-Take-Off (TTO) button should be pressed and HELD until the TTO display indicates a green 'TTO' icon.

The TTO system sets wings fully forward with the flaps fully deployed and retracts the spoiler. The process will take 30 seconds to complete. Any control input or trim system changes will cause the TTO to require a reset. The system will only function when the aeroplane is on the ground.

Pitch trim is set manually using the white knob located atop the left of the VSD.

Engine Control Switches



Left-clicking a control switch will cause it to enter the START position, and spring back to RUN after the engine start sequence has been initialised.

Right-clicking the switch will cause it to go to the OFF position, cutting the fuel to the engine and thus shutting it down. The switch will stay in the OFF position until brought back to RUN using the left mouse button.

Autopilot

Autopilot controls can generally be operated by clicking the gauge fascia. Left clicking will decrease the selected value, and right clicking will increase.

5.4.1 Automatic Flight Control System (AFCS)

Autopilot functions are engaged by pushing the Switch-light buttons on the Automatic Flight Control System panels located beneath the outer cowling of both the pilot and co-pilot. When a function is engaged the lined-through blue text of the function will turn off and a green text version will appear.

5.4.2 CMD - Command Mode

This is the autopilot master switch. Selecting it engages wing and pitch levelling.

5.4.3 ALT - Altitude Hold Mode

When Altitude Hold Mode is selected the system maintains the current EXISTING altitude. Therefore setting up an altitude prior to take-off is not possible. The selected altitude can then be adjusted after take-off by clicking the “altitude selector” window, located below the vertical altimeter to the right of the VSD.

5.4.4 NAV - Navigation Mode

When Navigation Mode is selected the system will enabling automatic tracking of a VOR, GPS course, or localizer. If the left selector knob of the Vertical Situation Display (VSD) is set to NAV the aircraft captures and steers towards the VOR course or localizer tuned on the active frequency of NAV1 on the centre console. If the left selector knob of the VSD is set to GPS and a flight plan is loaded the aircraft will track to the next waypoint.

5.4.5 HDG - Heading Hold Mode

When selected the system will adjust the aircraft heading to whatever is indicated on the Horizontal Situation Indicator (HSI) gauge below the VSD. Adjustments can be made using the knob in the lower left corner on the HSI. The selected heading bug rotates around the compass ring on the HSI.

5.4.6 APR - Automatic Approach Mode

When selected the aircraft will steer to follow the ILS localizer and glide slope signals from the station tuned into the active frequency of NAV1 on the centre console. Selecting ILS/AILA on the VSD automatically engages the Automatic Approach Mode. It can be manually disengaged by pushing the APR switch-lights.

5.4.7 SPD - Airspeed Hold Mode

When selected the system maintains the current existing airspeed. Clicking the display window will allow adjustment to be made. If the AP engages the afterburners, these may stick in the ‘ON’ position if your joystick/controller throttle is at the max position, resulting in excessive

speed. The workaround is to turn off SPD, then pull back the throttle from max, then re-engage SPD.

5.4.8 MCH - Mach Hold Mode

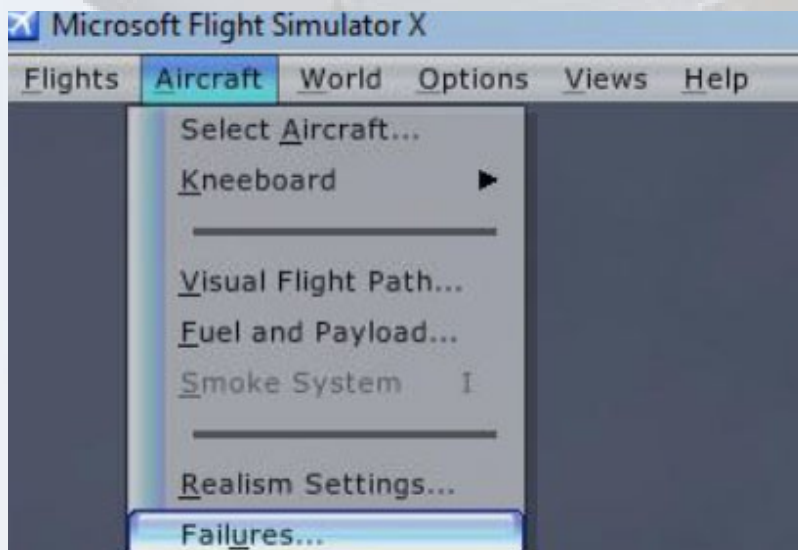
When selected the system maintains the current existing Mach value. Clicking the display window will allow adjustment to be made.

5.4.9 LOC - Localizer Back Course Mode

When selected the Localizer Back Course Mode enables automatic tracking of a localizer back course for instrument approaches. This works like the Automatic Approach Mode (APR) except the glide slope is disabled and the autopilot's response to a localiser signal reversed.

Failure Systems

Two unique scenarios covering engine failures are built into the B-1B package. The failures menu can be accessed by going to 'Aircraft -> Failures' via the header menu whilst in game.



Engine Failure

If 'Engine Fail' is selected from the in-game failures menu, a series of events will occur to simulate just that. This will include illumination of relevant lamps and run-down of the turbine itself.

Lamps that should be monitored include the hot oil warning, high vibration warning, and the master caution panel cluster.



Engine Fire

If 'Engine Fire' is selected, a series of events to simulate an engine fire will occur. A proper sequence is to be followed in order to extinguish the fire.

Should a fire occur, the relevant engine fire light(s) will illuminate. Smoke and flames may appear from the affected engine. First push the relevant engine switches to the OFF position. The fire extinguisher system should then be utilised by first selecting the correct engine pod. The extinguisher system has two supplies- MAIN and RES, either of which can be selected.

Once a supply and pod are selected, pressing the FIRE warning lamp will attempt to extinguish the fire and shut down the engine.

An audible warning will also sound should a fire occur. To cancel the warning manually, press the Master Audio button, located atop the front left panel.

Hatches & Entries

Should a malfunction occur with the hatches, or they simply be left open, the master caution light will illuminate. The exit-unlocked lamps will also illuminate red and will blink.

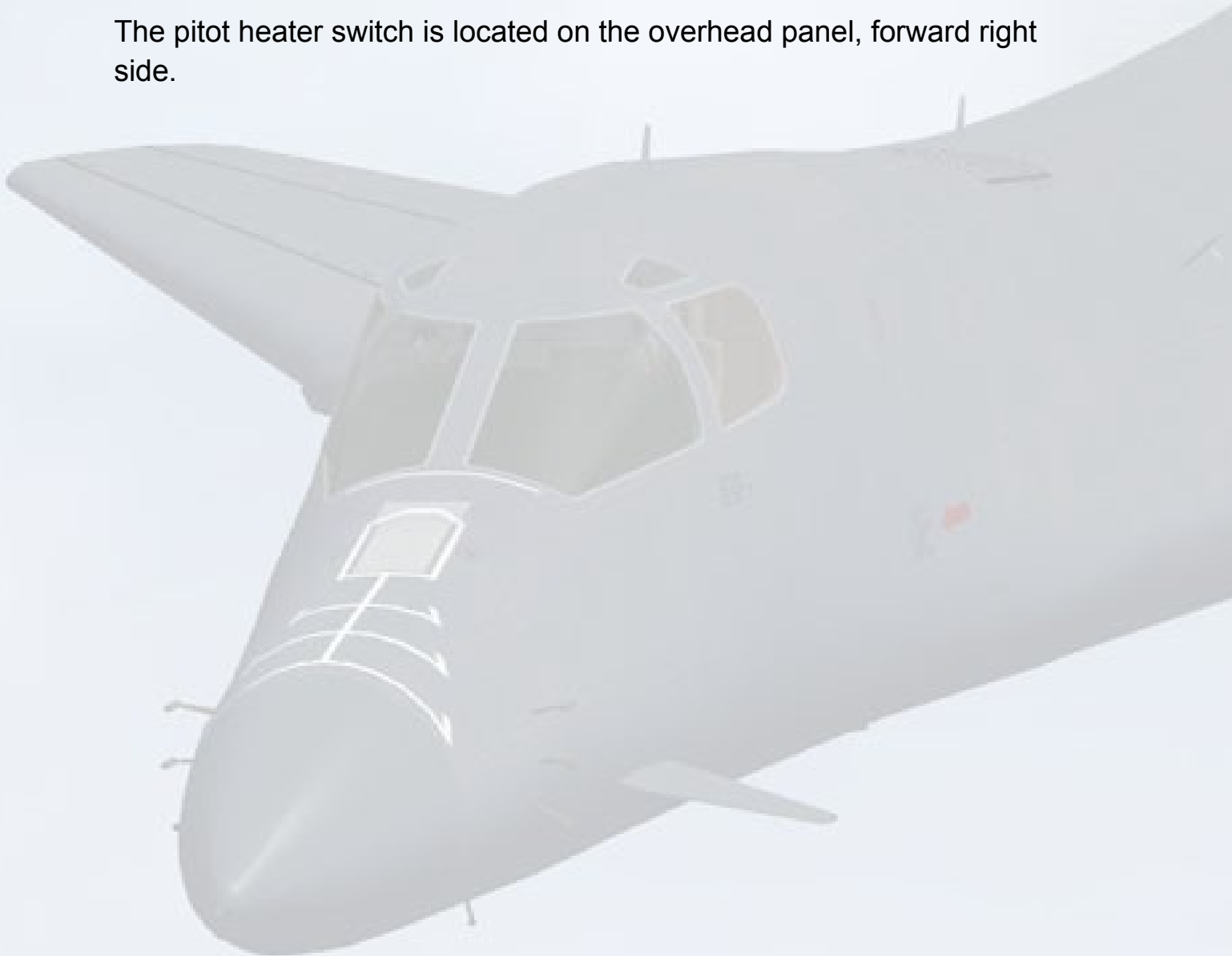
The amber exit-unlocked lamps will illuminate when an exit is open and unsecured.

Pitot Heater

The forward warning light panel contains pitot heat warning lamp. The lamp will illuminate green when the heater system is turned ON and amber when turned OFF.








If the outside air temperature drops below 5 deg. C, lamp will illuminate amber. Once OAT reaches zero, the lamp will flash red and Master Caution will illuminate. An audible warning tone will sound should the system not function correctly. To mute the sound, press the Master Audio button, located atop the front left panel.

The pitot heater switch is located on the overhead panel, forward right side.



Weapons Systems

The Virtavia B-1B is installed as 3 separate model variants :

-  Piper_J3Cub
-  RQ170
-  Tornado
-  TU-95
-  Virtavia B-1B Lancer v2 - ALCMs
-  Virtavia B-1B Lancer v2 - JDAMs
-  Virtavia B-1B Lancer v2 - Mk82s

The **ALCM** variant (Air Launched Cruise Missile) uses one lengthened weapons bomb bay and one aft, shorter bay for the auxiliary fuel tank. The bomb bay houses a single 8-station ALCM rotary launcher.

The following B-1B squadrons are represented :

28th BMS(H), 384th BMW(H), McConnell AFB, Kansas, 1992

46th BMS(H), 319th BMW(H), Grand Forks AFB, North Dakota, 1990

The **JDAM** variant (Joint Direct Attack Munition, or GBU-32) uses 3 standard bomb bays, each containing an 8-station rotary launcher. 24 guided GBU-32 bombs are carried.

The following B-1B squadrons are represented :

37th BS, 28th BW, Ellsworth AFB, South Dakota, “No Antidote”

9th BS, 7th BW, Dyess AFB, Texas, “Uncaged”

The **Mk82** variant uses 2 standard bomb bays each containing multiple racks of Mk82 ‘Snakeye’ unguided 1,000lb bombs. The real B-1B carries 28 bombs in each bay, however P3D limits this just 15 per bay. The forward bomb bay is reserved for the auxiliary fuel tank.

The following B-1B squadrons are represented :

37th BMS(H), 28th BMW(H), Ellsworth AFB, SD, 1988, “ Black Jack”

128th BS, 116th BW, Robins AFB, Georgia, 2000, “Memphis Belle”

34th BS, 366th BW, Mountain Home AFB, Idaho 2002, “Mountain Home”

77th BS, 28th BW, Ellsworth AFB, South Dakota, 2002, “Let's Roll”

Weapons Management

P3D comes with a built-in weapons system which includes a Weapons Selector and a basic Radar, together with 34 weapons types, including guided and unguided rockets, missiles and bombs. There is also a Countermeasures system, accessible though the Weapons Selector, which allows flares and chaff to be ejected from the aircraft.

The Virtavia B-1B uses the P3D Weapons Selector and Radar utilities in combination with a custom B-1B Weapons Management Panel. Clicking the new Sim Icon (yellow arrow below) will display these three utilities :



Weapons Selector Utility (WSU)

The WSU has three tabs along the top – Weapons, Guns and Countermeasures. The WSU will appear slightly differently depending on the selected aircraft. The image below shows a JDAM-equipped variant, the other variants will show ‘Cruise Missile’ or ‘Mk82 Snakeye’ in the Weapons tab. When there are too many weapons to display at once, use the page-left and page-right arrows to view the remaining weapons.



Individual weapons can be selected by clicking on their line in the Weapons window, it will change to white indicating it is now selected. Clicking again on it will deselect the weapon. Multiple weapons can be selected this way, although with the JDAM and ALCM variants this would not be appropriate (although possible), as weapons will fall through the rotary launcher. This is less of a problem for the Mk82's. A better method is to use the B-1B's custom Weapons Management Panel (WMP).

The System On/Off button is self-explanatory, the Safety On/Off button simply prevents the selected weapons from being launched.

The Station left/right arrows cycles through the available weapons, selecting them. This is an alternative to mouse-clicking them. The Weapon left/right arrows are not used as multiple weapons types are not carried simultaneously in this model. The Reset button replenishes used weapons. The Fire and Jettison buttons will be dealt with below.

Weapons Management Panels (WMP)

ALCM Weapons Management Panel



This panel is presented automatically when a Cruise Missile-carrying B-1B variant is active. Clicking the lowest Sim Icon in the vertical Sim Icon stack at the bottom left of the Pilot's panel, or bottom right of the Copilot's panel.

SYSTEM – toggle the Weapons or Countermeasures off. WSU screen goes blank.

SAFETY LOCKS – Prevents launch of weapon or countermeasure whilst maintaining WSU screen data and current selections. Note – Weapons Safety switch must be set to **SAFE** to rotate the weapons launcher. Return to **ARMED** when weapon is ready to launch.

CM SELECT – toggles between flares and chaff.

BAY FRT/MID/AFT – open and closes the bomb bay doors. Selected weapons can not be released if the bay doors are closed.

STATION SELECTOR – this control simultaneously rotates the Rotary Launcher and selects the lowest weapon station. Click the right side of the knob to advance, left side to return. Weapons Safety must be set to 'SAFE' for the knob to function.

WEAPON RELEASE – once a weapon is selected and the Weapons Safety is set to 'ARMED' (and the correct bay doors are open), this switch will release the selected weapon(s).

CM RELEASE – releases countermeasures. The CM SEL switch will determine if chaff or flares are released. Alternatively, P3D's WSU can also be used for this – go to the Countermeasures tab and use the page right arrow to find the countermeasure stations. Set the CM SAFETY to OFF, select the CM by clicking on it, then use the 'FIRE' button to launch the CMs.

JDAM Weapons Management Panel



This panel is presented automatically when a JDAM-carrying B-1B variant is active. Clicking the lowest Sim Icon in the vertical Sim Icon stack at the bottom left of the Pilot's panel, or bottom right of the Copilot's panel.

SYSTEM – toggle the Weapons or Countermeasures off. WSU screen goes blank.

SAFETY LOCKS – Prevents launch of weapon or countermeasure whilst maintaining WSU screen data and current selections. Note – Weapons Safety switch must be set to SAFE to rotate the weapons launcher. Return to ARMED when weapon is ready to launch.

CM SELECT – toggles between flares and chaff.

BAY FRT/MID/AFT – open and closes the bomb bay doors. Selected weapons can not be released if the bay doors are closed.

STATION SELECTORS – these controls simultaneously rotate the Rotary Launchers and selects the lowest weapon station. Click the right side of the knob to advance, left side to return. Weapons Safety must be set to 'SAFE' for the knob to function.

WEAPON RELEASE – once a weapon is selected and the Weapons Safety is set to 'ARMED' (and the correct bay doors are open), this switch will release the selected weapon(s).

CM RELEASE – releases countermeasures. The CM SEL switch will determine if chaff or flares are released. Alternatively, P3D's WSU can also be used for this – go to the Countermeasures tab and use the page right arrow to find the countermeasure stations. Set the CM SAFETY to OFF, select the CM by clicking on it, then use the 'FIRE' button to launch the CMs.

Mk82 Weapons Management Panel



This panel is presented automatically when a Mk82 Snakeye carrying B-1B variant is active. Clicking the lowest Sim Icon in the vertical Sim Icon stack at the bottom left of the Pilot's panel, or bottom right of the Copilot's panel.

SYSTEM – toggle the Weapons or Countermeasures off. WSU screen goes blank.

SAFETY LOCKS – Prevents launch of weapon or countermeasure whilst maintaining WSU screen data and current selections. Note – Weapons Safety switch must be set to **SAFE** to rotate the weapons launcher. Return to **ARMED** when weapon is ready to launch.

CM SELECT – toggles between flares and chaff.

BAY FRT/MID/AFT – open and closes the bomb bay doors. Selected weapons can not be released if the bay doors are closed.

WEAPON RELEASE – once a weapon is selected and the Weapons Safety is set to '**ARMED**' (and the correct bay doors are open), this switch will release the selected weapon(s).

CM RELEASE – releases countermeasures. The CM SEL switch will determine if chaff or flares are released. Alternatively, P3D's WSU can also be used for this – go to the Countermeasures tab and use the page right arrow to find the countermeasure stations. Set the CM SAFETY to OFF, select the CM by clicking on it, then use the 'FIRE' button to launch the CMs.

P3D Radar Utility

The Radar Utility, like the Weapons Management Utility, is not from Virtavia, it is built into P3D. It is simplistic, but useful for locating both ground or air targets. The buttons are self-explanatory. Note that for ground targets, this is restricted in P3D to airport ground vehicles and shipping. Buildings can not be targets. There seems to be a discrepancy between the target distance information shown on the Radar Utility and that shown in the WMU, it seems the radar's information is more accurate.

NOTE: The WMP, WSU and Radar can all be toggled independently using the following keystrokes :

shift-4 – toggles the B-1B's custom WMP

shift-5 – toggles P3D's WSU

shift-6 – toggles P3D's radar utility

**** FIRING WEAPONS – A QUICK GUIDE ****

ALCM's

NOTE – P3D uses guided rockets as the basis for the Cruise Missile behaviour. As a result, they have very limited range and must be launched within 7nm of the target or closer and the aircraft must face the target with no more than around 45 degrees of course deviation (figures are approximate, greater range may be possible from greater altitudes).

1. Pick a B-1B with ALCM's (McConnell or Grand Forks)
2. Fly level on Autopilot at 5,000ft or less towards target area. Lower altitudes provide a better view of the explosions and aftermath. Use P3D's Map feature to orient the approach, or vector in using normal ADF or NAV.
3. Use Weapons Sim Icon to present the P3D Weapons Selector (WSU) and Radar Utilities and the B-1B Weapons Management Panel (WMP). All three will come up together.
4. Click the FRT BOMB BAY switch to open the doors.
5. Check the status of the loadout on the WSU. Do not click on the weapons, opening the bay doors will have automatically selected weapon 0, the first in the list. If weapons have already been fired however, then manual weapon selection will be required. Use the B-1B's WMP to do this. Go to (6).
6. Set the Weapon Safety to SAFE.
7. Rotate the Station Selector knob to the desired station. The rotary launcher will animate, rotating the weapons. You may wish to view this from the outside, as it is so cool ...
8. Set the Safety back to ARMED.
9. Adjust the radar settings to your preference for display and range.
10. Select a ground target using the radar. Do this by clicking in the list on an in-range target such as a fuel truck, then click ACTIVE TARGET. You may need to click the 'populate targets' button on the WSU if it doesn't show there.

11. When the range to target is about 7nm, release the weapon by clicking the Weapon Release switch on the WMP, or the FIRE button on WSU. A wooshing sound will be heard and the weapon can be viewed using the P3D Weapons View option (right-click on the screen to gain access to the views menu). The missile will leave a smoke trail and is easy to spot.

12. Due to the limited range of the P3D ALCMs, there may not be time to select and fire again, but do so if possible. Otherwise, find a new target location or simply fly over and come around again.

JDAM's

NOTE – the P3D JDAMs are guided bombs and so will track to a ground target. However they do not turn like a missile or a rocket, instead they will move laterally which is odd at first sight. It may be possible to develop a custom weapon in future to prevent this strange behaviour. Like the ALCMs, the JDAMs have limited range and must be launched within 7nm of the target or closer and the aircraft must face the target with no more than around 45 degrees of course deviation (figures are approximate, greater range may be possible from greater altitudes).

1. Pick a B-1B with JDAM's ('Uncaged' or 'No Antidote')
2. Fly level on Autopilot at 5,000ft or less towards target area. Lower altitudes provide a better view of the explosions and aftermath. Use P3D's Map feature to orient the approach, or vector in using normal ADF or NAV.
3. Use Weapons Sim Icon to present the P3D Weapons Selector (WSU) and Radar Utilities and the B-1B Weapons Management Panel (WMP). All three will come up together.
4. Click the FRT, MID and AFT BOMB BAY switches to open the doors.
5. Check the status of the loadouts on the WSU. Do not click on the weapons, opening the bay doors will have automatically selected weapon 0, 8 and 15 - the first weapon on each of the three rotary launchers in the B-1B's bays. If weapons have already been fired however, then manual weapon selection will be required. Use the B-1B's WMP to do this. Go to (6).

6. Set the Weapon Safety to SAFE.
7. Rotate the Station Selector knobs to the desired stations. The rotary launchers will animate, rotating the weapons. You may wish to view this from the outside, as it is so cool ...
8. Set the Safety back to ARMED.
9. Adjust the radar settings to your preference for display and range.
10. Select a ground target using the radar. Do this by clicking in the list on an in-range target such as a fuel truck, then click ACTIVE TARGET. You may need to click the 'populate targets' button on the WSU if it doesn't show there.
11. When the range to target is about 7nm, release the weapons by clicking the Weapon Release switch on the WMP, or the FIRE button on WSU. The weapons can be viewed using the P3D Weapons View option (right-click on the screen to gain access to the views menu).

Mk82 Snakeyes

NOTE – the P3D Mk82's are unguided bombs and so will NOT track to a ground target. There is no bomb-aiming facility. As a rough guide, the lower the altitude, the closer to the target the bombs should be released.

1. Pick a B-1B with Mk82's ('Black Jack', 'Let's Roll', 'Mountain Home' or 'Memphis Belle').
2. Fly level on Autopilot at 5,000ft or less towards target area. Lower altitudes provide a better view of the explosions and aftermath. Use P3D's Map feature to orient the approach, or vector in using normal ADF or NAV.
3. Use Weapons Sim Icon to present the P3D Weapons Selector (WSU) and Radar Utilities and the B-1B Weapons Management Panel (WMP). All three will come up together.
4. Click the MID and AFT BOMB BAY switches to open the doors.
5. Check the status of the loadouts on the WSU. Select the bombs by clicking on the text in the window, they will turn white when selected.

8. Check that the Safety switch is at ARMED.
9. Adjust the radar settings to your preference for display and range.
10. There is no need to select a ground target using the radar, but it can be used for orientation, like a moving map.
11. When the range to target is about 7nm, release the weapons by clicking the Weapon Release switch on the WMP, or the FIRE button on WSU. The weapons can be viewed using the P3D Weapons View option (right-click on the screen to gain access to the views menu).



REFERENCE INFORMATION

Virtavia B-1B Lancer Procedures

Engine Start:

1. Set parking brake (center console lower left).
2. Set throttles to IDLE.
3. Switch all Generators to OFF.
4. Turn on the Master Battery switch on overhead electrical panel.
5. Check volts/freqs gauges next to the battery switch. Both should read in the green.
6. Push the "Push to Test" button on the Fire Warning and Extinguishing Control Panel (top center of main panel) to verify all ENG, APU and OWF fire warning lights are functional.
7. Turn on Generators 2 and 4 (overhead console).
8. Start Engines 2 and 4 using the engine start switches (center console aft).
9. Monitor engine parameters, allow 45-60 seconds for engine to stabilize at ground idle (approximately 25% N1).
10. Start Engines 1 and 3 and monitor engine parameters.
11. Turn on Generator 1 (overhead console).

NOTE: For simplified procedure, use Ctrl+E for auto engine start.

Taxi:

1. Prior to taxi check flight control surfaces by moving joystick and rudder pedals and verifying control surface movements on the Surface Position Indicator panel on the main panel.
2. The B-1B will require a different amount of thrust to break away depending on weight. It is not unusual at high gross weights to use up to 70% N1 to start rolling.

3. Use the lowest amount of thrust necessary to start rolling. Using excessive amounts of thrust will cause you to accelerate faster than you intended. Remember, engines are still producing thrust as they spool back down to idle.
4. Once you attain 12-15kts of taxi speed slowly reduce power to idle. The aircraft will taxi on idle thrust above this speed, but may require slightly more than idle at high gross weights.
5. Use maximum nose wheel steering deflection whenever possible. The use of differential braking is discouraged due to heat build-up in the brakes.

Takeoff Data:

Takeoff procedure (if noise abatement/speed restrictions unnecessary):

1. Push the Trim for TakeOff button (TTO) on the center console. This automated system will configure the aircraft for takeoff. As necessary, the wings will move to maximum extension angle (15°), speed brakes will retract, and the slats and flaps will extend to takeoff position. When ready the TTO light will turn on. Verify slat and flap positions on the Surface Position Indicator panel on the main panel.
2. Apply up trim as necessary using switch on pilot's left side console or knob on VSD.

Trim settings for takeoff (CG):

20% MAC = 5.5 up

22% MAC = 3.5 up

24% MAC = 1.5 up

26% MAC = 0.5 up

28% MAC = -1.0 down

30% MAC = -3.0 down

Reference MAC value on CG/GW gauge to the right of the engine gauges

3. Hold brakes and slowly increase power to approximately 80% N1. When engine readings appear stable, increase power to maximum.

NOTE: Afterburners engage automatically above 98.5% N1.

4. Accelerate to rotation speed and slowly pull back on the stick to attain a 2.5°/sec pitch rate to 10° and hold.
Use the following table to for rotation speeds (extrapolate for weights not listed):

470,000 lbs = 180 KIAS

400,000 lbs = 165 KIAS

350,000 lbs = 150 KIAS

300,000 lbs = 135 KIAS

250,000 lbs = 120 KIAS

5. As soon as positive climb rate is verified, raise landing gear.
6. Adjust trim as necessary after gear has retracted to maintain 10° hands-free.
7. Regardless of gross weight, retract trailing edge flaps at 220 KIAS.
8. Passing through 250 KIAS, retract slats and reduce pitch angle to 6°.
9. Proceed to Climb Procedure checklist.

Climb Procedure (all weights):

1. At 280 KIAS, sweep the wings to 20° (flap position 4). Adjust trim as necessary to maintain hands free pitch of 6°.
2. At 310 KIAS, sweep the wings to 35° (flap position 3). Adjust trim as necessary to maintain hands free pitch of 6°.
3. At 340 KIAS, sweep the wings to 45° (flap position 2).
4. At 360 KIAS, increase pitch to maintain that speed. Reduce thrust to military power (the maximum power that does not engage the afterburner, approximately 98.4% N1). Use pitch to maintain a

climb speed of 360 KIAS until reaching Mach .85, and then use Mach .85 as the reference climb speed.

5. At and above Mach .85, increase wing sweep to 55° (flap position 1).
6. At speeds above Mach .95, increase wing sweep to the maximum 67.5° (flap position 0).
7. Select the optimum cruise altitude from the chart below (extrapolate for weights not listed):

Sub-sonic cruise:

The chart below lists the recommended maximum altitudes for cruising using dry thrust (no afterburner/less than 98.4% N1) to maintain at or around Mach .87 for normal and ferry-flight operation:

Gross weight: Maximum altitude for normal cruise:

470,000lbs	31,000ft
400,000lbs	34,000ft
350,000lbs	36,000ft
350,000lbs	38,000ft
250,000lbs	40,000ft

Effect of wing sweep to cruise performance:

For normal cruise at or around Mach .87, it is intended for the wings to be swept at 55° (flap position 1). However, if one wishes to reduce the deck angle of the aircraft cruising at a particular altitude with a higher-than-recommended gross weight, it is possible to decrease the wing sweep to 45° (flap position 2). This will have the effect of increasing the efficiency of the wing to create lift at that sub-sonic speed. The tradeoff is higher induced drag, which will necessitate a slightly higher power setting. The tradeoff should result in less than a 3% range penalty.

Notes on fuel tanks and tank usage (normal operation)

The following is a table of the available fuel tanks and descriptions of each:

Center1	30,855 lbs	Fuselage Tank 1	"Fwd"
Center2	50,435 lbs	Fuselage Tank 4	"Aft"
LeftMain	23,116 lbs	Fuselage Tank 3	"Aft Intermediate"
RightMain	37,606 lbs	Fuselage Tank 2	"Fwd Intermediate"
LeftAux	9,600 lbs	Main Tank L	
RightAux	9,600 lbs	Main Tank R	
LeftTip	15,532 lbs	Wing Tank L	
RightTip	15,532 lbs	Wing Tank R	
External1*	8,352 lbs	Weapon bay	Optional Fwd bay tank
*For ALCM armed version use capacity of 8,352 lbs. For Mk82 load use capacity of 18,870 lbs.			
External2	18,870 lbs	Weapon bay	Optional Aft bay tank

Note: External1 and External2 are the weapon bay optional tanks. They default to fully-fueled, and must be manually adjusted depending on the aircraft configuration chosen. Failure to manually reduce the quantities of these tanks prior to flight will result in excessive gross weight and unrealistic range figures.

Order of fuel burn (normal operation):

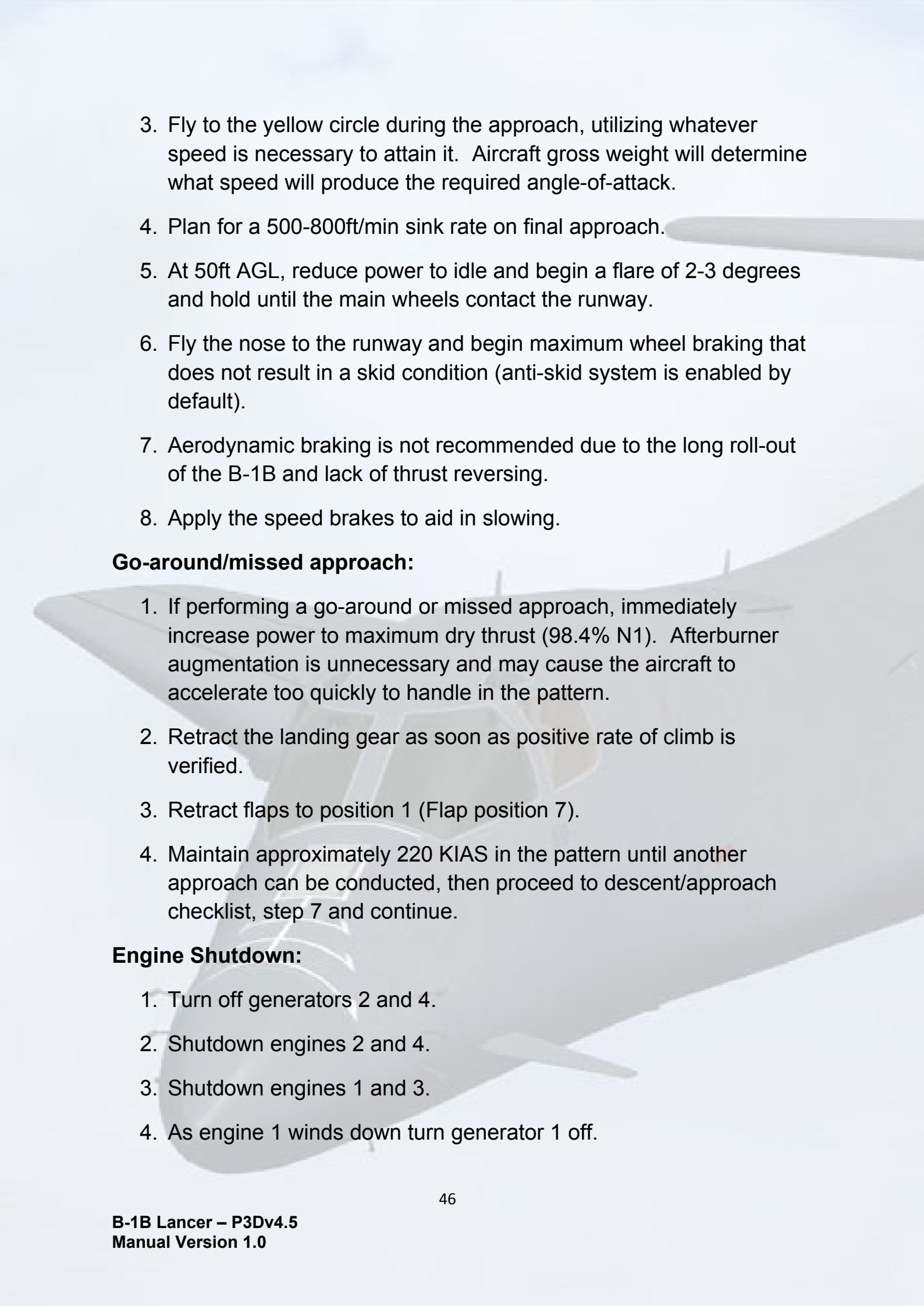
1. External1 and/or External2 burn 1st until empty.
2. LeftTip and RightTip burn 2nd once External1 and/or External2 are empty. Center2 burns simultaneously with LeftTip and RightTip until empty.
3. LeftAux and RightAux burn 3rd once LeftTip, RightTip, and Center2 are empty. Center1 burns simultaneously with LeftAux and RightAux until empty.
4. LeftMain and RightMain burn last after all other tanks are empty. Remember, these are actually fuselage main tanks and not located in the wings.

Descent and approach (all weights):

1. Normal descents should be made at Mach .85 or 300 KIAS, whichever is greater.
2. Descents should be planned well in advance of the actual execution due to the B1-B's inherent low-drag profile. It is very easy for this aircraft to gain a significant amount of airspeed in steep descent profiles.
3. Reduce the wing sweep to 35° (flap position 3) at 300 KIAS.
4. Upon beginning the deceleration for approach to landing, reduce wing sweep to 20° (flap position 4) at 280 KIAS.
5. Lower landing gear at or below 275 KIAS if landing.
6. Reduce wing sweep to the minimum sweep of 15° (flap position 5) and extend slats at 250 KIAS (flap position 6).
7. Extend flaps to position 1 at 220 KIAS (Flap position 7).
8. Extend flaps to position 2 at 200 KIAS (Flap position 8).
9. Extend flaps to position 3 at 180 KIAS (Flap position 9).
10. Proceed to Landing checklist.

Landing:

1. Establish on the approach path to the desired runway.
2. The B-1B does not use airspeeds as an index for approach, but rather angle-of-attack. Angle-of-attack can be adjusted both by changing the airspeed and the pitch being flown. There is an Angle-of-Attack Indexer on the glare shield. If you cannot see the AOA Indexer adjust the seat height using the Seat Adjustment Switch on the side console. A yellow circle indicates you are flying the correct glide path. The top downward pointing arrow, when illuminated, indicates that the approach is too shallow. An upward pointing arrow below the circle indicates that more speed is required to reduce the sink rate.

- 
3. Fly to the yellow circle during the approach, utilizing whatever speed is necessary to attain it. Aircraft gross weight will determine what speed will produce the required angle-of-attack.
 4. Plan for a 500-800ft/min sink rate on final approach.
 5. At 50ft AGL, reduce power to idle and begin a flare of 2-3 degrees and hold until the main wheels contact the runway.
 6. Fly the nose to the runway and begin maximum wheel braking that does not result in a skid condition (anti-skid system is enabled by default).
 7. Aerodynamic braking is not recommended due to the long roll-out of the B-1B and lack of thrust reversing.
 8. Apply the speed brakes to aid in slowing.

Go-around/missed approach:

1. If performing a go-around or missed approach, immediately increase power to maximum dry thrust (98.4% N1). Afterburner augmentation is unnecessary and may cause the aircraft to accelerate too quickly to handle in the pattern.
2. Retract the landing gear as soon as positive rate of climb is verified.
3. Retract flaps to position 1 (Flap position 7).
4. Maintain approximately 220 KIAS in the pattern until another approach can be conducted, then proceed to descent/approach checklist, step 7 and continue.

Engine Shutdown:

1. Turn off generators 2 and 4.
2. Shutdown engines 2 and 4.
3. Shutdown engines 1 and 3.
4. As engine 1 winds down turn generator 1 off.

5. Once crew chief has verified complete shutdown with no engine fires, switch Battery to OFF on overhead panel.

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