



FALCON **BMS**

F-15C TRAINING MANUAL



Ver: BMS 4.38.0
Date: 27 June 2025

FOREWORD

The purpose of this manual is to document the training missions in BMS 4.38 and guide you through your first flights in the BMS F-15C.

The BMS F-15C Training Manual supplements the following documents to offer the complete F-15C Eagle documentation.

1. The F-15C and its systems are explained in the **TO 1F-15C-1 BMS** (Dash-1) (*Docs\02 Aircraft Manuals & Checklists\02 F-15C*).
2. F-15C weapons and avionics are explained in the **TO 1F-15C-34-1-1 BMS** (Dash-34) (*Docs\02 Aircraft Manuals & Checklists\02 F-15C*).
3. F-15C checklists, normal and abnormal procedures are explained in the **TO1F-15C-1CL-1 BMS** (Checklists) (*Docs\02 Aircraft Manuals & Checklists\02 F-15C*).
4. Communication and Navigation procedures within the BMS simulation are explained in the **BMS Comms-Nav-Book** (*/Docs/00 BMS Manuals*).
5. The BMS User Interface is explained in the **BMS User Manual** (*/Docs/00 BMS Manuals*).

The purpose of the BMS Training Manual is to streamline the learning process by taking information from each document that is relevant to the training objective outlined in each training flight.

If you are new to Falcon BMS, please check the “WELCOME” document (*/Docs*) **first** to achieve the optimal learning experience and guideline.

The Falcon BMS 4.38 [changelog](#) presented on the Falcon BMS website provides an overview about all new features. Even experienced users should consider reviewing the documentation and periodically re-flying the training missions to ensure new features are identified and understood.

1. Whenever you need to stop the mission to read part of this document (or any other document), use the freeze mode (Shift+P). The difference between pause and freeze is the ability to use the avionics while in freeze mode; you can't when you are in pause mode. The downside is that the clock continues ticking. So, if you need to meet a time sensitive objective avoid freeze mode.
2. During the training missions the documentation will normally refer to key mappings by their name (e.g Castle switch, paddle switch, etc) and not by the keypress assigned to it.

If you wish to refer to the default key bindings, you may reference the **F-15 Print Layout (US Int).pdf** located in *Falcon BMS 4.37\Docs\01 Input Devices\01 Keyboard Layouts\F-15*.

3. This document has been heavily revised for version 4.38.0 and as such no change bars are present, treat this as a completely new document.



F-15C cockpit model by Stefano 'Qawa' – the genesis of the Eagle in Falcon BMS

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SETTING UP BMS FOR THE TRAINING MISSIONS

You may need to set up BMS correctly for the training missions to work as intended. From the UI select the SETUP button. It defaults to the SIMULATION tab which is what we need. Confirm that your desired pilot/logbook is selected by noting the name that appears after 'SETTINGS FOR', in this case it says Dusty. We believe that you should train the way you intend to fight. Therefore, we suggest you select ACE skill level and ensure that the following options are checked:



- Flight model: **Accurate (mandatory)**
- Air Refueling: **Realistic**
- Padlocking: At your discretion
- Invulnerability: At your discretion

Invulnerability can be a very useful training aid. Don't feel bad about enabling it for training purposes. It will lower your realism rating but this does not technically effect anything in the sim!

Did you know? You can record all of your flights on a virtual Air Combat Maneuvering Instrumentation (ACMI) file or .acmi file. This is a wonderful debriefing tool to use when reviewing any flight. You can toggle recording in the cockpit by pressing (F) to start and stop the file from recording or, by selecting the 'ACMI' button next to the 'Command Line' option on the Launcher. To review this file post mission, use [Tacview](#), which is available for free and fully compatible with BMS.

Please note that BMS has a pilot model in the cockpit. The leg and torso of the pilot may prevent you from seeing all the cockpit switches easily. You can toggle the pilot model on/off by pressing *Alt+C* release and then *P*. Or you can disable the pilot model by default from the GRAPHICS tab of the SETUP UI (option PILOT MODEL).

Also, if you have trouble understanding English ATC, we advise you to enable subtitles from the SETUP UI.

For additional help on setting up controls or graphics, please reference the BMS User Manual.

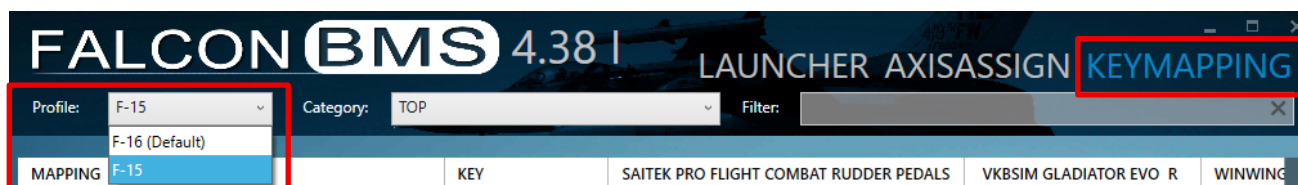
Now that you are familiar with how to set up BMS, it is time to start your BMS Training!

BINDING CONTROLS FOR THE F-15C

Control bindings are covered in the BMS-User-Manual.pdf - If you haven't bound any controls inputs yet, please consult the User Manual for expanded information.

The F-15C will use all the same axis bindings as the F-16C so you do not need to re-bind any control axis that you already have set. What you do need to do, is bind F-15C specific stick and throttle controls and any other unique functions you may want to map to your hardware.

To do this, the most straight forward method is to select the F-15 profile from the KEYMAPPING section of the launcher.



At an absolute minimum, strive to bind the green highlighted functions to your stick and throttle before attempting these training missions.

F-15C THROTTLE

===== 2.15 THROTTLE =====
THR: Modes - Cycle
THR: WEAPON Switch - Fwd (MRM)
THR: WEAPON Switch - Ctr (SRM)
THR: WEAPON Switch - Aft (A/A Mode & GUN)
THR: BOAT Switch - Fwd
THR: BOAT Switch - Aft
THR: SPEEDBRAKE Switch - Fwd (Retract)
THR: SPEEDBRAKE Switch - Aft (Extend)
THR: MICROPHONE Switch - Fwd (UHF1)
THR: MICROPHONE Switch - Aft (UHF2)
THR: MULTI-FUNCTION Switch - Up
THR: MULTI-FUNCTION Switch - Right
THR: MULTI-FUNCTION Switch - Down
THR: MULTI-FUNCTION Switch - Left
THR: TARGET DESIGNATOR CONTROL - Up
THR: TARGET DESIGNATOR CONTROL - Down
THR: TARGET DESIGNATOR CONTROL - Left
THR: TARGET DESIGNATOR CONTROL - Right
THR: TARGET DESIGNATOR CONTROL - Up Left
THR: TARGET DESIGNATOR CONTROL - Up Right
THR: TARGET DESIGNATOR CONTROL - Down Right
THR: TARGET DESIGNATOR CONTROL - Down Left
THR: TARGET DESIGNATOR CONTROL - Press

The weapon select switch is important to have quickly accessible, if you are using a HOTAS with limited buttons, you can simply bind the 'Modes – Cycle' button which will step through the 3 modes without requiring an individual

Currently there is no option to toggle the speed brake, this will come in a future update. In the meantime, it is worthwhile to have a readily accessible binding to extent and retract the speed brake.

The multi-function switch (otherwise referred to as the Coolie switch) has multiple uses. Most important for operation of the TWS radar modes are the up/down functions.

The Target Designator Control will get a lot of use in normal operation. It may be bound to an axis if you have a mini-stick or similar on your HOTAS (throttle *or* stick for that matter).

TDC – Press is effectively the 'designate' button for the radar and is analogous to the TMS-up from the F-16.

F-15C STICK GRIP

===== 3.18 CONTROL STICK =====
STICK: PADDLE Switch
STICK: Nose Gear Steering Btn.
STICK: TRIGGER FIRST DETENT
STICK: TRIGGER SECOND DETENT
STICK: Auto Acquisition Switch - Fwd
STICK: Auto Acquisition Switch - Aft
STICK: Auto Acquisition Switch - Down
STICK: WEAPON RELEASE Btn. (Pickle)
STICK: Castle - Up
STICK: Castle - Right
STICK: Castle - Down
STICK: Castle - Left
STICK: Castle - Press
STICK: TRIM Fwd - Nose Down
STICK: TRIM Right - Roll Right
STICK: TRIM Aft - Nose Up
STICK: TRIM Left - Roll Left

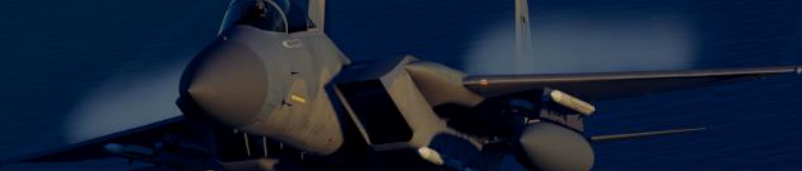
The Paddle switch is essential for take-off and landing as it reduces the sensitivity of the nosewheel steering. The nose gear steering button will allow you to get out of some tight hangar spaces (there are many in Korea!)

The second detent of the Trigger fires the gun and weapon release fire the missiles, which is pretty essential in an air superiority fighter!

Auto acquisition switch is another essential switch to manipulate the radar

Whilst the F-15C is a very stable aircraft, the flight control systems are not a digital fly-by-wire system like the Viper that automatically trims to 1G. You'll find yourself needing to apply trim during different regimes of flight in the F-15C.





PART 1: BASIC HANDLING

The training missions are accessed via the Tactical Engagement (TE) option of the BMS user interface (UI). By default, the uppermost tab named TRAINING is selected, which displays a list of available missions. Once a mission is selected, more windows will appear on the right side of the interface, these offer a short summary about the selected TE. Click the COMMIT button to launch the TE. Dedicated F-15C training missions are found at the bottom of the list.

In part one, you will fly a local training flight around Gunsan, Korea. The flight is broken up into three separate training missions, however, you may fly one after the other without leaving the cockpit. The specific missions (Ground Ops, Navigation & Landing) use the same overall TE, but allow you to start at a specific point in the mission to save time. When you complete the content of Mission 1 - Ground Ops you can continue to Mission 2 - Navigation without going back to the UI. To start in the air, you can choose the Navigation training mission from the TE list. The training scenario will end at the end of Mission 3 (Landing), when you land the F-15 back at Gunsan.

DESIRED LEARNING OBJECTIVES (DLOs):

- Mission 1: F-15C pre-flight planning and considerations, start-up procedure, checklist use, taxi and takeoff.
- Mission 2: F-15C basic handling exercise, navigation and systems.
- Mission 3: Approach, landing and shut-down procedure.

You are ready to begin training, select TR_BMS_F-15_01_GroundOPS from the TE list and let's start pre-flight preparation, your F-15C awaits you on the flight line!



MISSION 1: GROUND OPS (TR_BMS_F-15_01_GroundOPS)

OBJECTIVE: Conduct pre-flight planning, full start up procedure, taxi and day VMC single ship takeoff.

Entering the TE, you are presented with the 2D map and flight planning interface. Let's cover all aspects of pre-flight planning before we press the TAKEOFF button to step to our aircraft.

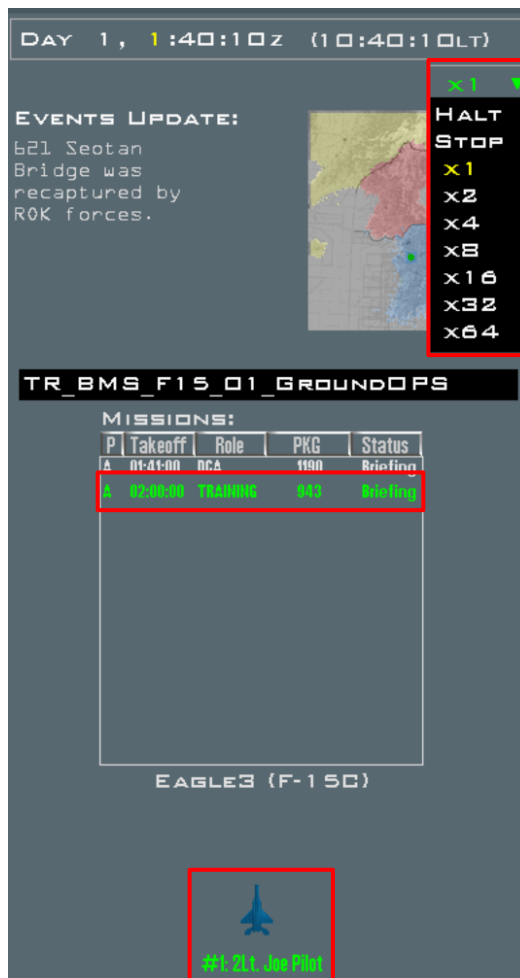
Time: Starting at the top-left side of the UI, you have the current simulator time shown in 'Zulu' aka Universal Time Code and then local time (LT), below that you have the clock control. Typically, when you load into a mission, the time is set to **x1** which means the simulator is already running at normal speed. In order to give you as much time as desired to complete pre-flight planning, select **STOP** from the drop-down list.

By default, selecting a RAMP start (which we will do today) loads you into the 3D world at takeoff time minus 20 minutes. A TAXI start will load you in at -4 minutes with the engines already running and RUNWAY at -1 minute.

Missions: Continuing down the left side of the UI we have the title of the selected TE and then the mission list. This box will display a list of all available flights for your team that you may wish to select to fly. It is important to verify that you have selected the correct flight and the correct aircraft within that flight that you wish you commence pre-flight planning for.

Select the **TRAINING** flight as pictured at right, **PKG 943** (package) with a takeoff time of **02:00:00** – you can see the status is 'Briefing'. You'll now see the callsign for this flight appear underneath the mission list, in this case 'EAGLE 3'. You will then need to click on the blue aircraft icon that corresponds to the position in the formation you would like to take. In this case Eagle 3 is a single ship flight, so there is only one option. Your pilot's name will be displayed under the icon in bright green. Now that we have selected the correct flight, let's continue with the planning process.

Along the bottom of the UI are many options that relate to flight planning, The OOB and ATO will be discussed at a later stage in the training. Select the **BRIEFING** icon to bring up information pertinent to your mission.



The Briefing pop-up window covers a lot of information about the mission, of particular note for today's training flight are the:

- Package elements summary
- Steerpoints/flight plan
- Comm Ladder
- Aircraft loadout
- Weather

1.1 BRIEFING

For more complex packages with multiple flights, the information contained in the briefing pop-up can be invaluable. You can compare each flight's takeoff and push times, mission numbers and pilot roster which will display the usernames of other players in online missions. For a solo training mission like this, it is still a useful summary of information to use when self-briefing your flight.

You will want to briefly review the Mission Overview and confirm that our flight callsign (EAGLE 3) matches our planned flight. Checking the pilot roster is also a great way to double check that you have selected the correct position in the correct flight.

Under the Package Elements section, you can see a summary of our mission number (FLT#), take-off and push time. It is particularly important to remember your takeoff and push time as we will find out later.

MISSION OVERVIEW:

EAGLE 3 (TRAINING)

PACKAGE #: 943 (Other)

PKG-MISSION: None. Perform training mission as briefed.

SUNRISE: 20:18:44z(05:18:44l)

SUNSET: 10:53:15z(19:53:15l)

PILOT ROSTER:

CALLSIGN: FLT LEAD: WING TWO: ELEM LEAD: ELEM TWO:

Eagle3 2Lt. Joe Pilot

PACKAGE ELEMENTS:

x = Primary Flight

CALLSIGN: FLT #: ROLE: AIRCRAFT: TASK:

Eagle3 1169 (x) TRAINING 1 F-15C TRAINING (Follow Instructions)

TJO: 02:00:00z Push: 02:15:00z Tgt: 02:16:08z IFF: M1234CS/162/21730/30704

THREAT ANALYSIS: We have no threats today so there is no information to glean from that section of the briefing.

STEERPOINTS: The Steerpoints section presents an overview of the flight plan with waypoints, timing, speeds and altitudes as they have been planned on the 2d map. As the F-15C has no advanced digital presentation of this information in the cockpit, this information can be very handy to note down before stepping to the jet. There are many 3rd party applications that can copy this information and present it on a kneeboard in the cockpit, but these will be discussed at a later stage.

All we need to note is that our takeoff time is 02:00:00 and our push point is steerpoint 5 with a push time of 02:15:00. Today's flight plan has 8 steerpoints but it is interesting to note that the F-15C navigation system refers to steerpoints/waypoints as **Destinations**. More on this later when we cover navigation.

NOTE

It is very important to understand that the 2D map flight plan steerpoint numbers do not align 1-to-1 with the F-15C 'destination' numbers when selected in the cockpit. This discrepancy is due to the F-15 internal navigation system designating the first flight plan destination as **B** which is numbered as waypoint 1 in the 2D UI! For example, on the map we can see our push point is numbered steerpoint 5 and the target is 6. However, in the cockpit, the push point will actually be destination 4 and the target destination 5. Very confusing I know, but it wouldn't be a realistic simulation if there wasn't some form of flight planning software incompatibility!

STEERPOINTS:		
#:	DESC:	TIME:
1	Takeoff	02:00:00z
2	--	02:00:46z
3	SEMI	02:04:12z
4	Holding Pt	02:06:44z
5	Push	02:15:00z
6	TGT	02:16:00z
7	Split	02:18:49z
8	Land	02:20:13z

COMM LADDER: The Communications Ladder is the summary of frequencies expected to be used during the mission. The frequencies for your departure, arrival, tactical operations and air-to-air refueling (if applicable) are automatically organized into pre-set channels for ease of selection in the cockpit.

COMM LADDER:				
AGENCY:	CALLSIGN:	UHF [CHNL]:	VHF [CHNL]:	NOTES:
INTRA-FLIGHT:	Eagle3	275.750 MHz [15]	137.250 MHz [15]	Flight Management Comms
GUARD:	None	243.000 MHz	121.500 MHz	Distress / Emergency
COMMON:	None	339.750 MHz [14]	119.500 MHz [13]	Advisory / UNICOM
BASE OPS:	None	304.800 MHz [1]	--	Homeplate Operations
TACTICAL:	None	254.450 MHz [6]	--	Package Comms
DEP ATIS:	Gunsan ATIS	--	120.225 MHz [2]	Departure Airbase
DEP GROUND:	Gunsan Ground	273.525 MHz [2]	--	Departure Airbase
DEP TOWER:	Gunsan Tower	292.300 MHz [3]	126.500 MHz [3]	Departure Airbase
DEP DEPARTURE:	Gunsan Departure	292.650 MHz [4]	--	Departure Airbase
ARR ATIS:	Gunsan ATIS	--	120.225 MHz [2]	Recovery Airbase
ARR APPROACH:	Gunsan Approach	292.650 MHz [4]	--	Recovery Airbase
ARR TOWER:	Gunsan Tower	292.300 MHz [3]	126.500 MHz [3]	Recovery Airbase
ARR GROUND:	Gunsan Ground	273.525 MHz [2]	--	Recovery Airbase

The F-15C is equipped with dual UHF radios (unlike the F-16 that has 1x UHF and 1x VHF) so although VHF information is presented in the Comm Ladder, we are only concerned with the UHF (CHNL) section. The UHF radios are referred to as COMM1 and COMM2 respectively, typically COMM1 will be used to talk to outside agencies like ATC and package tactical comms whereas COMM2 will be set to the intra-flight frequency to talk to your wingmen. In Eagle parlance, COMM1 is often referred to as 'PRI' (short from primary) and COMM2 is often referred to as 'AUX' (short for auxiliary).

You can see from the Comm Ladder section that all 'agencies' you may realistically expect to talk to are listed. Highlighted in red are the individual frequencies of those agencies and in green is the pre-set channel that is assigned to said frequency. This means that if you set your radios to CHAN mode, you can simply select the pre-set number instead of having to remember the entire six-digit frequency.

For today's flight, our intra-flight channel is set to 15 – this is the channel we would talk to our wingmen on, if we had any. Typical F-15 standard operating procedure is to set this on the COMM2 radio (Often referred to as 'AUX') which is on the left console.

Table 1 shows how the pre-set channels are organized in BMS. The 'ladder' refers to the how you would climb up the frequencies as the flight progresses and you contact each agency in roughly that sequence.

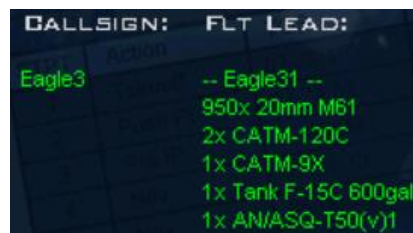
Today we will start on Channel 2 'Pri' to contact Kunsan Ground control.

IFF Identification Friend or Foe (IFF) and **LINK 16** datalink sections are not relevant for this training mission and will be described at a later stage.

BMS Radio Channel Pre-sets COMM 'LADDER'	
CHANNEL	Use/Agency
1	Departure AB Ops Freq
2	Departure AB Ground
3	Departure AB Tower
4	Departure AB Departure/Approach
5	Check-in (not used)
6	Package Tactical Comm
7	Arrival AB Departure/Approach
8	Arrival AB Tower
9	Arrival AB Ground
10	Alternate AB Departure/Approach
11	Alternate AB Tower
12	Alternate AB Ground
13	Air-to-air refueling frequency
14	Advisory 339.750 UHF 119.500 VHF

Table 1.

ORDNANCE: The flight's loadout is summarized in the ORDNANCE section of the briefing. Checking this section of the briefing is often overlooked but it is a perfect spot to catch any anomalies in your flight's overall loadout plan. Sometimes a mis-click in the loadout screen or a rebellious wingman in multiplayer might make adjustments to the loadout unbeknownst to the flight lead until they check the briefing prior to step.



WEATHER: The briefing window contains the weather information for our departure, target area and recovery airbase. It is a brief summary but covers all the essential weather data needed to inform the overall mission plan.

BMS summarizes weather into four distinct categories: sunny, fair, poor and inclement. Each has its own ranges of cloud cover, visibility and wind strength associated with it — Full information on weather in BMS is available in the BMS technical manual.

WEATHER:			
Conditions@	TAKE OFF:	TARGET AREA:	LANDING:
SITUATION:	Fair	Fair	Fair
WIND:	320deg@ 14kts.	320deg@ 14kts.	320deg@ 14kts.
VISIBILITY:	116km	116km	116km
TEMP:	15deg C.	15deg C.	15deg C.
CLOUD BASE:	5,000 ft MSL base	5,000 ft MSL base	5,000 ft MSL base
CON LAYER:	28,000 ft MSL base	28,000 ft MSL base	28,000 ft MSL base

Today, the weather for all areas of our flight is 'fair', this indicates generally good flying conditions where you can expect few to scattered clouds and light winds. Few to scattered clouds will range anywhere from 1-4 eighths of total sky covered by cloud; you can also see the cloud base is 5000ft, so we do not expect any cloud beneath that level. This will make for perfectly visual conditions for our departure and arrival.

We can see that the winds are from the north west at 14 knots—This means that we can expect runway 36 to be active at Kunsan and plan our departure/arrival accordingly.

An important area to note here, specifically for Eagle operations, is the CON LAYER. Con layer refers to the level at which you can expect to start generating contrails (huge white plumes of cloud vapor) from the exhaust of your aircraft engines. This is important to know as it can give away your position to hostile aircraft and surface to air missile sites.



Two F-15C's of the 21st TFW create huge contrail plumes while performing a peacetime intercept of two MiG-29s.
(Image credit: USAF)

Loadout	INV	QTY												
CATM-120C	HGH	2												
CATM-9X	HGH	1												
AN/ASQ-T50(v)1	HGH	1												
Tank F-15C 600gal	HGH	1												

Clean Wt: 30576 lbs

Munitions: 1877 lbs

Fuel 17355 lbs

Gross Wt: 49808 lbs

Max Wt: 68000 lbs

Drag Factor: 41.0

1.3 FLIGHT PLAN



PKG 043 X
 Flight: Eagle3
 STPT: 1 DEL
 TOS: 1.0 :00 :00
 ALT: 0
 TAS: 0 kts
 CAS: 0 kts
 Formation: Wedge
 Enroute: Nav
 Action: Takeoff
 Air Base:
 Gunsan AB (RKJL)

Our flight initiates at Kunsan AB, then via a local departure transition to waypoint SEMI, which is our entry point to MOA-17. MOA-17 is a Special Use Airspace (SUA) designated for military flying training and extends from 4000ft AGL to 40,000ft.

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1.4 DATA CARTRIDGE (DTC)



The DTC, otherwise known as the Data Transfer Module (DTM), in Eagle speak, is an essential part of the pre-flight procedure. The purpose of the DTC is to take pre-flight mission planning data and load it into the aircraft for use during flight. This includes radio frequencies, IFF codes, Link 16 track numbers, flight plan, steerpoint lines and pre-planned threat points.

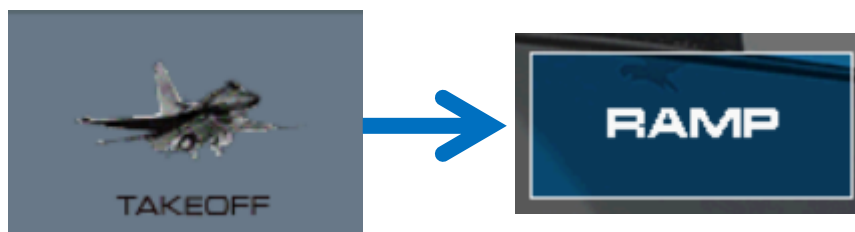
Full DTC functionality is documented in the 'dash 34' and 'BMS user' manual. For today's mission, we will conduct the basic operation to ensure the correct data is loaded and saved in the DTM. In the community, this procedure is known as the 'Click dance' and should be the final step performed before committing to 3D (stepping to the aircraft). This ensures that data from other missions does not remain present in the DTC to be loaded by mistake.

Open the Data cartridge

1. Click the "Comm" tab.
2. Click "Comm Plan".
3. Click the "IFF" Tab.
4. Click "IFF Plan".
5. Click "Link 16" tab
6. Click "L16 Plan"
7. Then click "Save"



1.5 COMMIT TO 3D (STEPPING TO THE AIRCRAFT)



LOCATION: Kunsan (Gunsan) Airbase, wolfpack flows.

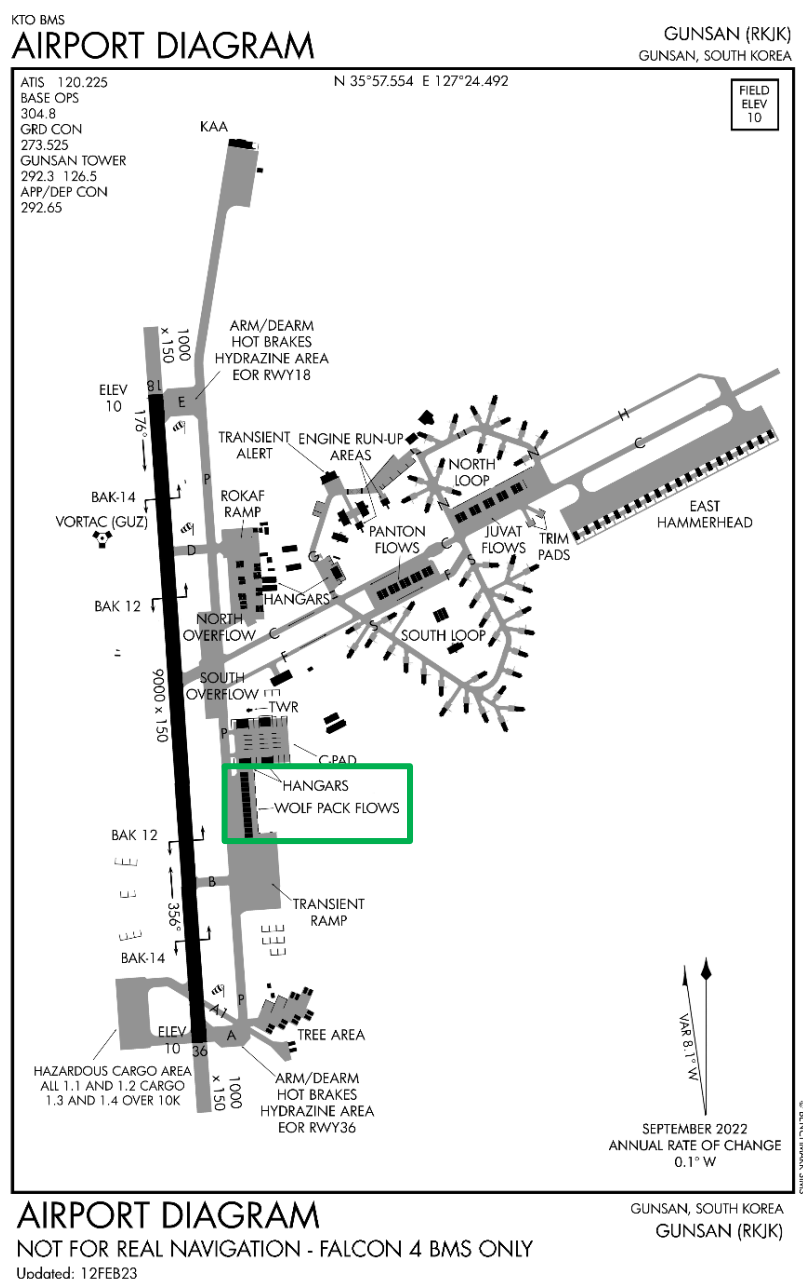
CONDITION: Aircraft cold & dark, canopy open. You have just been strapped in the jet by your Crew Chief.

LEARNING OBJECTIVES: In this training mission, we will guide you through a full ramp start procedure to taxi out and takeoff. Use the kneeboard checklists as a reference or the full checklist .pdf (**TO1F-15C-1CL-1 BMS**) in your F-15 docs folder.

Once you are in 3d, you will find yourself in a shelter at Kunsan airbase which is in the city of Gunsan, South Korea. The air base is located on the West coast and is the home of the 8th Fighter Wing, also known as the “Wolf Pack”.

You will be spawned at the “Wolf Pack flows”. For better orientation, you can find the Airport charts for in the *Docs\03 KTO Charts\01 South Korea (ROK-US)\Gunsan AB (RKJK)* folder.

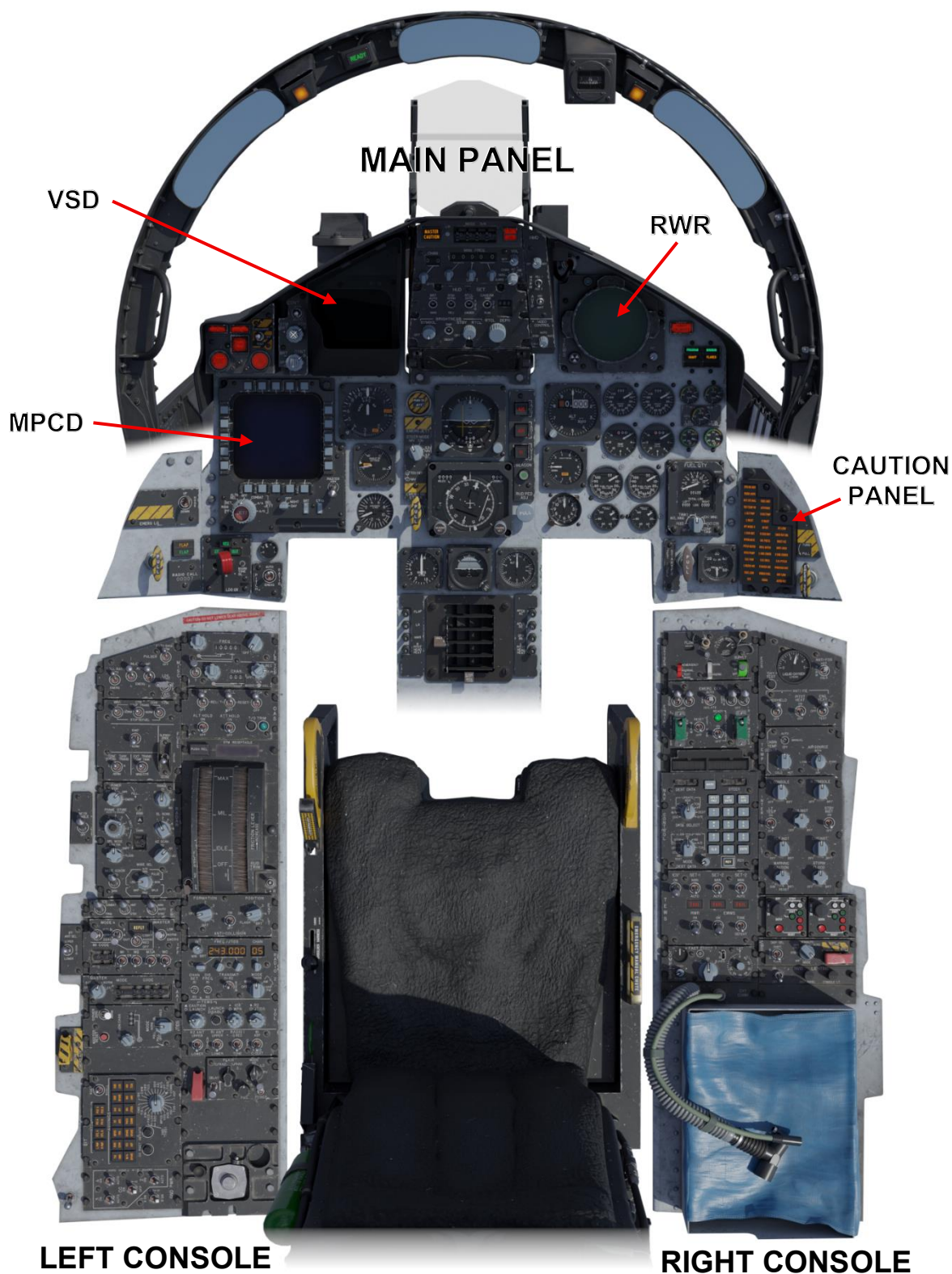
As you can see in the chart at right, the “Wolf Pack flows” are located near the parallel taxiway at the south center of the airbase (marked in green). You will be spawned at parking position 0. The active runway is 36. To verify where you are located exactly, use the Airport Parking chart for RWY 36 (“Gunsan AB (RKJK)_APC_RWY36.png”) to find your spawning point.



BMS F-15C TRAINING MANUAL

4.38.0

Before entering the cockpit, it will be beneficial to familiarize yourself with the general cockpit layout and arrangement of switches. Section 4 of the 'TO-F-15C-1 BMS.pdf' covers the full Instrument and cockpit layout.

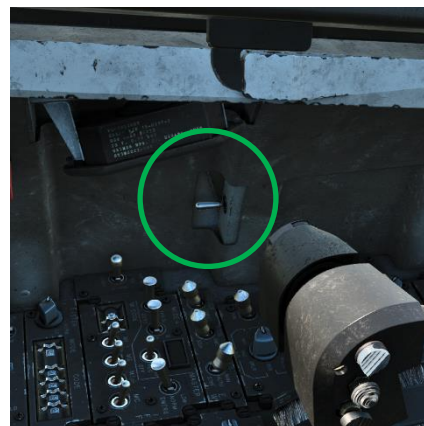


F-15C cockpit layout and panels

1.6 BEFORE STARTING ENGINES

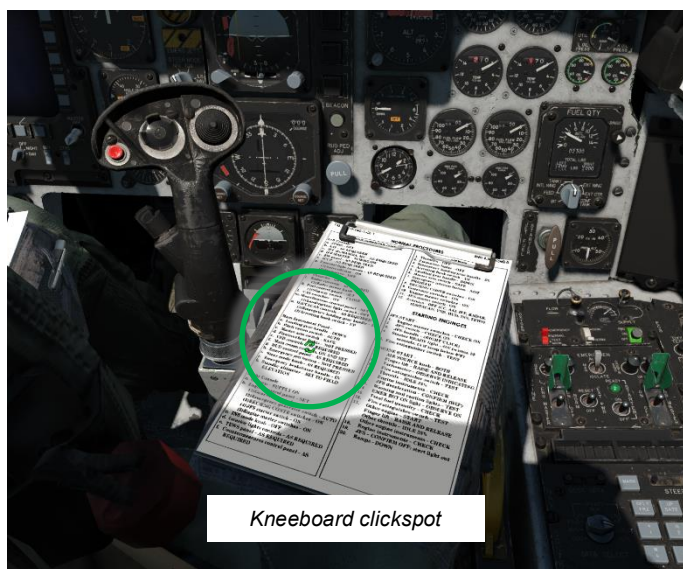
You've just strapped into the aircraft, the first step will be to get comfortable, make sure your desired view controls are working and adjust the seat height to your desired level. Regardless of your height in the real world, we are all about 6ft tall in BMS! Unfortunately, this may not even be tall enough for the impressively spacious F-15C cockpit, if you need to boost your seat, there is a control for that under the left canopy rail, just outboard of where the throttles sit in the OFF position.

Next, we will consult the checklist and start with COCKPIT INTERIOR CHECK. You can follow along with the long form checklist from the docs folder or reference the kneeboards. There is a clickspot on the pilot model kneeboard to cycle through the different pages that are available. In fact, there are two different types of clickspot in BMS, a standard clickspot is indicated by a green cross . To interact with this clickspot, a left click will increase or turn on the switch, while a right click will decrease or turn off the switch. Alternatively, the clickspot may display as two arrows forming a circle . This clickspot can either be left clicked to increase/rotate the knob clockwise or right clicked to decrease or rotate the knob anti-clockwise. You may also use your mouse scroll wheel when this type of click icon is displayed, scroll wheel up equates to clockwise switch operation.



Seat height adjust switch

At some point, you may wish to hide the pilot body so that you can access some hard to see switches, to do this, the key bind is [Alt]+[C] release, then press [P].



Kneeboard clickspot

The checklists are generally organized so that each item flows in an order, starting from the aft of the left console and working your way forward to the main panel from left to right. Then continuing onto the right console working from front to aft in a big left to right sweep of the cockpit.

Initially, you can *and should* use the checklists as a 'DO' list. This means, you work your way through each item as it is listed and perform the action after you have read the line off the list. As you become more familiar with the aircraft, you can transition to using the checklists as just that. A way to catch anything you might have missed after performing the items from memory. This greatly expedites the startup procedure as you no longer need to scan back and forth from cockpit to checklist.

The COCKPIT INTERIOR CHECK is about setting up the various switches in the cockpit ready for the engine start procedure. There are a couple of critical items to get correct in this check otherwise engine start will not be possible. In the full checklist document, there is a handy blurb that talks about the specific meanings of some checklist items, pictured at right.

As you read through the checklist, verify that the checklist items marked AS REQUIRED are in the off position.

TO 1F-15C-1CL-1 BMS

COCKPIT INTERIOR CHECK

A thorough cockpit interior preflight shall be accomplished prior to each flight. The design features of the aircraft greatly simplify this task, but do not alleviate the requirement. Switch positions designated AS DESIRED allow pilot preference in switch/control positioning. AS REQUIRED indicates those switches that will differ with mission requirements. If no specific requirement exists, pilot preference may be used. Normally, those avionics switches designated AS DESIRED or AS REQUIRED should be OFF for start.

After verifying that the JTIDS and AAI switches are in the OFF position. The first switches we will need to interact with are the IFF master switch and the M1,2,3 and MC switches. Our crew chief often likes to play a practical joke on us by leaving these switches in the on position, particularly of note is that the IFF master switch is set to EMERG! We don't want to leave that there by the time power is supplied to the jet otherwise we will be getting an awkward phone call from the ATC tower after our flight.

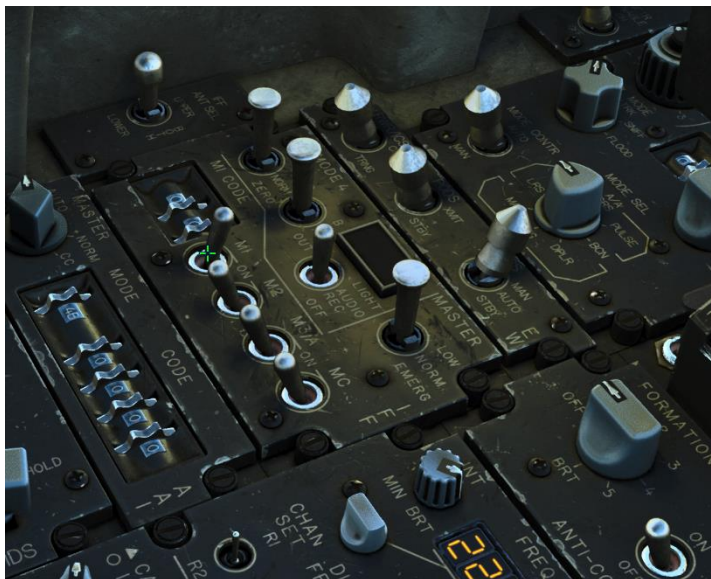
Next, the Anti-collision light on the EXT LT panel (aft of the throttles) can be placed to ON, this will indicate that the aircraft's engines are running as soon as power is supplied after engine start.

Continue reading through the checklist until you get to the Main Instrument Panel section. It is important to make sure that the landing gear handle (as well as any landing gear hardware switch you may have on your controllers) is set to the down and locked position. Set the standby altimeter to read field elevation, or you can delay this action until the radios are powered to get the QNH from ATC.

Moving to the right console, this is where things start to get fun. Pictured at right is a correctly set oxygen and engine control panel. First, the bright green SUPPLY switch should be placed to ON. Then, moving down to the ENGINE panel, The GEN and ENG CONTR switches (four in total) should be moved to ON, while the ENG MASTER switches should be placed to ON and the green guards locked down – this is achieved by left clicking the switches twice. Finally, the JFS starter switch needs to be in the ON position, otherwise the JFS will fail to start.

Continue by verifying that all other switches on the right console are in the OFF position.

Next comes the VERIFY check, which is basically a quick double check to touch on all the critical items that we just set for startup.



View of the IFF panel as we are about set the M1 switch to OFF/OUT



1.7 STARTING ENGINES

As the checklists state, normal engine start in the F-15C is not conducted with any external power, in fact, the F-15C doesn't even have a battery! We use the Jet Fuel Starter (JFS) as the primary means of rotating the engines, then as the emergency generator comes online some core systems will be powered like the engine tachometers (RPM) and the utility light. Only after the first main generator comes on (at approx. 44% RPM) does the cockpit come to life as the other engine instruments become energized and other caution/warning lights illuminate.

To start the JFS, first ensure the JFS starter switch is in the ON position, then initiate the JFS start by pulling the JFS handle. By left-clicking the PULL handle, you will discharge one of the two JFS accumulators, by right clicking you will discharge both accumulators (or the second accumulator if the first was already used). In BMS, it is recommended to use the **right click** function for an increased change of successful JFS operation.



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The JFS ready light should illuminate within 10 seconds (or 15 seconds if the temperature is below 0°F)

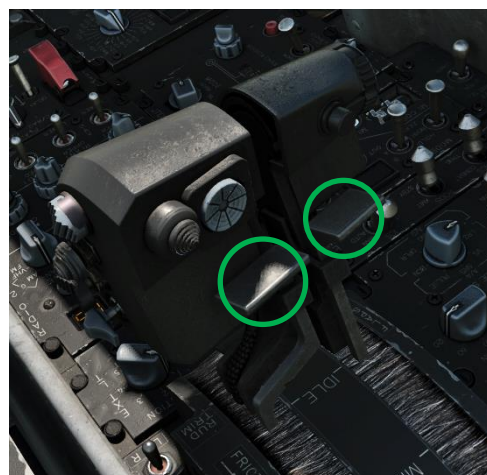
The JFS is basically a miniature jet engine mounted on the central gear box, it is started via a hydraulic motor powered by the aforementioned hydraulic accumulators. Because a JFS accumulator was discharged to start the JFS, the JFS LOW light will illuminate on the caution panel when power is available. It will extinguish when the accumulators are automatically recharged by a running engine.



Now that the JFS is running, we can commence starting the engines. Typically, the right engine is started first to permit checking the utility hydraulic pressure with only the right pump operating.

First, ensure the AIR SOURCE knob is selected to BOTH (left click once).

To initiate engine start, the corresponding throttle finger lift is pulled up and released. There is no 3D clickspot for this so you must use the default key binding (unless you mapped the key to your hardware). The right throttle finger lift is activated by the key mapping **[Alt]+[PageUp]**.



Left and right throttle finger lifts

MAPPING	KEY
THR: FINGER LIFT Switch - Left Engine	Alt Insert
THR: FINGER LIFT Switch - Right Engine	Alt PageUp

After a few moments, you will notice the right engine RPM gauge starting to indicate. At 25% the RPM should stabilize; this is your cue to take the throttle from the OFF detent to IDLE. This can be achieved via the IDLE/OFF toggle key command **[Ctrl]+[I]** for the right engine (**[Alt]+[I]** for the left engine). Moving the throttle to the idle detent introduces fuel to the engine so that light-off can occur.



Engine instruments to be monitored during start procedure

It is critical to monitor the engine TEMP and oil pressure during start. The two most common abnormal engine start occurrences are either a hot start or a lack of oil pressure during start. In both cases, immediate action is required by the pilot to avoid engine damage. Consult page EP-3 of the F-15C checklists for full emergency procedures.

A hot start is indicated by a rapidly rising Fan Turbine Inlet Temperature (FTIT) reading on the TEMP gauge. The start limit is 900°C, if the needle is rapidly approaching the 900°C mark, immediately place the throttle to OFF. If the start limit was not exceeded, the engine will need to cool below 200°C it before another start attempt is made. This can be achieved when the RPM is below 30% by engaging the JFS to that engine (finger lift), this will motor the engine to assist with cooling.

Oil pressure should begin to move as the engine starts to motor with the needle indicating in the green arc only seconds after engine light off occurs. If no increase in engine oil pressure is observed, the throttle must be moved to OFF immediately to prevent damage to the engine. A second start may be attempted in this scenario.

CONDITION	FTIT °C	RPM %	OIL PSI
START	900	--	--
IDLE	-	-	15-80
MIL/AB	960	94	30-80
TRANSIENT	970	94	30-80
FLUCTUATION	±10	±1	±10



Once the right engine instruments have stabilized, check they are within limits. Observe the EMER BST ON light illuminates after the first generator comes online to indicate both emergency generator and emergency boost pump are operating properly. 30 seconds after the main generator comes online, the BST SYS MAL light illuminates as the emergency generator cuts off. This indicates that the emergency fuel boost pump is now operating off an abnormal power source. When the second main generator comes on line, both EMER BST ON and BST SYS MAL lights should go out.

Now it's time to start the left engine using the exact same procedures as we started the right engine. JFS, confirm ON, then Left finger lift pull and release [Alt]+[Insert]. At 25% RPM, left throttle from OFF > IDLE and monitor engine instruments for a successful left engine start.

Now that the second engine is started, the JFS will automatically spool down (green light will extinguish). Finally, look outside the cockpit and confirm both the left and right engine intake 'ramps' are in the down position. This happens automatically during start and should be fairly obvious to spot. Great! Now it's time to perform the BEFORE TAXIING checklist.



As you may have noticed by now, it's absolutely deafeningly loud with two Pratt and Whitney 220 engines hissing and whining in the background. It's time to close the canopy which is done by right clicking the clickspot shown here.

Once we have some peace and quiet, the first thing we will do is initiate the INS alignment. The right console houses the Navigation Control Interface (NCI).

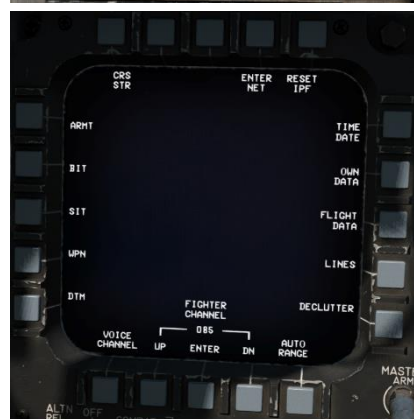
Take the NCI DATA knob to PP, then the MODE knob to ALIGN – GC. Press the RDY button at the bottom of the keypad, this effectively toggles the keypad on/off to avoid any inadvertent entries during flight. Finally, press ENTR on the keypad which will commence the alignment process.

Along the top of the NCI you will see a small yellow ALN light, initially it will be off but after 60 seconds, the ALN will illuminate to indicate a coarse align. After 120 seconds the ALN light will flash at 1Hz to indicate a partial alignment and after 240 seconds the light will flash rapidly to indicate a full align. While we are waiting for this to happen, we will continue with the rest of the before taxi checklist.

Moving over to the left console, the next item will be to prepare to load out DTM. The JTIDS terminal initialization takes a few moments so first you will take the JTIDS knob and place it to NORM.

Next, on the main panel, turn on the MPCD by switching the knob to DAY or NIGHT as desired. After a very quick built-in-test (BIT) the screen will display OFF in the middle, simply press the OSB adjacent to the M to access the main menu page which will look something like this:

After less than one minute, the center of the MPCD screen should display 'TERMINAL LOAD: INITIALIZE' – this is your cue to start the DTM read process. Press the OSB next to DTM to access the Data Transfer Module page.



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First, press the CC BUF OSB to clear any data from a previous flight that may cause issues (WIP). Then press the OSB adjacent to 'READ' to load the DTM data for your current flight.

Now that those tasks are complete, you may set about turning on the rest of the avionics.

Starting on the aft side of the left console, turn the AAI mode knob to AUTO. From there, move forward in two sweeps. The IFF panel is already set from our cockpit preparation checks so the next panel that requires attention is the electronic warfare or EW panel. This will not be required today but for more operations you will set the RWR/ICS switch to COMBAT to energize the system. The PODS switch is currently not implemented but the ICS switch operates the three functions of the self-protect jamming system available in BMS. I recommend you set this switch to AUTO which is the most versatile setting to air-to-air combat.

One step further forward is the radar panel. Set the power knob to STBY, this will initiate the mandatory radar BIT check that must be completed before the switch can be placed to OPERATE.

Now moving to the inside of the left console, scan over the RADIO 2 panel and set the correct preset channel for your flight. Today we are a single ship flight so this is superfluous but as we are the first flight in our non-existent package, let's set preset 15 just to get into the habit. Here you can also adjust the volumes for the RWR, AIM-9 seeker and the Radio 2.

In front of the throttles lies the ILS/TCN panel. Even though it is a VFR day, it's always a great habit to get into by inputting the ILS frequency of the expected recovery runway at our departure airport. In today's case, that is RWY 36 at Kunsan which has a frequency of 110.30.

Now we can move to the main panel and turn on the VSD and the HUD. The VSD should still be going thru its power up BIT at this stage as is displayed on the VSD screen. You do not need to monitor the BIT, but it is always a good idea to make sure that the BIT is being performed as it is essential to later radar operation.

Next, we move over to the right console and set up the TEWS panel. ICS switch – ON, SET-1, 2 and 3 switches are bound together but will require to be cycled to AUTO and back to MAN via a right and left click. This ensures correct ICS operation during the flight. RWR and EWWS switches can also be placed to ON at this stage.

At this stage there are only a few items remaining before we can commence taxi. Come back to the main panel and select preset 2 on the UHF 1 panel to tune the Kunsan ground control frequency. Make sure the right-hand knob is set to CHAN instead of MAN which would refer to the manual frequency input. As discussed before, all our frequencies for this flight are neatly arranged into pre-set channels for us to use.

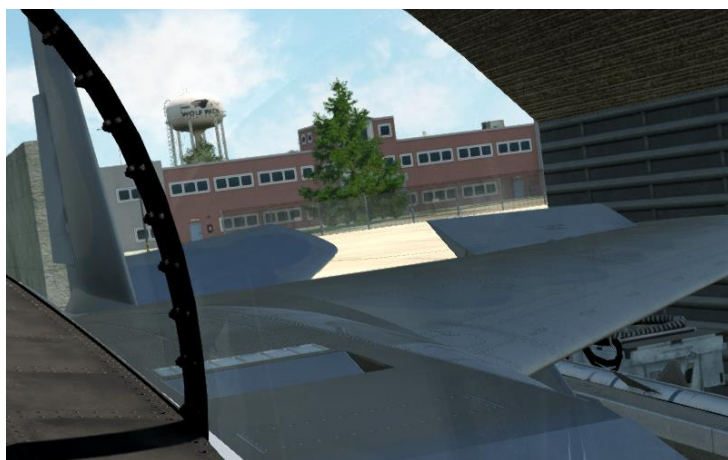


Each item on the DTM page will have 'pending' blank when that item is correctly loaded. Sometimes a 'partial xfer' caption will appear but can usually be corrected by a second READ of the DTM.



Finally, it is time to set and check our primary flight controls. Cycle the speed brake full open and back to fully closed to ensure proper operation. Cast a glance to the caution panel to make sure there is no mention of SPD BK OUT. Set flaps down and confirm the flap indicator goes from amber to green to indicate flaps set for takeoff. Then, perform the flight controls check as illustrated in the checklist (shown at right). Basically, you will perform a slow and deliberate clockwise 'wipe out' of the controls and pay specific attention to the position of the stabilator and ailerons.

Note that the positions of the rudders in BMS currently do not match the real world position. The FCS is still WIP and as such, rudder movement is opposite to lateral stick position.



a. View over pilots left shoulder showing correct flight control indications with full aft/left stick position

After the flight control check, the checklist calls to reset the CAS switches on the left console. The functionality to reset the CAS is not yet implemented but it is important to note that the CAS channels **can** be turned off which alter the handling qualities of the aircraft significantly. At this point, ensure the CAS switches are still in the ON position.

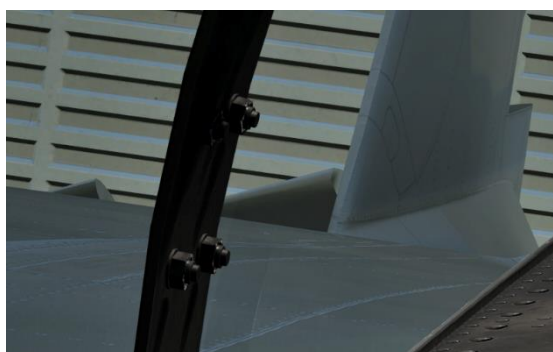
Next, we will back to the right console and cycle the ENG CONTR switches one-by-one and ensure the associated captions illuminate and more importantly extinguish on the caution panel. When an ENG CONTR switch is placed in the OFF position, that engine's nozzle % gauge should indicate the nozzle closing.

Finally, double check your oxygen quantity is sufficient (not modelled at this stage) and that the bright green Oxygen Supply switch is set to ON.

Glance up at your fuel quantity indicator which should show somewhere in the realm of 17,000lbs – sufficient for this flight.

15. FLIGHT CONTROLS – CHECK

- Stick full aft and full left – Observe stabilator trailing edge up (left further up than the right) rudders 30° left, left aileron up, right aileron down.
- Stick full forward and full left – Observe right stabilator leading edge moves into view and rudders move 30° right (ailerons should not move).
- Stick full forward and full right – Observe left aileron moves down and right aileron moves up, rudders move 30° left, and left stabilator leading edge in view.
- Stick full aft and full right – Observe stabilator trailing edge moves to full up (right higher than left) and rudders move 30° right (ailerons do not move).
- Rudder – Check. Hold stick neutral and paddle switch pressed. Move rudder pedals left and right and observe 15° rudder travel (CAS off).



b. Stick full forward and left – right stabilator leading edge moves into view.



By this stage the INS will be aligned, with the ALN light flashing quickly to indicate this. To complete the alignment sequence:

1. INS MODE knob – NAV INS
2. Numpad – ENTR (to confirm alignment)
3. Numpad – RDY (to turn off the keypad)

Ensure the INS is aligned by viewing the SIT page of the MPCD (you should see your flight plan present in yellow).



1.

2.

3.

1.8 TAXIING

Now we are ready for taxi. First of all, make sure your altimeter is set correctly. Kunsan has a field elevation just above sea level so it's easy to adjust the standby altimeter to read just above zero. Crosscheck the HUD altimeter tape shows the same value. You can always ask the ground frequency for the local QNH as well via the comm menu. In BMS 4.38, the comms menu is now a ring style by default. If you prefer the older style ingui windows you can set this by adjusting the line in your 'Falcon BMS.cfg' file: (*set g_bRingCommMenu 1*) by replacing the 1 with a 0.

This style of comm menu is more user friendly for those in VR but it still functions the same way with regard to keyboard presses. To request QNH, you would press [T] x6 to access the 'Common' menu, then [1] to select 'Request QNH'.



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To request taxi, select [T], [3]. The ground controller will reply:

"Good morning, Eagle 3 you are number 1 for departure, taxi Papa, Alpha, hold short runway 3-6."

It's a quick and easy taxi to runway 36. We will pull forward and join the main parallel taxiway (Papa) via a left turn. Taxiway Alpha is the perpendicular taxiway that joins RWY 36 at its southern most point, expect to turn right onto Alpha.

At this point we can ask the crew chief to remove the chocks and the EPU safety pin (this is not actually a thing in the F-15C but a limitation of BMS still applying the F-16 EPU pin message). Press [T], [1] then [T], [2] to remove these items.

Set your nose gear light to TAXI. External lighting settings are as follows:

PROCEDURE	SCENARIO	Taxi Light	FORMATION	ANTI-COLL	POSITION
TAXI	DAY – Good weather	Taxi	OFF	ON	1

Apply power to start gently rolling forward out of the shelter, the brakes are checked by lightly dabbing them to ensure they are operating normally. The nose gear steering is checked by a gentle left and right application of the rudder pedals to ensure the aircraft can turn left/right. Then as we join the parallel taxiway by turning 90 degrees left, ensure the HSI and HUD heading tape indicate a turn to the left. When we are lined up heading south on taxiway papa, our heading should read just to the left of 180.



Heading south on taxiway Papa

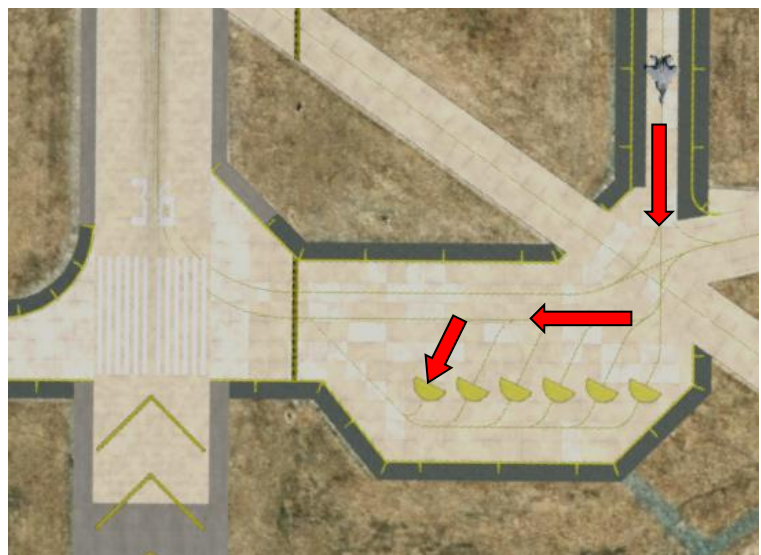
The main challenge of taxiing is to avoid a hot brakes situation. If the brakes are overused, they can overheat which may lead to wheel fires or blown tires.

Care should be taken to taxi slowly and avoid constant brake use. It's better to manage the throttle rather than riding the brakes constantly. Aim for a maximum taxi speed of 25-30 knots in straight lines and 10 kts in turns. Your ground speed is displayed in the bottom left side of the VSD.



Arriving at runway 36, you will be presented with 'End of Runway (EOR) South', we will take the position closest to the runway as there are no other aircraft ahead of us. As we approach this position it will trigger the ground controller to switch you to the tower frequency. If you aren't told to switch it means you are too far away from the runway. If there are many aircraft ahead of you, just wait your turn to taxi to the runway and you'll be prompted to change frequency in due course.

Arriving at the EOR we will complete the BEFORE TAKEOFF checklist.



Here's the direction you will take to line up in the number 1 EOR spot.

The correct parking position for each aircraft at the EOR (if available) is shown below.



The EOR is where ground crew would arm or de-arm your ordnance but as we only have captive training missile aboard today, this is not necessary (nor simulated in BMS). What we will do is either apply the wheel brakes or ask the ground crew to temporarily re-install the chocks so that we do not roll forward during our EOR checks. The F-15C does not have a parking brake so use of the chocks in this scenario is recommended.

The before takeoff checklist calls for some very important items to be set for flight:

1. Radar power knob – **OPERATE**
2. Ejection controls safety lever – **CHECK ARMED**
3. Flights controls – **CHECK FREE**
4. Flaps – **CHECK DOWN**
5. IFF – **ON/AS REQUIRED**

Once set, we are now ready for takeoff! Switch to channel 3 on the UHF/COMM 1 panel and report you are 'ready' to the tower [T], [T], [1]. If the option to report 'ready for departure' is greyed out in the menu, it is an indication that you are not on the correct radio frequency.

The Tower will then instruct you to either hold short, line up and wait, or clear you to take-off – depending on the scenario. In BMS, the ATC gives departure clearance based on take to your planned takeoff. If you managed to make it to the runway much earlier than the planned takeoff time of 02:00:00, the ATC won't give you clearance until one minute prior. In order to force the issue, you can simply report ready for departure again and the tower will make a concession and clear you early.



Once you have takeoff clearance, set the landing light to ON, and pull out of the EOR holding spot. Lineup on the runway and observe the windsock. The tower should give you the wind speed and direction as well, but it is always good to confirm with the physical windsock as the aircraft systems are unable to give you the wind speed and direction on the ground.

1.9 TAKEOFF EMERGENCIES

WIP

1.9.1 Abort / Rejected Takeoff

Typically, with the F-15's short take-off distance capability, aborting a take-off should not pose a challenge unless there is an issue with directional control, such as a blown tire. Optimal outcomes result from making an early decision to abort. Whether aborting before or after rotation, careful consideration of multiple factors is essential: remaining runway length, runway conditions (wet or dry), availability of barriers, and the aircraft's gross weight, among others. In many cases, it may be preferable to proceed to a high or low-key position after rotation and address the emergency during flight. Contemplation of aborting after rotation should occur only if reaching a key position in flight is not feasible.

During an abort, throttle should be retarded to idle, and maximum ANTI-SKID wheel braking should be applied with full pedal pressure while maintaining directional control. Once the nose wheel is on the ground, apply maximum braking effort, including full aft stick, fully opened speed brakes, and maximum wheel braking. Nose Wheel Steering (NWS) should only be engaged if maintaining directional control becomes problematic.

If the runway is equipped with arrestment cables, deploy the hook, and engage the cable as close to the runway centerline as possible. Note that all three wheels must be on the ground for the cable to work.

It is advisable to follow the hot brakes procedure after any abort, as taxiing post-abort increases the likelihood of hot brakes.

1.9.2 LG Fails to Retract

If the landing gear handle warning light persists after moving the handle up, it indicates that the landing gear or landing gear doors are not fully retracted. In BMS, this may be a result of over speeding the jet with the gear down (>305 knots). In such a case, promptly reduce speed to below 300 knots and return the gear handle to the down position.

If the landing gear deploys normally, prioritize landing as soon as possible. Avoid attempting to retract the gear, as this may cause additional damage and hinder further gear extension.

If the landing gear does not indicate down, further reduce speed to below 190 knots and utilize the emergency gear extension handle. Note that Nose Wheel Steering (NWS) is not available after an emergency gear extension.

Once the gear indicates it is down and locked, seek visual confirmation (if flying multiplayer) and proceed with a normal landing. Utilize differential braking for directional control if available.

If the gear still indicates it is unsafe, apply alternating G forces (-1.0 to +3.0G) to attempt to free the locked landing gear.

Consider landing with the landing gear unsafe or up or opt for ejection. If landing is inevitable, divert to a runway with minimal crosswind, retain wing fuel tanks (if carried), jettison all armament and centerline stations (if possible). Ensure wing fuel tanks are empty and reduce gross weight by burning fuel. If immediate landing is necessary and wing fuel tanks cannot be emptied, jettison them after depressurizing the wing tanks by opening the AR door.

Switch off the Radar, CM and ECM. Execute a low-angle approach at 19 units AoA, setting the throttle to CUTOFF immediately before touchdown.

1.10 TAKEOFF

Line up on the active runway magnetic heading (referenced on the charts). If you are a single ship like in this flight, you will use the centerline, otherwise, your position will depend on how many aircraft there are in your flight and on the briefed departure type. Normally, the flight lead lines up on the 'downwind' side of the runway.

Please note: the ATC code instructs AI to take-off in 2-ship elements by default, but you may instruct them to line up as a 4-ship with either #3 or #4 in the slot. Your position as lead should always be downwind to avoid the wind pushing your aircraft into the path of your wingmen.

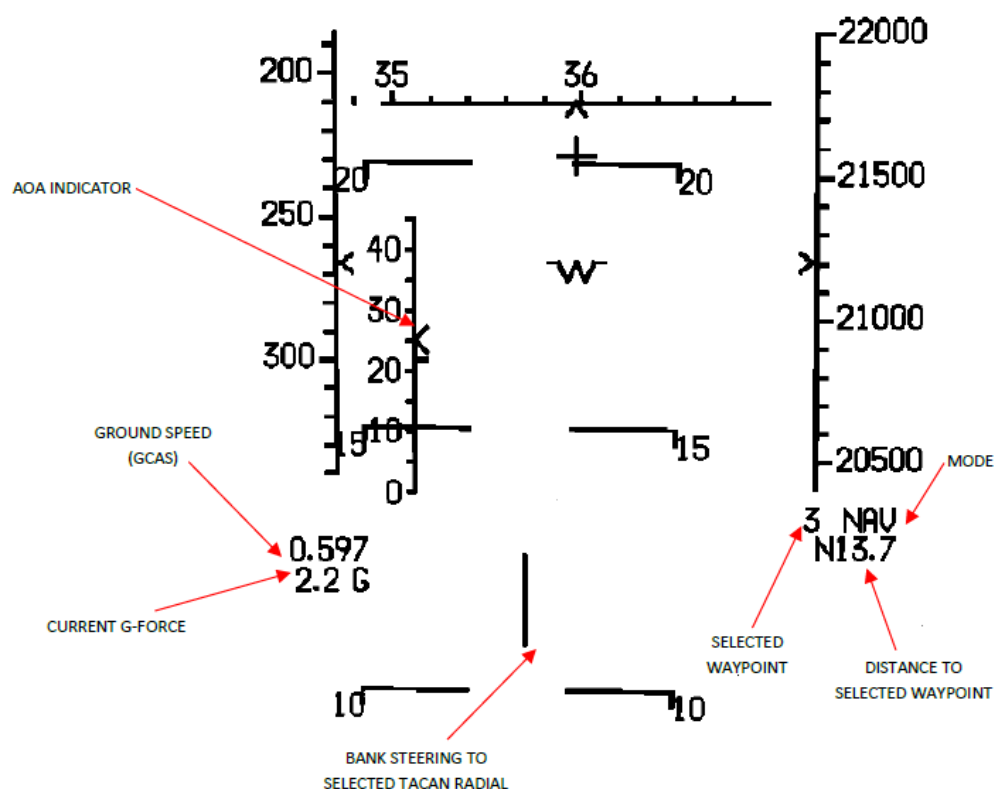
Stop the aircraft with the toe brakes and make a quick final check of engine gauges and for any caution or warning lights. Check the runway QFU (magnetic heading), the IFF master knob to NORM and lower your visor.

Taking off seems a relatively easy task. Notice the photo to the right. As you increase the throttle, **hold the paddle switch to disable your nose wheel steering**. NWS should be deactivated as your speed tape comes alive around 60 knots, use your NWS with caution even below that. Remember though that your airspeed scale will not start to move until you reach 60 kts and your NWS should be off very soon if not already after you reach 60 knots. If your jet is positioned correctly with the nose wheel straight on the centerline you will not need NWS during take-off, so it may be safer to align carefully on the runway and disable NWS before advancing the throttle.

Be sure to continue to keep on the centerline using the rudder and pull gently on the stick once you reach rotation speed for a clean configuration 160 will do fine. Do not raise the nose greater than 22 units AoA as you might tail strike and damage your aircraft.

The heavier you are the longer the take-off roll will be, and things will happen slower. If your aircraft is very light, as is the case in this training scenario, things will happen fast as the aircraft will accelerate very quickly.





All relevant information for take-off is displayed on the HUD. For a deeper explanation of the HUD please refer to Dash-34 Manual, chapter 2.1.8.2.

The airspeed scale remains at zero when moving at slow speed. The pitot probes need airflow to provide information and below 60kts the airflow is not sufficient.

The right scale indicates current altitude set to barometric as default.

The top scale is your heading, which can also be displayed on the bottom of the HUD. This one should indicate the Runway QFU as stated on the charts: 356° for Gunsan RWY36. Remember the better it is aligned, the less steering you will have to do initially.

The center part of the HUD displays the attitude lines, the Flight Path Marker (FPM), the Great Circle Steering Cue (aka tadpole) indicating the steer point and the gun gross which is the fuselage reference line indicating zero degrees. This is a very important item for take-off as you use it as your climb angle reference.

You are now ready to take off.

The first step is to keep the brakes firmly engaged and add power to 90% RPM. Once stabilized, check engine gauges and if all is good release the brakes and advance the throttle to full military power (aka Buster or MIL), then smoothly forward to engage afterburner.

The jet is now accelerating on the runway. Disengage NWS as quickly as possible by holding the paddle switch and steer lightly with the rudder to keep on the runway centerline. Be aware that the wind may push you sideways.

Once rotation speed is attained, pull back firmly on the stick, raising the nose to a 10° pitch up. Do not climb too steeply and keep under 12° pitch as you rotate, or you may risk scraping the nozzles on the runway. The aircraft will quickly accelerate.

Continue flying on the runway heading and raise the landing gear. The gear must be in the wells before the airspeed reaches 300 kts. It takes a few moments for the gear to retract so do not wait until 300 kts limit. Retract the gear as soon as a positive climb rate is established.

While the gear is in transit the gear handle red lollipop light will be ON. The gear is confirmed up & locked when the 3 gear green lights on the gear panel and the lollipop red light are OFF. If the lollipop remains lit, a gear malfunction is indicated, and aircraft speed should stay under 300 kts while solutions are considered.

Congratulations, you are flying!

Once your airspeed reaches 350 kts disengage the afterburner. Maintain buster (MIL) and pull more on the stick to adjust your climb angle to maintain 350 kts. With a very light jet the climb angle will be steep.

Switch to the Departure frequency (preset 4) and select 'Report Airborne' on the ATC menu Departure page. Departure will probably give you a heading of 355° and clear you to resume your own navigation.

Level out at 5000 ft on runway heading and retard the throttle to maintain 350 kts.

Helmet Visor

On bright days you may have a hard time being able to see your green HUD against the white clouds and blue sky at times. Press *Alt+V* to lower your visor giving you better HUD visibility.

MISSION 2: BASIC NAVIGATION (*TR_BMS_F-15_02_Navigation*)

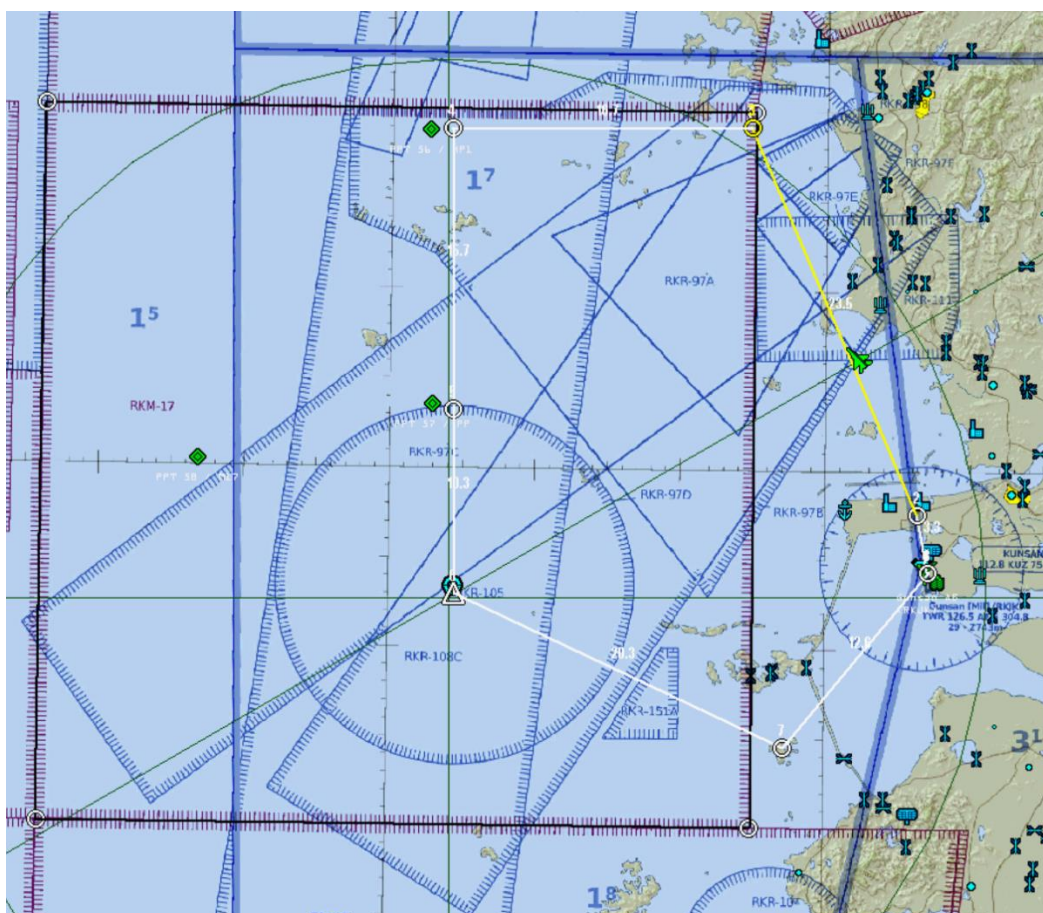
1. **TAKEOFF OPTION:** In Flight.

LOCATION: Approximately 12 Nm north of Gunsan.

CONDITION: Aircraft level at 15,000 feet - heading 350° - speed 350 kts. Once in the cockpit the training scripts will freeze BMS and set up your systems correctly.

LEARNING OBJECTIVES: Follow the INS (Inertial Navigation System) flight plan, train TACAN navigation and come back to the Initial fix for landing at Gunsan.

The key to a successful flight is good planning. Remember the 5 P's: Proper Planning Prevents Poor Performance. Before starting up this training mission let's study our flight plan.



The flight will take us south of Gunsan near Gwangju airbase. **When you are in the pit in the Eagle the steerpoints are a little different. The base you take off from will be labeled as B meaning that every steerpoint will be one less than what is depicted on the 2D map.** Below is referencing steerpoints as minus one because that is how it will be in 3D.

The training scenario will start somewhere between Gunsan and steerpoint 1. Steerpoint 3 is WOLF, Initial Approach Fix (IAF) for Gunsan. Steerpoint 5 is the alternate airbase for this flight and steerpoint 7 is where the training mission will end and the next one (Landing) will start. This route has been plotted on the UI screen using the Tactical Engagement Editor. The INS flight plan is displayed in white, with the steerpoints represented by empty circles.

2.1 In-Flight Emergencies

WIP

2.1.1 Canopy Unlocked Warning Light On

If the canopy unlocked warning light illuminates, that means you took off with your canopy open please close before you take off next time. It will be less windy I promise.

2.1.2 Canopy Loss/Pressurization in Flight

WIP

2.1.3 Cockpit Pressure Malfunctions

WIP

2.1.4 Equip Hot Caution Light

In such instances, the initial step is to ensure that the AIR SOURCE knob is set to NORM. Reduce power to 80% RPM. Another potential cause for the illumination of the EQUIP HOT indicator is extended flying with the landing gear extended at low altitudes. Prolonged flying below 8000 feet with the gear down for more than 7 to 8 minutes could lead to the ECS shutting off. If the EQUIP HOT indicator persists, shut down all non-essential avionics (the FCR will be automatically shut down) and initiate a landing at the earliest practical opportunity.

2.1.5 Ejection

Given the absolute absence of any risk of fatality or injury in our hobby, there should be no hesitation about utilizing ejection when deemed necessary. Simply pull the handle, and you will safely ascend to meet the parachute.

2.1.6 Electrical System Failure

WIP

2.1.7 Engine Malfunctions

In BMS several possibilities for engine trouble during flight have been introduced. Nearby explosions from AAA or SAM may lead to engine flameout, while fuel starvation can occur when running on fumes, especially during negative G maneuvers. In most cases, attempting an engine restart can be done using an air-start procedure.

Air-Start Procedure

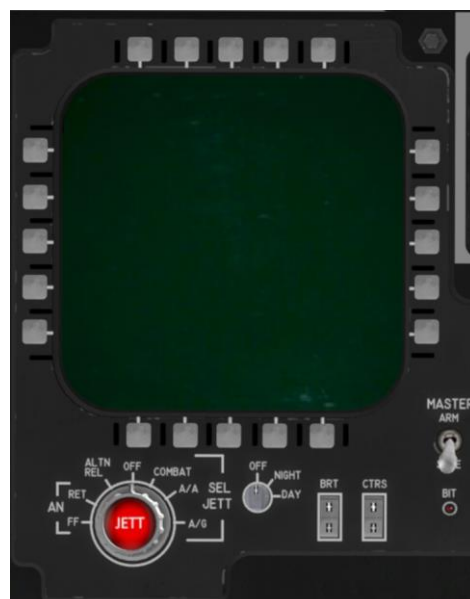
WIP

2.1.8 Jettison

Selective Jettison

On the MPCD the Jettison Selection knob can be changed to the appropriate setting and then the button can be pressed to jettison. You must be in Master ARM to jettison.

OFF Weapons cannot be jettisoned.



COMBAT Selects programmed selective jettison.

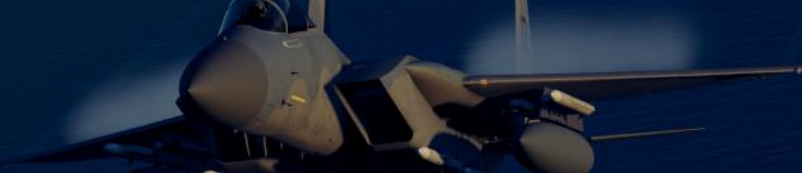
A/A Selects air-to-air selective jettison. (N/I)

Emergency Jettison

Centrally located on the front panel just to the left of the attitude indicator you will find the black and yellow emergency jettison button to be used to jettison all stores.

NOTE: In the current BMS version, missiles on stations 3,4,6 & 7 will not be jettisoned.





2.1.9 Empty for growth

WIP

2.1.10 Controllability Check

Performing a controllability check is essential whenever structural damage or any failure affecting aircraft handling is suspected or identified. The following steps should be executed:

1. **Attain a Safe Altitude:** Ascend to a safe altitude to allow ample time for the controllability check.
2. **Reduce Gross Weight:** Decrease the aircraft's Gross Weight to enhance maneuverability and control.
3. **Determine Optimum Landing Configuration:** Evaluate the optimum configuration for landing by adjusting to the landing configuration, considering factors such as dirtying up and assessing the best Angle of Attack (AOA) and landing speed.
4. **Land Using Identified Settings:** Execute the landing procedure employing the settings determined through the assessment.

If, during the controllability check, the aircraft proves uncontrollable to achieve a reasonable landing speed, consider the option of a controlled ejection.

2.1.11 Out of Control Recovery

If you find yourself in a dogfight (BFM) you can use your rudder and differential thrust to maneuver but be aware that the F-15C will be susceptible to unrecoverable spins especially at lower altitudes. Refrain from using these methods if below 10,000 feet as you may depart controlled flight.

2.1.12 Fuel leak

WIP

2.1.13 Oil leak

WIP

2.1.14 External Damage Checks

BMS heightens the potential for system failures resulting from battle damage and other damage. Engine stalls, fuel leaks, and oil leaks now pose a tangible threat, underscoring the critical importance of conducting thorough battle damage checks. It is strongly recommended to enlist the assistance of one of your human wingmen (if available) to perform a visual assessment and ascertain the extent of the damage.

Fuel leaks and oil leaks may be discernible from your wingman's perspective. Both instances generate white smoke; however, it's crucial to note that oil leaks specifically emanate from the engine, while fuel leaks may originate from various sources such as tanks in the wing, fuselage, etc.

2.1.15 Icing

With its introduction in 4.35, icing conditions are now a notable feature. It is strongly advised to steer clear of known icing areas. Icing tends to be more significant at medium altitudes in humid air, particularly in cloudy conditions. In BMS, this corresponds to flying in adverse weather conditions. The F-15 is equipped with two anti-icing protection systems.

The first system is designed to prevent the accumulation of ice in the engine inlet, which could pose a hazard to the engine. The second system involves probe heating to avert ice contamination of the data probes, preventing erratic instrument readings.

While the onboard systems can handle light to moderate icing, it is not recommended to intentionally fly into known icing conditions, as severe icing may compromise the effectiveness of the onboard systems. Failure to appropriately utilize the ANTI-ICE inlet protection or encountering ANTI-ICE failure may result in severe engine damage.

Similarly, improper use of PROBE HEAT or experiencing PROBE HEAT failure can impact flight instrument readings, making instrument meteorological conditions (IMC) piloting highly perilous.

2.1.16 FCS Failures

WIP

2.2 The Mission

When the flight plan (or single leg) turns red there is a problem somewhere. Possible causes may be not enough fuel on board for the flight plan distances, timing problems, or steerpoint problems. When you build your own TE's you will have to correct these issues to ensure your flight plan is white before flying the mission.

The alternate runway is displayed in the flight plan as the last INS steerpoint. In the F-15C the first steerpoint is B for Base and therefore shifting your steerpoints down by one in comparison to 2D. Once you are in the pit be sure to use what you see in the aircraft and not what the steerpoints used to be in 2D to make things less confusing. In this case our INS flight plan starts at Gunsan (STPT B) for base and ends at Gunsan (STPT 7) therefore the alternate runway (Gwangju airbase) will be steerpoint 9.

There is no indication of TACAN channels or airport information on the UI map. This extra information would overload the map. Yet that information is important and must be planned for the flight. There are multiple tools to help you do that. WDP and its data card will layout the relevant navigation information.

Here is the required information for this flight:

- Gunsan: TACAN 075X - RWY 18/36 - ILS RWY 36: 110.3 – Elevation: 10 feet - ATIS: 120.225 - Ground: 273.525 – Tower: 292.3 – Departure & Approach: 292.65
- Gwangju (Alternate): TACAN 091X – RWY 04/22 (L&R) – ILS RWY04L & 22R: 111.1 – Elev: 110 feet - ATIS: 128.875 - Ground: 275.8 – Tower: 254.6 – Departure & Approach: 268.0
- MUAN TACAN: 065X
- MOA 15 active: 11000' to FL400
 MOA 17 active: 5000' to FL400
 MOA 19 active: 10000' to FL400
 (these are restricted to you as other aircraft train in these areas).

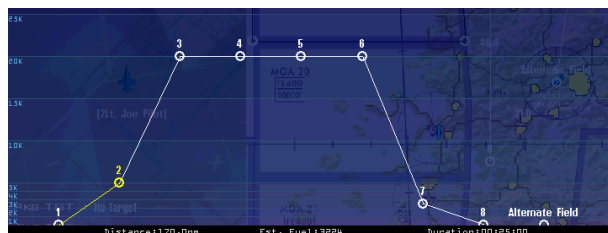
The mission planning map also displays relevant areas or specific points. These are Lines and PPTs. They are activated by right clicking on the UI map and selecting 'Set STPT Lines' or 'Set Pre-planned Threat Stpt'.

Lines are used to mark specific areas such as FLOT lines, CAP boxes, AAR boxes, AOR, Kill boxes, etc. PPTs are used to identify specific points like IAF, entry points, rendezvous points, push points, etc. They can also be used to label boxes you have created with Lines, like the MOA in this training scenario. Lines and PPTs are fully customizable and can be labelled as you prefer using WDP or by editing the PPT.ini file directly.

MOAs 15, 17 & 19 are lined and labelled and PPTs are also placed on WOLF IAF for Gunsan and JULOP fix for ILS RWY36. All these lines & PPTs will be visible on your HSD MFD page if you have loaded your DTC.

The map also displays MEF (Maximum Elevation Figures) in each box created by one degree of latitude and one degree of longitude. The MEF are the highest known point of elevation in each box. They are given in hundreds of feet, with the large number being thousands and the smaller number being hundredths of feet.

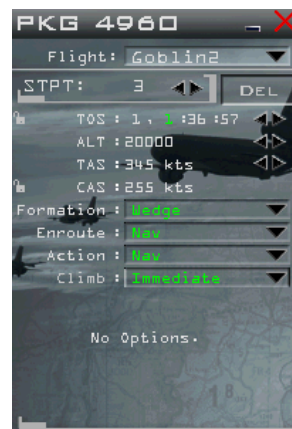
For instance, 5² indicates 5200 feet. To stay safe from hitting the ground (in bad visibility for instance) you should stay above that reference by at least 500 feet. MEF + 500feet = MSA (Minimum Safe Altitude), unless you are on a published SID or approach chart which will keep you safe from the terrain. The altitude of your flight plan can be checked as well: the first



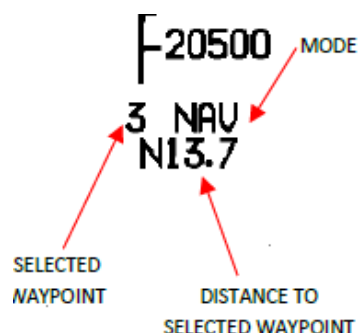
and 2 last steerpoints (departing airbase, arrival airbase and alternate) are at ground level. The altitude of the other steerpoints is displayed in two different graphics which you can enable or disable with the 2 graphic buttons on the right side of the UI screen. The total distance of the flight plan is 218 Nm and the ETE (Estimated Time Enroute) will be 25 minutes.

More information can be found for each steerpoint if you click on it. A new window will open with steerpoint information:

- Flight callsign: Eagle 1-1.
- Steerpoint number.
- Time over Steerpoint (TOS)
- Altitude required for steerpoint passage.
- True Airspeed passing the steerpoint.
- Calibrated airspeed.
- Formation required.
- Type of action enroute and at steerpoint. If the latter type is defined, then the Option box below will be filled in with relevant information.
- The type of climb when a change of altitude is set. It can be immediate or delayed.



All this information will be available once you are in the cockpit. Besides the main flying instruments, the most important tools for INS navigation are your HUD and your HSD MFD page. When you are wanting to change steerpoints the increase and decrease buttons are located on your Nav Control in the red boxed buttons below. Remember in comparison to the 2D screen you need to subtract one number from your steerpoints because of steerpoint 1 being B in the F-15.



BMS F-15C TRAINING MANUAL

4.38.0

The Situation Page (SIT Page) page is a god's eye view around your aircraft. It can be zoomed from 15 to 240 Nm and displays your INS flight plan, PPTs and lines as illustrated below. The SIT Page is explained in the Dash-34 (chapter 4).



The picture above is taken at the starting point of the Navigation training mission. You are between Gunsan airbase and currently over steerpoint 1, level at 5000 feet QNH. Calibrated airspeed is 300 kts. To increase to the next steerpoint press the right boxed button on your Nav controls as shown above. By default, they are Page Up and Page down for increase and decrease.

Steer towards steerpoint 1 (or the active steerpoint) by turning towards the towards the vertical line in the HUD as illustrated on the right. Try to on the horizon line (0° pitch line in the HUD).

In some parts of the mission, crosswind situations can cause the FPM to drift circumstances, the FPM may display off the side of the HUD. In these the center of the HUD to cut out any lateral drift, this is done in the ADI mode **down**. When the FPM is caged to the center of the HUD it will flash not showing the true velocity vector of the aircraft. While the FPM is caged vertical velocity (climb/descent) in this mode.



Between STPT 1 and 2 we will perform our G-Warmup. 4.36 introduced the concept of Warm up and Fatigue.

To get the best G response from the pilot, a G warm up procedure shall be done prior to each combat or training sortie. The G warm up consists of flying in the 3 -5 G region to train the body, the more you train in this area, the longer your body will remember the warmup. For example, a 45 second warmup in the 3-5 G region will provide a 20-minute full G capability, after 20 minutes, a new warm up should be done again. Without Proper warm up, the resistance of the pilot will be limited. The more you fly above 7G, the quicker the fatigue effect of the warmup will be in effect. After a certain amount of time above 7G, the G Load resistance of the pilot is equivalent to the one with no warmup.

Execute two g-warmup sessions before reaching STPT 2 with one 90° left and 90° right turn at 5000ft and 400-425kts. For the first 90° turn hold 3-5G. For the second turn hold 5-7G. Go gate or buster to achieve/hold these forces.

Note: For other trainings and mission sorties, execute your G-warm up inside the aircraft limits (Loadout) and energy limits (Altitude, Drag, Speed).



The flight plan calls for a climb to FL200 [20000 feet on QNE (29.92 or 1013Mb)]. Climbing to altitude can be achieved by pulling gently on the stick. The aircraft will climb, and airspeed will decrease.

In this training scenario, we will learn to perform a climb to altitude in a fuel-efficient way. Fuel is always a concern, so everything possible should be done to conserve fuel. One fuel efficient climb profile is to climb at a set speed and adjust your climb angle to maintain that speed. Advance your throttle to buster (MIL power), wait for 350 kts and then pull the stick and adjust the climb angle to maintain 350 kts throughout the climb. As you climb, your airspeed may drop below 350 kts, in which case simply decrease your climb angle to stabilize your airspeed and accelerate back to 350 kts.

Passing 14000 feet, set your altimeter to QNE: 1013 Mb or 29.92 inHg (use the barometric setting knob, located at the lower left corner of the instrument. Refer to page 49 of the Dash-1 flight manual for detailed information about the altimeter). That is the standard pressure for flights above the transition altitude in KTO (Korean Theatre of Operations). From now on altitude will not be called in feet, but in-Flight Levels expressed in hundreds of feet. e.g.: FL150 is 15000 feet. Before reaching FL200 decrease your climb to level out at your assigned altitude. Depending on your gross weight you may also need to retard the throttle a bit to maintain 350 kts.

Now is a good time to check your fuel. Fuel remaining and fuel imbalance problems should be one of your main concerns. Fuel remaining is checked by looking at the fuel gauge on the right AUX console. Fuel imbalance is checked by looking for a large difference between the left and right quantities on the fuel gauge. If the two numbers have a difference of 1k pounds or greater you should start thinking about fixing the situation by following the checklist. Fuel controls are WIP

Autopilot needs a few conditions to be enabled. These are also documented in the Dash-1 page 54.

- Gear is not down.
- AR door is not open.
- AOA is not greater than 15°.
- There is no A/P failure or FCS failure (STANDBY gains would be active).
- Stall Horn is not active.

Move the LEFT AP switch to ATT Hold and move the right AP switch to ALT hold. The autopilot will engage (if the above conditions are met) and fly the aircraft. At any moment you can take control over the AP simply by moving the stick but be aware that if you exceed any of the above limitations the autopilot will disengage and WARN will be displayed in the HUD.

TACAN Stations and VOR

WIP



MISSION 3: LANDING (TR_BMS_F-15_03_Landing)

TAKEOFF OPTION: In flight.

LOCATION: Approximately 15 Nm south of Gunsan.

CONDITION: Aircraft level at 3000 feet heading 360° - speed 420 kts. Fuel level just at 2.2k which is just about typical fuel level when you return from a mission. Once in the cockpit the training scripts will freeze BMS and set up your systems accordingly. Set up your MFDs according to your preferences.

LEARNING OBJECTIVES: Land on Gunsan RWY 36 Straight-in or overhead.

This mission starts 15 nm south of Gunsan airbase. Your airspeed is around 420 kts and you cover 7 Nm in a minute. You will be on the ground in about 5 minutes.

This training mission will be used as a starting point for different scenarios. We will start by explaining the landing procedure with a long straight-in approach. We will explain the nuts and bolts of a good approach and how to manage the jet to land safely.

We will explain other landing procedures such as the overhead or the ILS approach. In these chapters we will consider how to land the airplane has been mastered and concentrate on the specific approach procedures.

A good landing starts with a good approach. Configure your jet early enough with all the information you need for landing:

- Correct altitude. If your glideslope is too steep you will not be able to decelerate enough to lower your landing gear and even if you do, your final approach speed will be too high.
- Correct airspeed. The faster you are the more distance you will need to get down to landing speed.
- Know the weather. Ask Tower or Approach what the winds are at the airfield. Always be aware of the wind component according to the runway heading: that will help you compute your wind drift. The F-15 has a maximum crosswind component of 25 kts. If the crosswind is stronger than that, you should find a better-oriented runway to land on (the airbase might be closed). You are aware of the current visibility and can plan your approach accordingly.
- Know your landing weight to have a rough idea of your on-speed AOA for landing and know the runway. Although the F-15 can land on any runway in Korea the landing speed and the landing roll will depend on your gross weight at landing. GW computation can be done by taking empty weight + weight of stores remaining + weight of fuel remaining. That said, if you follow the AOA cues you will always fly the correct speed AOA for approach.
- Always place the SYM in the NORM position so the FPM drifts with the wind. That way you will automatically compensate for drift by placing the FPM on your desired touch down point.
- Listen to the ATC to build situational awareness of the traffic around the airport. Ground, Tower and Approach/Departure each have a separate frequency. Make sure you have tuned to the correct one. ATC is also able to tell you which runway is active for departure and arrival. At night, the ALS (Airport Lighting System) will be off unless you initiate contact with ATC and it will remain lit as long as aircraft are in the landing queue. If you don't contact ATC and there are no other aircraft taking off or landing, the ALS will remain off.



3.1 Landing Emergencies

3.1.1 *Landing With a Blown Tire*

The primary risk associated with landing with a blown tire is the potential collapse of the landing gear and the difficulty in maintaining directional control during the landing roll. If a blown tire condition is suspected, it is crucial to minimize the gross weight before attempting to land. Retain external fuel tanks if empty and depressurize them to reduce the risk of explosion. In BMS, this involves opening the AR door, but it comes at the expense of the Nose Wheel Steering (NWS) system. While the risk of explosion is not explicitly modeled, the importance of NWS functionality should be considered.

During landing, favor the side opposite the blown tire. Utilize roll control to alleviate pressure on the blown tire and NWS to ensure directional control. If equipped with differential braking, apply brakes on the undamaged tire.

Bring the aircraft to a stop in a straight-ahead direction and proceed to shut down the engine. Avoid attempting to taxi unless facing an emergency.

3.1.2 *LG Extension Malfunctions*

Typically, issues with extending the landing gear manifest as the landing gear handle failing to lower or the failure of one or more landing gear to extend, accompanied by the absence of corresponding green lights and continuous illumination of the red light in the landing gear lollipop. The lollipop's red light signals a problem, while the green lights indicate the specific gear affected.

As of BMS 4.35, the landing gear handle might not lower at all due to the implemented gear handle solenoid. If the landing gear is lowered while the aircraft is going greater than 300 knots there is a great chance that the gear will not lower fully. When this happens all three lights might not illuminate, and that gear has the possibility to collapse on landing. To troubleshoot make sure to decrease the speed and raise the landing gear to see if they raise. Most likely the suspect one will not. Proceed to Emergency Landing Gear Extension.

3.1.3 Emergency Gear Extension

The emergency gear extension serves as a pneumatic, one-time-use method for lowering the landing gear. When the emergency gear handle is pulled, the landing gear doors open, releasing the main legs, which lower and lock in place due to gravity and airflow. The nose wheel, however, must be pushed forward using the pneumatic system involved in the emergency gear extension.

To ensure a secure lock of the nose wheel gear, this procedure should be executed at the lowest feasible airspeed, ideally below 190 knots and certainly below 300 knots. Once the emergency gear has been initiated the doors will remain open.

Steps for Emergency Gear Extension:

1. Pull the emergency gear handle, initiating the process.
2. Allow the landing gear doors to open and release the main legs.
3. Confirm the gear is down and locked by verifying the absence of the lollipop's red light and the illumination of all three green lights.

Once the gear is confirmed down and locked, proceed to land the aircraft normally. If any landing gear remains unsafe or up, refer to the "LANDING WITH GEAR UNSAFE/UP" procedure.

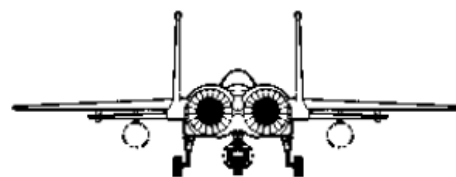
Important Note: Following an emergency gear extension, the Nose Wheel Steering (NWS) is unavailable, even if System B hydraulics are operational. Be mindful of this limitation during post-extension operations.

3.1.4 Landing With Gear Unsafe/Up

In the event of landing gear problems, it is advisable to retain empty fuel tanks and minimize gross weight to enhance the chances of a successful landing. Given the heightened risk of a potential crash, additional precautions may include shutting down the Fire Control Radar (FCR) and any non-essential avionics. These measures aim to optimize the aircraft's controllability and increase the likelihood of a safe landing under challenging circumstances.

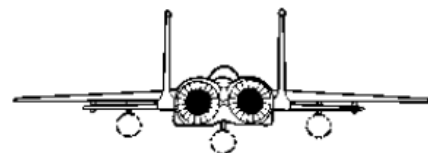
All landing gear indicate unsafe but appear normal:

In the event of a potential landing gear failure, take preventive measures by shutting down all non-critical avionics, including the Fire Control Radar (FCR) and CM before initiating the landing procedure. Subsequently, execute a standard landing protocol but take extra care in your landing. Try to be the last aircraft landing or land on the parallel runway so others can land.



All landing gear up:

1. Gear will not come down
2. Activate the Emergency Gear handle and wait for 5 seconds.
3. No green gear lights
4. Reset the Emergency Gear pushing it back in
5. Raise the landing gear handle
6. Hope for a smooth landing



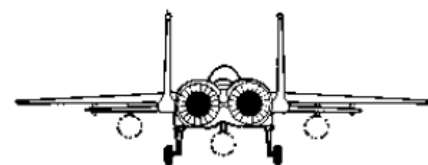
ALL GEAR UP

Land from a low angle approach at 18 Units AoA.
Throttle OFF immediately prior touch down.
Cable arrestment not recommended.

Both main landing gear up or unsafe:

Emergency Gear Extension Procedure

1. Discourage cable arrestment usage
2. Lower the gear
3. Activate the Emergency Gear handle and wait for 5 seconds.
4. Wait for green gear lights
5. Do no shut down engine until stopped

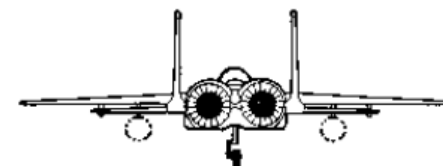


BOTH MAIN – NO NOSE/STUB NOSE

If the nose landing gear fails to retract, contemplate executing a low-angle approach at 15 Units AoA with empty fuel tanks if applicable.

Nose landing gear up or unsafe:

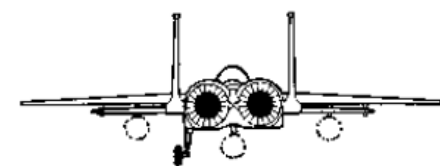
1. Discourage cable arrestment usage.
2. Contemplate executing a low-angle approach 18 Units AoA.
3. Recommend use arrestor gear at approach end of runway
4. If arrestor gear not practical do not shut down engines until stopped



NO MAIN – NOSE DOWN

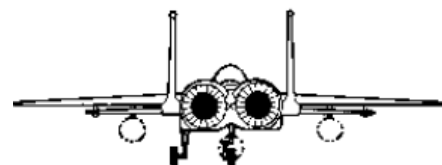
One main landing gear and nose landing gear unsafe or up:

1. Retract and land with gear up
2. If gear will not retract recommend ejecting



One main landing gear unsafe or up:

1. Recommend cable arrestment.
2. Counter wing dip opposite of raised gear
3. If arrestment not practical perform gear up landing
4. If gear will not retract recommend ejecting



ONE MAIN – NOSE DOWN

If landing gear retraction fails:

- Consider landing with a low angle approach at 15 Units AoA, using empty external tanks.
- After touchdown, use roll control to maintain wing orientation.

Land on the side of the runway opposite the malfunctioning gear.



3.1.5 *Brake Malfunctions*

WIP

3.1.6 *Nose Wheel Steering Malfunctions*

WIP

3.1.7 *Anti-Skid System*

The anti-skid system can be manually activated or deactivated by the pilot via an electrically controlled switch. In case of failure of the system, a cockpit warning will indicate to the pilot that the system has failed. It will only be triggered when the gear comes down. ANTI-SKID on the caution light panel and MASTER CAUTION will also come on. There is a touchdown protection system, which prevents brake application on touchdown before the wheels spin up.

Anti-skid and ARI (Aileron Rudder Interconnection) are connected. After touchdown, the ARI will be disengaged by the anti-skid wheel spin up signal.

Anti-skid switch positions:

- NORM: anti-skid is ON when the landing gear handle is down.
- OFF: Anti-skid and ARI are off when landing gear comes down.

3.1.8 Cable Arrestment

As of version 4.35, arrestor cables are operational on non-generic airbases. Engaging a cable requires no special ATC procedures; the cables are consistently present on applicable runways and are always ready for use (unlike real-life scenarios).

The number of cables varies across runways. Some may lack cables, while others have two cables at each runway end section, and certain runways feature a total of four cables. Cable positions are indicated by vertical panels displaying a plain yellow circle on both sides of the runway.

When uncertain about stopping within the available runway length, lower the hook and aim to engage the arrestor cable as close to the runway centerline as possible. Avoid riding the brakes over the cables, as this could compress the nose gear and potentially lift the hook above the cable, preventing proper engagement.

Plan your touchdown at least 500 feet from the cable to allow ample time for lowering the nosewheel to the ground before engaging the cable. Once the aircraft comes to a halt, raise the hook and, if possible, exit the runway promptly.

3.1.9 Takeoff/Landing in Crosswinds

To effectively manage wind conditions during take-off and landing, the initial step involves determining the wind direction and speed.

On the ground, obtain wind information through pre-flight briefings, contacting ATC for up-to-date wind speed and direction before departure.

The subsequent step is calculating the crucial crosswind component—the aspect of the wind perpendicular to the runway. While headwind or tailwind is favorable for take-off and landing, any crosswind component can potentially push the aircraft sideways.

Wind force is delineated into two components: the head or tail component and the full cross component. This can be determined using a graphic, considering the wind direction relative to the runway orientation and the wind speed. Refer to the example on the following page.

In BMS, a crosswind limit of 25 knots is established based on the graphical representation. Crosswind situations up to 24 knots can be managed in BMS, but any condition exceeding 25 knots necessitates diverting to an alternate runway with more favorable wind conditions.

Consider the following example:

Runway heading: 360°

Wind direction: 330° at 20 knots

1. Enter the graph on the line representing the wind direction relative to the runway: $360^\circ - 330^\circ = 30^\circ$.
2. Find the wind speed on the left side of the graph.
3. Follow the curve until it intersects the first line.

By plotting these coordinates, you determine the full headwind and full crosswind components. In this case, it results in 17.5 knots headwind and 10 knots crosswind.

Take-Off in Crosswind:

Position the aircraft on the upwind side of the runway centerline for take-off. Maintain directional control using the rudder until the ARI (Aileron Rudder Interconnect) engages. In BMS, crosswind effects are typically felt after the main wheels leave the runway.

Landing in Crosswind:

For the F-15, use the wing-level crab technique for crosswind landings. Avoid using the rudder during landing due to the ARI connection. Release the rudder pedals, pointing the aircraft nose into the wind. In high crosswinds, use the DRIFT C/O switch to center the FPM if it drifts outside the HUD field. Plan the touchdown point on the upwind side of the runway.

Upon touchdown, ARI (Anti Rudder Interconnection) disengages, and there may be yaw transients. Allow the aircraft to stabilize without applying additional controls. During aerobraking, use rudder and aileron for directional control. As air speed decreases, more rudder input is required. Once the nose gear is down, disable the NWS by holding the paddle switch and initiate braking while maintaining control with rudder, differential braking, and let go of the paddle switch to enable NWS below control speed. Avoid excessive differential braking to prevent hot brakes conditions.

3.2 Landing Straight-in

A straight-in landing is a long, controlled descent to the runway; usually beginning at a distance between 6 to 9 nautical miles. The landing phase will start aligned with the runway axis; you can use the airbase TACAN to do that, but it can be done visually as well. Your altitude should be 2000 feet and airspeed less than 300 knots for safe extension of the landing gear.

The TE starts 30 Nm out at 5000 feet and 400 kts, allowing a few miles to adjust parameters for the straight-in approach. Gunsan Runway 36 should be visible ahead. Adjust your line up, descend to 2000 feet and reduce speed to 300 kts. Due to the low drag nature of the F-15, speed brakes may need to be opened to reduce speed. However, the speed brake is very effective.

Initiate contact with ATC by requesting unrestricted approach. ATC will insert your flight into the landing queue, light up the approach lights and give your flight some flexibility for this scenario. Open the ATC menu Approach page and select 'Request unrestricted approach' by pressing 't t t 4'. Approach will instruct us to continue inbound and give us QNH.

From this point on we will no longer refer to airspeed but instead use Angle Of Attack (AOA). The optimal approach airspeed depends on your gross weight and the best way to be 'on speed' is to forget all about airspeed and think 20 Units AOA for landing with a max of 22 Units noted by a line extending right just above the 20 Unit mark

First lower your landing gear (double-check your airspeed: it must be below 300 kts). Doing so will automatically deploy leading and trailing edge flaps and the FCS will switch to take-off and landing gains. The drag caused by dirtying up your aircraft configuration will further decrease your airspeed and pitch the nose down a bit.

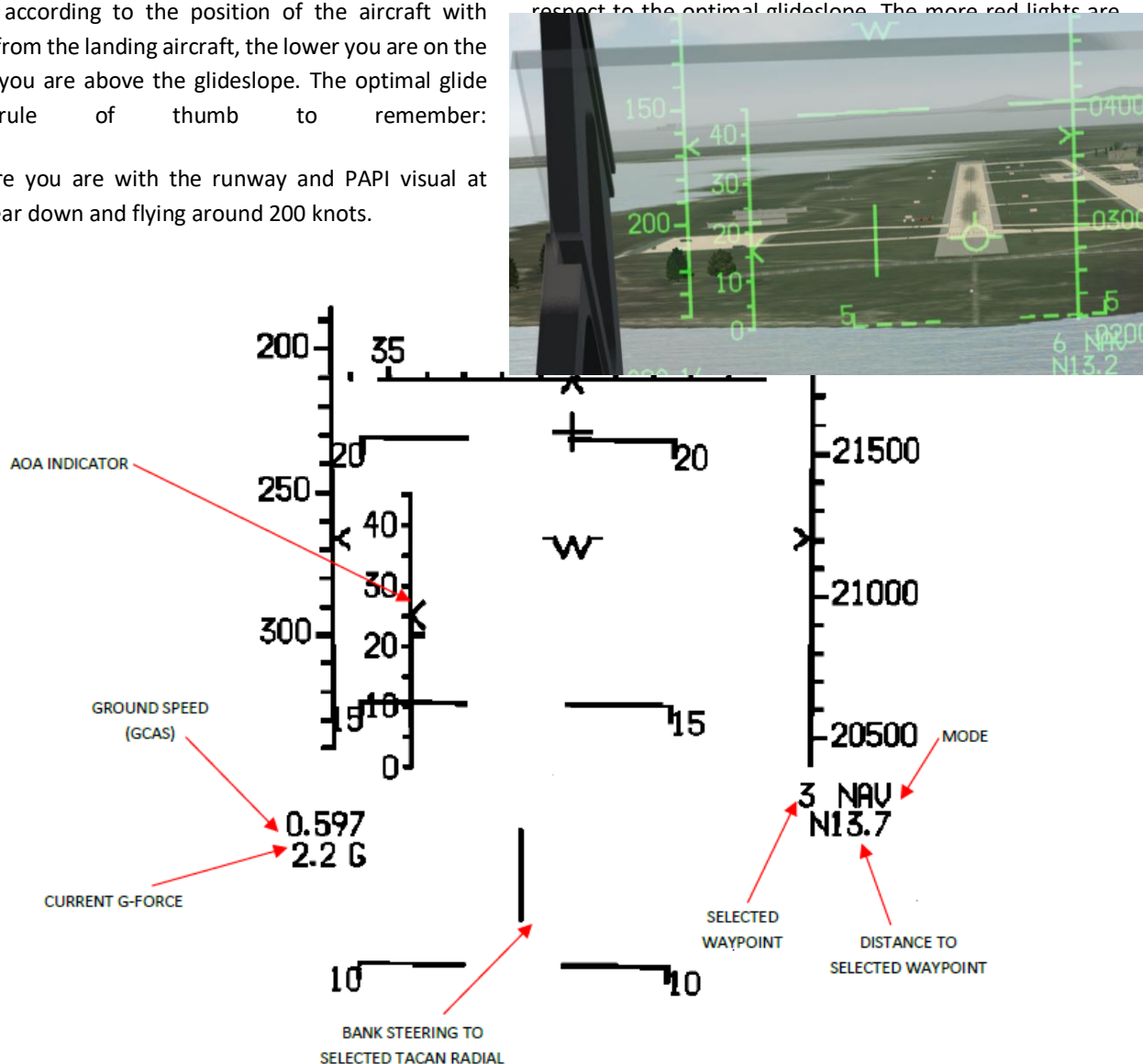
The HUD symbology will change notably an AOA tape will be displayed upon nose wheel lock in the down position. This tape is used to adjust your speed based on your weight. Air speed will change but AoA units will not as your main cues for controlling the approach.

At 10 Nm, Gunsan approach will call you to switch to Tower frequency. Input preset #3 or 292.3 into the COM1 radio and 'Request Landing' at initial contact with the tower with 't t 2'. Tower will clear you to continue inbound and ask you to "Report on Final".

The glide slope is 3° down to the runway.

Most runways in BMS are equipped with a visual landing aid system called Precision Approach Path Indicator or PAPI. It consists of four equally spaced lights situated to one side or both sides of the runway. The lights will be seen as white or red according to the position of the aircraft with respect to the optimal glideslope. The more red lights are visible from the landing aircraft, the lower you are on the glideslope. The optimal glide

A rule of thumb to remember:
So there you are with the runway and PAPI visual at feet, gear down and flying around 200 knots.



You know that placing the FPM on the runway threshold to land allows you to point where you want the aircraft fly.

You also know that to maintain two red and two white lights on the PAPI you must fly a 3° glideslope to the runway. This is done with the sidestick controller.

All you have left to do is to understand the angle of attack and how to control it with the throttle.

AOA is the angle between the aircraft wing chord line (equivalent here to the airframe longitudinal axis) and the relative vector of motion of the aircraft. Basically, it's the angular difference between where the aircraft is pointing and where it is going.



The optimal touch down AOA for the F-15 is 22 Units AOA; corresponding to when the AoA tape carat is near the tick mark above 20 Units.

AOA is controlled by the power setting. Increasing power decreases AOA. (The FPM moves up while the nose remains steady) Reducing power increases the AOA (The FPM moves down in the HUD while the nose remain steady)



Knowing that, if the FPM is lower on the scale, you know you will have to decrease power setting to increase the AOA.

You are too fast.



If on the other hand the FPM is higher on the scale, you will have to increase power to decrease AOA.

You are too slow.

The approach is made around 18 Units of AoA

The FPM should be just on the runway threshold and the PAPI should indicate two red and two white lights however in a fighter jet 3 red is the norm to shallow your approach angle to decrease the amount of flare needed when over the runway numbers.

From there the power setting is used to maintain the FPM on the runway threshold close to 20 units.

‘Report Final’ to the Tower Controller via the ATC Tower menu ‘t t 4’. Tower will then give you surface winds and clear you for landing.

The next phase will be the flare just prior to touch down. The F-15 does not require much flare. The idea here is to transition the carat from 20 units to 22 units.

Decreasing power is usually all it takes to transition to 22 units AOA. Once there, maintain it until the wheels kiss the ground and pull the power back to idle. If you land with the correct on-speed AoA the aircraft will not bounce off the runway and will not want to fly again unless you increase power.

Maintain aero braking by keeping 20 units of AoA. Since you are rolling and not flying anymore that is done by pulling gently on the stick. Finished extending the speed brake to introduce maximum drag. Beware that pulling too much will scrape the exhaust nozzle or the airbrakes and damage the aircraft. You can maintain directional control with the rudder during the landing roll; rudder efficiency is greater at higher speed and will decrease as your speed decays.

Around 80-90 knots the nose gear will drop to the runway; gently cushion it by pulling the stick. Be sure to hold the paddle switch to disable the NWS and not veer off the runway.

Wheel braking can then be initiated, being careful to avoid causing a hot brakes condition; nosewheel steering can be engaged once you are below 70-80 knots to steer the aircraft on the ground. Congratulations, you just made your first solo landing.

3.3 Overhead landing

Overhead landing is the preferred method for landing because it allows multiple aircraft to land in the minimum amount of time. AI can perform overhead landings under certain conditions. Similarly requests for an overhead approach will only be granted to humans under certain circumstances:

- Flight conditions must be VFR.
- The ATC must be able to manage all the flights recovering at the same
- All aircraft in the flight must be within 15 Nm of flight lead at time of initial request.

As with all the other approaches, the type of approach is requested on the Approach ATC menu. In this case, as soon as the training mission starts ‘Request Overhead Approach’ with: ‘t t 3’.

10 Nm from the airbase, approach will request a frequency change to Tower. Once the frequency is entered into the radio make initial contact as before with ‘Request Landing’ on the Tower ATC page: ‘t t 2’. It is important to make this initial contact before the break point. Tower will clear you inbound and request you to “Report overhead break”. The flight should be in a wingtip or echelon-close formation. The side of the formation is opposite the direction of the break, e.g.: left break for RWY 36 = flight lead left and wingmen in right echelon. Speed is 300 kts, altitude 1500 ft AGL and the flight aligned with the runway axis.

The last 5 miles are used to fine tune the formation, so the landing looks good. Fly at a constant airspeed level altitude until overhead the runway. To make overhead less restrictive and granted more often, the ATC code now requires the lead to call the break turn. This is done with the ‘Report Overhead Break’ option on the Tower ATC menu: ‘t t 5’. This is the only indication for the AI ATC to know you’re breaking so it can deconflict other flights faster.

BMS F-15C TRAINING MANUAL

4.38.0

From there aircraft will break in sequence, gain separation, and fly the downwind leg, bleeding airspeed and lowering the gear. At base, the jet will turn towards the runway and start descending to land in sequence.

In this training scenario you are a single ship, so you do not have to take other aircraft into account. The idea is to lay out the procedure so you can then join a 2- or 4-ship and perform your landing in sequence.

From JULOP you already have the runway in sight. Descend gently to 1500 ft AGL and reduce your speed to 300 kts, aligning your heading with Runway 36 QFU (356°).

Your jet should be within parameters at least 5 Nm from the runway threshold. Continue straight & level until you overfly the runway. The timing of the break turn depends on how many aircraft there are in your flight and on how long you want your downwind leg to be. The sooner you break, the shorter your downwind leg will be. A good cue for single-ship training is to wait for the opposite landing threshold (RWY 18 in this case) to disappear under your aircraft's nose. In a 4-ship scenario, the lead has the shortest downwind and should start his break much sooner (like the beginning of the runway) to allow the rest of the flight to break before overflying the opposite end runway threshold.

The direction of the break may be published on the airport visual charts or stated in the airport SOPs. Let's say that at Gunsan all the breaks are over the water to avoid overflying populated areas. Landing on RWY 36 the water is on the left side so the break will be to the left.

The break turn is a maneuver that will turn 180° level. Don't forget to report the break to ATC with "t t 5". While turning you will be bleeding airspeed and once established on the downwind leg (356-180=176°) you can lower your landing gear immediately.

The turn will define how wide your lateral separation with the runway will be.

The idea is to fly the downwind leg with the wingtip on the runway. If the runway is inside your wing the break turn was too tight; if the runway is outside the missile rail, then your break was too wide. Judging the correct lateral separation is the first challenge of an overhead recovery. It will come with experience, and it will soon be second nature. You may also need to adjust for crosswinds blowing you towards or away from the runway.

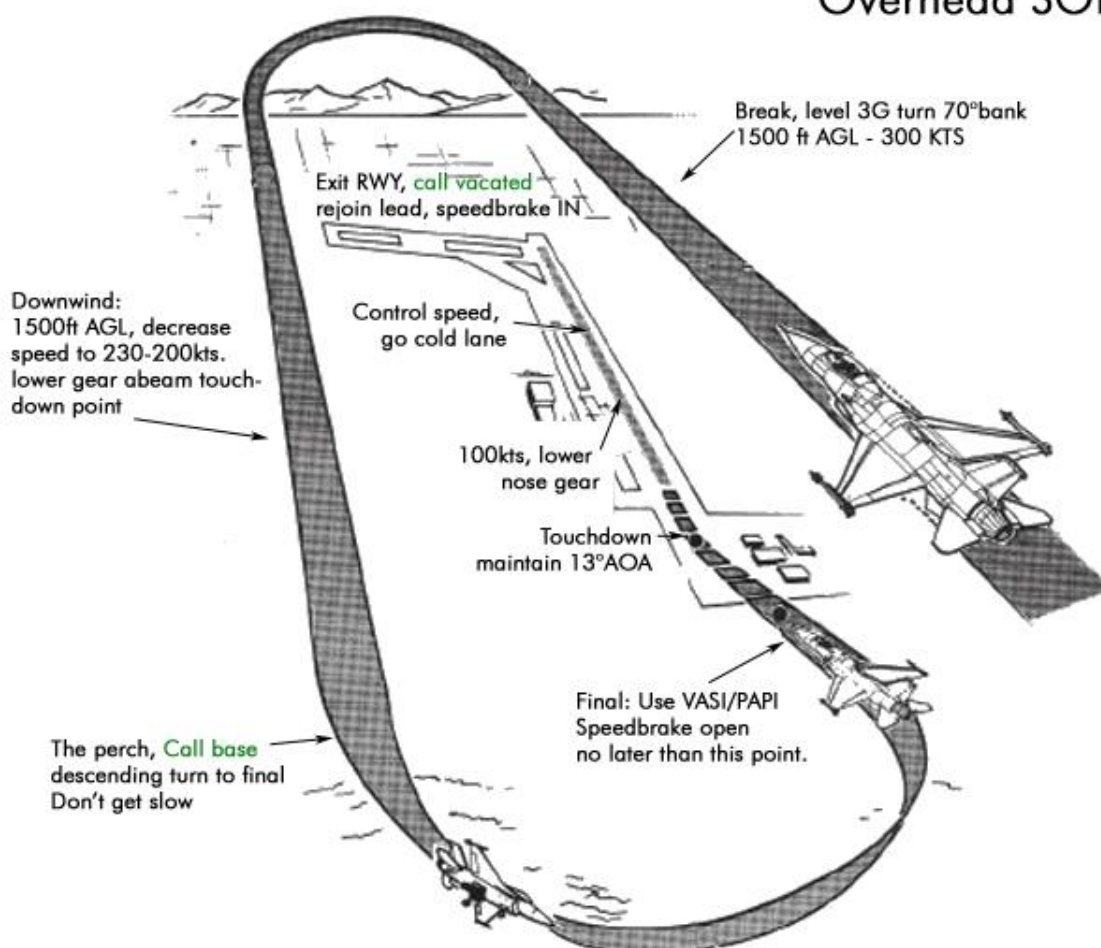


The downwind leg is flown at 230 to 200 kts - 1500 feet until you reach the Perch. That's the point where you will turn toward the runway and start your descent. Judging that point is the second challenge of the overhead. A good visual cue is when the front of the wingtip touches the runway threshold.

Retard the throttle (or deploy speed brakes) and start a left descending turn towards RWY 36. Keeping the runway in sight throughout the turn is very important. Avoid slowing down too much in the turn. Try to fly 19 Units of AoA.

The **Departure Warning** is a 900 Hz beeping tone sound when the yaw rate reaches 30°/second. As the yaw rate increases, the beep rate increases, reaching a maximum beep rate at 60°/second yaw rate.

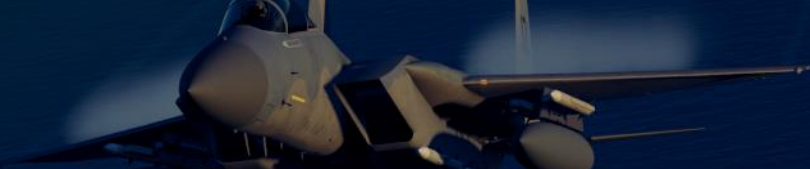
Overhead SOP



Final approach is when you are aligned with the runway. Use PAPI as a landing aid and maintain on-speed AOA about 15 Units AoA

If you reported the break to ATC correctly, the tower will clear you to land automatically as you reach a final position. If you forgot to call the break, the landing clearance will never come. The clearance is given for the whole flight entity, so wingmen do not need to report break or final. They are cleared automatically when the flight lead is cleared to land. Basically, the only thing wingmen need to do is call out their 'break' if they have AI in the flight.

Speedbrakes are optional during final. With the landing gear down the speedbrake can be extended to max extended (not recommended) when the switch is in the aft position but if button centered the speedbrake will only open about half which is the recommended position. The reason speedbrakes can be deployed is to overcome the slow spooling time of the engine. An engine at low revolutions may need a certain time to accelerate to go around setting. While the engine is spooling up, the aircraft will sink and may hit the ground. To keep engine revolutions high without accelerating, speedbrakes are used.

A close-up, low-angle shot of an F-15C fighter jet, showing its nose, cockpit, and wings. The aircraft is dark in color, possibly black or dark grey, and is set against a dark, blurred background. The lighting highlights the contours of the aircraft, giving it a sleek and powerful appearance.

BMS F-15C TRAINING MANUAL

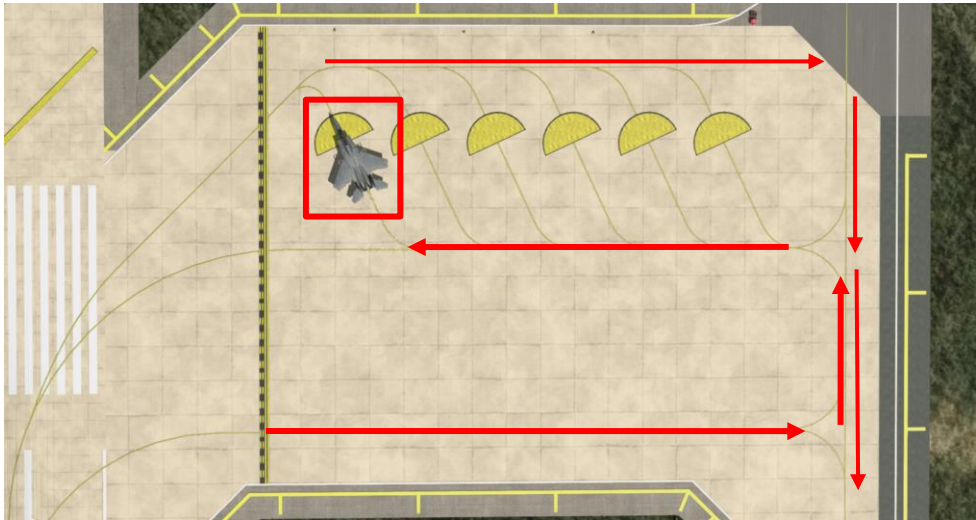
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In case of a go-around the speed brakes are retracted, and the engine spool time will be faster since the setting was higher than without use of the speedbrakes. Touch down on centerline and maintain aerobraking as explained in the section above.

3.4 Taxi back and shutdown the jet

Once at control speed (less than 80 kts) with 3 wheels on the runway you can enable NWS and use the wheel brakes as necessary. Exit the runway at the first available taxiway to the right and once past the runway hold lines retract your speed brakes.

ATC will automatically ask you to switch to the Ground frequency as you exit the active runway. Set Ground (preset #2). Taxi to the EOR north RWY 18 and hold at the yellow half-moon de-arming area like shown below:



Please note that arming and de-arming procedures at EOR areas are airbase and/or SOP driven and will vary in amount/position of areas and taxi patterns. Refer to the EOR-procedure chart if available.

Once arrived at the EOR, set your nose gear light to: OFF. External lighting settings at EOR are as follows:

PROCEDURE	SCENARIO	ANTI-COLL	POSITION	FORM
EOR	DAY – Good weather	OFF	ON	OFF

‘Request Taxi Back to Ramp’ on the Tower ATC page: ‘t 4’ if you finished your post landing checks (lights, speedbrakes, etc.). ATC will give

you clearance to taxi back and will assign you a taxi route to your assigned parking spot (example below: “05”). Check again the APC charts for airport orientation.

Currently the lights are Set your nose gear light to TAXI if you are leaving the EOR. Turn on your ANTI-COL and taxi light.

PROCEDURE	SCENARIO	ANTI-COLL	Taxi Light	POSI-TION	FORM
EOR	DAY – Good weather	ON	ON	ON	OFF

Taxi back to where the mission started in

Wolfpack flows, south of the tower. Taxi on Taxiway Papa all to way to the transient ramp and turn left behind Wolfpack flows. Select one emplacement and roll into it. Once parked, ‘Install / Remove chocks’ on the Ground ATC menu: ‘t 2’ and then safe the EPU: ‘t 1’.

Shutting down the jet, you start with shutting down all avionics before placing the throttle in CUTOFF (or use the idle detent callback). Open the canopy and then place the POWER switch on the ELEC panel to OFF.

You can breathe again and exit the aircraft with the ESC key.

ATTACHMENTS

Please note that all these settings are just possible options. Depending on the conditions and the SOP you use, create your own settings as desired.

II. BREVITY CODES

Refer to /BMS 4.37\05 Other Documentation\Real Manuals\ATP_1-02.1.pdf for all relevant brevity codes.

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- BMS Technical Manual
- BMS Comms & Nav Book
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- BMS Checklists
- BMS forums & articles
- Training scripts article

GLOSSARY

A			
A-A	Air-to-Air	AOA	Angle Of Attack (Arrival)
AA	Aspect Angle	AOR	Areas of Responsibility
AAA	Attitude Awareness Arc	APC	Aircraft Parking Chart
AAF	Attitude Advisory Function	ARH	Anti-Radiation Homing
AAM	Air-to-Air Missile	ARI	Aileron Rudder Interconnection
AATLL	Air-to-Air Target Locator Line	ARMT	Armament
ABC	Automatic Brightness Control	ARWR	Advanced Radar Warning Receiver
AC	Aircraft Configuration	ASE	Allowable Steering Error
ACAL	Altitude Calibration	ASEC	Allowable Steering Error Circle
ACCTVS	Advanced Color Cockpit Television Sensor	ASC	Attack Steering Cue
ACM	Air Combat Mode	ASCII	American Standard Code for Information In-terchange
ACMDS	Advanced Countermeasures Dispenser System	ASGN	Assign
ACMI	Air Combat Maneuvering Instrumentation	ASL	Azimuth Steering Line
ACQ	Acquisition	A TGTS	Air-to-Air Targets
ACRIU	Advanced Conventional Remote Interface Unit	ATC	Attack Target Complex (a type of Mission Assignment) , Air Traffic Controller
A-D	Analog-to-Digital	ATF	Automatic Terrain Following
AD	Arming Delay	ATK AZ	Attack Azimuth
ADDL	Additional	ATO	Air Tasking Order
ADI	Attitude Direction Indicator	ATP	Advanced Targeting Pod
ADL	Armament Datum Line	ATT, ATTD	Attitude
A DLNK	Air Data link	ATT/FPM	Attitude Bars and Horizon Line/Flight Path Marker
ADS	Avionics Display Set	Attack Profile	Weapon deliver options stored in SMS that are anticipated to be used in specific instances
ADTC	Advanced Data Transfer Cartridge	ATT	EGL Attitude Mode
ADTE	Advanced Data Transfer Equipment	AUTO	Automatic
ADTU	Advanced Data Transfer Unit	AUTO BRT	Automatic Brightness control to maintain, contrast ration between the symbols and background
A-G	Air-to-Ground		
AGC	Automatic Gain Control	AWACS	Airborne Early Warning and Control System
AGL	Altitude Above Ground Level	AV	Avoid
AGM	Air-to-Ground Missile	AVTR	Airborne Video Tape Recorder
AGR	Air-to-Ground Ranging	AZ/AZI	Azimuth
AGTD	Air-to-Ground Target Designator		
AGTLL	Air-to-Ground Target Locator Line		
AI	Airborne Intercept/Azimuth Indicator/ Artificial Intelligence		
A IDM	IDM Air Tracks		
AIFF	Advanced Identification Friend or Foe		
AIM	Air Intercept Missile		
Aimpoint	The preplanned point on or near target that is used to align pipper		
ALBIT	All Station Built-In-Test		
ALIC	Aircraft Launcher Interface Computer		
ALIGN	Alignment (INS)		
ALN	Transfer Alignment (IAM)		
ALOW	Altitude Low		
ALT	Altitude		
ALT CAL	Altitude Calibration (switch position)		
ALT REL	Alternate Release		
ALT TRK	Altitude Line Tracker/Blanker		
AM	Amplitude Modulation, Altitude Match (ATP)		
AMRAAM	Advanced Medium Range Air-to-Air Missile		
AMRIU	Advanced Missile Remote Interface Unit		
AMUX	Avionics Multiplex		
AMZ	Aircraft Maneuver Zone		
A/N	Alphanumeric		
ANT	Antenna		
ANT ELEV	Antenna Elevation		

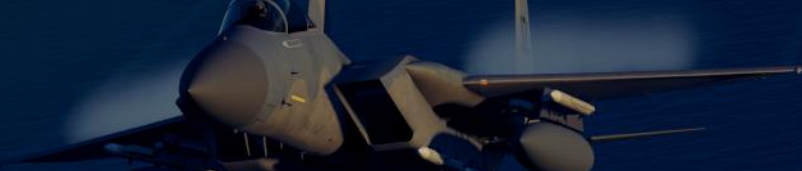


B			
BA	Burst Altitude	CDEEU	Common Data Entry Electronics Unit
BAL	Ballistics	CDI	Course Deviation Indicator
BAI	Bank Angle Indicator	CEM	Combined Effects Munitions
BAR	Elevation Bar	CEN	Centered
BARO	Barometric	CENT	Map center
BATR	Bullets at Target Range	CFIT	Controlled Flight Into Terrain
BATT	Battery	CFOV	Center Field Of View
BBS	Backup Bombing Sensor	CG	Center of Gravity
BCN	Beacon	CH	Chaff
BCN DLY	Beacon Delay	CH/CHAN	Channel
BDA	Battle Damage Assessment	CHNG	Change
BDU	Bomb Dummy Unit	CHNL	Channel
BGO	Bingo	CIT	Combined Interrogator and Transponder
BHOT	Black Hot	CIV/MIL	Civilian/Military
Bingo Fuel	A threshold fuel value that the pilot enters in MMC memory	CJ/R	Center Jettison/Release
BIT	Built-In Test	CKPT BLNK	Cockpit Blanking (HMCS)
BKUP	Backup	CLM	Climbing
Blind	Air-to-Ground weapon delivery modes that utilize radar ground map features rather than indicators to locate the target	CLR	Clear
Bombing		CM	Countermeasures
		CMBT	Combat (LASER)
BLOS	Beyond Line of Sight	CMDS	Countermeasures Dispenser System
BLU	Bomb Live Unit	CMFD	Color Multifunction Display
BNGO	Bingo	CMS	Countermeasures Management Switch
BOC	Bomb On Coordinate	CMSC	Countermeasures Set Control
BORE	Boresight	CNI	Communication/Navigation/IFF
BOT	Bomb On Target	CNTL	Control
BP	Bypass	C/A	Coarse Acquisition
BR	Bearing	C/O	Cutout (HUD function)
BRG	Bearing and Range	COH	Cold on Hot (Maverick Sensor Mode)
BRT	Bright, Brightness	COLR	Color
BRU	Bomb Rack Unit	COM1	Communications Radio 1
BSGT	Boresight	COM2	Communications Radio 2
BSU	Bomb Stabilization Unit	COMM	Communication
BTH	Both (Laser-Pointer)	CONT	Contrast, Continuous
BUP	Backup	CONV	Conventional
BUS	Electrical connection and distribution point	CORR	Canopy/Camera Corrections
B/R	Bearing/Range	CPL	Couple
B-W	Black-on-White	CRIU	Conventional Remote Interface Unit
C		CRM	Combined radar mode
CA	Cartridge	CRM	Combined Radar Mode
CADC	Central Air Data Computer	CRS	Course
CAL, Cal	Calibration	CRSE	Course
Canned Value	Data stored in permanent memory	CRUS	Cruise
CARA	Combined Altitude Radar Altimeter	CRU/EM	Cruise Energy Management
CAS	Calibrated Airspeed, Close Air Support	CS	Carriage System, Control Section
CAT	Category	CSFDR	Crash-Survivable Flight Data Recorder
CATA	Collision Antenna Train Angle	CTFOV	Center Total Field Of View
CATM	Captive Air Training Missile	CTVS	Cockpit Television Video System
CBU	Cluster Bomb Unit	CU	Cockpit Unit
CCIP	Continuously Computed Impact Point	CW	Continuous Wave Illumination
CCMFD	Common Color Multifunction Display	C/Z, CZ	Cursor Zero
CCRP	Continuously Computed Release Point		
CCTVS	Color Cockpit Television Sensor		



CDE	Circular Distance Estimates		
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D		E	
D	Degraded, Data Link	E	East
D&R	Depress And Release	ECM	Electronic Countermeasures
DAY	Day position allows control of brightness from off to full intensity	ECS	Environmental Control System
		DER	Endurance
DBS	Doppler Beam Sharpening	EEGS	Enhanced Envelope Gunsight
DBU	Digital Backup Unit	EGEA	End Game Entry Altitude
DCLT	The removal of display data from the HUD/MFD/HMCS (Declutter)	EGI	Embedded GPS/INS
		EGR	Embedded GPS Receiver
DCPL	Decouple	EHL	Extended Horizon Line
DCS	Data Control Switch	EHSI	Electronic Horizontal Situation Indicator
DDR	Digital Data Recorder	EHSIM	Electronic Horizontal Situation Indicator Master
DE	Default		
DEAD	Destruction of Enemy Air Defense	EHSIS	Electronic Horizontal Situation Indicator Slave
DED	Data Entry Display, Dedicated Channel Mode		
DEG	Degree(s)	E-J, EJ	Emergency Jettison
DEGR	Degraded	EL	Elevation
Delta	An increment of a variable	ELEC	Electrical
DEP	Depressed	ELEV	Elevation
DEPR	Depression	ELINT	Electronic Intelligence
DEPR RET	Depressible Reticle	EM	Energy Management (HUD display)
DES	Desired	EMER	Emergency
DESIG	Designate	EMTY	Empty
DEST	Destination	ENABL	Enable
DF	Direction Finder	ENG	Engine
DGFT	Dogfight	ENT, ENTR	Enter
DGPS	Differential Global Positioning System	E-O/EO	Electro-Optical
DIR	Direct, Direct-In Range	EOM, E	Equations of Motion
DISP	Dispense Command (switch position)	EOMG	Equations of Motion Glide
DL	Data Link	EON	Engagement Order Number
DL/DLNK	Data Link	EPU	Emergency Power Unit
DLAY/DLY	Delay	ERR	Error
DLZ	Dynamic Launch Zone	ESD	Enhanced Search Display
DMC	Digital Maneuvering Cue	ETA	Estimated Time of Arrival
DMD	Demand	ETR	External Time Reference
DME	Distance Measuring Equipment	EU	Electronics Unit
DMS	Display Management Switch	EXP	Expanded
DMUX	Display Multiplex Data Bus		
DPL	Deploy		
DRIFT C/O	Flight path marker with drift cutout		
DRNG	Delta Range		
DS	Dispenser Station		
D/S	Wind Direction and Speed		
DTC	Data Transfer Cartridge		
DTE	Data Transfer Equipment		
DTED	Digital Terrain Elevation Data		
DTOS	Dive-Toss		
DTS	Digital Terrain System		
DTT	Dual Target Track		
DTU	Data Transfer Unit		
DU	Display Unit		
DVR	Digital Video Recorder		
Dynamic Launch Zone	The zone in which a missile would strike a maneuvering target		
DWAT	Descent Warning After Takeoff		



F			
F, FAIL	Failed	GM	Ground Map
F-ACK	Fault Acknowledge	GMT	Ground Moving Target, Greenwich Mean Time
FC	Flight Channel	GMTT	Ground Moving Target Track
FCC	Fire Control Computer	GND	Ground
FCR	Fire Control Radar	GND SPD	Ground speed
FD	Function delay	GP Bomb	General Purpose Bomb
FDR	Standard Flight Data Recorder	GPS	Global Positioning System
FEBA	Forward Edge of the Battle Area	G/S	Ground Speed
FEDS	Firing Evaluation Display Set	GS	Ground Stabilized, Glide slope, Geographic Specificity
FI	Free Inertial	GT	Gyro Test
FINS	Forward Imaging Navigation Sensor	G TGTS	Ground targets
FIX	Fixtaking	G/T	Ground Track
FL	Flare	GW	General Weight
FL ON	Flight On		
FCS	Flight Control System	H	
FLIR	Forward Looking Infrared	HAD	HARM Attack Display
FLT	Flight	HARM	High-Speed Anti-Radiation Missile
FM	Frequency-Modulated	HARTS	Horn Awareness and Recovery Training Series
FMCW	Frequency-Modulated Continuous Wave	HAS	HARM-As-a-Sensor Mode
FOG	Fiber Optic Gyro	HAT	Height Above Target
FOV	Field of View	HD	Head
FPM	Flight Path Marker	HDG	Heading
FPS	Frames Per Second/Feet Per Second	HDGP	High Drag General Purpose
FR ON/OFF	Friendly Declutter	HDPT	Hardpoint
FRAG	Fragmentation	HE	High Explosive
FRQ	Frequency	HEX	Hexadecimal
FRZ	Freeze	HI, HOT	Hot Integration (LITENING)
FS	Front Section, or Fuselage Station	HLS	HARM Launch Scale
FT	Feet	HOBO	Hands-On Black-Out
FTIT	Fan Turbine Inlet Temperature Gauge	HOC	Hands On Controls
Fps	Feet per second	HOM	Home
FTT	Fixed Target Track	HMCS	Helmet Mounted Cueing System
Fuze	A device used to initiate weapon detonation	HMPT	Home Point
FWD	Forward	HOS	Hostile
FZ	Freeze	HOTAS	Hands-On Throttle And Stick
G		HOT	Jettison mode ready indication (Weapons selected released unarmed)
g	Gravitational (acceleration)	Hr	Hour
G	Gravity	HSD	Horizontal Situation Display
g available	The maximum number of g's allowed by the flight controls	I	Horizontal Situation Indicator
g sustainable	The maximum number of g's that can be pulled without losing current specific gravity	HTFOV	HUD Total Field-Of-View
GAAF	Ground Avoidance Advisory Function	HTS	HARM Targeting System
GBU	Guided Bomb Unit, conventional bomb with self-contained guidance system	HUD	Head Up Display
G/C	Great Circle Steering	HYD	Hydraulic
GC	Gyrocompass	Hz	Hertz
GCAS	Ground Collision Avoidance System		
GCS	Guidance and Control Section		
GD	Guard		
G DLNK	Ground data link		
GE	General Electrics		
GEM	GPS Embedded Module		
GEO	Geo-Location		

G FRND	Ground Friendlies		
GHL	Ghost Horizon Line		
G LIM	G Limit		

I		L	
I/O	Input/Output	L	Left
IAM	Inertially Aided Munition	LADD	Low Altitude Drogue Delivery
IAS	Indicated Airspeed	LANTIRN	Low Altitude Navigation Targeting Infrared For Night
IBIT	Initiated Built-in Test	LAR	Launch Acceptability Region
ICP	Integrated Control Panel	LASR	Laser
ID	Identification	LAT, Lat	Latitude
IDL	Intraflight Data Link, Initialization Data Load	LAU	Launcher Armament Unit
IDM	Improved Data Modem	Lb, Lbs	Pound
IFA	Inflight Alignment	LCD	Liquid Crystal Display
IFF	Identification Friend or Foe	LCODE	Laser Code
IFOV	Instantaneous Field Of View	LD	Low Drag, Lead
IKP	Integrated Keyboard Panel	LDETECT	LST Detect
ILS	Instrument Landing System	LDG	Landing
IMP ANG	Impact Angle	LDGP	Low Drag General Purpose
IMP AZ	Impact Azimuth	LDR	Laser Designator
INC	Increase	LED	Light Emitting Diode
IND LTS	Indicator Lights	LEV	Level
INIT	Initialization	LFT	Left
INR	Inertial Rates	LG	Large, Landing Gear
INS	Inertial Navigation System	LGB	Laser-Guided Bomb
INSM	Inertial Navigation System Memory	LIS	Line-In-the-Sky
INT	Intensity, Transfer of Initialization Data , Internal	LIT	LITENING Targeting Pod
INTRG	Interrogator	LJDAM	Laser Joint Direct Attack Munition
INU	Inertial Navigation Unit	LJ/R	Left Jettison/Release
INV	Inventory	L/L/E	Latitude/Longitude/Elevation
IP	Initial Point	LLLGB	Low Level, Laser-Guided Bomb
IP-TO-TGT	Initial Point to Target	LM	Laser Marker (IR Pointer)
IP-TO-PUP	Initial Point to Pull-up Point	LMODECMD	Laser Mode Command
IR	Infrared, In Range	LMS	Linear Missile Scale
IRC	In-Line Release Connector	LMZ	Laser Mask Zone
		LNCH	Launch, Launcher
		LNCHW	Missile Launcher With Track Adapter
J		LNG	Longitude
JASSM	Joint Air-to-Surface Standoff Weapon	LOB	Line of Bearing
J/R	Jettison and Release	LONG/LNG	Longitude, Long Calibration (LIT)
JDAM/JDM	Joint Direct Attack Munition	LOS	Line-of-Sight
/ JD		LOTG	Loss Of Track Glide
JDN	Joint Data Network	LPI	Low Probability of Intercept
JETT/JTSN	Jettison	LPRF	Low Power Radio Frequency
JFS	Jet Fuel Starter	L/R	Loader Reader
JHMCS	Joint Helmet Mounted Cueing System	LRCVRCNTL	Laser Receiver Control
JIR	JSOW In Range	LRG	Large
JIZ	JSOW/JASSM In Zone	LRM	Line Replaceable Module
JMR	Jammer	LRR	Laser Range Receiver
JSOW/JSW	Joint Standoff Weapon	LRU	Line-Replaceable Unit
JTAC	Joint Terminal Attack Controller	LSCD	Laser Spot Search Code
JTSN	Jettison	LSDL	Launch Status Divider Line
		LSL	Laser Spot Locator
		LSR	Laser Designator
		LSRCH	LST Search
K		LSS	Laser Spot Search
KF	Kalman filter	LST	Laser Spot Tracker, Land Specific Type
KL	Wind correction constant due to altitude gain	LT	Left
KCAS	Knots Calibrated Airspeed	LTE	Launch To Eject
		LTF	Left

KIAS	Knots Indicated Airspeed	LTIP	Laser Target Imaging Sensor
kpbs	Kilobits Per Second	LT HPT	Left Hardpoint
KT	Knot	LUU	Illumination Unit, Flare
Kts or KTS	Knots	LVL	Level
KYBD	Keyboard		
M			
m	Meter	MSEC	Millisecond, 1 msec = 0.001 second
m/s	Meters per second	M-SEL	Mode Select
M	Mode, Multiple, Mask, Master, Mass Model, Meters, Mission Store	MSL	Mean Sea Level
MA	MASTER ARM switch, Matrix Assembly, Medium	MSL	Missile, Missile Override
MAG	Altitude, Mission Assignment	MSMD	Master Mode
MAG VAR/	Magazine	MSN DUR	Mission Duration
MAGVR	Magnetic Variation Maintenance	MSN RT	Mission Route
MAL	Malfunction	MT	Multi Track
MAN	Manual	MTR	Moving Target Reject
MAU	Miscellaneous Armament Unit	MTT	Moving Target Track/Multi Target Track
MAX, Max	Maximum	MULT	Multiple or Multi Mode
MBAL	Manual Ballistics	MUX	Multiplex
MBC	Missile Boresight Correlator	N	
MC	Mission Channel, Mission Commander	N	North
MDDE	Menu Driven Data Entry	N/A	Not Applicable
MDS	Minimum Detectable Signal, Mission Data Set	N/M	North Pointer/Meterstick
MDT	Mass Data Transfer, Mission Data Table	NARF	Navigation Alignment Refining Feature
MER	Multiple Ejector Rack	NARO	Narrow
MFD	Multifunction Display (Unit)	NAV	Navigation
MFDS	Multifunction Display Set	NAV DB	Navigation Database
MFL	Maintenance Fault List	NC	Non-Cooperative
MGC	Manual Gain Control	NCTR	Non-cooperative Target Recognition
MHz	Megahertz	NFOV	Narrow Field-of-View
MIDS	Multifunctional Information Distribution System	NM	Nautical Miles
MIF	Missile-Inflight	NOGO	Cannot Comply
MIL-STD	Military Standard	NO RAD	No Radiation
MISC	Miscellaneous	NOM	Nominal
MIZ	Missile Impact Zone	NORM	Normal
MK	Mark, a designation preceding model num- bers	NOZ	Nozzle
MK INT	Marker Intensity	NSTL	Nose-Tail
MKPT	Markpoint	NRM	Normal
ML	Missile Launch	ns, nsec	nanosecond
MLE	Missile Launch Envelope	NT	Neutral Track
MLG	Main Landing Gear	NTO	Not Timed Out
MLNCH	Missile Launcher	NVIS	Night Vision Imaging System
MM/mm	Millimeter	NVM	Nonvolatile Memory
MMC	Modular Mission Computer	NVP	Navigation Pod
MNEMONI	Code/display relating to memory	NWS	Nose Wheel Steering
C	Missile Maneuver Zone	NXT	Next
MMZ	Manual	O	
MNL	Modification	O2	Oxygen
MOD	Monitor	OA1	Offset Aimpoint 1
MON	Monitor Program/Mission Planned	OA2	Offset Aimpoint 2
MP	HSD Map Center	OAP	Offset Aimpoint
MPCTR	Mission Planning Data	OBST	Obstacle
MPD	Maneuver Potential Line	OCT	Octal
MPL	Mission Planned Preplanned	OFLY	Overfly
MPPRE	Manual Pitch Overwrite	OFTRK	Offset Track
MPO	Mission Planning Station	OOB	Out Of Bounds
MPS	Milliradians (see MILS)	OPER	Operate, Operational
mR	Minimum Release Altitude	OPS	Operation
MRA	Multiple Reference Gun Sight	OPT	Option
MRGS	Missile Remote Interface Unit		
MRIU	Medium Range Missile		
MRM	Magnetic Receiver Unit		

MRU ms, msec	Millisecond, 1 ms = 0.001 second	OSB OVL OVRD OVRFLY	Option Select Button Overlay Override Overfly
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P			
PDU	Pre-Briefed Submode, Playback	RDR ALT	Radar Altimeter
PFL	Pilot Display Unit	RDRCP	Radar Coupled
PFLD	Pilot Fault List	RDRDE	Radar Decoupled
PGM	Pilot Fault List Display	RDY	Ready
Pickle	Program, Precision Guided Munition	REC	Receive
	The act of depressing weapon release button	REL	Release
Pipper	Optical sight aim dot	REL ANG	Release Angle
PM	Power Management	REP	Release Pulse
PNL	Panel	RET	Reticle
POI	Point-of-Interest	RET DEPR	Reticle Depression
POS	Position Known Mode, Position	RF	Radio Frequency
PPLI	Precise Participant Location and Identification	RIU	Remote Interface Unit
PPS	Precise Positioning Service	RKT	Rocket
PR	Pull-up Range	RM	Receiver Module
PRA	Planned Release Angle	RMAX	Maximum Range
Pressure	Altitude measured from standard sea level	RMIN	Minimum Range
Altitude	pressure. Altitude 29.92 inches of mercury (1013Mbar)	RMLG	Right Main Landing Gear
	Preplanned	RNAV	Area Navigation
PRE	Pulse Repetition Frequency	RNG	Range
PRF	Program	ROB	Range On Bearing
PRGM	Primary	Ropt	Optimum Steering
PRI	Profile	RP	Reference Point, Release Point, Release Pulse
PROF	Pounds Per Square Inch	RPM	Revolutions Per Minute
PSI	Precision Targeting (HTS)	RST	Reset
PT	Pointer (Laser Marker)	R/T	Receiver/Transmitter
PTR	Pull Up Anticipation Cue	RTAM	Reset Transfer Alignment Message
PUAC	An air-to-ground indication/cue, displayed on HUD	RT HPT	Right Hardpoint
Pull-up	that requires immediate action to avoid ground clobber	RTN	Return
	Pop-Up Point	RTS	Return-to-Search
PUP	Paveway , Pratt & Whitney	RTT	Round Trip Timing
PW	Power	RUK	Range Unknown Submode
PWR	Power	RWR	Radar Warning Receiver
		RWS	Range While Search
Q		RWY	Runway
	Atmospheric pressure at airfield elevation	RX	Receiver
QFE	Air pressure (Sea Level)		
QNH	Quantity	S	
QTY		S	South
R		S#	Set number
		SA	Situation Awareness, Selective Availability
R	Right	SAASM	Selective Availability Anti-Spoofing Module
RA	Release Altitude	SAD	Search Altitude Display
RACK	Mnemonic for loading rack store number and quantities	SAI	Situation Awareness Indicator
		SALT	System Altitude
RAD	Radius	SAM	Surface-to-Air Missile
Radar	A radar mile is the time required for one pulse of energy to be transmitted 6000 feet and reflected back to the receiver (12.4 microseconds)	SBC	Symbology Brightness Control
Mile		SBIT	Startup BIT
		SC	Scan Cycle, Special Channel
Raero	Maximum Kinematic Flight Range	SCP	Signal Control Processor
RALT	Radar Altimeter	SD	Shutdown
RAM	Random Access Memory	SDB	Small Diameter Bomb
Raster	Horizontal scan of the electron beam in a fixed TV format	SDC	Signal Data Converter
		SDP	Signal Data Processor



R/B RCCE, RECCE RCL RCVR RDR	Range/Bearing Reconnaissance Recall Receiver Fire Control Radar	SEA SEC SEAD SEL SEL JETT	Sea State Clutter Reduction Mode Secondary Mode Suppression of Enemy Air Defenses targets Selective Emergency Jettison Selective Jettison
S		T	
SEQ SFW SGL SH SIM SIT SJ or S-J SLAV, SLV SLNT SMS SMTH SNAP SNGL SNSR SOI Solution Cue SOP SP SPD SPI SQL SR SRCH SRM SS STA STAT STBY STOR STOR HDG Store Number STP/STPT STRF STRG ST SAM STN STT SW SY SYM SYNC	Sequence Sensor Fuzed Weapon Single Stored Heading Simulate Situation Selective Jettison Slave Silent Stores Management System Smooth ride option (TFR) Snapshoot gunnery (display) Single Sensor Sensor of Interest In air-to-ground modes, a symbol that indicates when bombs should be released to hit the target Standard Operational Procedure Snowplow Speed System Point of Interest Squelch Smart Rack Search Short Range Missile Snapshoot Station Status Standby Stored Stored Heading Identifier for weapons/racks (SMS) Steerpoint Strafe Steering Single Target SAM Source Track Number, Station Single Target Track Software System Computed, System Measured (WCMD) Symbology Synchronization status	T T/R TA TAA TAC Target Eleva- tion TCN/TACAN TD TD TE TEF TER TEWS TF TF or Tf TFOV TFR TGM TGP TGT THDG THLD Threat Warning System TI TISL TL TLA TLL TM TMD TMP TMS T/O TOF TOI TOS TOT TPNDR TQ T/R T-R TR Track TRK TRNG TUI TV TWA TWP	Training, track, TGP Transmit/Receive Threat Area, Transfer Alignment Target Aspect Angle, Threat Area Avoidance Tactical Height of target above mean sea level True Airspeed, Tail Actuator Subsystem Tactical Air Navigation Target Designator, Time Delay Threshold Detect (AIM-9L/M), Target Detector Tactical Engagement Trailing Edge Flaps Tactical Electronic Warfare System Triple Ejector Rack Terrain Following Time of Flight or Time of Fall Total Field-of-View Terrain Following Radar Training Guided Missile Targeting Pod Target True Heading Threshold A passive system which detects and identifies threat radar signals Target Isolate Target Identification Set, Laser Tail Target Locator Angle Target Locator Line Track Mode, Telemetry Tactical Munitions Dispenser Temperature Target Management Switch Takeoff Time of Flight Target Of Interest Time Over Steerpoint, Time On Station Time on Target Transponder Track Quality, Time Quality Transmit/Receive Threat Rings Training To lock on a target with the radar and continue following its position. Track Training (LASER) Time Until Impact, Time Until Intercept Television

		TWS TX TXA	Threat Warning Aux Threat Warning Prime Track While Scan Transmitter Transfer Alignment
U		X	
UAI	Universal Armament Interface	XMIT/XMT	Transmit
UFC	Upfront Controls	XMTR	Transmitter
UHF	Ultra High Frequency	XR	Extended range
UI	User Interface		
ULFT	Unified Loft	Y	
ULS	Up-look Search		
UNK	Unknown	Z	
UNLK	Unlock		
UTC	Universal Time Coordinated		
UTM	Universal Transverse Mercator		
UV	Ultraviolet		
V			
V	Velocity, Volts		
VAH	Velocity, Altitude, Heading (HUD)		
VEL	Velocity		
VG	Aircraft Groundspeed		
VHF	Very High Frequency		
VID	Visual Identification		
VIP	Visual Initial Point		
VIPCRP	VIP/CCRP Combination		
VIS	Visual		
VMS	Voice Messaging System		
VMU	Voice Message Unit		
VOL	Volume		
VOR	VHF Omnidirectional Range		
VRP	Visual Reference Point		
VRPCRP	VIP/CCRP Combination		
VS	Velocity Search		
VSR	Velocity Search with Ranging		
VV	Vertical Velocity		
VVI	Vertical Velocity Indicator		
VX	X-Axis Velocity		
VY	Y-Axis Velocity		
VZ	Z-Axis Velocity		
W			
W	West		
WAC	Wide Angle Conventional		
WAR	Wide Angle Raster		
WAT	Along track winds at run-in altitude		
WCMD	Wind Corrected Munitions Dispenser		
WD	Wide, Wind		
WEZ	Weapon Engagement Zone		
WHOT	White Hot		
WL	Waterline, a plane of horizontal reference on an aircraft		
WLCO	Will Comply		
WOB	White on Black		
WOW	Weight-On-Wheels		



WP/WPT	Waypoint		
WPN	Weapon		
W/SPAN	Wingspan		
WUP	Warm-up		
WVR	Within Visual Range		
WX	Weather		