WEAPON FOR FSX

FIRST. TRUE. FUN.

User's Manual

ABOUT THIS MANUAL

VERSION: 15 NOVEMBER, 2011

WARNING: THIS MANUAL IS DESIGNED FOR MICROSOFT® FSX USE ONLY. DO NOT USE FOR FLIGHT.

FOR GENERAL INFORMATION ON THE 'WEAPON' PRODUCT PLEASE VISIT WWW.CAPTAINSIM.COM .
THIS MANUAL PROVIDES ADDITIONAL INFORMATION ONLY, WHICH IS NOT AVAILABLE ON THE WEB SITE.

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39 | CUSTOMER CARE
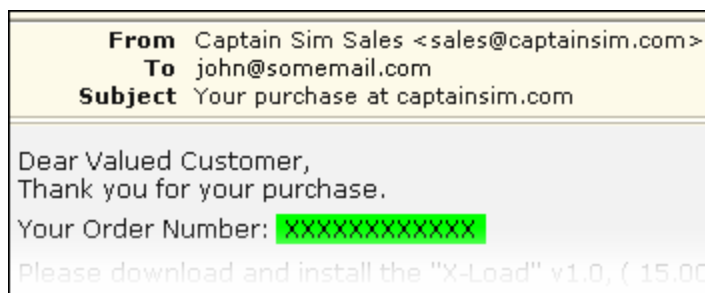
WEAPON FOR FSX PRODUCT

SPECIFICATION

The **Weapon for FSX** is available exclusively at our Online Store at www.captainsim.com

File Name: csb521_XX00.exe

Size: ~ 11 MB

INSTALLATION

1. Shortly after a purchase you will receive an email message from Captain Sim Sales with your Order Number and download links.

From   Captain Sim Sales <sales@captainsim.com>
To   john@somemail.com
Subject   Your purchase at captainsim.com

Dear Valued Customer,
Thank you for your purchase.
Your Order Number: XXXXXXXXXXX
Please download and install the "X-Load" v1.0, (15.00

Note:
How to get the product download links if you have not received the email receipt?
- Please check-in to Your Profile (ORDER NUMBER REQUIRED)
- In Your Profile click: **Product Name > Extended Download Service** and download the product.
- Please keep your ORDER NUMBER safe. You will need it for future re-install, updates etc.

2. Download the .exe file to any folder. Please backup the file(s) to avoid an extra charge in future. Please keep your download and Check-in info safe.

3. Run the .exe file (right click on the .exe file, select 'Run as Administrator') and follow the prompts.

Note:

- YOUR PC MUST BE CONNECTED TO THE INTERNET FOR THE INSTALLATION.

- ORDER NUMBER IS REQUIRED FOR THE INSTALLATION.

Product installer adds the Weapon for FSX to:

CS F/A-18 - if your simulator is FSX Acceleration
CS LX-45 (armed version of Learjet 45) - if your simulator is FSX SP2

F/A-18

LX-45

Use Weapon Loader to install/remove the Weapon to/from any FSX aircraft/rotorcraft. *See Weapon Loader section.*

UNINSTALLATION

Click START > Programs > Captain Sim > Weapon for FSX > Uninstall

WEAPON SYSTEM STRUCTURE

The Captain Sim 'Weapon for FSX' is *the first* and the only weapon expansion ever made for any version of MS Flight Simulator.

Weapon system consists of the following components:

1. Weapon loader
2. Weapon control panel
3. Keyboard/joystick support
4. Radar
- Search mode
- LCOS mode
- Target tracking mode

5. HUD
Basic modes
- Navigation steering mode
- TACAN steering mode
- ILS Steering mode

Attack modes
- Search mode
- LCOS mode
- IR seeker mode
- IR tracking mode
- Radar tracking mode

6. Weapon physics engine
7. Weapon simobjects
8. Sounds
9. Visual effects
10 Armed versions of F/A-18 or LX-45 aircraft
11. Target damage model
12. Military traffic sceneries
13. Military AI aircraft set
14. Configuration file
15. SDK

WEAPON LOADER
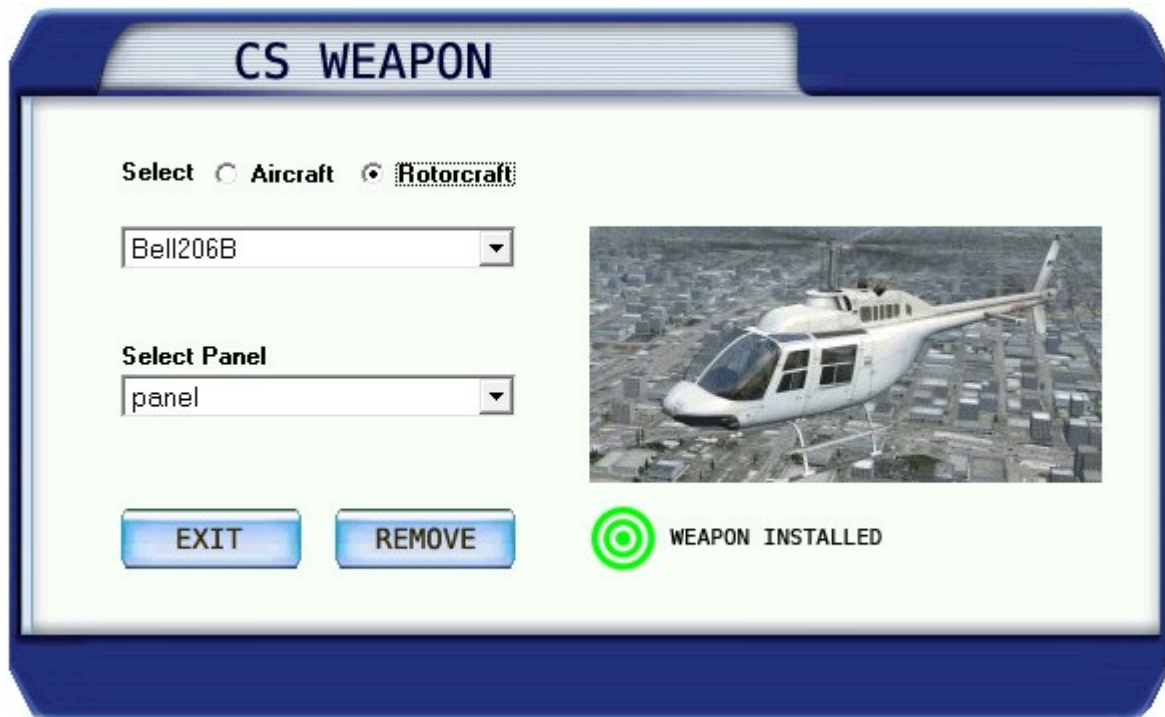
Weapon Loader provides "one click" installation/removal* of the Weapon to/from any FSX aircraft or rotorcraft.

1. Run the Loader (Programs>Captain Sim>Weapon for FSX>Loader)
2. Select any aircraft or rotorcraft.
3. Select a panel (if the aircraft has more than one panel)
4. Click INSTALL
5. Click EXIT

 This logo in aircraft preview means the Weapon has been already installed. Click REMOVE if you wish to uninstall the weapon from this aircraft.

* - 2D HUD and control panel only. For HUD installation to VC see SDK.

WEAPON CONTROL PANEL (WCP)

2D panel provides total system control on any FSX aircraft/rotorcraft.
Keyboard inputs duplicate the 2D panel and provide additional functionality. *Note comments in Italic grey font.*

1. Weapon Master Switch *Ctrl+6*

2. Weapon Type Selector Switch *Ctrl+7*

   GUN - gun *Ctrl+Shift+7 to cycle weapon sub-types:*
         M60C *Ctrl+Shift+8 to select fire mode for any weapon subtype*
         GSH-30
         M61 Vulcan

   RCKT - rockets *Ctrl+Shift+7 to cycle weapon sub-types:*
         Hydra 70
         Zuni 127

   MSL - missiles *Ctrl+Shift+7 to cycle weapon sub-types:*
         AIM7 Sparrow
         AIM9 Sidewinder

   BOMB - bombs (inop)

3. Radar AIR-SURFACE Mode Selector Switch *Ctrl+8*

4. Rounds Counter Indicator

5. HUD Mode Selector Switch *Ctrl+9*

6. Radar Range Selector Switch *Ctrl+0*

7. Locked Target Range Indicator (NM)

8. Attack Hemisphere Indicator
- ППС - if interceptor and the target heading difference is more than 90 degrees.
- ЗПС - if interceptor and the target heading difference is less than 90 degrees.

9. Lock-On Light

Illuminates if the target is locked.

10. Shoot Light

Illuminates if the target is within effective range for selected weapon. Supported with audio alert.

Note:
- Unlimited number of weapon types can be added or removed.
- Unlimited number of weapon subtypes can be added or removed.
- All weapon settings are editable.
- All keys can be reassigned.
- See SDK for details.

KEYBOARD/JOYSTICK SUPPORT

System totally supported by keyboard assignments.

CONTROL KEYS REFERENCE CARD

We would highly recommend printing the following card:

CONTROL KEYS REFERENCE CARD	
WEAPON ON/OFF	CTRL+6
SELECT WEAPON TYPE	CTRL+7
SELECT WEAPON SUBTYPE	Ctrl+Shift+7
SELECT SUBTYPE FIRE MODE	Ctrl+Shift+8
SWITCH AIR-SURFACE MODES	CTRL+8
SWITCH BASIC HUD MODES	CTRL+9
SELECT RADAR RANGE	CTRL+0
DROP/SWITCH TARGET LOCK	CTRL+U
FIRE	SPACE OR JOYSTICK BUTTON 1

Note:
None of the keys above conflict with default FSX keys.
You can reassign any key for extra convenience. See SDK for details

HEAD-UP DISPLAY (HUD)

2D AND VC VERSIONS

2D HUD

2D HUD supports 'one click' installation to any FSX aircraft/rotorcraft. See Weapon Loader section for details.

PANELS ORDER

2D HUD installs in the following panels order:
Acceleration F/A-18:
Weapon control panel – panel 1 *(Shift+1)*
HUD indication – panel 2 *(Shift+2)*
HUD glass – panel 3 *(Shift+3)*
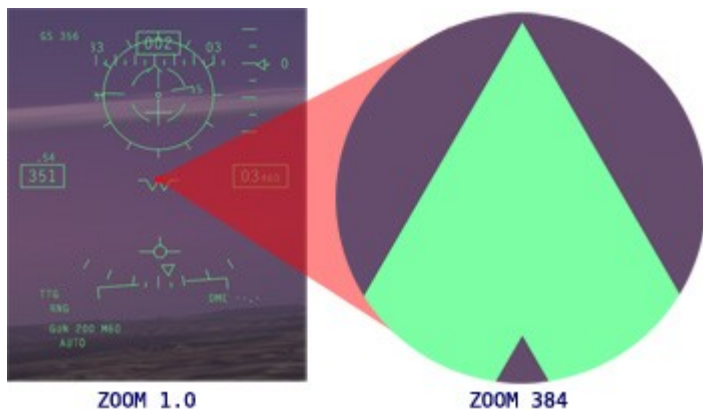
Any other FSX aircraft/rotorcraft*:
Weapon control panel – panel 2 *(Shift+2)*
HUD indication – panel 3 *(Shift+3)*
HUD glass – panel 4 *(Shift+4)*

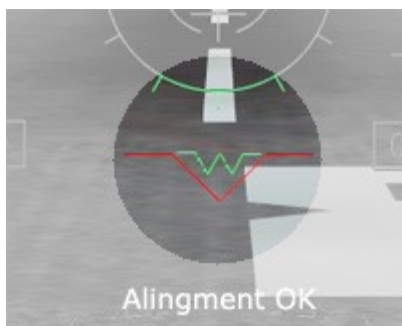* - Third-party aircraft may use other order of panels.

ZOOM

2D HUD supports full range of FSX zoom from minimal (0.30) to unlimited.

Left: Actual 2D HUD screenshots.

2D HUD ALIGNMENT CHECK

Alingment OK

Once you have installed the Weapon to any new FSX aircraft/rotorcraft, if there are no mistakes in panel.cfg 2D HUD should be aligned properly. To check 2D HUD alignment:

1. Make sure aircraft is on the ground, speed=0.
2. Call Axis indicator (Views >Axis indicator > small V)
3. Weapon master switch – ON
4. Make sure the Axis indicator V position match the Pitch Reference Symbol

CALIBRATION

All new installations of the weapon require calibration.

If you are on wide screen monitor, we would recommend to set Wide View Aspect:
C:\Users\.....\AppData\Roaming\Microsoft\FSX\fsx.CFG.txt
[Display]
WideViewAspect=True

Not calibrated   Calibrated OK
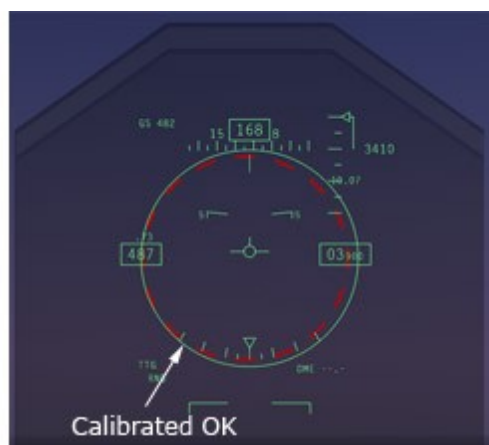
1. Make sure aircraft is on the ground, speed=0.
2. Call 2D HUD panels (Shift+number)
3. Set any zoom (HUD scale) you like using + and – keys.
4. Using Ctrl + Shift + 9 or Ctrl + Shift + 0 resize GREEN circle to match the red calibration circle
5. Red calibration circle automatically disappears in 2 sec

Also we would recommend checking calibration from time to time.

VC HUD

HUD in VC works on the following aircraft:
- FSX Acceleration F/A-18 (preinstalled)
- FSX Acceleration CS F/A-18D (use Weapon Loader)

But VC HUD can be installed on most of third-party aircraft HUDs. See SDK for details.

COLLIMATION

VC HUD provides true collimation with automatic calibration.

ZOOM

VC HUD supports full range of FSX zoom from minimal (0.30) to unlimited.

CALIBRATION

VC HUD does not require manual calibration.

BASIC HUD MODES

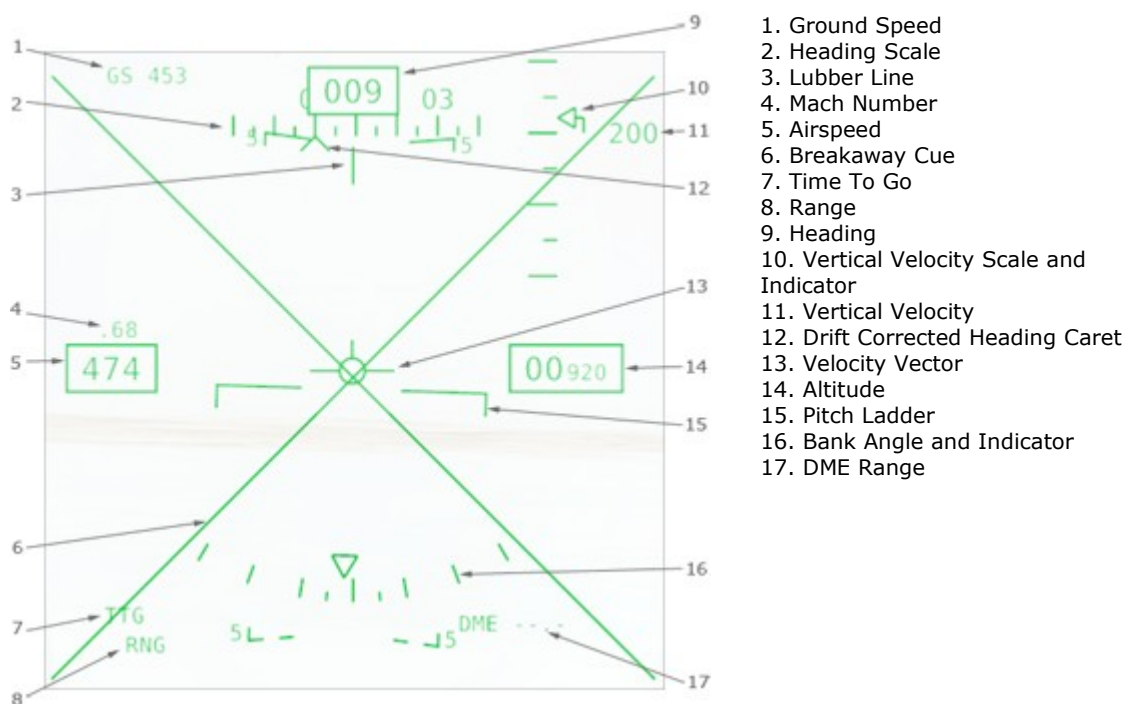Before use:
ELECTRICAL MASTER BATTERY – ON *(Shift+M)*
AVIONICS MASTER SWITCH – ON *(must be assigned)*

The following Basic HUD modes can be selected using HUD mode selector switch on 2D weapon control panel (WCP) *Ctrl+9*:

1. Navigation steering (NAV) – loads by default.
2. TACAN steering (TCN).
3. ILS Steering (ILS).

BASIC SYMBOLS

All HUD modes include the following basic symbols:

1. Ground Speed
2. Heading Scale
3. Lubber Line
4. Mach Number
5. Airspeed
6. Breakaway Cue
7. Time To Go
8. Range
9. Heading
10. Vertical Velocity Scale and Indicator
11. Vertical Velocity
12. Drift Corrected Heading Caret
13. Velocity Vector
14. Altitude
15. Pitch Ladder
16. Bank Angle and Indicator
17. DME Range

1. Ground Speed

Ground speed is displayed in knots to within one knot.

2. Heading Scale

The heading scale is a horizontal moving display of magnetic heading, referenced to a fixed lubber line. Major graduations are multiplies of 10°, and minor graduations are at odd multiplies of 5°. The most significant two digits of heading are displayed at multiplies of 30°.

4. Mach Number

A two-digit readout of Mach number is displayed, accurate to two decimal places.
When ILS is selected, the following symbols and displays are removed from the HUD.

5. Airspeed

A boxed three-digit readout of indicated airspeed (IAS) is displayed to the nearest knot.
When the rate of change is greater than 5KIAS per second, IAS is displayed to the nearest 5 knots.

6. Breakaway Cue

The breakaway cue is a large X which is displayed flashing whenever inflight radio altitude is at or below 1000 feet.

7. Time To Go

Depends on HUD mode

8. Range

Depends on HUD mode

9. Heading

A boxed three-digit readout of magnetic heading is displayed to the nearest degree.

10. Vertical Velocity Scale and Indicator

The vertical velocity scale displays vertical velocity in feet per minute with a moving indicator against a fixed scale. Major graduations indicate multiplies of 1000 feet, and minor graduations indicate odd multiplies of 500 feet. The scale represents a range of +1000 to -2000 feet per minute. When the vertical velocity exceeds the scale limits, the pointer remains at the limit position.

11. Vertical Velocity

An unboxed digital readout of vertical velocity is displayed to the nearest ten feet per minute. The ones' digit is always zero. When vertical acceleration is greater than 0.667 feet per second per second, the tens' digit is also zero. The readout consists of up to four digits and, in case of downward velocity, includes a minus sign.

12. Drift Corrected Heading Caret

This symbol indicates the magnetic heading required to fly a course set by heading select knob. The drift corrected heading is computed by applying INS-determined wind drift to the commanded/selected course.
In ILS mode the caret indicates the magnetic heading set by heading select knob with no wind correction.

13. Velocity Vector

The velocity vector displays the inertially derived flight path of the aircraft. The velocity vector is free to indicate aircraft flight path in both pitch and yaw.

14. Altitude

A boxed five-digit readout of barometric altitude is displayed to the nearest ten feet. The ones' digit is always zero. When rate of change of altitude is greater than 40 feet per second, the tens' digit is also zero. An occlusion zone prevents other symbols, such as the pitch ladder, from intruding into the box.

15. Pitch Ladder

The roll attitude is indicated by rotation of the entire pitch ladder. The horizon bar is projected
to overlie the actual horizon, when viewed by the pilot. Pitch attitude is indicated by movement of the entire pitch ladder in a direction perpendicular to the horizon. Pitch angle reference bars are shown at multiplies of 5°. All pitch angle reference bars, including the horizon bar, have a central gap slightly wider than the

velocity vector symbol. The inside ends of the pitch ladder bars bend toward the horizon line; the bend varies linearly from 0 to +- 45° as the pitch angle varies from 0 to +- 45°, and remains a constant +- 45° as the pitch angle varies from +-45° to +-90°.

16. Bank Angle and Indicator

Bank angle is indicated by a moving indicator against a fixed scale. Major graduations are at +- 10, 20, and 30°, and minor graduations are at +- 5°.

17. DME Range

Depends on HUD mode

TACAN STEERING MODE

TACAN STEERING HUD MODE
Includes the following specialized symbols:

1. Bank Steering Bar

2. Time To Go

3. Range

4. DME Range

1. Bank Steering Bar

If NAV1 station tuned, the bank steering bar provides bank steering commands referenced to the velocity vector. The direction of displacement of the bar indicates the direction in which the aircraft should be rolled to establish the desired bank angle. When the desired bank angle is established, the bar is centered on the velocity vector.

2. Time To Go

In all modes time-to-go to the selected NAV1 station is displayed to within one second.
MM:SS 99:59 max.

3. Range

Ground range to the selected NAV1 station is displayed in all modes. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.
Displays "--.-" if DME unavailable or inop.

---

4. DME Range

The DME range indicates slant range to the selected NAV1 station in nautical miles to the nearest 0.1 nm. Displays "--.-" if DME unavailable or inop.

NAVIGATION STEERING MODE

Includes the following specialized symbols:

1. Time To Go

2. Range

3. Bank Steering Bar

4. Out-Of-Corridor Warning

5. DME Range

1. Time To Go

In all modes time-to-go to the next flight plan waypoint is displayed to within one second.
MM:SS 99:59 max.

2. Range

Ground range to the next flight plan waypoint is displayed in all modes. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.

Displays "--.-" if DME unavailable or inop.

3. Bank Steering Bar

If FSX flight plan loaded, the bank steering bar provides bank steering commands referenced to the velocity vector.

The direction of displacement of the bar indicates the direction in which the aircraft should be rolled to establish the desired bank angle. When the desired bank angle is established, the bar is centered on the velocity vector.

4. Out-Of-Corridor Warning

If FSX flight plan loaded, this symbol is displayed and flashes whenever the aircraft is outside flight plan corridor (2NM each side).

5. DME Range

The DME range indicates slant range to the selected NAV1 station in nautical miles to the nerest 0.1 nm. Displays "--.-" if DME unavailable or inop.

ILS STEERING MODE

ILS STEERING HUD MODE
Includes the following specialized symbols:

1. Glide Slope Indicator

2. Approach Angle Of Attack Bracket

3. Localizer Deviation Indicator.

4. Time to go

5. Range

6. Pitch Steering Bar

7. Bank Steering Bar

8. DME Range.

1. Glide Slope Indicator

The position of the ILS glide slope relative to the aircraft is indicated by a moving pointer against a fixed scale. The center dot represents the glide slope. The inner dots represent 0.25° and the outer dots represent 0.5° deviation from the glide slope.

2. Approach Angle Of Attack Bracket

The approach AOA bracket is referenced to the velocity vector so that, when the aircraft AOA is at the optimum value, the middle bar of the bracket is level with the velocity vector wing. When the AOA is 1° greater than optimum, the top of the bracket is level with the wing.

When the AOA is 1° less than optimum, the bottom of the bracket is level with the wing. The bracket moves well above and below the velocity vector if the AOA varies greatly from the optimum value. The bracket appears only when the airspeed is decreasing through 200 IAS, and is removed when the airspeed increases through 230 IAS.

See CSWeapon.xml - **OptimumAOA.**

3. Localizer Deviation Indicator.

The position of the ILS localizer inbound course relative to the aircraft is indicated by a moving pointer against a fixed scale. The center dot represents the inbound course. The inner dots represent 1.25° and the outer dots represent 2.5° deviation from the ILS localizer inbound course.

4. Time to go

In all modes time-to-go to the selected ILS station is displayed to within one second.
MM:SS 99:59 max.

5. Range

Ground range to the selected ILS station is displayed in all modes. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.
Displays "--.-" if DME unavailable or inop.

6. Pitch Steering Bar

In ILS steering mode only, this symbol provides vertical steering commands referenced to the velocity vector. The direction of displacement of the bar from the velocity vector indicates the direction in which flight path should be corrected to return to the ILS glide slope. When the aircraft is at the commanded pitch angle, the bar is centered on the velocity vector. The ILS pitch steering bar displays the pitch command during ILS approaches.

7. Bank Steering Bar

The bank steering bar provides bank steering commands referenced to the velocity vector.
The direction of displacement of the bar indicates the direction in which the aircraft should be rolled to establish the desired bank angle. When the desired bank angle is established, the bar is centered on the velocity vector.

8. DME Range

The DME range indicates slant range to the selected ILS station in nautical miles to the nerest 0.1 nm.
Displays "--.-" if DME unavailable or inop.

HUD ATTACK MODES

UNGUIDED WEAPON (GUNS AND ROCKETS)

Note:
Weapon master switch must be ON *Ctrl+6* to power a radar, weapon control system and HUD attack modes.
- Radar activates SEARCH-AIR mode
- HUD turns into SEARCH mode (no TCN, NAV, ILS mode cues displayed, except DME)
- System sets M60C gun as default
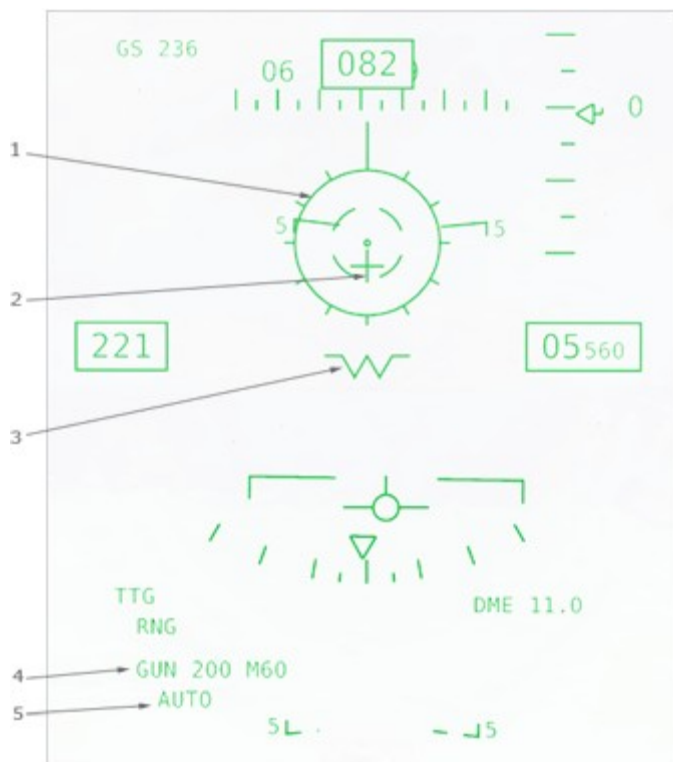- Press *Ctrl+Shift+8* to cycle through available HUD/Radar modes for selected weapon.

AUTO-ACQUISITION (SEARCH) MODE

Radar auto-acquisition (search) mode is enabled when the weapon system is ON but no target locked.

Note:
Radar range in SEARCH mode is 10NM. Radar range selector is INOP.

Search HUD mode includes the following specialized symbols:

1. Reticle

2. Gun Cross

3. Pitch Reference Symbol.

4. Weapon Info String

5. Weapon Fire Mode String

1. Reticle

Reticle appears on HUD below a lubber line. The reticle consists of a 2-mil pipper centered inside a 25-mil segmented circle, likewise centered within a 50-mil circle. The reticle does not move and provides no information except to quickly identify that the SEARCH mode is enabled.

2. Gun Cross

Indicates where selected weapon's barrel points to.
Can be adjusted (see SDK>**CSWeapon.xml>Station**)

3. Pitch Reference Symbol.

A fixed W aircraft pitch reference symbol appears in the center of
the HUD and indicates where the aircraft's nose is pointing.

4. Weapon Info String

Selected weapon information appears in the lower-left corner in WEAPON TYPE / ROUNDS REMAINING / WEAPON SUBTYPE format.
GUN 1200 M61 means M61 Vulcan gun with 1200 rounds remaining.

5. Weapon Fire Mode String

Selected weapon fire mode string indicates selected fire mode (AUTO, 1+4, SINGL etc.) All fire modes are defined in CSWeapon.xml (See SDK)

LCOS MODE

Lead Computing Optical Sight (LCOS) mode automatically activates and replaces the static reticle as soon as any target get locked. To lock a target fly the gun reticle over the target.

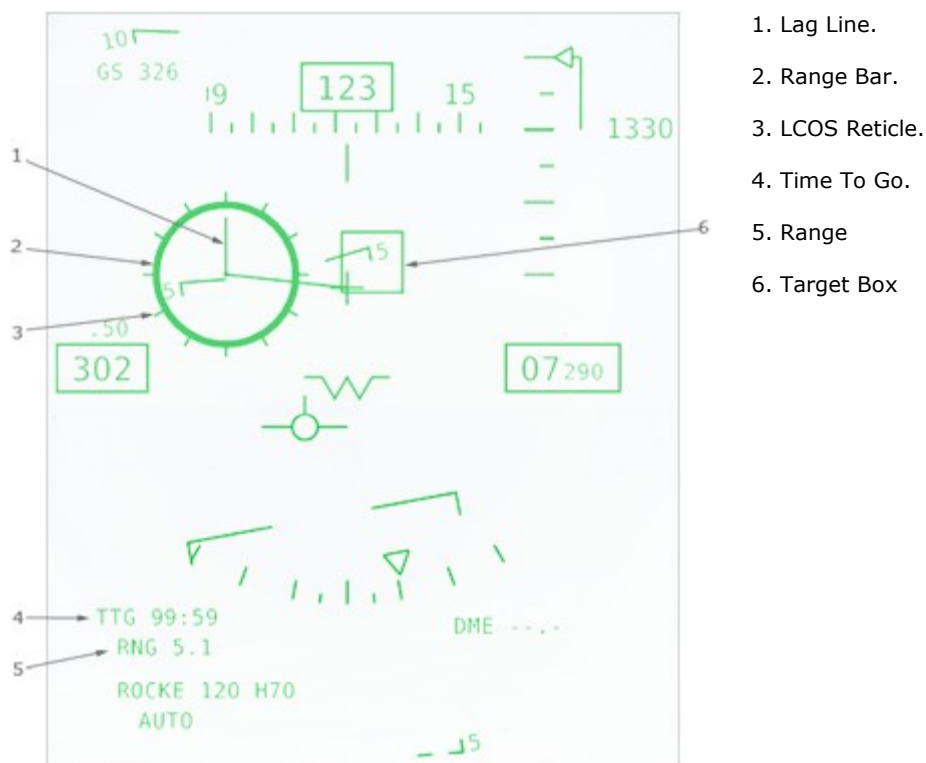**Note:**
Target must be within 10NM range

To drop a target lock:

Manoeuvre to get the target out of radar feed angle range or press Ctrl+U

Note:
Target lock will be dropped automatically if a target gets out of the 10NM range limit.

LCOS HUD mode includes the following specialized symbols:

1. Lag Line.

2. Range Bar.

3. LCOS Reticle.

4. Time To Go.

5. Range

6. Target Box

1. Lag Line

No lag line displayed if a target is within an effective range for selected weapon.

The lag line extends from the center dot indicating an error. The longer the lag line, the greater the error (maximum displayed error is 12,000 feet).

2. Range Bar

The range bar (circle) provides a visual reference on the range to a target.

Each mark on the circle is 1,000 feet of range (clockwise, 12 o'clock = 0 feet, 3 o'clock = 3,000 feet).

3. LCOS Reticle

Lead Computing Optical Sight (LCOS) calculates and provides visual information on where a shell will be when it has traveled the distance to the target, taking into account numerous conditions (accelerations, velocity, drag, gravity etc). See SDK for details.

To ensure a hit, steer the LCOS center dot on the target box

4. Time To Go

Flight time to a target.
MM:SS 99:59 max.

5. Targer range

Direct range (distance) to a target. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.

6. Target Box

The target designator box appears on the locked target.

GUIDED WEAPON (MISSILES)

The following target lock and missile launch conditions apply to all missile types:
- Target must be within the missile effective range (MIN-MAX).
- Target must be within the missile seeker or aircraft radar field of view and range.
- Normal G force must be within the missile launch limits.
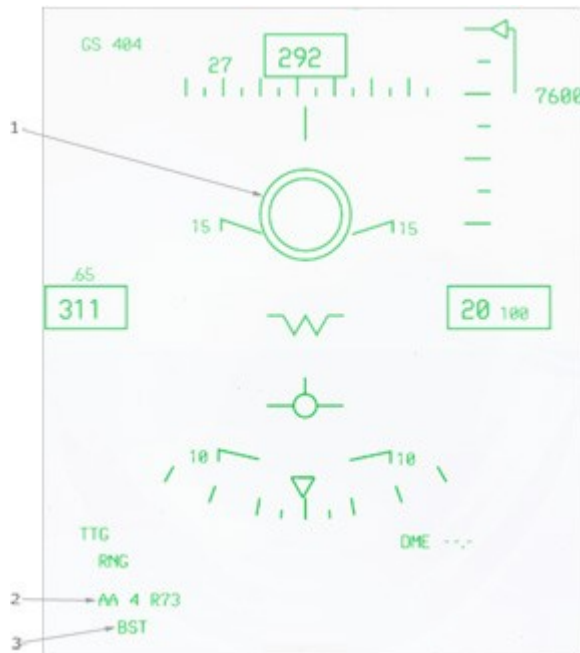
IR SEEKER BORESIGHT MODE

Note:
Available for infrared homing (heat-seeking) missiles only.

An infrared homing missile has a seeker head independent from a radar. The seeker can acquire targets with or without using the radar. Once the missile is launched, it receives no further guidance from the launching aircraft.

IR SEEKER SEARCHING

In the search mode a fixed double circle appears around an aircraft symbol. This fixed circle aligned with a missile's line of sight, and represents a missile's seeker field of view. A steady low-pitched tone indicates the seeker is engaged. If the target is within visual range you can steer the aircraft to position the target within the circle.

1. Missile seeker boresight reticle. Remains fixed over an aircraft symbol until a target is detected by the missile seeker.

2. Missile class (AA – Air-to-Air, AS – Air-to-Surface), units, type.

3. Seeker boresight mode indicator string.

IR SEEKER TRACKING

When a missile locks a target, the seeker tone will increase in pitch and the missile seeker boresight reticle will turn into single tracking circle.
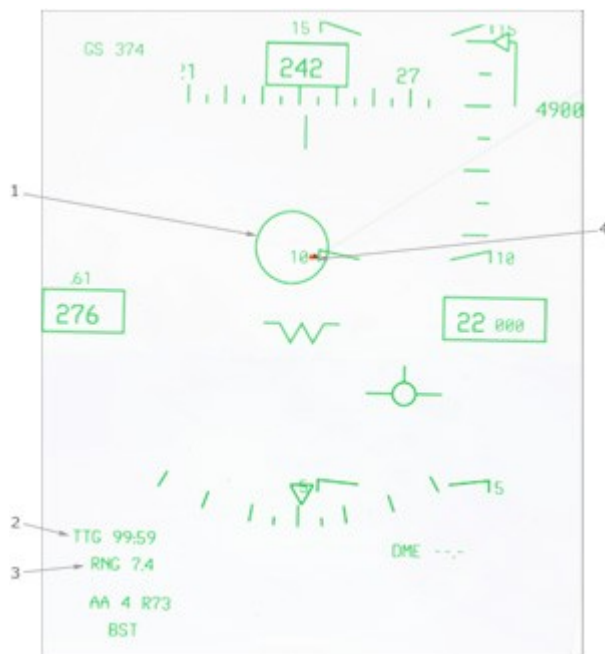
1. Tracking Circle

The circle moves to follow the target. As long as the target remains within the circle the missile continues to track and may be launched.

2. Time To Go

Flight time to a target.
MM:SS 99:59 max.

3. Target Range

Direct range (distance) to a target. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.

4. Target At Visual Distance

IR SEEKER UNCAGED MODE

Note:
Available for infrared homing (heat-seeking) missiles only.

IR SEEKER SCANING

Uncaging the a seeker changes the HUD display. Two circles appear. The larger circle represents the missile seeker field of view. The smaller circle represents the missile's seeker position.
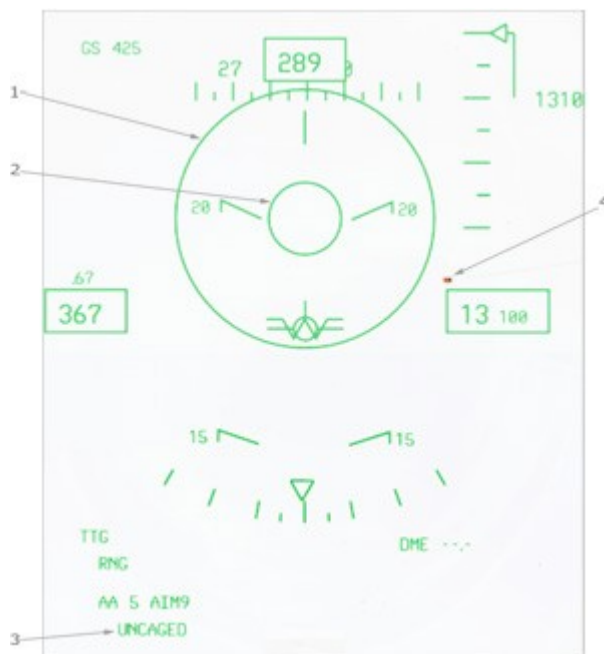
1. Scan mode outer circle

The outer field-of-view circle always remains stationary and disappears when the missile locks a target.

2. Scan mode inner circle

The inner circle remains fixed over an aircraft symbol until a target is detected, then the circle moves to follow the target. A steady, high-pitched tone indicates the seeker is locked.

3. Uncaged mode indicator string

4. Target at visual distance

IR SEEKER TRACKING

1. Tracking Circle

The circle moves to follow the target. As long as the target remains within the circle the missile continues to track and may be launched.

2. Time To Go

Flight time to a target.
MM:SS 99:59 max.

3. Target Range

Direct range (distance) to a target. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.

4. Target at Visual Distance

RADAR TARGET TRACKING MODE

Note:
In the radar target tracking mode an aircraft radar tracks a target, so required range must be set using a range selector switch.
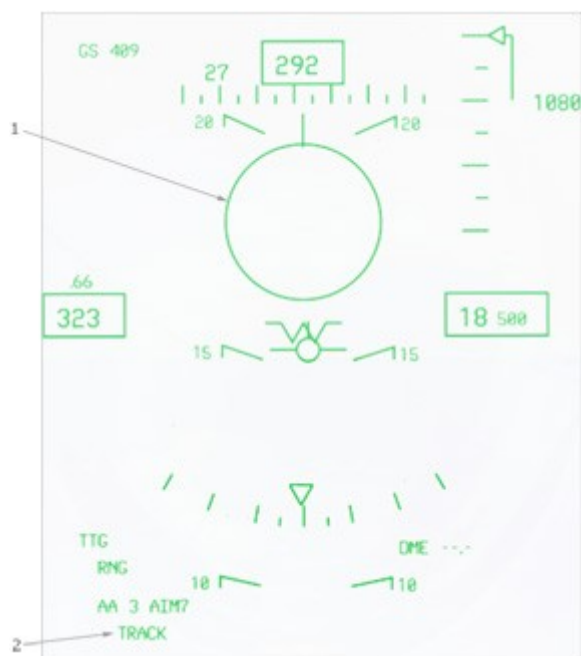
1. The Allowable Steering Error (ASE) circle provides a frame of reference for the missile launch representing the missile's field of view.

2. Tracking mode indicator string

With a radar lock established the HUD provides additional information about a target.
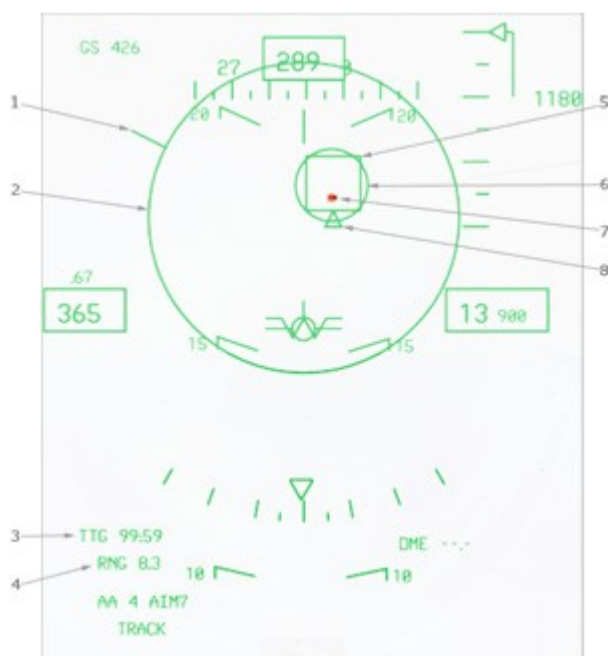
1. Angle of Line.

2. Allowable Steering Error Circle

3. Time To Go

4. Target Range

5. Target Designator Box

6. Missile Seeker

7. Target at visual distance

8. Shoot Cue

1. Angle of Line.

The angle-off line appears outside the ASE, providing a graphical representation of the aspect angle. When the line is at the top of the circle the target is moving directly away. When the line is at the bottom the target is moving directly toward the aircraft.

Note:
Even though most of modern missiles are all-aspect weapon but they are far
more effective at lower aspect angles.

2. Allowable Steering Error Circle

The circle doubles in size when the missile's seeker has acquired the target. Maneuver the aircraft to place the steering dot in the center of the ASE circle.

Note:
A large "X" appears across the circle when a target is closer than the missile's minimum launch range.

3. Time To Go

Flight time to a target.
MM:SS 99:59 max.

4. Target Range

Direct range (distance) to a target. Range is displayed in feet for ranges up to 30 000 feet, and in nautical miles within 0.1 nm for ranges exceeding 30 000 feet.

5. Target Designator Box

The TD box shows the target's position, tracked by the radar. Steer the TD box inside the ASE circle.

8. Shoot Cue

When the is target within the missile's minimum and maximum launch ranges a flashing triangular 'shoot' cue appears under the TD box.

WEAPON SIMOBJECTS

Each shot (shell, rocket or missile) has its own realistic but optimized visual model (simobject).

EXTERNAL STORES

As far as the key feature of the Weapon is '*any FSX aircraft/rotorcraft compatibility*', exterior weapon simobjects are not installed on some particular external stores. Any Weapon simobject appears at the moment of fire and follows its own flight path driven by Weapon physics engine.
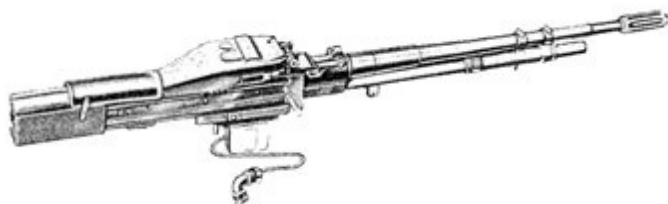
In further development we can install any of exterior weapon simobjects on any particular external stores of any third-party aircraft. Provided there will be enough interest from Weapon users and the third-party aircraft developers.

WEAPON DESCRIPTION

Version 1.0 delivers the following weapon types and subtypes:

GUNS

M60C

Type	General purpose machine gun
Place of origin	United States
In service	1957–present

Specifications:

Weight	10.5 kg (23.15 lb)
Length	1,105 mm (43.5 in)
Barrel length	560 mm (22.0 in)
Cartridge	7.62x51mm NATO
Caliber	7.62 mm (0.308 in)
Action	Gas-operated, open bolt
Rate of fire	550 rounds/min (rpm)
Muzzle velocity	2,800 ft/s (853 m/s)
Effective range	1,200 yd (1,100 m)
Feed system	Disintegrating belt with M13 Links

The M60C is a variant of the standard M60 for aircraft-mounting, such as in helicopter armament subsystems. It lacks things like the bipod, pistol grip, and iron sights. The main difference between the standard M60 and the "C" variant is the electronic control system and the hydraulic swivel system used. It could be fired from the cockpit by the pilot or co-pilot. It is an electronically-controlled, hydraulic-powered, air-cooled, gas-operated, belt-fed weapon system. M60C production was on the order of several hundred.

GSH-30

Type	Automatic cannon
Place of origin	Soviet Union
In service	1980–present
Designed	1977
Specifications	
Weight	46 kg
Length	1978 mm
Barrel length	1500 mm
Width	156 mm
Height	185 mm
Cartridge	30×165mm
Caliber	30mm
Barrels	1
Action	Short recoil operated
Rate of fire	1500–1800 rounds/min
Muzzle velocity	860 m/s

The **Gryazev-Shipunov GSh-30-1** (the actual Russian designation is GSh-301; also known by the GRAU index designation **9A-4071K**) is a 30 mm cannon designed for use on Soviet and later Russian military aircraft, entering service in the early 1980s. Its current manufacturer is the Russian company Izhmash JSC.

M61 Vulcan

Type	Six-barrelled Gatling-style rotary cannon
Place of origin	United States
In service	1959–present
Designed	1946
Specifications	
Weight	248 pounds (112 kg) (excluding feed system)
Length	71.93 in (1,827 mm)
Cartridge	20 × 102 mm.
Caliber	20 mm (0.787 in)
Barrels	6
Action	Hydraulically operated, electrically fired, Gatling
Rate of fire	6,000 rounds per minute
Muzzle velocity	3,450 feet per second (1,050 m/s)
Feed system	Belt or linkless feed system

The **M61 Vulcan** is a hydraulically or pneumatically driven, six-barreled, air-cooled, electrically fired Gatling-style cannon, which fires 20 mm rounds at an extremely high rate. The M61 and its derivatives have been the principal cannon armament of United States military fixed-wing aircraft for fifty years. The M61 was originally produced by General Electric.

ROCKETS

HYDRA 70
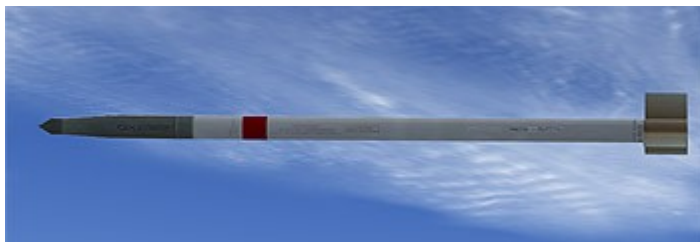
The **Hydra 70** rocket is a weapon derived from the 2.75 inch (70 mm) Mk 4/Mk 40 Folding-Fin Aerial Rocket developed by the United States Navy for use as a free-flight aerial rocket in the late 1940s.

ZUNI 127

The **Zuni** is a 5.0 in (127.0 mm) unguided rocket deployed by the United States armed forces. The rocket was developed for both air-to-air and air-to-ground operations. It can be used to carry various types of warheads, including chaff for countermeasures. It is usually fired from the LAU-10 rocket pod holding four rockets.

AIR-TO-AIR MISSILES

R-73M2

The **R-73** (NATO reporting name **AA-11** *Archer*) developed by NPO Vympel, is the most modern Russian short-range air-to-air missile.

Type	short-range air-to-air missile
Place of origin	Soviet Union
In service	1982-present

Specifications	
Weight	105 kilograms (230 lb)

Length	2.93 metres (9 ft 7 in)
Diameter	165 millimetres (6.5 in)
Warhead	7.4 kilograms (16 lb)
Engine	solid-fuel rocket engine
Wingspan	510 millimetres (20 in)
Operational range	40km (24.7 miles)
Speed	Mach 2.5
Guidance system	All-aspect infrared homing
Launch platform	MiG-21(Upgraded), MiG-23-98, MiG-29, MiG-31, MiG-35, Sukhoi Su-24, Su-27, Su-30, Su-33, Su-35, Su-34, Su-47, Mil Mi-24, Mil Mi-28, Kamov Ka-50, Yak-141, HAL Tejas, J-10

R-60

The **R-60** (NATO reporting name **AA-8 *'Aphid'***) developed by NPO Vympel, is an infrared homing lightweight air-to-air missile designed for use by Soviet fighter aircraft. It has been widely exported, and remains in service with the CIS and many other nations.

Type	Short-range Air to Air Missile
Place of origin	Soviet Union
In service	1974- present

Specifications	
Weight	43.5 kg (96 lb)
Length	2090 mm (6 ft 10 in)
Diameter	120 mm (4¾ in)
Warhead	3 kg (6.6 lb)
Wingspan	390 mm (15¼ in)
Operational range	8 km (5 mi)
Flight altitude	20,000 m (65,615 ft)
Speed Mach	2.7
Launch platform	MiG-21, MiG-23, MiG-25, MiG-27, MiG-29, MiG-31, Su-15, Su-17, Su-20, Su-22, Su-24, Su-25, Yak-28, Yak-38, Yak-141, Mi-24, BAE Hawk

AIM-7E Sparrow III

The **AIM-7 Sparrow** is a medium-range semi-active radar homing air-to-air missile operated by the US as well as various allied air forces and navies.

Type	Medium-Range Air-to-Air Missile
Place of origin	United States

Specifications	
Weight	510 lb (230 kg)
Length	12 ft (3.7 m)
Diameter	8 in (200 mm)
Wingspan	2 ft 8 in (0.81 m) (AIM-120A/B)

Operational range	45 kilometres (28 mi)
Speed	Mach 4
Launch platform	Aircraft: F-4 Phantom II, F-15 Eagle, F-16 Fighting Falcon, F-14 Tomcat, F/A-18

Hornet, JA-37 Viggen, F-104S Starfighter, Tornado F.3 ADV, F/A-18E/F Super Hornet, Mitsubishi F-2.

AIM-9 Sidewinder

The **AIM-9 Sidewinder** is an infrared homing, short-range, air-to-air missile carried mostly by fighter aircraft and recently, certain gunship helicopters. Variants and upgrades remain in active service with many air forces after five decades.

Type	Short-range air-to-air missile
Place of origin	United States
In service	1956 (AIM-9B) – present

Specifications	
Weight	190 pounds (86.2 kg)
Length	9 feet 4.2 inches (2.850 m)
Diameter	5 in (127.0 mm)
Wingspan	24.8 in (629.9 mm)
Operational range	0.6 to 11.3 miles (1.0 to 18.2 km)
Speed	Mach 2.5
Launch platform	Aircraft, helicopter gunships

AIM-132 ASRAAM

The **AIM-132 Advanced Short Range Air-to-Air Missile** is an infrared homing air-to-air missile, produced by MBDA. It is currently in service in the Royal Air Force and Royal Australian Air Force, replacing the AIM-9 Sidewinder in those services.

Type	Short-range air-to-air missile
Place of origin	United Kingdom
In service	2002

Specifications	
Weight	88 kg
Length	2.90 m
Diameter	166 mm
Wingspan	450 mm
Operational range	300 m – 18 km
Flight altitude	N/A
Speed Mach	3+
Launch platform	Aircraft: Royal Air Force: Tornado, Harrier, Eurofighter Typhoon, Royal Australian Air Force: F/A-18

AIR-TO-SURFACE MISSILES

AGM-88 HARM

The **AGM-88 High-speed Anti-Radiation Missile (HARM)** is a tactical, air-to-surface passive radar homing missile designed to home in on electronic transmissions coming from surface-to-air radar systems. It was originally developed by Texas Instruments (TI) as a replacement for the AGM-45 Shrike and AGM-78 Standard ARM system.

Type	Air-to-surface anti-radiation missile
In service	1985 - present
Produced	1985–present

Specifications	
Weight	355 kilograms (780 lb)
Length	4.1 metres (13 ft)
Diameter	254 millimetres (10.0 in)
Wingspan	1.1 metres (3.6 ft)
Operational range	57 nautical miles (66 mi; 106 km)
Speed	2,280 kilometres per hour (1,420 mph)
Launch platform	F/A-18, F-4G, F-16, Tornado IDS, F-35 and others

Kh-29T

The **Kh-29** (NATO reporting name **AS-14 'Kedge**) is a Russian air-to-surface missile with a range of 10–30 km. It has a large warhead of 320 kg, has a choice of laser or TV guidance, and is typically carried by tactical aircraft such as the Su-24 and Su-30, as well as the "T/TM" models of the Su-25, giving that craft an expanded standoff capability.

It is comparable to the United States' AGM-65 Maverick missile but with a much heavier warhead. The Kh-29 is intended for primary use against larger battlefield targets and infrastructure such as industrial buildings, depots and bridges, but can also be used against ships up to 10,000 tonnes, hardened aircraft shelters and concrete runways.

Type	air-to-surface missile
Place of origin	Soviet Union
In service	1980s-current

| Specifications	
Weight	685 kg (1,510 lb)
Wingspan	110 cm (43 in)
Operational range	Kh-29T :12 km (6.5 nmi)
Speed	1,470 km/h (910 mph).
Launch platform	Kh-29L&T : MiG-27K, MiG-29M, Su-27UB, Su-30MK, Su-39; Su-35;
	Also : Mirage F1E, Su-17/22, Su-24, Su-33, Su-34, Su-37

ALARM

ALARM (Air Launched Anti-Radiation Missile) is a British anti-radiation passive radar seeker missile designed primarily to destroy enemy radars for the purpose of Suppression of Enemy Air Defense (SEAD).

Type	Air-to-surface anti-radiation missile
In service	1990 - present

Specifications	
Weight	268 kilograms (590 lb)
Length	4.24 metres (13.9 ft)
Diameter	230 millimetres (9.1 in)
Wingspan	0.73 metres (2.4 ft)
Operational range	93 kilometres (58 mi)
Speed	2,455 kilometres per hour (1,525 mph)
Launch platform	Tornado GR.4, Tornado F3

AS.34 Kormoran
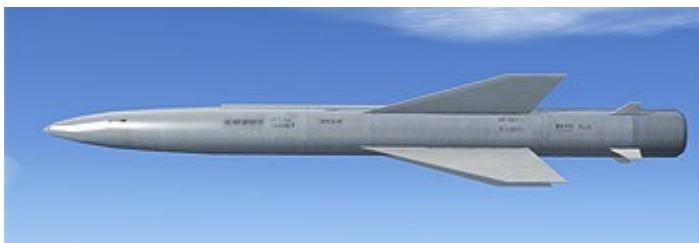
The AS.34 Kormoran is a German-produced Anti-ship missile. The Kormoran (cormorant) uses an inertial guidance system for the midcourse phase, switching to active radar homing during the terminal attack phase. It carries a 165 kg (363 lb) delay-fused warhead, designed for 90mm of penetration prior to detonation.

The missile entered service with the German Navy in 1991. Approximately 140 missiles were produced for Germany. The missile is now in service with the German Luftwaffe and Italian Air Force.

Type	Medium-range, active radar homing air-to-surface missile
Place of origin	Germany

Specifications	
Weight	600 kg
Length	4.40 m
Diameter	344 mm
Warhead	165 kg
Operational range	23 km
Speed	Mach 0.9
Launch platform	Aircraft: F-104G Starfighter, Tornado IDS

WEAPON CONTROL

1. Weapon master switch – ON *Ctrl+6*
2. Weapon type selector switch - GUN, RCKT, MSL or BOMB *Ctrl+7*
3. Select weapon subtype – AS REQUIRED *Ctrl+Shift+7:*
GUN - Guns:

- <u>M60C</u> *Ctrl+Shift+8 to cycle fire modes:*
  - AUTO – fire until trigger released
  - X3 – burst of 3 shots
  - SINGL – one shot fire
- <u>GSH-30</u>
  - AUTO – fire until trigger released
  - X8 – burst of 8 shots
- <u>M61 Vulcan</u>
  - AUTO – fire until trigger released
  - X10 – burst of 10 shots

RCKT - rockets *Ctrl+Shift+7 to cycle weapon sub-types:*

- <u>Hydra 70</u> *Ctrl+Shift+8 to cycle fire modes:*
  - AUTO - fire until trigger released (from all stores 1,2,3,4)
  - X4 – 4 rockets volley (from all stores 1,2,3,4)
  - 1+4 - 2 rockets volley (from stores 1 and 4 - outboards)
  - 2+3 - 2 rockets volley (from stores 2 and 3 - inboards)

- <u>Zuni 127</u> *Ctrl+Shift+8 to cycle fire modes:*
  - AUTO - 4 rockets volley (from all stores 1,2,3,4)
  - 1+4 - 2 rockets volley (from stores 1 and 4 - outboards)
  - 2+3 - 2 rockets volley (from stores 2 and 3 – inboards)
  - SINGL – one shot fire

MSL - missiles *Ctrl+Shift+7 to cycle weapon sub-types:*
  - AIM-7 Sparrow
  - AIM-9 Sidewinder
  - R-73M2
  - R-60
  - AIM-132 ASRAAM
  - AGM-88 HARM
  - X-29 (Kh-29)
  - ALARM
  - AS.34 Kormoran

MILITARY TRAFFIC SCENERIES

Military traffic sceneries add AI military aircraft operations on the following ten areas of the world:

1. Iraq
Period: 90-00-s
Area: Baghdad ORBI, Basrah ORMM
Aircraft: B-2, B-52, C-130, F-14, MiG-25

2. Yugoslavia
Period: 90-s
Area: Croatia Cilipi LDDU, Serbia Pristina BKPR, Slovenia Ljbljana LJLJ
Aircraft: MiG21, F-16, IL-76, B-2, Mi-6, C-130

3. Afganistan
Period: 80-s
Area: Kabul OAKB, Kandagar OAKN
Aircraft: MiG-21, An-12, IL-76, Tu-16

4. Germany
Period: 80-s
Area: Dresden EDDC , Tempelhof EDDI, Nobitz EDAC
Aircraft: F-4, B-52, C-130

5. Western Europe
Period: 80-s
Area: UK Jersey EGJJ, UK Bournemouth EGHH, France Maupertus LFRC
Aircraft: F16, F-4, B-52, C-130, Mirage III

6. Eastern Europe (USSR)
Period: 70-s
Area: Khrablovo Kaliningrad UMKK, Grodno UMMG, Brest UMBB
Aircraft: MiG-21, MiG-25, An-12, Tu-95, Mi-6

7. Middle East
Period: 60-70-s
Area: Lebanon Beirut OLBA, Egypt Port Said HEPS, Israel Jerusalem LLJR, Palestinian Authority Gaza LVGZ
Aircraft: F-4, F-14, Mirage III, MiG-21, MiG-25, C-130

8. Vietnam
Period: 60-s, Vietnam war
Area: Tansonnhat Hochiminh VVTS, Danang VVDN, Noibai Hanoi VVNB
Aircraft: B-52, F-4, MiG-21

9. Korea
Period: 50-s, Korean war
Area: North Korea Sunan Pyeongyang ZKPY, South Korea Incheon Seoul RKSI, Jeju RKPC
Aircraft: MiG-17, IL-28, F-86, B-29, Tu-16

10. Far East
Period: 40-s, WWII, 'Ramp Tramp'
Area: China Chengdu ZUUU, USSR Knevichi UHWW Vladivostok
Aircraft: B-29

Notes:
- The sceneries add AI military aircraft operations traffic only. No new buildings or anything else.

- To switch off default FSX non-combatant traffic: Options> Settings> Display> Traffic set:
    - Airline traffic density 1-3%,
    - General aviation traffic density 0%

- The Weapon can work with unlimited number of military add-on sceneries created by third-party developers.

SECRET MISSIONS

Two sets of top secret flight missions are included.
One is Tu-95 bombers transatlantic flight, another is U-2 rec mission.

Where? When? Try to find out yourself!

MILITARY AI AIRCRAFT SET

The following nineteen military AI aircraft models provides military operations on the ten areas of the world:

F-4	F-14	F-16
F-86	MiG-17	MiG-21
MiG-25	Mirage III	U-2
IL-28	IL-76	TU-16
TU-95	AN-12	B-2
B-29	B-52	C-130

Mi-6

Also the models can be used in new third-party military scenery projects creation.

USE IN THIRD-PARTY PROJECTS COPYRIGHTS NOTICE:

- No Captain Sim AI aircraft models/textures are allowed to be included in the scenery release. Bgl files only.
- Scenery description must include the following text: *The scenery requires Captain Sim Weapon for FSX AI aircraft set.*

CONFIGURATION FILE

Configuration file (CSWeapon.xml) provides extensive flexibility of the Weapon system modification. See SDK for details.

WEAPON PHYSICS ENGINE

Each shot is driven by realistic weapon physics engine. See SDK for performance, ballistics and other settings and envelopes.

SOUNDS

Weapon and target fire, launch, hit, splash and explosion sounds. See SDK for details.

VISUAL EFFECTS

Weapon and target fire, wake, smoke, launch, hit, splash, explosion and damage effects. See SDK for details.

TARGET DAMAGE MODEL

Realistic physics of gradual partial to total damage. See SDK for details.

FURTHER DEVELOPMENT

The Weapon for FSX is a pilot project, so its further development is totally depends on the initial flightsim community feedback (sales).

If the product will receive an enthusiastic welcome, then most likely we will consider an addition of the following features:
- Multiplay
- Unguided bombs
- Weapon exterior models installation on external stores of any aircraft
- Many other exciting features

Technically there are no limits in the Weapon integration into FSX.

Note:
Initial release of the Weapon for FSX product does not include any
'promised' expansions or features.

CUSTOMER CARE

FORUM

You are invited to join Captain Sim community forum

DAILY NEWS

For Captain Sim *daily* news please follow us at Twitter or Facebook.

VIDEO CHANNEL

For Captain Sim videos please watch our YouTube channel.

TECH SUPPORT

Our product is not perfect (unfortunately nothing is). But we are working on improvements. If you have some important issue to report, please check-in to Your Profile then click Product Name > Customer Support > and use the Trouble Ticket System. We process all tickets and consider the most significant issues for the next service packs.