SU-25T

ESSENTIALS

V1

Table of Contents

Introduction 3
- Other sources 3
- Joystick Configuration 3

Cockpit 4
- HUD 4
- Instruments 4

Flying and Navigation 5
- Ramp Start and Take-off 5
- Navigation 6
- Landing 8
- Auto Pilot 9
- Fuel Panel 10

Air to Ground 11
- Weapon Status Panel 12
- Weapon Control Panel 12

Air to Ground – Unguided Bombs 14
- CCIP vs CCRP bombing 14
- CCRP mode 14
- CCIP mode 15

Air to Ground – Unguided Rockets and Guns 16

Air to Ground – TV Guided 17

Air to Ground – Laser Guided Missiles 18
- Vikhr Missile HUD: 18

Air to Ground – Anti Radar Missiles 19

Air to Air 20

Countermeasures 21
- RWR Panel 21

Damage Control 22
- Hydraulics Panel 22
- Emergency HUD 22

Radar Threats 23

IR / Optical Threats: 25

Weapons Loadout Table 26

Airport IDs 28

Introduction

This guide is not supposed to be a comprehensive tutorial how to fly Su-25T, rather it's an effort to put all relevant information about the plane in one place. For guides see below:

Other sources

For beginners:

In game tutorial missions.

Robert Sogomonian's excellent YouTube tutorials

DCS World Su-25T operation: A Beginner's tips for beginners.

Ironhand SEAD guide

Su-25T QuickStart Guide - Fly and Destroy in minutes

Also digitalcombatsimulator.com download section has a number of training missions for SU-25T.

Other reference material:

Su-25T: Weapon Specifications List / Other useful information

SU-25T reference documentation

Su-25t manual condensed from the original Lockon FC 2 manual.

Joystick Configuration

Buttons and axis worth to bind to HOTAS joystick:

Trim

Zoom View (axis)

Weapon Fire

Weapon Change

Cannon
Countermeasures Chaff Dispense (chaff and flares)
Target Designator slew

Target Lock / Unlock

Target Size / Gunpod Elevation Increase / Decrease

Display Zoom In / Out
Airbrake

Wheel Brake On

Flaps Up / Down / Landing

Electro-Optical System ON / OFF (Shkval)

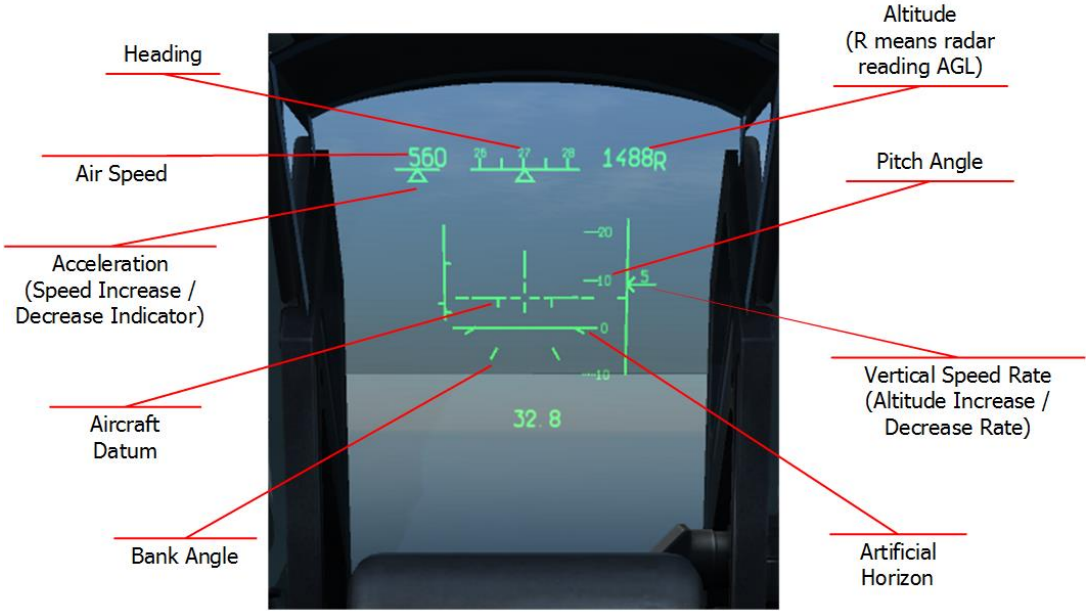
Night Vision (FLIR or LLTV) pod ON / OFF (Merkury pod)

ELINT Pod On / Off
Laser Ranger ON / OFF
IR Jamming
ECM pods on/off

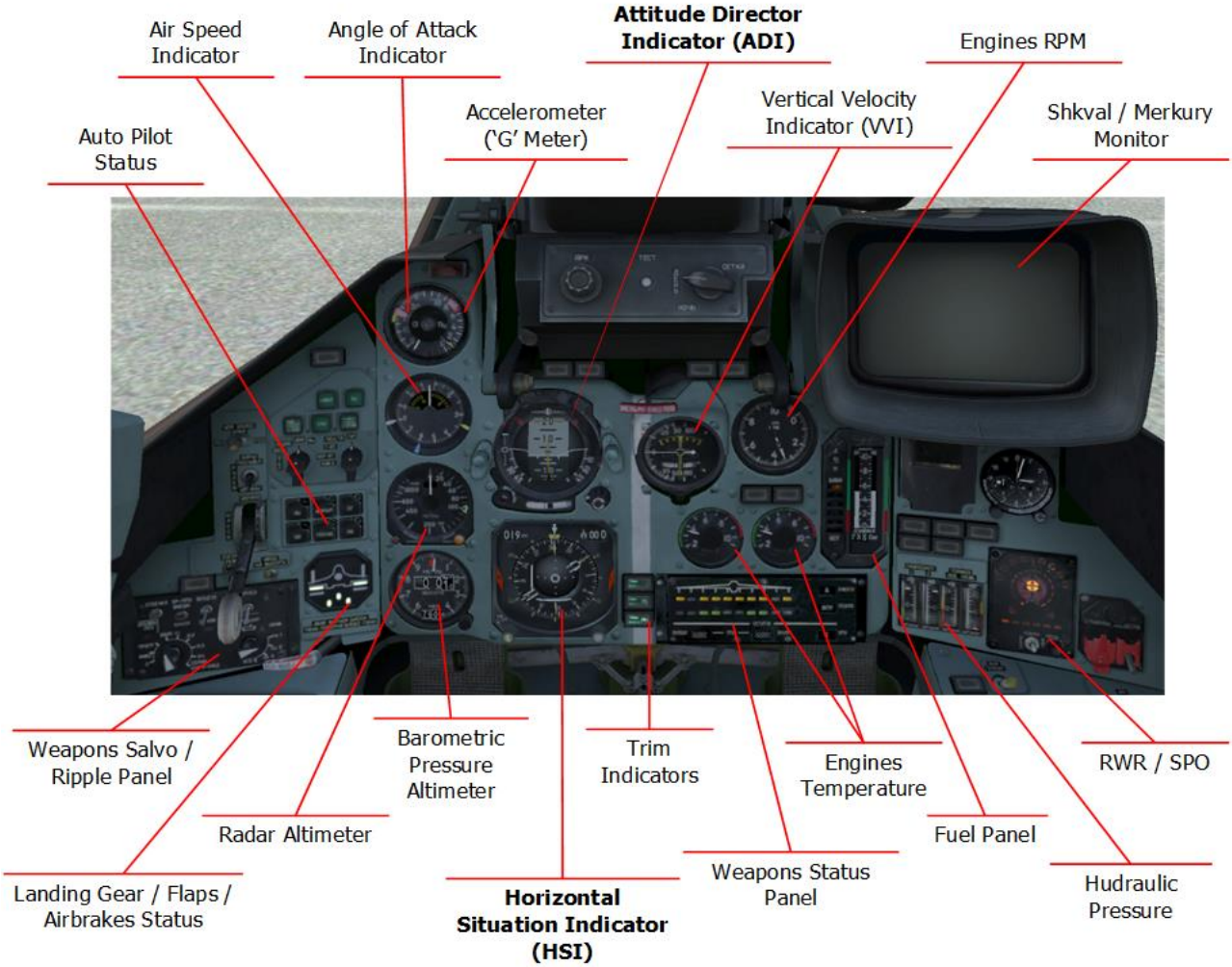
Eject (still have to press it three times despite reassigning to Joystick)
Autopilot Disengage
Autopilot – Transition to Level Flight Control
Dragging Chute

Cockpit

HUD



Instruments

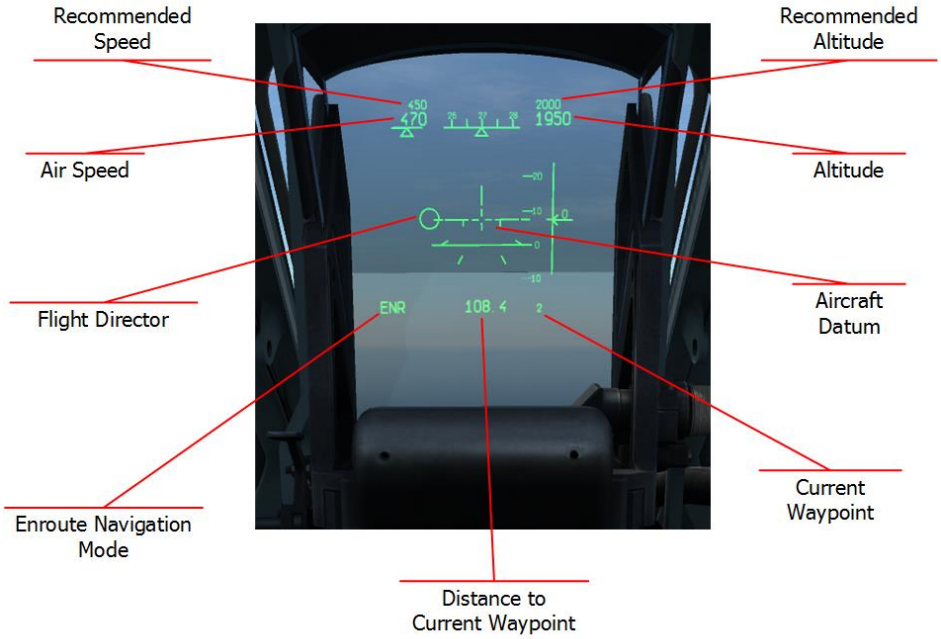


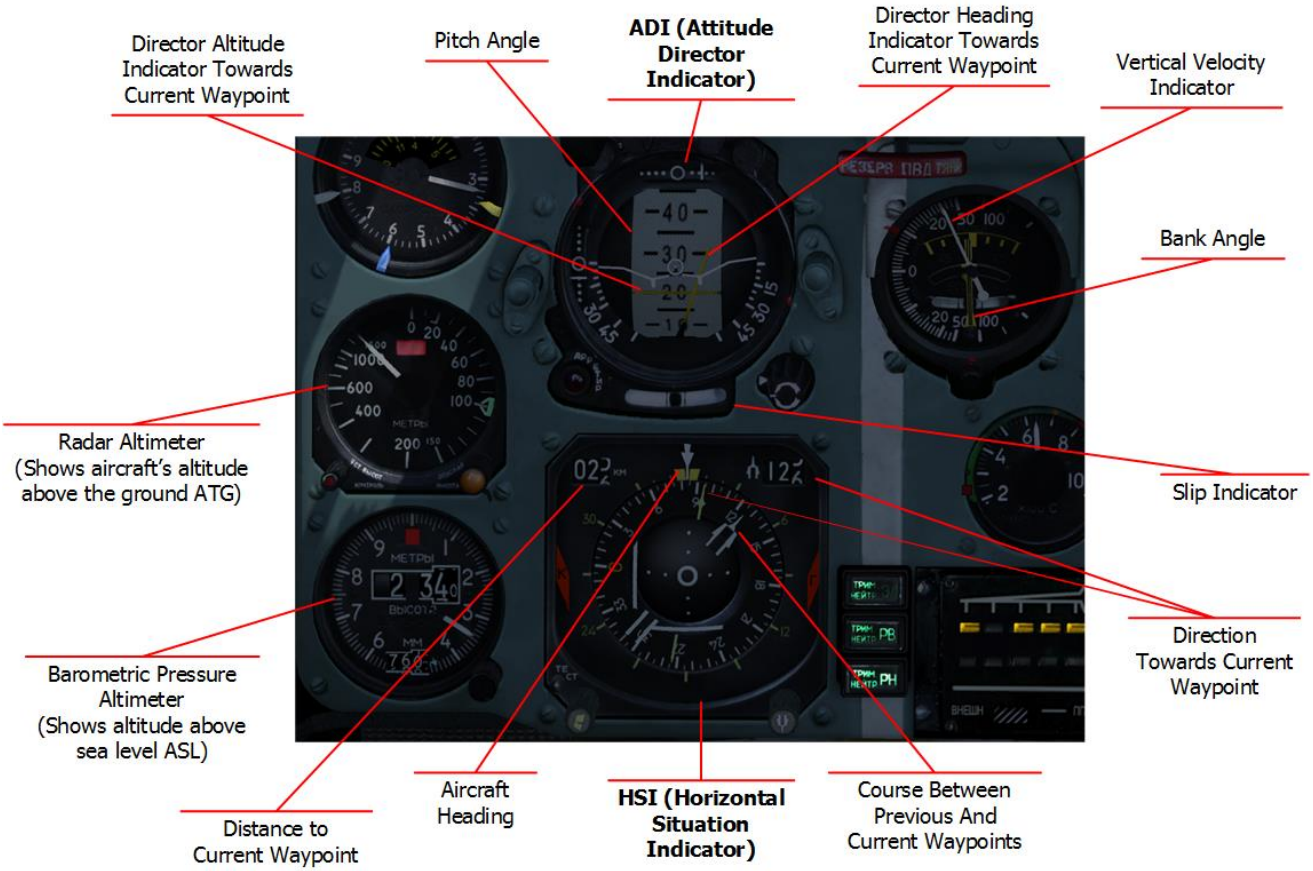
Flying and Navigation

Ramp Start and Take-off

Step	Default HotKey	My HotKey
Electric Power Switch (APU) Turns on auxiliary power unit Rearming and Refuelling Window To request rearming after landing, both engines must be stopped and the canopy open. Altimeter Pressure Increase Altimeter Pressure Decrease Altimeter pressure must be set to air pressure at the airfield for the barometer altimeter to be precise.	R_SHIFT + L L_ALT + ‘ R_SHIFT + = R_SHIFT + -	
Start engines: Left Engine: Right Engine: Both Engines: The throttle has to be at idle position (0%) to start the engines. To save time both engines can be started at the same time. Engines are ready when warning lights (below RPM indicator) go off.	 R_ALT + Home R_CTRL + Home R_SHIFT + Home	
Canopy Open / Close Gear Light Near / Far / Off Taxi / Landing lights Navigation Lights Cycles through steady, alternating left / right, off. Illumination Cockpit	L_CTRL + C R_ALT + L R_CTRL + L L	
Communication Menu Depends on keyboard layout Map Cockpit View Check the map for the airfield layout and taxing routes.	\ or # F10 F1	
Taxi to the runway, don’t exceed 30 km/h while taxing. Wheel Brake On Flaps Up / Down They are normally not needed but may help if the aircraft is heavy.	 W F	
For take-off, keep the wheel brakes on and power up the engines. Release the brakes when the aircraft start rolling. Take off speed is about 280 – 320 km/h, depending on aircraft’s weight.		
Landing Gear Up / Down	G	

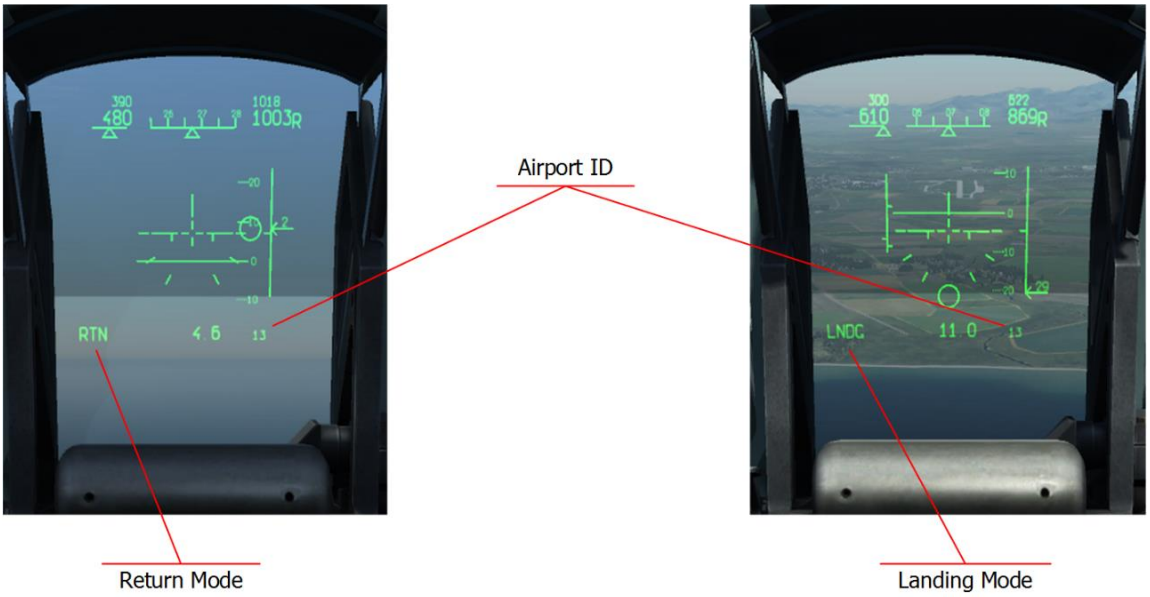
Navigation


Recommended Speed
Recommended Altitude
Air Speed
Altitude
Flight Director
Aircraft Datum
Enroute Navigation Mode
Current Waypoint
Distance to Current Waypoint
470
1950
ENR
108.4


Director Altitude Indicator Towards Current Waypoint
Pitch Angle
ADI (Attitude Director Indicator)
Director Heading Indicator Towards Current Waypoint
Vertical Velocity Indicator
Bank Angle
Radar Altimeter (Shows aircraft's altitude above the ground ATG)
Slip Indicator
Direction Towards Current Waypoint
Barometric Pressure Altimeter (Shows altitude above sea level ASL)
Distance to Current Waypoint
Aircraft Heading
HSI (Horizontal Situation Indicator)
Course Between Previous And Current Waypoints

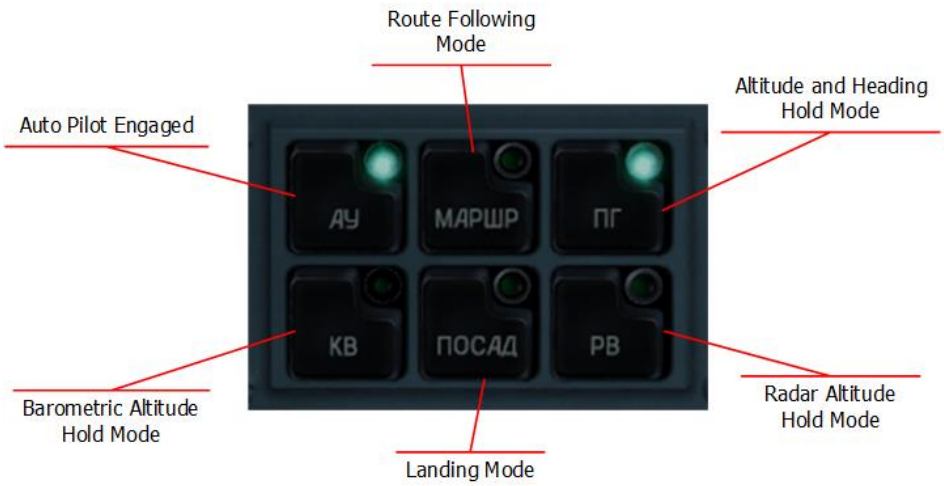
Step	Default HotKey	My HotKey
Navigation Modes Cycles through enroute (waypoints navigation), return and landing modes. Next Waypoint, Airfield or Target Previous Waypoint, Airfield or Target	1 L_CTRL + ` L_SHIFT + `	
When flying pre-planned route (between waypoints): **Flight Director** circle should be kept in the middle of aircraft symbol on the HUD. It computes intercept route for direct course between previous and current waypoints. **ADI** is an analogue equivalent of Flight Director, yellow vertical line indicates left / right turn and yellow horizontal line ascend or descend. **HSI** shows aircraft's heading, the yellow arrow points towards current waypoint and white two-line arrow shows a course between previous and current waypoints.		
Trim Nose Up Trim Nose Down Trim Right Wing Down Trim Left Wing Down	R_CTRL + . R_CTRL + ; R_CTRL + / R_CTRL + ,	

Landing



Step	Default HotKey	My HotKey
Return / Landing mode Flaps Landing Position Landing Gear Up / Down Airbrake Dragging Chute Wheel Brake On	1 L_SHIFT + F G B P W	
In **Return mode** Director Circle guides to airport approach (about 15km / 1000m up from the runway). In **Landing mode** Director Circle follows ILS landing glide slope. Lower **landing gear** and **flaps** to landing position to decrease aircraft's speed. Final approach speed is about 280-300 km/h, touchdown is 240-260 km/h. Use **air brakes** to further reduce the air speed if needed. Director Circle points at the middle of the runway so glide a little below it in the final approach. Release **parachute** when speed is below 190 km/h.		
Stop left engine Stop right engine Stop both engines	R_ALT + End R_CTRL + End R_SHIFT + End	
Repair To request aircraft repair open radio (communication) menu, then F8, F3		

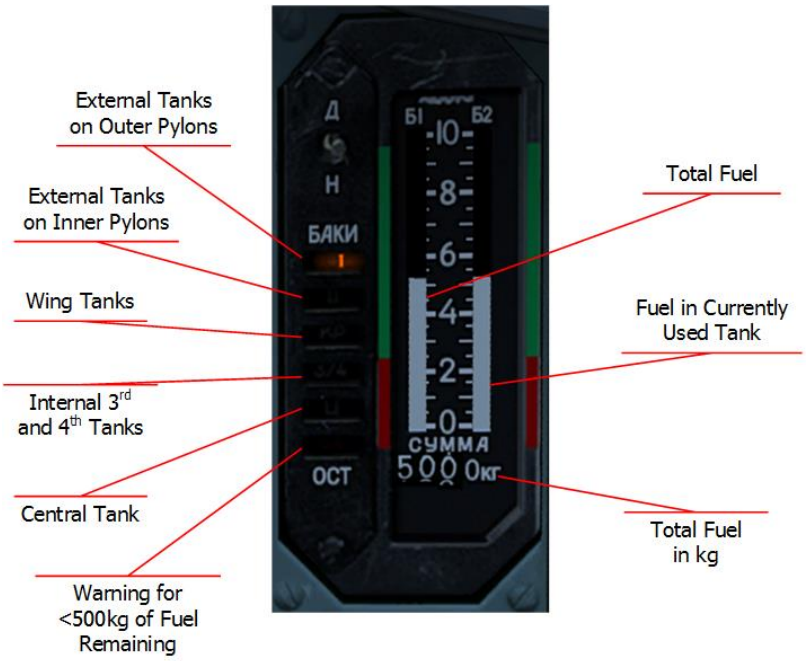
Auto Pilot



Step	Default HotKey	My HotKey
Autopilot in SU-25T controls aircraft's trim. After AP disengage the trim stay as it was with AP engaged. The easiest way to trim it to neutral is to use AP in transit flight (L_ALT + 3).		
Autopilot - Attitude Hold Maintains bank and pitch angle.	L_ALT + 1	
Autopilot - Altitude and Roll Hold Maintains barometric pressure altitude ASL and bank angle.	L_ALT + 2	
Autopilot – Transition to Level Flight Control Returns aircraft to straight and level flight.	L_ALT + 3	
Autopilot - Barometric Altitude Hold Maintains barometric pressure altitude ASL.	L_ALT + 4 or H	
Autopilot - Radar Altitude Hold 'Follow terrain' mode, maintains radar altitude AGL.	L_ALT + 5	
Autopilot – 'Route Following' In Navigation Mode Auto Pilot follows navigation route to next waypoint, return point or ILS approach in landing mode. In A2G Combat Mode Auto Pilot can be engaged when the target is locked by Shkval targeting system and it will steer the aircraft towards target.	L_ALT + 6 or A	
Autopilot Override Temporarily allows the pilot to have full control over the aircraft.	L_ALT + A	
Autopilot Disengage	L_ALT + 9	

Fuel Panel

Step	Default HotKey	My HotKey
Fuel Dump	R	
Lit indicator means an empty tank.		



Air to Ground

Step	Default HotKey	My HotKey
Air to Ground Mode	7	
Weapon Change	D	
Cannon	C	
Weapon Fire	Space	
Target Lock	Enter	
Jettison Fuel Tanks (Jettison external fuel tanks on outboard pylons first, then inboard pylons)	L_ALT + R	
Weapons Jettison (A2G outer pylons first working inwards, then A2A outer pylons working inwards)	L_CTRL + W	
Launch Permission Override	L_ALT + W	
Laser Ranger ON / OFF Laser rangefinder has limited running period, about 1 minute after which it has to cool down for about the same time period.	R_SHIFT + O	
Shkval / Merkury		
Electro-Optical System ON / OFF Turns on Shkval targeting system	O	
Night Vision (FLIR or LLTV) pod ON / OFF Turns on Merkury low light targeting pod	R_CTRL + O	
Target Designator Up	;	
Target Designator Down	.	
Target Designator Right	/	
Target Designator Left	,	
Target Designator to Center	R_CTRL + I	
Target Size / Gunpod Elevation Increase	R_CTRL +]	
Target Size / Gunpod Elevation Decrease	R_CTRL + [	
Display Zoom In	=	
Display Zoom Out	-	
Target lock Stabilizes the camera.	Enter	
ELINT Pod On / Off	I	

Weapon Status Panel

Weapon Type		Gun Ammunition	
Б	- Bombs	К	- Full
УР	- Missiles	1/2	- half remaining
НРС	- Rockets	1/4	- quarter remaining
ВПУ	- Main Gun		

Weapon Control Panel

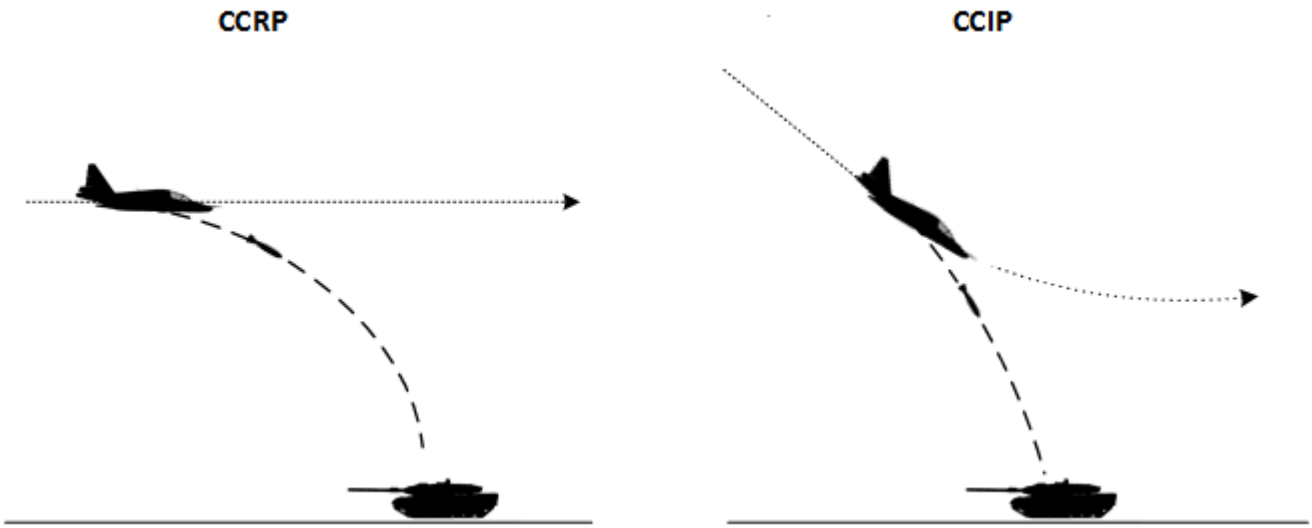
Step	Default HotKey	My HotKey
Ripple Quantity Select / SPPU select	L_CTRL + Space	
Salvo Size Switch		
Ripple Interval Increase	V	
Ripple Interval Decrease	L_SHIFT + V	
Release Mode Switch		

Release Mode Switch		Salvo Size Switch	
<u>Gun Pods Settings:</u>		**<u>Guns Settings:</u>**	
0	- Gun pods bore sighted (aligned with internal gun, automatically chosen when gun pods are used with internal gun)	**ПО 1**	- Internal Gun Only
ФИКС	- (FIXED) Gun pods barrel depression in manual mode	**ПО 2**	- Single Pair of Gun Pods
		ПО 4	- All Gun Pods
		ВСЕ	- (ALL) Gun Pods and Internal Gun

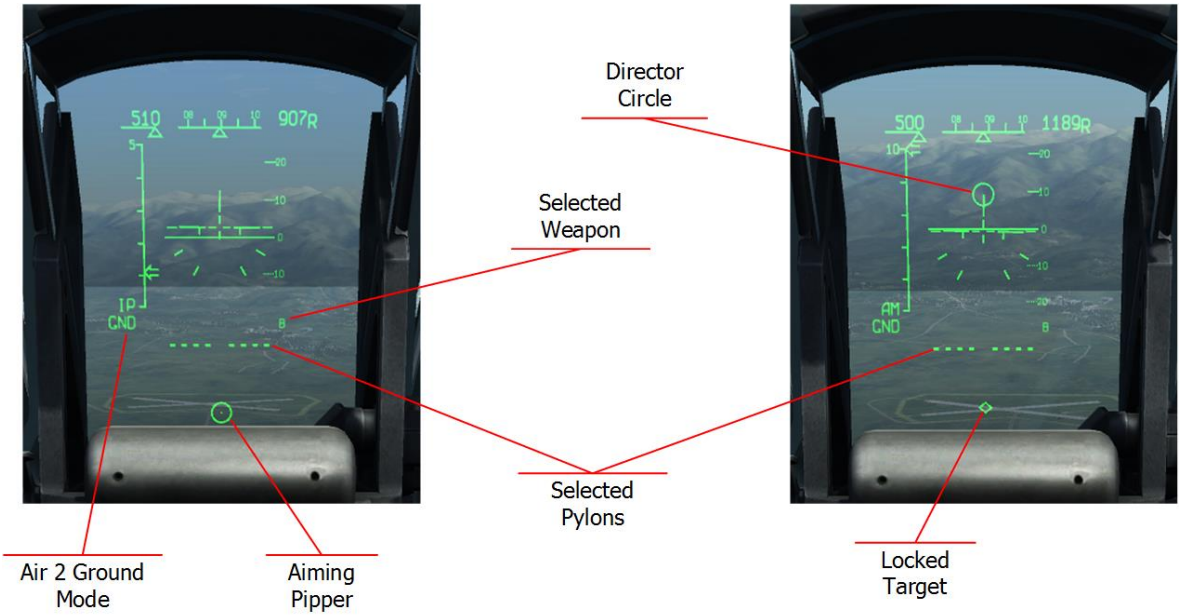
ПРОГР - (PROGR) Gun pods barrel depression in auto mode used with laser designated targets	
<u>Bombs Settings:</u> **ЗАЛП** **-** (SALVO) All weapons released simultaneously **0.1** **0.2** **0.3** **0.4** - Weapons released in set interval (in seconds) **СЕРИЯ КМГУ-МБД** - (Series KMGU-MBD) release mode for KMGU series cluster bombs and multiple ejection racks (MBD). KMGU bombs are released in 2s intervals and munition on MBD racks in 0.3s intervals.	**<u>Bombs Settings:</u>** **ПО 1** - Single Bomb **ПО 2** - Two Bombs **ПО 4** - Four Bombs **ВСЕ** - All Bombs

Air to Ground – Unguided Bombs

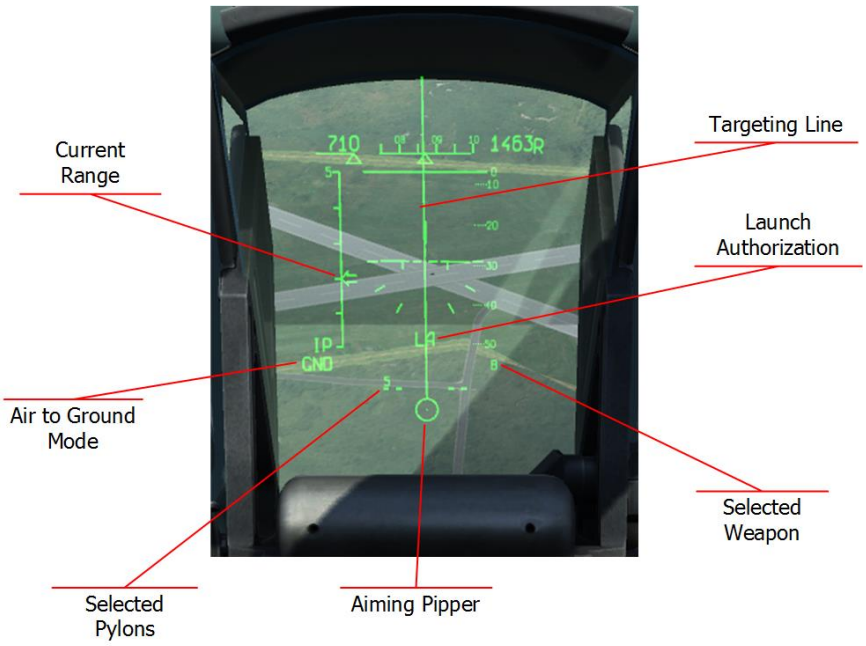
CCIP vs CCRP bombing



CCRP mode



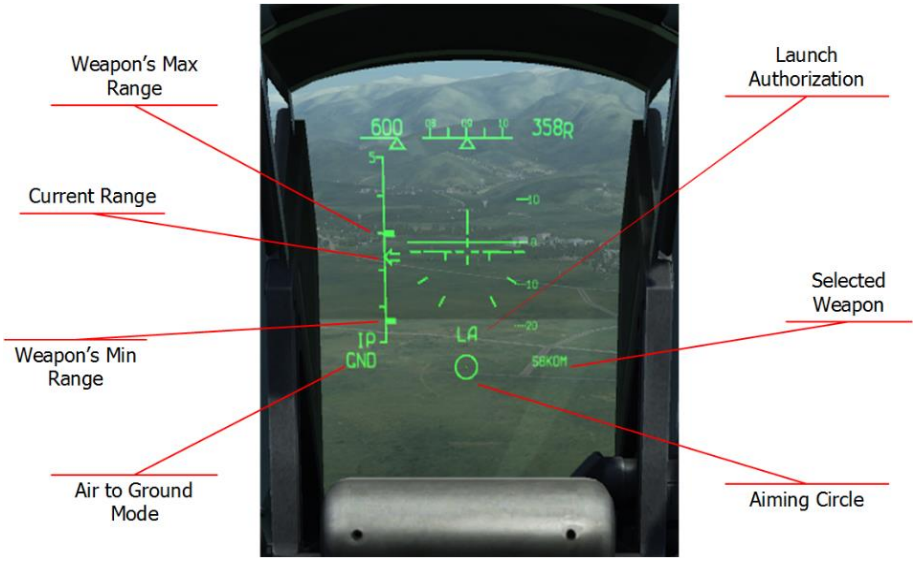
CCIP mode



Step	Default HotKey	My HotKey
Ripple Quantity Select / SPPU select Ripple Interval Increase Ripple Interval Decrease Select **Ripple Quantity** for number of bomb to be dropped and **Ripple Interval** for interval between each bomb. Target Lock	L_CTRL + Space V L_SHIFT + V Enter	
The aircraft's avionics switch automatically between CCIP and CCRP modes depending on selected weapon and dive angle. If the bomb's impact point is below the HUD then CCRP mode is selected. If the impact point is within HUD then the mode switch to CCIP delivery. **CCIP mode** Align aircraft with the target and manoeuvre into steep dive to place the pipper on the target. 'LA' is displayed on the HUD when the spot marked by pipper is in range. Drop bombs when the pipper is on the target. **CCRP mode** Place CCRP diamond marker on the target. Fly straight as indicated by Director Circle (put aircraft tail in the center of the circle). The scale on the left side of the HUD will show time to release in seconds. Press and hold Weapon Release button, the bombs will be released automatically when the time reach zero.		
TV Aided Shkval TV and Merkury IR targeting systems can significantly help with locating and acquiring the target in CCRP bombing mode. Use the monitor to find and lock the target. Fly straight as indicated by Director Circle (put aircraft tail in the center of the circle). Turn on		

Laser Rangefinder. The scale on the left side of the HUD will show time to release in seconds. Press and hold Weapon Release button, the bombs will be released automatically when the time reach zero. After the bombing run turn the Laser off to let it cool down.		

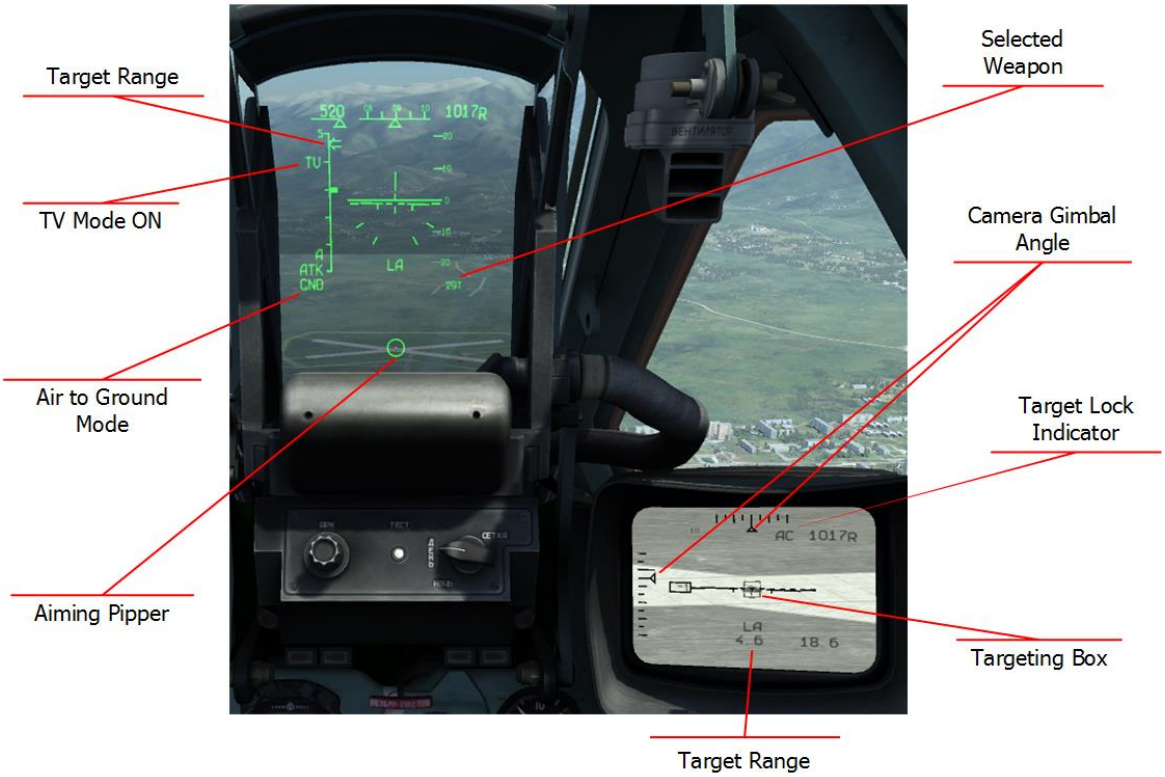
Air to Ground – Unguided Rockets and Guns



Step	Default HotKey	My HotKey
Select rockets or guns. Manoeuvre the aircraft into shallow dive towards the target. 'LA' is displayed on the HUD when the point in the pipper is in range. Press Weapon Release button when pipper is on the target.		
Canon Ripple Quantity Select / SPPU select Ripple Interval Increase Ripple Interval Decrease Target Size / Gunpod Elevation Increase Target Size / Gunpod Elevation Decrease	C L_CTRL + Space V L_SHIFT + V R_ALT +] L_ALT + [	
In Canon mode **Ripple Quantity** selects guns to be used: 1 – Main gun only 2 – Gun pods on internal pylons 4 – All gun pods All – Gun pods and internal gun Gun pods selected with main gun are always bore sighted. Barrels of gun pods selected on their own can be lowered so they shoot below the flight path. **Laser Aided** Targets can also be laser designated while using gun pods. Turn the laser on and put the pipper on the target. Angle depression of gun		

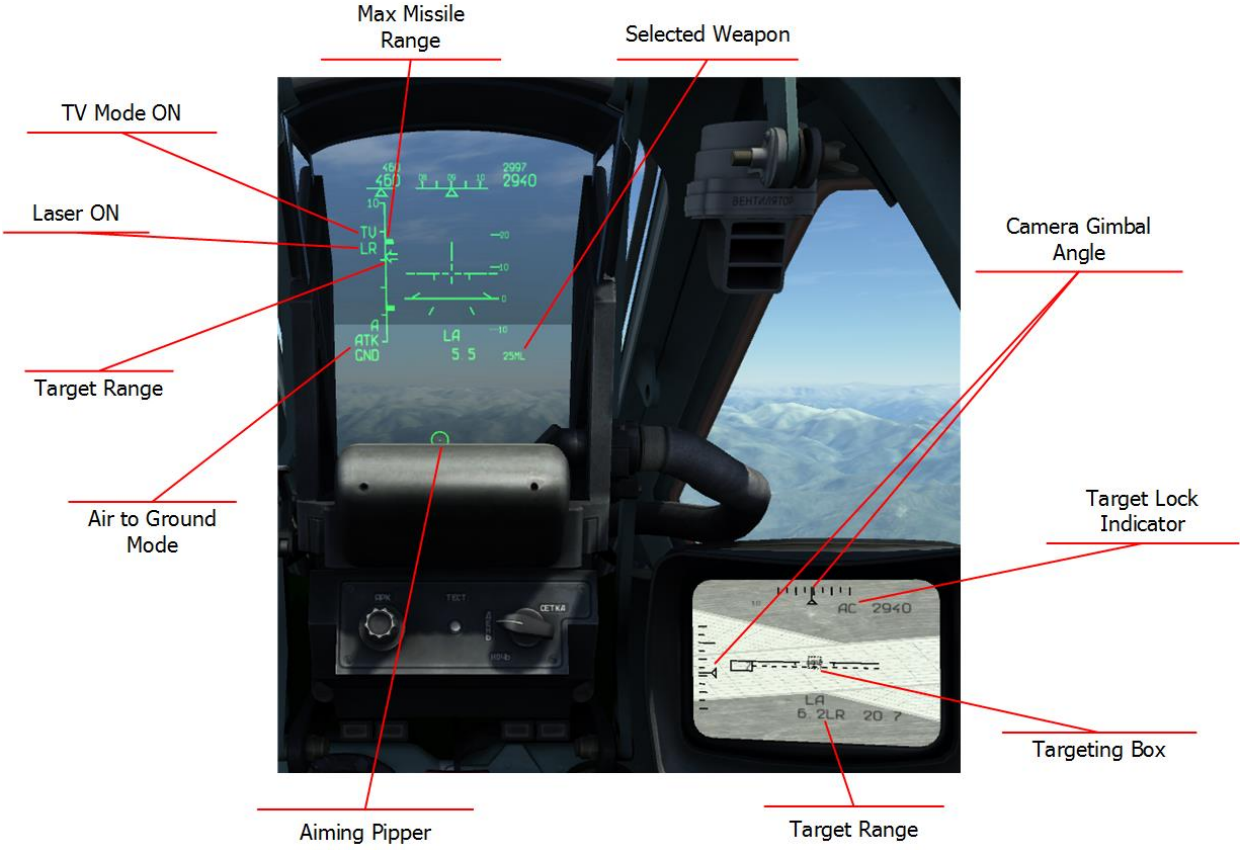
barrels will be automatically adjusted to shoot at the spot market by laser. Remember that gun pods barrels can only move vertically. **TV Aided** Shkval TV and Merkury IR targeting systems can also be used to designate targets. Use the monitor to find and lock the target. Fly straight as indicated by Director Circle (put aircraft tail in the center of the circle). Turn on Laser Rangefinder. The scale on the left side of the HUD will show distance to the target. Press Weapon Release button when Launch Authorization appear. Turn the Laser off to let it cool down.		

Air to Ground – TV Guided



Step	Default HotKey	My HotKey
Electro-Optical System ON / OFF Night Vision (FLIR or LLTV) pod ON / OFF	O R_CTRL + O	
The pipper on the HUD corresponds where camera is aimed. Move target designator over the target. Stabilize the camera with 'Target Lock' button. Adjust target designator according to target size. It will automatically lock to target (snap on) just before the aircraft is in weapon range. Wait for LA to fire the weapon. TV guided munition is of fire and forget type, the aircraft doesn't have to keep the target locked after the weapon is released.		

Air to Ground – Laser Guided Missiles

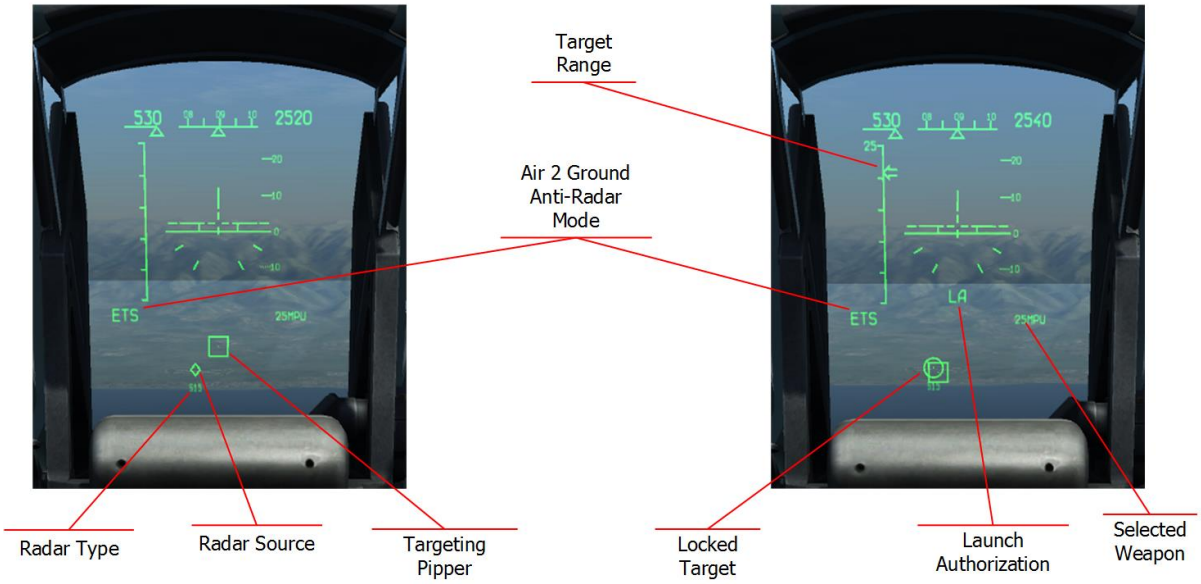


Vikhr Missile HUD:

Step	Default HotKey	My HotKey
Turn on the laser designator, move aiming pipper over the target and lock it, shoot when launch authorization appears (aircraft is in weapon's range). **TV Aided** Shkval TV and Merkury IR targeting systems are used to locate and designate targets. Use the monitor to find and lock the target. Turn		

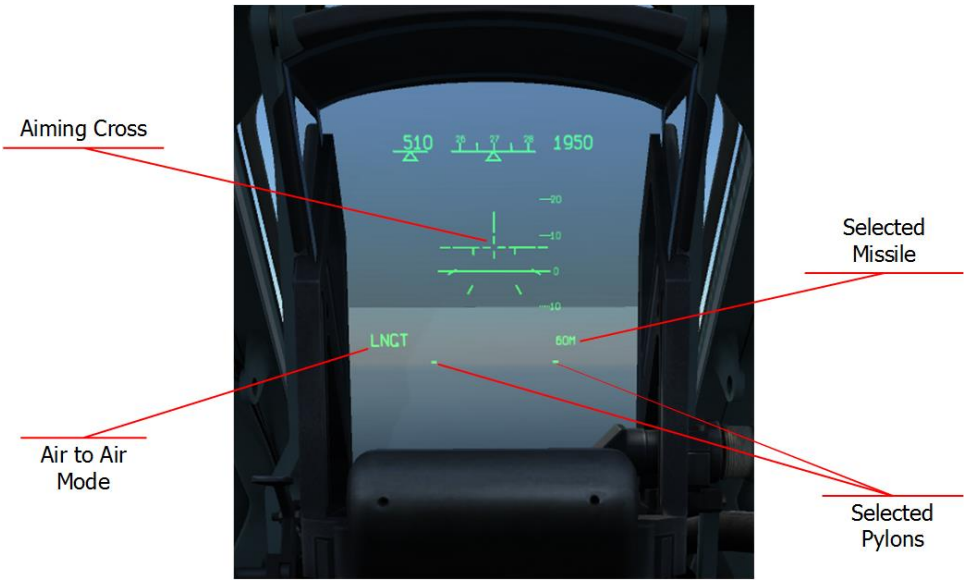
on Laser Rangefinder. The scale on the left side of the HUD will show missile range and distance to the target. Fire when Launch Authorization appear. The target has to be marked by the laser for the whole duration of missile flight, during which the camera must be kept within its gimbal limits. It is possible to adjust the aim after missile launch. Turn the laser off to let it cool down. **Vikhr Missile** Vikhr is a laser beam riding missile and as such requires stricter launch parameters. To launch the missile, the aiming pipper must be located inside guide circle. The laser doesn't have to be manually enabled.		

Air to Ground – Anti Radar Missiles



Step	Default HotKey	My HotKey
Elint Pod On /Off	I	
Turn on the **ELINT pod**. Discovered radar emitters will be shown on HUD. Move the target designator to selected target and lock it. LA will appear when the target is in missile range. Radar homing missiles are fire and forget weapons, the aircraft doesn't have to keep the target locked after they are fired.		

Air to Air

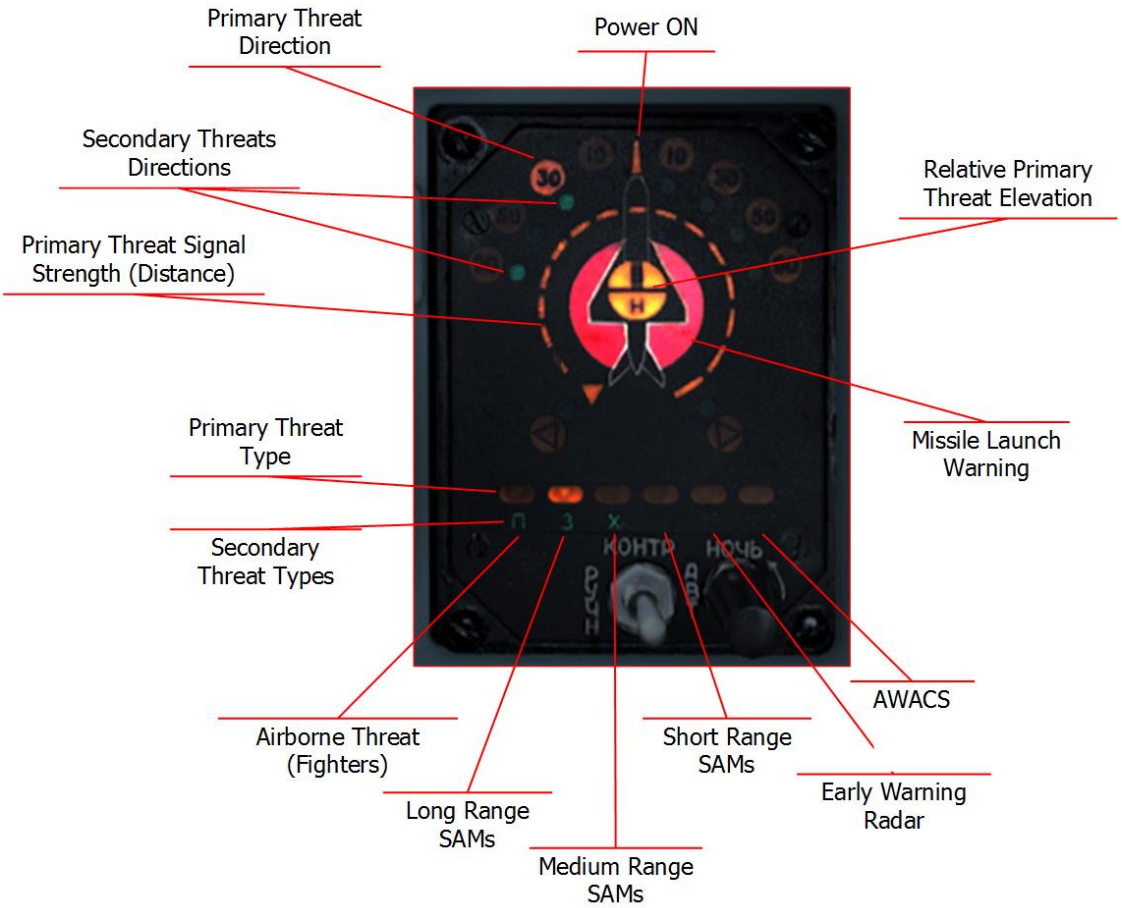


Step	Default HotKey	My HotKey
Longitudinal Missile Aiming Mode Air to Air Mode Select Weapon Launch / Fire Selected Weapon When using A2A missiles the target has to be positioned in the middle of the aiming cross. When the missile acquire lock there is steady sound and 'LA' (launch authorization) displayed on HUD. There is no distance to target measurement, the pilot has to check visually if the target is in missile range.	6 D Space	
Canon Increase target wingspan (in gun mode) Increase target wingspan (in gun mode) When using a canon against air target the pilot must configure the wingspan of the target (in meters) for the gun funnel to be correct.	C R_ALT +] R_ALT + [	

Countermeasures

Step	Default HotKey	My HotKey
IR Jamming	L_SHIFT + E	
ECM	E	
ECM jammer pods MPS-410 Warmup period is 15 sec during which the ECM symbol on the HUD is flashing. You need both pods in order for the jammer to work.		
Countermeasures Chaff Dispense	Insert	
Countermeasures Flares Dispense	Delete	
RWR/SPO Mode Select	R_SHIFT + R	
RWR/SPO Sound Signals Volume Up	R_ALT + .	
RWR/SPO Sound Signals Volume Down	R_ALT + ,	

RWR Panel



Damage Control

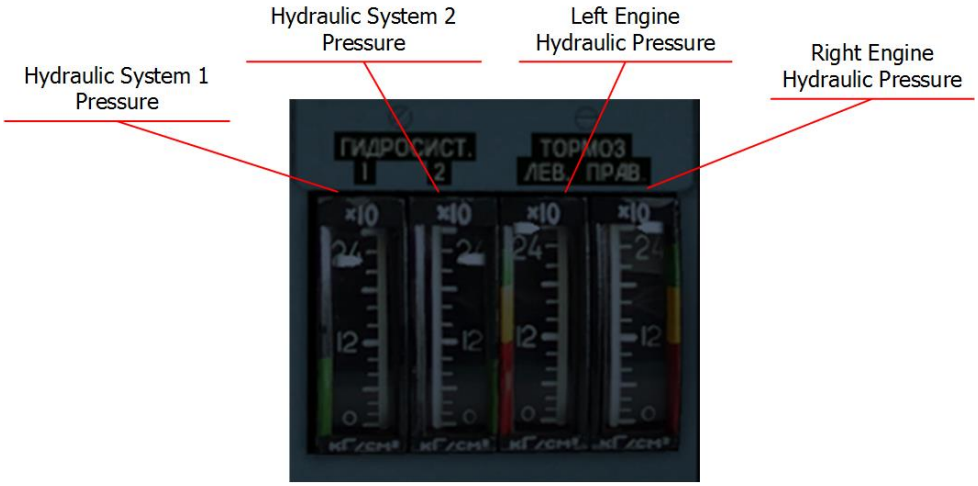
If you are hit:

Check engines temperature, if the engine is on fire the temperature will be in red zone. Shut it down or the fuel tank will explode.

Check for fuel leaks, the fuel amount as indicated by fuel panel will go down drastically.

Check hydraulic systems pressure, if hydraulics are damaged, the systems depending on it will not work when the pressure drops below 50%. In case of a leak it is essential to lower the landing gear and close the airbrakes before the hydraulics stop working. Flaps can be also lowered, although they are not essential.

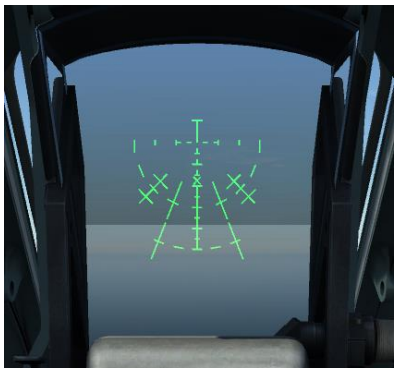
Hydraulics Panel



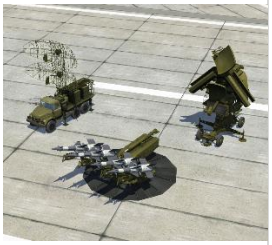
Hydraulic System 1 controls the nose wheel steering, the initial chambers of the aileron boosters, the airbrakes, the slats, the flaps and the elevators.
Hydraulic System 2 controls the undercarriage extension and retraction, main wheel braking, the yaw damper, and the second chambers of the aileron boosters.

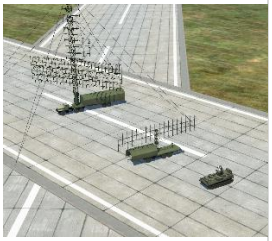
Emergency HUD

Step	Default HotKey	My HotKey
Gunsight Reticle Switch Can be used in case of main targeting system damage.	8	



Radar Threats

	M163 Vulcan ELINT: none Range: 2.5 km Altitude: 1.5 km		**ZSU-23-4 Shilka** ELINT: none Range: 2.5 km Altitude:2 km
	Gepard ELINT: none Range: 4 km Altitude: 2.5 km		**9A33 Osa** **(SA-8 Gecko)** ELINT: **SA8** Range: 10 km Altitude: 6.5 km
	Roland ADS ELINT: **R** Range: 8 km Altitude: 5.5 km		**2S6 Tunguska** **(SA-19 Grison)** ELINT: **S19** Min range: 1.5 km Max range: 8 km Max altitude: 3.5 km
	Roland EWR ELINT: **G** (Early warning radar)		**9A331 Tor** **(SA-15 Gauntlet)** ELINT: **S15** Min range: 1.5 km Max range: 12 km Max altitude: 6 km
	Hawk ELINT: **H46** (Targeting radar) **H50** (Search radar) Min range: 2 km Max range: 45 km Max altitude: 13.7 km		**S-125 Neva** **(SA-3 Goa)** Elint: **FLF** (Search radar) **SA3** (Targeting radar) Min range: 2.5 km Max range: 18 km Max altitude: 14 km
	Patriot ELINT: **P** Min range: 3 km Max range: 100 km Max altitude: 24 km		**2K12 Kub** **(SA-6 Gainful)** Elint: **SA6** Min range: 4 km Max range: 25 km Max altitude: 8 km

			9K37 Buk **(SA-11 Gadfly)** Elint: **S11** Range: 35 km Max altitude: 25 km
			S-300PS **(SA-10 Grumble)** Elint: **CS** (Search radar) **BB** (Search radar) **FL** (Targeting radar) Min range: 4 km Max range: 60 km Max altitude: 27 km
			**9S80M1 Sborka** **EWR 1L13** **EWR 55G6** Early Warning Radars ELINT: none

IR / Optical Threats:

	Stinger (Manpad) Range: 4.5 km Altitude: 3.8 km		ZU-23 Range: 2.5 km Altitude: 2 km
	M1097 Avenger PMS Stinger missile: Range: 4.5 km Altitude: 3.8 km		9k38 Igla (Manpad) Range: 4.5 km Altitude: 3 km
	M6 Linebacker Stinger missile: Range: 4.5 km Altitude: 3.8 km		Strela-1 Range: 4.2 km Altitude: 3.5 km
	M48 Chaparral Range: 8.5 km Altitude: 3 km		9A35M3 Strela-10M3 (SA-13 Gopher) Range: 5 km Altitude: 3 km

Weapons Loadout Table

1	2	3	4	5	6	7	8	9	10	11		
Bombs												
											FAB 100/250/500	General purpose free-fall bombs (45kg, 120kg, 240kg warheads)
											BetAB-500	Concrete piercing, runways, bunkers (free-fall penetration bomb, 76kg warhead)
											BetAB-500ShP	Concrete piercing, runways, bunkers (penetration bomb with parachute / rocket system, 77kg warhead)
	96	96	96	96		96	96	96	96		KMGU-2-96 AO-2.5RT	All-purpose cluster bomb (96x2.5kg HE bomblets)
	96	96	96	96		96	96	96	96		KMGU-2-96 PTAB-2.5KO	Anti-tank / personnel cluster bomb (96x2.5kg armour piercing bomblets)
											RBK-250 PTAB-2.5M	Anti-personnel / anti-materiel cluster bomb (30x2.5kg bomblets)
											RBK-500 PTAB-10-5	Anti-personnel / anti-materiel cluster bomb (30x10kg bomblets)
											RBK-500U PTAB-1M	Anti-personnel / anti-materiel cluster bomb (352x1kg bomblets)
Rockets												
	32	32	32	32		32	32	32	32		UB-32A-32 S-5 KO	All-purpose (32x1kg HE warhead, 3km range)
	20	20	20	20		20	20	20	20		B-8M1-20 S-8 KOM	Light armoured targets (20x3.6kg warhead, 4km range)
	20	20	20	20		20	20	20	20		B-8M1-20 S-8 OFP2	Light armoured targets (20x9.2kg warhead, 4km range)
	5	5	5	5		5	5	5	5		B-13L-5 S-13 OF	Light armoured targets (5x33kg warheads, 2.5km range)
											S-24 B	Soft targets (1x123kg fragmentation warhead, 2km range)
											S-25 OFM	Armoured / concrete targets (1x190kg warhead, 3km range)
TV guided												
											KAB-500Kr Bomb	Armoured / concrete targets (195kg warhead, **16km range**)
											Kh-29T Missile	Armoured / concrete targets (317kg warhead, **12km range**, Mach 2.5)
Laser guided missiles												
											Kh-29L	Armoured / concrete targets (317kg warhead, **10km range**, Mach 2.5)
											Kh-25ML	Armoured / concrete targets (90kg warhead, **15km range**, Mach 0.72)

											S-25L	Armoured / concrete targets (190kg warhead, 3km range, Mach 2)
											APU-8-8 9A4172 Vikhr	Armoured targets, tanks (12kg warhead, **10km range**, Mach 1.8)
Anti radar												
											Kh-25MPU	SAM radars (90kg warhead, **25km range**, Mach 0.76)
											Kh-58U	SAM radars (150kg warhead, **70km range**, Mach 4)
Air 2 Air												
											R-60M	Short range infrared A2A missile
											R-73	Medium range infrared A2A missile
Other												
											SPPU-22-2	23mm Gunpod, max 3km range (effective at < 800m), 260 rounds
											SAB-100	Illumination (parachute bomb, 2 minutes)
											B-8M1-20 S-8 TsM	Smoke marker (unguided rocket, 3km range)
											L-081 Fantasmagoria	ELINT pod (Radar Target Acquisition System)
											Merkury LLTV	IR / Low Light Level Targeting pod
											MPS-410	ECM pod
											Fuel tank	800L wing fuel tank
											Smoke generator	Look like R-73 missile, various colours, activated with 'T'

Airport IDs

ID	Airport	ATC Frequency
1	Anapa	121.0
2	Krasnodar Center	122.0
3	Novorossiysk	123.0
4	Krymsk	124.0
5	Maykop – Khanskaya	125.0
6	Gelendzhik	126.0
7	Sochi – Adler	127.0
8	Krasnodar – Pashkovsky	128.0
9	Sukhumi – Babushara	129.0
10	Gudauta	130.0
11	Batumi	131.0
12	Senaki – Kolkhi	132.0
13	Kobuleti	133.0
14	Kutaisi – Kopitnari	134.0
15	Mineralnye Vody	135.0
16	Nalchik	136.0
17	Mozdok	137.0
18	Tbilisi – Lochini	138.0
19	Tbilisi – Soganlug	139.0
20	Vaziani	140.0
21	Beslan	141.0