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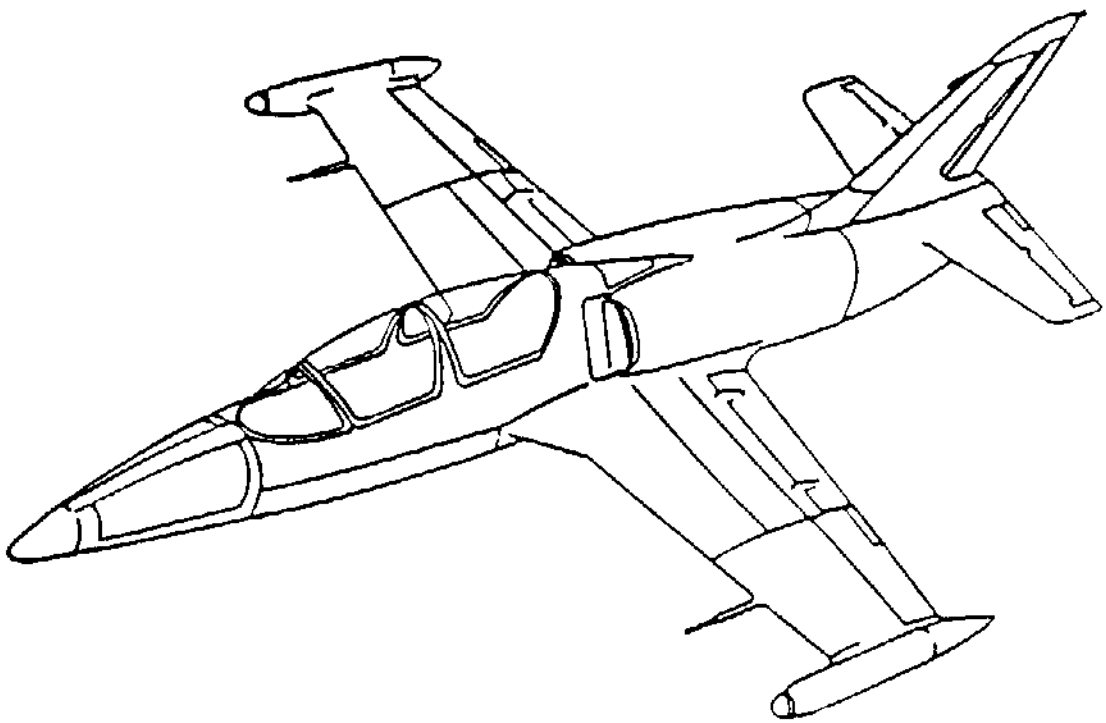
L-39C ALBATROSS



AIRCRAFT DATA SHEET

FLYING JETS IS A SERIOUS BUSINESS

AND WE ARE SERIOUS ABOUT OUR BUSINESS

CONTACT: *WAYNE WHISENANT*
SALES MANAGER

L-39 C ALBATROSS

GENERAL INFORMATION & PERFORMANCE DATA

WEIGHTS AND LOADING

EMPTY WEIGHT	7617 LB
NORMAL TO WT.	9976 LB
MAX WT.	10,362 LB

DIMENSIONS

SPAN	31 FT ½ IN
LENGTH	39 FT 9 ½ IN
HEIGHT	15 FT 7 ¾ IN

PERFORMANCE

TAKE OFF DISTANCE	1740 FT*
MAX SPEED SEA LEVEL	380 KTS
INITIAL RATE OF CLIMB	4500 FPM
TIME TO 16,500 FT	5 MIN
NORMAL CRUISE	310 KTS
MAX SPEED LEVEL FLT:	
(@ 16,500 FT)	409 KTS
SERVICE CEILING	36,100 FT
FUEL CAP	332 US GAL
ENDURANCE	2 HR 18 MIN

LANDING DISTANCE	2135 FT*
STALL SPEED (CLEAN)	105 KTS
STALL SPEED (GEAR DOWN):	
FLAPS EXT 25deg	95 KTS
FLAPS EXT 44deg	89 KTS
FINAL APPROACH	120 KTS
TOUCHDOWN SPEED	100KTS
G LOADING	+8 -4
RANGE	600 NM

* Average Day - 59 deg. F. at Sea Level

FUEL BURN

Altitude of 3,500 ft. at 230 Knots ..... 145 gals/hr.
Altitude of 16,500 ft. at 260 Knots ..... 117 gals/hr.
Altitude of 26,500 ft. at 290 Knots ..... 107 gals/hr.

Maximum range for the L-39C is approximately 600 NM or about 2.3 hours endurance. The following scenario is offered as an example and indicates an average fuel burn yield of about 123 gallons per hour.

Engine start up, taxi to runway, take-off, climb to 26,000 ft.
Cruise at 290 KIAS, descend at destination, perform one circuit of the airport to enter pattern, exercise one missed approach and go around to re-enter the pattern, land and taxi to ramp.
After shut down there should be approximately 50 gallons of usable fuel remaining if the flight is accomplished by the book.
Averting the missed approach will, of course, increase the amount of fuel remaining after the flight is culminated.

L-39 ALBATROSS
AIRCRAFT BACKGROUN & OVERVIEW

The L-39 basic and advanced trainer was developed by Aero Vodochody Aircraft factory of Czechoslovakia. The first flight made on November 4, 1968.

A pre-production batch of ten aircraft joined the flight test program in 1971, and series production started in late 1972, following official selection of the L-39 to succeed the L-29 Deflin as the standard jet trainer for the air forces of the Soviet Union, Czechoslovakia and the German Democratic Republic.

By May 1977, when the L-39 made it's first appearance in the west, at the Paris airshow, some 400 - 500 were in service with several air forces.

The Albatros is used in the former Czechoslovakia for all pilot training, including that of helicopter pilots. On average, students solo after 14 hours of dual instruction.

The L-39 basic version, for basic and advanced flight training. Two underwing stations only. In service with the air forces of Afghanistan, Cuba, Czechoslovakia, Germany (Democratic Republic) and USSR.

TYPE: Tandem two-seat basic and advanced fan jet trainer.

WINGS: Cantilever low wing monoplane, with 2 degrees 30 minutes dihedral from roots. Wing section NACA 64A012 mod. 5. Incidence 2 degrees. Sweptback 6 degrees 26 minutes on leading edges, 1 degree 45 minutes at quarter chord. One piece all-metal double slotted trailing edge flaps, operated by push/pull rods actuated by a single hydraulic jack. Flaps retract automatically when airspeed reaches 167 knots (193 mph). Stall fence above and below trailing edge between flaps and aileron. Mass balanced ailerons, each with electrically operated servo tab; port tap used also for trim, is operated by electromechanical actuator. Flaps deflect 25 degrees for take-off, 44 degrees for landing; ailerons deflect 16 degrees up or down; air brakes deflect 55 degrees downward. Non-jettisonable wing tip fuel tanks, incorporating landing/taxi lights.

FUSELAGE: Metal semi-monocoque structure, built in two portions. Front portion consists of three sections, the first of which is a laminated fiberglass nose cone housing avionics, antenna, battery, compressed air and oxygen bottles and the nose landing gear. Nest, comes the pressurized compartments for the crew. The third section incorporates the fuel tanks, air intakes and engine bay. The rear fuselage, carrying the tail unit, is attached by five bolts which can be removed quickly to provide access for engine installation and removal. The two air brakes, side by side under fuselage, just forward of the wing leading edge, actuated by single hydraulic jack; these are lowered automatically as airspeed nears a maximum of mach 0.80.

TAIL UNIT: Conventional all metal cantilever structure, with sweepback on vertical surfaces. Variable incidence tailplane. Control surfaces actuated by pushrods. Electrically operated trim tab in each elevator; servo tab in rudder. Elevators deflect 30 degrees to the right and left.

LANDING GEAR: Retractable tricycle type, with single wheel and oleo pneumatic shock absorber on each unit. Gear is designed for touchdown sink rate of 11.15 ft/sec at auw of 10,141 lb. Retraction/extension is operated hydraulically, with electrical actuation. All wheel well doors close automatically after wheels are lowered to prevent ingress of dirt and debris. Main wheels retract inward into wings(with automatic braking during retraction) , nose wheel forward into fuselage. K-24 main wheels, fitted with Barum tubeless tire size 610 x 215 mm, pressure 85.34 psi. K-25 castoring and self centering nose wheel, fitted with Barum tubeless tie size 450 x 165 mm pressure 56.89 psi. Hydraulic disc brakes and anti-skid units on main wheels; shimmy dampner on nose wheel leg. The L-39 is capable of operating from grass strip (with a bearing strength of 85 psi.) at up to 10,141 lbs take off weight or from unprepared runways. Landing gear of l-39 ZA reinforced to withstand higher operating weights.

POWER PLANT: One 3792 lb Ivchenko AI-25 TL turbofan engine mounted in rear fuselage, with semicircular lateral air intake, fitted with splitter plate on each side of fuselage above wing center section. Fuel in five rubber main tanks aft of cockpit, with combined capacity of 279 gallons, and two 26.5 gallon non-jettisonable tip tanks. Total internal fuel capacity 332 gallons. Gravity refueling points on top of fuselage and on each tip tank. Provisions for two 88 gallon drop tanks on inboard underwing pylons increase total fuel capacity to a maximum of 498 gallons. Fuel system permits up to 20 seconds of inverted flight.

ACCOMODATION: Crew of two in tandem, on Czech VS-1-BRI rocket assisted ejection seats, operable at 0 height and at speeds down to 81 kts , beneath individual transparent canopies which hinge sideways to starboard and are jettisonable. Rear seat elevated. One-piece windscreen hinges forward to provide access to front instrument panel. Internal transparency between front and rear cockpits. Dual controls are standard.

SYSTEMS: Cabin pressurized (standard pressure differential 3.29 psi, max overpressure 4.20 psi) and air conditioned, using engine bleed air and cooling unit. Air conditioning system provides automatic temperature control from 10 degrees to 25 degrees C at ambient air temperatures from -55 degrees C to +45 degrees C. Main and standby interconnected hydraulic systems, the main having a variable flow pump with an operating pressure of 2133 psi for actuation of landing gear, flaps, airbrakes, ram air turbine and at 500 psi, wheel brakes. Emergency system, for all of above except airbrakes, incorporates three accumulators. Pneumatic canopy seals supplied by a 2 liter compressed air bottle in nose 2133 psi.

Electrical system (27V DC) is powered by a 7.5 kVA engine driven generator. If primary generator fails, a V 910 ram air turbine is extended automatically into the airsteam and

generates up to 3 kVA of emergency power for essential services. 12V 28Ah SAM 28 lead acid battery for standby power and for APU starting. Two 800 VA static inverters (the first for radio equipment , ice warning lights, engine vibration measurement and air conditioning, the second for nav and landing systems, IFF and air- to -air missiles) provide 115 V single phase AC power at 400Hz. A second circuit incorporated a 500VA rotary inverter and 40VA static inverter to provide 36V three phase AC power, also at 400Hz.

APU: Saphir-5 APU and SV-25 turbine for engine starting. Air intakes and windscreen anti-iced by engine bleed air; normally, anti-icing is sensor activated automatically, but a manual standby system is also provided. Six bottle oxygen system for crew, pressure 2133 psi.

INSTRUMENTATION: Instrumentation of the L-39 aircraft enables flights by day and night as well as difficult weather conditions. The range of instruments in front and rear cockpits are practically the same. Instruments are grouped on instrument panel, center panel and two side consoles.

ESCAPE SYSEM: The escape system is fully automatic and enables reliable ejection of pilots from heights 0 - 50 meters at aircraft speeds of 80 - 250 kts and from heights of 50 m up to the ceiling at a max speed of 400 kts.
Ejection is effected after canopy jettisoning. Only in emergency when it is not possible to drop canopy is it allowed to go through glass which is fractured by seat headrest.
The simultaneous ejection of pilots is prevented by blocking system.

EJECTION SEAT: The VS-1 ejection seat is a fully automatic, cartridge operated, rocket assisted seat. The initial power for seat ejection is provided by ejection gun the further one by rocket engine, which is adjustable to compensate for differences in the weight of pilots. The parachute system consists of main parachute located in seat back pad and of stabilizer parachute placed in pilots headrest. The separation of the pilot from the seat and deployment of the main parachute is deployed automatically by means of barostatic units. The integral harness system is used. A shoulder harness system allows pilots forward movement. The correct pre-ejection posture is secured by retraction of shoulder harness by means of pyromechanism and by automatic fastening of pilots leg. The height of the seat pan from the aircraft floor can be adjusted in range of 180 mm. The ejection including the canopy jettisoning is controlled by double firing handle. The ejection seat is equipped with it's own oxygen system. The survival pack, with contents according to customers request, is located in the seat pan.

The VS-1 ejection seat is designed to accommodate pilots wearing helmets of sizes from height 162 cm to height 184 cm—the sitting height from 80 cm to 98 cm.

LIGHTING SYSTEM: The exterior lighting system consists of nav lights, landing and taxi lights. Nav lights are located on each wing tip and on the fin. Flashing and

brightness control of the nav lights is provided by means of a flasher unit. Taxi and landing lights are installed in both wingtip tanks.
The illumination of cockpits is provided by lights distributed on the instrument panels and above all consoles. In both cockpits it is possible to choose either red or white light and adjust the required brightness.

BOARD LIGHT SIGNAL SYSTEM: The signal system consists of individual lights which are in accordance with their function arranged in warning panels and enables the pilots to monitor the conditions of aircraft systems. Warning lights for failures requiring urgent action from the pilot are of red color. These ones which signalize some most critical conditions have intermittent lights. Warning lights for other failures are yellow, green are white color.
Eight most important failures indicated by warning light illuminate a Master warning light. The system is equipped with control of light intensity.

POWER PLANT

The aircraft is powered with a turbofan mounted in the fuselage compartment behind the fuel tanks. The engine mounting consists of 2 + 2 suspensions located on each side of the engine and attached to the front fuselage structure. The front suspensions are fixed, the rear ones enable the length dilatation of the engine. The engine is slipped onto the fuselage in forward direction using the "U" profiles fitted on both sides of the inner fuselage space. For engine mounting and dismantling it is necessary to detach the fuselage rear part. The good access for engine and accessories servicing is secured by doors in fuselage.

The AI-25 TL is a twin spool, by pass turbojet with a by-pass ratio of 2.0. The low pressure compressor has three stages, the high pressure compressor has nine stages. The total compressor pressure ratio is 9,5.
The combustion chamber is circular in section and has 12 single channel nozzles. The axial turbine has two shafts, three stages. The first stage rotates the high pressure compressor and the second and third stage rotates the low pressure compressor. The main parameters of the engine (H=0, v =0, ISA) are shown in the following table.

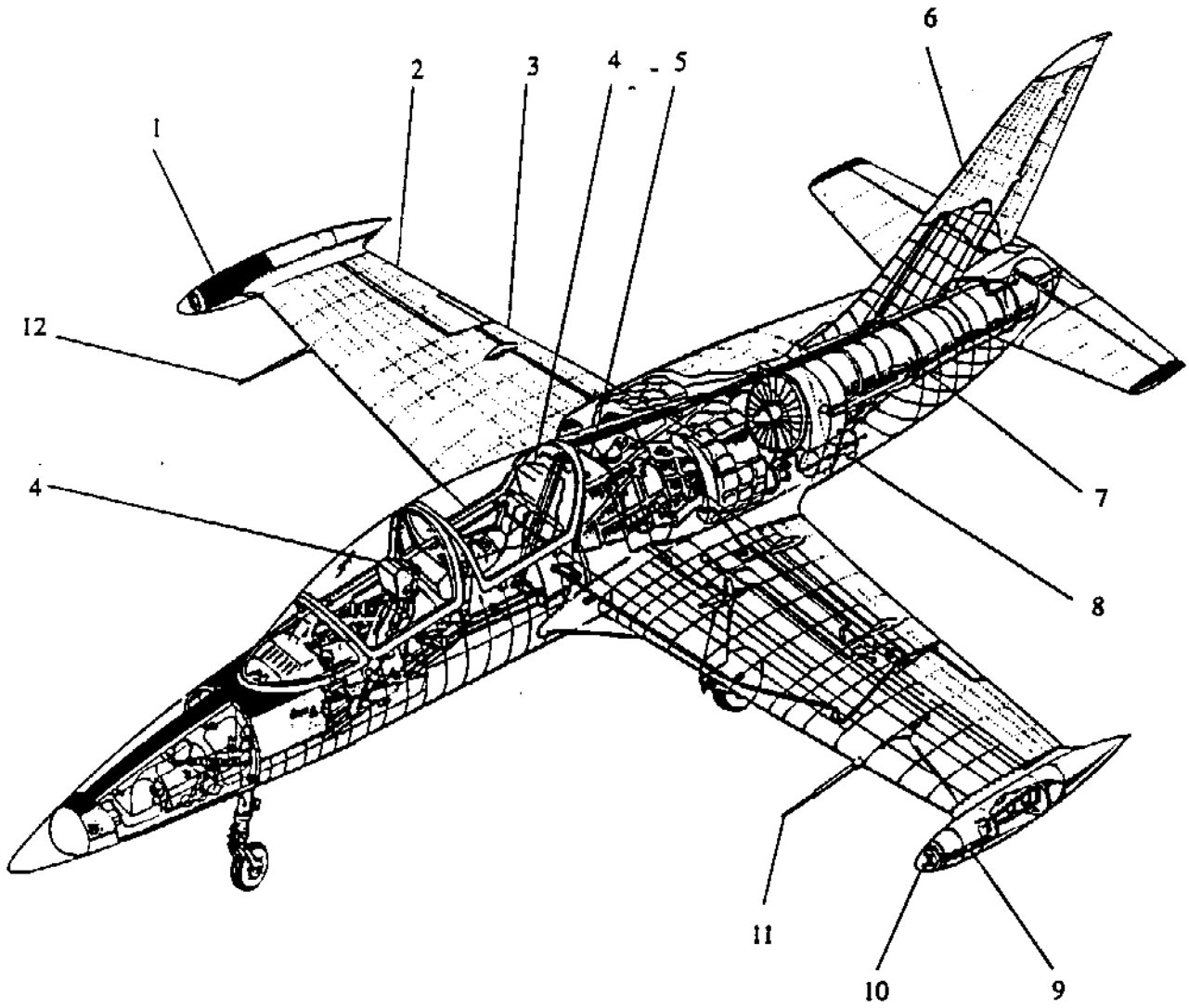
S.L. static rating	R.P.M. of H.P.C.	kN	Thrust kp	S.F.C.(kg/kp/h)	Max Time
Max Take-off	17626	16,87	1720	0,600	20 min
Nominal	17032	14,71	1500	0,585	unlimited
0,85	16438	12,5	1275	0,580	"
Idle	8995	1,3	135		"

CONTROL SYSTEM: The aircraft is equipped with conventional flight control surfaces controlled by push/pull rods and operated manually. The movement of the ailerons and elevator is controlled by two control sticks located one in each cockpit. For decreasing the stick force, the longitudinal control is provided with a spring.

The aileron trim system consists of two tabs, trim switch mounted on each control stick, electro-mechanical actuator and indication of the trim neutral position. The control stick is equipped with a grip incorporating lever controlling the main wheel brakes, trim switch for longitudinal and lateral trimming.

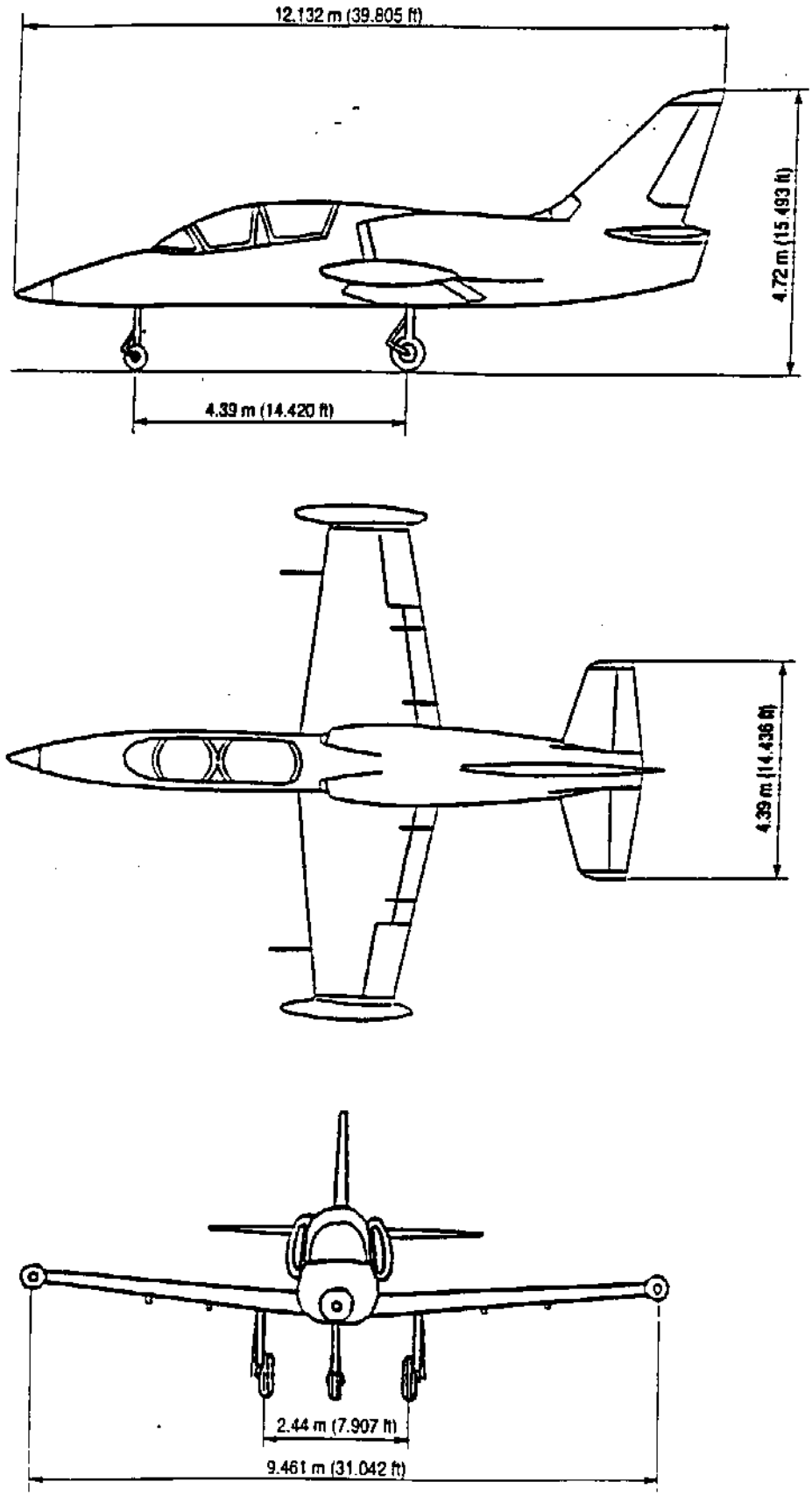
The movement of the rudder is controlled by two sets of pedals which are also used for differential braking. The rudder pedals are adjustable for pilots of various sizes. The rudder is provided with servo tab.

The wing flaps are operated by hydraulic system or emergency hydraulic system and controlled by a control box with three push buttons (0^ , 5^ , 44^) located on the left hand console in both cockpits. The speed brakes are operated hydraulically and controlled by a selector located on both engine throttle levers.

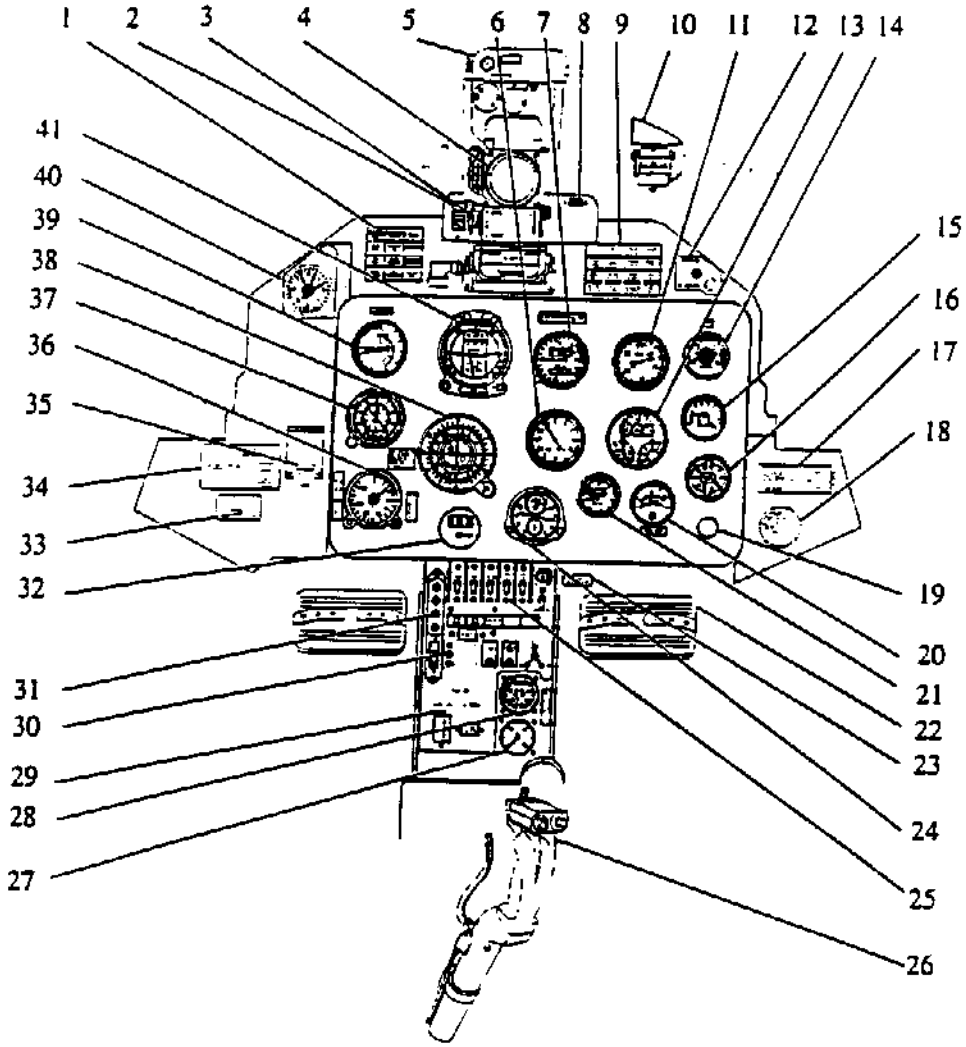


1. Wing–tip Tank
2. Aileron
3. Flap
4. Ejection Seat
5. Fuselage Fuel Tanks
6. Tail Unit
7. Engine
8. APU
9. Navigation Light
10. Landing/Taxi Light
11. Stand–by Pitot Tube
12. Main Pitot Tube

General Arrangement

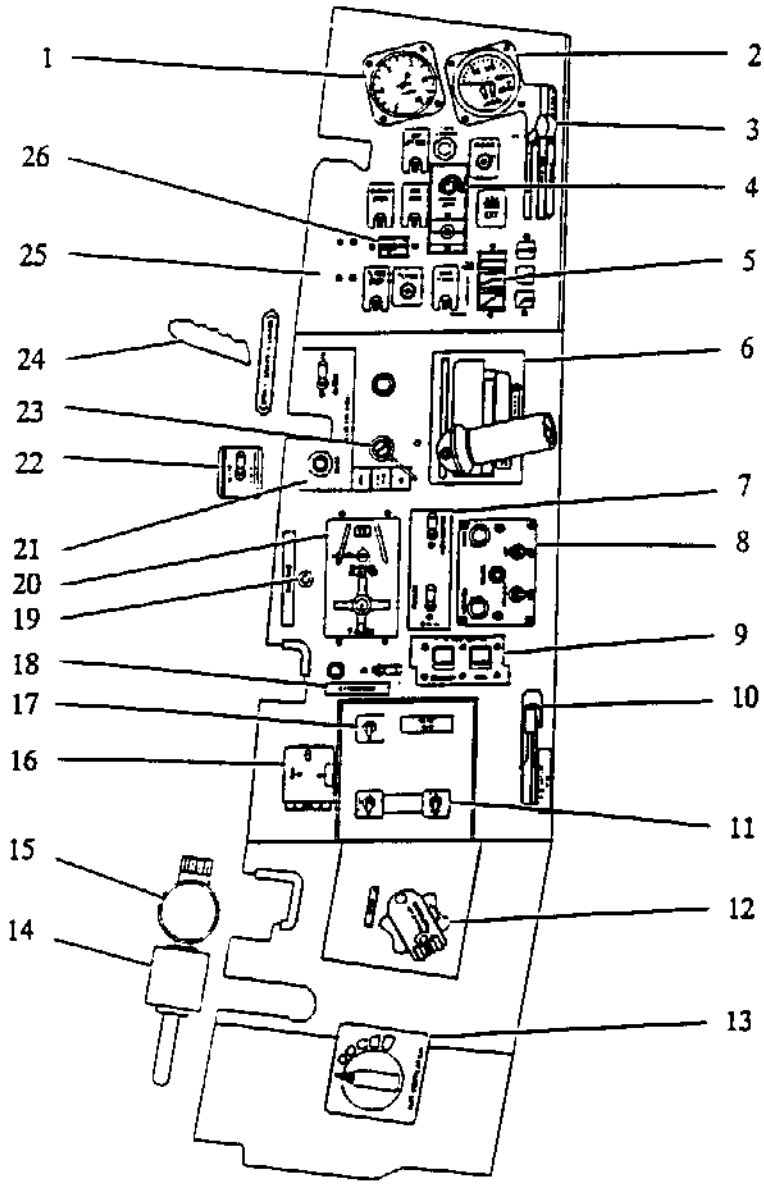


Aircraft Dimensions



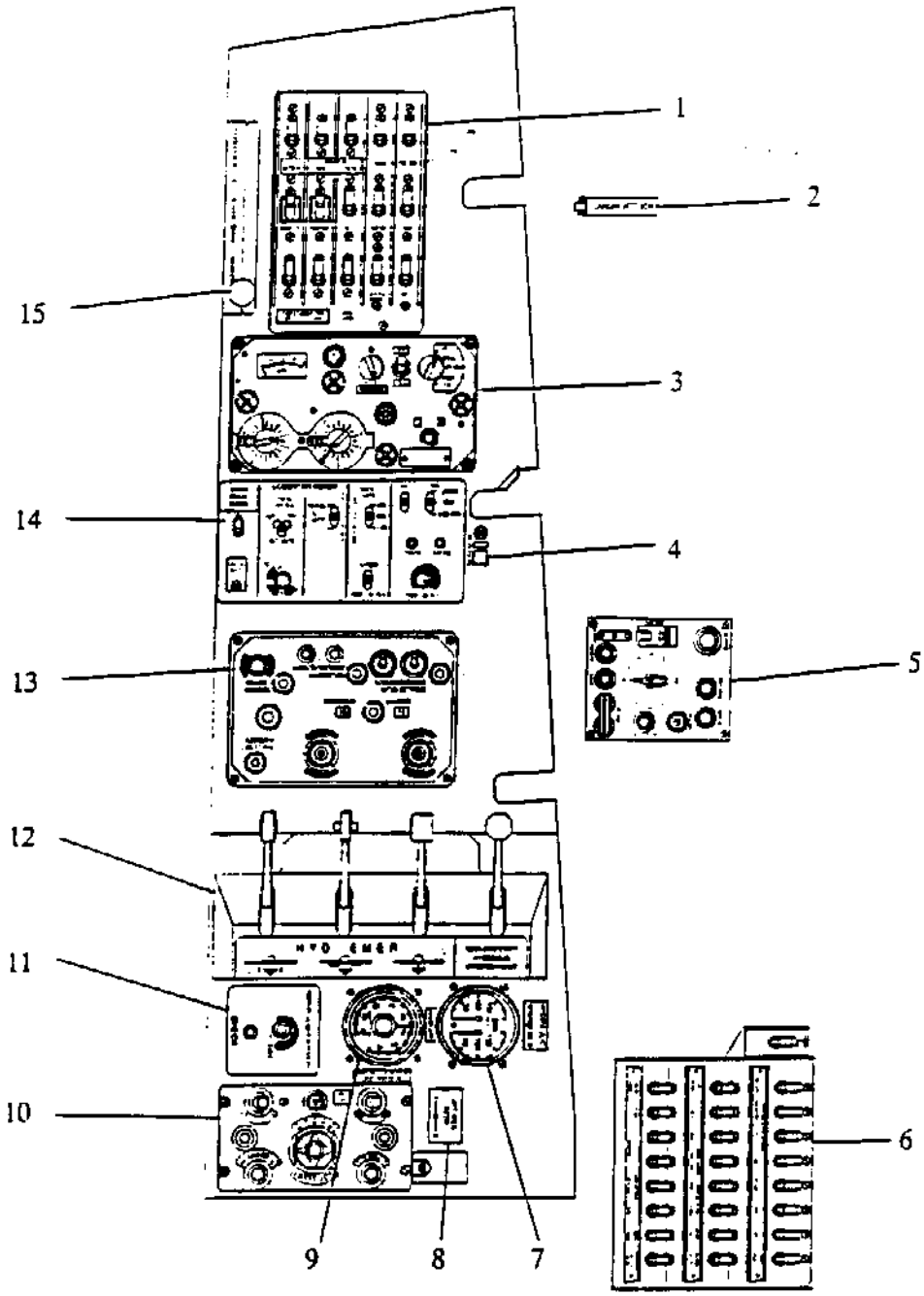
1. Warning Lights Panel
2. Upper Armament Indication Panel
3. Instrument Panel Emergency Lights Switch
4. Gyroscopic Sight
5. Gun Camera
6. ADF. Automatic Direction Finder
7. Vertical Velocity/Turn & Slip Indicator
8. Master Caution Panel
9. Caution & Advisory Lights Panel
10. Stand-by Compass
11. RPM Indicator
12. Directional Gyro Front Control Panel
13. Triple Engine Indicator
14. EGT Indicator
15. Fuel Quantity/Flow Indicator
16. Voltammeter
17. Diffuser and Flight Suit Temperature Control Panel
18. Diffuser (Air Shower)
19. Engine Vibration Ground Test Socket
20. Engine Vibration Indicator
21. Cabin Pressure Indicator
22. Rudder Pedal
23. Pedal Adjustment Controller
24. Clock
25. Armament Panel
26. Control Stick
27. Emergency Brake Pressure Indicator
28. LH/RH Wheel Brake Pressure Indicator
29. Pitch and Roll Trim Indicator Panel
30. Fire Detector Test Switch
31. Signal Flares Control Panel
32. RSBN Range Indicator
33. Short-Long Distance Beacon Switch
34. L/G Position Indication Panel
35. L/G Control Lever
36. Height Indicator
37. Altitude Indicator
38. RMI. Radio Magnetic Indicator
39. Airspeed/Mach Indicator
40. Accelerometer
41. ADI. Attitude Director Indicator

Forward Cockpit Layout



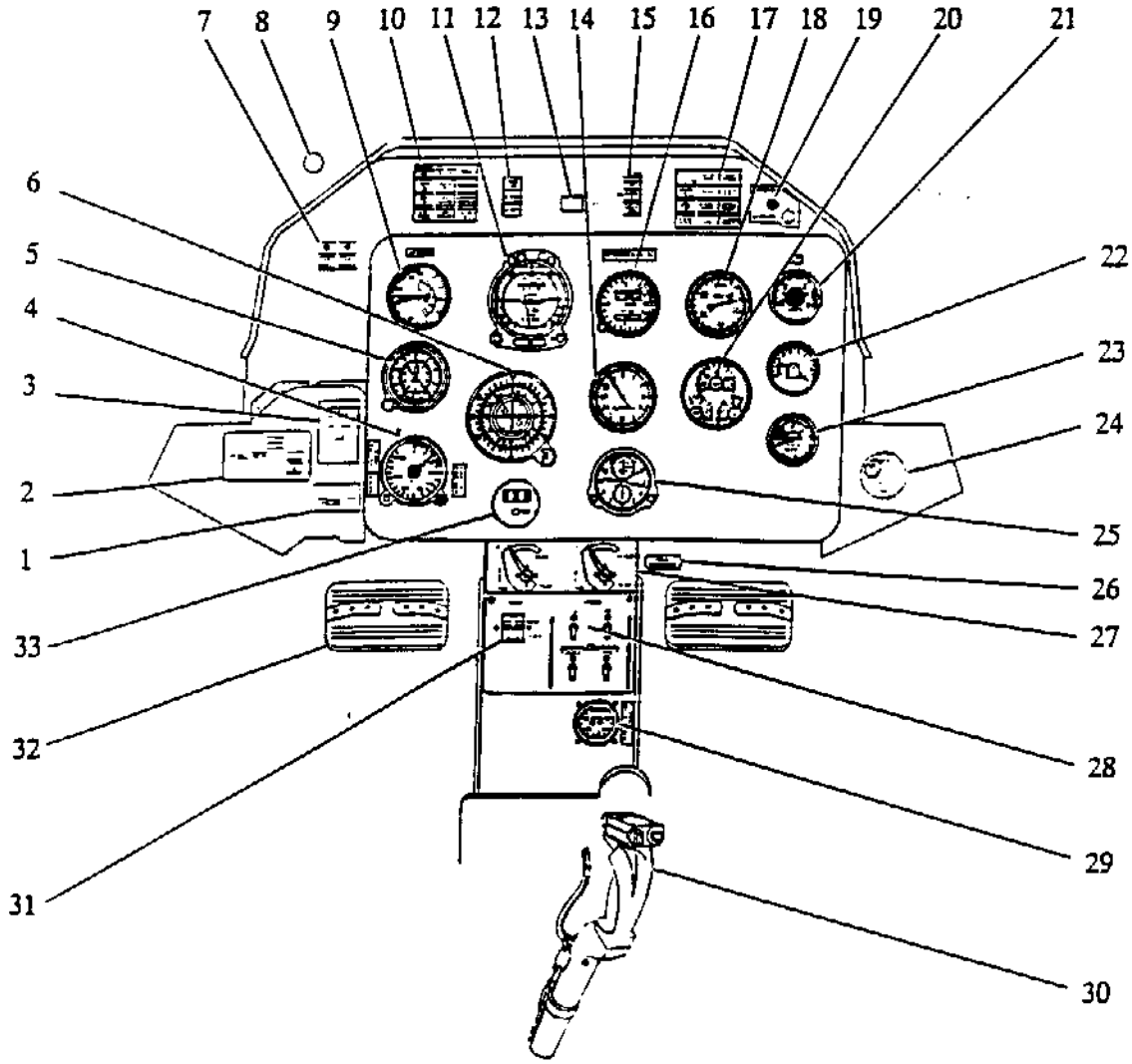
1. Helmet Oxygen Pressure Indicator
2. Oxygen Pressure Indicator and Flow Annunciator
3. Emergency/Parking Brake Control Handle
4. Instrument Lights Control Panel
5. Flaps Control and Indicator Panel
6. Throttle Quadrant
7. Audio panel
8. ICS Control Box
9. Pitot Tube Heating Buttons
10. Fuel Shut–off Valve Lever
11. Oxygen Control Panel
12. Oxygen Supply Valve
13. Flight Suit Ventilation Controller
14. Anti–G Valve Filter
15. Anti–G Valve
16. Oxygen Regulator Test Access
17. Helmet Ventilation Switch
18. FDR Controls
19. RSBN Beacon Audio Button
20. Radio Set Control Box
21. Helmet Visor Heating Control Panel
22. Taxi and Landing Lights Control Switch
23. Pitot Controls
24. Canopy Lock Handle
25. Engine Control Panel
26. External Power Indicator Light

Forward Cockpit LH Console



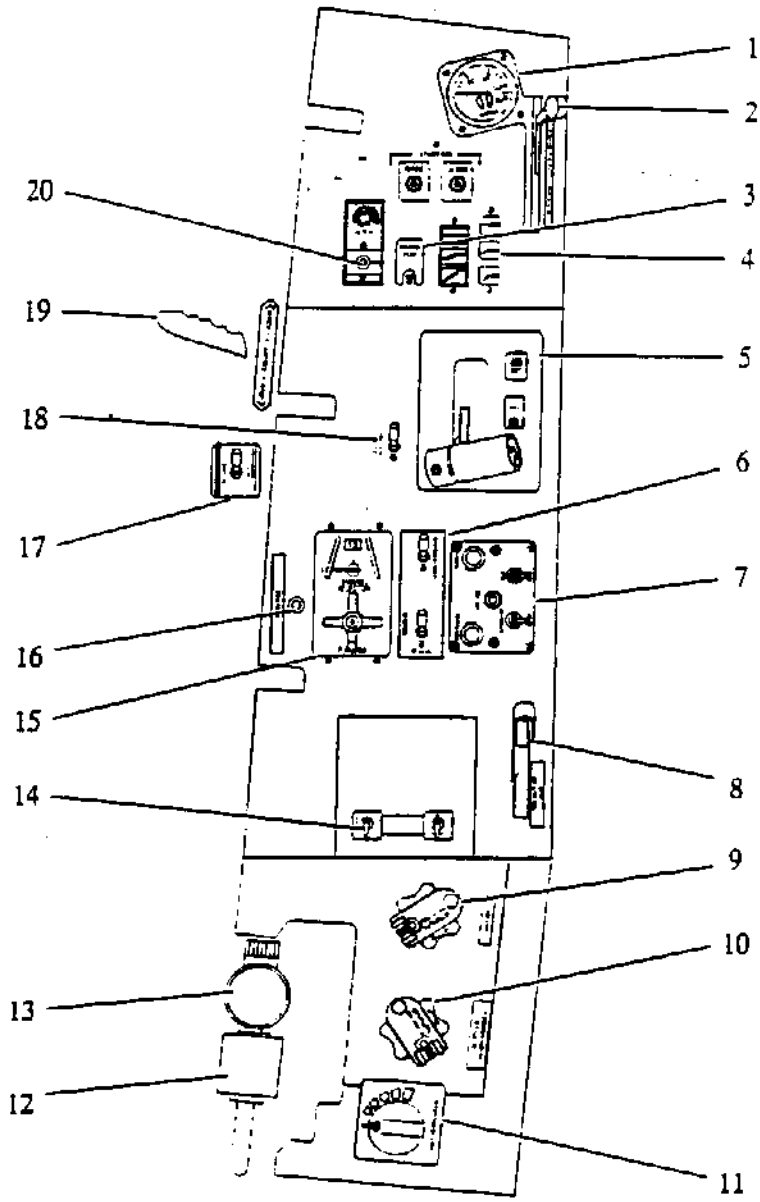
1. Main C/B Switch Panel
2. Canopy Emergency Jettison Handle
3. ADF Control Box
4. De–Ice Sensor Heating Control Panel
5. IFF Control Box
6. Aft C/B Switch Panel
7. Main & Emergency Hydraulic Pressure Indicator
8. EGT Limiter Test Switch
9. RSBN System Altitude Selector
10. Directional Gyro Control Box
11. Advisory & Warning Lights Intensity Controls
12. Emergency Extension and Interconnection Co
    Levers
13. RSBN Control Box
14. Auxiliary Switch Panel
15. Cabin Pressurization and ECS Handle

Forward Cockpit RH Console



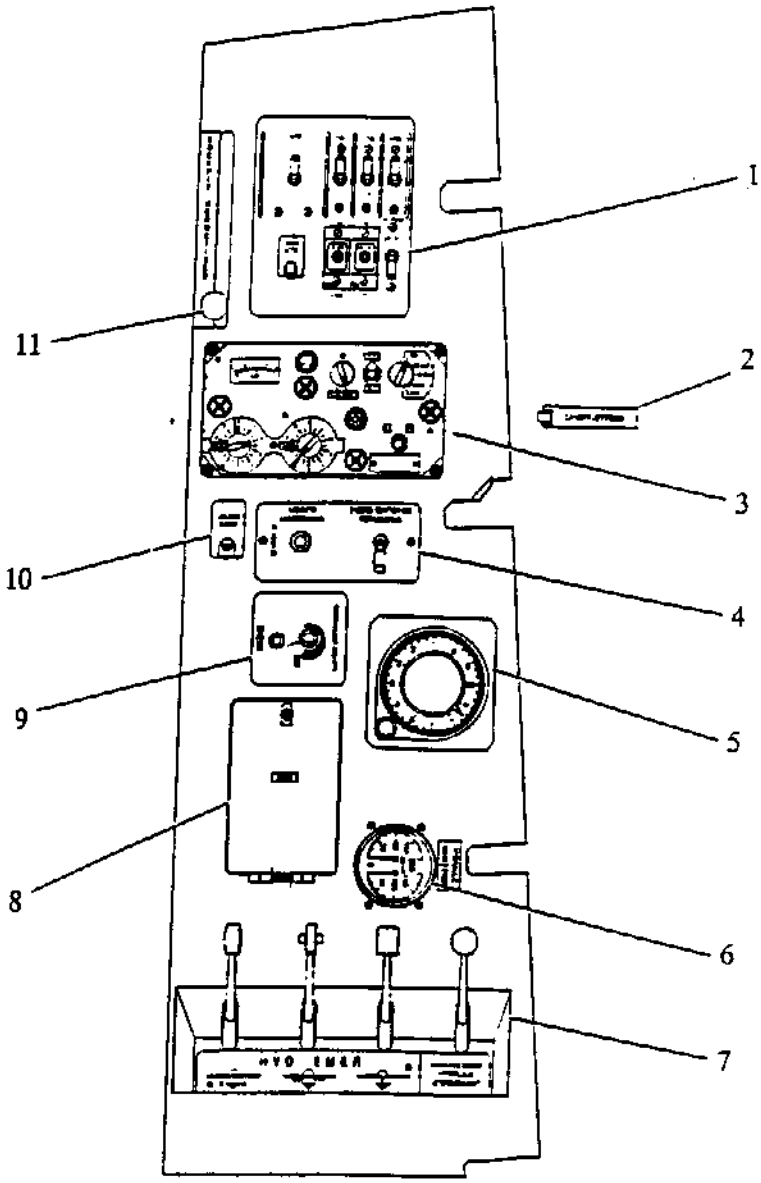
1. Short – Long Distance Beacon Switch
2. L/G Position Indicator
3. L/G Control Lever
4. Height Indicator
5. Altitude Indicator
6. RMI, Radio Magnetic Indicator
7. Stores Indication Panel
8. Instrument Flight Hood Control Handle
9. Airspeed/Machmeter
10. Warning Lights Panel
11. ADI, Attitude Deviator Indicator
12. Left Armament Indication Panel
13. Master Caution Light
14. ADF, Automatic Direction Finder
15. Right Armament Indication Panel
16. Vertical Velocity/Turn & Slip Indicator
17. Caution & Advisory Lights Panel
18. RPM Indicator
19. Directional Gyro Front Control Panel
20. Triple Engine Indicator
21. EGT Indicator
22. Fuel Quantity/Flow Indicator
23. Cabin Pressure Indicator
24. Diffuser (Air Shower)
25. Clock
26. Pedal Adjustment Controller
27. Pitot Fault Simulator Panel
28. Navigation Fault Simulator Panel
29. LH/RH Wheel Brake Pressure Indicator
30. Control Stick
31. Pitch and Roll Trim Indicator Panel
32. Rudder Pedal
33. RSBN Range Indicator

Aft Cockpit Layout



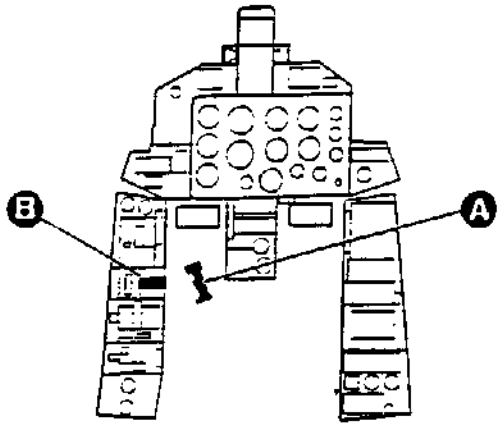
1. Oxygen Pressure Indicator and Flow Annunciator
2. Emergency Brake Control Handle
3. Engine Control Panel
4. Flaps Control and Indicator Panel
5. Throttle Quadrant
6. Audio panel
7. ICS Control Box
8. Fuel Shut–off Valve Lever
9. Oxygen Bottles Interconnect Valve
10. Oxygen Supply Valve
11. Flight Suit Ventilation Controller
12. Anti–G Valve Filter
13. Anti–G Valve
14. Oxygen Control Panel
15. Radio Set Control Box
16. RSBN Beacon Audio Button
17. Taxi and Landing Lights Control Switch
18. Forward/Aft Cockpit EGT Transfer Switch
19. Canopy Lock Handle
20. Instrument Lights Control Panel

Aft Cockpit LH Console

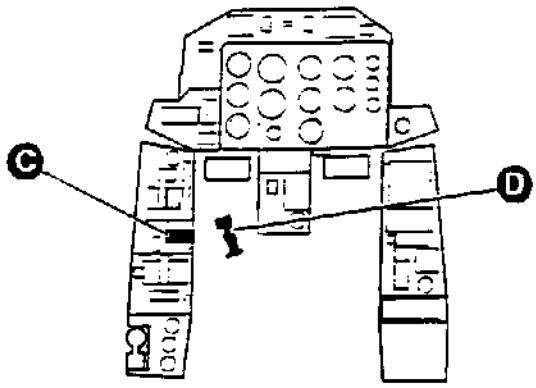


1. Miscellaneous C/B Switch Panel
2. Canopy Emergency Jettison Handle
3. ADF Control Box
4. RSBN Aft Control Panel
5. Directional Gyro Correcting Instrument
6. Main & Emergency Hydraulic Pressure Indicator
7. Emergency Extension and Interconnection Control Levers
8. Gyro Unit Ground Checkout Access Panel
9. Advisory & Warning Lights Intensity Controls
10. Ejection Unlock Switch
11. Cabin Pressurization and ECS Handle

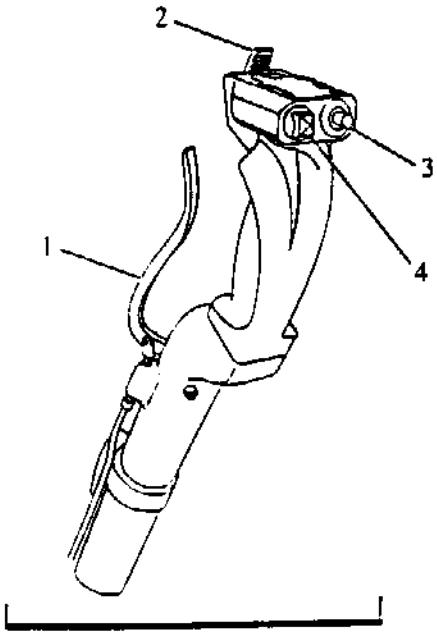
Aft Cockpit RH Console



FORWARD COCKPIT

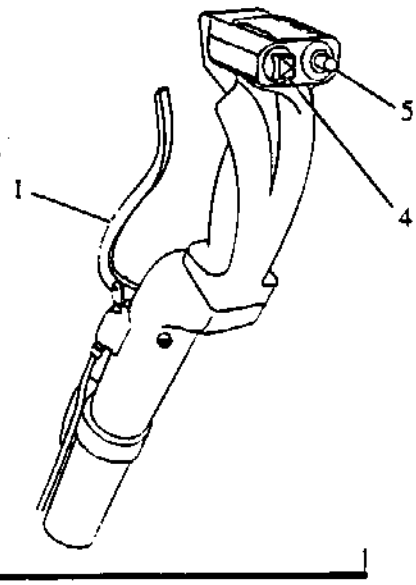


AFT COCKPIT



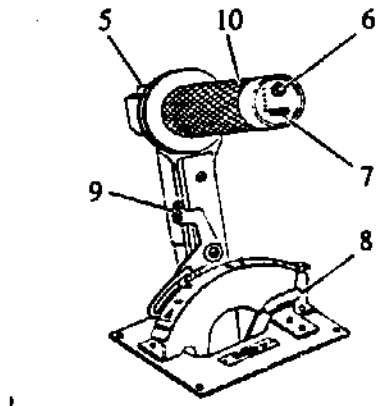
A

STICK GRIP
(FWD COCKPIT)



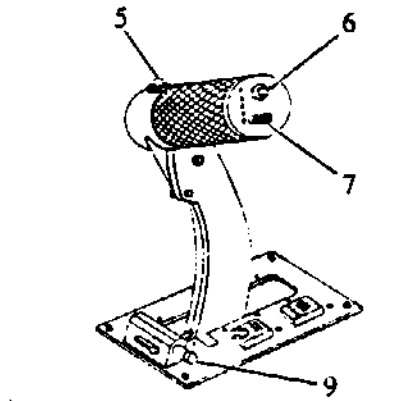
D

STICK GRIP
(AFT COCKPIT)



B

FWD THROTTLE GRIP



C

AFT THROTTLE GRIP

1. Wheel Brakes Lever
2. Trigger Cover
3. Camera Gun Release
4. Trim Switch
5. Intercom Button
6. PTT Button
7. Speed Brakes Switch
8. Throttle Friction Pawl
9. Finger-lift STOP
10. Target Framing Grip

Stick and Throttle Controls