SABRE 6

C-L
CANADAIR LIMITED

PILOTS MEMO FOR SABRE 6 AIRCRAFT

issued by: service department

CANADAIR
LIMITED · MONTREAL
1958 SECOND EDITION

INTRODUCTION

Canadair Sabres have formed the backbone of RCAF fighter strength for several years. Sabres have seen service in many parts of the world, under many flags, and have earned an unrivalled reputation for excellence in performance and dependability.

This booklet, covering the Mark 6, is primarily intended for those pilots who have not flown any mark of Sabre aircraft. It is for information only and must not be regarded as an authority or as superseding any established Pilots Operating Instructions.

TABLE OF CONTENTS

DESCRIPTION

The Sabre 6 aircraft is a single-seat, high-speed, high-altitude fighter, characterized by a swept-back wing and empennage. The wings are fully slatted to provide maximum best performance speed range.

The power plant is an Orenda 14-4 axial-flow turbo-jet engine, providing approximately 7300 pounds static thrust at sea level.

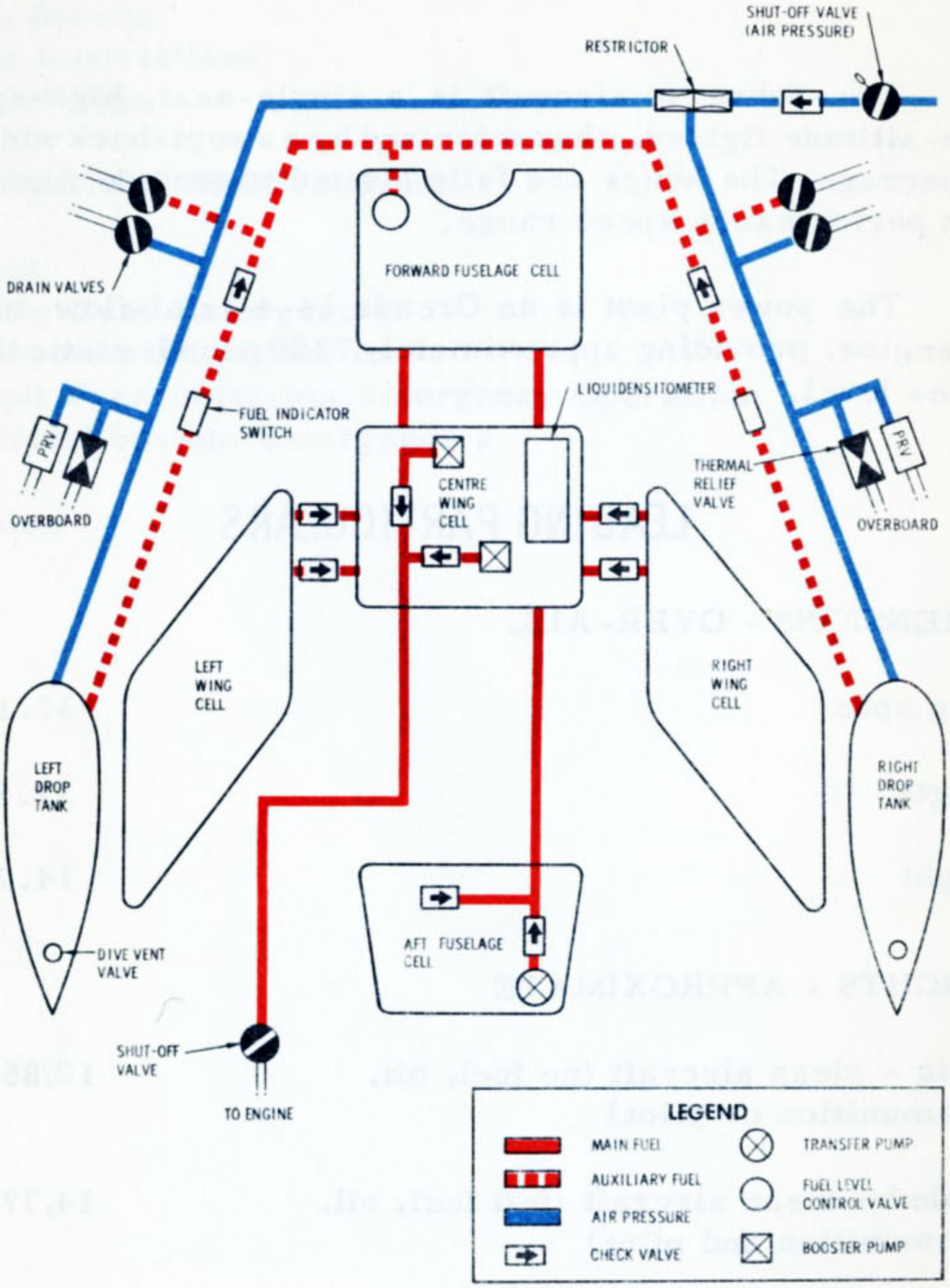
LEADING PARTICULARS

DIMENSIONS - OVER-ALL

Wing span	37.1 feet
Length	37.5 feet
Height	14.7 feet

WEIGHTS - APPROXIMATE

Basic - clean aircraft (no fuel, oil, ammunition or pilot)	10,850 lbs
Loaded - clean aircraft (full fuel, oil, ammunition and pilot)	14,370 lbs
With two 100 Imp (120 U.S.) gal drop tanks	16,135 lbs
With two 167 Imp (200 U.S.) gal drop tanks	17,315 lbs



Aircraft Fuel System

FUEL AND OIL TANK CAPACITIES

Total internal fuel	357 Imp (429 U.S.) gals
Total fuel with two 100 Imp (120 U.S.) gal drop tanks	557 Imp (669 U.S.) gals
Total fuel with two 167 Imp (200 U.S.) gal drop tanks	691 Imp (830 U.S.) gals
Maximum oil tank capacity	2.9 Imp (3.5 U.S.) gals with expansion space of 0.8 Imp (1 U.S.) gal

FUEL SYSTEM

Five self-sealing fuel cells are installed; two in the fuselage, one in the centre wing section and one in each outer wing panel. Fuel is supplied to the engine from the centre wing cell which receives fuel from all other internal cells, except the aft fuselage cell, by gravity feed. The fuel from the aft fuselage tank is transferred, via the centre wing cell, to the forward fuselage tank as the level drops in the latter. The main fuel supply can be augmented by installing a 100 Imperial (120 U.S.) or 167 Imperial (200 U.S.) gallon drop tank under each outer wing panel. Fuel from the drop tanks is forced to the forward fuselage cell, by compressed air drawn from the engine compressor section, when the fuel level in the forward fuselage cell has fallen by 4 Imperial (5 U.S.) gallons.

FUEL GRADE AND SPECIFICATIONS

The recommended fuel is 3-GP-22 (MIL-F-5624) (latest issues) Grade JP-4, 7.8 pounds per Imperial or 6.5 pounds per U.S. gallon.

FUEL QUANTITY GAUGE

A fuel quantity gauge, indicating total internal fuel in pounds, is located on the instrument panel. No gauge is provided for the drop tanks, but two amber lights on the instrument panel indicate when the drop tanks are empty. A liquidensitometer system is installed. The system incorporates a guarded selector switch on the right forward console. When the guard is down, the switch is at the IN or normal position, and the fuel quantity gauge will show the total fuel supply in pounds, corrected for any variation in fuel density. When the guard is raised and the switch moved to OUT, the system is adjusted to permit uncompensated gauge readings. This latter condition is used when a standard indication of quantity, such as full condition after refuelling, is desired.

BOOSTER PUMPS

Two fuel booster pumps in the centre wing cell supply fuel under pressure to the engine fuel system. The pumps are actuated by initial outboard movement of the throttle control lever.

SHUT-OFF VALVE

The fuel shut-off valve is located upstream of the main fuel filter and is controlled by the engine master switch. The valve is open when the switch is ON and closed when the switch is OFF.

DROP TANK PRESSURE SHUT-OFF VALVE

A drop tank pressure shut-off valve is located on the left aft console. When the valve is turned ON, both tanks are pressurized by air drawn from the engine compressor section. The valve should be ON at all times when drop tanks are carried.

OIL SYSTEM

Lubrication of the engine is provided by a pressure-type oil system. An electrical oil pressure indicator is located on the instrument panel. No manual control of the system is provided. The oil specification is 3-GP-901 (MIL-O-6081) (latest issues), (Grade 1010).

HYDRAULIC SYSTEMS

The aircraft is equipped with three separate hydraulic systems; utility, normal flight control and alternate flight control. The systems are of the closed-centre constant-pressure type.

UTILITY HYDRAULIC SYSTEM

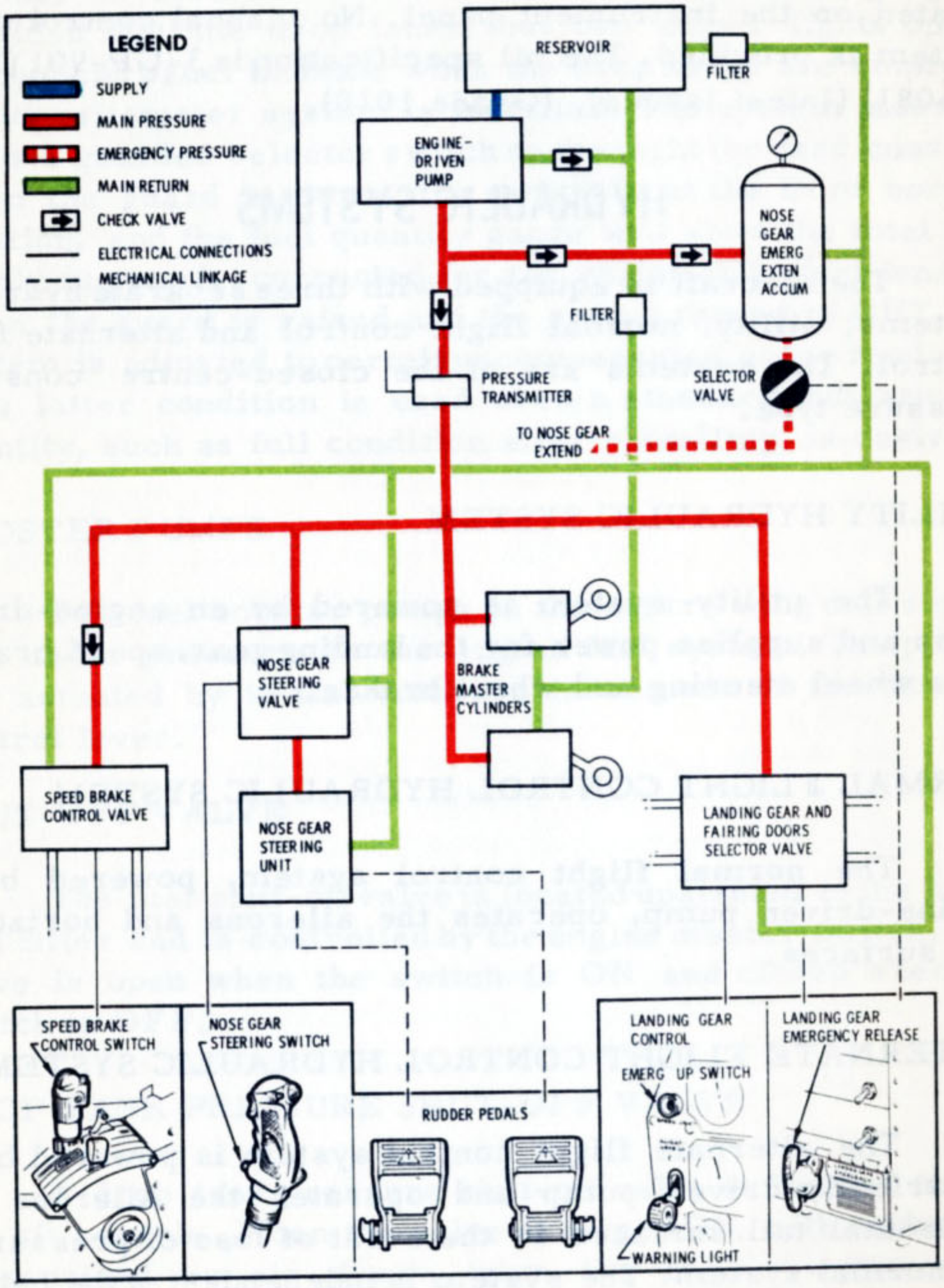
The utility system is powered by an engine-driven pump and supplies power for the landing gear, speed brakes, nose wheel steering and wheel brakes.

NORMAL FLIGHT CONTROL HYDRAULIC SYSTEM

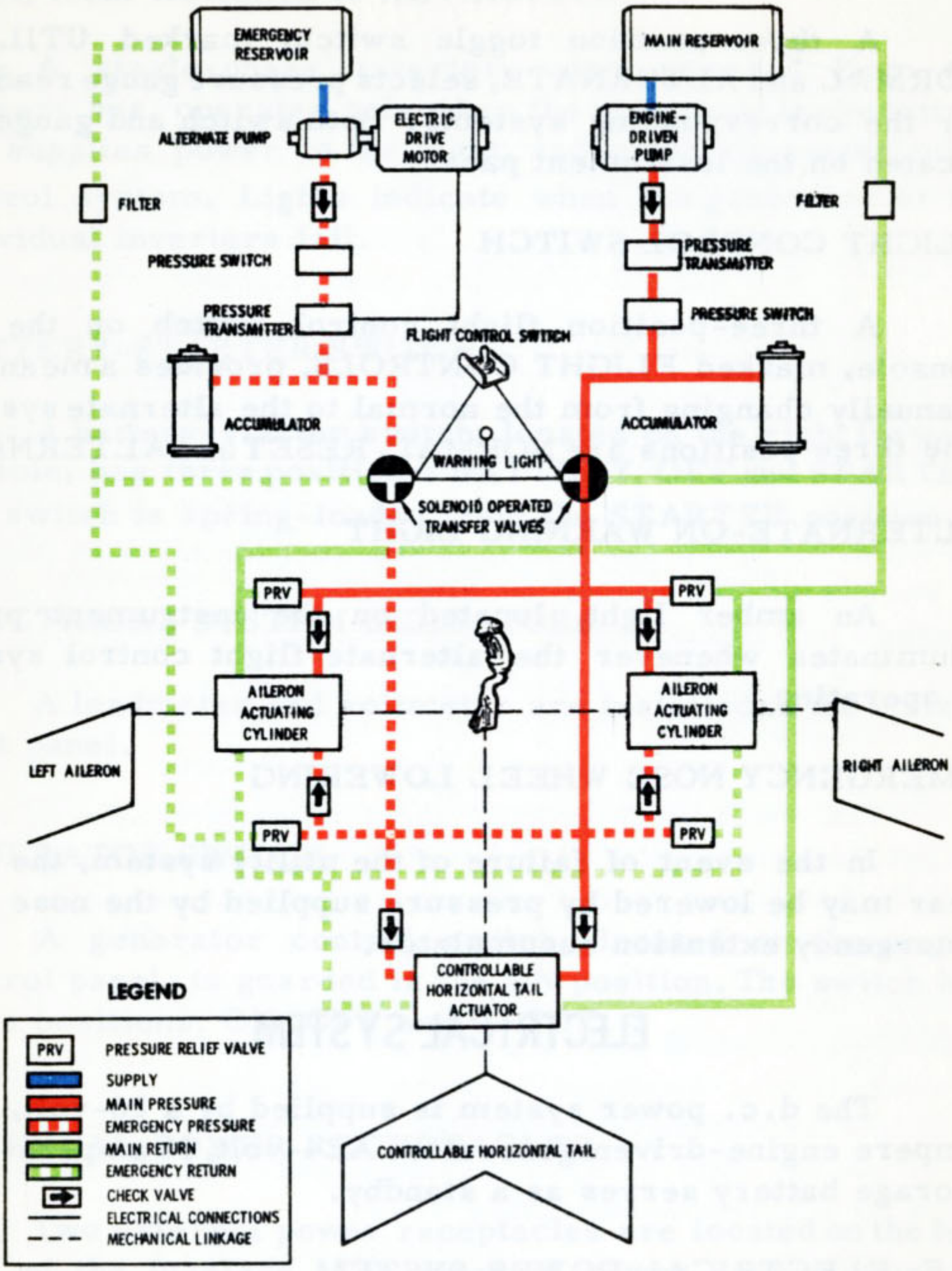
The normal flight control system, powered by an engine-driven pump, operates the ailerons and horizontal tail surfaces.

ALTERNATE FLIGHT CONTROL HYDRAULIC SYSTEM

The alternate flight control system is powered by an electrically-driven pump and operates the ailerons and horizontal tail surfaces in the event of loss of pressure in the normal system. The system is independent of the battery switch and is automatic in operation but may also be manually selected by use of the flight control switch.



Utility Hydraulic System



Flight Control Hydraulic System

HYDRAULIC PRESSURE GAUGE AND SELECTOR SWITCH

A three-position toggle switch, marked UTILITY, NORMAL and ALTERNATE, selects pressure gauge readings for the corresponding systems. Both switch and gauge are located on the instrument panel.

FLIGHT CONTROL SWITCH

A three-position flight control switch on the left console, marked FLIGHT CONTROLS, provides a means for manually changing from the normal to the alternate system. The three positions are NORMAL, RESET and ALTERNATE.

ALTERNATE-ON WARNING LIGHT

An amber light, located on the instrument panel, illuminates whenever the alternate flight control system is operating.

EMERGENCY NOSE WHEEL LOWERING

In the event of failure of the utility system, the nose gear may be lowered by pressure supplied by the nose gear emergency extension accumulator.

ELECTRICAL SYSTEM

The d.c. power system is supplied by a 28-volt, 400-ampere engine-driven generator. A 24-volt, 36 ampere-hour storage battery serves as a standby.

A.C. ELECTRICAL POWER SYSTEM

A main and an alternate three-phase instrument inverter receive power from the primary bus. Should the main inverter fail, the alternate inverter is engaged by

moving the instrument power switch, located on the armament panel, from NORMAL to ALTERNATE.

A single-phase inverter, also powered from the primary bus, operates only when the generator is operating, and supplies power to the sight, radar and air conditioning control system. Lights indicate when the generator or the individual inverters fail.

BATTERY-STARTER SWITCH

A battery-starter switch, located on the right forward console, has three positions; BATTERY, OFF and STARTER. The switch is spring-loaded from the STARTER position.

ELECTRICAL SYSTEM INDICATORS

A loadmeter and voltmeter are installed on the instrument panel.

GENERATOR SWITCH

A generator control switch, located on the engine control panel, is guarded in the ON position. The switch has three positions; ON, OFF and RESET.

EXTERNAL POWER RECEPTACLES

Two external power receptacles are located on the left side of the fuselage. The external power source must be connected to the No.1 receptacle to make power available to all the buses. If the No.2 receptacle only is connected, power is supplied only to the primary bus. Both external power receptacles should be connected for engine starting.

SURFACE CONTROLS

The ailerons and horizontal tail surfaces are operated by the normal or alternate flight control hydraulic power systems. The rudder is cable-operated and is provided with an electrically-actuated trim tab.

ARTIFICIAL FEEL SYSTEM

An artificial feel system is installed. Normal stick forces resulting from G loads are provided by a bob-weight. Control surface air loads are simulated by bungees connected into the control system. The bungees apply loads according to the degree of stick deflection from neutral position. To trim, the neutral position of the stick is changed by means of the normal or alternate trim switches and the bungees are repositioned to maintain proper stick feel.

CONTROL STICK

The stick grip mounts the following controls: radar target selector button, lateral and longitudinal normal trim switch, bomb and rocket release switch, nose wheel steering engaging switch and the gun trigger.

RUDDER PEDALS

Pedal reach is adjustable by means of an adjustment lever at the side of each pedal. Exact alignment is facilitated by a position-indicating wheel.

CONTROLLABLE HORIZONTAL TAIL

The controllable horizontal tail consists of the elevators and horizontal stabilizer which are controlled and operated as one unit.

TRIM CONTROLS

Trim controls consist of a five-position knurled switch on top of the control stick grip, a four-position lateral alternate trim switch, a four-position longitudinal alternate trim switch and a rudder trim tab control switch located on the trim control panel. The lateral alternate trim switch positions are NORMAL, LEFT, RIGHT and OFF. The longitudinal alternate trim switch positions are NORMAL GRIP CONT, NOSE UP, NOSE DOWN and OFF. For normal operation, the lateral trim switch should be at NORMAL and the longitudinal switch at NORMAL GRIP CONT. The normal and alternate trim circuits are inoperative when these switches are at OFF.

TRIM TAKE-OFF POSITION INDICATOR LIGHT

An amber light on the instrument panel indicates trim take-off position for ailerons, horizontal tail and rudder. The light will illuminate whenever any one of these controls is trimmed to take-off position and will go out when the trim switch is released. The light does not operate when the alternate trim switches are used.

WING FLAPS

Electrically-operated slotted-type flaps are fitted. Each flap is actuated by its own electric motor and circuit. The flaps are mechanically interconnected to prevent uneven flap operation and provide for protective operation should one motor fail.

WING FLAP CONTROL LEVER

The flap control lever, located on the throttle box, has three positions; UP, HOLD and DOWN. To operate the flaps, the lever is placed at UP or DOWN and then returned to HOLD when desired flap position has been obtained. There is

no flap position indicator, but a red line painted on the leading edge of the flap indicates take-off position when it becomes visible.

RUDDER CONTROL LOCK

A rudder control lock is installed below the centre of the instrument panel. When the control handle is pulled aft, a rudder cable lock is set to engage when the rudder is neutral. The other surfaces, being hydraulically operated, are irreversible and do not require a lock.

SPEED BRAKES

Hydraulically-operated speed brakes are located on each side of the rear fuselage. A speed brake switch, located on top of the throttle control, has three fixed positions, IN, OUT and a neutral position indicated by a white mark on the switch guide. Following actuation, the switch should be returned to neutral.

LANDING GEAR

The landing gear and wheel fairing doors are hydraulically actuated and electrically controlled and sequenced. A removable ground safety lock is provided for the nose gear.

NORMAL LANDING GEAR CONTROL

A gear control handle, located on the left side of the instrument panel, has two positions; UP and DOWN. A ground safety switch prevents retraction if the gear handle is inadvertently moved to UP. The fairing doors are not controlled by this switch and will follow their normal sequence, opening when the gear control is moved to UP, thereby warning the ground crew that the gear control is in the wrong position.

LANDING GEAR EMERGENCY UP CONTROL

If it is necessary to collapse the gear while the aircraft is on the ground because insufficient runway remains in which to stop the aircraft, the landing gear ground safety switch can be overridden by use of a guarded EMERG UP push button switch located above the gear control handle. When the gear control is at UP and the EMERG UP button is depressed, the gear will retract.

CAUTION

The EMERG UP button should not be used to retract the gear in the air, as the undercarriage doors will be damaged.

LANDING GEAR EMERGENCY RELEASE

When the landing gear emergency release handle, located at the bottom of the armament panel, is pulled fully out and held for at least 11 seconds, the main gear and all the fairing doors are mechanically unlocked and the gear and door hydraulic selector valves are positioned to lower the gear. Simultaneously, the nose wheel is hydraulically extended by means of the emergency nose wheel accumulator. Whenever the landing gear emergency lowering system has been used, the nose gear cannot be retracted in flight. It will then be necessary to manually reset the nose gear emergency lowering valve on the ground and service the accumulator.

LANDING GEAR POSITION INDICATORS

The position of the landing gear is shown by three indicators on the left forward console.

LANDING GEAR CONTROL WARNING LIGHT

A red warning light, located within the gear control handle, will illuminate when the handle is UP and any gear

or door is unlocked. The light will also illuminate when the handle is DOWN and any gear is unlocked or when the handle is UP and the gear and doors are locked up with the throttle retarded below minimum cruising rpm.

LANDING GEAR WARNING HORN

When the throttle is retarded below cruising power a warning horn sounds if the gear is not down and locked. A horn cut-out button is located on the left forward console.

NOSE WHEEL STEERING

The nose wheel steering system is electrically engaged, hydraulically powered and controlled by the rudder pedals. Steering is accomplished by depressing a switch on the stick grip, synchronizing the rudder pedals with the nose wheel, and then operating the rudder pedals to control a hydraulically-operated nose wheel steering unit. A safety switch prevents engagement of the steering unit whenever the weight of the aircraft is off the nose gear.

WHEEL BRAKES

The wheel brakes are operated by toe action on the rudder pedals. Brake pressure is supplied by brake master cylinders supplemented by power from the utility hydraulic system.

PARKING BRAKE CONTROL

A parking brake handle is located on the left side of the cockpit. Parking brakes are set by pressing on the toe brakes and pulling the parking brake handle fully out, then releasing toe pressure and releasing the parking brake handle. Parking brakes are released by pressing on the toe brakes.

POWER PLANT CONTROL SYSTEMS

MAIN FUEL CONTROL SYSTEM

The engine fuel system consists of two engine-driven variable-delivery pumps, a proportional flow control unit, acceleration control unit, jet pipe temperature limiter (JPT), non-return valves, flow distributor, minimum pressure valve and dump valve. Engine requirements are sensed through a servo mechanism which controls pump delivery according to throttle opening. Ram pressure and altitude are also controlling factors.

EMERGENCY FUEL SYSTEM

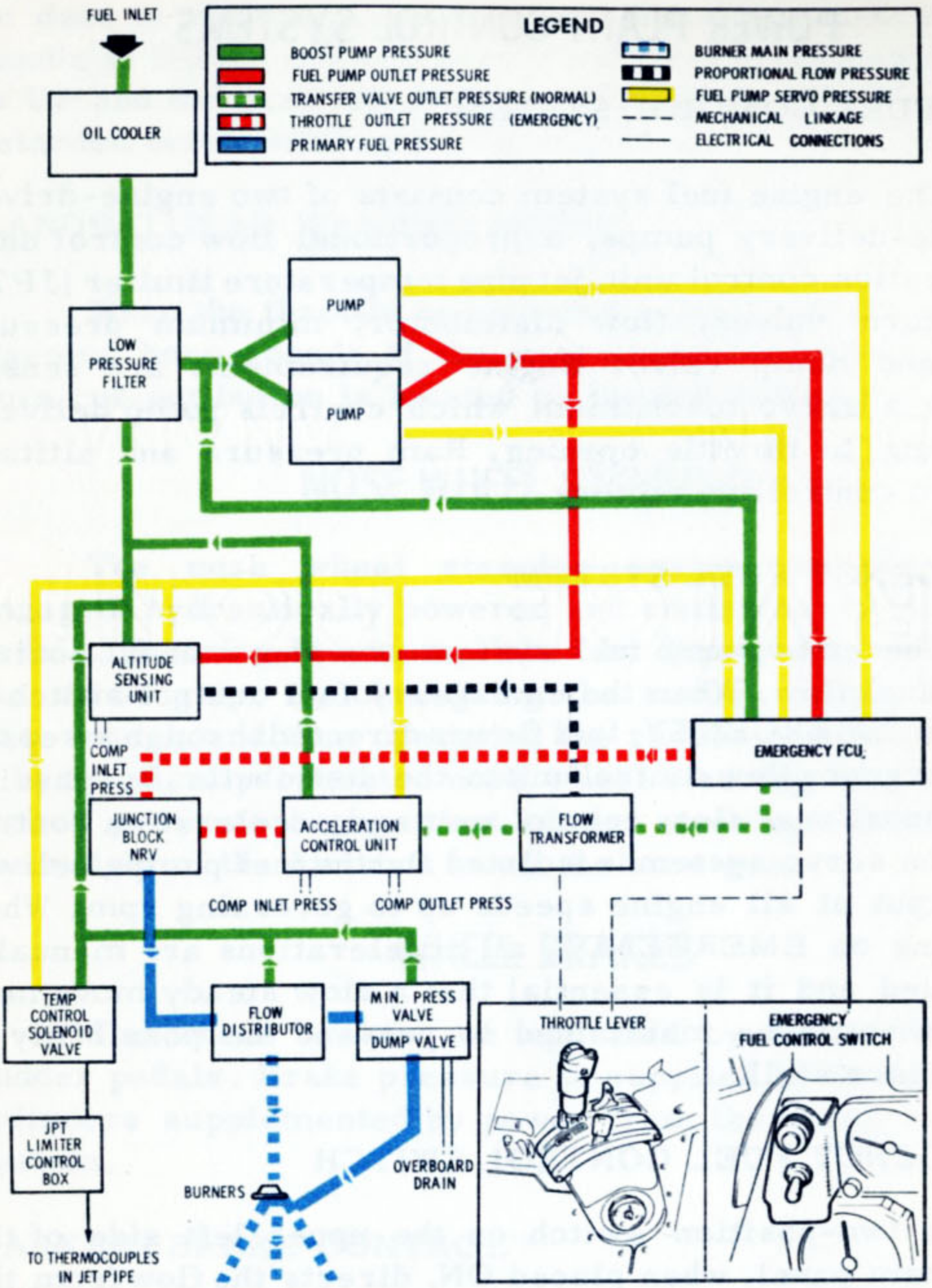
The emergency fuel system provides manual control of the fuel flow. When the emergency fuel control switch is placed in EMERGENCY, fuel flow is directed through a separate emergency flow control unit to the distributor, by-passing the proportional flow control unit and acceleration control unit. The servo system is isolated and the fuel pumps deliver full output at all engine speeds up to governing rpm. When operating on EMERGENCY, all accelerations are manually controlled and it is essential that a slow steady movement of the throttle be maintained to prevent the possibility of compressor stall.

EMERGENCY FUEL CONTROL SWITCH

A two-position switch on the upper left side of the instrument panel, when placed ON, directs the flow from the engine fuel pumps through the emergency fuel system. A warning light indicates when the switch is ON.

LOW FUEL PRESSURE WARNING LIGHT

A warning light on the instrument panel indicates when the fuel pressure drops to approximately 3 psi.



Engine Fuel System

THROTTLE CONTROL LEVER

The throttle control lever is linked to the throttle valves on the proportional flow control and emergency flow control units. With the engine master switch ON, initial outboard movement of the throttle lever energizes the fuel booster pumps and the ignition circuits. When the throttle lever is advanced from OFF to IDLE, fuel flow for idling is maintained by a by-pass from the throttle valve. A stop is fitted to the quadrant at the IDLE position to prevent inadvertent shutting off of the fuel supply. The grip on the throttle lever contains the speed brake switch, the gunsight gyro caging button and the microphone button. Rotation of the grip will manually range the radar gunsight. The normal full throttle stop may be overridden in an emergency by moving the throttle lever outboard and advancing it to the end of the quadrant. This action overrides the JPT limiter and breaks the telltale wire.

ENGINE MASTER SWITCH

The guarded engine master switch on the engine starting panel controls the low pressure fuel shut-off valve and completes the electrical circuits to the fuel booster pumps and to the throttle-actuated microswitch, controlling the ignition during starting.

IGNITION

The ignition circuit is energized when the master switch is placed in the ON position, the battery-starter switch is momentarily held in STARTER position and the throttle lever is moved from the OFF position. The ignition relay is de-energized when the starter is disconnected from the circuit.

EMERGENCY IGNITION SWITCH

An emergency ignition switch on the engine starting panel is used to supply ignition for restarting in flight. With the emergency ignition switch ON, the battery is connected to the ignition system when the battery switch is ON and the throttle lever is advanced from OFF. The switch should be left ON only until ignition occurs.

STARTER-GENERATOR UNIT

A combination starter-generator unit is provided for starting the engine. An external power source must be used for starting. The battery-starter switch on the engine starting panel operates the starter when held momentarily at the STARTER position.

PUSH TO STOP STARTER BUTTON

A PUSH TO STOP STARTER button is located below the battery-starter switch. During starting, the button is used to de-energize the starter if the engine fails to start and also to prevent damage to the starter if the starter cut-out fails to operate.

INSTRUMENTS

FLIGHT INSTRUMENTS

The following flight instruments are provided: altimeter, airspeed indicator, vertical speed indicator, turn and bank indicator, artificial horizon, gyro compass, magnetic compass, radio compass, accelerometer, machmeter and clock.

GYRO COMPASS FAST SLAVING BUTTON

A gyro compass fast slaving button, located on the instrument panel, de-energizes the slow slaving cycle to

permit faster gyro recovery to the correct heading. Ten minutes should be allowed between successive operations of this button.

AIRCRAFT INSTRUMENTS

The following aircraft instruments are provided: fuel quantity indicator, loadmeter, voltmeter, hydraulic pressure indicator and cabin altimeter.

ENGINE INSTRUMENTS

The following engine instruments are provided: oil pressure indicator, tachometer and exhaust temperature indicator.

LIGHTING EQUIPMENT

NAVIGATION LIGHTS

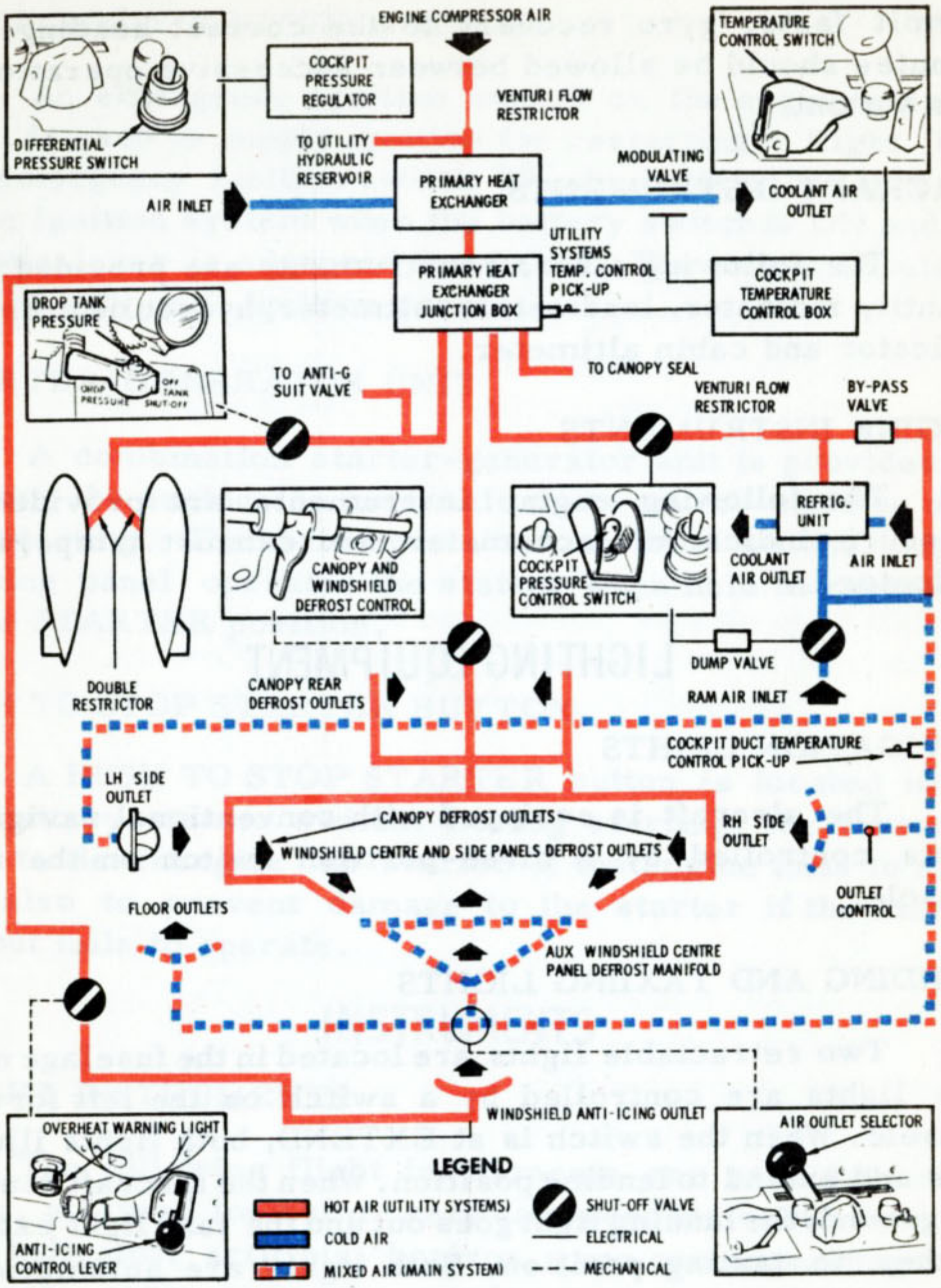
The aircraft is equipped with conventional navigation lights controlled by a three-position switch on the right console.

LANDING AND TAXIING LIGHTS

Two retractable lights are located in the fuselage nose. The lights are controlled by a switch on the left forward console. When the switch is at EXTEND, both lights illuminate and extend to landing position. When the aircraft touches the ground, the landing light goes out and the taxi light extends further to taxiing position. Both lights are automatically extinguished when in the retracted position.

INTERIOR LIGHTS

Instrument panel and console lights are controlled by switches and rheostats.



Heating, Ventilating and Pressurizing System

COCKPIT EQUIPMENT

CANOPY

The electrically-operated canopy can be controlled from inside or outside the aircraft. Emergency release of the canopy in flight is accomplished by means of a remover which fires the canopy off the aircraft. The handgrip on either armrest, when raised, will jettison the canopy. An alternate canopy jettison release handle is located below the right forward console.

EJECTION SEAT

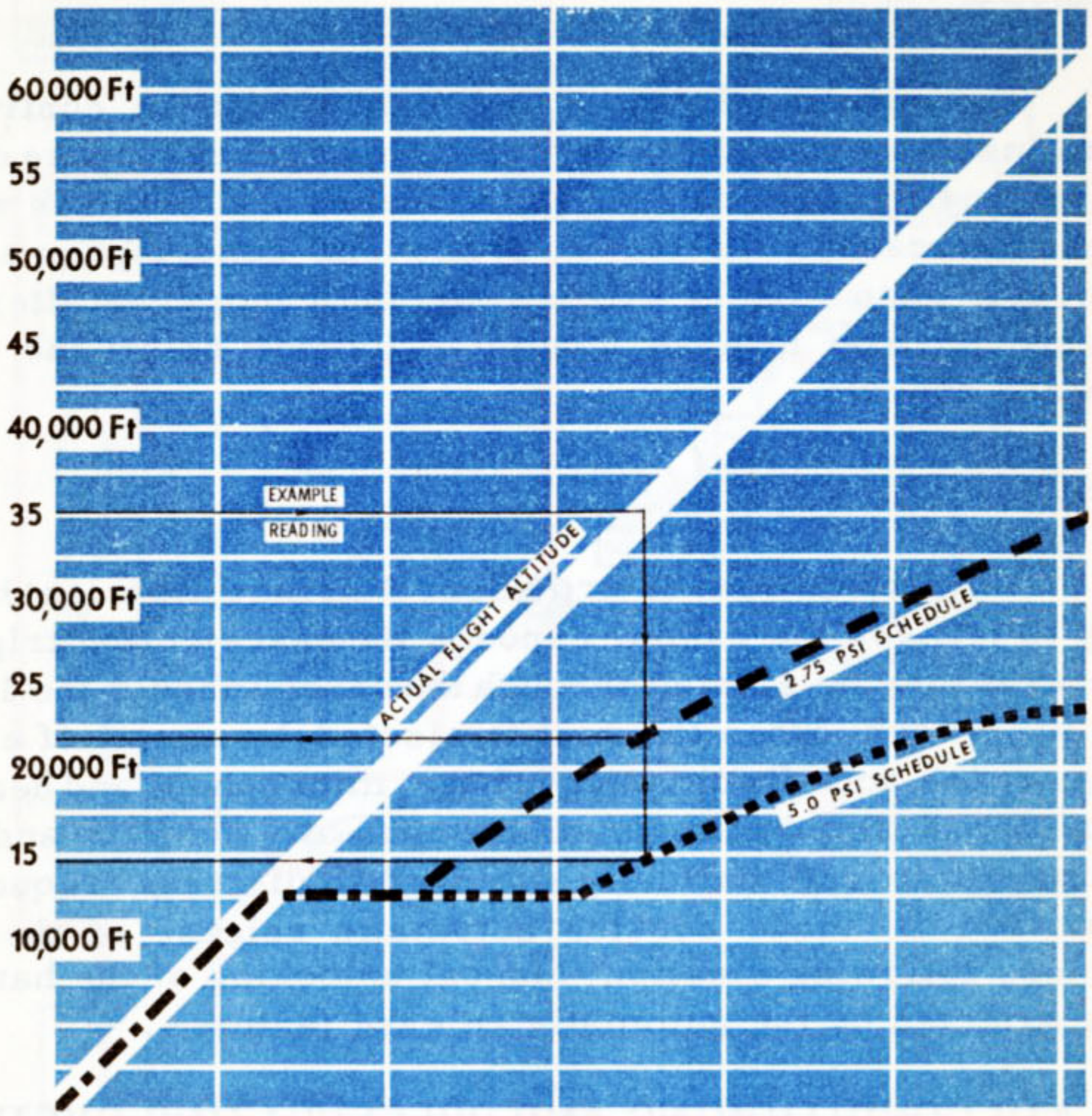
An ejection seat is provided. Raising either seat handgrip to jettison the canopy exposes the seat ejection trigger. The seat may be ejected through the canopy should the latter fail to jettison. When the seat is ejected by means of either trigger, the anti-G suit, oxygen hose, microphone and headset connections automatically disconnect and the VHF and IFF equipment is automatically switched to distress frequency. Provision is made for the automatic release of the seat harness following ejection. Manual unlocking of the harness is unaffected by the automatic release features.

AIR CONDITIONING AND PRESSURIZING SYSTEM

Eighth-stage engine compressor air is delivered to the cockpit at selected temperature for heating, ventilation and pressurization. The cockpit is not pressurized up to 12,500 feet. Above this altitude a 2.75 psi or a 5 psi schedule is available.

CONTROLS

The controls for the system are located on the air conditioning and pressurizing system control panel on the left



NOTES

1 COCKPIT ALTITUDE DECREASES WITH INCREASE IN AIRSPEED, AND AT MAXIMUM IAS, BELOW 12,500 FT FLIGHT ALTITUDE, COCKPIT ALTITUDE CAN BE 4,000 FT BELOW FLIGHT ALTITUDE, ALTHOUGH NORMAL DIFFERENCE IS 1,000 FT OR LESS.

2 PRESSURE DIFFERENTIAL IS MAINTAINED ABOVE 21,200 FEET AT 2.75 PSI AND ABOVE 31,000 FEET AT 5.0 PSI. COCKPIT ALTITUDE IS MAINTAINED AT APPROXIMATELY 12,500 FEET FROM 12,500 FEET UP TO 21,200 FEET USING 2.75 PSI SCHEDULE AND UP TO 31,000 FEET USING 5.0 PSI SCHEDULE.

Cockpit Pressure Schedule

console. A three-position lever, marked FLOOR, DEFROST and BOTH, controls the air outlets in the cockpit. The pressure control switch has two positions, PRESS and RAM. At PRESS, the system will maintain the selected pressure schedule; at RAM, the cockpit is depressurized and cold air is allowed to enter. The pressure selector switch may be positioned at either 2.75 psi or 5 psi to select the desired cockpit pressure schedule. The cockpit air temperature control switch has four positions, AUTO, HOT, COLD and a centre OFF position. The switch is guarded in the AUTO position. A rheostat is provided which will permit a wide range of temperature selection with the temperature control switch in AUTO.

DEFROSTING AND ANTI-ICING SYSTEMS

WINDSHIELD AND CANOPY

Windshield defrosting is accomplished by directing heated cockpit air through windshield defrost outlets. Perforated tubes along the windshield and canopy tracks direct engine compressor air for auxiliary canopy defrosting. Windshield anti-icing is provided from an outlet through which engine compressor air passes over the outside surface of the windshield.

CONTROLS

The canopy and windshield auxiliary defrost control lever is located on the left longeron in the cockpit. Pulling the lever aft turns the system OFF, pushing it forward turns the system ON. The windshield anti-icing control lever is located forward of the air outlet above the left console and has two positions, ON and OFF. A windshield anti-icing overheat warning light is located on the left side of the cockpit aft of the side air outlet. When this light is illuminated, the windshield anti-icing lever should be moved to OFF.

PITOT TUBES

The pitot tube on the right wing is heated by an electric element controlled by a switch on the forward left console. A switch on the right console controls the heating element of the engine fuel scheduling pitot tube in the air intake duct. The heater elements should not be used on the ground.

OXYGEN SYSTEM

A low pressure oxygen system with a normal minimum pressure of 400 psi is provided. The system includes a type D-2 automatic pressure-demand regulator, a flow indicator and a pressure gauge. The flow indicator and pressure gauge are on the face of the regulator located in the forward left lower corner of the cockpit.

ARMAMENT EQUIPMENT

The aircraft is equipped with an A-4 gun-bomb-rocket sight. Range data for gunnery operation is supplied to the sight by AN/APG-501 radar ranging equipment or by a pilot-operated manual range control. Three .50-calibre machine guns are mounted on each side of the engine air intake. Bomb racks or rocket launchers may be carried under the wings.

A-4 SIGHT

The following controls are located on the sight: radar range sweep control, target span adjustment knob, sight reticle dimmer control and a gyro mechanical caging lever. A sight range dial and radar target indicator are also located on the sight.

ARMAMENT PANEL

The following controls are on the armament panel, located below the instrument panel: bomb-target-wind control, rudder lock, gun charger switch, gun heater switch, guns (sight, camera and radar) switch, target speed switch, sight function selector lever, rocket setting lever, rocket single-auto selector switch, rocket jettison switch, rocket arming switch, instrument power selector switch, fragmentation bombs release switch, demolition bomb release selector switch, demolition bomb single-all selector switch, demolition bomb arming switch, a sight filament selector switch and fragmentation bombs indicator light.

ADDITIONAL CONTROLS

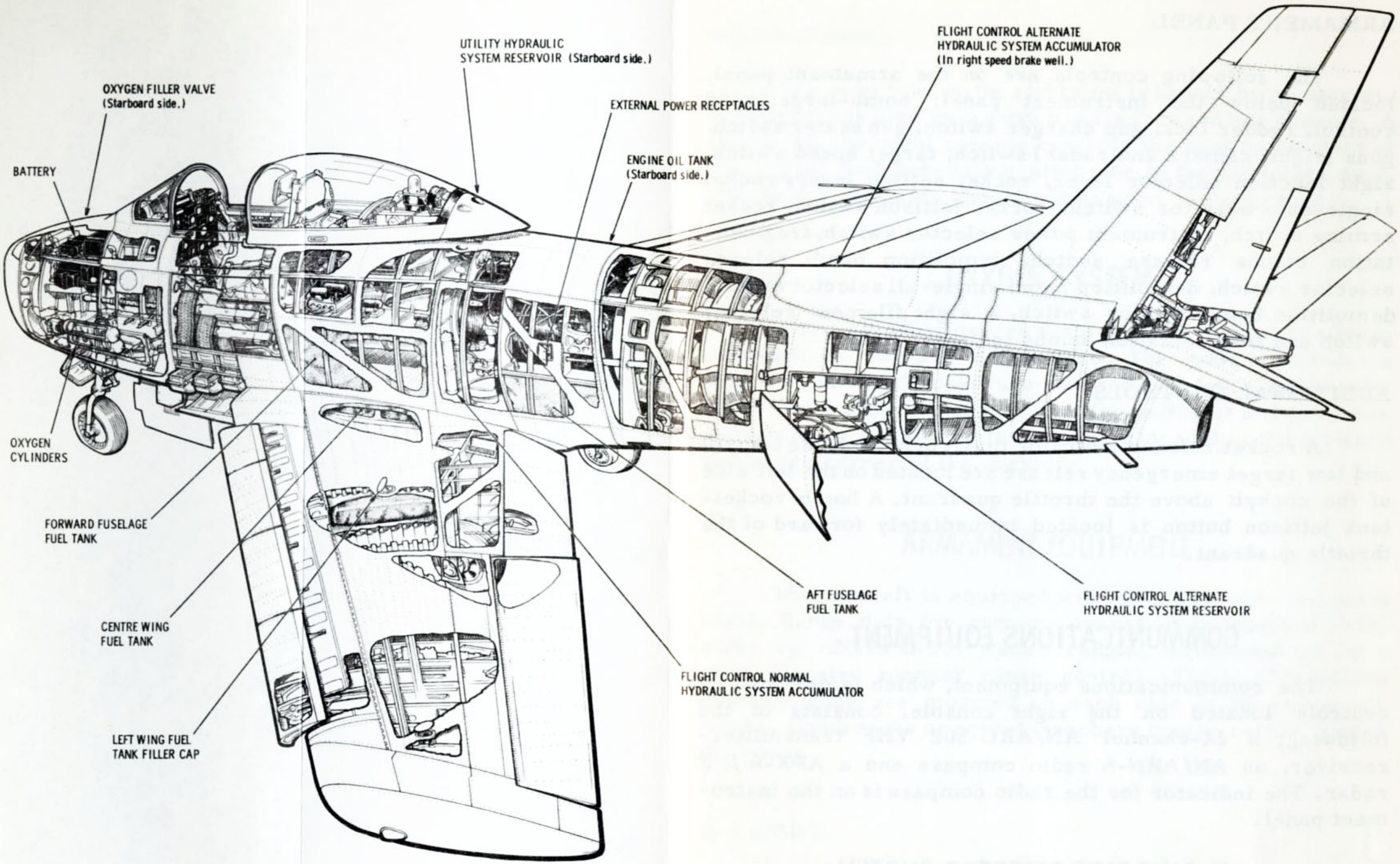
A rocket release indicator dial, rocket release control and tow target emergency release are located on the left side of the cockpit above the throttle quadrant. A bomb-rocket-tank jettison button is located immediately forward of the throttle quadrant.

COMMUNICATIONS EQUIPMENT

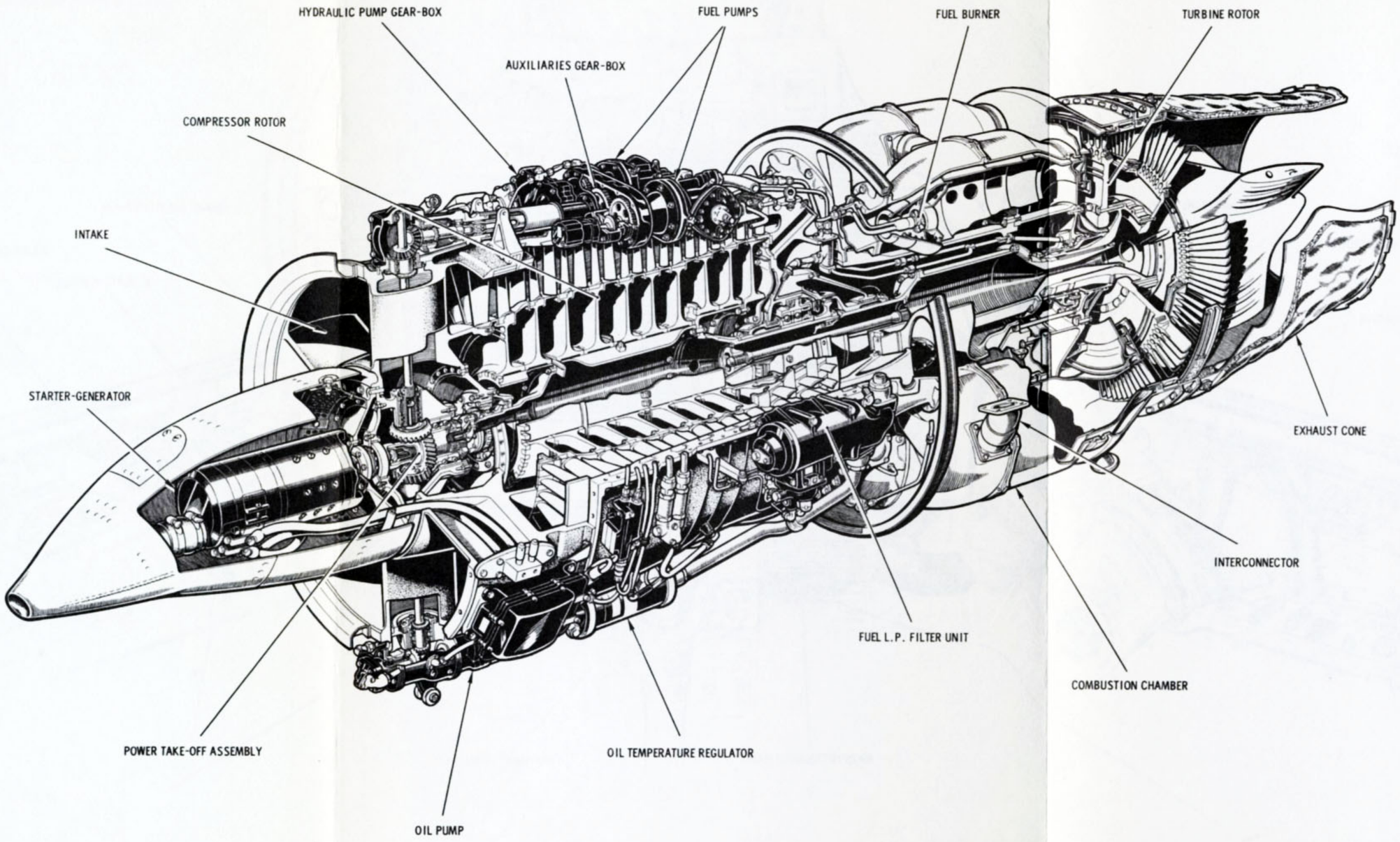
The communications equipment, which is operated by controls located on the right console, consists of the following; a 24-channel AN/ARC-502 VHF transmitter-receiver, an AN/ARN-6 radio compass and a APX-6 IFF radar. The indicator for the radio compass is on the instrument panel.

ENGINE FIRE DETECTOR SYSTEM

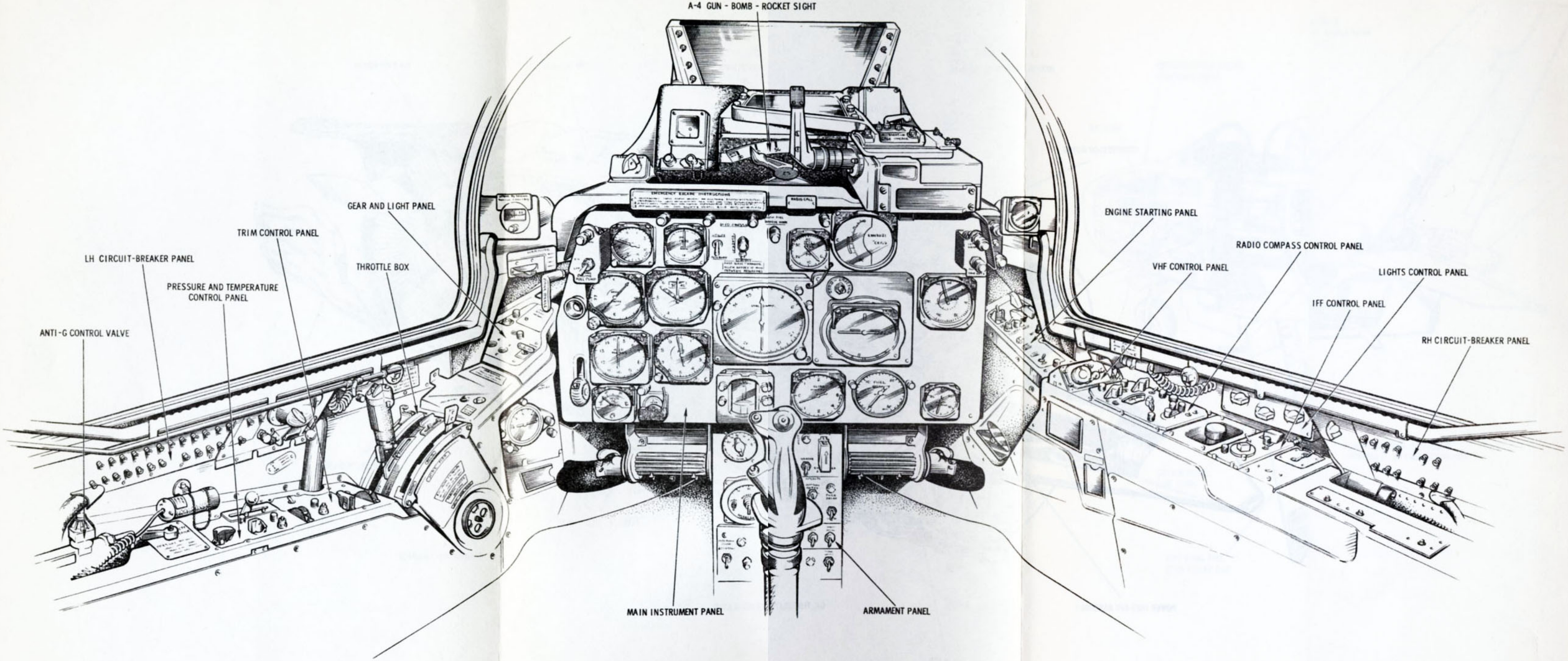
Forward and aft engine fire warning lights are mounted above the right side of the instrument panel. A system test button is located below the lights.



General Arrangement and Servicing Diagram



General Arrangement of the Engine



Cockpit Layout

NORMAL PROCEDURES

EXTERNAL PRE-FLIGHT CHECKS

Check the following:

NOSE

Nose gear - ground safety lock removed

- tow pin safety cap tightness

- oleo strut extension

- hydraulic fluid leaks

- tire for slippage, inflation and condition

Nose Gear Emergency Accumulator - leaks and security

Nose Gear Emergency Lowering Valve - reset

Air Pressure Gauge - 1200 psi

Intake - blanking plug removed

- duct pitot head - clear and secure

Gun port plugs installed

GSAP Camera Access Panel - condition and security

FORWARD FUSELAGE AND RIGHT WING LEADING EDGE

Armament Door - secure

Fuel Caps - secure

Oil and Hydraulic Tank Access Doors - secure

Drop Tank Sway Braces - check for looseness and alignment of retaining lugs

Pitot Head - cover removed - clear

Position Light - condition

Leading Edge Slat - condition and operation

RIGHT WING TRAILING EDGE AND AFT FUSELAGE

Aileron and Flap - condition and security

- loose rivets

Main Gear - door position and security

- strut extension

- hydraulic fluid leaks

- tire for slippage, inflation and condition

- wheel chocked

Aft Fuselage Fuel Tank Cap - secure

Access Doors - secure

Alternate Hydraulic Accumulator Air Pressure (in speed brake well) - 600 psi

- compensator pin - extension

EMPENNAGE

Tail Surfaces - condition

Position Lights - condition

Tail Pipe - cover removed

- cracks or excessive distortion

- check for sufficient play and movement

AFT FUSELAGE AND LEFT WING TRAILING EDGE

Access Doors - secure

Emergency Flight Control Circuit-breaker - pushed in

Landing Gear Door Switches and Microswitch (in wheel well) - function

Normal Hydraulic Accumulator Air Pressure (in wheel well) - 600 psi

- compensator pin - extension

Main Gear - door position and security

- strut extension

- hydraulic fluid leaks

- tire for slippage, inflation and condition

- wheel chocked

Aileron and Flap - condition and security

- loose rivets

LEFT WING LEADING EDGE AND FORWARD FUSELAGE

Position Light - condition

Drop Tank Sway Braces - looseness and alignment of retaining lugs

Fuel Cap - secure

Leading Edge Slat - condition and operation

Armament Door - secure

CANOPY

Canopy - cracks or crazing

- alignment pointers coincide

BEFORE ENTERING COCKPIT

Check that both seat handgrips are down and lockwire secure.

Remove safety pins from canopy remover initiator and seat triggers.

Check safety pin removed from canopy remover.

Adjust and lock headrest.

Check all cockpit circuit-breakers in.

BEFORE STARTING

Tighten safety belt and shoulder harness; attach parachute auto rip-cord connection to clip on harness; connect radio, oxygen and anti-G suit; adjust seat and rudder pedals.

All armament switches OFF.

Throttle OFF.

Speed brake switch neutral.

Engine master and emergency ignition switches OFF.

Anti-G suit valve HI or LO.

Drop tank pressure shut-off valve ON - if no tanks fitted OFF.

Cockpit temperature control AUTOMATIC.

Cockpit pressure control at desired schedule.

Windshield anti-icing control OFF.

Lateral alternate trim switch NORMAL.

Longitudinal alternate trim switch NORMAL GRIP CONT.

Emergency fuel control OFF.

Oxygen regulator valve NORMAL OXYGEN. Check pressure.

Pitot heat and landing light switches OFF.

Landing gear handle DOWN.

Parking brake released.

Instrument power switch NORM.

Gunsight CAGED.

Set clock and altimeter.

Sight dimmer DIM.

Generator switch ON.

Battery-starter switch OFF.

External power source connected to both receptacles.

Wing flap lever HOLD.

Check landing gear unsafe warning light by depressing horn cut-out button.

Check all warning lights and indicators for correct operation.

All light switches OFF.

Release rudder lock and check rudder, ailerons, trim and horizontal tail for correct response.

Flight control switch NORMAL.

Communication equipment on - check operation.

Check fuel quantity - densitometer IN and OUT.

Prior to night or instrument take-off, check all lights and flight instruments for correct operation.

STARTING PROCEDURE

Check ignition circuit-breaker in.

Engine master switch ON.

Move throttle outboard.

Check low fuel pressure warning light goes out.

Hold battery-starter switch in STARTER position for 3 seconds, then switch to BATTERY.

At a minimum of 9% rpm advance throttle to IDLE.

At approximately 30% rpm, depress the PUSH-TO-STOP-STARTER button.

Check that engine accelerates to idle speed - 34% to 39%.

Check JPT does not exceed 850°C.

Signal to disconnect external power.

In the event of a false or hot start, pull the throttle back immediately and depress the PUSH-TO-STOP-STARTER button. Turn the engine master and battery switches OFF and investigate the cause before attempting to restart.

BEFORE TAXIING

Check idling rpm - 34% to 39%.

Check idling JPT - 540°C maximum.

Check idling oil pressure - 2 psi minimum.

Check other engine instruments for desired readings.

Hold flight control switch in RESET for one second and check that alternate light goes out.

With flight control and hydraulic pressure gauge selector switches in NORMAL, move stick and visually check control surfaces movement - pressure should return to 3000 (+160 -60) psi.

Reduce normal pressure by operating ailerons and elevators. Check that alternate light comes on when normal pressure is between 960 to 540 psi.

Place hydraulic pressure gauge selector switch in ALTERNATE. Pressure should cycle between 2540 and 3300 psi - pump the stick slightly to verify alternate system is operating.

Hold flight control switch in RESET for one second and check that alternate light goes out and normal system is operating.

Run speed brakes through one complete cycle.

With pressure gauge selector switch at UTILITY, check pressure is 3000 (+160 -60) psi.

Gunsight ON.

Advance throttle to 45% rpm and check that the loadmeter is indicating and the voltmeter reads approximately 28 volts.

On first flight of the day, with emergency fuel control switch OFF and engine at idle rpm, move throttle lever to full power setting in 1 second. Check engine speed increases to maximum in 12 seconds and JPT does not exceed 790°C. Reduce engine speed to 90% rpm, place emergency fuel control switch ON and check that change in engine speed results. Adjust throttle to obtain 90% rpm and return emergency fuel control switch to OFF and check that change in engine speed results.

Retard throttle to IDLE.

BEFORE TAKE-OFF

H Hydraulics - Pressure 3000 (+160 -60) psi

Harness - Tightened

- Inertia reel lock handle - unlocked

T Trim - Set for take-off

F Fuel - Sufficient for flight

Flaps - Set for take-off - speed brakes IN

G Gyros - Erected

S Switches - Generator ON

- Engine master ON

- Battery-starter at BATTERY

- Instrument power NORM

- Bomb release selector AUTO RELEASE

- All other armament switches OFF

O Oxygen - Checked and NORMAL

C Canopy - Closed

P Pitot heat (wing and duct) - As required

BEFORE LANDING

Check harness tightened, inertia reel lock handle unlocked.

All armament switches OFF.

Gunsight CAGED.

Hold gun charger switch momentarily in RETRACT.

Check hydraulic pressures normal.

Speed brakes OUT.

Gear down below 185 knots - check horn and indicators.

Flaps down below 185 knots - return lever to HOLD.

Final turn - 160 knots.

Final approach - 140 to 170 knots.

Touch down - 115 to 135 knots.

GO-AROUND

Open throttle to full power.

Speed brakes IN.

Gear up.

Flaps up at 155 knots.

Clear traffic.

Flap lever to HOLD.

END OF FLIGHT

Set parking brakes.

Idle engine at approximately 65% rpm for 2 minutes.

Throttle OFF.

Wait until engine stops rotating.

Engine master switch OFF.

All other switches except generator switch OFF.

Engage rudder lock.

Detach parachute auto rip-cord connection from spring clip on harness.

Install safety pins in seat and canopy ejection systems.

Check wheels chocked and nose gear safety lock installed.

Release parking brakes.

Close canopy.

Install intake duct plug and tail pipe cover after engine has cooled.

FLIGHT CHARACTERISTICS AND GENERAL PERFORMANCE

FLIGHT CONTROLS

The flight control system, being hydraulically operated, is considerably more sensitive than conventional control systems. Until experience is gained in handling the increased power of the system, large or abrupt control stick movements should be avoided.

STALL

The stall with gear and flaps down is preceded by a light general aircraft buffet about 10 knots above the stall and a rudder buffet of medium intensity just before the stall. The approach of a high-speed stall is indicated by considerable airframe buffet.

SPINS

The aircraft shows normal spin characteristics during spin entry, sustained spin and recovery. Spins are initiated in the normal manner and may vary between aircraft. They may also vary between spins to the left and spins to the right and in some cases it may be impossible to properly spin the aircraft at all. In a fully developed spin the nose rises and falls slowly during each turn, which takes about four seconds and about 2000 feet of height. Buffeting occurs and usually decreases as the spin progresses. A non-oscillatory type spin may also be encountered. In this case, the nose of the aircraft will not rise and fall through each turn; instead the aircraft will spin rapidly with a steady pitch angle. This type of spin usually requires more turns for recovery after corrective action is taken.

PROCEDURE FOR SPIN RECOVERY

Reduce throttle to idle, close speed brakes and retract flaps and landing gear.

Apply full opposite rudder.

Move the control stick slowly forward until the spin stops. Do not push control stick fully forward as this is not necessary and will only result in an excessively steep recovery attitude, possibly beyond the vertical.

Keep the ailerons neutral.

Centralize the rudder as soon as the spin stops.

Gently ease out of the resulting dive. Be sure to regain flying speed before opening the speed brakes or pulling up, or the aircraft may stall and snap into another spin.

If a spin does not stop after maintaining standard recovery control for a minimum of three turns, hold recovery control and apply power.

PRACTICE SPINS

Practice spins may be carried out in clean aircraft only, and will be entered between 25,000 and 30,000 feet.

MINIMUM ALTITUDE FOR SPIN RECOVERY

Flight tests indicate that the altitude loss during a one-turn spin plus a one-turn recovery and a 4G pull-out is about 6500 feet. If in a spin below 10,000 feet, bail out, as the margin of safety is too small to try a recovery.

INVERTED SPINS

Inverted spins in this aircraft are characterized by a roll upright into a 45° dive attitude approximately every three-quarters of a turn, followed by a roll again into the inverted spin position, repeating the initial spin. Each turn takes approximately six seconds. Recovery can be initiated at any time by neutralizing the controls and dropping the nose as the aircraft rolls upright. It is improbable that an inverted spin condition will be encountered.

INVERTED FLIGHT

Inverted flight or any other manoeuvre resulting in negative acceleration must be limited to a three-second period to prevent starvation of the fuel booster pumps.

SPEED BRAKES

To reduce speed, especially in aerobatics or formation flight, speed brakes may be used without causing objectionable buffeting or uncontrollable changes in trim. In a pull-out, recovery may be effected with minimum altitude loss by first opening the speed brakes and then pulling out at maximum permissible G. Opening the speed brakes without back pressure on the stick results in an automatic pull-out of up to 3G. Caution should be exercised when exerting back pressure on the stick while the speed brakes are opening.

CRUISE SPEED

In the medium-to-high speed range, level flight handling characteristics are good about all three axes - roll, pitch and yaw. The elevators are very sensitive to small stick movements.

ROLLING PULL-OUT

When the aileron is depressed to initiate a rolling manoeuvre, a change in the lift distribution over the wing takes place giving rise to increased wing loads. For this reason the maximum load factor for rolling pull-outs is limited to 4.5G.

HIGH SPEED

Stability and control are unaffected by compressibility up to approximately Mach 0.95. The power of the controllable horizontal tail becomes particularly noticeable above 500 knots, especially in turbulent air. The limit airspeed for the clean aircraft is 600 knots IAS or the airspeed where wing roll becomes excessive.

COMBAT TURNS

Combat turns should always be carried out at or above best climb speed. If the airspeed is allowed to fall below best climb speed, the opponent can easily effect evasion by means of a climbing manoeuvre.

LETDOWN

Normally, the most economical letdown with a clean aircraft is at Mach 0.8 with a throttle setting which allows a minimum operating JPT. Emergency letdown rates of descent as high as 27,000 feet per minute can be obtained by closing the throttle, opening the speed brakes and diving to the limit airspeed.

COMPRESSOR STALL

When the airflow through the compressor becomes too small for a given rpm, the resultant relative airflow causes the compressor blades to reach the stall.

Over-fuelling the engine, either by erratic throttle movements or malfunction of the fuel system, is the most common cause of compressor stall. This produces a high burner pressure and a back pressure which has a negative reaction on entry airflow. An uneven airflow distribution at the inlet, produced by slipping, skidding, and flight at low speeds and high angles of attack, may result in a fluctuating entry flow, with successive stalling and unstalling of some of the blades, evidenced by a surging in engine noise level. High altitudes, where air is less dense, accentuate all these effects. The result of a compressor stall is a sudden decrease in the pressure of air delivered to the combustion chambers.

There are two types of compressor stall - the hot stall and the cold stall or hang-up. Both stalls are usually recognized by an increase in aircraft vibration and a change in engine noise while engine speed hangs at an rpm slightly above idle speed for that altitude. The hot stall is characterized by loud engine noises and exhaust flames with a rapid rise in JPT, whereas the more common cold stall is accompanied by engine rumbling but no large rise in JPT.

To avoid compressor stall, always treat the throttle lever with respect and avoid erratic movements. As the tendency to stall is greater at high altitudes, exercise greater care in throttle movements and avoid incoordinated flight and abnormal aircraft attitudes. Good aircraft maintenance - involving correct exhaust pipe segmentation, proper adjustment and good condition of fuel system components, airbleeds, etc. - is of vital importance in maintaining stall-free operation.

To recover from a compressor stall, correct any abnormal attitude, close the throttle to idle stop, reduce airspeed and decrease altitude. Allow the rpm and JPT to stabilize before advancing the throttle cautiously to the

desired setting. If the stall fails to dissipate retard the throttle slightly from IDLE. If this is not succesful and altitude permits, shut down the engine and carry out relight procedure. Report all compressor stalls on landing.

SABRE SAVERS

Carry out all pre-flight checks thoroughly.

Check and test the oxygen system before starting and recheck it at regular intervals in flight.

To check the controls, displace the stick and check for accurate centering. Initiate trim action with the normal trim switch and check that there is little or no creep when the switch is released to the OFF position. If the switch sticks, do not fly the aircraft. Initiate trim action with the alternate trim switches and check that there is no creep when the switches are released. An excessive amount of trim control creep, either laterally of longitudinally, will cause overcontrolling in the air, particularly at high altitude.

Test the brakes and nose wheel steering as soon as the aircraft starts to roll after opening up to taxi. Aircraft have been known to have brake lines reversed and the nose wheel steering system disconnected following routine maintenance.

While taxiing, ensure that a comfortable degree of rudder movement produces a sufficient degree of nose wheel reaction with steering engaged. Check that the nose wheel steering switch is easily held in. If excessive pressure is required, it is easy to inadvertently release pressure and thereby cause steering disengagement. Do not operate the speed brakes while taxiing.

When cleared for take-off, line up with the runway and release the steering switch with the rudder pedals centralized. If steering is disengaged with the rudder pedals displaced from centre, it cannot be re-engaged until the rudder pedals have been moved back to the position at which steering was disengaged. To pick up steering, move the rudder pedals until engagement occurs.

On opening up for take-off, check that the brakes hold at 100% rpm. After releasing the brakes at take-off power, the rudder will become sufficiently effective for control within 3 to 4 seconds.

When taking off on hot days with full drop tanks, take-off flap should be maintained for longer than usual. If the flaps are selected UP too soon after take-off, considerable aircraft sink will result.

Always climb at the recommended best climbing speeds.

Check operation of the pressurizing system during climb. The cabin altitude should be between 11,000 and 13,200 feet, on the 5 psi schedule, when the aircraft is between 12,000 and 31,200 feet above sea level. At 35,000 feet above sea level, with the engine set at 88% rpm, the cabin altitude should be 14,500 (±1000) feet on the 5 psi schedule.

The lateral stick breakout force is set at 2 pounds and the longitudinal stick breakout force is set at approximately 4 pounds. If a sudden increase in stick breakout forces is experienced during climb, it is an indication that ice may have formed in the linkages of the flight control system. Should this occur, descend to a lower altitude and return to base.

A high-speed dive at full power may cause the aft fire warning light to illuminate. This is a definite indication that an overtemperature condition exits and will require an immediate reduction of power and airspeed.

Recovery from a supersonic dive under certain conditions may produce momentary aileron lock. This is caused by aerodynamic uploads minimizing the pressure of the aileron control system. If this phenomenon occurs, do not use aileron trim in an attempt to move the stick. Recovery from this condition is immediate when airspeed is reduced by opening the speed brakes or reducing power. If any trim has been applied, it will cause an immediate rolling effect on recovery from the locked condition.

When carrying out high-speed flight in the vicinity of Mach 0.98, the stick is usually to the right. An abrupt movement of the stick toward the left will produce an immediate fast roll to the right, due to aileron reversal. Abrupt rolls at this speed are uncomfortable. Centering the stick and opening the speed brakes are the best methods of recovery.

When initiating a spin, do not trim fully aft into the stalled condition. During recovery from a spin with full aft trim, the trim might be left inadvertently in the aft position and, when stick push force is released after spin recovery, the resulting action could easily cause another stall and spin, and so on until below minimum recovery altitude.

High-speed, rapid-rolling manoeuvres should be avoided at low altitude. The rate of roll is slow when carrying out high-speed passes at low altitude.

Avoid unnecessary slamming of the throttle. The acceleration control unit dictates rate of increase in engine speed unless the emergency fuel system is in use. In this case, slamming could result in compressor stall.

Know your emergency procedures and fly the aircraft within the specified operating limits at all times.

In the event of an engine seizure, RCAF procedure requires the aircraft to be abandoned if sufficient altitude is available to permit successful ejection. If, however, a landing is to be attempted, the use of the flight controls must be kept to a minimum in order to conserve the battery power required to operate the alternate flight controls hydraulic pump. The aircraft can be controlled directionally by use of rudder alone up to final manoeuvring for landing.

FLIGHT RESTRICTIONS

SPEEDS

Maximum clean		600 knots IAS*
With two 100 Imp (120 U.S.) gal drop tanks	Above 15,000 ft	Maximum obtainable*
	Below 15,000 ft	Mach 0.90 or 555 knots IAS*
With two 167 Imp (200 U.S.) gal drop tanks		550 knots IAS*

*or airspeed where wing roll is excessive

G LIMITS	Below 13,395 pounds gross weight	Above 13,395 pounds gross weight
Symmetrical positive:		
Clean - At 15,000 feet or below	7.33G	7.0G
- Over 15,000 feet	7.33G	6.0G
With 100 Imp (120 U.S.) gal drop tanks		6.0G
With 167 Imp (200 U.S.) gal drop tanks		5.0G

Symmetrical negative:

Clean aircraft any altitude	-3.0G
With drop tanks	-2.0G

Rolling pull out positive:	Below 13,395 pounds gross weight	Above 13,395 pounds gross weight
Clean - At 15,000 feet or below	4.88G	4.5G
- Over 15,000 feet	4.88G	4.0G
With 100 Imp (120 U.S.) gal drop tanks		4.0G
With 167 Imp (200 U.S.) gal drop tanks		3.33G

Rolling push downs negative:

Any altitude or with drop tanks	-1.0G

ENGINE LIMITATIONS

Maximum rpm (maximum JPT: 720°C for 5 minutes static or 15 minutes in flight)	100%
Military climb rpm (maximum JPT: 685°C for 30 minutes)	97.5%
Normal cruise rpm (maximum JPT: 620°C unrestricted)	93%
Idle rpm (maximum JPT: 540°C unrestricted)	34.0% to 39.0%

PROHIBITED ACTIONS

Do not - open canopy above 215 knots IAS.

- lower landing lights above 170 knots IAS.

Do not - raise or lower landing gear or flaps above 185 knots IAS.

- carry out spins with external stores or drop tanks.

- carry out any aerobatics with rockets or bombs installed.

- carry out inverted flying or any manoeuvre where negative G will be applied for more than 3 seconds.

- carry out continuous rolls with rockets or 167 Imp (200 U.S.) gallon drop tanks installed.

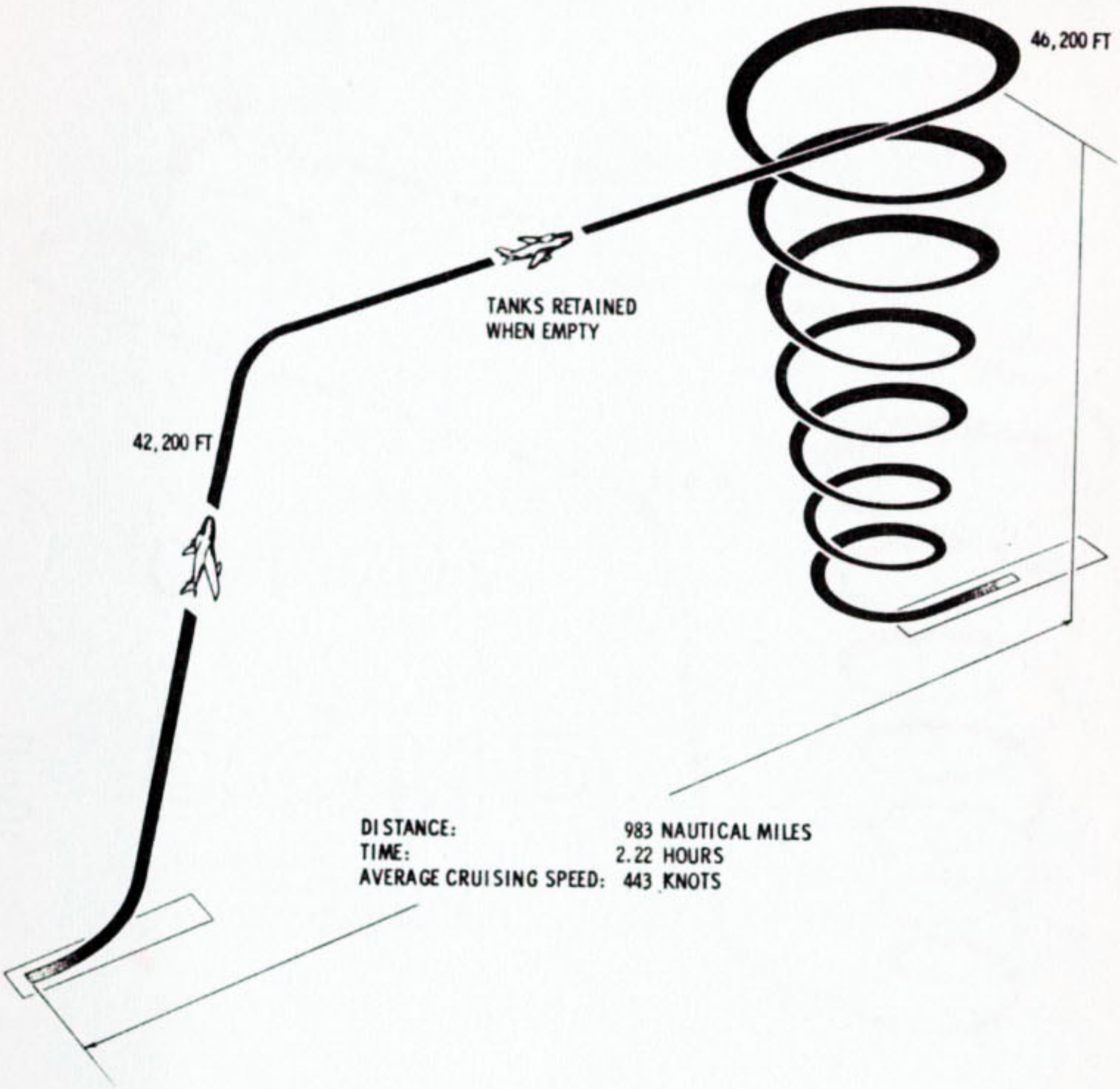
GENERAL DATA

Approximate take-off ground run distance - sea level - no wind - temperature 15°C - 14,400 lbs.

Clean aircraft	1150 feet
With two 100 Imp (120 U.S.) gal drop tanks	1500 feet
With two 167 Imp (200 U.S.) gal drop tanks	1800 feet

Approximate landing ground roll - sea level - 12,000 pounds AUW - full flaps - speed brakes open:

With or without drop tanks	1850 feet
Distance from 50 feet	2850 feet



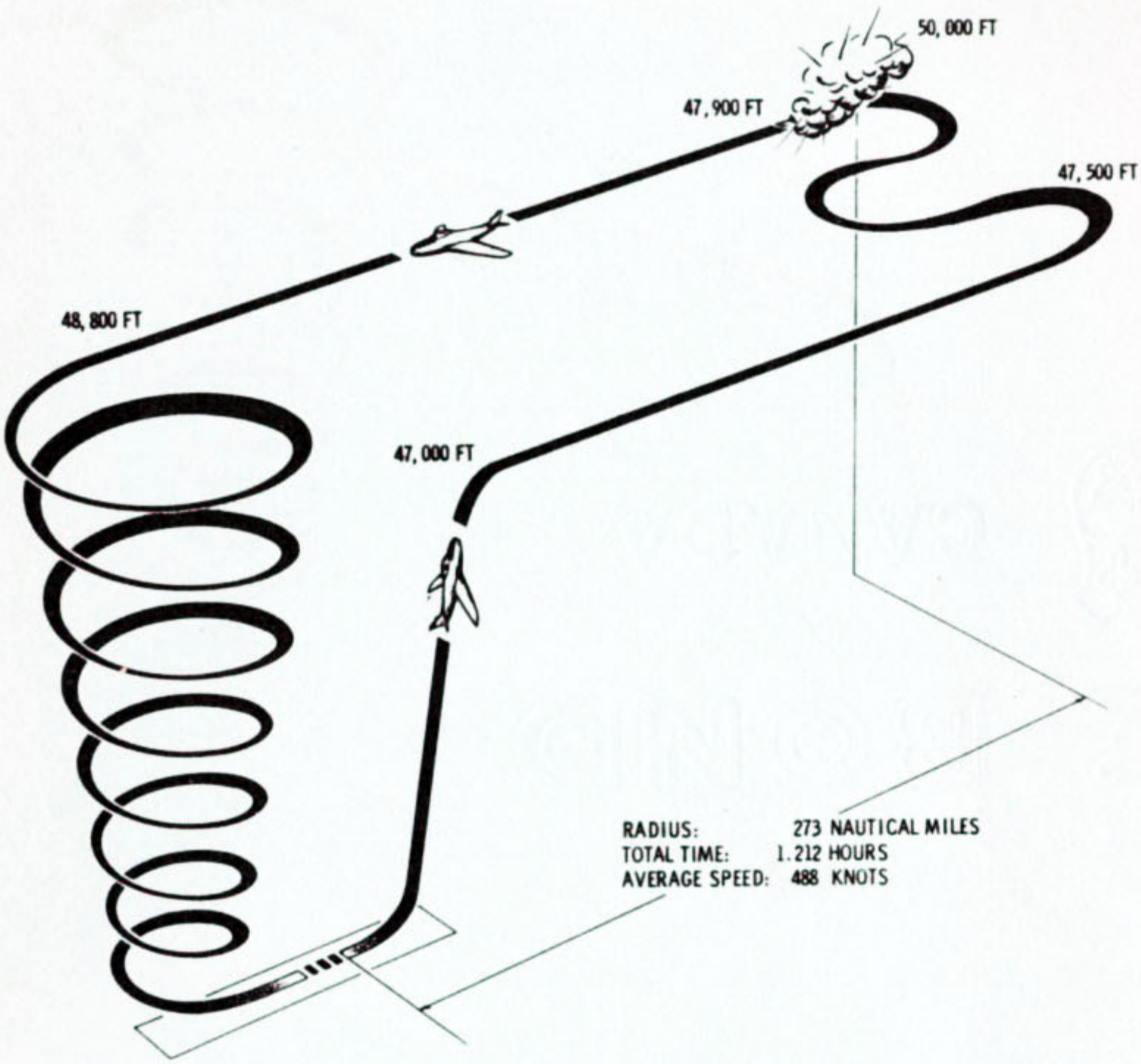
TAKE-OFF

WEIGHT:	16,122 LBS
FUEL:	4,347 LBS
STARTING AND TAKE-OFF FUEL:	180 LBS

RESERVE

FUEL:	823 LBS
TIME:	20 MINS

Typical Ferry Mission (2-120 U.S. Gallon Tanks)



TAKE-OFF

WEIGHT:	14, 359 LBS
FUEL:	2, 787 LBS
STARTING AND TAKE-OFF FUEL:	180 LBS

COMBAT

WEIGHT:	13, 075 LBS
ALTITUDE:	50, 000 FT
TIME:	5 MINS

RESERVE

FUEL:	820 LBS
TIME:	20 MINS

Typical Air Combat Mission (Clean Aircraft)

EMERGENCY PROCEDURES

RELIGHT

Procedure for relight on normal system below 35,000 feet:

(a) Turn off all non-essential electrical equipment.

(b) If altitude permits, windmill engine for one minute to evaporate excess fuel.

(c) With throttle closed, place emergency ignition switch ON.

(d) Glide at 180 to 200 knots IAS.

(e) At 14% to 25% rpm, move and hold throttle outboard for 4 to 6 seconds.

(f) Check low fuel pressure warning light out.

(g) Advance throttle slowly to idle stop.

(h) Allow rpm to stabilize before slowly advancing throttle to avoid possibility of compressor stall.

(j) Place emergency ignition switch OFF.

Procedure for relight on normal system between 35,000 feet and 40,000 feet:

(a) Immediately close throttle and place emergency ignition switch ON.

(b) Regardless of rpm, move throttle outboard and immediately advance it to idle stop.

(c) After light up, allow rpm to stabilize before slowly advancing throttle to avoid the possibility of compressor stall.

(d) Place emergency ignition switch OFF.

Procedure for relight on emergency fuel system:

(a) Turn off all non-essential electrical equipment.

(b) Throttle OFF.

(c) Place emergency fuel control switch ON. Check that light comes on.

(d) Place emergency ignition switch ON.

(e) At 14% to 25% rpm, move and hold throttle outboard for 4 to 6 seconds.

(f) If above 20,000 feet, advance throttle slowly to the idle stop, taking 4 to 6 seconds to complete the movement. If below 20,000 feet, advance throttle slowly to approximately one-half inch forward of the idle stop, taking 4 to 6 seconds to complete the movement.

(g) Allow rpm to stabilize before slowly advancing throttle to avoid the possibility of compressor stall.

(h) Place emergency ignition switch OFF.

NOTE

Before attempting a restart after an unsuccessful start, allow the engine to windmill at 14% to 25% rpm, 180 to 200 knots IAS, for at least 30 seconds to clear the engine of unburned fuel.

LANDING GEAR EMERGENCIES

EMERGENCY GEAR RETRACTION

Move gear handle to UP.

Depress emergency up button.

EMERGENCY GEAR EXTENSION

Reduce airspeed below 175 knots IAS.

Landing gear handle DOWN.

Pull gear emergency release and hold fully extended for minimum of 11 seconds to lower gear.

Check indicator shows gear down - if necessary, yaw aircraft to lock main gear.

If the landing gear control handle is jammed or malfunctioning, pull out the landing gear control circuit-breaker before operating the emergency release. (The circuit-breaker is located on the left circuit-breaker panel, bottom row, fourth from the rear.)

LANDING WITH NOSE GEAR UP

Fire all ammunition and burn off all excess fuel.

If drop tanks are empty and landing can be made on a hard, prepared surface, retain drop tanks. Otherwise jettison all external load.

Jettison canopy.

Make normal approach.

Throttle control OFF.

Just before touchdown, switch off engine master, generator and battery-starter switches.

Manually lock shoulder harness.

Hold nose off as long as possible.

ONE MAIN GEAR UP OR UNLOCKED

Fire all ammunition and burn off all excess fuel.

Jettison all external load.

Retract gear for belly landing.

Jettison canopy.

Just before touchdown, throttle control OFF, switch off engine master, generator and battery-starter switches.

Manually lock shoulder harness.

FLAT TIRE LANDING

Make a normal approach and landing, but put the nose wheel on the runway as soon as possible after landing to permit immediate use of nose wheel steering. Directional control is easily maintained by use of nose wheel steering and light braking against the flat tire.

When landing with the nose gear tire flat, hold the nose wheel off the runway as long as possible after landing. Do not attempt to use nose wheel steering for directional control during the landing run or taxiing. Use as little braking action as possible compatible with safety.

FUEL SYSTEM EMERGENCIES

The emergency fuel system provides full manual control if the normal system fails. At altitudes below 10,000 feet the emergency system must not be selected unless an actual emergency exists. In an emergency at any altitude, if engine speed falls below 80% rpm before emergency selection is made, carry out the following procedure to avoid flameout:

Retard throttle to IDLE.

Emergency fuel control switch ON.

Advance throttle carefully.

JPT LIMITER OVERRIDE

Use for combat emergency only.

Move throttle lever outboard and advance to end of quadrant, breaking telltale wire.

COCKPIT PRESSURIZATION EMERGENCY OPERATION

EMERGENCY DEPRESSURIZATION

Move cockpit pressure switch to RAM.

Descend to below 25,000 feet.

COOLING UNIT FAILURE

Descend to 20,000 feet or less. Move cockpit pressure switch to RAM.

GENERATOR FAILURE

1 In event of generator failure the following major equipment will be inoperative:

RADIO COMPASS
IFF CONTROL
COCKPIT TEMPERATURE CONTROL

2 To conserve the battery switch off the following:

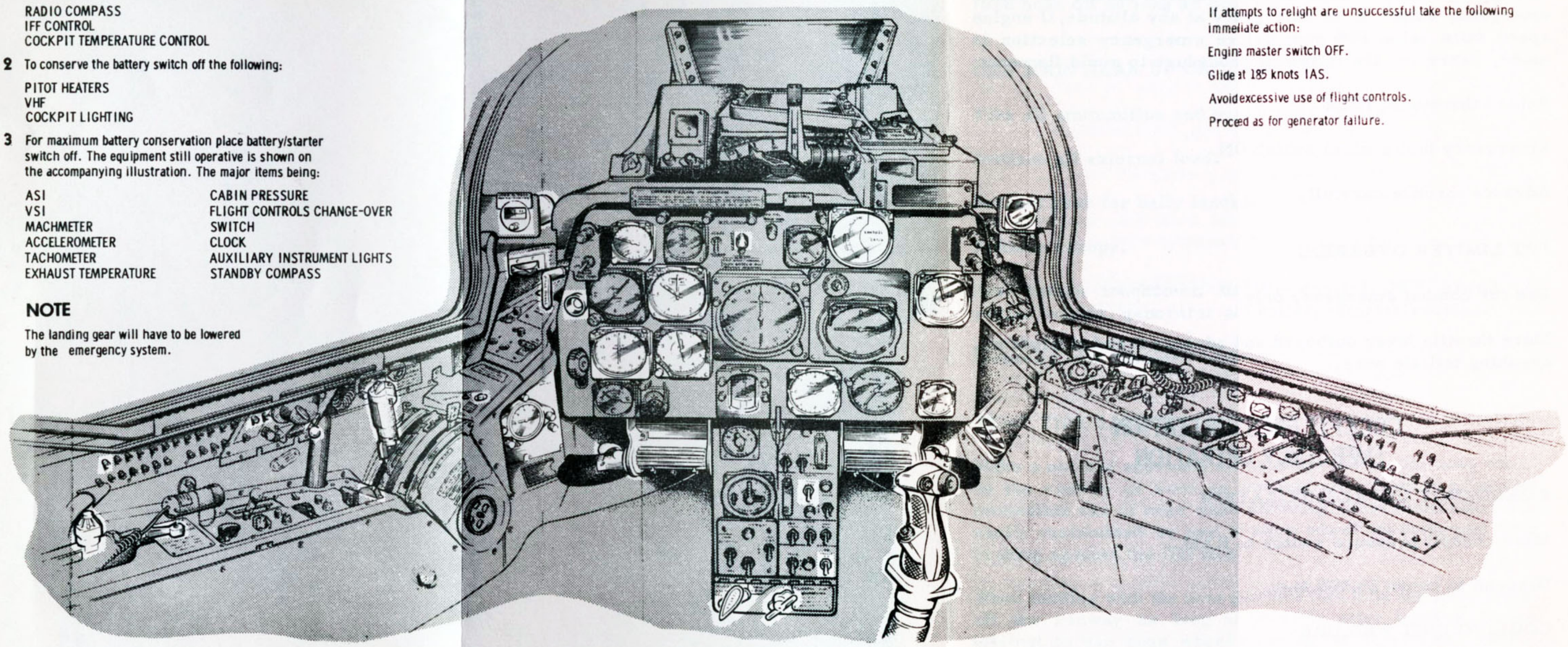
PITOT HEATERS
VHF
COCKPIT LIGHTING

3 For maximum battery conservation place battery/starter switch off. The equipment still operative is shown on the accompanying illustration. The major items being:

ASI
VSI
MACHMETER
ACCELEROMETER
TACHOMETER
EXHAUST TEMPERATURE
CABIN PRESSURE
FLIGHT CONTROLS CHANGE-OVER SWITCH
CLOCK
AUXILIARY INSTRUMENT LIGHTS
STANDBY COMPASS

NOTE

The landing gear will have to be lowered by the emergency system.



Generator Failure

FLAMEOUT PROCEDURE
(Engine windmilling)

If attempts to relight are unsuccessful take the following immediate action:

Engine master switch OFF.

Glide at 185 knots IAS.

Avoid excessive use of flight controls.

Proceed as for generator failure.

ELECTRICAL SYSTEM EMERGENCIES

COMPLETE ELECTRICAL FAILURE

See illustration: Generator Failure.

GENERATOR FAILURE

See illustration: Generator Failure.

GENERATOR OVERVOLTAGE

Hold generator switch at RESET momentarily, then switch ON.

If light comes on again, switch generator OFF.

Switch off all non-essential equipment.

Land as soon as possible.

MAIN INVERTER FAILURE

Move instrument power switch to ALT when main instrument (three-phase) inverter off warning light is illuminated.

FIRE

ENGINE FIRE DURING STARTING

Throttle control OFF.

Master and battery switches OFF.

Leave aircraft as quickly as possible.

STEPS

1 ENSURE INSTRUMENT FLOODLIGHTS IN STOWED POSITION AND, IF AT HIGH ALTITUDE, PULL BALL HANDLE ON BAIL-OUT BOTTLE.

2 LOWER HEAD - PULL UP RIGHT HANDGRIP TO JETTISON CANOPY AND LOCK SHOULDER HARNESS.

WARNING

LOWER HEAD AND BODY AS FAR AS POSSIBLE BEFORE JETTISONING CANOPY

NOTE

SHOULD THE CANOPY FAIL TO JETTISON, OPEN ELECTRICALLY AT SPEEDS BELOW 215 KNOTS IAS. ONCE OPEN, AIRLOADS SHOULD REMOVE THE CANOPY WHEN IT IS DECLUTCHED. IN THE EVENT OF THE CANOPY FAILING TO OPEN ELECTRICALLY, IT IS POSSIBLE TO EJECT THE SEAT THROUGH THE CANOPY BY PULLING EITHER TRIGGER. IT IS IMPORTANT TO FIRST LOWER THE SEAT FULLY, TO PERMIT THE TOP OF THE SEAT RAILS TO STRIKE THE CANOPY AND THEREBY SHATTER THE PLEXIGLASS.

3 PULL UP LEFT HANDGRIP TO PROVIDE HAND SUPPORT DURING EJECTION. THIS WILL ALSO JETTISON THE CANOPY AND LOCK SHOULDER HARNESS IF PULLING THE RIGHT HANDGRIP WAS NOT EFFECTIVE.

4 SIT ERECT, HEAD HARD BACK AGAINST HEADREST, CHIN TUCKED IN.

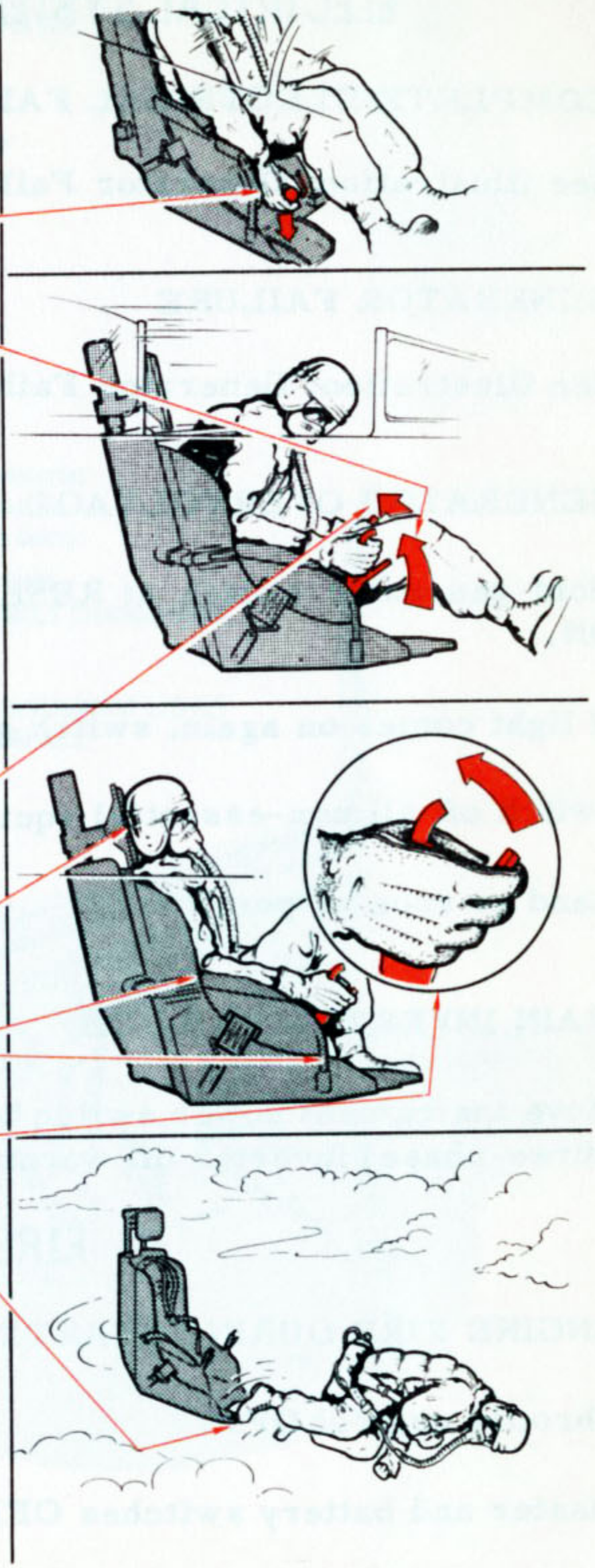
5 HOOK HEELS IN FOOTRESTS AND BRACE ARMS ON ARMRESTS.

6 SQUEEZE EITHER SEAT EJECTION TRIGGER.

7 AFTER EJECTION AND RELEASE OF SAFETY HARNESS, KICK AWAY FROM SEAT.

NOTE

THE PRESENT AUTOMATIC PARACHUTE MAY BE USED SUCCESSFULLY AS LOW AS 400 FEET IN STRAIGHT AND LEVEL FLIGHT.



Ejection Seat Operation

ENGINE FIRE DURING FLIGHT

If forward fire detector light comes on, shut down the engine immediately.

If aft detector light comes on, reduce power and check if light will go out. If light goes out, continue flight at reduced power, landing as soon as possible. If light does not go out, shut down the engine immediately.

If indication of fire persists after shutting down the engine, or if fire goes out and emergency landing is inadvisable - eject.

SMOKE OR FUMES IN COCKPIT

Move cockpit pressure switch to RAM.

Oxygen regulator to 100% OXYGEN.

At lower altitudes, reduce airspeed to 215 knots IAS and open canopy.

DITCHING

Ditching should only be carried out as a last resort. All emergency survival equipment is carried by the pilot and there is no advantage in riding the aircraft down.

UNAVOIDABLE DITCHING

Follow radio distress procedure.

Jettison all external stores.

Disconnect anti-G suit and oxygen hose.

Unlock parachute harness.

Check gear UP and speed brakes closed.

Throttle control OFF.

Jettison canopy.

Lower wing flaps.

Engine master, generator and battery-starter switches OFF.

Manually lock shoulder harness.

Make normal approach and flare out to normal landing attitude, being careful to keep the nose high.

Do not ditch in near-level attitude or aircraft will dive violently on contact.

Printed in Canada

C-L

CANADAIR LIMITED

PUBLICATION No. 115