AN01-65BJE-1

FLIGHT HANDBOOK USAF SERIES F-84G AIRCRAFT



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Paragraphs NOT covering all the aircraft series in this handbook are identified by code letters which appear at the top right corner of the paragraph. The code letter assigned to aircraft series are as follows:

A - G-1RE

R - G-2RE

_ G - 5 RE

_ G - 6 RE

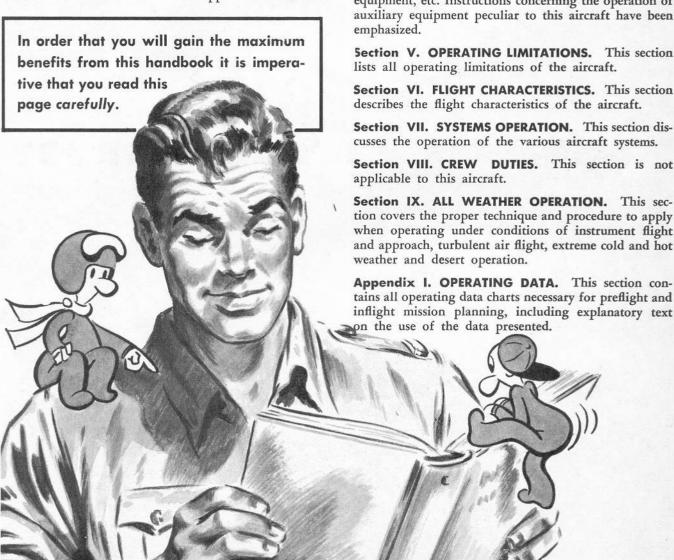
- G-10RE

- - G-11RE

In a few instances reference must be made to aircraft within a series by serial number. This is designated by the code letter followed by a number in parenthesis. The number will designate the specific serial numbers and will be identified at the bottom of each page on which it appears. Paragraphs applicable to all aircraft series in the handbook are not coded.

FOREWORD

This handbook contains all the information necessary for the operation of the airplane during normal and emergency flight. These instructions are not intended to teach the basic principals of flight, but are designed to provide the pilot with a general knowledge of the airplane, its flight characteristics, the specific normal and emergency procedures to be used in operating the airplane and its related equipment. The pilot's flying experience is recognized, and elementary instructions have been avoided. The information contained herein is kept current by frequent revisions, but since revisions take time, changes affecting the airplane, flight procedures, or critical flight restrictions are issued immediately as short Technical Orders in the 01-65BJ series. These Technical Orders supersedes the Flight Handbook. Consult your base Technical Order index to be sure you have the latest issue of the Flight Handbook and for the effectivity of short Technical Orders. The handbook is divided into nine sections and an appendix as follows:



Section I. DESCRIPTION. This section describes the aircraft and all its systems and controls which contribute to the physical act of flying the aircraft. Also included is a description of all emergency equipment which is not part of the auxiliary equipment.

Section II. NORMAL PROCEDURES. This section presents the steps of procedure to be accomplished from the time the aircraft is approached by the pilot until it is left parked after accomplishing one complete nontactical flight under normal conditions.

Section III. EMERGENCY PROCEDURES. This section describes the procedure to be followed in meeting any emergency (except those in connection with the auxiliary equipment) that could reasonably be expected.

Section IV. DESCRIPTION AND OPERATION OF AUXILIARY EQUIPMENT. This section includes a description, normal operation and emergency operation, of all equipment not directly contributing to flight such as armament equipment, oxygen system, communication equipment, etc. Instructions concerning the operation of auxiliary equipment peculiar to this aircraft have been

Section V. OPERATING LIMITATIONS. This section

Section VI. FLIGHT CHARACTERISTICS. This section describes the flight characteristics of the aircraft.

Section VII. SYSTEMS OPERATION. This section discusses the operation of the various aircraft systems.

Section VIII. CREW DUTIES. This section is not

Section IX. ALL WEATHER OPERATION. This section covers the proper technique and procedure to apply when operating under conditions of instrument flight and approach, turbulent air flight, extreme cold and hot

tains all operating data charts necessary for preflight and inflight mission planning, including explanatory text

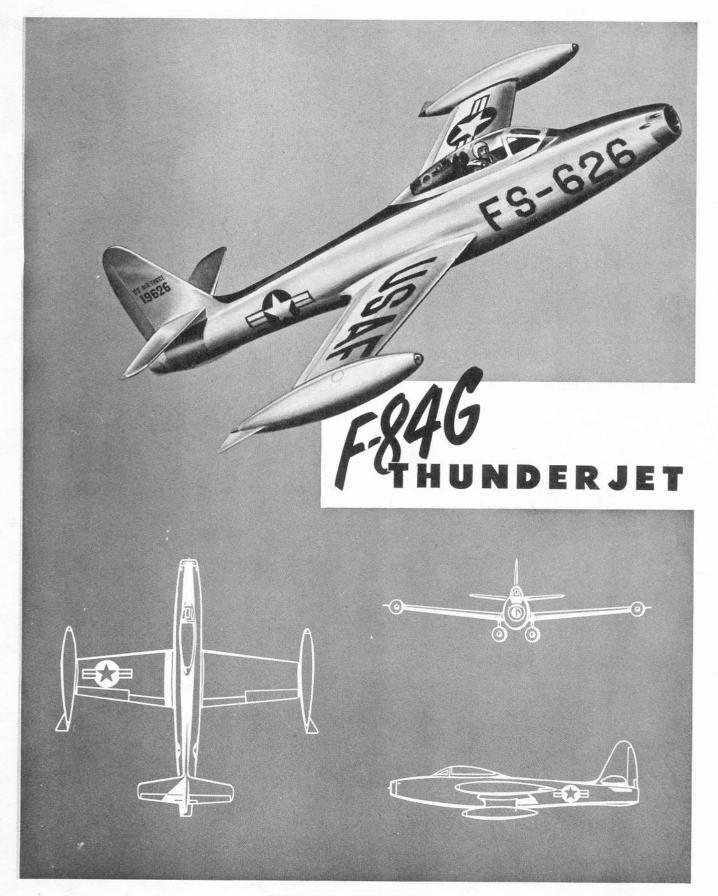


Figure 1-1. F-84G Airplane



AIRPLANE.

The airplane is a single-place, high speed, jet propelled, mid-wing fighter built by Republic Aviation Corporation. The airplane is semi-monocoque in design and of all-metal stressed skin construction equipped for pressurization at altitudes above 10,000 feet. The pilot's seat is a catapult type, roller mounted in channel rails and attached to an ejection cylinder. The canopy is jettisoned with the aid of pneumatic guns which remove the canopy without danger of injury to the pilot. The canopy and seat jettison controls are interconnected so that the canopy is jettisoned before the seat is ejected. The airplane is equipped with an automatic pilot, inflight refueling system, single point refueling system, and a hydraulic aileron boost with a variable ratio. Armament consists of a gun-bomb-rocket sight with a radar range finder, a gun camera, four .50 caliber fuselage guns, two .50 caliber wing guns and two jettisonable bomb rack adapters.

ENGINE.

The airplane is powered by an AF Model J35-A-29 jet propulsion engine rated at 5,600 pounds thrust. The

engine consists of a multi-stage axial flow compressor, eight combustion chambers, a single stage gas turbine, an exhaust cone and an accessory section. Air enters the compressor through the annular duct in the forward section of the fuselage. The ram air is compressed to approximately five atmospheres at rated power. The compressed air is admitted to combustion chambers where it is mixed and burned with the fuel sprayed from the fuel nozzles. Combustion is continuous once ignition is accomplished. The hot combustion gases are conducted through turbine nozzles to the turbine wheel, through the exhaust cone and tailpipe where the gases are expanded to atmospheric pressure.

ENGINE FUEL CONTROL SYSTEM.

The engine fuel control system (figure 1-3) is designed to maintain constant rpm during normal operation; however, during emergency operation, the system does not maintain constant rpm for as many variables as it does during normal operation, due to the lack of the many compensatory units provided in the normal operating system. The engine fuel control system consists mainly of an engine driven dual fuel pump, main and

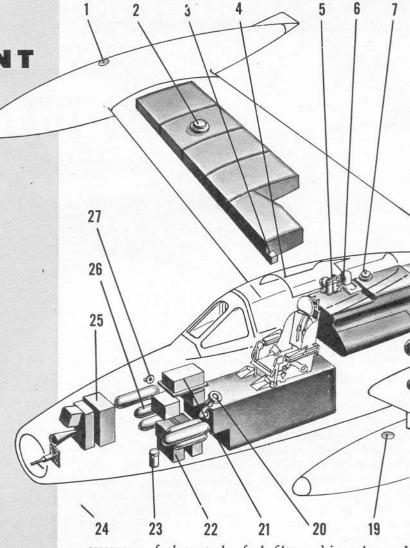
TABLE 1-1. AIRPLANE DIMENSIONS AND GROSS WEIGHT

AIRPLANE DIMENSIONS
Approximate overall dimensions are as follows:
LENGTH
WING SPAN 36.4 ft
WING SPAN (with tip tanks) 39.6 ft
HEIGHT (to top of fin) 12.6 ft
TREAD 16.6 ft

AIRPLANE GROSS WEIGHT Approximate gross weights of the airplane in various configurations are as follows: NORMAL GROSS WEIGHT 15,300 SAMPLE CONFIGURATIONS: Interceptor 15,300 Escort Fighter 18,600 Fighter Bomber 21,900 Penetration Fighter 22,200

General ARRANGEMENT DIAGRAM 1. Wing Tip Tank Filler 2. Wing Fuel Tank Filler 3. External Power Receptacle 4. Radio Compass Antenna

- Cockpit Pressure Regulator
 Radio Compass Loop Antenna
- 7. Cockpit Pressure Dump Valve
- 8. Main Fuel Tank Filler
- 9. Engine Oil Tank Filler
- 10. Identification Radio Equipment
- 11. Radio Compass Equipment
- 12. Command Radio Equipment
- 13. Command Radio Antenna
- 14. Position Light
- 15. Hydraulic Oil Tank Filler
- 16. Alcohol Tank Filler
- 17. Jet Engine
- 18. High Pressure Oxygen Bottle
- 19. Pylon Tank Filler
- 20. Forward Fuel Tank Filler
- 21. Sight Computer Equipment
- 22. Batteries
- 23. Battery Drain Jar
- 24. Pitot Tube
- 25. Radar Equipment
- 26. Low Pressure Oxygen Bottles
- 27. Oxygen Filler Valve



emergency fuel controls, fuel filters, drip valve and nozzles. The dual fuel pump includes two sets of gears, one set comprising the main fuel pump and the other set forming the emergency pump. The two sets of gears are driven by concentric shafts, with the shear section on each shaft located so that failure of the shear section of either pump will not interfere in the operation of the drive shaft of the alternate pump. The emergency system may be selected directly by the pilot or alerted so that if the main pump pressure drops below approximately 80 psi the emergency pump will take over. An indicator is provided to signify which system is operating.

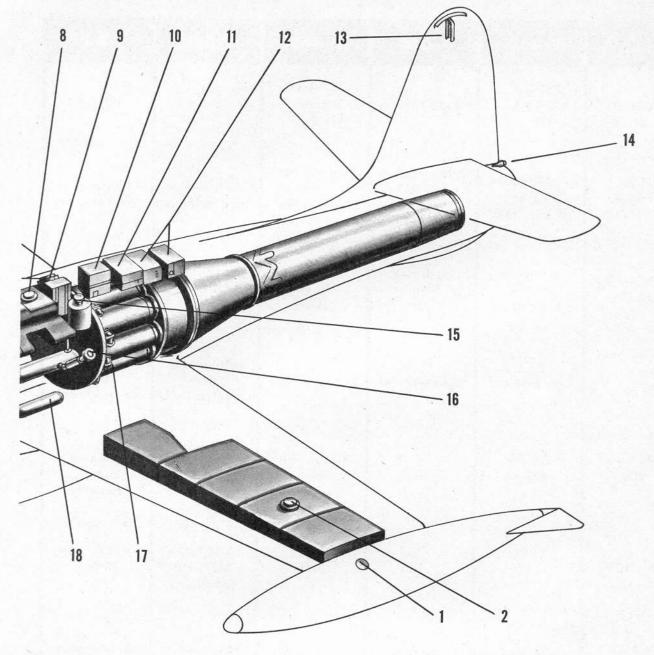
Note

Note that emergency operation is possible only when electrical power is available, since it is dependent on solenoid valves.

MAIN FUEL CONTROL.

The main fuel control is designed to adjust fuel flow to the engine so as to prevent overspeeding beyond a

Figure 1-2. General Arrangement Diagram

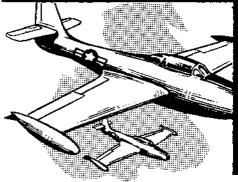


maximum governed speed, to preserve constant engine speed by compensating for changes in air density with changes in altitude, to limit the engine acceleration rate so as to prevent excessive exhaust gas temperature, to limit the engine deceleration rate so that the combustion flames will not be extinguished, and to provide a means of selection of the emergency fuel control system whenever a failure occurs in the main fuel control system. The fuel flow adjustments are made automatically by barometric and governing controls. As engine rpm tends to exceed the prescribed limit, the governor control opens a by-pass valve to permit excess fuel to return to the fuel pump thus preventing engine overspeed and the barometric control provides correct amounts of fuel during changes in altitude by by-passing fuel supply with decreased air density.

EMERGENCY FUEL CONTROL.

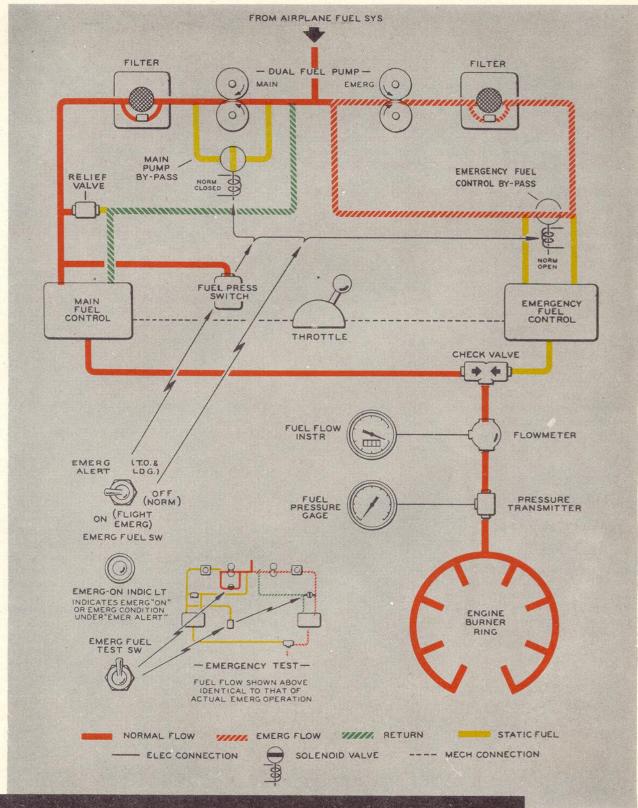
The emergency fuel control adjusts fuel flow in the event of failure of the main fuel pump or the main fuel control system. The emergency fuel control incorporates a barometric device similar to the one in the main fuel control, which insures a constant speed during altitude changes but lacks the governing device of the normal system for preventing engine overspeed and does not prevent rapid engine acceleration and deceleration; therefore, the throttle must be moved with caution to prevent overspeeding, excessive exhaust temperatures or flame-out, when operating on the emergency fuel system. The emergency fuel control is adjusted to provide 100% engine rpm on the ground on a 100°F day; therefore, available full throttle rpm will vary with free air temperature and altitude.

AIRPLANE MODEL	F-84B	F-84C	F-84D	F-84E	F-84G
ENGINE	J35-C-3 J35-A-5 J35-A-15	J35-A-13	J35-A-17 Derated J35-A-29	J35-A-17	J35-A-29
FUEL SYSTEM CONTROLS	Toggle switches up to F-84B-21RE	Rotary switch F-84B-21RE up to F-84C-11RE	Manual fuel tank selector F-84C-11RE and up	Manual fuel tank selector	Manual fuel tank selector
LANDING GEAR	Hydraulic Shrink Struts	Hydraulic Shrink Struts	Mechanical Shrink Struts	Mechanical Shrink Struts	Mechanical Shrink Struts
TRIM TABS	Conventional	Conventional	Conventional	Left aileron and elevators only	Left aileron and elevators only
CANOPY	Jettison	Jettison	Jettison with canopy remover	Jettison with canopy remover	Jettison with canopy remover
GUN SIGHT	K-14B	K-14B	A-1C	A-1C with APG-30 provisions	A-ICM with APG-30
BOMB RACKS	Fixed Pylon	Fixed Pylon	Fixed Pylon	Jettisonable pylon	Jettisonable pylon



Hirplanes F-84B through F-84G
MAIN DIFFERENCES TABLE

TABLE 1-2. MAIN DIFFERENCES



ENGINE FUEL CONTROL SYSTEM Schematic

Figure 1-3. Engine Fuel Control System - Schematic

EMERGENCY FUEL SWITCH.

The emergency fuel system is controlled by an emergency fuel switch (18, figure 1-17). The switch has three positions which are: ON (FLIGHT EMERG), OFF (NORM) and EMERG ALERT (T.O. & LDG). The EMERG ALERT position energizes the fuel pressure switch so that a reduction in main fuel pump pressure to approximately 80 psi will open the main pump by-pass valve and close the emergency fuel control bypass valve, so that output of the emergency fuel pump will be immediately available. The fuel system emergency-on indicator light will illuminate to show that the emergency system is operating. The ON (FLIGHT EMERG) position opens the main fuel pump by-pass valve, closes the emergency fuel control by-pass valve and illuminates the emergency-on indicator light regardless of fuel pressure in the main fuel system or the position of the fuel pressure switch.

Note

Since the fuel pressure switch is set to close at a pressure drop below approximately 80 psi, a partial power failure in the main fuel system may not be great enough to close the fuel pressure switch when operating in the EMERG ALERT position.

EMERGENCY FUEL TEST SWITCH.

An emergency fuel test switch (17, figure 1-17) is provided to simulate main fuel pump failure and check the operation of the emergency fuel system. The emergency fuel test switch is a spring loaded type switch protected by a red cover guard which is marked EMERG TEST.

Emergency-on L Actuation of the fuel pressure switch due to INDICATOR low fuel pressure with the emergency fuel LIGHT switch in the ALERT The emergency-on indicator (T.O. & LAND) posi-(37, figure 1-16) located on the instrument panel, is an amber light and when illuminated indicates that the emergency fuel system is operating. The light will go on in any one of the following conditions. 2. If the emergency fuel switch is in the ON (FLIGHT EMERG) po-3. If the emergency fuel test switch is held in the EMERG TEST position.

Figure 1-4. Emergency-On Indicator

Holding the emergency fuel test switch in the EMERG TEST position alerts the fuel pressure switch and opens the main fuel pump by-pass valve which lowers the normal fuel pressure. The fuel pressure switch senses the lowered pressure and closes the emergency fuel control by-pass valve and the fuel system emergency-on indicator light illuminates to show that the engine is operating on the emergency fuel system. When testing the emergency fuel system the emergency fuel switch must be OFF so that the normal fuel system will take over after completion of the test.

FUEL PRESSURE GAGE.

The fuel pressure gage (21, figure 1–16) indicates fuel pressure at the fuel manifold.

THROTTLE

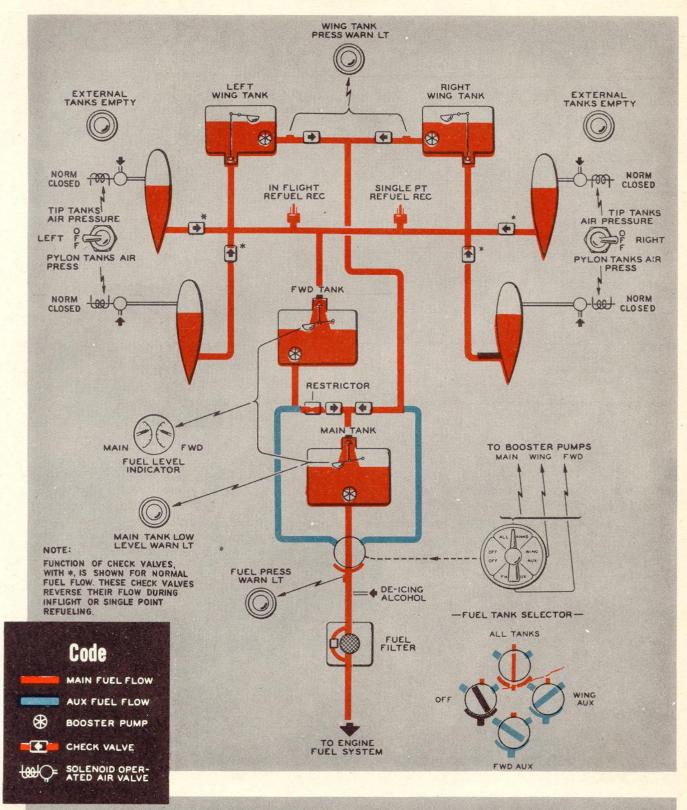
Engine rpm is mechanically controlled by the throttle (37, figure 1-17) which is mounted on the left console. Advancing the throttle from the CLOSED position, open the fuel system stopcock thereby supplying fuel to the engine. Continued movement of the throttle to the OPEN position increases the rpm of the engine until maximum rpm is reached. A gate stop, is provided near the aft end of the throttle travel to prevent inadvertent reduction of the throttle below idle position. The gate stop is marked IDLE STOP and can be by-passed by down thumb pressure when the engine is to be stopped. Throttle creep is prevented by an adjustable friction lock (40, figure 1-17). The throttle incorporates a caging button (red button) for the gun-bomb-rocket sight, a microphone press-to-talk button (black button) and a twist grip for operating the gun-bomb-rocket sight manual range control. A detent at the counter clockwise end of rotation of the twist grip is provided for use with the radar range control.

IGNITION.

The fuel-air mixture in the engine is ignited by an automatic ignition system which incorporates a spark plug in number 1 and 5 combustion chambers. Once the engine is started, and rpm reaches approximately 22%, the ignition system is no longer used as burning in the combustion chambers is continuous. Power for the ignition system is supplied solely from the main inverter. The main inverter derives its operating power from the primary bus; however, the power to turn the main inverter on is supplied from the secondary bus. Therefore, if ignition is required when secondary bus is not energized (external power from No. 2 receptacle only or generator not operating) the instrument power switch is positioned to the alternate position. This supplies power from the primary bus through an ignition relay to turn the main inverter on and at the same time the alternate inverter is operating to supply power to the instruments. The main inverter will operate only as long as the starting system is energized with the instrument power switch in the alternate position. In the event the main inverter fails it will be impossible to accomplish an air start or a ground start. The ignition system is operated by the ground start or air start switches which are discussed under STARTING SYSTEM.

STARTING SYSTEM.

The starter and generator are combined into one unit, mounted on the front of the engine and using a common drive. The starter motor is a 28 volt, d-c type



AIRPLANE FUEL SYSTEM Schematic

Figure 1-5. Airplane Fuel System - Schematic

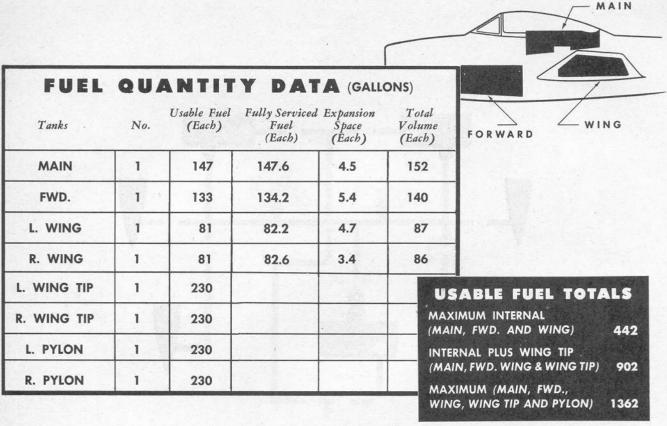


Figure 1-6. Fuel Tank Elevation and Capacities

and is controlled by air start and ground start switches. The starter is energized from the airplane batteries or from the No. 1 or No. 2 external power receptacles. However, as indicated in the IGNITION discussion, ignition is not available for starting if start is from the airplane batteries or No. 2 external power receptacle alone, unless the instrument power switch is in the alternate position (even though the starter is in operation).

GROUND START SWITCH.

The ground start switch (2, figure 1–18) is a three position switch spring-loaded to the OFF position. The switch positions are GROUND START, OFF and STOP STARTING CYCLE. Actuating the ground start switch for two seconds to the GROUND START position engages an automatic starting system which energizes the starter and ignition systems. This system continues to function until the engine has reached approximately 22% rpm, at which time operation of the starter and ignition systems automatically ceases. If the engine fails to reach 22% rpm, the starter and ignition systems will continue to operate until the ground start switch is placed momentarily in the STOP STARTING CYCLE position which will arrest the operation of the starter and ignition systems.



To assure operation of the automatic starting system and prevent damage to the starter from prolonged use when starting the engine, the ground start switch must be placed in the STOP STARTING CYCLE position after the engine has reached 22% rpm.

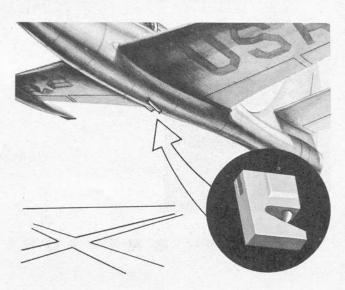


Figure 1-7. Jato Installation

AIR START SWITCH.

The air start switch (1, figure 1–18) is a three-position switch spring-loaded to the OFF position. The switch positions are: AIR START, OFF and STARTER ONLY. Actuating the air start switch momentarily to the AIR START Position, energizes the ignition system for a period of approximately 2 minutes. Placing the air start switch in the STARTER ONLY position energizes the starter which will operate only as long as the switch is held in the STARTER ONLY position. This position is used for ground test of engine rotation.

ASSIST TAKE-OFF SYSTEM.

Provision is made for the installation of two or four jato units. In the two jato configuration the jato units are installed on electrically retractable hooks on the underside of the fuselage. In the four jato configuration two units are installed on each of two adapters which in turn are attached to the electrically retractable hooks on the underside of the fuselage. The adapters are jettisoned with the jato units. The design of the jato hooks are such that the jato units can not be jettisoned while they are producing thrust.

JATO READY SWITCH.

The jato ready switch (21, figure 1-17) is a switch-type circuit breaker and has two positions: OFF and JATO READY. The JATO READY position illuminates the jato ready warning light (41, figure 1-17) and supplies power to the jato-ignition and jato jettison switches.

JATO IGNITION SWITCH.

The jato ignition switch (42, figure 1-17) is a push button type switch marked JATO IGNITION, and when pushed in supplies ignition to the jato units. The jato ignition switch is inoperative unless the jato ready switch is in the JATO READY position.

JATO JETTISON SWITCH.

The jato jettison switch (20, figure 1–17) has two positions: OFF and JATO JETTISON, and is guarded in the OFF position by a red cover guard. The JATO JETTISON position will jettison the jato units and adapters and retract the jato hooks. Approximately 4 seconds are required to complete the hook retracting cycle. The jato jettison switch is inoperative unless the jato ready switch is in the JATO READY position.

CAUTION

Recommended jato jettision speed is between 250 and 300 mph IAS. If the jato units are jettisoned at higher speeds they may strike and damage the rear hooks and fuselage.

OIL SYSTEM.

The engine incorporates a dry sump, full scavenge lubrication system. Oil is supplied from a 65.7 lb (9 U.S. gal) capacity oil tank located aft of the main fuel tank. Scavenged oil is pumped through a heat exchanger,

located on the bottom of the compressor casing, and returned to the oil tank. Oil grade and specifications are noted in the servicing diagram figure 1-25.

FUEL SYSTEM.

The airplane fuel system (figure 1-5) is designed to provide automatic fuel transfer during normal operation without attention from the pilot. Fuel from all tanks, internal and external, is transferred to the main tank simultaneously and in such rate as to maintain a favorable c.g. However, fuel flow may be altered from the normal automatic sequence by the use of a manual selector valve. The airplane is basically equipped with four internal, self-sealing fuel tanks. A main tank is installed behind the pilot, a forward tank under the cockpit floor, and a set of five-celled, interconnected tanks in each wing. In addition four tanks may be carried externally; one on each wing tip and one by each of two pylons. These external tanks may be cleanly jettisoned and, with some modification, are interchangeable. Normal fuel feed order is from the internal wing and forward tanks to the main tank until aggregate fuel drops below float valve levels, then the external fuel transfers to the internal wing and forward tanks maintaining them full. The process continues until all fuel has flowed into the main tank. Fuel flow is effected proportionately to automatically maintain the required c.g. location. Transfer of fuel from external to internal tanks is by means of air pressure, and manually controlled by selector switches. Internal tank fuel is pumped into the main tank by booster pumps which operate automatically, according to the position of the fuel tank selector. Also the pilot may vary the sequence of fuel feed by setting the manual fuel tank selector to allow a direct feed to the engine from either the internal wing tanks or the forward tank. The system is provided with a flowmeter which indicates rate of fuel flow and total remaining. Provisions for ground refueling of the airplane from a single point are made through a receptacle in the right wheel well, and the associated electrical circuits. The equipment is designed to operate in conjunction with the in-flight refueling system. The refueling truck must be equipped with a single-point nozzle and must be capable of delivering fuel at 500 gpm under a pressure of 50 psi. A safety cap fitted with a spring-loaded seal covers the receptacle when the equipment is not in use. The airplane is provided with an inflight refueling system and a fuel filter deicing system which are covered in Section IV.

FUEL SPECIFICATION AND GRADE.

Recommended and alternate fuel specifications and grade are noted on the servicing diagram, figure 1-25.

BOOSTER PUMPS.

A booster pump is provided in the main fuel tank to supply fuel to the engine fuel control system. Booster pumps in the wing and forward tanks normally transfer fuel from these tanks to the main tank but also may be used to supply the engine fuel control system directly by proper positioning of the fuel tank selector. All the booster pumps are electrically operated and are

ALL TANKS

The ALL TANKS (normal) position sets all booster pumps in operation and channels all internal fuel into the main tank. The main tank empties through the main feed line until a float valve in the tank opens to receive fuel from the wing and forward tanks. When the fuel level in the wing and forward tanks drop, float valves in the tanks open to receive fuel from the pylon tanks, if installed, and then the wing tip tanks. When external tanks have emptied, fuel from the wing and forward tank enter the main tank simultaneously. These tanks empty at rates which vary to maintain favorable cg travel, so that approximately 0 to 52 gallons will still be in the forward tank after the wing tanks have emptied. The remaining forward and main tank fuel is then used.

WING AUX.

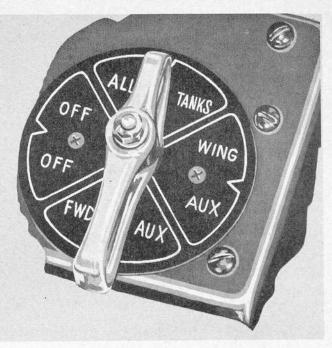
The WING AUX position sets the wing tank booster pumps operating and routes wing tank fuel directly to the engine driven fuel pump. No other booster pumps will operate when the control is in this position. Operation in WING AUX will normally be selected if there is a failure of the main tank booster pump. In that case some fuel will transfer into the main tank until the tank is full at which time the float valve in the tank will shut-off the entrance and all fuel will then pass to the engine.

External tank fuel will transfer to the wing and forward tanks if the external tanks air pressure switches are placed in either the TIP TANKS AIR PRESSURE or PYLON TANKS AIR PRESS positions. When the forward tank is full all external tank fuel will then transfer to the wing tanks.

FWD AUX.

The FWD AUX position operates the forward tank booster pump only and sends forward tank fuel directly to the engine driven pump. No other booster pumps will operate when the control is in this position. As in the WING AUX position some fuel will transfer into the main tank until the tank is full at which time the float valve in the tank will shut-off the entrance and all fuel will then pass to the engine. External tank fuel will transfer to the wing and forward until the wing is full then all external fuel will transfer to the forward.

Figure 1-8. Fuel Tank Selector



controlled by a rotary switch mechanically connected to the fuel tank selector. At altitudes below 6,000 feet, full engine rpm may be maintained with a failed booster pump under all conditions. Satisfactory reduced power engine operation may result up to 20,000 feet if operating on JP-1 fuel, on cool JP-3 or on cool gasoline. Operation of the engine from a tank containing a failed booster pump may result in vapor lock and damage or complete failure to the engine driven fuel pump if operating above 6,000 feet on hot fuel or above 20,000 on JP-1 or cool fuel. Caution must be observed when switching from a fuel tank without the booster pump operating to a fuel tank with the booster pump operating as the engine rpm may surge enough to cause an acceleration flame-out. Fuel from the wing or forward tanks can not be transferred to the main fuel tank without the aid of the booster pumps in the respective tanks, however fuel may be fed directly to the engine from the forward tank up to 6,000 or 20,000 feet, depending on the fuel, with an inoperative booster pump. It is possible to feed in this manner from the wing tanks but operation under these conditions is prohibited due to the lack of wing fuel tank level indicators. There are no direct indicators to show when a booster pump is not operating, however, booster pump failure may be suspected as noted under fuel system indicators.

FUEL TANK SELECTOR.

(See figure 1-8)

CAUTION

In auxiliary operation, WING AUX should be used before FWD AUX to maintain favorable c.g. travel.



Figure 1-9. External Tanks Air Pressure Switches

EXTERNAL TANKS AIR PRESSURE SWITCHES (See figure 1-9)

FUEL TANK BATTLE DAMAGE SWITCHES.

Fuel tank battle damage switches (10, figure 1-17) are provided to close the fuel shut-off valves in the internal wing and forward tanks; so that fuel will not transfer to these tanks. Refer to Section IV for detailed description.

TIP TANK JETTISON SWITCH.

The tip tank jettison switch (32, figure 1-17) is a spring loaded switch guarded by a red cover guard which is marked TIP TANK JETTISON. If the jettison switch is held in the TIP TANKS JETTISON position momentarily, electrically actuated solenoids will jettison the wing tip tanks simultaneously.

MANUAL TIP TANK RELEASE.

The manual tip tank release (33, figure 1–16) is a red handle marked TIP TANKS. This manual release is interconnected with a rocket release so that when the manual release is pulled aft the tip tanks and any rockets that are carried will be jettisoned simultaneously. The manual release is mechanically actuated and is used in the event of electrical power failure.

BOMB RELEASE SWITCH.

The pylon tanks are jettisoned in the same manner as for manually releasing bombs. When the pylon tanks are jettisoned, two compressed air cylinders push the forward and aft ends of the tank down, so that there is a clean break from the airplane. See bomb release switch in Section IV.

BOMB PYLON JETTISON SWITCH.

The pylon tanks can be jettisoned by actuating the bomb pylon jettison switch, as noted in Section IV. This drops the pylons and pylon tanks as a unit.

SALVO SWITCH.

The tip tanks and pylon tanks can be jettisoned simul-



through a pressure regulator to the respective tanks to transfer fuel to the forward and wing fuel tanks.

One switch is marked LEFT and the other RIGHT. When the switches are in either the TIP TANKS AIR PRESSURE or the PY-LON TANKS AIR PRESS position, compressed air from the engine is directed

taneously with the salvo switch as noted in Section IV. This will also salvo the rockets, providing the aircraft is airborne.

EXTERNAL TANKS EMPTY INDICATORS.

Two external tanks empty indicators (15, figure 1-17) are amber colored lights marked EXT TANKS EMPTY. One light is marked LEFT and the other RIGHT. When the light illuminates it indicates that the tank, noted by the position of the external tanks air pressure swiches, is empty. The light will go out if the external tanks air pressure switch is placed in the OFF position.

WING TANK PRESSURE WARNING LIGHT.

The wing tank pressure warning light (34, figure 1-16) is an amber light marked WING TANK PRESS. WARN and when on indicates the pressure in the fuel lines is below approximately 5 psi and that one or both wing tanks are empty or the booster pump in one or both wing tanks have failed. When operating on WING AUX full rpm of the engine may be maintained with a failed booster pump in the wing up to approximately 6,000 feet altitude, however, there will be no indicator to show when the wing tanks are empty as the wing tank pressure warning light, which would normally indicate empty wing tanks will remain on at all times. In the event of a failed booster pump in one wing, fuel will not be transferred from that wing and the remaining fuel will affect trim only slightly and may even be unnoticeable.

CAUTION

In normal operation the flicker or light-on condition of the wing tank pressure warning light is disregarded, since fuel is being fed to the engine from the main tank; however, in WING AUX operation, engine is being fed directly from the wing tanks and at the first flicker or flash of the warning light select the FWD AUX position immediately (if fuel remains in the forward tank) to assure against flame-out. Empty the forward tank first then switch to the ALL TANKS position to maintain a favorable cg location.

MAIN TANK LOW LEVEL WARNING LIGHT.

The main tank low level warning light (23, figure

1-16) is a red light marked MAIN TANK LOW LEVEL and will illuminate when there are 700 pounds or fuel or less remaining in the main tank.

FUEL PRESSURE WARNING LIGHT.

The fuel pressure warning light (19, figure 1–16) is a red light marked PRESSURE WARNING and when illuminated indicates the pressure in the fuel feed line to the engine driven fuel pump has dropped to approximately 3 psi.

FUEL LEVEL INDICATOR.

The fuel level indicator (28, figure 1–16) is a volumetric type instrument controlled by the position of the liquidometer floats in the forward and main tanks. Two pointers on the dial of the instrument indicate the amount of fuel in the forward and main tanks in pounds.

Note

The fuel level indicator is calibrated at 6.41 lbs/gal and will therefore read too high when fuel of a lower density is used, and too low with a higher density fuel.

FUEL FLOW INSTRUMENT.

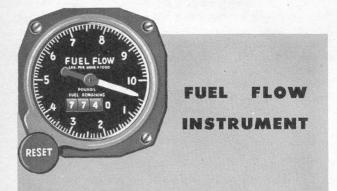
FUEL FLOWMETER.

The flowmeter indicates the amount of fuel being consumed in lbs per hr. The flowmeter is subject to error depending on fuel grade, fuel density, fuel temperature and the instrument error. The error may amount to more than 20% of the reading.

FUEL COUNTER.

10

The fuel counter must be set, using the reset knob at the front of the instrument, to read the amount of useable fuel in the aircraft each time the tanks are serviced. As fuel is consumed the fuel counter reading



The fuel flow instrument located on the instrument panel incorporates a fuel flowmeter and a fuel counter. The instrument is actuated by AC power through a fuel flow transmitter mounted on the engine which registers all fuel consumed regardless of whether the normal or emergency fuel systems are used.

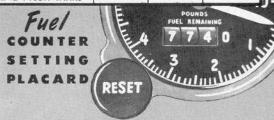
Figure 1-10. Fuel Flow Instrument

FROM THE CLOSED POSITION

SETTING OF FUEL COUNTER

- 1. Fill fuel tanks to spill-over level and set counter to values noted.
- 2. If mixed fuels are in the airplane set totalizer to the lower value.
- 3. If counter reaches "ZERO REMAIN" and main tank gage shows fuel \longrightarrow disregard counter.

FUEL ABOARD	JP-1 MIL-F-5616	Grade JP-4 or JP-3 MIL-F-5624	GASOLINE LOWEST GRADE AVAILABLE MIL-F-5572
INTERNAL 442 GALLONS	2570	2429	2451
INTERNAL +185 GAL. TIP TANKS	4559	4282	4350
INTERNAL +230 GAL. TIP TANKS	5017	4708	4789
INTERNAL $+230$ GAL. TIP & PYLON TANKS	7488	7028	7151



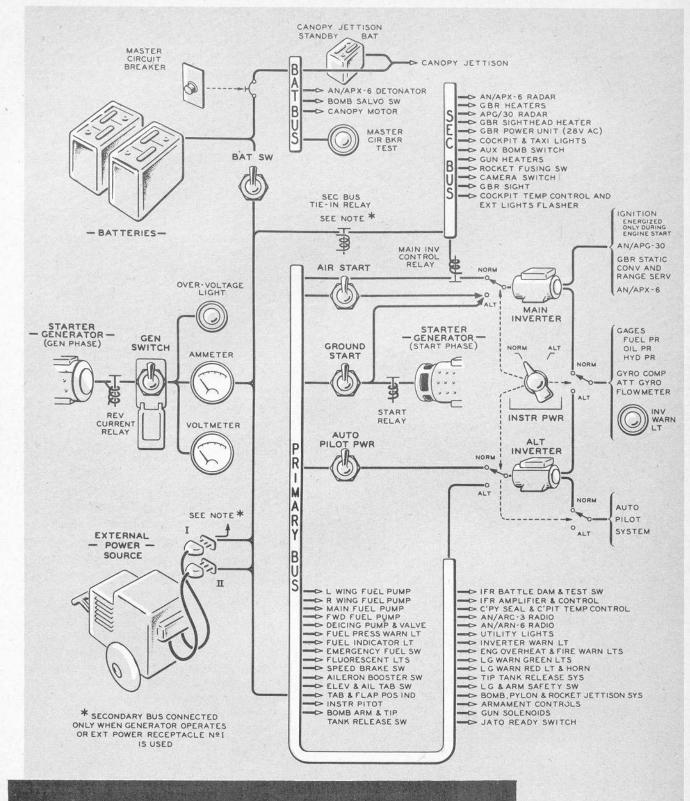
The fuel counter setting placard is stowed in the map case and gives instructions for setting the fuel counter after the various fuel tanks have been serviced. The counter settings noted on the placard are below the actual fuel weights by an amount equal to the maximum possible counter error. This assures the pilot that the fuel will not be exhausted before the counter reads zero except for the possible error listed under the fuel counter.

Figure 1-11. Fuel Counter

decreases and shows the amount of fuel remaining in the aircraft in pounds. The reading on the counter will be accurate except under the following conditions:

- 1. Any fuel which is released when the wing tip or pylon tanks are jettisoned will not be recorded.
- 2. Any fuel leaking from the tank vent or a fuel line upstream of the flow transmitter will not be recorded.
- 3. Evaporation and/or boiling of fuel in the tanks may result in losses up to 1000 lbs depending on use of warm or hot fuel at the time of take-off, high rate of climb or high cruising at altitude. Loss of fuel from evaporation and/or boiling is more likely with MIL-F-5624, grade JP-3 or MIL-F-5572, lowest grade available than with MIL-F-5616, grade JP-1 or MIL-F-5624, grade JP-4 fuel.

Any one, or a combination of these factors may exist; therefore, the main tank fuel level indicator or main tank low level warning light may indicate that the actual fuel load is less, toward the end of a flight, than the indication given by the counter. This must be taken into account in planning a long flight at high altitude when the fuel reserve for landing will be marginal.



ELECTRICAL SYSTEMS Schematic

Figure 1-12. Electrical Power Supply Systems - Schematic



ELECTRICAL POWER SUPPLY SYSTEM.

D-C SYSTEM.

The 28-volt d-c system is powered from a 400 ampere, engine-driven starter-generator. The system also incorporates two 12-volt batteries connected in series and external power receptacles for the accommodation of an external battery cart. A 4.5-volt canopy jettison battery is provided and is reserved strictly for canopy jettisoning in event of failure of the normal electrical systems. Electrical power is distributed through a three bus system consisting of: a battery bus, a primary bus, and a secondary bus. The battery bus services emergency equipment and remains energized regardless of battery's switch position or generator operation. The primary bus services equipment essential to flight and is energized by the battery, generator and both external power receptacles. The secondary bus services equipment not essential to flight and is energized only by receptical No. 1 and the generator. Therefore, in the event of generator failure in flight, all equipment not essential to flight will be automatically cut out since the secondary bus will cease to be energized. Thus, battery power will be conserved for primary bus equipment, (i.e. equipment essential to flight). A master circuit breaker is provided in the system to de-energize the battery bus when ground personnel are working on the aircraft. The two external power receptacles are marked No. 1 and No. 2. No. 1 energizes the primary and secondary buses and No. 2 energizes the primary bus only. Therefore, No. 1 receptacle must be used for operational check of electrical equipment.

Note

Secondary bus is not energized by the aircraft battery.

A-C SYSTEM.

The a-c system is powered from two single phase, 115-volt, 400 cycle inverters; one known as a main inverter and the other as an alternate. The main inverter requires power from the primary and secondary buses and will therefore not be available if secondary bus (or generator) fails except for ignition during an air start. The alternate inverter is powered from the primary bus and therefore in event of generator failure all a-c energized instruments (which are necessary for flight) will operate. A switch for the selection of the inverters and a light for indication of failure of either inverter are provided in the cabin.

MASTER CIRCUIT BREAKER INDICATOR LIGHT.

The master circuit breaker indicator light (34, figure 1–19) is marked LIGHT ON INDICATES MASTER CB CLOSED. When the indicator light is pressed, and illuminates, it shows that the master circuit breaker, located adjacent to the battery, is closed.

BATTERY SWITCH.

The battery switch (3, figure 1–20) is a toggle switch having two positions ON and OFF. It controls power from the battery to the primary bus. Energy to the battery bus is independent of the battery switch positions.

GENERATOR SWITCH AND OVER-VOLTAGE LIGHT.

The generator is controlled by a generator switch (4, flgure 1–20). Generator circuit over-voltage is indicated by the illumination of a generator over-voltage light (8, figure 1–20) which is marked GEN. OUT FROM OVER VOLTAGE. The generator switch positions are ON, OFF and RESET. If the over-voltage light becomes illuminated the generator switch is placed in the RESET position for a few seconds to reset the over-voltage relay. If the generator over-voltage light remains on after reset, the generator switch is placed in the OFF position. The generator over-voltage light will remain on; however, the generator will not be in the electrical circuit. The generator switch is guarded in the ON position by a red cover guard.

INSTRUMENT POWER SWITCH. (INVERTER SELECTION)

The instrument power switch (6, figure 1–20) has two position; NOR and ALT. The NOR position supplies power from the main inverter to the instruments and ignition circuits if the generator is operating or an external power supply is connected to the No. 1 external power receptacle. The NOR position also supplies power from the alternate inverter to the auto-pilot if the primary bus is energized. The ALT position supplies power from the alternate inverter to the instruments in the event of failure of the main inverter or ignition from the main inverter when making an air start. The ALT position must be used to supply ignition to the engine if the generator is inoperative or external power supply is not connected to the No. 1 external power receptacle.

CIRCUIT BREAKERS.

Circuit breaker panels are provided to protect the various electrical circuits in the airplane. The circuit breakers are of the push button type and are pushed in to reset.

AMMETER.

The ammeter (9, figure 1–18) is marked LOAD and indicates the load being drawn from the generator in percent from 0 to 100% with provisions for an additional 25% reading to indicate over-load and a minus 10% reading to indicate discharge.

VOLTMETER.

A voltmeter (5, figure 1-18) indicates the voltage output of the generator.

INVERTER FAILURE INDICATOR LIGHT.

Failure of the main or alternate inverter is indicated by illumination of the inverter failure indicator light (7, figure 1–18). If the instrument power switch is in the NOR position and the inverter failure indicator light goes on, the main inverter or generator has failed. Turning the instrument power switch to the ALT position will put the light out in a few seconds. If the inverter failure indicator light goes on with the instrument power switch in the ALT position, it indicates that the alternate inverter has failed.

HYDRAULIC POWER SUPPLY SYSTEM.

The hydraulic system pressure (figure 1-13) is not mally supported by a variable delivery engine driven pump. Since this type pump can deliver a high rate of flow, the hydraulic system is not provided with an accumulator. See figure 1-25 for servicing instructions. A hydraulic hand pump is provided for emergency use. The hydraulic system is automatic with the engine operating and it is only necessary to select a control and move it to the desired position. Hydraulically operated equipment includes: landing gear system, landing flap system, aileron boost, and the speed brake and inflight refueling system doors which are electrically operated hydraulic valves. These controls are described under the applicable system. Hydraulic fluid is supplied from a reservoir which has two standpipes. The upper standpipe supplies the engine driven pump while the lower one supplies the hand pump. In the event of hydraulic failure due to the loss of hydraulic fluid, emergency pressure is obtained with the hydraulic hand pump as an emergency supply of hydraulic fluid is available from the lower standpipe. F-84G-10RE and subsequent aircraft are equipped with a pneumatic system for emergency extension of the nose wheel. Air pressure is maintained by a hydraulically operated compressor.

HYDRAULIC HAND PUMP.

The hydraulic hand pump (12, figure 1-17) is installed in all airplanes and supplies hydraulic pressure in the event of normal system failure. The hand pump has a telescoping handle that is pulled out, rotated 90 degrees and moved aft about 1/4 inch before using. This provides a longer handle and clearance between the handle and console for greater ease in operation.

Note

In the event of normal hydraulic system failure on airplanes prior to F-84G-10RE and it becomes necessary to use the hydraulic hand pump, the landing gear should be extended first since hydraulic pressure is required to extend the nose wheel.

HYDRAULIC HAND PUMP SELECTOR. A, B, C, D

The hydraulic hand pump selector (11, figure 1-17) is installed in airplanes prior to F-84G-10RE and is used only if the normal hydraulic system fails and it becomes necessary to use the hydraulic hand pump. The hand pump selector is mechanically operated and has two positions; SYSTEM and NOSE WHEEL. The SYSTEM position allows hydraulic pressure from the hand pump to be transferred to the normal hydraulic system. The NOSE WHEEL position allows the hydraulic pressure from the hand pump to be transferred to the nose wheel actuating cylinder for emergency extension of the nose wheel. On airplanes prior to F-84G-10RE, the hand pump should not be operated after the nose wheel is down and locked as the pressure built up in the hydraulic lines will become excessive and prevent returning the hand pump selector to the SYSTEM position. To assure sufficient supply of hydraulic fluid for nose gear extension it is necessary to drop the main gear by gravity, select the nose wheel position and extend the nose gear, then return the hand pump selector to the SYS-TEM position before operating any other system that is necessary.

Note

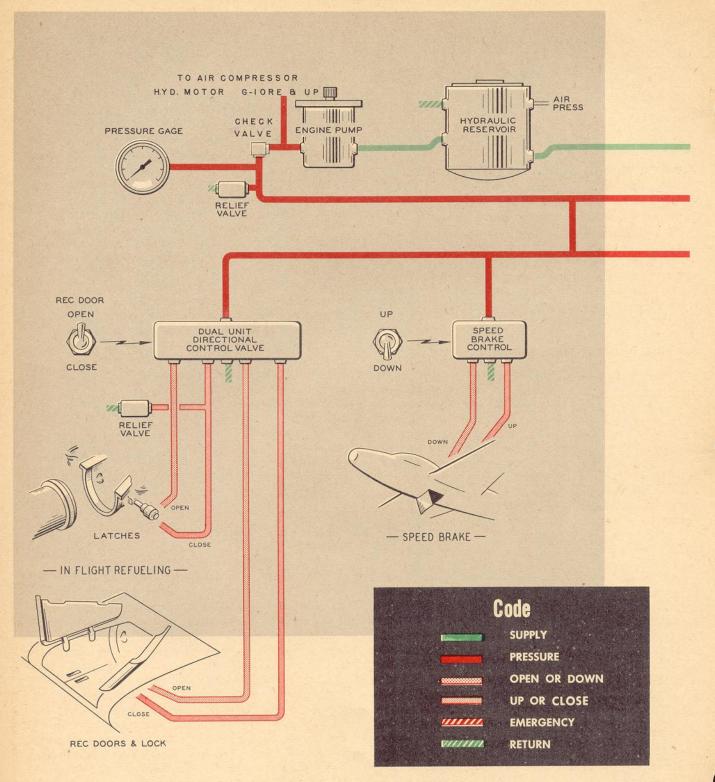
During normal operation of the hydraulic system, the hand pump selector remains in the SYSTEM position.

HYDRAULIC PRESSURE GAGE.

The hydraulic pressure gage (35, figure 1–16) indicates system pressure.

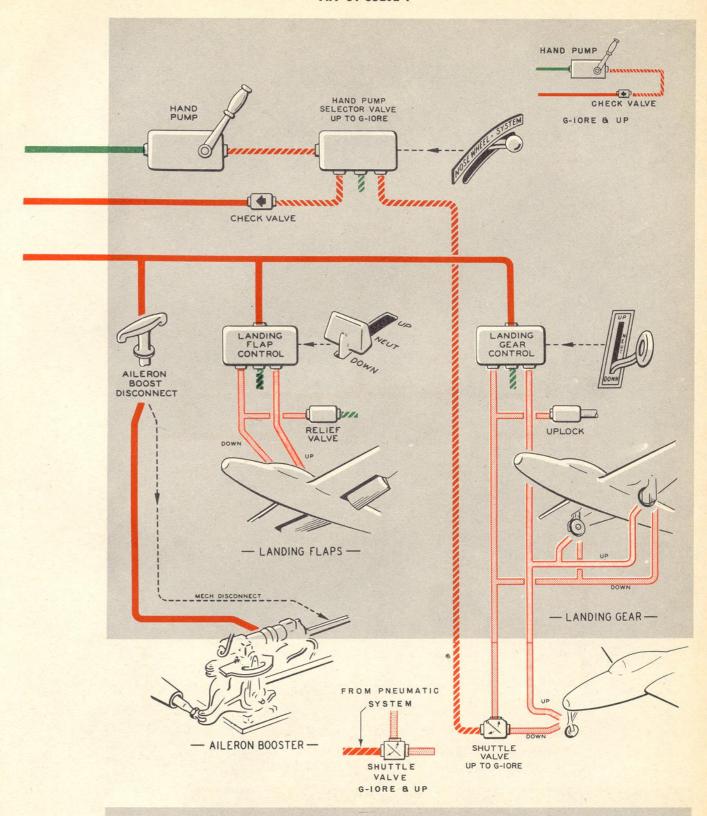
PNEUMATIC POWER SUPPLY SYSTEM. E, F

A pneumatic power supply system (figure 1-13A) is installed in F-84G-10RE and subsequent airplanes and is used to charge the wing and fuselage guns and to extend the nose gear in the event of a hydraulic power supply system failure. The hydraulic hand pump is used in these airplanes for emergency operation of the landing flaps and speed brake. Air pressure is supplied by a hydraulically operated compressor and stored in two storage bottles. Hydraulic pressure is automatically shutoff through an electrical switch when the air pressure in the storage bottles reaches 3000 psi. A manual means of shut-off is also provided. Air from the larger storage bottle is supplied to the gun chargers and is sufficient for two complete charges without being replenished. Air from the smaller bottle is supplied to the nose wheel extension cylinder through a manually operated control valve. The smaller bottle pressure is sufficient for one nose gear extension without being replenished. In the event of failure of the primary bus the shut-off valve will close and the compressor will be inoperative. Emergency hydraulic pressure from the hand pump is prevented from entering the compressor by a check valve.



HYDRAULIC SYSTEM Schematic

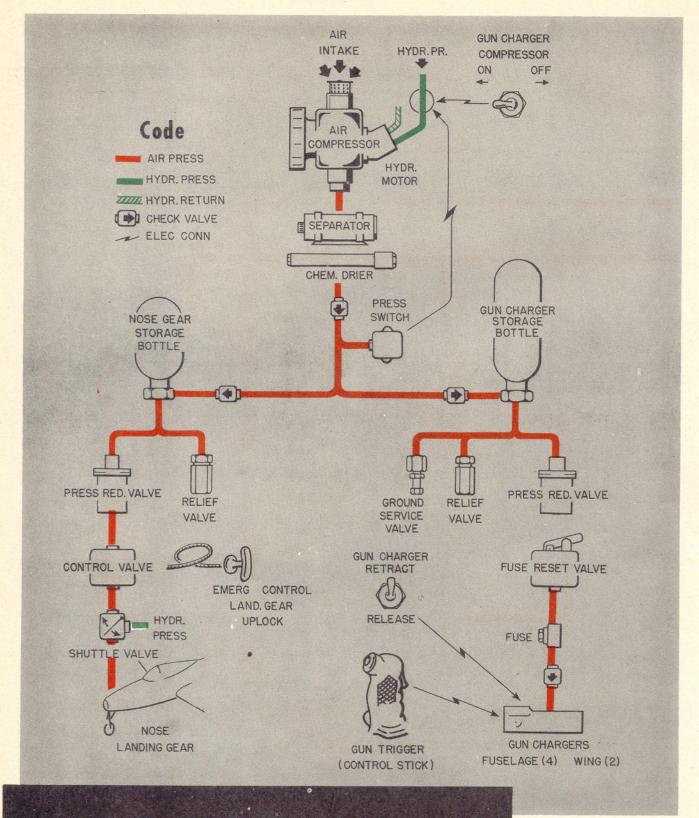
Figure 1-13. Hydraulic Power Supply System - Schematic (Sheet 1 of 2)



HYDRAULIC SYSTEM Schematic

Figure 1-13. Hydraulic Power Supply System - Schematic (Sheet 2 of 2)

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1



PNEUMATIC POWER SUPPLY SYSTEM

Figure 1-13A. Pneumatic Power Supply System

GUN CHARGER COMPRESSOR SWITCH (NOSE GEAR EXTENSION).

The gun charger compressor switch (10A, figure 1–17) is provided so that the pneumatic compressor can be turned on or off at any time. If there is low pressure in the storage bottles and the pneumatic compressor starts to operate during take-off and landing, sluggish operation of the other hydraulic systems may result. Therefore, the gun charger compressor switch is positioned to OFF during take-off and landing and to the ON position after take-off is completed. Control of the pneumatic compressor is then automatic.

PNEUMATIC PRESSURE GAGES.

Early F-84G-10 and 11RE airplanes have a pneumatic pressure gage for each storage bottle installed in the gun deck. On F-84G-10RE Serial No. 51-1108 and subsequent and F-84G-11RE Serial No. 51-10206 and subsequent, the pneumatic pressure gage for the nose wheel storage bottle is located in the cabin. The gage is red lined at 3400 psi with a green arc ranging from 2500 to 3400 psi.

FLIGHT CONTROL SYSTEM.

The primary flight control surfaces are conventionally operated by a control stick and rudder pedals which are mechanically connected to the control surfaces. Aileron stick forces are reduced by a hydraulic aileron booster. Trim tabs on the elevators and left aileron are electrically operated. An automatic pilot is inter-connected in the flight control system which can be overpowered by the pilot at any time.

CONTROL STICK.

The control stick (figure 1-14) is conventional incorporating a hand grip with the following controls; trim tab switch, bomb release switch, stick trigger, radar "out" switch, microphone button and an auto-pilot release switch. These switches are discussed under the applicable systems.

RUDDER PEDAL ADJUSTMENT.

The rudder pedals are adjusted for leg length by turning the rudder pedal adjusting knob (26, figure 1-16)

10

clockwise to lengthen or counter clockwise to shorten the leg length.

SURFACE CONTROL LOCK.

A surface control lock (figure 1–14) secures the control stick and rudder pedals in the neutral position when engaged, to prevent damage to the control surfaces when the airplane is parked. To engage, the rudder pedals are positioned to neutral then the surface control lock is raised and hooked over the fitting on the control stick.

TRIM TABS.

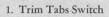
Controllable trim tabs are hinged to the inboard trailing edge of the left aileron and the inboard trailing edge of each elevator. Elevator trim tabs are very effective and a small trim change causes a large variation in stick forces. Structural design limits of the airplane may easily be exceeded if the elevator is trimmed to zero stick force when applying "g" load.

Ground adjustable fixed trim tabs are included on the inboard trailing edge of the right aileron, the center trailing edge of the left aileron, the trailing edge of the left and right elevators and the trailing edge of the rudder.

WARNING

Elevator trim tabs should not be used to reduce stick forces in pull outs, turns or during

CONTROL STICK & LOCK



- 2. Bomb Release Switch
- 3. Stick Trigger
- 4. Radar Out Switch
- 5. Auto-pilot Release Switch
- 6. Control Stick
- 7. Microphone Press-totalk button
- 8. Control Lock Locked position
- 9. Parking Brake Control
- Control Lock Stowed position



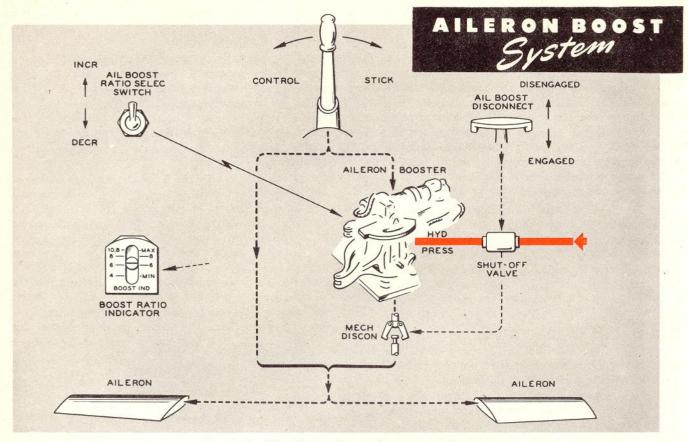


Figure 1-15. Aileron Boost System - Schematic

other accelerated maneuvers. If elevator trim is used, stick forces can be reduced sufficiently to permit the pilot to easily exceed structural design limits of the airplane.

TRIM TAB SWITCH.

The trim are actuated by electric motors. The elevator and aileron trim tabs are controlled by a four-way switch, (figure 1–14) located on top of the control stick grip. The elevator and aileron trim tab switch has no markings, however, the fore and aft positions of the trim switch controls the elevator trim tabs and the lateral positions of the trim switch controls the aileron trim tab.

CAUTION

Although spring loaded to the OFF position, elevator and aileron trim tabs switch must be actuated and returned to neutral by the use of thumb pressure to insure return of switch to neutral.

TRIM TAB INDICATOR LIGHTS.

Aileron and elevator trim tab indicator lights (figure 1–19) are amber lights which illuminate when the respective trim tabs are in the neutral position.

AILERON BOOST SYSTEM.

The aileron boost system (figure 1-15) is supplied with power from the main hydraulic system. With the aileron

boost system disengaged, the aileron control is conventional. With the aileron boost system engaged, the stick force exerted by the pilot is multiplied by a preselected factor. This factor may be varied from a minimum boost ratio of 4 to 1 to a maximum boost ratio of 10.8 to 1. The boost ratio is the ratio between the load felt by the pilot with the aileron boost engaged and the load he would feel with the aileron boost disengaged. Aileron boost will be effective with the engine operating at a minimum of approximately 40% rpm (idle).

AILERON BOOST DISCONNECT.

The aileron boost disconnect (22, figure 1–17) is a manually operated valve having two positions: ENGAGED and DISENGAGED. In the ENGAGED position, the hydraulic pressure is supplied to the aileron boost system and the boost system is connected mechanically to the aileron controls. In the DISENGAGED position, hydraulic pressure is shut off from the boost system and the boost system is disconnected mechanically from the aileron control. The aileron boost system may be engaged or disengaged during flight.

Note

When engaging the aileron boost disconnect it is held down until engaged. If the disconnect springs back to the disengaged position it is returned to the engaged position and held while the control stick is moved from side to side.

AILERON BOOST RATIO SELECTOR.

The aileron boost ratio selector (9, figure 1–17) is a spring loaded switch having three positions: INCR, OFF and DECR. The aileron boost ratio is selected electrically by holding the aileron boost ratio selector in the INCR or DECR position until the desired boost ratio is obtained.

Note

In the event of electrical failure, aileron boost ratio will remain at its last setting.

AILERON BOOST RATIO INDICATOR.

The aileron boost ratio indicator (7, figure 1-17) is a sliding pointer connected mechanically to the aileron boost selector actuator and indicates the aileron boost ratio selected.

LANDING FLAPS.

Partial span, double-camber, NACA slotted-type flaps are hinged to the inboard trailing edge of the wing. The flaps are actuated hydraulically and are interconnected by a series of balance cables which synchronize their travel. Full travel of the flaps is 40° down. If the flaps are fully down and the airspeed approaches 220 mph IAS, the air loads on the flaps will be great enough to open a relief valve and permit the flaps to retract from 40 to 20 degrees; from 20 to 0 degrees no automatic retraction is possible as the flap linkage is at dead center. It is possible to lower the flaps at airspeeds above the safe limits, therefore airspeed limitations must be observed when operating the flaps. A mechanical uplock is incorporated in the flap actuating cylinder so that the flaps will remain in the up position without the aid of hydraulic pressure.

LANDING FLAP CONTROL.

The flaps are controlled by a landing flap control (36, figure 1–17) which mechanically positions the valve as follows: DOWN, NEUT and UP. The flaps are placed in the up or down position by placing the landing flap control in the desired position. After the flaps reach the full up position the flap control is returned to the NEUT position. A mechanical lock, in the flap cylinder, keeps the flaps up and a thermal relief incorporated in the selector valve relieves pressure due to thermal expansion. Any intermediate setting of the flaps may be obtained by moving the flap control to the NEUT position when the indicator shows the desired flap position. Flaps are lowered by selecting the DOWN position and leaving the landing flap control at DOWN.

LANDING FLAP POSITION INDICATOR.

Markings on the landing flap position indicator (44, figure 1-17) show the position of the landing flap from UP to 40 degrees down.

SPEED BRAKE.

(See figure 1-20)

SPEED BRAKE SWITCH.

Operation of the speed brake is controlled electrically by a speed brake switch (38, figure 1-17) which actuates

a solenoid valve and has two positions: DOWN and UP. When placed in the DOWN position the speed brake extends its full travel of 54½ degrees, and when placed in the UP position the speed brake retracts to its normal position flush with the underside of the fuselage. The speed brake cannot be positioned in any intermediate position.

LANDING GEAR SYSTEM.

The landing gear is a tricycle gear consisting of two main wheels and a nose wheel. Each wheel is mounted on an air-oil shock strut and all are hydraulically retracted and extended. The main wheels retract inboard into wheel wells in the wing and when retracted are enclosed by fairing doors that are flush with the contour of the underside of the wing. The nose wheel retracts aft into a wheel well in the nose of the fuselage and is enclosed with fairing doors that are flush with the contour of the fuselage. Each strut is mechanically shrunk as it is being retracted and automatically extends to its fully extended position when the gear is let down. A track and roller assembly prevents the landing gear struts from being locked in the wheel wells if the shrink struts should fail when the landing gear is retracted. Mechanical locks secure the three struts in the retracted or extended positions. Inadvertent retraction of the gear when airplane is on the ground is prevented by an electrically actuated lock which automatically prevents moving the landing gear selector. A control is provided to override this safety system in emergencies. The main landing gear is locked down mechanically. The down locks are spring loaded to the locked position and are unlocked by hydraulic pressure when the gear is retracted. In an emergency the main gear extends by gravity and the airplane is yawed to engage the downlocks; nose gear on airplanes prior to F-84G-10RE is extended with hydraulic pressure from the hand pump. On F-84G-10RE and subsequent airplanes the nose wheel is extended by air pressure. Ground safety locks are provided for maintenance purposes only.

Note

Since the only means for extending the nose gear on airplanes prior to F-84G-10RE is by hydraulic pressure, the nose gear must be downlocked with the handpump prior to emergency operation of any other system.

LANDING GEAR SELECTOR.

The landing gear selector (4, figure 1-17) is a mechanical valve having three positions: UP, NEUT, and DOWN. The handle on the selector has a wheel shaped knob for identification and must be pulled out to move it to a desired position. The landing gear is normally retracted and extended by selecting the UP or DOWN position of the landing gear selector. After the landing gear is fully retracted the landing gear selector is returned to the NEUT position to relieve pressure in the landing gear system as the hydraulic lines are open to return with the selector in the NEUT position. The landing gear is extended by placing the selector in the

DOWN position and leaving it there after the landing gear is extended. The NEUT position of the landing gear selector is selected prior to emergency operation of the hydraulic system to prevent the loss of hydraulic fluid in the event of system leakage downstream of the landing gear selector valve.

LANDING GEAR EMERGENCY UPLOCK RELEASE.

A landing gear emergency uplock release (5, figure 1-17) is a cable release that permits extension of the landing gear in the event of failure of the normal hydraulic system. When the landing gear emergency uplock release is pulled it releases the uplock on the three landing gear struts and on F-84G-10RE and subsequent airplanes it also opens the pneumatic pressure line to the nose gear extending cylinder. The main gears will extend by gravity but the nose gear on airplanes prior to F-84G-10RE must be extended with the emergency hydraulic system.

Note

If the nose gear is extended by the pneumatic power supply system on F-84G-10RE and subsequent airplanes the control valve for the nose gear must be reset to the closed position manually as the nose gear will not retract until the air pressure in the extending cylinder is re-

LANDING GEAR EMERGENCY GROUND RETRACT SWITCH.

The landing gear emergency ground retract switch (2, figure 1-17) operates a solenoid, so that in the event of an emergency the landing gear may be retracted before the airplane is airborne. The switch is guarded in the OFF position by a red cover guard. Placing the switch ON will enable the pilot to move the landing gear selector valve to UP before the weight of the airplane is off the landing gear.

LANDING GEAR POSITION INDICATOR LIGHTS.

Four landing gear position indicator lights (1, figure 1-17) one red marked WARNING GEAR UNSAFE and three marked LEFT SAFE, NOSE SAFE and RIGHT SAFE indicate the position of the landing gear struts. The indications are as follows:

UNSAFE red light on

- below minimum cruise rpm.
- a. With throttle a. Indicates landing gear not locked down.
- b. With throttle b. Indicates land above minimum cruise rpm.
 - ing gear in any unlocked position.

green lights on

Indicates respective landing gear down and locked

LANDING GEAR POSITION INDICATOR.

Three landing gear position indicators replace the three green lights installed on previous models. The indicators

INSTRUMENT

- 1. Engine Overheat Warning Light
- 2. Canopy Control Switch
- 3. Gun-Bomb-Rocket Sight
- 4. Span Adjustment Dial
- 5. Rear View Mirror
- 6. Compass Correction Card
- 7. Slaved Gyro Magnetic Compass Indicator
- 8. Engine Fire Warning Light
- 9. Stand-by Compass
- 10. Mechanical Caging Lever
- 11. Target Indicator
- 12. Radar Range Sweep Control
- 13. Sight Filament-Circle Switch
- 14. Sight Filament-Dot Switch
- 15. Reticle Dimmer Control
- 16. Tachometer
- 17. Rate of Climb Indicator
- 18. Exhaust Temperature Indicator
- 19. Fuel Pressure Warning Light
- 20. Fuel Flow Instrument
- 21. Fuel Pressure Gage
- 22. Attitude Indicator
- 23. Main Tank Low Level Warning Light
- 24. Pilot's Relief Tube
- 25. Engine Oil Pressure Gage
- 26. Rudder Pedal Adjustment
- 27. Gun-Bomb-Rocket Sight Test Receptacle
- 28. Fuel Level Indicator
- 29. Rocket Indicator and Reset Switch
- 30. Parking Brake Control
- 31. Turn and Bank Indicator
- 32. Clock
- 33. Manual Tip Tank Release
- 34. Wing Tank Pressure Warning Light
- 35: Hydraulic Pressure Gage
- 36. Accelerometer
- 37. Fuel System Emergency-On Indicator Light
- 38. Radio Compass Indicator
- 39. Slaved Gyro Fast Slaving Switch
- 40. Slaved Gyro Compass Switch
- 41. Altimeter
- 42. Air Speed Indicator
- 43. Rocket Dive Angle Control
- 44. Bomb-Target-Wind Control

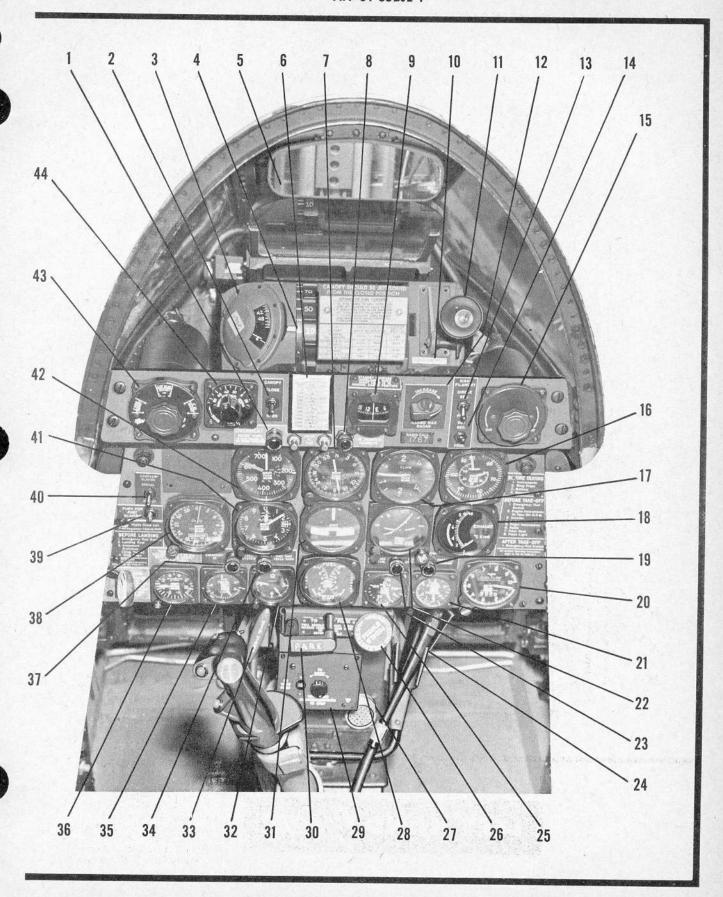
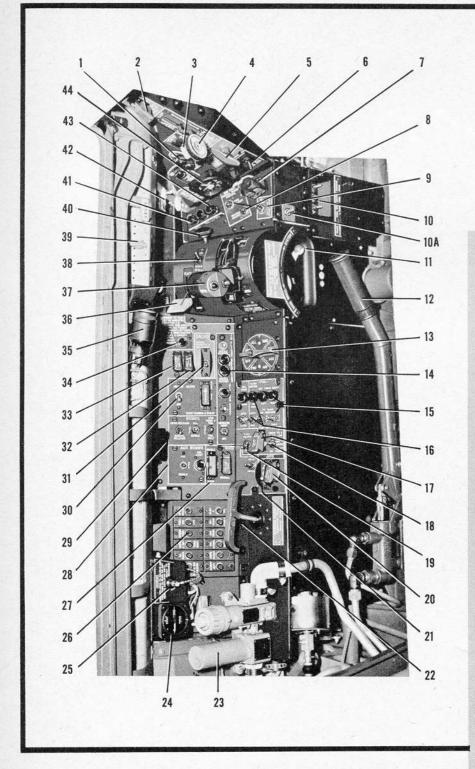
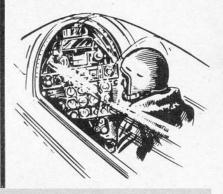


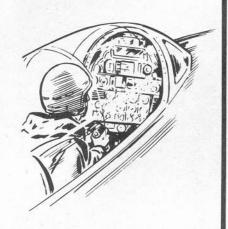
Figure 1—16. Instrument Panel







- 1. Landing Gear Position Indicator
- 2. Landing Gear Emergency Ground Retract Switch
- 3. Landing Lights Switch 4. Landing Gear Selector
- 5. Landing Gear Emergency Uplock Release
- 6. Landing Gear Warning Horn Release Switch
- 7. Aileron Boost Ratio Indicator
 8. Gun-Bomb-Rocket Sight Manual
 Range Control Adjustments
 9. Aileron Boost Ratio Selector
- 10. Fuel Tank Battle Damage Switches
- 10.A Gun Charger Switch
- 11. Hydraulic Hand Pump Selector
- (up to F-84G-10RE) 12. Hydraulic Hand Pump
- 13. Fuel Tank Selector
- 14. Inflight Refueling Control Panel
- 15. External Tanks Air Pressure Switches and Empty Indicator Lights
- 16. Fuel Filter De-icing Switch and Ice Warning Light
 17. Emergency Fuel Test Switch
 18. Emergency Fuel Switch
- 19. Pitot Heater Switch
- 20. Jato Jettison Switch 21. Jato Ready Switch
- 22. Aileron Boost Disconnect 23. Anti g Valve
- 24. Canopy Pneumatic Gun Air Pressure Gage
- 25. Canopy Pneumatic Gun Air Filler Valve
- 26. Circuit Breaker Panel
- 27. Rocket Control Panel
- 28. Aux Bombs Control Panel
- 29. Bombs Control Panel
- 30. Guns Control Panel
- 31. Salvo Switch 32. Tip Tank Jettison Switch
- 33. Bomb Pylon Jettison Switch
- Master Circuit Breaker Indicator Light
- Instrument Panel Light
- 36. Landing Flap Control
- 37. Throttle
- 38. Speed Brake Switch
- 39. Side Air Outlet Shut-Off
- 40. Throttle Friction Lock
- 41. Jato Ready Warning Light
- 42. Jato Ignition Switch 43. Trim Tab Indicator Lights
- 44. Landing Flap Position Indicator



- 1. Air Start Switch
- 2. Ground Start Switch
- 3. Battery Switch
- 4. Generator Switch
- 5. Voltmeter
- 6. Instrument Power Switch
- 7. Inverter Failure Indicator Light
- 8. Generator-over-voltage Light
- 9. Ammeter
- 10. Cabin Altimeter
- 11. Console Lights Rheostat Switch
- 12. Oxygen Regulator
- 13. Instrument Panel Lights Rheostat Switch
- 14. Side Air Outlet Shut-Off
- 15. Oxygen Low Pressure Gage
- 16. Taxi Light Switch
- 17. Position Lights Intensity Switch
- 18. Instrument Panel Light
- 19. Position Lights Switch
- 20. Defroster Control
- 21. Cockpit Heat & Vent Switch
- 22. Cockpit Light
- 23. Cabin Temperature Control
- 24. Map Case
- 25. AC Power Fuse Panel
- 26. IFF Control Panel
- 27. Command Radio Control Panel
- 28. Radio Compass Control Panel
- 29. Oxygen Flow Indicator
- 30. Circuit Breaker Panel
- 31. Flight Controller
- 32. Auto-Pilot Power Supply Switch

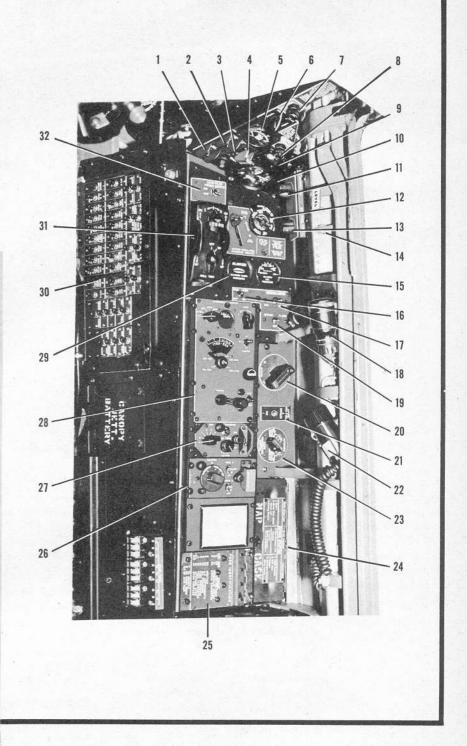




Figure 1—18. Right Hand Console
RESTRICTED



Figure 1-19. Trim Tab Indicators

are marked LEFT, NOSE and RIGHT. When the respective gear is locked down the outline of a wheel appears on the indicator. When the gear is in any position between locked down or up, red diagonal strips appear and when the gear is retracted the word UP appears on the indicator. A red light located in the landing gear selector handle illuminates when the landing gear is in an unsafe condition. The indications are as follows:

Red light on

below minimum cruise

rpm.

- a. With throttle a. Indicates landing gear not locked down.
- b. With throttle b. Indicates landabove minimum cruise rpm.
 - ing gear in any unlocked position.

LANDING GEAR WARNING HORN.

A landing gear warning horn located on the aft wall of the cockpit will sound if the throttle is retarded below the minimum cruise setting and the landing gear is not down and locked.

LANDING GEAR WARNING HORN RELEASE SWITCH.

A landing gear warning horn release switch (6, figure 1-17) is provided so that the landing gear warning horn may be silenced.

BRAKES.

The two main landing gear wheels are provided with hydraulically operated disc-type brakes. The brakes are actuated individually by a master brake cylinder operated by toe pressure on each rudder pedal. The brake system has its own hydraulic reservoir and is independent of che main hydraulic system.

PARKING BRAKE CONTROL.

A parking brake control (30, figure 1-16) is located below the instrument panel. Parking brakes are applied by depressing the toe of each rudder pedal then pulling the parking brake control aft and releasing the rudder pedals. Parking brakes are released by depressing the toe of the rudder pedals.

INSTRUMENTS.

The fuel level indicator, the voltmeter, the ammeter, the radio compass indicator, the turn and bank indicator and the pitot heater are operated from the d-c power supply. The engine tachometer and the exhaust temperature indicator are self-generated electrical instruments which do not require power from the airplane's electrical system. The slaved gyro magnetic compass indicator and the attitude indicator are electrically driven gyro instruments powered from the ac power circuit. The hydraulic pressure indicator, fuel pressure indicator, oil pressure indicator and the fuel flow indicator are

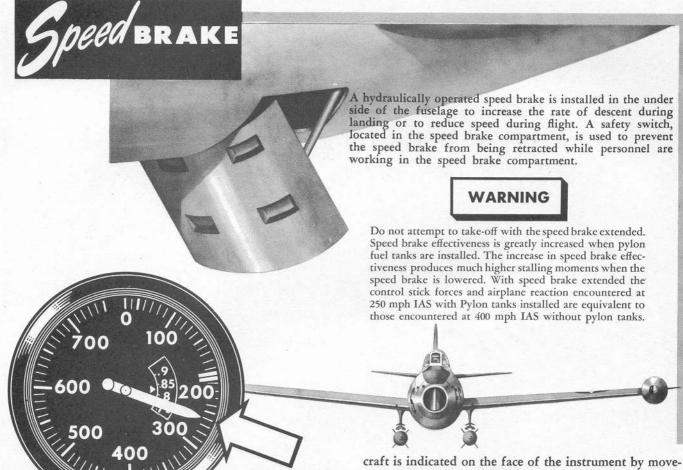


Figure 1-20. Speed Brake

operated from the a-c power supply. The accelerometer, installed on the instrument panel, shows positive accelerations only and does not require any electrical power. The static vent is located on the lower section of the forward fuselage. The pitot pressure head is located in the tunnel division of the nose section and the pitot heater is described in Section IV.

AIRSPEED INDICATOR.

The airspeed indicator (42, figure 1–16) has a conventional white pointer and a red pointer which indicates maximum allowable indicated airspeed. The position of the red pointer varies with altitude to indicate maximum allowable indicated airspeed corresponding to the limiting Mach No. Therefore, when the two pointers meet, the airplane is moving at the maximum allowable indicated airspeed (the critical Mach No) of the aircraft.

ATTITUDE INDICATOR.

The attitude indicator, Type J-8 (figure 1–21) shows the attitude of the aircraft in relation to the earth's horizontal plane during any aircraft maneuver, throughout 360 degrees. The portion of the sphere which is visible to the pilot during level flight and in dives or climbs up to 27 degrees, is unmarked. Relative motion of the air-

ment of the horizontal bar with respect to the miniature airplane in the center of the dial. Angular displacement of the horizontal bar with respect to the miniature airplane indicates the degree of roll. The actual amount of roll is indicated by the position of the bank index relative to the 10, 20, 30, 60 and 90-degree roll markings on the bezel mask. When the aircraft exceeds 27 degrees of dive the horizontal bar is held in its extreme (27 degree) position. At this point the word DIVE on the upper portion of the sphere becomes visible. As the angle of dive increases, graduations become visible towards the pole of the sphere which indicates the angle of dive as they coincide with the trim indicator on the dial. These graduations are placed at the 70, 75 and 80 degree intervals; the 85 degree dive indication is reached when the trim indicator coincides with the edge of the bulls eye. When the aircraft exceeds 27 degrees of climb the horizon bar is held in its extreme (27 degrees) downward position and any increase in climb is indicated on the sphere. The lower portion of the sphere is marked similarly to the upper with the word CLIMB substituted for DIVE. After a loop or during a turn displacement of the horizon bar in excess of five degrees in pitch and/or bank may result. The J-8 indicator will immediately begin to correct these errors once true gravitational forces are sensed. This characteristic error is commonly called "sluggishness" or "lag" by pilots. In successive loops, the above described error may become increasingly greater and may cause the horizon bar to

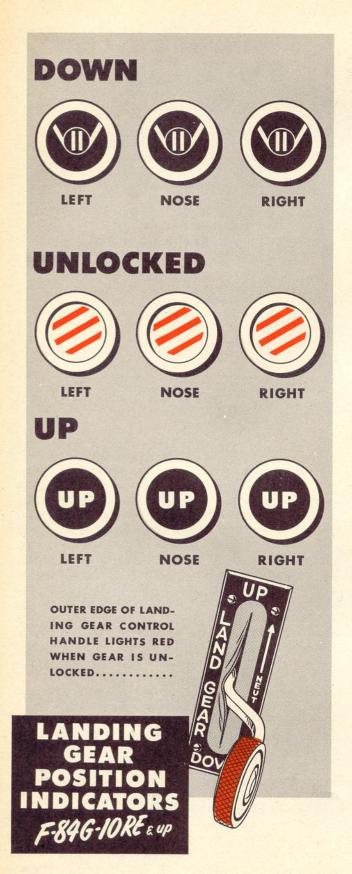


Figure 1-20A. Landing Gear Position Indicator

reach the limit of its movement. This is normal in successive loops and is not indicative of a defective instrument. The J-8 attitude indicator may be caged manually by means of a gyro centering device operated by pulling the cage knob. To cage the gyro, the PULL TO CAGE knob is drawn smoothly away from the face of the instrument. A momentary stop will be felt when the bank caging mechanism is engaged; as the cage knob is pulled further out the pitch caging mechanism is engaged. As soon as the caging knob reaches the limit of its travel it should be released quickly.

CAUTION

A violent or hard pull on the caging knob when caging the attitude indicator may damage the instrument. Remember that the indicator cages to the attitude of the aircraft and not to the true vertical. Therefore, the instrument should never be caged to correct in-flight errors unless the aircraft is in straight and level flight by visual reference to a true horizon.

EMERGENCY EQUIPMENT. FIRE DETECTION.

The airplane has an engine overheat system and an engine fire warning system. The engine overheat system consists of a set of thermal switches installed in the aft fuselage section and an amber warning light (1, figure 1–16) which is marked OVERHEAT. The engine fire warning system consists of a set of thermal switches in the forward section of the fuselage and a red warning light (8, figure 1–16) which is marked FIRE. Both systems are automatic and each have a test switch adjacent to lights marked PRESS TO TEST. Illumination of the light indicates circuit is complete.

WINDSHIELD.

The windshield (figure 1–22) consists of three transparent panels, set in rubber and mounted in an aluminum frame. The two side panels are of plexiglass. The center panel is bullet-resistant glass.

CANOPY.

The canopy is a one piece plexiglass bubble type, attached to the fuselage with three sets of rollers and is sealed to the cockpit structure by rubber tubes that are automatically inflated by air pressure from the engine compressor when the canopy is closed. The canopy (figure 1-23) is normally opened or closed by sliding fore and aft with the aid of an electrical actuator, which is energized directly from the battery bus. Engine rpm should be at least 50% when closing the canopy so that the output of the generator is high enough to close the canopy tight. Manual operation is accomplished by disengaging the actuator and sliding the canopy fore or aft. To jettison canopy, explosive charges in the attachment fittings are exploded electrically simultaneously with two pneumatic guns so that canopy is broken loose and guns rotate the canopy about two aft hinges up and away from the pilot into the airstream. This design eliminates the necessity



Figure 1—21. Attitude Indicator
RESTRICTED

of the pilot ducking when the canopy is jettisoned. The canopy remover guns are interconnected to the ejection seat cylinder by a cable so that the seat cannot be ejected until after the canopy has been jettisoned. An air pressure gage located on the left side of the cabin indicates the air pressure in the canopy remover pneumatic guns. These guns must be charged prior to flight since they are not charged by any airplane system.

WARNING

The canopy roller explosive charges and the canopy remover pneumatic guns will fire when canopy is jettisoned whether it is open or closed and regardless of the position of the battery switch and of main battery failure since the jettison circuit is provided with its own 4.5 volt battery. The canopy should be jettisoned from the fully closed position as the canopy remover pneumatic guns contact the bumper on the canopy only when the canopy is in the fully closed position. If the canopy is ejected from any position other than fully closed, these pneumatic gun pistons fire through the canopy glass and are ineffective in forcing the canopy away from the airplane. The canopy should be jettisoned when in straight and level flight if possible so as to avoid any side wind loading which will cause diagonal slueing of the canopy.

CANOPY CONTROL SWITCH.

Normal canopy operation is accomplished by means of the canopy control switch located on the instrument panel. The canopy control switch has three positions: OPEN, off and CLOSE and is spring-loaded to the off position. The canopy is held in the open, closed, or any intermediate position by a breaking mechanism within the canopy actuator.

CAUTION

The canopy should not be opened at taxi speeds above 15 mph so as to avoid high loads and eventual failure of the canopy actuator which results when the canopy is partially opened at high speeds.

EXTERNAL CANOPY CONTROL SWITCHES.

Two external canopy control switches are located on the left side of the fuselage under the canopy track. These switches make it possible to open or close the canopy while standing on the ground. The switches are of the pushbutton type and are flush with the contour of the fuselage skin. The forward switch is marked CLOSE and the aft one is marked OPEN. The canopy is opened or closed by pressing and holding the respective switch. The canopy may be stopped at any intermediate position by releasing the control switch.

Note

The master circuit breaker, located adjacent to the airplanes batteries and the canopy motor circuit breaker, located on the right circuit breaker panel, must be closed before the canopy will operate with the external canopy control switches. The operation of the canopy with the external canopy control switches is independent of the position of the battery switch.

EXTERNAL CANOPY CONTROL (MANUAL).

An external canopy control, located on the left side of the canopy skirt, marked EXIT RELEASE, is used to open or close the canopy if electrical power is not available. The aft end is marked PUSH and if pushed in the control rotates from its flush position so that handle is available and at the same time disengages the canopy actuator clutch.

INTERNAL CANOPY CONTROL (MANUAL).

To operate the canopy manually from the inside of the airplane an internal canopy control is provided on each side of the forward end of the canopy. The canopy is moved by rotating the controls inboard and moving the canopy fore or aft.



The pilot should grasp these internal controls with the palms of the hands facing aft because when the canopy is raised, the wind stream may force the canopy aft suddenly pinning the pilot's hands on his shoulders if the palms are forward.

INTERNAL CANOPY JETTISON CONTROL (RIGHT HANDGRIP).

The canopy can be jettisoned by actuating the right-hand grip on the pilot's seat which is guarded with a spring loaded clip. This exposes the handgrip for seat ejection. When the canopy is jettisoned from the cockpit the pneumatic remover guns fire and the ejection seat safety pin is released thus permitting the seat to be ejected.

EXTERNAL CANOPY JETTISON CONTROL.

The canopy can be jettisoned from outside the airplane by actuating the external canopy jettison control located under a red cover on the left side of the airplane. This switch fires the canopy roller explosive charges without firing the pneumatic guns.

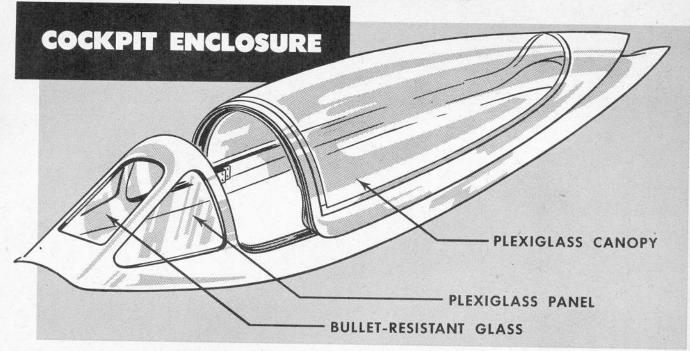


Figure 1-22. Cockpit Enclosure

PILOT'S SEAT.

The pilot's seat (figure 1-24) is the ejection type designed to catapult the seat and the pilot clear of the airplane in an emergency. The seat includes adjustable head rest, adjustable arm rests, and is designed to accommodate a life raft attached to the pilot's parachute harness. A lap type safety belt is attached to the sides of the seat and a shoulder harness is attached to the seat by means of an inertia reel and cable attached to the aft side of the seat. A ground safety cotter pin is inserted near the top of the seat catapult, to prevent inadvertant catapulting when the airplane is on the ground.

SHOULDER HARNESS LOCK CONTROL.

A two position (locked-unlocked) shoulder harness inertia reel lock control is located on the left side of the pilot's seat. A latch is provided for positively retaining the control handle at either position of the quadrant. By pressing down on the top of the control handle, the latch is released and the control handle may then be moved freely from one position to another. When the control is in the unlocked position (full aft), the reel harness cable will extend to allow the pilot to lean forward in the cockpit; however, the reel harness cable will automatically lock when an impact force of 2 to 3 g's is encountered. When the reel is locked in this manner, it will remain locked until the control handle is moved to the locked and then returned to the unlocked position. When the control is in the locked position (full forward) the reel harness cable is manually locked so that the pilot is prevented from bending forward. The locked position is used when a crash landing is anticipated. This position provides an added safety precaution over and above that of the automatic safey lock.

VERTICAL SEAT ADJUSTMENT.

A vertical seat adjustment lever is located on the right side of the pilot's seat. Moving the lever aft releases the seat so that it may be raised or lowered to the desired height. At the same time the foot rests are released from the seat so that they remain in contact with the floor at all times. When the seat is at the desired height the vertical seat adjustment is released. The lever is spring-loaded to automatically engage the locking pins. Jiggling the seat is recommended to permit the locking pins to fully seat.

ARM RESTS.

The pilot's seat has two arm rests that may be moved fore and aft. The forward position must be used when ejecting the seat. The aft position allows for more accessibility to the console controls. When the arm rests move all the way back, locks automatically hold them in that position. The arm rest is released to the forward position by moving the arm rest release aft. The arm rests will automatically move to the forward position when the respective seat hand grips are pulled up.

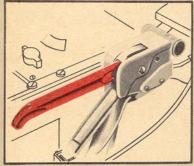
LEFT HAND GRIP.

The left hand grip is for emergency use. When the hand grip is pulled up it automatically releases the left arm rest to the forward position and locks the shoulder harness if it has been left unlocked.

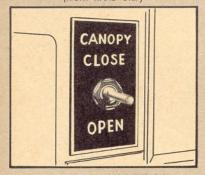
RIGHT HAND GRIP. (CANOPY AND SEAT JETTISON)

The right hand grip is the canopy and seat ejection control. The grip is safetied to the seat with a spring loaded clip. Moving the hand grip up releases the arm rest to the forward position and jettisons the canopy. With the hand grip up the seat trigger is exposed. When the seat trigger is squeezed the pilot's seat is ejected.

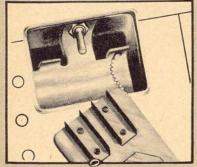
CANOPY CONTROLS



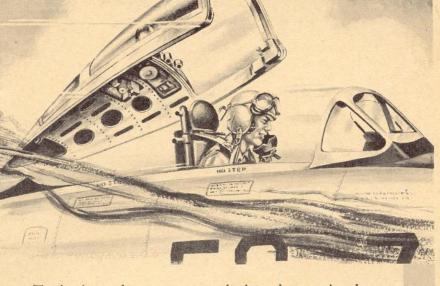
INTERNAL CANOPY
JETTISON CONTROL
(RIGHT HAND GRIP)



CANOPY CONTROL SWITCH



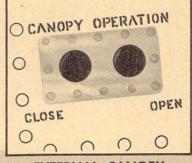
EXTERNAL CANOPY
JETTISON CONTROL



To jettison the canopy, explosive charges in the attachment fittings are exploded electrically simultaneously with two pneumatic guns so that the canopy is broken loose and the guns rotate the canopy about two aft hinges up and away from the pilot into the airstream.

WARNING

Stand clear when jettisoning canopy on the ground. If either cockpit or external jettison switches are actuated the canopy will be jettisoned whether the battery switch is in the ON or OFF position as a canopy jettison battery supplies current to the circuit.



EXTERNAL CANOPY CONTROL SWITCHES



CONTROL
(MANUAL)



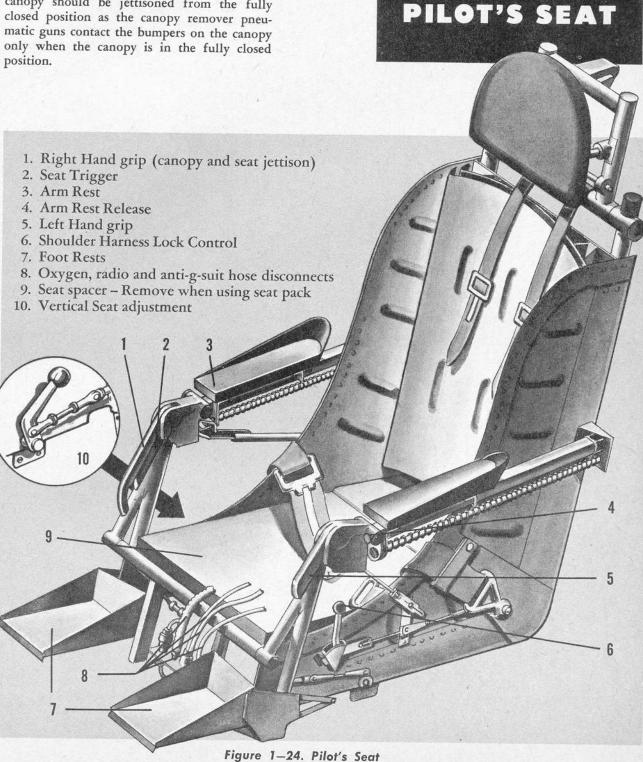
INTERNAL CANOPY
CONTROL
(MANUAL)

WARNING

The canopy roller explosive charges and the canopy remover pneumatic guns will fire when the right handgrip is actuated whether the canopy is open or closed and regardless of the position of the battery switch. However, the canopy should be jettisoned from the fully closed position as the canopy remover pneumatic guns contact the bumpers on the canopy only when the canopy is in the fully closed position.

AUXILIARY EQUIPMENT.

Section IV of this handbook contains information on the following auxiliary equipment: oxygen, pressurization, heating, ventilating, communications, in-flight refueling, armament, anti-g, de-icing, lighting and auto-pilot.



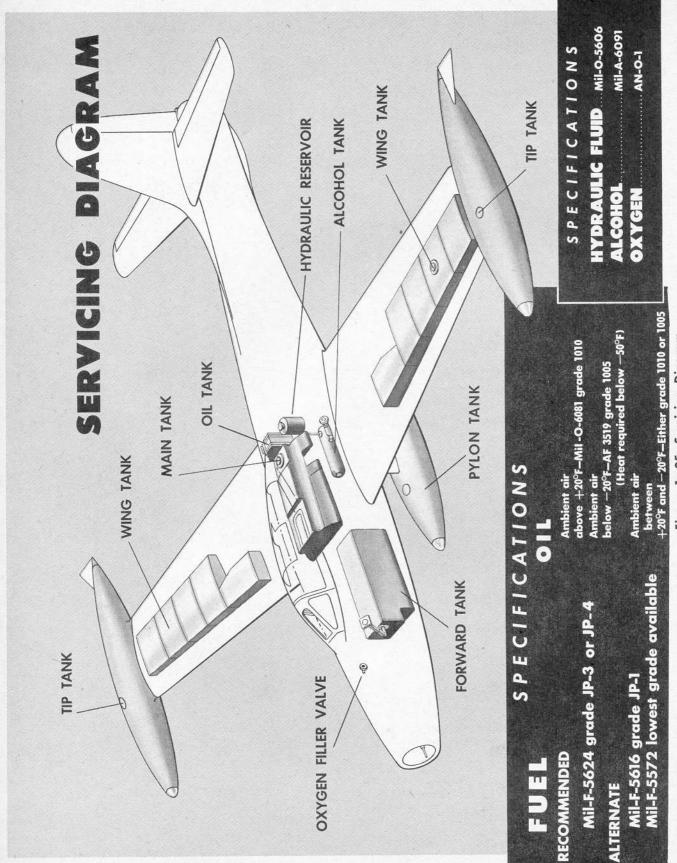


Figure 1—25. Servicing Diagram



WEIGHT AND BALANCE.

Check take-off and anticipated landing gross weight and balance. Consult Handbook of Weight and Balance AN01-1B-40 for loading procedure. Make sure weight and balance clearance (Form F) is satisfactory. Check that total weight of fuel, oil, armament, oxygen, and special equipment carried is suitable to the mission to be performed. Refer to Section V for weight limitations for various configurations.

EXTERIOR INSPECTION.

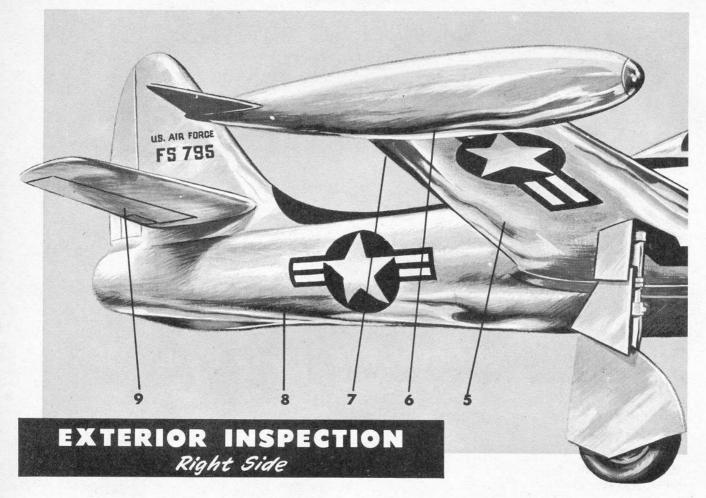
- 1. Check Forms 1 for status of the airplane.
- 2. Make a complete pre-flight inspection of the airplane. (See figure 2-1).

TO GAIN ENTRANCE TO AIRPLANE.

- 1. Open canopy by actuating the aft external canopy control switch. If electrical power is not available, use the EXIT RELEASE.
- 2. Place a ladder against the left side of the aircraft at the cockpit. No external grips or steps are provided.



Do not use the canopy rail for a step or the gun sight as a hand hold.



1. NOSE SECTION.

- a. Intake dust plug and pitot cover Removed.
 - b. Air intake ducts for foreign objects.
- c. Nose wheel shock strut Visible damage and proper inflation. Strut extension 4 to 6 inches depending on weight of airplane.
 - d. Nose gun blast tubes plugs installed.

2. NOSE - RIGHT SIDE.

- a. Nose wheel well Condition.
- b. Nose gear safety pin Removed.
- c. Nose wheel tire Proper inflation and evidence of slippage.
- d. Nose wheel static ground wire ground contact.
 - e. Nose wheel door Condition.

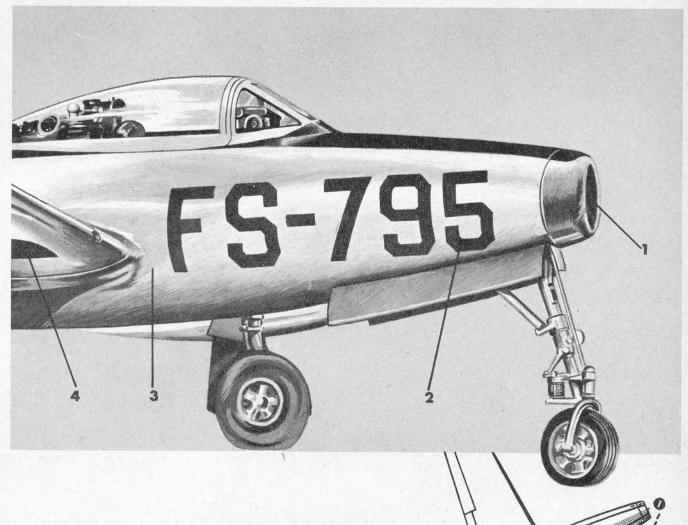
 - f. Static air vents Open.g. All access doors Installed.
 - h. Proper ballast in ammunition cans.
 - Gun deck cover Secured.
 - k. Oxygen filler Secured.

3. FUSELAGE - RIGHT SIDE FORWARD.

- a. Wing gun blast tube plug installed.
- b. Gun camera lense Clean.
- c. Wing leading edge Condition.
- d. Speed Brake Condition.
- e. Pylon tank or bomb proper installation and pylon tank filler cap secured.

4. RIGHT WHEEL WELL.

- a. Wheel well for evidence of fuel leakage.
- b. Single point refueling filler Secured.
- c. Armament safety over-ride switch Pin and streamer removed and stowed.
- d. External power source Connected to no. 1 & 2 or No. 1 receptacle.
- e. Landing gear strut Visible damage and proper inflation.
- f. Landing gear tire Blisters, grease or oil, proper inflation and evidence of slippage.
 - g. Landing gear fairing doors Secure.
 - h. Wheel chock In place.
 - j. Landing gear safety clip Removed.
- k. Air pressure in bomb pylon pneumatic jettison system – pylon jettison cylinders 800 to 1000 psi; Pylon tank jettison cylinders – 1100 to 1300 psi.



5. RIGHT WING OUTBOARD.

- a. Front rocket posts Properly retracted.
- b. Rear rocket doors Flush fit with under-
- side of wing skin and security of latches.
 c. Wing covering Condition and evidence of fuel leakage.

6. RIGHT WING TIP.

- a. Wing tip tank and fairing Secured.
 b. Wing tip tank fin Installed.

- c. Filler cap Installed. d. Position lights Condition.

7. RIGHT WING TRAILING EDGE.

- a. Wing, aileron and flaps Condition.
- b. Wing fuel filler cap Installed.

8. AFT FUSELAGE - RIGHT SIDE.

- a. Jato Units Installed and nozzles clear.
- b. Engine access doors Closed and Secured.
- c. Fuselage covering Condition.

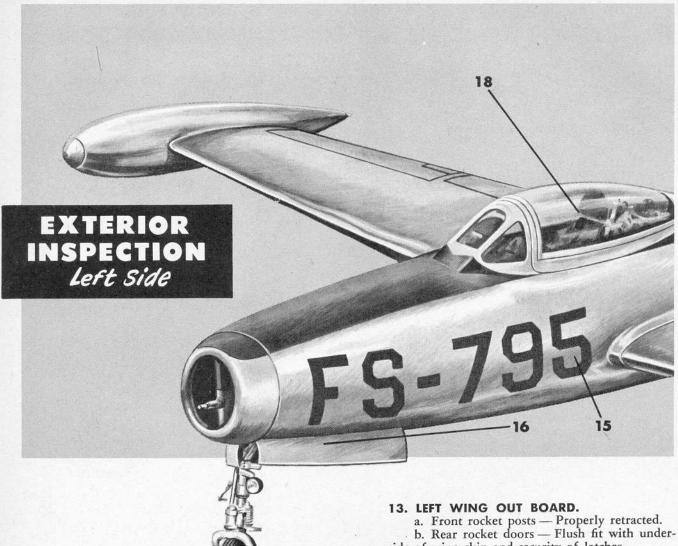
9. EMPENNAGE.

- a. Tailpipe dust plug Removed.b. Tailpipe for accumulation of fuel or oil.

.0---

- c. Elevator tabs Condition.
- d. Rudder fixed tab Condition.
- e. Empennage for general condition.
- f. Tail position lights Condition. g. Fuel tank vents Condition.

Figure 2-1. Exterior Inspection (Sheet 2 of 4)



10. AFT FUSELAGE - LEFT SIDE.

- a. Jato units Installed and nozzles clear.
- b. Engine access doors Closed and secured.
- c. Fuselage covering Condition.

11. LEFT WING TRAILING EDGE.

- a. Wing, aileron and flaps Condition.
- b. Wing fuel filler cap Installed.

12. LEFT WING TIP.

- a. Wing tip tank and fairing Secured.
- b. Wing tip tank fin Installed.
- c. Filler cap Installed.
- d. Position lights Condition.

- side of wing skin and security of latches.
- c. Wing covering Condition and evidence of fuel leakage.

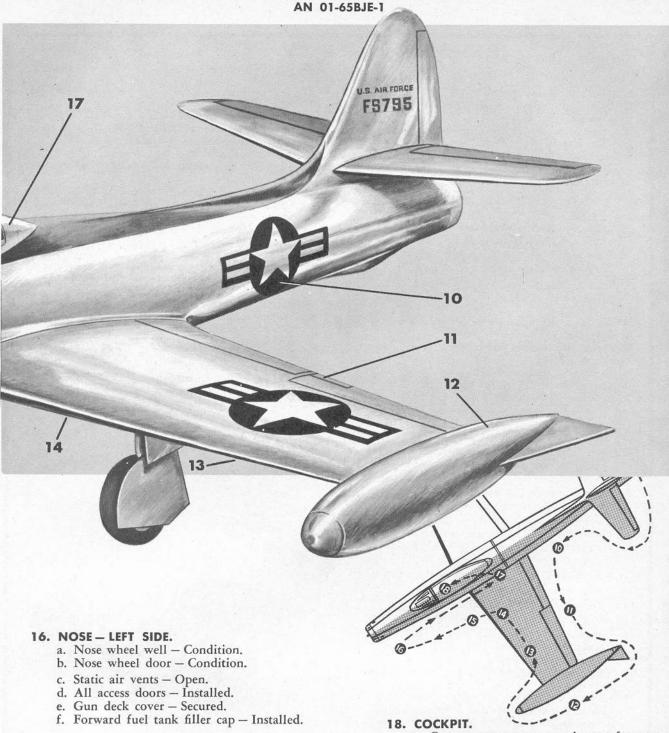
14. LEFT WHEEL WELL.

- a. Wheel well for evidence of fuel leakage.
- b. Landing gear strut Visible damage and proper inflation.
- c. Landing gear tire Blisters, grease or oil, proper inflation and evidence of slippage.
 - d. Landing gear fairing doors Secure.
 - e. Wheel chock-In place.
 - f. Landing gear safety clip Removed.
- g. Air pressure in bomb pylon pneumatic jettison system - pylon jettison cylinders 800 to 1000 psi; Pylon tank jettison cylinders - 1100 to 1300 psi.

15. FUSELAGE — LEFT SIDE FORWARD.

- a. Wing gun blast tube plug installed.
 b. Wing leading edge Condition.
- c. Speed brake Condition.
- d. Pylon tank or bomb Proper installation and pylon tank filler cap installed.
- e. Inflight refueling doors Evidence of damage.

Figure 2-1. Exterior Inspection (Sheet 3 of 4)



f. Forward fuel tank filler cap - Installed.

17. AFT CANOPY.

- a. Check oil supply and tank filler cap -Installed.
 - b. Hydraulic reservoir filler cap Installed.
 - c. Main fuel tank filler cap Installed.
 - d. Alcohol tank filler cap Installed.
- e. Canopy and canopy frame Cleanliness
- f. Canopy for cracks, nicks, crazing and security.

18. COCKPIT.

- a. Canopy remover pneumatic guns for proper air pressure - 1000 - 1200 psi.
- b. Lead seal affixed to top of seat catapult
- c. Safety shear wire secured in drilled hole in lower end of catapult arming pin.
- d. Catapult free from dents or other visible damage.
- e. Seat ejection safety-pin cable proper installation.
- f. Catapult ground safety cotter pin-Removed.

Figure 2-1. Exterior Inspection (Sheet 4 of 4)

ON ENTERING THE PILOT'S COMPARTMENT

1. Check jato ready switch - OFF.

Adjust arm rest to desired position and seat for proper height.

Check that the internal canopy jettison control safety clip is in position.

Examine safety belt and shoulder harness for security of adjustment and proper operation of lock movement and leave unlocked.

CAUTION

Exercise caution when fastening or adjusting seat safety belt in order to prevent damage to the seat jettison cable guard, located on the right side of the seat

- Release control lock and adjust rudder pedals to proper position. Check controls for free and correct movement.
- 6. Check for firm, positive brake pedal action.

7. Reset parking brake.

- Check that external power is connected and battery switch is OFF.
- 9. Check all circuit breakers.
- 10. Aileron boost disconnect ENGAGE.
- 11. Armament switches OFF or SAFE.

WARNING

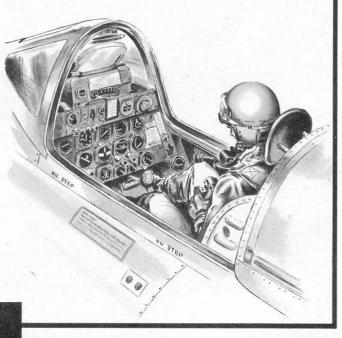
Since take-off requires a large amount of rearward stick travel there is a good possibility of the bomb release button being inadvertently energized by contacting the pilot's clothing or the parachute harness. In order to preclude this possibility the bomb and rocket selector switches must be placed in the OFF position and the bomb and rocket arming switches must be in the OFF or SAFE position prior to take-off.

- 11A. Rocket arming switch OFF.
- 11B. Rocket jettison switch NORMAL.
- 12. Gun selector switch SIGHT CAMERA & RADAR.
- 13. Rocket selector switch OFF.
- 14. Pitot heat switch OFF.
- Test operate throttle twist grip for gun sight operation.
- 16. Throttle CLOSED.
- 17. Test master circuit breaker indicator light.
- 18. Emergency fuel switch OFF.
- 19. Receiver door switch CLOSE.
- 20. Fuel Filter de-icing switch OFF.
- 21. External tank air pressure switches TIP TANKS AIR PRESSURE (PYLON TANKS AIR PRESS).
- 22. Fuel tank selector OFF.

- Check hydraulic hand pump selector SYSTEM. (up to F-84G-10RE)
- Test operate hydraulic hand pump to insure pressure.
- 25. Landing flap control NEUT.
- 26. Speed brake switch DOWN.
- 27. Landing gear selector DOWN.
- 28. Aileron boost set at 6 or as desired.
- 28A Gun charger compressor switch OFF (F-84G-10RE and up).
- 29. Fuel tank battle damage switches down position.
- 30. Slaved gyro compass switch NORMAL.
- 31. Set accelerometer.
- 32. Set altimeter to correct setting.
- 33. Check clock for proper setting.
- 34. Check fuel quantity.
- 35. Set fuel counter. (See table for proper setting.)
- Gun-bomb-rocket sight mechanical caging lever CAGE.
- 37. Reticle dimmer control DIM.
- 38. Instrument power switch NOR.
- 39. Check generator switch ON.
- 40. Check oxygen equipment and low pressure 400 psi and high pressure if installed 1800 psi pressure.
- 41. Check radio controls.
- 42. Cockpit heat and vent switch PRESSURE.
- 43. Cabin temperature control AUTOMATIC.
- 44. Test all warning lights.
- 45. Auto pilot power supply OFF.
- 46. Internal and external lights OFF.

INTERIOR CHECK (NIGHT FLIGHTS)

- 1. Test operate all internal and external lights.
- 2. Check flashlight.



INTERIOR CHECK

BEFORE STARTING ENGINE.

1. Head aircraft into the wind if possible.

CAUTION

To prevent damage to the fuselage shroud, be sure that all inspection doors and openings in the aft fuselage are closed before starting the engine.

STARTING ENGINE.

- 1. Throttle CLOSED.
- 2. Battery switch OFF and check external power connected.

Note

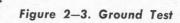
If external power is not available turn battery switch ON and instrument power switch to ALT position, (this is considered an emergency procedure.) After engine has started return instrument power switch to NOR position.

GROUND TEST

- 1. Check hydraulic pressure,
- 2. Test operate landing flaps, trim tabs and speed brake through complete range. If speed brake does not operate check safety switch in speed brake compartment.
- 3. Test operate aileron boost and check boost ratio at 6 or as desired.

 - 4. Check flight controls for free and correct movement. 5. Check fuel tank selector ALL TANKS. 6. Check charge on ammeter at 40% rpm and above.

 - 7. Check voltmeter at 40% and above. 8. Check communication equipment.
- as follows:
- 9. Check auto-pilot interlocks for proper functioning
- a. With instrument power switch in NOR position
- a. With instrument power switch in INOR position and auto-pilot power supply OFF it should not be possible to move auto-pilot control switch to ON position. b. With Turn Knob in detent and auto-pilot power supply switch ON, it should not be possible to move autopilot control switch to ON until 2 minutes time delay has
- c. With control switch OFF and power supply switch to move control switch to ON position.
- ON, place turn knob out of detent; it should not be possible d. With turn knob in detent and control switch in ON position, place power supply switch OFF; control switch and country switch of control switch
- Should automatically drop back to OFF and it should not be possible to move it to ON position. e. With auto-pilot power supply switch ON and after 2 minutes time delay, position control switch to ON, move instrument power switch to ALT position. Control switch
- should automatically drop back to OFF and it should not be possible to move it to ON position. f. Return instrument power switch to NOR, control switch to ON.
- 10. Check auto pilot flight controller as follows: a. Move pitch control, aileron trim control and the turn control and check for correct movement of control
- 11. Check that no fuel is overflowing from the main tank vent lines (observed by ground crew).



SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1



CAUTION

After a false start allow combustion chambers to drain for 3 minutes, or longer (if drainage continues) before attempting another start. Do not operate starter continuously for more than one minute. The starting motor provides only three starts, or attempted starts, with a minimum interval of 3 minutes between starts. Each series of three starts must be followed by a 20 minute interval.

- 3. Fuel tank selector ALL TANKS.
- 4. Emergency fuel switch OFF.
- 5. Move ground start switch to GROUND START for two seconds to engage the automatic starting system.
- 6. When engine speed reaches 7.5% rpm, open throttle to idle or above. After opening the throttle, if ignition, as indicated by rising exhaust temperature, does not occur within 5 seconds, close the throttle, place the ground start switch momentarily in STOP STARTING CYCLE position and investigate.
- 7. If engine speed does not reach 7.5% rpm in 30 seconds place the ground start switch in STOP STARTING CYCLE position momentarily. Wait for engine to stop. Insure that the source of electrical power is adequate and the connections are good, especially the external power connection. If repeated starting attempts still fail, investigate condition of starter-generator and engine.

Note

Fire fighting while starting the engine is covered in Section III.

8. At approximately 22% rpm the starter and ignition circuits will cut off. To assure this procedure, place the ground start switch in the STOP STARTING CYCLE position when engine speed reaches 22%.

TABLE 2-1. RPM REQUIREMENTS FOR EMERGENCY FUEL SYSTEM TEST

RPM tolerance +0.5, -1.0 percent rpm.						
Percent RPM	96.9	97.6	98.2	98.8	99.4	100.0
Ambient Temp. °I	50	60	70	80	90	100
Percent RPM	92.9	93.6	94.3	95.0	95.6	96.3
Ambient Temp. °F	-10	0	10	20	30	40
Percent RPM	88.5	89.0	89.9	90.7	91.4	92.2
Ambient Temp. °F	-65	-60	-50	-40	-30	-20

- 9. When engine speed has stabilized at idle rpm check the oil pressure. The throttle may be advanced to secure any desired rpm, if the engine is running normally. Recommended idle speed is 36-39% rpm.
- 10. Check that all engine instruments are within range and indicate normal operation.

Note

In the event of condensation in the form of mist or snow is blown into the cockpit from the side air outlets they should be turned OFF and if it is still found to be objectionable to the pilot, the cockpit heat and vent switch can be positioned to RAM.

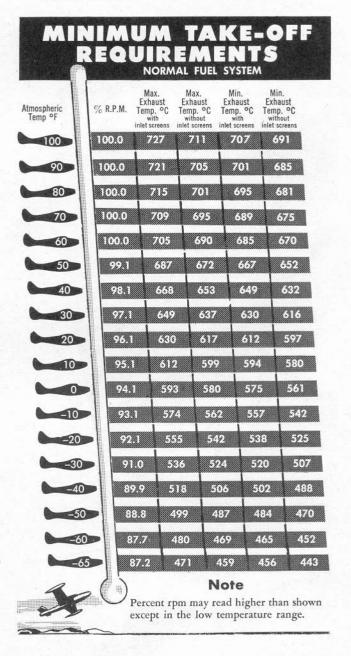


Figure 2-4. Minimum Take-off Requirements

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11. Have external power supply disconnected and turn battery switch ON.

WARNING

A "hot start" is defined as a start during which the exhaust temperature exceeds 900°C. Record each "hot start" in USAF Form 1. After five starts in which the temperature is between 900 1000°C or one start in which the exhaust temperature reaches 1000°C, accomplish the speical inspection outlined in applicable inspection guide. Engine passing this inspection may be returned to service. Record each hot start thereafter in USAF Form 1. When the maximum permissible number of hot starts again has been experienced, reinspect the engine. Engine overspeed limits: Engine speed is limited to 100.5% rpm for take-off. Reset fuel control if stabilized speed exceeds 102% rpm in flight. Remove engine for overhaul if stabilized speed exceeds 103% or if speed momentarily exceeds 104% rpm during ground or flight operation.

ENGINE GROUND OPERATION.

No warm-up period is necessary. Take-off may be made immediately if the engine tachometer and exhaust temperature indicator show normal readings.

CAUTION

Hold ground run-ups to a minimum when using high rpms.

TAXIING INSTRUCTIONS.

Remove chocks, release brakes and increase power until airplane starts to move. Approximately 45% rpm is necessary. Adjust power for desired taxi speed. Brakes are required for steering as the rudder is ineffective at low speeds. Slightly higher than normal force is required on the brakes for turning, however, the airplane is easy to taxi. When the airplane is fully loaded with external items, a much higher rpm is necessary to get the airplane rolling. When heavily loaded the airplane is easy to steer, but the turning radius must be slightly increased to prevent excessive side loads on struts and tires. Limit taxiing to a minimum as the fuel consumed in taxiing is approximately 19 to 26 pounds per minute.

BEFORE TAKE-OFF. PRE-FLIGHT ENGINE CHECK.

CAUTION

Do not operate at 100% rpm any longer than is absolutely necessary. Refrain from rapid manipulations of the throttle whenever possible.

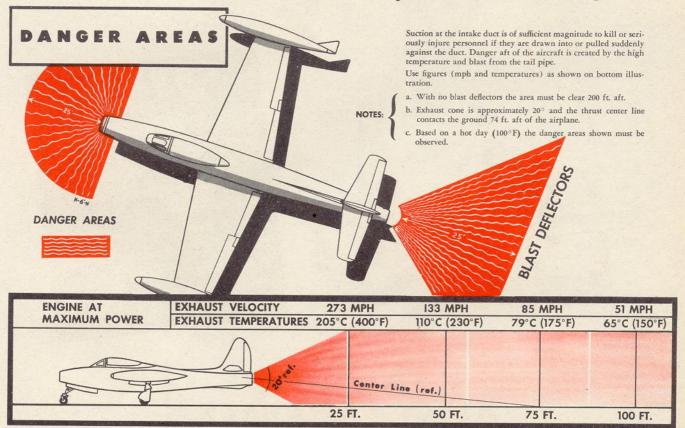


Figure 2-5. Danger Areas

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1



1. Maintain 50% rpm to generate adequate electrical power and then close canopy.



2. Landing flaps down 20°.



3. Trim tabs neutral. (check lights)



4. Check speed brake switch UP.



5. Fuel tank selector ALL TANKS.



6. Emergency fuel switch EMERG ALERT.



7. External tank air pressure switches - TIP TANKS AIR PRES-SURE (PYLON TANKS AIR PRESS.)



8. Safety belt and shoulder harness tightened and check inertia reel unlocked.



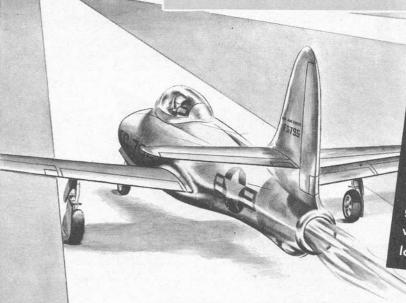
9. Auto-pilot power supply switch OFF.



10. Prior to jato takeoff, place jato ready switch in JATO READY. Jato ready warning light should go on.



11. Oxygen mask adjusted properly and oxygen system operating. Arrange oxygen hose so as not to interfere with full stick movement.



CAUTION

Brakes are adequate at the design gross weight of 14,500 lbs and up to a maximum gross weight of 17,800 lbs. In addition, the brakes will have normal life at these weights. In event of a refused takeoff with a configuration of 4-230 gallon tanks (22,200 lbs gross weight), the brakes will be overloaded by 53%.

PRE-FLIGHT

AIRCRAFT CHECK

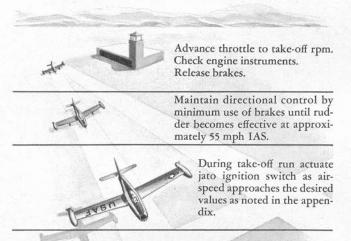
Figure 2-6. Preflight Aircraft Check

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1. Check emergency fuel system: With emergency fuel switch OFF and the engine operating at 100% rpm on the main fuel system, hold the emergency fuel test switch in the EMERG TEST position. Engine speed should be consistent with values shown in Table 2–1. The fuel system emergency-on indicator light will illuminate.

CAUTION

During operation with ambient temperatures of approximately 102°F and above, it may be necessary to reduce engine speed below 100% to prevent the exhaust temperature from exceeding 712°C on engines without fixed inlet



The nose wheel should not be raised as the take-off run will be extended because

(see

Leave control stick in neutral until best take-off speed is reached. This reduces drag to a minimum.

As best take-off speed is approached, aft pressure on the stick should be steadily increased with a definite pull being exerted. This pressure must be held as take-off speed is reached and the airplane becomes airborne.

TAKE-OFF

of increased drag.

screens and 727°C on engines with fixed inlet screens.

2. Return to normal engine operation by quickly retarding the throttle to a position which will give approximately the same rpm on the normal fuel system as was obtained at full throttle on the emergency fuel system, and at the same time release the emergency test switch.

Note

When changing over from the emergency fuel system to the main fuel system during operation at idle speed, accelerate the engine speed to 77% before making the change, otherwise a momentary overtemperature may result.

- 3. Check engine acceleration time. From 42% rpm to full rpm 20 sec max.
- 4. Check instruments for desired readings at take-off power.
- 5. Check normal fuel system for minimum take-off rpm on main fuel system and for exhaust temperature at minimum rpm in accordance with figure 2-4.

TAKE-OFF.

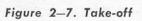
(See figure 2-7)

The following technique must be used to obtain performance in Appendix.

1. Refer to Appendix for minimum take-off distances required for various combinations of gross weight, pressure altitude and air temperature, also for best climbing speed, rate and time of climb and fuel consumption.

NOTE

A nose-high attitude at take-off is to be expected as this is characteristic of the airplane. This attitude will continue throughout the first part of the ascent.



Note

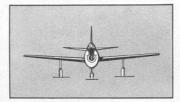
Elevator control is adequate to raise the nose wheel prior to normal take-off speed at the heaviest forward c.g. loading possible with normal use of the airplane. Installation of pylon tanks has the effect of slightly increasing elevator (or speed) required to unstick. At minimum take-off speeds, the control stick travel will be comparatively large and the airplane will be very nose high. As the pull off speed is increased, the control stick travel necessary, and the nose high attitude will diminish. Control stick force necessary to pull the nose wheel off will increase in forward cg loading configurations, however the force is not prohibitive at any time. Use of excessive trim tab to lighten these forces should be avoided, since this trim tab deflection reduces the effectiveness of the elevator and consequently increases the nose wheel lift off speed.

CAUTION

Do not use more than one half the available nose-up trim on take-off for a heavily loaded airplane at forward c.g. The tail of the airplane can be dragged by excessive nose high attitude on take-off as well as landing.

LIFT OFF PROCEDURE-WITHOUT TIP TANKS

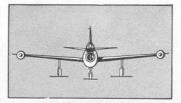
Hold neutral control stick until approximately 125-130 mph IAS is reached, at which time pull the airplane off the ground using the necessary control stick travel. Allow airspeed to increase to 160 mph IAS and hold until all obstacles are cleared.



15,300 LBS

LIFT OFF PROCEDURE-WITH TIP TANKS

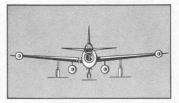
Hold neutral control stick until approximately 135-140 mph IAS is reached, at which time pull the airplane off the ground using the necessary control stick travel. Allow airspeed to increase to 180 mph IAS and hold until all obstacles are cleared.



18,600 LBS

LIFT OFF PROCEDURE - WITH 4 EXTERNAL TANKS

Hold neutral control stick until approximately 150 mph is reached, at which time pull the airplane off the ground using the necessary control stick travel. Allow airspeed to increase to 190 mph IAS and hold until all obstacles are



22,200 LBS

ASSISTED TAKE-OFF.

The effect of jato on airplane trim is slight as the units are located near the center line of the fuselage. No special technique is required. Take-off performance will depend on the speed at which the jato units are fired

during the take-off run. Refer to the Appendix for the jato cut-in speed for either a two or four jato unit take-off.

AFTER TAKE-OFF.

1. Landing gear selector UP when definitely airborne. Return to NEUT after gear is retracted, as indicated by landing gear lights.

Note

If the landing gear selector is moved slowly from the UP or DOWN position to the NEUT position a momentary flashing of the landing gear unsafe warning light may occur due to the construction of the landing gear selector valve. This momentary flashing does not indicate that the landing gear has been unlocked. The landing gear will retract in approximately 6 seconds at normal temperatures.

2. Landing flap control: UP at approximately 170-190 mph IAS. Return to NEUT after flaps are retracted.

3. After take-off, drop jato units when desired by actuating JATO JETTISON switch. Leave switch in JATO JETTISON position for a minimum of 4 seconds.

4. Return jato ready switch to OFF.5. Climb to safe altitude and adjust speed for best

CAUTION

During continuous operation with engine speeds of 95.6% and below, the exhaust gas temperature must not exceed 651°C on engines without fixed inlet screens and 666°C on engines with fixed inlet screens. It may be necessary to reduce engine speed to prevent the exhaust gas temperature from exceeding the maximum values when the compressor inlet temperature exceeds approximately 102°F.

- 6. Emergency fuel switch OFF (NORM) as soon as oracticable.
- 7. Cockpit heat and vent switch PRESSURE if takeoff was made in RAM.
- 8. Gun charger compressor switch ON (if compressor is installed).

CLIMB.

The climb characteristics of the airplane permit a high initial rate of climb and sustained climbing speed to the service ceiling. See Appendix for climb performance.

FLIGHT CHARACTERISTICS.

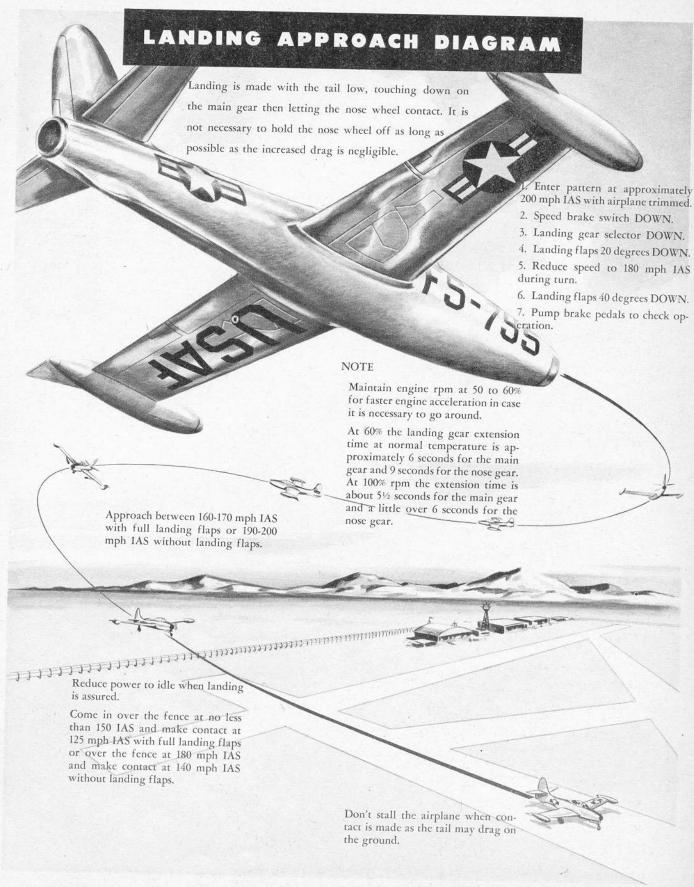
Refer to Section VI for detailed information on the airplane flight characteristics.

SYSTEMS OPERATION.

Refer to Section VII for detailed information regarding operation of the various aircraft systems.

DESCENT.

Refer to appendix for various descent performances. Generally a normal fast descent from high altitude using the least range can be made at 30-50 mph IAS below the maximum speed with the throttle closed and the speed brake open. The airplane will have good stability and control throughout the entire descent in all configurations. A faster descent will result in good control to approximately 25,000 feet, where the dive angle will become much steeper and the increased forces will cause an increase in stick force. The airplane will tend to pitch



and buffet as the lower altitudes and higher indicated airspeeds are reached.

It is not recommended to exceed 525 mph with the speed brake down because of the high loads imposed. A slow descent for the purpose of stretching range in event of low fuel quantity may be accomplished at 225 mph IAS with the speed brake closed and the engine at idle rpm.

PRE-TRAFFIC PATTERN CHECK LIST.

- 1. Armament switches OFF or SAFE.
- 2. Gun selector switch OFF.
- Gun-bomb-rocket sight mechanical caging lever CAGE.

CAUTION

If the mechanical caging lever is left in the UNCAGE position during landing or taxiing, the sight mirror or mirror suspension may become damaged due to vibration.

- 4. Fuel tank selector ALL TANKS unless operation has been necessary in AUX.
- 5. Emergency fuel switch EMERG ALERT.
 - 6. Auto-pilot control switch OFF.
- 7. Gun charger compressor switch OFF (F-84G-10RE and up.)

LANDING.

CAUTION

Avoid landing the airplane with fuel in the tip tanks or with bombs. Landing with fuel in the tip tanks or with bombs requires that good landing technique be employed to prevent wrinkling or buckling of the wings during such landings.

NORMAL LANDING.

Refer to Appendix for landing data. A ten minute interval between landings is necessary to permit the brakes to cool.



1. Landing is made with the tail low, touching down on the main gear then letting the nose wheel contact.

It is not necessary to hold the nose wheel off as long as possible as the increased drag is negligible.

- 2. After touchdown apply brakes momentarily to check if brakes are effective.
- 3. Allow the airplane to roll approximately 1000 feet, then apply brakes intermittently until airplane speed reduces to taxiing speed.



The time required to regain take-off thrust is longer with jet airplanes than with reciprocating engine aircraft. From 50% rpm reasonable acceleration is possible.

- 1. Open throttle to full rpm.
- 2. Retract the landing gear if airborne.
- 3. Retract landing flaps to 20 degrees immediately and to full up position as conditions dictate. The flaps may be retracted full up at once, if airspeed is available, as they retract slowly from 20° to UP.
 - 4. Speed brake UP.

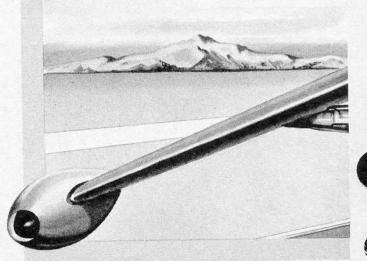


Figure 2-9. Go Around or Wave-off (Sheet 1 of 2)

Note

Directional control is good throughout the entire landing roll.

CAUTION

Do not open the canopy until speed has reduced to 15 mph to avoid high loads and eventual failure of the canopy actuator which results when the canopy is partially opened at high speeds.

- 4. Emergency fuel switch OFF.
- 5. Landing flap control UP before taxiing.
- 6. Return landing flap control to NEUT after flaps are up.

- 7. Leave speed brake DOWN for ground maintenance.
- 8. Refer to Section III for emergency landings.

LANDING WITH EXTERNAL LOAD.

Landing with external loads such as bombs, pylon tanks, rockets or fuel in the wing tip or pylon tanks should be avoided because the loads applied to the wing structure during such landings will cause wrinkles in the wing unless good smooth landings are made. Landing is made in the normal manner except that the speed will be higher because of the higher stalling speed due to the increased weight.

CROSS WIND LANDING.

The procedure for cross wind landing is the same as for

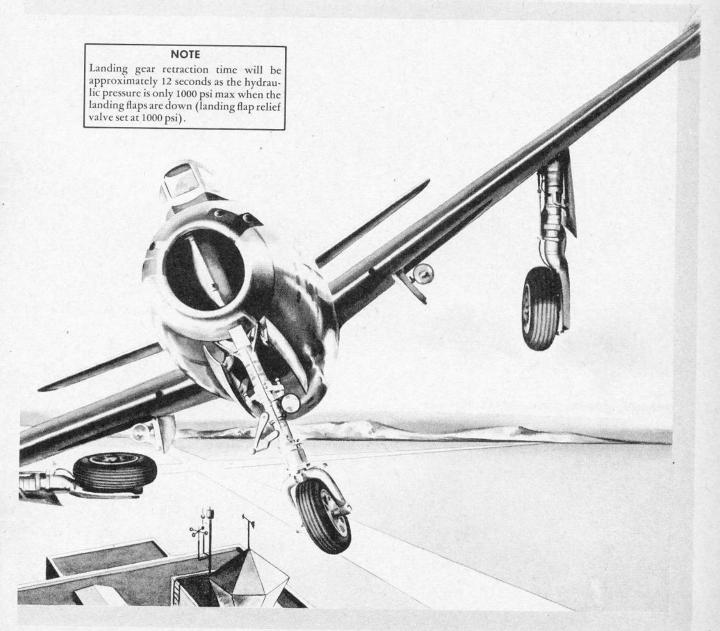


Figure 2-9. Go Around or Wave-off (Sheet 2 of 2)

SECURITY INFORMATION -- RESTRICTED AN 01-65BJE-1

normal landing. However, if the drift appears excessive, the upwind wing may be lowered until just before contact.

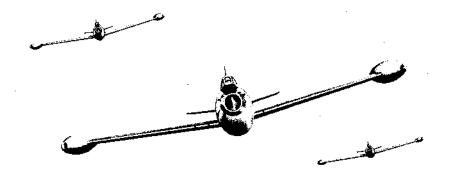
STOPPING THE ENGINE.

- 1. Parking brakes on.
- 2. If possible head aircraft into the wind so that air circulation after the engine has stopped will clear the engine of fumes.
- 3. Move throttle lever to CLOSED and hold or lock in this position, until engine stops.
 - 4. Fuel tank selector OFF.

- 5. Elevator trim tabs neutral.
- 6. All switches OFF except generator switch.

BEFORE LEAVING PILOT'S COMPARTMENT.

- 1. Chocks in place.
- 2. Parking brakes off.
- 3. Flight controls locked.
- 4. Insert the ground safety cotter pin in the ejection seat catapult.
 - 5. Fill out Form 1.
- 6. Leave canopy open slightly to allow for air circulation.





ENGINE FAILURE.

PROCEDURE ON ENCOUNTERING ENGINE FAILURE.

Successful engine operation is primarily dependent upon satisfactory function of the two fuel systems: The engine fuel system, which provides fuel at the required pressure and the airplane fuel system, which maintains the supply of fuel to the engine system. Both systems are provided with emergency change-overs in case of failure. If the supply of fuel from the main fuel system fails, the emergency fuel system is available. If the main fuel tank (the normal source of supply to the engine fuel system) should fail, fuel from the wing and forward tanks can be recovered in WING AUX and FWD AUX operation. Failure of each of these systems is covered in detail in this section. If power does fail, the fuel pressure warning light will isolate the source of trouble. If the fuel pressure warning light is on, the main tank has failed, so that switching to auxiliary operation is necessary to recover fuel. If the fuel pressure warning light is off, the main tank is operating properly and therefore failure must have occurred in the engine fuel system. In this case, fuel for the engine is recovered by turning the emergency fuel switch ON, which sets the emergency fuel system in operation. In any event, the first step on encountering complete engine failure is to close throttle so as to prevent the engine from flooding and then, after proper selection of systems, to attempt a re-start of the engine.

Note

Flight characteristics of the aircraft with a dead engine are normal and rapid trim changes are not necessary.

COMPLETE ENGINE FAILURE DURING TAKE-OFF. BEFORE FLYING SPEED IS REACHED.

- 1. Close throttle.
- 2. Turn fuel tank selector OFF.
- 3. Open canopy.
- 4. Turn battery and generator switches OFF.
- 5. Brake to a stop on runway if possible.
- 6. Beyond runway: Landing flaps DOWN, leave battery switch ON, operate landing gear emergency ground retract switch, landing gear selector UP and then turn battery switch OFF.

AFTER LEAVING THE GROUND.

- 1. Close throttle.
- 2. Turn fuel tank selector OFF.
- 3. Salvo switch SALVO to jettison external stores.
- 4. Landing flaps DOWN.
- 5. Landing gear UP.
- 6. Turn battery and generator switches OFF.
- 7. Land straight ahead, changing course only enough to miss obstacles.

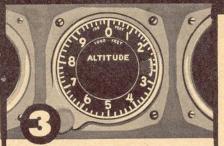
Emergency AIR STARTING OF ENGINE



Close throttle.



Raise nose to drain out unburned fuel through tail pipe.



Descend to 20,000 feet or lower. Starts at lower altitudes are more positive.



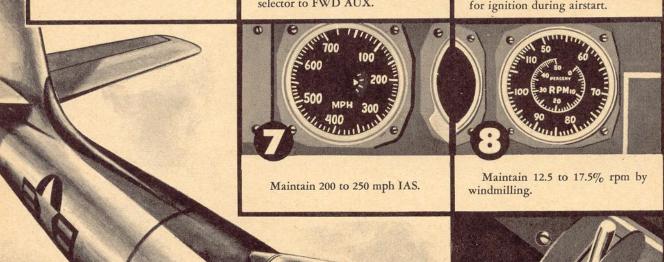
If engine failure occurred with the fuel pressure warning light OFF, indicating a probable engine pump or main fuel control failure, turn the emergency fuel switch ON, fuel tank selector ALL TANKS.

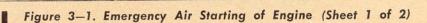


If engine failure occurred with the fuel pressure warning light ON, indicating a failed booster pump in the main tank, leave the emergency fuel switch OFF and turn fuel tank selector to WING AUX. If fuel pressure warning light remains ON, indicating a failed booster pump or empty wing tanks turn fuel tank selector to FWD AUX.



Instrument power switch ALT for ignition during airstart.





Momentarily depress air start

switch to AIR START.

After Engine Starts

NOTE

If rpm is below 12.5%, depress ground start switch to GROUND START position for two seconds.

- Advance throttle to get fuel pressure required for start and observe exhaust gas temperature gage for evidence of firing.
- Retard throttle if necessary to prevent excessive exhaust gas temperature after engine fires.
- If ground start switch was used for starting, place it momentarily to STOP STARTING CYCLE position when rpm reaches 22%.
- Instrument power switch: NOR after engine has started.
- When rpm and exhaust gas temperature have stabilized at idle speed, throttle may be advanced as desired.

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If engine has not fired within five seconds after opening the throttle, as indicated by rising exhaust temperature, close throttle and repeat the above procedure. If ground start switch was used in attempted start, depress it momentarily to STOP STARTING CYCLE.

Figure 3-1. Emergency Air Starting of Engine (Sheet 2 of 2)

PARTIAL ENGINE FAILURE DURING TAKE-OFF.

- 1. If not airborne, abort take-off.
- 2. If airborne and fuel pressure warning light is ON indicating a failed booster pump in the main tank, turn fuel tank selector to WING AUX. Go around to land.
- 3. If airborne and fuel pressure warning light is OFF indicating a failed engine pump, place emergency fuel switch ON. Go around and land.

WARNING

Remember that even though the emergency fuel switch is in EMERG ALERT (T.O. & LDG) position during take-off; partial power failure may not cause a fuel pressure drop sufficient to start the emergency fuel system automatically.

ENGINE FAILURE DURING FLIGHT.

1. Attempt to restart the engine.

CAUTION

If engine restart is unsuccessful and an emergency landing is anticipated, move the aileron boost disconnect to the DISENGAGE position to avoid erratic aileron boost if the engine stops windmilling. Aileron boost will be satisfactory with a windmilling engine.

PARTIAL ENGINE FAILURE DURING FLIGHT.

1. In high altitude operation, partial engine failure may be corrected by leaving the throttle in the open position and descending to a lower altitude rapidly.

MAXIMUM GLIDE.

If it is desired to obtain the maximum glide of the aircraft to reach a suitable landing area with a dead engine, proceed as follows:

- 1. Throttle CLOSED.
- 2. Fuel tank selector OFF.
- 3. Landing flaps UP.
- 4. Speed brake UP.
- 5. Jettison external stores. Do not drop stores over inhabited areas.

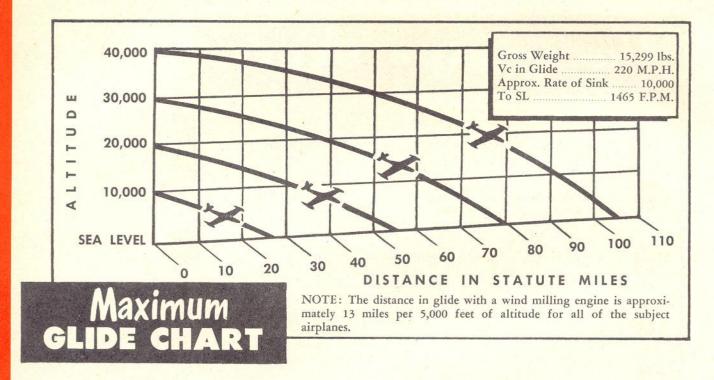


Figure 3-2. Maximum Glide Chart

6. Jettison tip tanks if they contain fuel in straight flight above 250 mph IAS.

Note

It is not necessary to jettison empty tip tanks as they contribute to lift and the additional drag is negligible.

7. Trim the aircraft to maintain a recommended glide speed (figure 3-2).

LANDING WITH DEAD ENGINE.

See figure 3-3.

FAILURE TO ASSIST TAKE-OFF UNITS.

In the event of failure of one or more of the jato units during take-off, a rapid change of trim will not be necessary as the jato units are close to the center line of the aircraft. Take-off distance will be increased as shown in the appendix.

FIRE.

ENGINE FIRE DURING FLIGHT.

- 1. Engine overheat light ON. Reduce power instantly. If light remains on, follow emergency procedure in following paragraphs.
- 2. Engine fire warning light ON. Close throttle, turn fuel tank selector OFF, turn battery and generator switch OFF and make emergency landing or abandon airplane, as circumstances dictate.

FIRE WHILE STARTING THE ENG.

- 1. Close throttle, turn fuel tank selector OFF, and turn battery switch OFF or disconnect external power supply.
 - 2. Leave aircraft as quickly as possible.

FIRE DURING TAKE-OFF - IF AIRBORNE.

- 1. Close throttle.
- 2. Turn fuel tank selector OFF.
- 3. Turn battery switch OFF.
- 4. Land straight ahead.
- 5. Beyond runway: Landing flaps DOWN, landing gear UP.

FIRE DURING TAKE-OFF - IF NOT AIRBORNE.

- 1. Close throttle.
- 2. Turn fuel tank selector OFF.
- 3. Turn battery switch OFF.
- 4. Brake to a stop on runway if possible.
- 5. Beyond runway: Leave battery switch ON, operate landing gear emergency ground retract switch. Landing gear selector UP and then battery switch OFF.

SMOKE ELIMINATION.

If smoke or fumes enter the cabin, the cause may be a fire or fuel leakage in the engine compartment or a failed turbo-refrigerator.

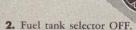
- 1. Connect oxygen mask.
- 2. Set oxygen regulator diluter lever to 100%.
- 3. Position cabin temperature control to highest point.

Landing WITH DEAD ENGINE

If it is possible to land on a prepared runway of adequate length the landing can be made with the landing gear extended. In case a runway of sufficient length is not available, land with the wheels retracted.



. Throttle CLOSED.



3. Jettison as required external stores over uninhabited areas. Tip tanks that are not empty must be jettisoned unless the landing is to be made on smooth terrain. This action is necessary in order to minimize the possibility of fire and preclude any additional loss in glide ratio,

CAUTION

The decision concerning the retention of tip tanks should be based on a consideration of whether there is fuel in the tip tanks and the type of terrain available for landing. In smooth terrain the retention of the tip tanks will alleviate damage to the aircraft for they act as skids and also tend to preclude cart wheeling due a wing tip digging in.

4. Safety belt and shoulder harness tightened and enertia reel lock control locked.



5. Speed brake UP.

6. Landing approach should be made at a higher altitude as the glide path with a dead engine is steeper than with an idling engine.

7. Landing gear DOWN. Use emergency procedure.

8. Landing flaps 20° DOWN until it is estimated that field will not be undershot. Then lower to 40°. Use emergency procedure.

9. Come in over the fence at normal speed but at a higher altitude and make contact in the normal manner.

Figure 3-3. Landing With Dead Engine

CAUTION

The pilot is prevented from bending forward when the enertia reel lock control is in the locked position; therefore all switches not readily accessible should be "cut" before moving the control to the locked position.

If smoke or fumes are eliminated the cause is in the turbo-refrigerator if not the cause is in the engine compartment.

4. If smoke is not eliminated, position cockpit heat and vent switch to RAM and defroster control to OFF.

Note

The intake distribution valve will close and the ram air and safety relief valves will open. The intake of air through the ram air valve will scavenge the air in the cockpit through the open relief valve and rapidly dissipate the fumes and smoke.

LANDING EMERGENCIES.

LANDING WITH WHEELS RETRACTED.

1. Jettison as required external stores over uninhabited areas. Unless the landing is to be made on smooth terrain, tip tanks that are not empty must be jettisoned in order to minimize the possibility of fire.

CAUTION

The decision concerning the retention of tip tanks should be based on a consideration of whether there is fuel in the tip tanks and the type of terrain available for landing. In smooth terrain the retention of the tip tanks will alleviate damage to the aircraft for they act as skids and also tend to preclude cart wheeling due to a wing tip digging in.



WARNING

In case of electrical failure of the battery bus the tip tanks can be jettisoned together with the rockets by the manual tip tank and rocket release but bombs or pylon tanks cannot be jettisoned. Be certain that the bomb arming switch is SAFE and the rocket arming switch is OFF.

- 2. Open canopy.
- 3. Safety belt and shoulder harness tightened and inertia reel lock control locked.

CAUTION

The pilot is prevented from bending forward when the control is in the locked position; therefore all switches not readily accessible should be "cut" before moving the control to the locked position.

- 4. Extend landing flaps as desired.
- 5. Make normal approach.
- 6. Before contact with the ground, close throttle and turn battery switch OFF.

BRAKE FAILURE.

- 1. If left brake is out make landing on left side of runway.
- 2. If right brake is out make landing on right side of runway.
- 3. If both brakes are out, land as short as possible at lowest safe speed. Landing flaps 40 degrees and speed brake DOWN. After touch down, open canopy immediately to help slow down the aircraft and if you are not sure that you can stop, and there is a chance of going off the end of the runway, close the throttle to "cut" the engine. If the engine rotation is stopped or slowed up below normal idling speed, a definite braking action is experienced.

LANDING WITH FLAT TIRE.

- 1. With nose wheel tire flat; make normal landing holding nose off as long as possible.
- 2. With one main wheel tire flat; make normal landing on side of runway nearest inflated tire.
- 3. If both main wheel tires are flat; make normal landing in center of runway and use brakes sparingly and with caution.

LANDING WITH UNBALANCED TIP TANK LOAD

If one tip tank contains fuel and the other is empty, extreme caution must be observed before attempting a

DITCHING

Bail out is preferred to ditching. Until further information is obtained it is recommended that the jet engine be shut off.



1. Turn IFF to EMERGENCY.



Jettison tip tanks, and all external stores including bomb pylons.

NOTE

For additional buoyance do not drop the tip tanks if the tanks are empty or nearly empty and the sea surface is calm.

- 3. Retard throttle beyond gate.
- 4. Shoulder harness and safety belt secured and inertia reel lock control locked. Unbuckle parachute and disconnect oxygen, anti g suit and electrical connections.

CAUTION

The pilot is prevented from bending forward when the inertia reel lock control is in the locked position; therefore, all switches not readily accessible should be "cut" before moving the control to the locked position.

- 5. Check landing gear and speed brake UP.
- 6. Set flaps 20 to 30 degrees DOWN.



- 7. Jettison canopy by pulling up right hand grip.
- 8. Touchdown in a slightly nose high attitude.
- 9. If a regular wave or swell pattern exists aim the touchdown parallel to the waves and attempt to land on the crest or on the falling side of the wave.
- 10. More often the sea surface will be irregular with two or more wave or swell patterns intermingled. In this case the best compromise is to head into whatever wind may be blowing. Examine sea to find areas where the intermingling waves cancel out. Aim touchdown for one of these calmer areas.

11. Make actual touchdown in the same attitude as for normal landing. Make the "softest" possible landing. Do not stall airplane at time of contact.

12. After the airplane has slowed down in the water, leave the cabin at once, since fighter aircraft sink very rapidly.



WARNING

The canopy roller explosive charges and the canopy remover pneumatic guns will fire when the right handgrip is actuated whether the canopy is open or closed and regardless of the position of the battery switch. The canopy should be jettisoned from the fully closed position as the canopy remover pneumatic guns contact the canopy fittings only when the canopy is in the fully closed position. If the canopy is ejected from any position other than fully closed, these pneumatic gun pistons fire through the canopy glass and are ineffective in forcing the canopy away from the aircraft. The canopy should be jettisoned when in straight and level flight if possible so as to avoid any side wind loading which may cause diagonal slueing of the canopy.



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Figure 3-5. Ditching Procedure

landing to avoid an unsatisfactory wing heavy condition. The airplane can be trimmed at normal speeds, however as the speed is reduced aileron displacement may not be sufficient to keep the airplane level. If an unbalanced loading condition exists, as indicated by the necessity to trim the airplane laterally as fuel is transferred from only one tip tank, proceed as follows:

- 1. Jettison tip tanks over uninhabited areas electrically or by means of the manual tip tank release.
- 2. If the tip tanks cannot be jettisoned due to electrical or mechanical failure, a practice landing should be attempted at a safe altitude to determine the slowest speed where the airplane can be held level with sufficient control remaining to pick up a wing. The speed will vary with the amount of fuel remaining in the tip tank.
- 3. After the safe speed is determined a landing can be accomplished provided the touch down speed does not go below the safe speed.
- 4. If the landing is made at a high speed it must be remembered that sufficient runway must be available in order to slow up and stop.

ÉMERGENCY ENTRANCE.

See figure 3-4

WARNING

Stand clear when jettisoning explosive canopy.

DITCHING.

See figure 3-5

BAIL OUT.

See figure 3-6

FUEL SYSTEM FAILURE.

See figure 3-7

TIP TANK JETTISON.

WARNING

Jettison empty tip tanks in straight flight at speeds above 250 mph IAS if conditions permit. At lower speeds, the air loads that separate the tank from the airplane are small and one or both tanks may hang up. If this should occur, hold the airplane straight then yaw slightly away from the tank by tapping the rudder pedal. Do not roll or yaw the airplane sharply. Do not jettison empty tip tanks in a turn. Jettison full tip tanks in straight flight or shallow turns, if possible at any speed.

TIP TANK JETTISON SWITCH.

- 1. External tank air pressure switches OFF.
- 2. Tip tanks jettison switch JETTISON.

SALVO SWITCH.

The tip tanks can be jettisoned by operation of the salvo switch to the SALVO position. The rockets and pylon tanks or bombs will also be jettisoned.

MANUAL TIP TANK RELEASE.

In the event of an electrical failure the tip tanks can be jettisoned by pulling the manual tip tank release aft. This will also jettison the rockets.

PYLON TANK JETTISON.

WARNING

Do not jettison pylon tanks above 325 mph IAS except in emergency. Release tanks in straight and level flight.

Normally the pylon tanks are jettisoned in the same manner as releasing bombs manually.

- 1. Bomb selector switch, ALL.
- 2. Bomb release selector switch, MANUAL RELEASE.
- 3. Bomb release switch, depress.

SALVO SWITCH.

In an emergency the pylon tanks are jettisoned simultaneously with the rockets and tip tanks by placing the salvo switch in SALVO.

BOMB PYLON JETTISON SWITCH.

The pylon tanks can be jettisoned together with the bomb pylons by positioning the bomb pylon jettison switch to the JETTISON position.

COLLAPSED TIP TANKS.

Flight tests indicate that a tip tank with the inboard quadrants collapsed has a tendency to roll to the right. When the outboard quadrants are collapsed the airplane has a greater tendency to roll to the left, especially at low altitudes. The roll off is accompanied by severe tank buffeting and aileron vibration at low altitude and high Mach Nos. In the event of the collapse of a tip tank, slow the airplane down to a speed that will alleviate buffeting of the collapsed tank. Airplane control is not affected at the slower speeds.

ELECTRICAL POWER SUPPLY SYSTEM FAILURE.

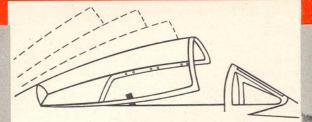
INVERTER FAILURE.

Inverter failure is indicated if the inverter failure indicator light goes on. Turn the instrument power switch to ALT position. If light does not go out both inverters have failed.

CAUTION

In the event of failure of the main inverter the attitude indicator, the slaved gyro magnetic compass indicator, the fuel pressure gage and the oil pressure gage will tend to remain at

BAIL-OUT PROCEDURE...



1. At altitude, pull ball handle on bail-out bottle.

2. Jettison canopy by pulling the internal canopy jettison control all the way up until it locks in position.

WARNING

The canopy roller explosive charges and the canopy remover pneumatic gunz will fire when the right hand-grip is actuated whether the canopy is open or closed. The canopy should be jettisoned from the fully closed. The canopy should be jettisoned from the fully closed position as the canopy remover pneumatic guns contact the canopy fittings only when the canopy is in the fully closed position. If the canopy is ejected from any position other than fully closed, these pneumatic gun pistons for the canopy away from the aircraft. The canopy forcing the canopy away from the aircraft. The canopy should be jettisoned when in straight and level flight for possible to avoid any side wind loading which will cause diagonal slueing of the canopy.

their last reading for a short period of time. The above instruments will return to normal operation when the instrument power switch is placed in the ALT position.

GENERATOR FAILURE.

If generator fails as indicated by over voltage light check following:

- 1. Place generator switch in RESET position for a few seconds. Light should go out.
- 2. If light remains on, position generator switch to OFF.
- 3. Turn off all electrical equipment possible to conserve battery for necessary electrical operations.

Note

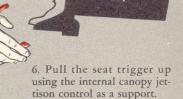
See figure 1-12 for equipment that will be inoperative with generator failure.

- 4. Turn instrument power switch to ALT.
- 5. Pull the right and left wing tank pump circuit breakers when the wing tank pressure light goes ON.
- 6. Pull the forward tank pump circuit breaker when the forward fuel level indicator shows EMPTY.

In all cases of emergency exit in flight, it is recommended that escape be accomplished by means of seat ejection. This is the safest method of escape in either high speed or low speed flight since it precludes the possibility of pilot injury through collision with the tail surfaces. In the event bail-out becomes necessary, proceed as follows:



WARNING In order to avoid being strapped in the ejection seat with the oxygen hose, unclamp the hose from the shoulder harness before ejecting the



5. Sit erect with head hard against head rest and chin tucked in.

7. After seat has been ejected, release safety harness and kick away from the seat as soon as

8. Delay opening parachute as long as altitude will permit to allow seat to clear parachute canopy and reduce parachute opening shock.

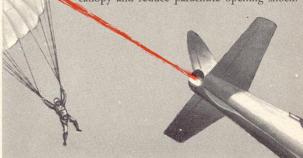


Figure 3-6. Bail-out Procedure

Fuel system failure is indicated by premature illumination of the wing tank pressure warning light, the illumination of the fuel pressure warning light or a low reading on the fuel pressure gage. Refer to paragraph on engine failure for a discussion on these lights.

FUEL SYSTEM

MAIN TANK BOOSTER PUMP FAILURE



Main tank booster pump failure is indicated by illumination of the fuel pressure warning light.

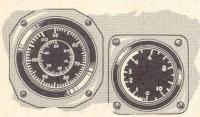
illumination of the fuel pressure warning light.

1. Turn fuel tank selector to WING AUX until the first flicker or flash of the wing tank pressure warning light then turn to FWD AUX immediately to avoid possible flame-out.

NOTE

Main tank booster pump failure may not cause an rpm drop under ordinary conditions below 6,000 feet altitude, as the fuel in the main tank can be recovered by direct suction of the engine driven fuel pump.

ENGINE DRIVEN FUEL PUMP FAILURE



Engine driven fuel pump failure is indicated by a drop in fuel pressure and loss of power.

1. If fuel pressure warning light is OFF turn emergency fuel switch ON, leave fuel tank selector at ALL TANKS.

CAUTION

The emergency fuel control does not incorporate features of the main fuel

control which prevent overspeed and limit acceleration and deceleration to safe rates. Therefore, the throttle must be carefully manipulated so that extreme tail pipe temperatures, flameouts, or overspeeds do not occur while operating on the emergency fuel system.

ENGINE DRIVEN FUEL PUMP AND MAIN TANK BOOSTER PUMP FAILURE



If main tank booster pump fails, indicated by illumination of the fuel pressure warning light, and the engine driven fuel pump fails, indicated by a loss of fuel pressure and power, occur simultaneously, continue operation as follows:

1. Turn emergency fuel switch to ON (FLIGHT EMERG).

- 2. Turn fuel tank selector to WING AUX until first flicker or flash of the wing pump pressure warning light.
- 3. Then turn fuel tank selector to FWD AUX.
- 4. Land as soon as possible.

WING TANK BOOSTER PUMP FAILURE



Wing tank booster pump failure in one or both tanks is indicated by a premature light-on condition of the wing pump pressure warning light. Fuel in the wing tank with the inoperative booster pump will not be transferred to the main tank. Although the engine can be operated without booster pump pressure up to an altitude of approximately 6,000 or 20,000 feet depending on the fuel used, fuel remaining in one wing

tank cannot be recovered if the other wing tank is empty as the engine driven pump will suck air from the empty tank.

NOTE

To prevent external fuel from transferring to the wing tanks, position the L. WING and R. WING fuel tank battle damage switches to the VALVE CLOSED position.

FORWARD TANK BOCSTER PUMP FAILURE



Forward tank booster pump failure is indicated if the forward tank fuel level indicator shows that there is no fuel flow from the forward tank. Fuel in the forward tank can be recovered up to an altitude of approximately 6,000 or 20,000 feet depending on the fuel used, by operating with the fuel tank selector in the FWD AUX

position until the fuel level indicator shows the forward tank to be empty.

NOTE

To prevent external fuel from transferring to the forward tank, position the FWD fuel tank battle damage switch to the VALVE CLOSED position.

ELECTRICAL FAILURE COMPLETE FAILURE

If the electrical failure is complete the booster pumps and fuel system indicators will not operate. The wing tip and pylon tank air pressure solenoid valves will assume the closed position making external fuel unavailable. At altitudes below 6,000 feet, full engine rpm may be maintained with a failed booster pump under all conditions. Satisfactory reduced power engine operation may result up to 20,000 feet if operating on JP-1 fuel, on cool JP-3 or cool gasoline. Operate fuel system as follows:

- 1. Operate with the fuel tank selector on WING AUX until wing tank fuel is used, indicated by a drop in rpm.
- 2. Turn fuel tank selector to FWD AUX. RPM will return to normal. Continue to operate in FWD AUX until rpm drops.
- 3. Turn fuel tank selector to ALL TANKS for remainder of fuel in the main tank.

Figure 3-7. Fuel System Failure (Sheet 1 of 2)

SELECTS ANY OF THREE COURSES OF FUEL FLOW TO ENGINE SYSTEM FUEL TANK SEL ALL TANKS WING AUX FWD AUX MAIN MAIN EMERG EMERG (T. O. & LDG.) ALERT SELECTS EITHER OF TWO COURSES OF FUEL FLOW THRU OFF NORMAL FUEL FLOW (NORM) ENGINE SYSTEM EMERGENCY FLOW (FLIGHT EMERG) STATIC FUEL RETURN NORMAL EMERGENCY 1 MAIN EMERG EMERG SWITCH AT "OFF" OR AT "EMERG ALERT" SWITCH AT "ON" OR AT "EMERG ALERT" WITH NORMAL FUEL PRESSURE SUSTAINED WHEN NORMAL FUEL PRESSURE FAILS CAUTION

With complete electrical failure, fuel warning lights or indicators are inoperative and fuel consumption from the fuel tanks will have to be estimated. Fuel in the wing tip and pylon tanks cannot be recovered because the solenoid operated air valve will be closed. Land as soon as possible.

GENERATOR FAILURE

In the event of generator failure only, the booster pumps and indicators will operate and fuel system operation will be normal.

1. Pull circuit breakers in all pumps which are not essential so as to conserve the battery.

Figure 3-7. Fuel System Failure (Sheet 2 of 2)

COMPLETE ELECTRICAL FAILURE.

In the event of complete electrical failure, all indicators and warning systems will be inoperative. Trim tabs and aileron boost ratio will remain at their last setting, the speed brake will not operate, but landing flaps and landing gear will operate normally. Fuel tank booster pumps will not operate, but fuel except from the wing tip and pylon tanks will be recoverable at reduced altitudes. All external stores except the jato units, bombs or pylon tanks can be jettisoned. The canopy can be jettisoned since it has its own 4.5 volt jettison battery.

FLIGHT CONTROL SYSTEM FAILURE.

AILERON BOOST SYSTEM FAILURE.

HYDRAULIC FAILURE.

If hydraulic system fails or if undue binding occurs in stick operation or stick "freezes," disengage the aileron boost system by pulling up the aileron boost disconnect.

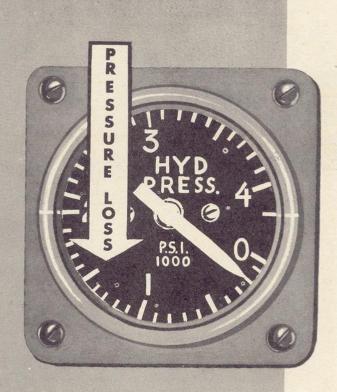
WARNING

A roll tendency with the landing gear or wing

HYDRAULIC POWER SUPPLY SYSTEM FAILURE

Hydraulic system failure will be noted by the loss of pressure on the hydraulic pressure gage or by failure of the aileron boost system. If hydraulic failure occurs proceed as follows:

- 1. Aileron boost disconnect DISENGAGE to prevent pressure achieved from the hydraulic hand pump from leaking back to the reservoir.
- 2. Extend landing gear (See Landing Gear System Failure) before using any other system so that there will be sufficient hydraulic fluid for nose wheel extension (Airplanes prior to F-84G-10RE).
 - 3. Check landing gear selector NEUT.
 - 4. Check landing flap NEUT.
- 5. Check hydraulic hand pump selector in SYSTEM (Airplanes prior to F-84G-10RE).
- 6. Move desired hydraulic selector to desired position.
- 7. Pull out handle of hydraulic hand pump, rotate it 90 degrees and move aft about 1/4 inch, then operate pump.







Place the landing gear selector in the DOWN position.



Pull the landing gear emergency uplock release all the way aft, then yaw the airplane to lock main gear as indicated by the landing gear position lights. This also extends the nose wheel on F-84G-10RE and subsequent airplanes



Move the hydraulic hand pump selector to the NOSE WHEEL position (Airplanes prior to F-84G-10RE).



If possible, have the tower operator, or your wingman check to see that the nose wheel has extended out of the wheel well before moving the hand pump selector to the NOSE WHEEL position. This will assure you that the uplock has released before applying hydraulic



Operate the hydraulic hand pump until the NOSE SAFE green light illuminates (Airplanes prior to F-84G-10RE).



Return landing gear selector to NEUT.



CAUTION

Do not return landing gear selector to NEUT until landing gear position indicator lights show the main and nose gear to be down and locked.



Return hydraulic hand pump selector to SYSTEM position (Airplanes prior to F-84G-10RE).

Figure 3-9. Landing Gear System Failure

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1

flaps extended may not necessarily indicate aileron boost failure, therefore, do not disconnect aileron boost. First, retract gear and flaps. If this does not correct roll, and if there is an indication of an unbalanced fuel load condition, drop all external load. If the roll tendency is still felt, climb to above 12,000 feet, reduce airspeed to approximately 20 percent above stall speed and disconnect aileron boost.

ELECTRICAL FAILURE.

In cases of electrical failure the aileron boost ratio cannot be changed and will remain at last setting.

TRIM TABS.

In the event of complete electrical failure the trim tabs will remain at their last setting. In event of generator failure only, trim tabs may be set in the normal manner.

LANDING FLAPS SYSTEM FAILURE.

HYDRAULIC FAILURE.

WARNING

To insure sufficient supply of hydraulic fluid for nose wheel extension on airplanes prior to F-84G-10RE, extend the landing gear before using any other system.

- 1. Check landing gear selector in NEUT to avoid pumping fluid into landing gear system.
- 2. Aileron boost disconnect in DISENGAGE to avoid pumping fluid into aileron boost system.
 - 3. Place landing flap control in DOWN position.
- 4. Place the hydraulic hand pump selector in SYS-TEM position. (on airplanes prior to F-84G-10RE.)

5. Operate the hydraulic hand pump until the flaps are in the desired position as indicated on the landing flap position indicator.

Note

Approximately 75 cycles (fore and aft strokes) of the hand pump are required to lower both the landing flaps and the speed brake. To lower either the landing flaps or speed brake separately approximately 38 strokes are required.

6. Return landing flap control to NEUT.

ELECTRICAL FAILURE.

The landing flap position indicator will be inoperative in cases of electrical failure.

SPEED BRAKE FAILURE.

HYDRAULIC FAILURE.

- 1. Aileron boost disconnect DISENGAGE.
- 2. Check landing gear selector NEUT.
- 3. Check landing flap control NEUT.
- 4. Hydraulic hand pump selector SYSTEM. (Airplanes prior to F-84G-10RE)
 - 5. Speed brake switch to desired position.
 - 6. Operate hydraulic hand pump.

ELECTRICAL FAILURE.

The speed brake is inoperative in event of complete electrical power failure but may be operated in the normal manner with generator failure only.

LANDING GEAR SYSTEM FAILURE.

HYDRAULIC FAILURE.

See figure 3-9.

ELECTRICAL FAILURE.

No indicator lights or horn will be available to indicate an unlocked gear.





HEATING, PRESSURIZING AND VENTILATING SYSTEM.

Pressurization, heating and ventilating are combined into an air conditioning system (figure 4-3). When the canopy is closed the cabin is sealed by an automatically inflated rubber seal. Air for pressurization, heating, ventilating and canopy seal inflation is obtained from the engine compressor. Cabin temperature is controlled by diverting a portion of the hot air from the engine compressor through the turbo-refrigerator, for cooling before it enters the cabin. Air enters the cabin through two side air outlets, two foot registers and a register behind the pilot's seat. Pressurization is maintained automatically by the pressure regulator which releases air from the cabin through a variable opening designed to maintain the proper pressure differential and rate of change of cabin air. From sea level to 10,000 feet altitude the cabin is unpressurized; from 10,000 feet to 18,000 feet cabin pressure remains equivalent to atmospheric pressure at 10,000 feet; above 18,000 feet a constant pressure differential of 2.75 psi is maintained between the cabin and outside atmosphere. The cabin altimeter (10, figure 1-18) indicates the equivalent cabin altitude. The pressure relief, vacuum relief and dump valve operates automatically to relieve excessive cabin pressure and can also be opened to dump cabin pressure if necessary. Outside ventilating air is available to the cabin only if pressurization is shut off.

COCKPIT HEAT AND VENT SWITCH.

The cockpit heat and vent switch (figure 4-1) located on the right console has two positions: RAM and PRES-

SURE. The RAM position closes the flow mixing valve, shutting off all pressurized air to the cabin (except the defroster line), and opens the ram inlet electrical actuator and dump valves allowing a flow of ram air through the cabin. In the PRESSURE position the ram inlet and dump valves close and the flow mixing valve electrical actuator modulates to maintain the temperature called for by the cabin temperature control. The pressure control switch is normally left in the PRESSURE position.

CABIN TEMPERATURE CONTROL.

The cabin temperature control (figure 4-1) located on the right console is a rotary switch having three positions: OFF-MANUAL DECREASE, AUTOMATIC and OFF-MANUAL INCREASE. With the control switch in the AUTOMATIC range and the heat and vent switch in the PRESSURE position the cabin heating system will automatically provide temperature controlled air to maintain the selected temperature in the cabin. This automatic range is approximately 40° to 90°F. The OFF-MANUAL DECREASE position or OFF-MANUAL IN-CREASE position will turn the automatic temperature control off. The MANUAL DECREASE and MANUAL INCREASE positions are spring-loaded and when held on will override the automatic control. If a temperature lower or higher than the automatic range is desired, turn control to either MANUAL DECREASE or MANUAL INCREASE momentarily. The MANUAL DECREASE position will lower the cabin temperature by moving the flow mixing valve to provide colder air, and the MAN-UAL INCREASE position will increase cabin temperature by moving mixing valve to provide hot air. The flow mixing valve will remain in the last setting until the tem-

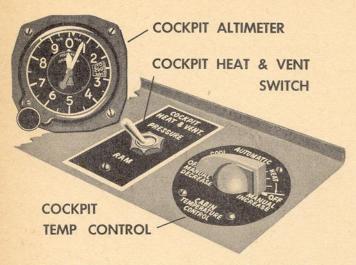


Figure 4–1. Cabin Heating and Pressurizing Controls

perature control is returned to AUTOMATIC. Since only 2-1/2 seconds is required to move the flow mixing valve from its full cold setting to its full hot setting the temperature control should be held in the manual positions momentarily.

Note

To prevent temperature surges in the cabin, the temperature control should be moved only 10% of its range at a time, allowing the temperature to stabilize before moving another 10%.

SIDE AIR OUTLET SHUT-OFF.

A side air outlet shut-off valve (39, figure 1–17 and 14, figure 1–18) is located on each side of the cabin. The quantity of hot air going into the cabin through these outlets may be varied by sliding the shut-off valve over the outlets.

ANTI-ICING AND DE-ICING SYSTEMS.

WINDSHIELD DEFROSTING SYSTEM.

Hot air is supplied from the engine compressor to a defroster tubing assembly clamped to the windshield frame. The windshield defroster is available whenever the engine is running regardless of the position of heat and vent switch.

DEFROSTER CONTROL.

The defroster control (20, figure 1–18) is a manually operated shut-off valve having an ON and OFF position. The ON position supplies hot air to the windshield defroster.

PITOT HEATER.

The pitot tube, installed in the duct divider in the nose air intake, is electrically heated.

PITOT HEATER SWITCH.

The pitot heater switch (19, figure 1-17) has two positions; OFF and PITOT HEATER. The PITOT HEATER position heats the pitot tube to keep it free from ice.

FUEL FILTER DE-ICING SYSTEM.

A fuel filter de-icing system (figure 4–4) consisting of an alcohol tank, a solenoid shut-off valve, an electrically driven pump, a differential pressure switch and a warning light is installed to remove ice that may collect in the low pressure fuel filter. Automatic or manual operation may be selected. The alcohol supply is sufficient for approximately two minutes and 20 seconds of continuous injection. Specifications of the de-icing fluid is noted in the servicing diagram.

FUEL FILTER DE-ICING SWITCH.

The fuel filter de-icing switch (figure 4–2) located on the left console is a toggle switch having three positions: AUTO, OFF and MAN. In the AUTO position the injection of alcohol starts automatically at the predetermined pressure drop across the low pressure fuel filter and ceases as soon as the pressure drop across the fuel filter returns to normal. In the MAN position a continuous flow of alcohol is injected into the fuel filter. The MAN position is used in the event of failure of the AUTO system.

Note

If the fuel filter de-icing switch is turned on with the throttle closed and the fuel tank selector in the OFF position, the alcohol will build up enough pressure in the fuel line to prevent turning the fuel tank selector to any other position.

FUEL FILTER ICE WARNING LIGHT.

The fuel filter ice warning light (figure 4–2) located on the left console is a red light marked ICE WARN. The ICE WARN light will illuminate automatically when the fuel pressure drop across the low pressure fuel filter is indicative of icing and go out when the pressure returns to normal.

CAUTION

When the ICE WARN light is out or when the alcohol supply has been depleted the fuel filter de-icing switch should be in the OFF position to prevent damage to the alcohol pump.

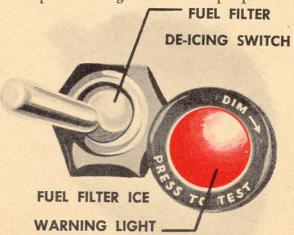
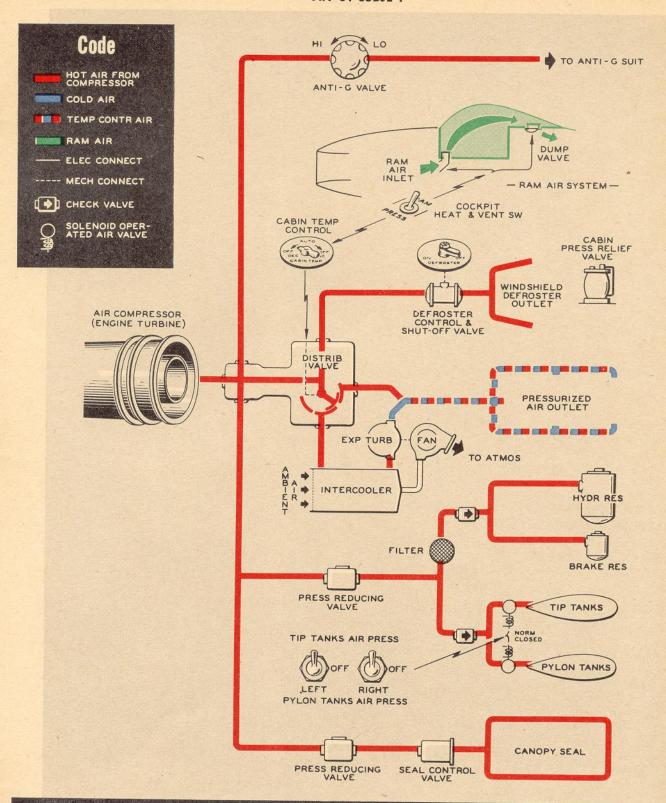


Figure 4-2. Fuel Filter De-icing System Controls



HEATING, PRESSURIZING AND VENTILATING SYSTEM Schematic

Figure 4-3. Heating, Pressurizing and Ventilating System - Schematic

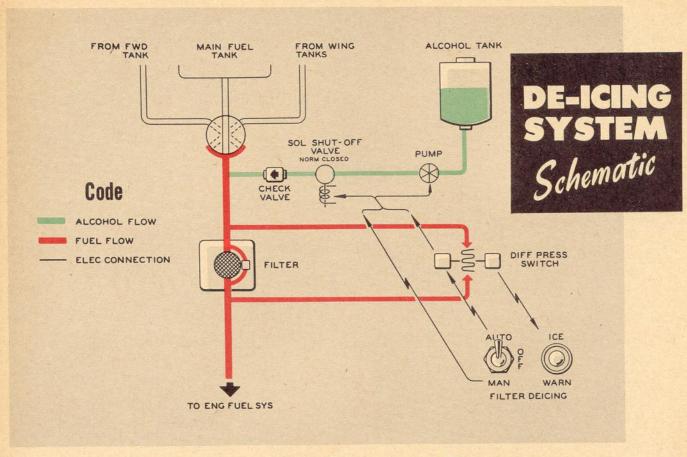


Figure 4-4. Fuel Filter De-icing System - Schematic

COMMUNICATION AND ASSOCIATED ELECTRONIC EQUIPMENT.

Communication equipment includes a command set, an IFF identification set and a radio compass (see figure 4-5). All radios are remotely controlled from the right console. Each set is described individually in the following paragraphs.

Note

Provisions are made for the installation of an AN/ARC-33 Command Radio in F-84G-5RE and subsequent airplanes. These radios are not available, therefore, the AN/ARC-3 Command Radio is installed until the AN/ARC-33 becomes available. Due to space limitations the AN/APX-6 IFF set must be removed when the AN/ARC-3 radio is installed but will be reinstalled along with the AN/ARC-33 radio.

OPERATION OF COMMUNICATION EQUIPMENT.

Insert microphone plug and headset plug into two extensions on the front of the pilot's seat. The airplane's battery switch must be ON or an external power supply connected to the airplane for radio operation.

Note

The AN/ARC-3 or AN/ARC-33 Command Set and the AN/ARN-6 radio compass will operate from the airplane's batteries as power is

supplied to these sets from the primary bus. The AN/APX-6 IFF Radio Set will not operate unless the generator is operating or an external power supply is connected to the No. 1 external power receptacle, as the power for this set is supplied from the secondary bus.

COMMAND SET - AN/ARC-3.

Radio Set AN/ARC-3 is an airborne receiving and transmitting equipment designed to provide VOICE and MCW communication from plane to plane or from plane to ground. There are eight channels, "A" to "H" inclusive, for operation in a frequency range of 100 to 156 megacycles. Remote control of the equipment is accomplished with a control panel (figure 4–5) installed on the right console.

STARTING.

- 1. Place the on-off switch on the control panel ON.
- 2. Set the channel selector switch on the control panel to the desired channel, "A" through "H".

CAUTION

Do not change position of channel selector switch or turn equipment OFF while set is cycling to prevent damage to the cycling mechanism.

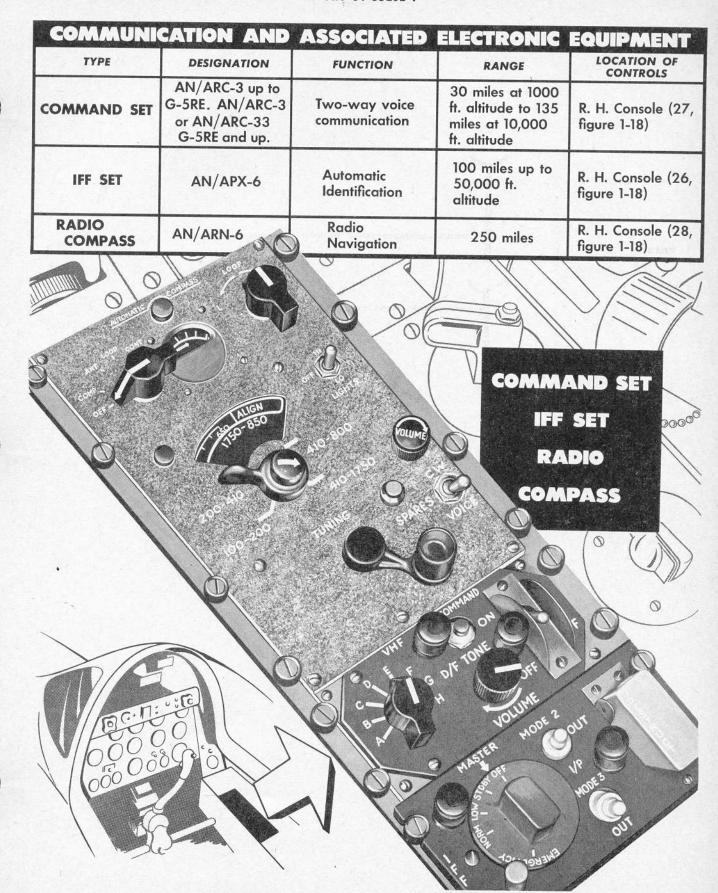


Figure 4-5. Communications and Associated Equipment Controls

OPERATION.

- 1. Allow 30 to 45 seconds for the tubes in the equipment to reach normal operating temperature. During the latter portion of this period an audio tone will be heard in the headset. When this tone stops, the receiver and transmitter have been tuned to the selected channel and reception should then be possible. The receiver will continuously monitor the channel indicated except during periods of transmission.
- 2. Adjust the audio level fed to the headset by setting the VOLUME control on the control panel.
- 3. To transmit, press the microphone press-to-talk switch located on top of the throttle control. An additional press-to-talk switch is located on the control stick grip.
- 4. For "MCW" operaion use the "D/F TONE" button on the control panel.

STOPPING.

1. Place the ON-OFF switch, on the control panel, in the OFF position.

CAUTION

When radio set AN/ARC-3 has been turned off, do not turn the set ON for at least one minute in order to allow the tuning motor to stop.

RADIO SET AN/ARC-33.

C, D, E, F

Radio Set AN/ARC-33 is a remote controlled receivertransmitter designed to operate in the 225 to 399.9 mc band. A total of 1750 crystal controlled receive and transmit channels are provided within tuning range of the set. Any 20 of these channels may be preset at the radio set control unit so as to be quickly available when desired. Because of the nature of the operating frequencies employed, communication is essentially over lineof-sight distances with a practical maximum of approximately 75 miles. The radio set is designed to operate at altitudes as high as 50,000 feet. A guard channel receiver is incorporated which may be placed in operation along with the main channel receiver, thus making it possible to continually monitor an emergency or command channel while still carrying on communication on another channel. During the warm-up period of approximately 30 seconds and for approximately three to six seconds when changing channels a tone is heard in the head set to indicate to the operator that the set is not ready for operation.

STARTING.

- 1. Place the on-off switch on the control panel in the ON position. Allow approximately 30 seconds for warm-up.
- 2. Rotate the channel selector control knob until the respective number for the desired channel appears in the window above the knob.

Note

The tuning drive motor is protected by a thermal time delay cut-out which opens the motor circuit after approximately one minute of continuous tuning. Therefore, if the tuning motor is unable to come to rest because of some fault in the equipment or because of constant rotation of the channel selector control the tuning motor circuit is automatically broken after approximately 30 seconds. The motor circuit may be reset by selecting a new channel then returning to the original channel.

- 3. Listen for the tone in the headset. Make no attempt to receive or transmit while the tone is heard.
- 4. Place the function switch to the MAIN, BOTH or G position depending on the operation desired.
- 5. Adjust the volume control for a comfortable level in the headset.

STOPPING.

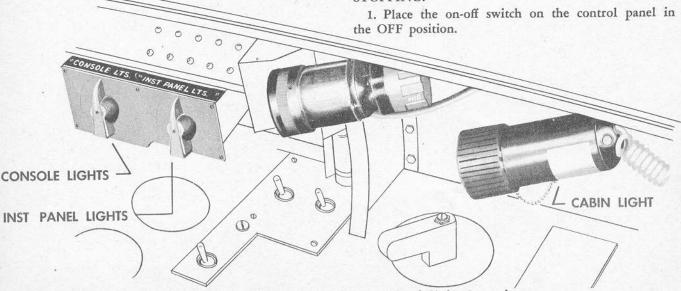


Figure 4—6. Cabin and Instrument Panel Light Controls

RADIO SET AN/APX-6.

The purpose of this set is to enable the aircraft in which it is installed to identify itself, automatically, as friendly, whenever it is properly challenged by suitably equipped friendly surface and airborne radars.

CAUTION

Before take-off make sure that AN/APX-6 IFF frequency counters have been set to the proper frequency channels, and the three destructors have been inserted in the face of the IFF transponder.

STARTING.

1. Rotate the master control to NORM position unless instructed otherwise.

Note

The AN/APX-6 set will be inoperative in the event of generator failure as power is supplied from the secondary bus.

- 2. Set mode 2 and mode 3 control as instructed. STOPPING.
 - 1. Rotate the master control to the OFF position.

Note

If the destruct control was operated during the flight, report this fact immediately upon landing so that a new receiver-transmitter may be installed.

RADIO COMPASS — AN/ARN-6.

The radio compass AN/ARN-6 is an airborne navigational instrument. There are four bands covering a frequency range of 100 to 1750 kilocycles. The radio compass is controlled from a control panel (figure 4-5) located on the right console. The radio compass is capable of providing the following:

- 1. Automatic visual bearing indication of the direction of arrival of r-f energy and simultaneous aural reception of modulated r-f energy.
- 2. Aural reception of modulated r-f energy, using a non-directional antenna.
- 3. Aural-null directional indicators of the arrival of modulated r-f energy using a loop antenna.

Note

Canopy must be closed to complete radio compass circuit.

STARTING.

1. Turn the function switch to COMP, ANT or LOOP position.

Note

The function switch position marked CONT on the control panel is not used on this installation.

STOPPING.

1. Rotate function switch to OFF.

LIGHTING EQUIPMENT. INSTRUMENT PANEL LIGHTS.

The instrument panel lights are of two types, fluorescent for night flying and incandescent for day operation. The two incandescent lights, one on each side of the cabin, are controlled by a rheostat switch (figure 4-6). The two fluorescent lights, (35 figure 1-17 and 18, figure 1-18) are controlled by individual rheostat switches at the rear of each light.

CONSOLE LIGHTS.

Console lights are mounted on the right and left side of the fuselage and are directed to the respective console. The lights are controlled by a rheostat switch (figure 4-6).

CABIN LIGHT.

A type C4A cabin light (figure 4-6) is mounted on the right side of the cabin. The light is provided with an extension cord and it may be removed from its mounting bracket to be used as a portable light. The light is controlled by a rheostat switch located on the light. The rheostat switch controls the intensity of the light for continuous illumination. A push-button type switch on the light may be used for intermittent light use. The light is equipped with a red filter which may be removed and the light used as a white spot light.

LANDING LIGHTS.

One landing light is bracket mounted on each inboard landing gear door. A safety switch, operated by the closing of the landing gear door, will put the lights out after the landing gear has been retracted. The landing lights are controlled by an ON-OFF switch (3, figure 1-17) on the left console.

TAXI LIGHTS.

A taxi light is a bracket-mounted on the nose wheel strut. The taxi light is controlled by an ON-OFF switch (16, figure 1–18) located on the right console.

POSITION LIGHTS.

Red and green position lights are installed in the fore and aft corners of the wing tips. A white and yellow position light is installed on aft end of the fuselage, below the rudder. Provision is made for the fore and aft position lights on the wing tip tanks to be interconnected to the wing tip position lights. When the tip tanks are jettisoned the wing tip position lights will be switched on automatically. The position lights are controlled by a position lights switch (19, figure 1–18) having three positions: STEADY, OFF and FLASH. In the STEADY position the wing and tail lights will provide continuous illumination. In the FLASH position the wing and white tail lights will flash alternately with the yellow tail light. The intensity of the position lights is controlled by a DIM-BRIGHT switch (17, figure 1-18) adjacent to the position light switch.

OXYGEN SYSTEM.

A combination high and low pressure oxygen system (figure 4-7) is installed in the aircraft. The system is supplied with four type A-6 low pressure and two high pressure oxygen cylinders. The four low pressure cylinders are installed above the battery in the battery well and one high pressure cylinder is located in each wing root between the front and rear spars. Aircraft Serial Nos. AF 51-692 through 51-1046 and 51-9623 through 51-9797 are provided with three filler valves, one for the low pressure cylinders and one each for the high pressure cylinders. In this system oxygen from each high pressure cylinder passes through a reducing valve and is then directed to the pressure demand regulator along with the supply from the low pressure cylinders. Aircraft Serial Nos. AF51-1047 through 51-1066 and 51-9798 through 51-9964 are provided with a single filler valve. The filler valve services the high pressure cylinders. Flow from these cylinders passes through a reducing valve and refills the low pressure cylinders. Supply to the demand regulator is taken directly from the low pressure system. A gage is provided in the cockpit to indicate the pressure in the high pressure system. On all aircraft a pressure breathing diluter demand oxygen regulator (figure 4-8) is located on the forward part of the right console. The regulator automatically supplies the proper mixture of cabin air and oxygen to the oxygen mask at all altitudes up to 30,000 feet cabin altitude.

WARNING

On aircraft equipped with the three point filler system there is no gage provided to indicate the pressure in the high pressure system. Before take-off be sure that the high pressure system has been refilled so that an adequate supply of oxygen is available in flight.

REGULATOR DILUTER LEVER.

The diluter lever (figure 4-8) is provided so that the oxygen flow to the oxygen mask may be varied. In the NORMAL OXYGEN position oxygen and cabin air are automatically mixed so as to supply the proper mixture to the pilot. The ratio of oxygen and cabin air is dependent on cabin altitude. In the 100% OXYGEN position the cabin air inlet port is closed and pure oxygen is supplied to the pilot at any altitude.

REGULATOR PRESSURE CONTROL KNOB.

The pressure control knob (figure 4-8) on the oxygen regulator is provided so that the oxygen pressure delivered to the oxygen mask may be varied. Below 30,000 feet cabin altitude, oxygen and cabin air are automatically mixed to supply the proper mixture to the pilot. Between 30,000 and 40,000 feet cabin altitude, oxygen is supplied at a pressure slightly above that of cabin air as a measure of protection against leakage of air into

the oxygen mask. Above 40,000 feet cabin altitude the oxygen pressure supplied to the oxygen mask may be increased for various altitudes to assure against anoxia.

PRESSURE GAGE.

On aircraft equipped with the three point filler system a pressure gage (figure 4-8) indicates the pressure being supplied to the demand regulator from either the high or low pressure systems. On aircraft equipped with the single point filler system this gage indicates pressure in the low pressure system. An additional gage, located above the right console, shows the pressure in the high pressure system.

FLOW INDICATOR.

A flow indicator is located on the forward part of the right console (figure 4-8). The indicator will blink when oxygen is flowing through the regulator.

NORMAL OPERATION.

The regulator diluter lever should be set at the NOR-MAL OXYGEN position. The pressure dial of the regulator should be set as follows:

- 1. For cabin altitudes below 30,000 feet, leave dial at NORMAL position.
- 2. For cabin altitudes between 30,000 and 40,000 feet, set the dial at SAFETY position.
- 3. For cabin altitudes above 40,000 feet, set the dial to the cabin altitude.

EMERGENCY OPERATION.

- 1. With symptoms of the onset of anoxia, set the diluter lever to 100% OXYGEN.
- 2. In the event of accidental loss of cabin pressure, immediately turn the pressure dial of the regulator to ABOVE 45M position and tighten mask to hold pressure.
- 3. If the oxygen regulator should become inoperative, pull the cord of the H-2 emergency oxygen cylinder and descent to cabin altitude not requiring oxygen.

INFLIGHT REFUELING SYSTEM.

The airplane is equipped with an inflight refueling system (figure 4-10) which enables the airplane to be refueled in the air from a tanker using a flying boom. The receiver is located in the left wing leading edge and is concealed by flush type doors which are hydraulically operated. During the refueling operation, the engine is operated with the fuel tank selector in the ALL TANKS position so that the engine is fed from the main tank. The forward, wing, wing tip and pylon tanks are filled during inflight refueling while the main is filled by transfer of fuel from the forward and wing tanks. Once the receiver doors in the wing are opened and the tanker's boom is inserted in the nozzle, refueling sequence is accomplished electrically through an amplifier which is powered from the primary bus. When the tanks are full, the fuel flow in the refueling lines is reduced to an amount equal to the engine consumption and the fuel pressure in the lines increases. These changes are

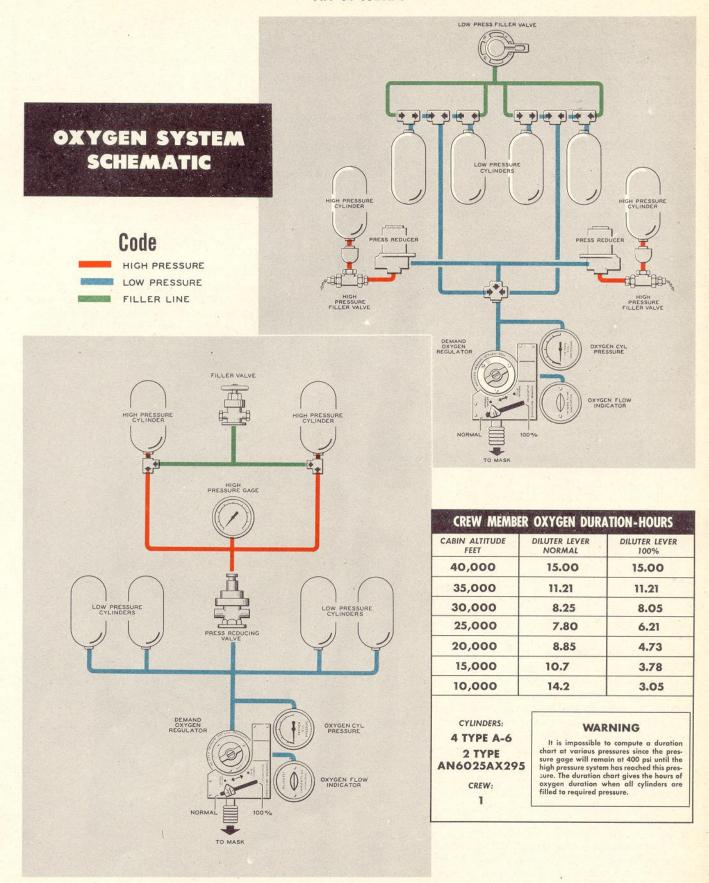


Figure 4-7. Oxygen System - Schematic and Duration Chart

noted in the tanker airplane and a disconnect is effected. An automatic disconnect will be accomplished if the fuel pressure is excessive in the refueling lines, if rough air causes excessive tension on the nozzle or by any uncontrolled or intentional change in flight attitude of the receiver airplane wherein a conical angle of 15° from the normal is exceeded. Provision is made so that the forward or wing tanks can be isolated, if damaged, from the refueling system.

RECEIVER DOOR SWITCH.

The receiver door switch (figure 4-9) is a two position toggle switch marked OPEN and CLOSE. The OPEN position unlocks and opens the receiver doors hydraulically also supplies d-c power to the refueling amplifier which is an electronic device that sends and receives signals from the tanker to the receiver aircraft through the refueling boom. The OPEN position also repositions the external fuel tank check valves electrically so that they will allow fuel to flow into the tanks. The receiver door indicator light (figure 4-9) marked REC DOOR OPEN will illuminate when the receiver door is unlocked. The CLOSE position closes and locks the receiver doors, disconnects the power supply to the receiver amplifier, positions the external fuel tank check valves to allow fuel to flow from the tanks and extinguishes the receiver door indicator light.

NOZZLE DISCONNECT SWITCH.

The nozzle disconnect switch (figure 4–9) is a push button switch spring loaded to the off position. The switch is depressed to NOZZLE DISCONN if it is desired to end the refueling cycle before the fuel tanks are full. Depressing the nozzle disconnect switch extinguishes the nozzle contact indicator light, illuminates the disconnect indicator light, causes the tanker pumps to shut down, closes the fuel valves, signals the tanker operator that a disconnect has been made and releases the refueling boom from the receiver nozzle.

RESET SWITCH.

The reset switch (figure 4–9) is a push button switch spring loaded to the off position. If at any time during a refueling cycle the airplane becomes disconnected and the disconnect indicator light illuminates the airplane is made ready for refueling again by depressing the reset switch to RESET. The refueling system can also be made ready for refueling by closing then reopening the receiver doors.

RECEIVER LIGHT SWITCH.

The receiver light switch (figure 4-9) is a toggle switch with two positions; OFF and RECEIVER LIGHT. The receiver light position illuminates a flood light on the side of the aircraft which illuminates the receiver doors to aid the boom operator in the tanker to make contact during operation at night.

FUEL TANK BATTLE DAMAGE SWITCHES.

Three fuel tank battle damage switches (figure 4–9) are two position toggle switches marked with an arrow pointing up to VALVE CLOSED position. The three switches are marked L. WING, FWD and R. WING. These switches provide a means of controlling fuel flow to the wing and forward tanks by closing a valve at the fuel line entrance to the tank. During normal operation the switches are left in the down position, which allows fuel to transfer from the external to the wing and forward tanks and also allows all tanks to be refueled from the refueling receptacle. By placing the fuel tank battle

damage switches in the VALVE CLOSED position the respective fuel tank will not receive fuel by transfer or during the refueling operation. This system is provided to isolate the wing or forward tanks in the event of battle damage to the tank or failure of the booster pump in the tank. The fuel tank battle damage switches are energized from the primary bus.

RECEIVER DOOR INDICATOR.

The receiver door indicator light (figure 4-9) illuminates when the receiver door is unlocked and is marked REC DOOR OPEN.

READY INDICATOR.

The ready indicator light (figure 4–9) is a blue light marked READY and when illuminated indicates that the receiver doors are open, power is supplied to the refueling amplifier and the amplifier is ready for the refueling cycle. The ready indicator light will go out when contact is made.

NOZZLE CONTACT INDICATOR.

The nozzle contact indicator light (figure 4–9) is a green light marked NOZZLE CONTACT and when illuminated indicates that the nozzle on the boom is inserted into the receiver and that the amplifier is sequenced to the refueling cycle. The ready indicator light will go out and the nozzle disconnect system, both manual and automatic, will be armed.

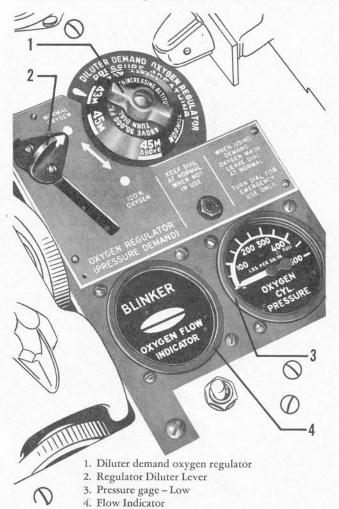
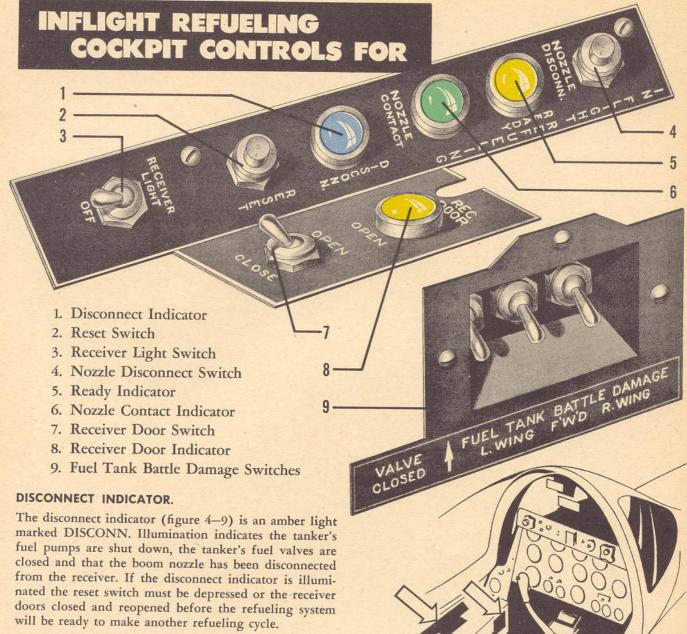


Figure 4-8. Oxygen System Controls



INFLIGHT REFUELING SYSTEM OPERATION. (See figure 4-11).

BATTLE DAMAGE.

If the forward or wing tanks have been damaged and it is desired to refuel, these tanks may be isolated from the refueling system by placing the desired battle damage switch is the CLOSED position. Refuel as in normal operation.

EMERGENCY OPERATION.

At any time when in contact made position, the word BREAKAWAY is heard, the receiver pilot will actuate his disconnect switch immediately. The tanker pilot, in such a situation, will pull up abruptly, 50 to 100 feet, and apply power. The receiver pilot shall not dive out of the refueling envelope until separation has been made.

Figure 4-9. Inflight Refueling Controls

AUTOMATIC PILOT.

An F-5 automatic pilot unit is installed in the aircraft. This auto-pilot will hold the aircraft on any pre-determined course that may be desired, change this course at will with an exact coordinated turn or maintain the aircraft laterally level and in any desired angle of climb or dive. Automatic control starts in an a-c powered gyro unit which includes vertical and directional gyros as a reference. The directional gyro establishes a reference for the azimuth heading of the aircraft and the vertical gyro establishes a flight reference about the

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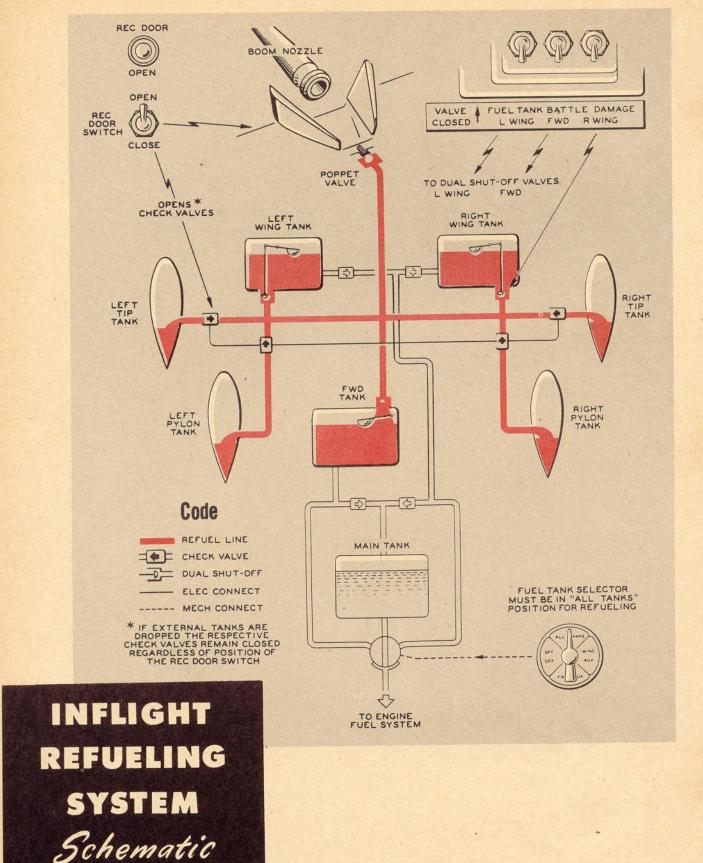
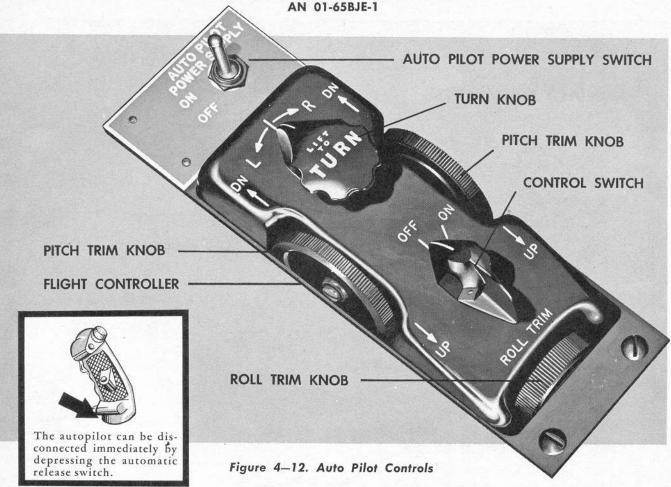


Figure 4-10. Inflight Refueling System - Schematic

NORMAL OPERATION 1. Approach tanker at selected altitude and speed. 2. Fuel tank selector ALL TANKS. 3. Receiver door switch OPEN. Receiver door indicator light on and ready indicator light on. 4. Receiver light switch ON if refueling operation is at night. 5. Check nozzle contact indicator light on after contact is made. Ready indicator light out. 6. After refueling check disconnect indicator light on. 7. If the disconnect indicator light illuminates before refueling is completed, depress the reset switch. A disconnect may be accomplished at any time by depressing the disconnect switch. 8. Receiver door switch CLOSE after refueling is completed. Fuel system operation is normal after the receiver doors are closed. **EMERGENCY OPERATION** Power supply to the inflight refueling amplifier and the external tanks shut-off valves is turned off when the receiver doors are closed. However, if the receiver doors are damaged during the inflight refueling operation and cannot be closed, the amplifier and external tanks shut-off valves will remain energized and prevent fuel transfer from the external tanks to the internal tanks. The receiver door indicator light will remain illuminated. If the receiver door indicator light remains illuminated after the doors are closed, pull the circuit breaker labeled INFLIGHT REFUEL AMP & CONTROL, located on the right console, which will disconnect the amplifier power and de-energize external tanks dual shutoff valves allowing fuel to transfer from the external tanks to the internal tanks. The receiver door indicator light will go out.

Figure 4-11. Inflight Refueling System Operation



lateral and longtitudinal axis of the aircraft with relation to a gravitational reference. The signal from the gyro unit passes through a servo amplifier then to a d-c powered servo which is connected to the surface controls, with a mechanical linkage. The auto-pilot control can be overpowered by the human pilot at any time or can be disconnected immediately by use of the automatic release switch on the control stick. If the aircraft is in a climb or dive and the auto-pilot is turned on, the aircraft will continue on its course. However, if the aircraft is in a climbing or diving turn and the auto-pilot is turned on the flight path will change to a straight climb or dive respectively as there is no follow-up unit on the aileron trim tabs.

AUTO-PILOT POWER SUPPLY SWITCH.

The auto-pilot power supply switch (figure 4–12) is a two position toggle switch having an ON and OFF position. The ON position supplies power from the primary bus to the alternate inverter through the instrument power switch. After placing the power supply switch in the ON position you should not be able to move the auto-pilot control switch to ON until after a two minute time delay has elapsed. This eliminates the possibility of putting the auto-pilot into the control system until enough time has elapsed for all units to warm up to operating temperatures. With the power supply switch in the OFF position it should not be possible to turn the auto-pilot control switch ON.

FLIGHT CONTROLLER.

All control functions of the auto-pilot are centered about the flight controller (figure 4–12) which contains the auto-pilot control switch, the roll trim and pitch trim knobs and the turn knob. An automatic interlocking system is provided which prevents the auto-pilot from operating until it is warmed up or if the turn knob is out of the neutral position.

AUTO-PILOT CONTROL SWITCH.

The auto-pilot control switch is a rotary switch having two positions OFF and ON. The ON position connects the auto-pilot to the control system. It will not be possible to place the control switch in the ON position if the turn knob is out of neutral or a time delay of 2 minutes has not elapsed from the time the power supply switch was turned ON. The control switch will automatically return to the OFF position if the power supply switch is turned OFF or the automatic release switch on the control stick is depressed.

PITCH TRIM KNOB.

The pitch trim knob controls the nose up or nose down attitude of the aircraft. If the pitch trim knob is rotated aft for nose up or roated forward for nose down trim the aircraft will maintain the selected attitude. The pitch trim is limited to a climb or dive angle of approximately 40 degrees.

ROLL TRIM KNOB.

The roll trim knob controls the lateral trim of the aircraft. If the roll trim knob is rotated clockwise for right wing down or counterclockwise for left wing down the aircraft will maintain the selected trim. The roll trim is limited to approximately 10 degrees left wing or right wing down.

TURN KNOB.

The turn knob is a rotary switch marked LIFT TO TURN and two extreme position L and R. If the turn knob is in the neutral position it must be lifted up before it can be turned to L or R position. When turned to L or R the aircraft will make a coordinated turn to the left or right. The angular rotation of the turn knob will govern the bank angle in the turn up to a maximum of approximately 35 degrees right or left.

AUTOMATIC RELEASE SWITCH.

An automatic release switch (figure 4-12) is installed on the forward side of the control stick. This is a spring loaded switch and when depressed, automatically disconnects the auto-pilot from the control system. The auto-pilot control switch on the controller will automatically return to the OFF position when the release switch is depressed.

AUTO-PILOT OPERATION.

LEVEL FLIGHT.

- 1. Level the airplane at the desired altitude and on the proper directional heading.
 - 2. Trim the airplane.
 - 3. Turn the auto-pilot ON.
- 4. Adjust the roll trim knob as necessary to level the airplane.

MANEUVERING.

Once the auto-pilot has been engaged, it is possible to perform simple flight maneuvers by means of the flight controller.

NAVIGATION EQUIPMENT.

SLAVED GYRO MAGNETIC COMPASS.

A type J-2 slaved gyro magnetic compass is installed in the airplane which provides visual indication of the magnetic heading of the airplane. The indication is read on an indicator (figure 4-13) whose operation is governed by a gyro whose spin axis is stabilized in a horizontal plane by means of a leveling device and whose orientation in azimuth is slaved to the earth's magnetic meridian by a direction-sensing component, located in the left stabilizer. The compass requires both a-c and d-c power. The d-c power is supplied from the primary bus and the a-c power is supplied by the main or alternate inverter, therefore, the compass will operate as long as the engine is operating. The gyro is free to operate within 85 degrees from level flight in dive and climb, and in right and left bank. At the limits, it strikes mechanical stops which render the indications on the directional gyro control and the settable dial indicator

inaccurate. After return to level flight errors up to 5 degrees in heading may be introduced; but the gyro will recover its erect and slaved positions automatically in a period of 5 minutes or less and thereafter will again resume correct indications until the limits are again exceeded. The flux valve unit of the remote compass transmitter remains pendulous through 30 degrees on both sides of the vertical in pitch and roll. When these limits are exceeded or a coordinated turn is being executed the vertical components of the earth's field are picked up which results in flash signals. Restoration of the airplane to an attitude within these limits renders the flux valve unit pendulous again, and it automatically resumes correct sensing. A thermal switch in the amplifier provides fast slaving and leveling of the directional gyro during the initial operation of the compass.

SLAVED GYRO COMPASS SWITCH.

The slaved gyro compass switch (40, figure 1–16) has two positions: NORMAL and CUT OUT. The NORMAL position supplies power to the heating, leveling and slaving systems. The CUT OUT position cuts off the power supply to the control field of the slaving torque motor and is used when the horizontal lines of magnetic force dip at 84 degrees or more.

SLAVED GYRO FAST SLAVING SWITCH.

The slaved gyro fast slaving switch (39, figure 1–16) is pushed in momentarily to shorten the time required to restore the gyro to its erect and slaved position, after level flight is resumed, following maneuvers in which the gyro has hit the mechanical stops. Approximately two minutes of fast slaving is obtained by depressing the fast slaving switch.

STARTING.

The compass will operate if the engine is operating and the instrument power switch is in NOR or ALT, if the engine is inoperative and the instrument power switch is in ALT or if external power is connected to No. 1 external power receptacle and the instrument power switch is in NOR. Allow 3 minutes to elapse so that the gyro in the directional gyro control comes up to operating speed, levels and aligns the indication on the settable dial indicator with that sensed by the remote compass transmitter.

Note

It is necessary, for proper operation of the J-2 compass, that the a-c and d-c power supplies to the system be turned on simultaneously. To assure this, depress the fast slaving switch momentarily after the engine is running. This action turns the d-c power (to the compass) off and on again with the inverter running.

OPERATION.

SETTING INDICATOR. By means of the SET COURSE knob on the indicator, set the dial index for the heading it is desired to fly. It is preferable to set the dial index against the zero bezel index of the indicator although any index may be chosen.

USING THE COMPASS – STRAIGHT FLIGHT. After the airplane becomes airborne, the indicator is referred to in the same manner as a magnetic compass.

USING THE COMPASS—IN TURNS. Perfect 45, 90 and 180 degree turns can be executed by setting the dial index, with the overlapping pointer against the zero bezel index, then flying the aircraft to align the pointer with the 45 and 90 degree bezel indices on both sides of the zero index or with the index at 180 degrees. Then final heading may be set against the zero bezel index by means of the SET COURSE knob. Another method is to set the dial index for the new heading against any bezel index, then flying the aircraft to align the pointer with that bezel index.

ARMAMENT EQUIPMENT.

This aircraft is equipped to carry guns, bombs, rockets and chemical tanks. The guns are installed internally and the bombs, rockets and chemical tanks are installed as external stores. A gun sight or one of two different types of gun-bomb-rocket sights is provided in the aircraft. The gun sight is for firing guns only while the gun-bomb-rocket sight is used in firing the guns and rockets or releasing the bombs at the proper time to be effective on a target. Manual operation is also provided. The pilot is protected from enemy fire by an armor plate installed in the aft end of the canopy. A gun camera in the right wing records results of fixed gun firing.

GUN SELECTOR SWITCH. See figure 4-16.

The gun selector switch has three position; GUNS, OFF and SIGHT-CAMERA & RADAR. A-C power is supplied to the sight gyros and heaters as soon as the secondary bus is energized if the instrument power switch is in the NOR position. The SIGHT-CAMERA & RADAR or GUNS position supplies d-c power to the sight tube heaters, relays and control units in addition to the gyros and heaters and also energizes the gun camera circuit. The GUNS position also energizes a relay so that the guns will fire when the stick trigger is actuated if the aircraft is airborne. The sight is ready for use with the gun selector switch in either the SIGHT-CAMERA & RADAR or GUNS position.

GUN-BOMB-ROCKET SIGHT.

The A-ICM gun-bomb-rocket sight (figure 4–14) automatically computes the fire control problems for gunfire from fixed guns, for bombing and for rocket fire. The sight reticle image, consisting of a circle and a central dot, is reflected on an inclined transparent window. The automatic features of the sight enables the pilot to direct his full attention to the selected target provided he flies the aircraft so that the reticle circle is continuously superimposed on the target. Range data is supplied to the sight, for gunnery operations, by a manual range control or automatically by the AN/APG-30 radar ranging unit. The radar system also provides automatic search within its range. It automatically locks onto, and tracks, a target in range and indicates to the pilot when the equipment is tracking a target. On overland targets be-

low 6,000 feet, radar range distance may be reduced by use of the range maximum radar control to prevent the radar from locking on the ground when target is at lower altitudes. Bombs can be released automatically at the proper release point by a mechanism within the sight. Electrical power (28 volt d-c) is supplied to the sight and sight heaters from the secondary bus. A-C electrical power is supplied from the main inverter and a sight inverter which are both powered from the secondary bus. Manual sight ranging may be used if the a-c power supply fails or when the radar system is inoperative. The sight can be operated as a fixed reticle sight as long as d-c power is available.

GUN-BOMB-ROCKET SIGHT.

C. E

The A-4 gun-bomb-rocket sight (figure 4–14A) is similar to and is used for the same purposes as the A-1CM sight in previous aircraft. This sight is improved and more accurate since the computed range takes into account the speed of the target.

RETICLE DIMMER CONTROL.

The reticle dimmer control (9, figure 4-14) controls the illumination intensity of the reticle image from DIM to BRIGHT.

SIGHT FILAMENT SWITCHES.

A

The sight filament switches (8, figure 4-14) are marked CIRCLE and DOT. Each switch has two positions PRIM and SEC. The lamps for the sight reticle circle and dot have dual filaments. If either filament goes out the spare filament may be cut-in by changing the switch to the other position.

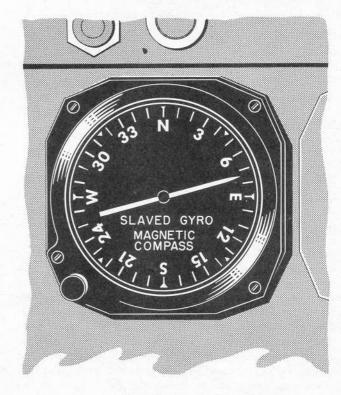
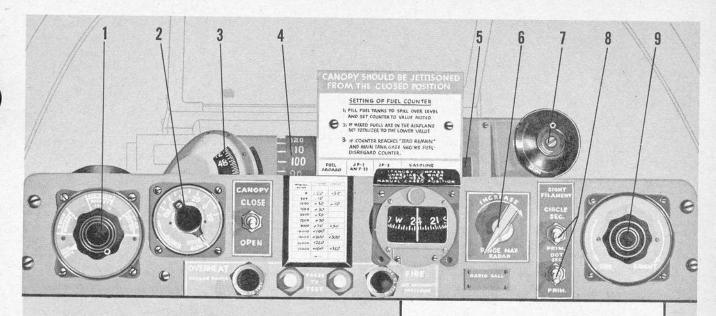


Figure 4-13. Slaved Gyro Compass Indicator

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GUN BOMB ROCKET SIGHT

- 1. Rocket Dive Angle Control
- 2. Bomb-Target-Wind Control
- 3. Gun-Bomb-Rocket Sight
- 4. Span Adjustment Dial
- 5. Mechanical Caging Lever
- 6. Radar Range Sweep Control
- 7. Target Indicator
- 8. Sight Filament Switches
- 9. Reticle Dimmer Control

Figure 4-14. A-ICM Gun-Bomb-Rocket Sight Controls

SIGHT FILAMENT SWITCH.

C

The sight reticle is illuminated by one double filament bulb instead of the two bulbs as in previous models. The sight filament switch (6, figure 4–14A) has two positions; PRIM and SEC. If the bulb goes out with the switch in either position, the alternate position is selected. The outer limits of the reticle are marked by a series of diamond shaped dots.

ELECTRIC CAGING BUTTON.

The push-button type caging switch, on the throttle control is used to stabilize the reticle image on the target.

Depressing the switch electrically cages the gyros in

Depressing the switch, electrically cages the gyros in the computer and brings the sight line to the "no deflection" position, which gives the pilot a fixed sight for placing the reticle image on the target initially.

MECHANICAL CAGING LEVER.

The mechanical caging lever (5, figure 4-14) is moved to the left to CAGE and right to UNCAGE the sight mirror. For firing at ground targets, or in the event of

sight failure, the caging lever may be placed at CAGE and the reticle used as a fixed sight.

SPAN ADJUSTMENT DIAL.

A

The span adjustment dial (4, figure 4-14) is set to the wingspan of the target, in feet, when the gun-bombrocket sight is operated with manual range.

SPAN ADJUSTMENT LEVER.

C, E

The wing span of the target aircraft is set into the sight by moving the span adjusting lever (4, figure 4-14A) to the number on the span adjusting dial corresponding to the wing span of the target.

MANUAL RANGE CONTROL.

The manual range control, incorporated in the throttle control provides for manual ranging during gunnery operation when radar ranging is impossible (below 6,000 feet on overland targets). The range control covers a span of 1,500 feet, from approximately 1,200 feet to approximately 2,700 feet. Clockwise rotation of the twist grip reduces the range (increases the reticle size).

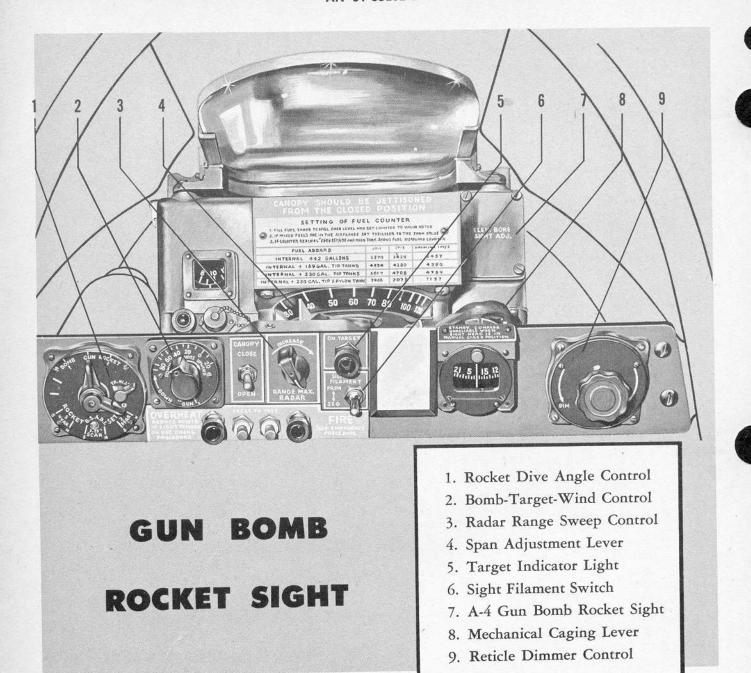


Figure 4-14A. A-4 Gun-Bomb-Rocket Sight Controls

The manual ranging control is spring-loaded to the full counterclockwise (detent) position which is used for operation of the radar ranging system.

RADAR "OUT" SWITCH.

When the radar detects a target, it locks on it and measures its range. The radar may be shifted to another target by means of the radar "out" switch (figure 4–15) located on the left side of the control stick grip. Depressing the "out" switch for several seconds causes the radar to reject the target and drift in or out in range.

RADAR "OUT" SWITCH.

The radar "out" switch (figure 4–15), on these aircraft serves the same purpose as the radar "out" switch on previous aircraft. In addition if the rocket dive angle control is in either the BOMB or ROCKET position, it will automatically return to the GUN position when the radar "out" switch is depressed so that the guns can be fired immediately.

RADAR RANGE SWEEP CONTROL.

The radar range sweep control (6, figure 4-14) is a rheostat marked INCREASE with an arrow showing the

Revised 20 June 1952

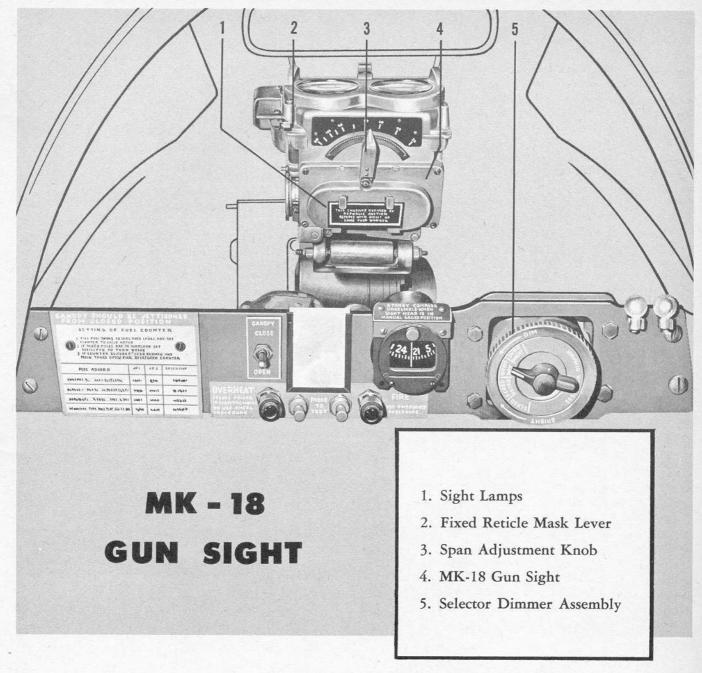


Figure 4—14B MK—18 Gun-Sight Controls ■

directions. Turning the control in the minimum direction lowers the radar ranging distance to prevent radar from locking on the earth when the aircraft is at low altitudes. Turning the control toward MAXIMUM increases the range. During normal operations control should be at MAXIMUM.

BOMB-TARGET-WIND CONTROL.

The bomb-target-wind control (2, figure 4–14) has a ROCKET GUN position and a BOMB scale indicating downwind and upwind adjustment. Setting the B-T-W control adjusts the sight to compensate for the components of wind velocity and target motion parallel to the direction of the attacking airplane. The ROCKET GUN

position is selected when using the sight for gun or rocket firing.

ROCKET DIVE ANGLE CONTROL.

The rocket dive angle control (1, figure 4–14) has four positions: GUN-BOMB and three rocket positions: 5" HVAR 2.25" SCAR and 5" AR. Each of the rocket positions have an "N" and "S" position. The GUN-BOMB position is selected when using the sight for bombing or gunnery. When firing rockets the rocket dive angle control is turned to "N" for dives up to 40° to "S" for dives greater than 40°, under the type of rocket being fired.

ROCKET DIVE ANGLE CONTROL.

The rocket dive angle control (1, figure 4-14A) is three separate controls on one dial. One pointer has three positions on the top of the dial; BOMB, GUN and ROCKET. The approximate position is selected for bombing, gunnery or rocket firing. If the pointer is in either the BOMB or ROCKET position and the radar "out" switch on the control stick is depressed the pointer will automatically return to the GUN position. The second pointer is the rocket setting pointer and has three positions; 5"HVAR, 2.25 SCAR and 2.75 FFAR. Each position has an N and S position. When firing rockets the rocket dive angle control is turned to N for dives up to 40 degrees or to S for dives greater than 40 degrees under the type of rocket being fired. The third pointer has three positions; TR, HI and LO and is used for gunnery only. The TR position is used for training when the target speed is approximately 180 mph. The HI position is used for high speed targets where the target speed is over 400 mph and the LO

TARGET INDICATOR LIGHT.

The target indicator light (7, figure 4-14) is located on the right side of the A-1CM gun sight. In aircraft equipped with the A-4 sight the target indicator (5, figure 4-14A) is located on the upper instrument panel. Illumination of the light indicates that the radar set is "locked-on" a target.

position is for low speed targets up to 400 mph.

OPERATION.

STARTING THE SIGHT. The sight gyros and heaters start to operate as soon as the secondary bus is energized. A period of approximately 20 minutes is necessary for the sight to come up to operating temperatures and stabilize.

- 1. Position the gun selector switch to either the GUNS or SIGHT CAMERA & RADAR position which supplies power to the amplifier. Allow approximately one minute for the amplifier tubes to warm up.
- 2. Check to see that the reticle image appears on the reflector glass.
- 3. Check the reticle image by moving the mechanical caging lever from one position to the other. The dot should flicker as the lever is moved and the circle should change to four circular arcs in the CAGE position.

STOPPING. Position the gun selector switch to the OFF position. This turns off the tube heaters, relays and controls but leaves the sight operating and ready for use within one minute after repositioning the gun selector switch. The gyros and heaters will operate as long as the secondary bus is energized. Position the mechanical caging lever to CAGE.

GUN SIGHT.

B, D

The MK-18 gun sight (figure 4-14B) is a precision gyroscopic sight designed to automatically compute the lead angle required for the firing of calibre .50 fixed

guns in order to score a hit on a target. Essentially, the gyro gun sight replaces the complicated and unreliable procedure of using a fixed sight and estimating the lead by the relatively simple operation of ranging and tracking which becomes nearly automatic after a little practice. In addition the computing sight also incorporates a fixed or a non-computing sight. The gyro motor is powered from the secondary bus. Provisions are made for the installation of the A-1CM or A-4 gun-bomb-rocket sight and the APG-30 radar range finder.

SELECTOR DIMMER ASSEMBLY.

The selector dimmer assembly (5 figure 4-14B) is a dual control. The dimmer ring is marked BRIGHT and DIM and controls the brightness of the fixed and gyro reticle lamps. The selector switch has four positions: FIXED, FIXED & GYRO, GYRO DAY and GYRO NIGHT. When the selector switch is set at FIXED, only the lamp which illuminates the fixed reticle is connected to the current supply. With the selector switch set on FIXED & GYRO both the fixed and gyro reticle lamps are connected to the power supply. Only the gyro reticle lamp is connected to the power supply with the selector switch in the GYRO DAY or GYRO NIGHT position. The GYRO NIGHT position automatically sets the range at 170 yards as at night it is usually impossible to see an airplane outline clearly enough to range accurately.

SPAN ADJUTMENT KNOB.

The span adjustment knob (3, figure 4-14B) is set to the wing-span of the target, in feet, when the gun sight is operated.



Figure 4-15. Control Stick Grip

SIGHT LAMPS.

The fixed and gyro lamps are accessible through a lamp housing access door located under the crash pad on the sight head. Two spare lamps are stowed on the upper right hand corner of the instrument panel.

RANGING CONTROL.

The gun sight ranging control is operated by the throttle twist grip. Clockwise rotation of the twist grip to its extreme position moves the range unit sheave to the 200 YARD or minimum range position. Full counter clockwise rotation of the throttle twist grip moves the range unit sheave to the 800 YARD or maximum range position. The pilot maintains correct range by keeping the target framed within the circle of the diamond-shaped pips. As the range changes, the circle increases or decreases by operation of the twist grip. The range unit is wired so that when the range control system is in the 800 YARD position the sight is electrically caged. The more the twist grip is moved toward the 200 YARD position the less the gyro is permitted to lag behind the pilot's tracking.

FIXED RETICLE MASK LEVER.

A mask, with a small hole in the center, can be placed over the fixed reticle to eliminate all except the cross in the center. The mask is positioned by the fixed reticle mask lever (2, figure 4–14B) on the left side of the sight head.

OPERATION.

STARTING THE SIGHT.

- 1. Remove the protective cover from gun sight head.
- 2. Connect external power to the No. 1 power receptacle and check that the gyro motor starts to function.
- 3. Place the gun selector switch to the SIGHT-CAM-ERA & RADAR position and the selector dimmer switch to the FIXED & GYRO position. Check to see that both reticle images are visible and that their brilliance can be varied. Move mask lever down and make sure only the cross of the fixed reticle image is visible.
- 4. Move the selector dimmer to GYRO DAY position and make sure that only the compensating reticle image is visible. The reticle image should settle in a few seconds and should not vibrate afterwards.
- 5. Make sure that the reticle image is well defined. Should the six diamond-shaped dots continue to be fuzzy or distorted after 10 minute warm-up period, the gyro is probably out of dynamic balance and the sight head should be replaced.
- 6. Turn throttle twist grip clockwise to stop and check for proper reading, 200 YARDS. Make sure the diameter of the gyro reticle enlarges as twist grip is turned clockwise.
- 7. Turn twist grip counter-clockwise to stop, and check for proper reading, 800 YARDS. Make sure gyro reticle becomes smaller as the twist grip is rotated counterclockwise. The gun sight ranging system must not bind, or require excessive effort to operate.
- 8. Move the selector dimmer to FIXED and GYRO and rotate range to 500 YARDS. The reticle image central dot should be superimposed on the cross when aiming at the horizon. The horizon point must be at least 500 feet distant.

STOPPING THE SIGHT.

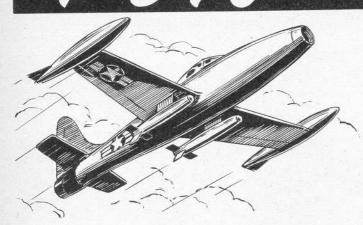
1. Place the gun selector switch in the SIGHT-CAM-ERA and RADAR position. The sight will remain

GUN SELECTOR Switch

With the gun selector switch in the GUNS position the guns will fire when the stick trigger is depressed provided the aircraft is airborne. Refer to gun selector switch under armament equipment for complete description.

GHT CAMERA & RADAR

BOMBING



A jettisonable bomb pylon can be installed under each wing. The pylons are jettisoned by explosive charges in the attaching bolts and are blown away from the airplane by compressed air cylinders. These cylinders must be charged manually. Each pylon can carry single bombs from 100 up to 1000 pounds, one fragmentation bomb rack assembly, a chemical tank or an external fuel tank. The gunbomb-rocket-sight is used for bomb sighting and automatic bomb release. Controls are provided for normal or emergency release of any external stores carried on the pylons. Normal release may be accomplished automatically or manually, with bombs released singly or simultaneously. The arming condition of the bomb nose and tail fuses is manually selected.

BOMB SELECTOR

The bomb selector switch has three positions: ALL, OFF and SINGLE. When the switch is in the SINGLE position the left bomb will release when the bomb release switch is depressed. The right bomb will release when the release switch is depressed again. With the switch placed in the ALL position both bombs will release simultaneously when the bomb release switch is depressed. When in the OFF position the bombs will not release even though the bomb release button is depressed.



BOMB RELEASE

The bomb release switch is a spring-loaded, button type switch installed on the top of the control stick. When the switch is depressed the bomb rack electric circuit is energized to release the bombs or pylon tanks in accordance with the setting of the bomb selector switch. The bomb release switch will also fire the rockets, or salvo the rockets, and bombs depending on the position of the rocket selector switch or the bomb selector switch.

NOSE & TAIL



BOMB ARMING **SWITCH**

The bombs arming switch has three positions: NOSE AND TAIL, SAFE and TAIL ONLY. When the switch is placed in the NOSE AND TAIL position the electric circuit is indexed to arm the bombs for time explosion. When the switch is placed in the TAIL ONLY position the electric circuit is indexed to arm the bombs for impact explosion. In the SAFE position the bombs are unarmed when dropped.





BOMB RELEASE SELECTOR SWITCH

The bomb release selector switch has two positions which are AUTO RELEASE and MANUAL RELEASE. In the AUTO RELEASE position the bombs will be released automatically by the gun-bomb-rocket sight. In the MANUAL RELEASÉ position the bombs are released manually by depressing the bomb release switch on the control stick regardless of whether or not the sight is utilized or in operation.

Auxiliary Bomb Selector Switch



The auxiliary bomb selector switch is used when fragmentation bomb racks or chemical tanks are attached to the bomb racks. The auxiliary bomb selector switch has three positions: ALL, ÓFF and SINGLE. In the SINGLE position the left rack

will release its bombs then transfer the circuit to the right rack. In the ALL position both fragmentation racks will operate simultaneously to drop their bombs or the chemical tanks will fire when the bomb release switch is actuated. The auxiliary bomb release indicator light (, figure) illuminates when the fragmentation racks are loaded and remains on until the fragmentation bombs are dropped. The ALL position is used when firing chemical tanks.

SALVO SWITCH

The salvo switch has two positions which are NORMAL and SALVO. The switch is springloaded to the NORMAL position. If held in the SALVO position the bombs, pylon tanks or chemical tanks, rockets and tip tanks will be jettisoned instantly regardless of the position of the respective selector switch on the control stick.



The rockets will jettison only if the airplane is airborne.

EQUIPMEN'



BOMB PYLON JETTISON SWITCH

The bomb pylon jettison switch is a spring-loaded switch guarded in the OFF position. When placed in the JETTISON position it completes an electrical circuit to explosive charges in the attaching fittings of the bomb pylon adapters and at the same time releases a charge of compressed air to blow the bomb pylon adapters away from the airplane.

BOMBING OPERATION

ALL

MANUAL



Set bomb selector switch as desired.

ARM



Set bombs arming switch as desired.

Set bomb release selector as desired.

AUTO RELEASE



MANUAL RELEASE

Press bomb release switch on control stick



CAUTION

Before depressing the bomb release switch, check to determine that all selector switches are in proper position. This is necessary to determine that only the desired circuits will be energized. It is possible, for example, if both the rocket jettison ready switch and the rocket selector switch are both on, to fire some rockets and drop the others when the bomb release switch is depressed.

OMBING OPERATION

USING

GUN-BOMB-ROCKET SIGHT

the GUN position.

Set rocket dive angle control to GUN-BOMB (F-84G-1RE) or to the BOMB position on F-84G-5 and 10RE).

Note If the radar "out" switch is

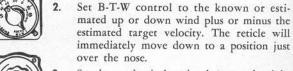
depressed with the dive angle control in the BOMB position on

F-84G-5 and 10RE aircraft, the

sight will automatically return to









over the nose. Set the mechanical caging lever on the sight head to UNCAGE.

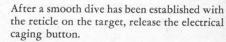
Set reticle dimmer control for desired bril-



AUTO RELEASE

Set the bomb release selector switch in the AUTO RELEASE position.

Fly an approach which will give the desired dive angle during the bombing run. The electrical caging button must be depressed during



Depress the bomb release switch at approximately the bomb drop point.

Track very smoothly until the image circle becomes extinguished and a red flashing light is reflected on the reflector glass. This indicates an automatic bomb release.

MANUAL RELEASE

If manual release is desired, place the bomb release selector switch in the MANUAL RELEASE position, get on the target and track as above. After the reticle image circle becomes extinguished, press the bomb release button. The manual release is not as accurate as the automatic release because of the time lag due to the pilot's reaction time.

Computation accomplished during the above prescribed procedure will be good for only one release, i.e., a single bomb, bombs in train with interval control not exceeding 1/2 second from the first to the last bomb, a pair of bombs released simultaneously or a salvo.

The bombs can be dropped simultaneously unarmed by operating the master salvo switch to the SALVO position.

CAUTION

The bombs, pylon tanks or chemical tanks will be dropped if the master salvo switch is actuated with the airplane in the static position.

Figure 4-17. Bombing Equipment (Sheet 2 of 2)

F-84G ROSKET

Rocket firing equipment is provided for launching eight 5" HVAR type rockets. The equipment consists of two forward retractable support posts and four aft retractable support posts under each wing, an electrical control box mounted below the instrument panel and four arming solenoids mounted in the leading edge of each wing to retain the rocket nose-fuse arming wires. Each forward post is equipped with a jettison mechanism for jettisoning the rockets in an emergency. The fore and aft supports retract automatically after the rockets have been fired or jettisoned. The gun-bomb-rocket sight is used for aiming rockets and the rockets are fired by depressing the bomb release switch.

ROCKET INDICATOR & RESET SWITCH



The rocket indicator is a conventional counter-type labeled: RX TO BE FIRED, with a rotary type reset switch. The indicator informs the pilot, by rocket number, the position and wing location of the next.rocket to be fired and enables him to keep check of the number of rockets fired and those remaining on the launchers. The reset knob permits the counter to be re-indexed.

CAUTION

The rockets to be fired may be selected by turning the reset switch until the correct rocket number is shown on the indicator dial, but in the two rocket configuration the indicator must be set at "3" and in the four or eight rocket loadings the upper rockets must not be selected until the lower rockets have been fired.

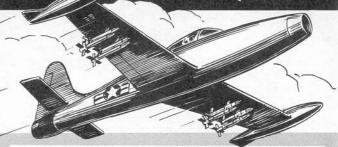
ROCKET JETTISON READY SWITCH



The rocket jettison ready switch has two positions: NORMAL and JETTI-SON READY. The normal position is guarded with a red cover guard. The JETTISON READY position indexes the rocket jettison circuit so all rockets will be jettisoned simultaneously when the bomb release switch on the control stick is pressed.

NOTE

Rockets can be jettisoned electrically only if the airplane is airborne.



ROCKET SELECTOR SWITCH



The rocket selector switch has three positions: OFF, SINGLE and AUTO. When the switch is placed in the SINGLE position, the electrical circuit to the rocket shown by number on the indicator will be energized when the bomb release switch is pressed. When the switch is placed in the AUTO position, the firing circuits to each of the rockets is completed in automatic sequence when the bomb release switch is pressed and held.

ROCKET ARMING SWITCH

FUSE DELAY



The rocket arming switch has three positions: FUSE DELAY, OFF and INSTANT. When the switch is in the INSTANT position the arming wire is clamped between the fixed and springloaded jaws of the solenoid which retains the wire when the rocket is fired. This will arm the rocket for contact detonation by releasing the contact fuse pin. When the switch is placed in the FUSE DELAY position, the solenoids are energized to release the arming wires which will remain attached to the rockets. The nose contact fuses will therefore remain in the safe or unarmed position and the rockets will be detonated by the base fuse.

SALVO BOMES ROCKITS I TOP TANK

SALVO SWITCH

The salvo switch has two positions which are NORMAL and SALVO. In the salvo position the bombs, chemical tanks or pylon tanks, rockets (if aircraft is airborne) and tip tanks will be jettisoned instantly regardless of the position of the respective selector switches and without using the bomb release switch on the control stick.



MANUAL TIP TANK RELEASE

A manual jettison for the rockets is provided. The manual control is interconnected with the manual tip tank release so that when the manual tip tank release is pulled the wing tip tanks and rockets are jettisoned simultaneously.

EQUIPMENT.

ROCKET LOADING

The rocket launcher installation permits loading of two, four or eight rockets. In the two-rocket loading, rocket number 3 is loaded on the outboard launcher of the left wing and number 4 rocket on the outboard launcher on the right wing. In the four rocket configuration, rockets No. 1 and 3 are mounted together (over and under or "double-shot") on the left outboard launcher and Nos. 2 and 4 are similarly mounted on the right outboard launcher. The eight rocket configuration is loaded as indicated in figure

ROCKET FIRING (MANUAL)



- 1. Set rocket selector switch as desired.
- 2. Set rocket arming switch as desired.
- 3. Set rocket indicator as desired.
- 4. Press bomb release switch on control

CAUTION

The lower rocket must always be fired first. When a misfire occurs in the air during "single" round firing the pilot shall check his intervalometer to ascertain which round has misfired, remembering that the number shown on the intervalometer is the rocket number to be fired. Reference to rocket firing sequence will identify the rocket as an upper rocket or lower rocket. If the rocket is a lower rocket, the rocket firing sequence will reveal from which rocket it is suspended. The upper rocket should not be fired. The intervalometer should be positioned upon the next position when the number of the upper rocket of the misfired pair appears on the intervalometer, thereby bypassing a double rocket release. (During automatic firing, the pilot has little control over the rockets as they fire at 0.1 second intervals while firing button is held down. If a misfire should occur during automatic firing, experience indicates that if the upper rocket is fired with the lower rocket still attached thereto, and provided the fins are secured per instruction, only slight damage will occur to the aircraft consisting of two superficial scratches on the under surface of the wing and scorched paint. The trajectory of the rocket under double release is immediate nose-over).

ROCKET FIRING SEQUENCE **EMERGENCY** RELEASE

ROCKET FIRE OPERATION



- 1. Set B-T-W control to ROCKET-GUN.
- 2. Set rocket dive angle control to type rocket being fired and the expected dive condition; set pointer to S for steep dives of more than 40° or N for dives less than 40°.





If the radar "out" switch is depressed with the dive angle control in the ROCKET position on F-84G-5 and 10RE aircraft the sight will automatically return to the GUN position.

- 3. Set mechanical cage lever on sight head to UNCAGE.
- 4. Set reticle dimmer control tor desired brilliance.
- 5. Depress the electrical caging button.
- 6. Fly on the desired approach to the target, until the reticle image lies on the target, then track smoothly.
- 7. Release the electrical caging button between 2,000 and 3,000 yds.
- 8. Continue tracking smoothly for one solution time (approximately two seconds after releasing the caging button) then fire while holding the reticle on the target.
- 9. If the caging switch is depressed, or if the reticle slips off the target after releasing the caging button, a new solution time will be required before firing.
- 10. Rockets may be fired singly, or in train as desired by the pilot and computation will be correct as long as the reticle remains on the target continuously.

1. To jettison the rockets position the salvo*switch to the SALVO position momentarily. This will also jettison the wing tip tanks and any stores carried on the bomb pylons.

2. The rockets can also be jettisoned by placing the rocket arming switch in the OFF or DELAY position, the rocket jettison ready switch in the JETTISON READY position and then depressing the bomb release switch on the control stick.

3. In event of electrical failure pull the manual tip tank release all the way aft. This will also jettison the wing tip tanks.

Figure 4-18. Rocket Equipment (Sheet 2 of 2)

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1

ready for operation as long as the generator is operating.

GUNNERY EQUIPMENT.

Four .50 caliber machine guns are installed in the gun bay of the fuselage and one .50 calibre machine gun is installed in the leading edge of each wing. Electric heaters are provided for the guns. The normal load of ammunition for each gun is 300 rounds.

On aircraft prior to F-84G-10RE all guns are charged manually, prior to flight, by a manual charger stowed in each gun compartment. The guns are charged on F-84G-10RE and subsequent aircraft with a pneumatic gun charger. A gun camera, installed in the leading edge of the right wing operates automatically when the guns are fired or it may be operated separately. A safety circuit, controlled by the extension of the landing gear shock strut prevents the gun from being fired, or the rockets jettisoned if the airplane is in the static position. If for any reason the guns must be fired or the rockets jettisoned while the airplane is on the ground the safety circuit can be by-passed by actuating the armament safety override switch located in the right wheel well.

GUN CHARGER.

The gun charger, mounted on each gun in F-84G-10RE and subsequent aircraft, is operated by compressed air and controlled electrically. The charger can be used for charging the guns from the cockpit, holding the guns in the retracted position for purposes of safety and to permit cooling of the guns, automatically charging the guns during gunfire when a failure to fire occurs, and for firing the gun by the use of an electro-pneumatic

sear actuator contained in the charger.

GUN CHARGER SWITCH. The gun charger switch (10A, figure 1–17) located on the left console, is a three position switch spring loaded to the OFF position. The positions are RETRACT, OFF and RELEASE. The guns are charged by placing the gun charger switch in the RETRACT position. This actuates a solenoid which in turn allows air pressure to draw the bolt to the rear and locks it in that position. The RELEASE position will return the gun bolt to the forward position. The guns will fire, if the gun selector switch is in the GUNS position and the aircraft is airborne, when the stick trigger is depressed regardless of the position of the gun bolt. If the bolt is in the forward position the guns will charge first then fire when the stick trigger is depressed.

STICK TRIGGER.

The stick trigger (figure 4-5) has two positions. The first position operates the camera and the second position fires the guns, provided the airplane is airborne and the gun selector switch is in the GUNS position.

GUN HEATER SWITCH.

The gun heater switch located on the left console is a circuit breaker type switch having two positions: OFF and HEATER. The HEATER positions supplies power to the gun heaters from the secondary bus.

GUNFIRE OPERATION (WITH RADAR RANGE). A, C, E

1. Gun heater switch HEATER.

- 2. Gun selector switch GUNS. Allow one minute for amplifier to warm up and stabilize.
- 3. Set rocket dive angle control to GUN-BOMB. (F-84G-1RE)
- 4. Set rocket dive angle control to GUN (F-84G-5 and 10RE)
- 5. Set the TR, HI, LO pointer on the rocket dive angle control to suit gunnery target speed (F-84G-5 and 10RE).
 - 6. Set B-T-W control to ROCKET-GUN.
 - 7. Check instrument power switch NOR.
 - 8. Manual range control on throttle in detent.
- 9. Set mechanical caging lever on sight head to UN-CAGE.
- 10. Set reticle dimmer control for desired brilliance.
- 11. When searching for targets, press caging button on throttle control to stabilize the reticle image.
- 12. When target is located and tracking is started, release caging button. Fly the airplane so that the reticle image is continuously and accurately centered on the target. After the target has been tracked smoothly without slipping or skidding for approximately one second, fire the guns.

GUNFIRE OPERATION (WITH MANUAL RANGE). A, C, E

- 1. Gun heater switch HEATER.
- 2. Gun selector switch GUNS. Allow one minute for amplifier to warm up and stabilize.
- 3. Set rocket dive angle control to GUN-BOMB (F-84G-1RE).
- 4. Set rocket dive angle control to GUN (F-84G-5 and 10RE)
 - 5. Set B-T-W- control to ROCKET GUN.
 - 6. Check instrument power switch NOR.
- 7. Set mechanical caging lever on sight head to UN-CAGE.
 - 8. Set reticle dimmer control for desired brilliance.
- 9. Identify target and set wing span on span adjustment dial which is mounted on the left of the sight head.
- 10. When searching for targets, press caging button on throttle control to stabilize the reticle image.
- 11. After the target is close enough for a sphere containing the wing tips to coincide with the framing circle at minimum diameter, release the caging button.
- 12. Track smoothly, turning manual range control on throttle so that the circle continuously and accurately frames or encloses the target. After the target has been framed and tracked smoothly for approximately one second without slipping or skidding, fire the guns.

GUNFIRE OPERATION.

B, D

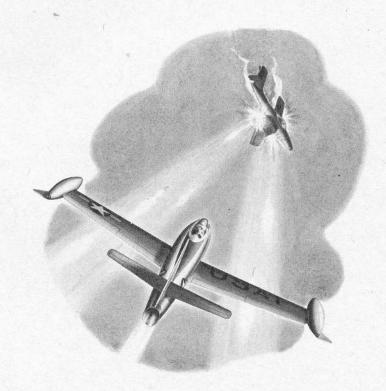
- 1. Gun heater switch HEATER.
- 2. Gun selector switch GUNS.
- 3. Set dimmer ring on selector dimmer assembly for desired brilliance.
- 4. Place selector dimmer assembly switch to desired position.

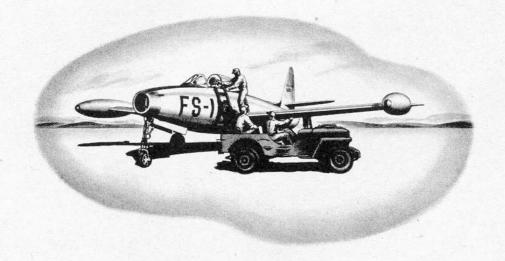
- 5. Keep span adjustment knob set at wing span of aircraft most likely to be encountered. As soon as the target is recognized check the setting and alter as necessary.
- 6. When tracking a target, it is necessary to smoothly maneuver the ship so that the center dot will be on the target at all times.
- 7. Adjust the twist grip so that the moving reticle properly frames the target.
- 8. Track the target for a minimum of 1 second then fire the guns.

MISCELLANEOUS EQUIPMENT.

ANTI-G SUIT PROVISIONS

An air pressure outlet connection on the front of the pilot's seat (figure 1–24) provides for the attachment of the air pressure intake tube of the pilot's anti-G suit. Air pressure for inflation of the anti-G suit bladder is conducted from the engine compressor through a pressure regulating valve located on the left console (23, figure 1–17) which starts functioning when a force of 1.75 g's is applied to the aircraft. A control marked HI and LO allows for adjustment of the rate of inflation of the anti-G suit. In the LO range the valve opens at 1.75 g and then allows 1 psi of air pressure to pass to the suit for every increase of 1 g force thereafter. In the HI range the valve still opens at 1.75 g but delivers 1.5 psi per g force thereafter. The suit will inflate in 0.2 to 2.0 seconds depending on the input pressure.







INTRODUCTION.

This section includes the engine and aircraft limitations that must be observed during normal operation. Instrument markings form a part of these limitations; however, these limitations are not repeated in the text and must be referred to on the instrument marking page. For complete restrictions carefully read the instrument marking page.

ENGINE LIMITATIONS. OVERSPEED LIMITS.

The engine is limited to an rpm of 100.5% for take-off. Reset fuel control if stabilized speed exceeds 102% rpm in flight. Remove the engine for overhaul if the stabililized speed exceeds 103% or momentarily speed exceeds 104% during flight or ground operation.

Note

The allowable flight variations in rpm from ground setting is minus 1½% rpm.

OVER TEMPERATURE LIMITS.

After five starts in which exhaust temperature is between 900°C-1000°C or after one start in which the exhaust temperature reaches 1000°C the engine will be removed

and the special inspections outlined in applicable inspection guide must be accomplished.

PROHIBITED MANEUVERS.

- 1. Inverted flying or any other maneuver resulting in extended negative acceleration may result in engine flame-out since there is no means of insuring flow of fuel in this attitude.
- 2. Do not accomplish any maneuvers solely by the use of trim tabs as this procedure may result in air loads on the airplane sufficient to cause complete structural failure.
- 3. Steep angle dives should be avoided at airspeeds closer than 40 mph to red line (.76 Mach No.) at altitudes below 15,000 ft. in order to avoid the application of "g" forces in excess of airplane strength at the time of pull-out.
- 4. Do not attempt intentional spins below 15,000 feet altitude.
- 5. Intentional spins are prohibited with fuel in the tip tanks or with external stores installed.
- 6. All acrobatics except those employed for normal tactical maneuvers are prohibited below 15,000 feet.
- 7. Avoid landing the airplane with fuel in the tip tanks or with bombs installed. Landing with fuel in the



1. Do not exceed 260 mph IAS with flaps set at 20 degrees. The flaps will automatically retract from 40 to 20 degrees if the airspeed exceeds 220 mph IAS.

2. Do not jettison empty tip tanks in straight flight at speeds below 250 mph IAS. At lower speeds, the air loads that separate the tank from the airplane are small and one or both tanks may hang-up. If this should occur, hold the airplane straight then yaw slightly away from the tank by tapping the rudder pedal. Do not roll or yaw the airplane sharply. Do not jettison tip tanks in a turn. Jettison full tip tanks in straight flight or shallow turns at any speed.

- 3. Do not jettison pylon tanks above 325 mph IAS except in an emergency.
- 4. Do not extend the speed brake for recovery from maneuvers at speeds in excess of 500 mph IAS since this aggravates the compressibility pitch-up.
- 5. Jettison jato units at speeds between 250 and 300 mph IAS. At higher speeds units may strike the rear hooks and fuselage.
- 6. Do not open inflight refueling doors at speeds above 280 mph IAS.

7. AIRSPEED LIMITATIONS - WITHOUT PYLON TANKS INSTALLED.

NOTE: The aircraft is redlined at .82 Mach No.

The following indicated airspeeds at the prescribed altitudes and under the prescribed flight conditions shall not be exceeded with any loading configurations except with pylon tanks installed.

Altitude — ft.	Flight Conditions	Airspeeds	
Below 15,000	Diving or maneuvering flight (other than straight and level flight 1g)	40 mph below Red Line	
Below 15,000	Straight and level flight only — (1g)	Red Line	
Above 15,000	ÀĬĬ	Red Line	

8. AIRSPEED LIMITATIONS - WITH 230 GAL PYLON TANKS INSTALLED

The following indicated airspeeds at prescribed altitudes and under prescribed flight conditions will not be exceeded.

Altitude — ft.	Flight Conditions	Indicated Airspeeds		
Below 15,000	All	80 mph below Red Line		
Above 15,000	All	40 mph below Red Line		

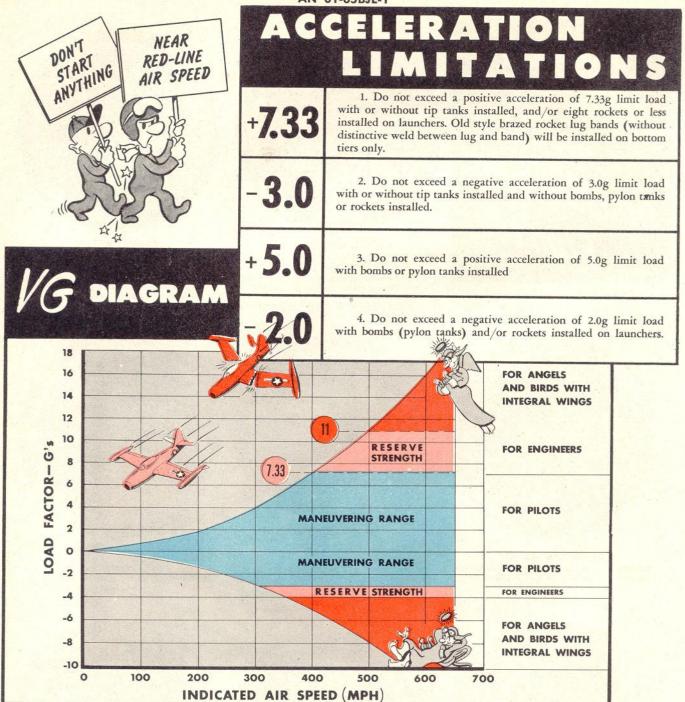
AIRSPEED LIMITATIONS

Figure 5-1. Airspeed Limitations

Indicated



Figure 5-2. Instrument Markings



This is a velocity and g load diagram for the F-84 airplane. It shows what speeds and g's are possible and allowable for the airplane. The upper and lower curved lines represent the maximum load that the airplane can sustain before the wing stalls. At 150 mph IAS the upper curved line shows that the load can be 1g. This corresponds to the stalling speed of the airplane with flaps and gear up. At this speed the load cannot be greater than 1g because the wing cannot lift any more than the weight of the airplane at this airspeed. At 300 mph IAS it is possible for the airplane to develop a load of 4g. When the load on the airplane at 300 mph has been increased to 4g the airplane has reached the point where the wings cannot lift any more, and the airplane will stall if the pilot tries to increase the load. Further

study of this diagram will show that the pilot cannot exceed the load of 7.33g unless the airplane is indicating a speed which is greater than 400 mph; therefore the pilot cannot overload the airplane unless the indicated airspeed is greater than 400 mph. Above this indicated airspeed of 400 mph it is up to the pilot to be careful to make sure that a load greater than 7.33g is not obtained. It is the high indicated airspeeds which pack the terrific wallop and the high indicated airspeeds are only possible at low altitudes. The blue area represents the area of g loads and airspeeds which may be used by the pilot without damage to the airplane. It should be possible for the airplane to perform all the maneuvers and tactics which are required, within the blue area.

Figure 5-3. Operating Flight Strength Diagram

tip tanks or with bombs installed requires that good landing technique be employed to prevent wrinkling or buckling the wings during such landings.

8. Do not use tip tanks without fins installed. Under accelerated flight conditions of 4G at .74 Mach No. or higher speeds, with medium to aft center of gravity, airloads on tip tanks without fins produce a nosing-up tendency which can easily result in the application of G forces in excess of the strength of the aircraft.

WEIGHT LIMITATIONS.

MAXIMUM GROSS WEIGHT.

The maximum gross weight for take-off is approximately 23,100 lbs and for landing 14,850 lbs.

BALLAST WEIGHTS.

If ammunition is not carried for the fuselage guns, each ammunition can must be ballasted with a minimum of 45 pounds ballast. If the ballast is not carried the cg

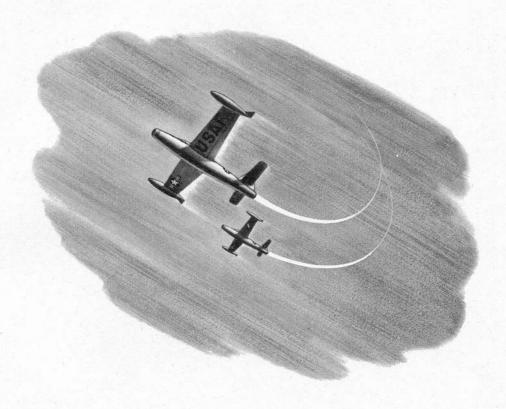
may move aft enough to make the stick forces light, therefore excessive g may be applied to the aircraft.

NOSE WHEEL STRUT EXTENSION.

The nose wheel strut should have the correct extension as noted in figure 2-1. A bottomed or low strut will increase the nose wheel "unsticking speed" to above the take-off speed. Consequently this will increase the take-off speed and ground roll.

CANOPY JETTISON.

The canopy should be jettisoned from the fully closed position as the canopy remover pneumatic guns contact the bumpers on the canopy only when the canopy is in the fully closed position. If the canopy is jettisoned from any position other than fully closed, these pneumatic gun pistons fire through the canopy glass and are ineffective in forcing the canopy away from the airplane.





GENERAL FLIGHT CHARACTERISTICS.

The airplane is stable and trims well. For all speeds and altitudes, aileron forces can be set as desired by use of the aileron boost ratio selector switch. Only small amounts of rudder are necessary for coordination with ailerons for turns etc. Maneuvering elevator forces, on the other hand, are heavy at low altitude, but at high altitude, forces become increasingly lighter. The airplane can make good about 2.3g when maneuvering at 40,000 feet depending on load conditions. The rate of roll of the airplane is exceptionally good and aileron feel is excellent. Due to increased thrust, over early models, the acceleration is good for jet aircraft of this type. Flight characteristics of the airplane with tip tanks and rockets remain the same as for the clean airplane; however, with the installation of pylon tanks and bombs, changes in flight characteristics are as follows: When pylon tanks are installed, buffeting occurs before the critical Mach number of the airplane and therefore in this configuration the airplane is restricted to the buffet speed of the pylon tanks. When bombs are carried, buffeting may be noticed at lower Mach numbers depending on the type of bombs carried. This buffeting should define the limit speed for each particular bomb configuration.

RED-LINE FLIGHT.

The airplane is red-lined at .82 Mach number which is the critical Mach number of the wing. This means that at .82 Mach (or at 82% of the speed of sound) the airflow on some point of the wing of this airplane has reached 1.0 Mach (or 100% of the speed of sound). Airflow at 1.0 Mach or 100% of the speed of sound forms shock waves (or compressibility) which very abruptly affect the trim of the airplane and produce buffet. In short, the red line on the airspeed indicator always indicates the highest airspeed at which the stability and con-

trol of the airplane remains normal. The airplane near red-line speed reacts as follows in unaccelerated flight (lg):

In accelerated flight (greater than lg) the sharp compressibility pitch-up occurs at lower speeds, see figure 6-3. Since the pylon tanks buffet at a speed lower than

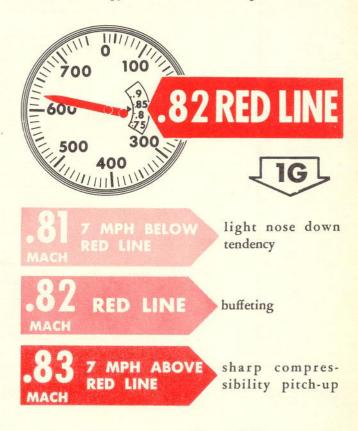


Figure 6-1. Red-Line Flight

the red-line speed of the airplane, the limit in this configuration is restricted to the pylon tank buffet speed. In this configuration then, the airplane buffeting and compressibility pitch-up noted for red-line flight would not be applicable.

When bombs are carried, buffeting may occur prior to the red-line speed. Trim characteristics with bombs may differ from those of the clean airplane in that possibly additional nose down trim may be required at the higher indicated airspeeds. If abnormal nose down trim is used a sudden nose down trim change may be experienced upon bomb release. Therefore it is recommended that stick force not be fully trimmed out at the higher indicated speeds with bombs installed.

WARNING

The compressibility pitch-up is present at all altitudes, but is hardly noticeable at high altitudes. At 15,000 feet the effects are pronounced

and at altitudes of 15,000 feet or below when airspeed is increasing, pitch-up is extremely sudden and dangerous.

MANEUVERING FLIGHT.

The speed and g's which may be reached on this airplane without exceeding red-line airspeed (critical Mach number of wing) for altitudes up to 40,000 feet are shown in figure 6-2, which is based on results of numerous tests. This figure shows the stall and compressibility buffet boundaries of the airplane and the tops of the curves rounded off to show the performance limits at which compressibility buffet will occur. Unlike the V-G diagram in Section V, it does not show the maximum load factor to which the airplane can be subjected if speeds beyond the buffet boundary are reached. Consequently, although this figure would indicate that ultimate load cannot be attained at 10,000 feet, this merely means that buffeting will be experienced prior to ultimate load factor. However, as indicated on V-G diagram in Section V the ultimate load factor can be experienced at any speed above 500 IAS and this speed is attainable

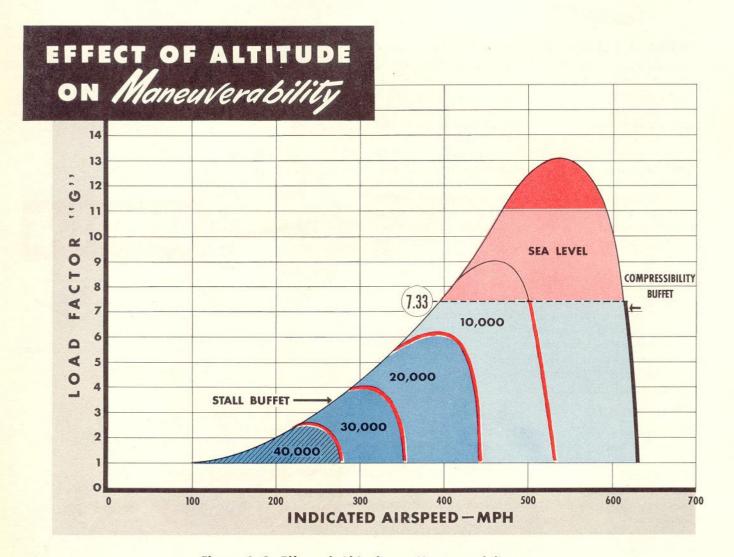


Figure 6-2. Effect of Altitude on Maneuverability

Above 20,000 Feet:

At altitudes of 20,000 feet and above, the maximum load factor can be obtained about 5 mph per "g" less than red-line airspeed. If speed is lower, the "g's" will be limited by a stall buffet at less than maximum "g's" and by a compressibility buffet if speed is too high. At high altitudes (above 20,000 feet) it is difficult to distinguish a stall buffet from a compressibility buffet. The rule of 5 mph per "g" will help you get maximum maneuverability at altitude. For example at 30,000 feet it is possible to obtain 4g (figure 6–2) but this g can only be obtained at an indicated airspeed which is about 20 mph less than red-line speed.

700 100 600 | 85 200 500 300 400

5 MPH UNDER RED LINE

ABOVE 20.000 FT BELOW



A good rule of thumb to remember is: Each "g" imposed on the airplane lowers the red-line speed (critical Mach number) by 5 mph. (Example: Red-line speed of 550 is reduced to 525 when 5 "g's" are imposed on airplane).

REMEMBER

the red-line on your airspeed indicator does not subtract for "g's". You must do this yourself.

Below 20,000 Feet:

As indicated by the instruments on the figure, a maneuver which imposes "g's" is started at 1g and at 530 mph (red-line speed); at the peak of the maneuver the accelerometer reads 7.33g (limit g's) and the airspeed indicator reads 500 mph (which is 30 mph below red-line speed). The airspeed indicator being a pressure reading device does not take into account "g" loads being imposed and continues to register red-line speed at 530 mph; however, due to the increased "g's" the red-line (critical Mach number of wing) has, in reality, moved to a lower speed value (500 mph) even though the airspeed instrument is indicating that the red-line speed is 530 mph. If the airplane had continued to maintain the (530 mph) red line speed as "g's" were increased, it would enter the compressibility buffet zone at about 3g and at low altitudes (15,000 feet or below) the buffet would be followed by a sudden and dangerous pitch-up which could result in excessive "g's" and airplane failure.

When entering a maneuver from 1g or unaccelerated flight (very shallow dives or level flight) speed decrease is automatic and unavoidable and the airplane, therefore, of itself will avoid encountering compressibility and pitch-up as "g" loads are increased. However, if the maneuver is entered from a steep dive when the airspeed needle has been gaining on the red line needle, the speed will not decrease as "g's" are applied and compressibility and pitch-up will be encountered; at low altitude this can impose destructive load factors on the airplane.

MANEUVERING FLIGHT

Figure 6-3. Maneuvering Flight

RESTRICTED

at altitudes up to 15,000 feet. Note particularly that at any given altitude, the compressibility buffet or red-line moves to a lower speed as the load factor increases.

WARNING

Roll-off may be encountered on some airplanes at high speeds before 15,000 feet, particularly with 230-gal. tip tanks installed. This roll-off will be aggravated by increase G's during pull-out.

DIVING.

Diving, in the sense mentioned above, is defined by that maneuver which often requires high g's (6 or 7g) for recovery; the imposition of these "g's", as discussed under "MANEUVERING FLIGHT" in this section, lowers the red-line airspeed (critical Mach number of the wing) even though the airspeed indicator does not so indicate. Therefore, at altitudes below 15,000 feet, maneuvers which involve steep dive angles must be completed and the level flight attitude must be regained before the airspeed comes closer than 40 mph below the red-line. If the dive is steep and recovery is not started until the airspeed is close to the red-line airspeed, it will not be possible to recover a level flight attitude without encountering a sudden and dangerous pitch-up. Figure 6-4 illustrates a situation which must be avoided. The dive is steep and the airspeed is close to the red-line. To recover from this attitude requires "g's" and "g's" reduce the red-line speed by 5 mph per "g". Yet, if the pilot does not pull "g's" the airplane will hit the ground. If the dive is steep enough, he will exceed the red-line airspeed by continuing the dive, and the airplane will pitch-up and structural failure of the wings could result. If the pilot attempts to recover and pull "g's" the pitchup will occur below the red-line airspeed. There is no



Figure 6-4. Diving

good, certain and sure way to recover from such a situation. Recommendations for recovery (which have not been flight tested) indicate that the pull up must be the most gentle possible, within space limitations, maintaining a constant alert for pitch-up and keeping prepared for instant corrective action (push force on the stick to prevent excessive acceleration). Speed brake should not be extended for recovery at high indicated speeds since this aggravates the pitch-up tendency.

STALLS.

With the landing gear or flaps up or down, the airplane stalls straight ahead with no roll-off tendencies. The stall warning occurs at 5-8 mph ahead of the stalling speed with slight airframe buffet increasing to a slight control stick shake at 2-4 mph above the stall. During accelerated stalls in 2g turns there is no roll-off.

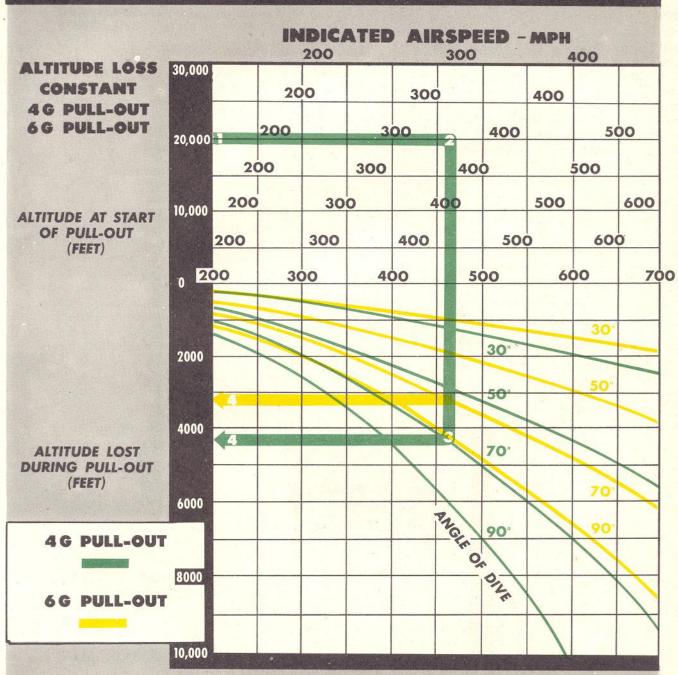
MPH I.A.S.	FLAP DEFLECTION DEGREES	GROSS WEIGHT-LB.		
		MAXIMUM 22,242	DESIGN 15,299	MINIMUM 12,359**
TAKE-OFF (GEAR DOWN)	20°	159	131	117
CLEAN (GEAR UP)	0°	176	146	132
LANDING				
O° BANK	40°	130	124	109
30° BANK	40°	165*	134	118
45° BANK	40°	185*	150	133
60° BANK	40°	227*	182*	162

*INSUFFICIENT POWER FOR LEVEL FLIGHT

Figure 6-5. Stall Chart

^{**} CLEAN AIRPLANE PLUS 10% RESERVE FUEL

DIVE RECOVERY CHART



HOW TO USE CHARTS: Select appropriate chart, depending upon acceleration (4G or 6G) to be held in pull-out; then –

- Enter chart at altitude line nearest actual altitude at start of pull-out. (For example, 20,000 ft).
 - On scale along altitude line, select point nearest the IAS at which pull-out is started (350 miles IAS).
- Sight vertically down to point on curve of dive angle (70°) directly below airspeed.
- Sight back horizontally to scale at left to read altitude lost during pull-out.

89

(Constant 4G pull-out 4400 ft; Constant 6G pull-out 3100 ft).

Stall warning in this attitude occurs with a slight buffeting at 25 mph above the stall, increasing to a control stick shake at 10 mph above the stall. Stall recovery is accomplished by conventional methods.

SPINS.

The spin characteristics of the airplane are good. It must be forced into a spin. The airplane, without tip tanks or with empty tip tanks, will recover from a spin in less than 1 1/2 turns. Intentional spins, with fuel in the tip tanks are prohibited since the added weight at the wing tips will aggravate the spin. Intentional spins, with empty tip tanks, should not be attempted below 15,000 feet. Elevators are to be maintained full up during the spin, to minimize any longitudinal oscillation. With aft cg the spins are slightly more flat but the longitudinal oscillations will be much milder.

SPIN RECOVERY.

The best technique, indicated by flight tests, is as follows:

- a. Apply full opposite rudder.
- b. Return elevators to approximately neutral.
- c. Ailerons neutral.

WARNING

As elevators are very effective, bring stick only partially toward neutral as a full neutral tick tends to over control to a "tuck under" flight path on recovery.

FLIGHT CONTROLS.

STICK FORCES.

Figure 6–7 indicates the quantitive values of stick forces at high and low altitudes. Note that stick forces to produce a given "g" decrease as altitude is increased. Note also that at the high altitudes the curves are shorter because the "g" which can be produced before the airplane stalls are less.

TRIM CHANGES.

An increase in stick force with g's is provided for the pilot's safety. At low altitudes the stick forces are higher and these forces may be safely alleviated by sensible use of the trim tab.

WARNING

Trim tabs should not be used as a primary means of control. No maneuvers should be accomplished solely by use of the trim tabs. The use of trim tabs effectively increases your apparent strength by reduction of required stick force. The high stick forces experienced without the use of trim are intended to protect you and the airplane; accordingly, trim tabs when used during a maneuver should only be used to lighten the stick forces to tolerable values and not to zero. Trim may be used with caution, but rapid use of trim, use of trim in anticipation of a maneuver, or use of trim to reduce stick forces to very small values in maneuvers may result in airloads on the airplane sufficient to cause complete structural failure.

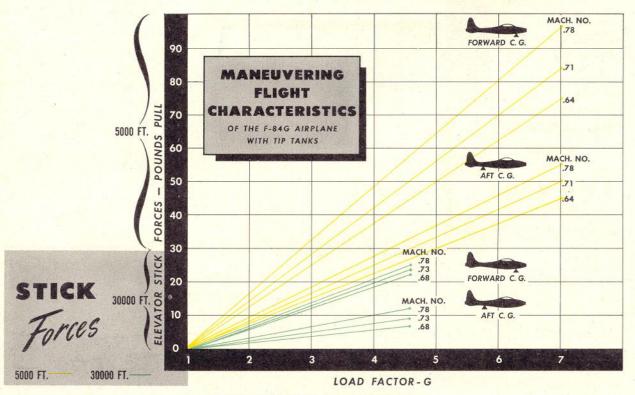


Figure 6-7. Stick Forces Diagram

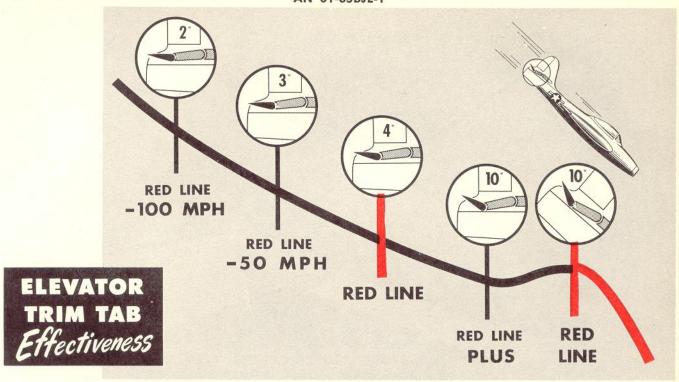


Figure 6-8. Elevator Trim Tab Effectiveness

TRIM EFFECTIVENESS.

When speed is increased more trim is required; the ratio between speed and trim required remains fairly constant until red-line speeds are approached where loss in control effectiveness is experienced. Figure 6-8 depicts loss in trim tab effectiveness at the higher Mach numbers in excess of red-line airspeed. The curved line represents the flight path of an airplane which is diving and as the speed increases, the force on the stick is decreased by trimming the airplane. As the speed increases up to the red-line the action of the trim system is normal in that it takes only a small movement of the trim tab to decrease the stick force to zero or to a small amount. When the speed exceeds the red-line airspeed the stability and control no longer behave in a normal manner. Beyond the red-line airspeed it takes excessive trim tab angles to trim the airplane, and it is possible to use the full trim tab movement and yet not completely trim the airplane. No unusual effects are noticed until the airplane slows down and here lies the danger. As speed is reduced to redline speed, the trim tab becomes extremely effective abruptly and the airplane can now be out of trim to the extent that it requires excessive pilot effort to control.

RUDDER TRIM CHANGES.

Since no torque effect is produced by the jet engine, rudder forces are zero if the fixed rudder tab is adjusted properly.

ELEVATOR TRIM CHANGES AT LOW ALTITUDE — BELOW 25,000 FEET.

The following elevator trim changes apply to unaccelerated flight (lg) only. During maneuvering flight (higher than lg) the flight characteristics specified below occur

at a lower Mach number. Diving to these Mach numbers is prohibited below 15,000 feet.

- 1. At speeds approaching 7 mph below red line (.81 Mach number) nose-down trim required.
- 2. At just below mph red line (.81 Mach number) a slight nose down tendency is experienced such that if the trim tab setting is maintained at this point, slight back pressure is required as Mach number is slowly increased.

Note

The airplane is restricted to .82 Mach number (red-line) for straight and level flight, however, if speed is inadvertently increased beyond red line (.82 Mach number) trim requirements are listed below.

- 3. At .82 to .83 Mach number (from red-line to 7 mph above red-line) pull force decreases as speed approaches .83 and at .83 Mach number push force is required.
- 4. At .835 to .84 Mach number (10 to 13 mph above red-line) a sudden violent pitch-up occurs. This condition even with full nosedown trim will require a push force of 20 to 70 lbs depending on altitude to maintain airplane attitude. Unless you are fully prepared, a violent pitch-up can occur. The airplane should not be trimmed beyond the red-line airspeed because excessive trim tab angles are required. If the airplane is trimmed beyond the red-line the airplane will be excessively nose heavy as soon as the Mach number decreases.

ELEVATOR TRIM CHANGES AT HIGH ALTITUDE — 25,000 TO 40,000 FEET.

Reduced aerodynamic forces at altitudes over 25,000 feet make it possible to overcome the pitch-up at critical Mach number.



Figure 6-9. Speed Brake Effect

CAUTION

Speed decreases rapidly after airplane pitch-up at critical Mach number, therefore do not use excessive nose-down trim as violent pitch-down may result.

AILERON.

Maneuvers at high altitude should be approached with a moderate boost ratio due to lightening of stick forces. The stick forces vary inversely with the boost ratio. Control centering is good without any "hunting" characteristics. With a high aileron boost ratio (10.8:1) and a high airplane speed (300 to 400 mph IAS) the airplane stick forces are light and the stick tends to center after deflection.

SPEED BRAKE.

When the speed brake is used at high indicated airspeed, there will be a definite nose-up tendency. This nose-up tendency may be counteracted by applying nose-down trim tab at the same time the extension of speed brake is started.

CAUTION

Because of the fast acting speed brake it is necessary to start retrim at the same time or slightly before actuating the speed brake switch since the time for the required elevator trim tab change is longer than that for the airplane to attain a new trim due to the speed brake extension at the higher air speeds. This will require some elevator forces to maintain attitude.

Application of the speed brake to lower the airspeed at high indicated airspeeds without compensating trim will add additional g's to those already imposed on the aircraft.

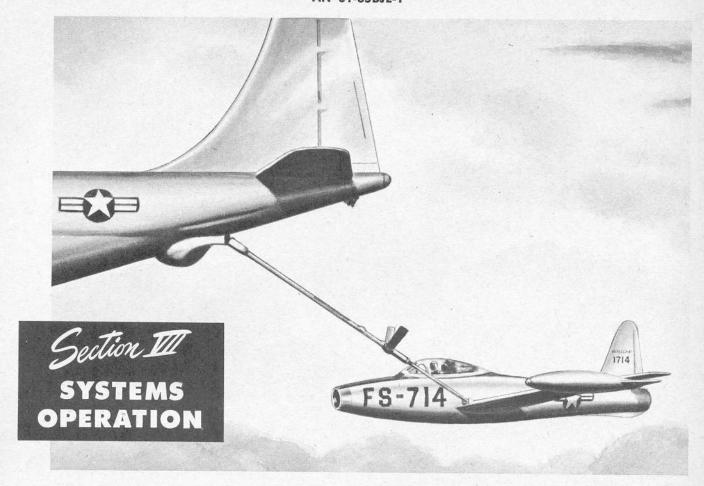
CAUTION

The speed brake should not be extended for recovery from maneuvers at speeds in excess of 500 mph IAS due to the large trim change experienced.

The action of the speed brake when pylon tanks are installed is effectively increased and produces much higher stalling moments. The stick forces and airplane reaction encountered at 250 IAS are equivalent to those encountered at 400 IAS without pylon tanks.

WARNING

DO NOT attempt take-off with speed brake extended.



ENGINE.

ENGINE ACCELERATION.

When increasing thrust, move throttle slowly and as rpm increases throttle may be advanced more rapidly. If operating on the normal fuel system on the main fuel control will compensate for rapid movement of the throttle at all altitudes. If operating on the emergency fuel system the throttle must be moved slowly to prevent compressor stall or flame-out at all altitudes.

COMPRESSOR SURGE AND STALL.

Compressor surge (or pulsation) may result from too rapid engine acceleration, especially at altitudes above 20,000 feet. If acceleration is made with very high tail pipe temperatures the pulsations will be more severe. If

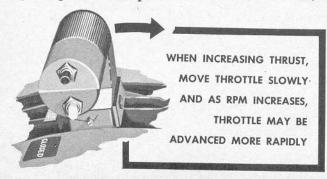


Figure 7-1. Throttle Movement

the rate of acceleration was a marginal case, surge may be absent and compressor stall will occur. Surge or stall may be recognized in flight by one or more of the following characteristics.

- 1. Pulsation roaring noise.
- 2. Loss of thrust.
- 3. Rapid rise of tail pipe temperature.
- 4. Loss of acceleration or possibly deceleration.
- 5. Long flame from tail pipe.
- 6. Possible flame-out at high altitude.

Whenever such conditions are encountered, immediately retard throttle until tail pipe temperature decreases; then accelerate more slowly to desired rpm.

WARNING

At altitudes above 15000 feet and at low aircraft speeds, some J35-A-29 engines may develop compressor stall if the throttle is rapidly advanced from idle to full rpm. Compressor stall causes pulsating airflow through the engine, which is easily detected through vibration of the aircraft, and is accomplished by a rapid and continued rise of exhaust gas temperature. There is no evidence that compressor stall results in any engine damage

provided it is stopped as soon as possible, and the exhaust gas temperature is not allowed to exceed the maximum allowable temperature during acceleration. If stall is encountered, retard the throttle quickly to the idle stop or until the vibration stops and the gas temperature begins to decrease. As soon as the stall has been stopped, the throttle may be advanced to the desired setting, but this should be done at a slow enough rate to prevent a repetition of the stall. Experience indicates that stall will not be encountered below 15000 feet regardless of aircraft speed or throttle manipulation. It has been found that stall will not occur at any altitude or any aircraft speed if the throttle is advanced normally.

ACCELERATION FLAME-OUT.

Acceleration flame-out may result from compressor surge and is most likely to be encountered at high altitude. It is indicated by loss of thrust, drop in exhaust temperature and deceleration. If the exhaust temperature does not drop too low it may mean some of the combustion chambers are still ignited. An attempt may be made to relight the other chambers by retarding the throttle to IDLE and then advancing it slowly.

ENGINE NOISE AND ROUGHNESS.

Engine roughness in flight may occur on some airplanes, especially when operating at high powers above 15,000 feet altitude. Usually this roughness can be eliminated by changing the rpm. However, if engine roughness occurs at all altitudes and engine speeds it may indicate some mechanical failure, and an immediate landing should be made.

STARTING SYSTEM.

The starting system is automatic so that an engine start is accomplished without holding the starter switch. A holding coil will keep the starter system operating until the combination of the battery current drop, together with the decreased current requirements of the starter reach a predetermined value at which time the starter circuit is deenergized if operating from the airplanes batteries. The current requirements of the starter are such that if operated from an external power source, delivering a constant current, the holding coil may not drop out at the required time. Therefore when the engine is started the ground start switch is actuated to stop the starting cycle when a selected rpm or time limit is reached to ascertain that the starting system is deenergized.

DIFFERENCES IN FUEL GRADES.

The airplane servicing diagram (figure 1–25) notes four fuels that can be used in the aircraft. There is little difference between JP-3 and gasoline, therefore, they will be discussed as JP-3 fuel. The main advantage of JP-4 fuel is the decreased evaporation losses due to boiling and foaming in the tanks. Although JP-3 and JP-4 fuels have some distinct disadvantages for use in jet aircraft, they are recommended as the availability is much greater from a quantity of crude oil than JP-1.

FUEL

During normal operation fuel is transferred first from the pylon tanks to the internal tanks so that the pylon tanks may be dropped to reduce drag. Fuel is then transferred from the wing tip tanks to the internal tanks until all external fuel is consumed. The wing tip tanks need not be jettisoned as they contribute to lift and the drag is negligible. Fuel is then transferred simultaneously from the wing and forward tanks to the main tank at varying flows so that the wing tanks will empty while there still remains 0 to 52 gals in the forward tank. The fuel remaining in the main tank is then consumed. Inasmuch as the normal fuel system is fully automatic, with the fuel tank selector in the ALL TANKS position, the pilot does not have to select the various fuel flow patterns except for manual selections of the external tanks air pressure. If it is necessary to operate on either the wing or forward auxiliary fuel flow patterns the fuel tank selector should not be turned through the OFF position as a flame out may occur due to a lack of fuel supply.

Figure 7—2. Fuel System Management (Sheet 1 of 2)

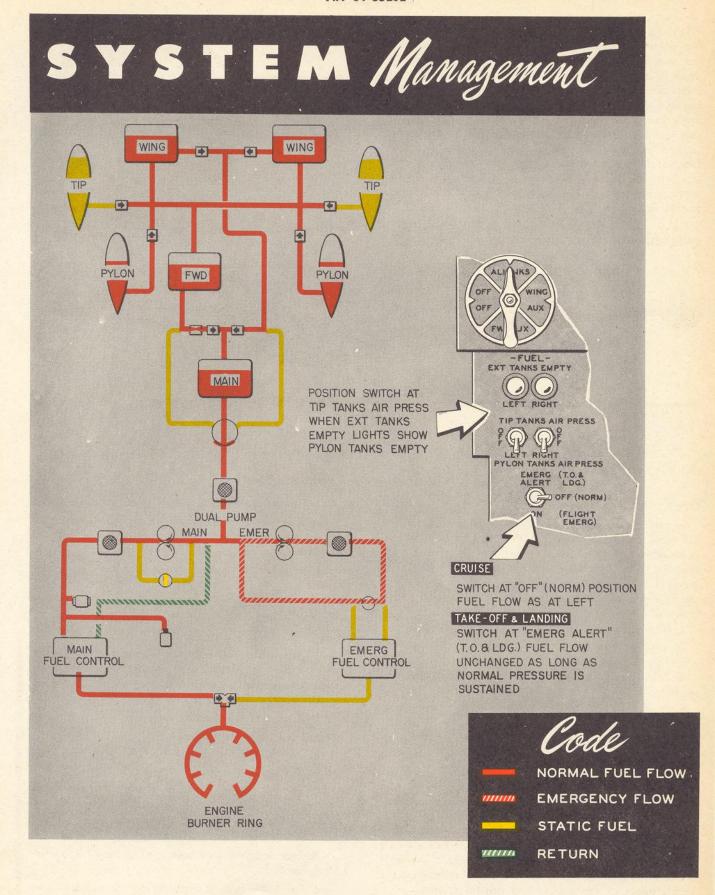


Figure 7-2. Fuel System Management (Sheet 2 of 2)

With 1750 psi

landing gear retracts in

SECONDS

Flight tests have shown that JP-1 fuel has negligible fuel losses through the tank vents. Evaporation losses are zero and losses from the vent lines is negligible. With JP-3, pure evaporation losses are high and slossing losses are even higher due to violent boiling and foaming in the tank, coupled with high velocity flow in the vents due to the volume of vapor given off. This loss can amount to approximately 15% and should be taken into account whenever it is necessary to make good a certain range following a hot fuel climb. The variations in density between JP-1 and JP-3 make it necessary to set the fuel counter for each type of fuel used as it is calibrated to read in pounds.



Figure 7-3. Landing Gear Retraction Time

OPERATION WITH JP-1 FUEL.

The engine fuel control is calibrated and adjusted for use with fuel in accordance with Spec No. MIL-F-5624 grade JP-4 (JP-3) or gasoline in accordance with Spec No. MIL-F-5572 lowest grade available. If the aircraft is serviced with fuel Spec. No. MIL-F-5616 grade JP-1 the following changes may occur and the engine fuel control will have to be readjusted.

- 1. Top rpm on main fuel system will increase.
- 2. Top rpm on emergency fuel system will increase.
- 3. Idle rpm on main fuel system will decrease.
- 4. Idle rpm on emergency fuel system will increase slightly.
- Engine may not accelerate to idle rpm from cranking speed.
- 6. Engine may shift to emergency operation during snap decelerations to idle, with the emergency system

OPERATION WITH JP-3 OR JP-4 FUEL.

If the engine fuel control has been adjusted for operation with fuel in accordance with Spec No. MIL-F-5616 grade JP-1 and is then serviced with fuel in accordance with Spec No. MIL-F-5624 grade JP-4 (JP-3) or gasoline in accordance with MIL-F-5572 lowest grade available the following changes may occur and will necessitate the readjustment of the engine fuel control system.

1. Full rpm on main fuel system will decrease.

- 2. Full rpm on emergency fuel system will decrease.
- Idle rpm will increase or main fuel system and time required for engine to decelerate to idle will be increased.
- 4. Idle rpm on emergency fuel system may be slightly decreased.
- 5. Higher starting tail pipe temperatures will be experienced.

OPERATION WITH JP-4 FUEL.

Due to the wide over-lapping tolerances for specific gravity which are not limited to viscosity, it may be necessary to adjust the main fuel control or the engine and main fuel control combination.

- 1. Full throttle rpm may increase.
- 2. Altitude idle rpm may change.
- 3. If an altitude idle adjustment has been made the following flight check will be necessary.
- a. Climb to 20,000 feet, 300 mph IAS with full throttle.
- b. Snap throttle back to idle and at same time extend speed brake.
- c. Reduce airspeed and hold altitude until 220 mph IAS is reached.
- d. Read idle rpm. If altitude idle rpm of less than 67%, the altitude idle should be adjusted.

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CAUTION

Burst accelerations from subnormal rpm may result in compressor stall.

HYDRAULIC POWER-SUPPLY SYSTEM.

The hydraulic power supply system operates with a normal pressure of 1350 to 1500 psi. This pressure is maintained by an engine driven variable displacement pump. A relief valve in the down side of the landing flap system, set to crack at 1000 psi, is employed so that the air loads on the landing flaps will cause the flaps to retract from 40 to 20° if the airspeed is excessive. During normal take-off with the flaps at 20° (landing flap control NEUT) the landing gear is retracted with hydraulic pressure of 1350 to 1500 psi in approximately six seconds. In the approach prior to landing, the flaps are positioned to 40° (landing flap control DOWN) which will cause the hydraulic pressure to relieve at 1000 psi. Therefore in the event of a wave-off or go-around, the landing gear is retracted with hydraulic pressure of 1000 psi which increases the retracting time to approximately 12 seconds. Normal hydraulic pressure (1350 to 1500 psi) may be obtained by returning the landing flap control to the NEUT position with the flaps at 40°. This eliminates the landing flap relief valve from the landing gear system but does not prevent the landing flaps from retracting to 20° due to excessive speeds.

FLIGHT CONTROL SYSTEM.

During high speed flight a roll to the right or left may be experienced. If the roll is trimmed out and speed is

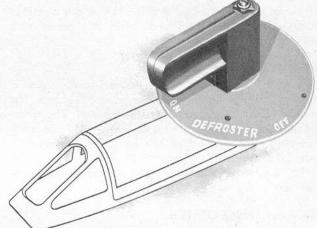


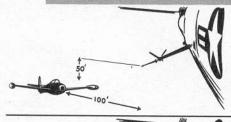
Figure 7-4. Defroster Control

reduced, it may become necessary to retrim to the original condition. If after landing, there is no visible cause for the roll it may have been caused by one of the rear rocket post doors opening. One or more doors may open during high speed flight and close again after the speed is reduced. If a right hand door opens the roll will be to the left and if the left hand door opens the roll will be to the right.

AILERON BOOST SYSTEM.

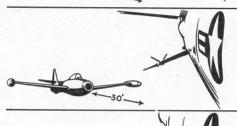
The aileron boost system utilizes hydraulic pressure to actuate the ailerons but electrical power is used to select the aileron boost ratio desired. If a vibration is felt on the control stick when maneuvering it usually will be caused by improperly seated internal valves in the boost

PILOT TECHNIQUE Inflight Refueling

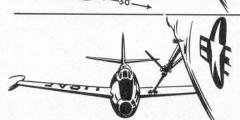


OBSERVATION POSITION

A position 100 feet directly behind and 50 feet below the tanker airplane is known as the observation position. Upon reaching the observation position, the receiver pilot should trim the airplane, stabilize the throttle setting so as to stay in that position and check the throttle friction lock setting. Elevator trim is not critical as it may require slight retrim as the receiver flies into the tanker downwash.



When going from the observation position to the contact position, the recommended procedure is to move forward and upward simultaneously to a position at the proper elevation but approximately 30 feet aft of the contact position and then move straight forward from that position. It is possible, though somewhat more difficult, to move directly from the observation position to the contact position.



CONTACT POSITION

While moving into the contact position the receiver pilot will rely primarily upon his visual observations and verbal instructions from the boom operator. The pilot director lights, located on the bottom of the tanker, are actuated by movements of the boom and therefore provide assistance only when in contact. When contact has been established, the receiver pilot's visual observations are confirmed by the pilot director lights and the boom operator's instructions.

Figure 7-5. Pilot Technique-Inflight Refueling

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1

unit or an improperly bled system. This is not a serious condition and the pilot should enter this observation on Form 1.

LANDING GEAR SYSTEM.

A vibration, felt after take-off when the landing gear is retracted may be mistaken for engine roughness but could be caused by an unbalanced nose wheel. The vibration caused by an unbalanced nose wheel would be more noticeable after take-off in the heavier configurations as the take-off speed is higher. If the vibration is caused by the nose wheel it will diminish as the wheel coasts to a stop.

COCKPIT ENCLOSURE.

Under certain flight conditions a whistling noise may be heard that is caused by the air flow around the canopy skirt. At high altitudes the canopy frame and cockpit sides expand because of increased pressure. Either at altitude or after descent the canopy frame may "pop" or snap. This is caused by the canopy frame shifting or snapping back into place over the canopy rails and is no cause for concern.

HEATING, PRESSURIZING AND VENTILATING SYSTEM.

The cabin pressure dump valve may chatter at some altitudes but does not cause any discomfort due to cabin pressure surges. Under more severe conditions the dump valve may "pop" with a more audible sound. These conditions are not serious and if they occur will disappear without any corrective action.

DEFROSTER OPERATION.

Because of the large mass of the bullet proof windshield

panel, it is essential that the defroster be fully operative one half hour before descent. However, since descent can rarely be anticipated 30 minutes in advance, the defroster should be operated continuously at altitude. On short flights including ascent and descents, the windshield defroster should be operated continuously after take-off at the highest setting consistent with comfort In adverse conditions when progressive frosting of the canopy takes place, use of the side air outlets, particularly at high engine power, is recommended.

INFLIGHT REFUELING SYSTEM.

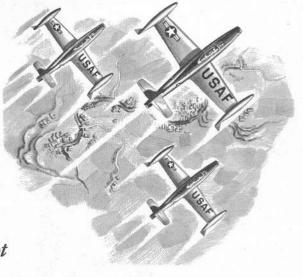
The word "BREAKAWAY" is restricted to use as a code word to denote emergency separation. At any time when in contact made position, any crew member of the tanker or receiver can call the radio signal "BREAKAWAY" when he feels that circumstances are either hazardous to the safety of the aircraft or malfunction of the equipment warrants disconnect. On hearing the work "BREAKAWAY" the receiver pilot will actuate his disconnect switch immediately. The tanker pilot will pull up abruptly 50 or 100 feet and apply power. The receiver pilot shall not dive out of the refueling envelope until separation has been made.

AUTOMATIC PILOT.

Power requirements for the auto-pilot system are such that the main inverter would be overloaded if it were utilized. Therefore, the alternate inverter is used to supply the auto-pilot. If, however, the main inverter becomes inoperative and the alternate inverter is selected as a power supply for the instruments, the power supply to the auto-pilot is automatically cut off and the auto-pilot becomes inoperative.



Section VIII "Crew Duties" is not applicable to this airplane





INTRODUCTION.

This section contains only those procedures that differ or are in addition to the normal operating instructions covered in Section II except where repetition may be necessary.

OPERATION UNDER INSTRUMENT CONDITIONS.

The airplane handles satisfactorily on instruments. Stability in all axis is satisfactory. It cannot be flown "hands off" for any appreciable time. Takeoff characteristics are unlike those of other jet airplanes in that the aircraft definitely has to be pulled off the runaway. It cannot be trimmed to takeoff by itself. Flyability on GCA is satisfactory. Below 200 mph, in either gear up or down configuration, controls become less positive and the aircraft sluggish at all aileron boost settings.

INSTRUMENT TAKE-OFF.

The airplane definitely has to be pulled off the runaway. It cannot be trimmed to takeoff by itself. Forward visibility in moderate to heavy precipitation is poor.

- 1. Visually align aircraft on centerline.
- 2. Advance throttle to take-off rpm.
- 3. Release brakes.
- 4. Use brakes for directional control until rudder becomes effective.
- 5. Allow aircraft to accelerate to 135 mph, then use back pressure to break nose wheel off ground. It requires noticable amount of stick force to get aircraft airborne.
- 6. Raise gear and start milking flaps immediately after takeoff.
- 7. Climb to safe terrain altitude, level out and accelerate to 350 mph and establish climb.

INSTRUMENT CLIMB.

Climbing airspeed and attitude are easily maintained and the aircraft handles satisfactorily up to the maximum rate of climb. Climbing turns should be limited to 45 degrees.

CRUISING UNDER INSTRUMENT CONDITIONS. SPEED RANGE.

In moderate to severe turbulence accurate instrument flight above 400 mph is extremely difficult. From 400 to 275 mph control becomes progressively easier. Handling qualities in smooth air are good throughout entire speed range.

FLIGHT IN SNOW, ICE AND RAIN.

Only forward visibility in heavy precipitation is through curved side panels of the windshield. Adequate fuel reserve should be allowed for missed GCA approach due to radar controller's difficulty in maintaining contact with the airplane when precipitation echoes clutter GCA scopes. Icing has marked effect on wing of this aircraft, notably in reduced airspeed and rate of climb. Flight should be planned at ice-free altitudes due to absence of wing and tail de-icing. A fuel filter de-icing system is provided.

UNUSUAL MANEUVERS.

Unusual maneuvers should be avoided during IFR flight, particularly those which may allow the aircraft to accelerate beyond the critical Mach. Recovery from unusual attitudes or maneuvers can be accomplished by use of the J-8 attitude indicator. However, a cross check of all instruments is recommended and the pilot should be cognizant of the limitations of the J-8.

DESCENT.

With dive brakes extended aircraft can descend up to

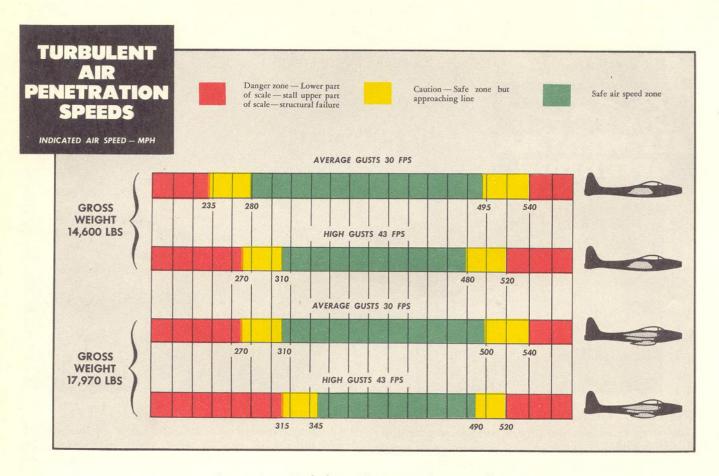


Figure 9-1. Turbulent Air Penetration Speeds

6,000 feet a minute without difficulty in smooth air. Most comfortable descent in turbulent air is between 2,000 and 3,000 feet per minute.

RADIO RANGE LETDOWN.

In all letdowns, particularly on a radio range, the outstanding factor is the time required after reaching low altitude. Before the descent is started the pilot should make his decision to letdown or proceed to his alternate depending on the latest weather and traffic on arrival at his destination. The recommended letdown is made maintaining minimum fuel pressure (50 lbs.), speed brake down, 250 to 275 mph and 2000-3000 fpm. The aircraft is slowed and landing gear dropped when leveled off at initial approach altitude. The average descent from 20,000' over the station requires 10-12 minutes and requires 35-45 gallons of fuel.

INSTRUMENT APPROACHES. See figure 9-2.

OPERATION UNDER ICING CONDITIONS.

Air intake icing may occur when jet aircraft are operated in areas where atmospheric conditions are such that icing is possible. Air intake icing can occur when no visual evidence of ice can be detected on the aircraft. The effect of air intake icing on jet aircraft at a fixed throttle setting causes a reduction in air flow to the combustion chambers with a corresponding loss in thrust. This condition is not accompanied by any discernable change in fuel flow but results in a rapid increase of indicated exhaust gas temperatures.

OPERATION.

- 1. Avoid flying into known icing conditions whenever possible.
- 2. If tail-pipe temperatures increase, immediately retard throttle to maintain a normal temperature and attempt to leave the icing area.

WARNING

If the throttle is not immediately retarded to maintain normal tail-pipe temperatures, engine failure may result due to overheating of the turbine and exhaust system. This may occur very rapidly. Do not advance the throttle in an effort to maintain thrust as this will aggravate the overheating condition and accelerate engine failure.

3. If engine overheating with resulting explosions occur, denoting turbine bucket failure, do not attempt an air restart.

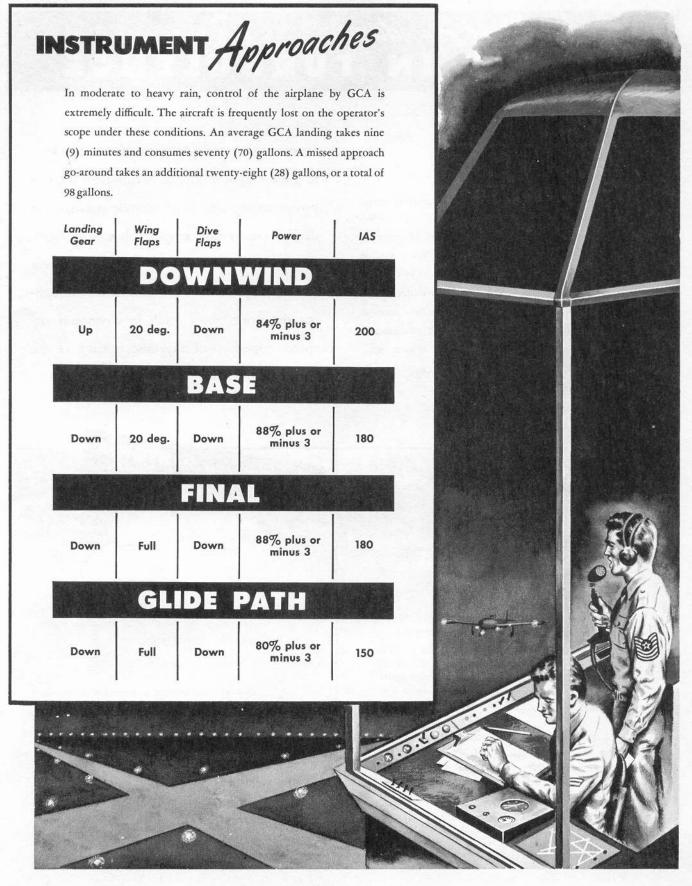


Figure 9-2. Instrument Approaches

Instrument Flight Procedures FLIGHT IN TURBULENCE



Thunderstorm flying demands considerable instrument experience and should be intentionally undertaken only by pilots able to qualify for AF Form 8A (Green) instrument card. However, many routine flight operations require a certain amount of thunderstorm flying, since it is often impossible to detect individual storms and find the in-between clear areas. A pilot, using modern equipment and possessing a combination of proper experience, common sense and instrument flying proficiency, can safely fly thunderstorms.

Power setting and pitch attitude are the keys to proper flight technique in turbulent air. The power setting and pitch attitude required for desired penetration airspeed should be established before entering the storm. This power setting and pitch attitude if maintained throughout the storm, must result in a constant airspeed, regardless of any false reading of the airspeed indicator.



- 1. Check Turbulent Air Penetration Speed Chart (figure 9-1) for best penetration speed.
- 2. Make a thorough analysis of the general weather situation to determine thunderstorm areas and prepare a flight plan which will require least exposure of the airplane to regions of possible thunderstorms.
- 3. Be sure to check proper operation of all flight instruments, navigation equipment, pitot heaters, instrument panel lights, and anti-icing equipment before undertaking any instrument flight and also before attempting flight into thunderstorm areas.



It is imperative that you prepare the airplane prior to entering a zone of turbulent air. If the storm cannot be seen, its proximity can be detected by radio crash static. Prepare the airplane as follows:

- Auto-pilot control switch OFF.
- 2. Adjust throttle control as necessary to obtain safe penetration speed.
- 3. Trim airplane before entering storm. Speed brake may be opened to reduce speed then returned to UP.
- 4. Use low aileron boost setting to keep from overcontrolling.



APPROACHING THE STORM

Note

The most comfortable penetration speed is between 275-300 mph IAS. At higher speeds the turbulence of the storm will cause constant jarring of the airplane.

- 5. Pitot heater switch ON.
- 6. Check gyro instruments for proper settings.
- Safety belt fastened.
- 8. Turn off any radio equipment rendered useless
- 9. At night, turn cockpit lights full bright or use dark glasses to minimize effects of lightning.

CAUTION

Do not lower gear and flaps, as they merely decrease the aerodynamic efficiency of the air-



1. Maintain power setting and pitch attitude (established before entering the storm) throughout the storm. Hold these constant and your airspeed will be constant, regardless of the airspeed indicator.

2. Devote all attention to flying the airplane.

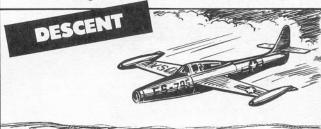
- 3. Expect turbulence, precipitation and lightning. Don't allow these conditions to cause undue concern.
- 4. Maintain attitude. Concentrate principally on holding a level attitude by reference to artificial
- 5. Maintain original heading. Do not make any turns unless absolutely necessary.
- 6. Don't chase the airspeed indicator, since doing so will result in extreme airplane attitudes. If a sudden gust should be encountered while airplane is in a nosehigh attitude, a stall might easily result. A heavy rain, by partial blocking of the pitot tube pressure head, may decrease the indicated airspeed reading considerably.

tain your attitude in order to minimize the stresses imposed on the airplane.

8. The altimeter may be unreliable in thunderstorms because of differential barometric pressure within the storm. A gain or loss of several thousand feet may be expected. Make allowance for this error in determining minimum safe altitude.

Note

Altitudes between 10,000 and 20,000 feet are usually the most turbulent areas in a thunderstorm. The least turbulent areas will be below 6,000 feet and above 30,000 feet. Therefore if flying at an altitude near 30,000 feet or if over rugged terrain, altitudes in excess of 30,000 feet are recommended for thunderstorm penetration. However, if flight is at altitudes close to 6,000 feet and over flat terrain, it would be more desirable to let down to 6,000 feet instead of climbing to 30,000 feet.



A normal fast descent from high altitude using the least range can be made at 30-50 mph IAS below the maximum speed with the throttle closed and the speed brake open. The airplane will have good stability and control throughout the entire descent in all configurations. A faster descent will result in good control to approximately 25,000 feet, where the dive angle will become much steeper and the increased forces will cause a rapid increase in stick force. The airplane will tend to pitch and the aileron control will decrease slightly as the lower altitudes are reached. Because of the location of the trim tab switch on the control stick, it may be necessary to use both hands on the stick to actuate the trim tabs. A slow descent for the purpose of stretching range in event of low fuel quantity may be accomplished at 225 mph IAS with the speed brake closed and the engine at idle rpm.

COLD WEATHER



1. When the ambient temperature is 0°C (32°F) or lower, use a portable heater to blow hot air into the airplane air inlet duct for a period of 10-15 minutes. This procedure is necessary to prevent the starter-generator unit from being damaged due to ice seizure of the compressor rotor.

Note

To heat the cockpit, loosen the canopy cover and slide the canopy aft far enough so that the heater hose can be inserted into the cockpit.

- 2. Inspect fuel tank yents, pitot tubes, fuselage and wing drainage and ventilation holes, and remove ice if present.
- 3. Clean dirt and ice from shock struts and all exposed actuating cylinder pistons. Check shock struts and tires for proper inflation. Wipe exposed parts of shock struts and pistons with a rag soaked in the same type hydraulic fluid as used in the system.

4. Use external power for operating and ground checking all electrical and radio equipment.

- 5. Remove wing, empennage and canopy covers, and the dust plugs in the air intake ducts and tail pipe.
- 6. Remove snow and ice from surfaces, control hinges, fuel tank caps and vents, and inside and outside of wings and fuselage.
 - 7. Check surface controls.



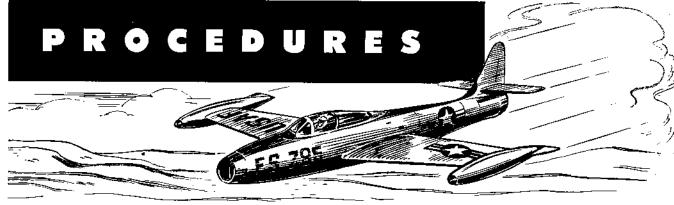
- 1. Start engine in normal manner.
- 2. If there is no oil pressure after 30 seconds running, or if pressure drops after a few minutes ground operation, shut down and check for blown lines or for congealed oil.
- 3. Care should be exercised when using full, or near full engine power when airplane is being run-up on chocks as slippage of chocks occurs frequently.
 - 4. Inspect all instruments for proper operation.
 - 5. Operate wing flaps through several cycles.



- Do not taxi through loose snow as it may get into brakes and freeze. Pack or remove loose snow from runway prior to take-off.
- 2. Never turn on electrical equipment except that absolutely needed, until generator shows CHARGE.
- 3. Pitot heater ON if icing conditions are anticipated.
- 4. Heating (pressurizing system), and windshield defroster system ON.
- 5. Full power check will probably be impossible until airplane is in position for take-off due to slippage on ice or hard packed snow, therefore it will be necessary to make full power check in conjunction with take-off. Power should be applied as rapidly as possible in order to enable use of maximum amount of runway if take-off is discontinued due to engine malfunctioning or failure.

WARNING

Never take-off with snow, ice or frost on wings. (Even loose snow may not blow off.) Loss of life and treacherous stalling characteristics will ensue.



AFTER TAKE-OFF

- 1. Turn gun heat switch (9, figure 1-5) ON immediately after take-off.
- 2. After take-off from a snow or slush covered field, operate landing gear and flaps through several complete cycles to preclude their freezing in the UP position.

Note

Landing gear retracting time is from 12 seconds at -22°F to 30 seconds at -65°F.



- 1. Pump brake pedals several times dufing the approach.
 - 2. Disconnect electrical units not absolutely needed.

WARNING

Landing gear extension time is from 13 seconds at -22°F to 30 seconds at -65°F.

- 3. Use brakes sparingly and not until absolutely necessary after setting the airplane down.
- Taxi with sufficient rpm to cut-in generator if conditions permit because low temperature decreases battery output.

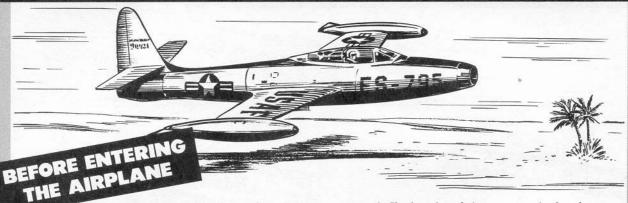


- Clean dirt and ice from shock struts and all exposed actuating cylinder pistons and wipe with a rag soaked in hydraulic fluid of the same type as used in the system.
 - 2. Leave brakes in OFF position.
- 3. Leave canopy slightly open to prevent cracking of transparent areas due to differential contraction. Also air circulation retards frost formation in cockpit.
- 4. Install wing, empennage and canopy covers and install dust plugs in air intake duct and tail pipe.
- 5. Check specific gravity of battery at least weekly. If less than 1.250 remove battery and service.
 - 6. Moor airplane firmly,
- 7. If lay-over of several days is expected, remove the battery. Further, at temperatures below -20°C (-20°F), remove the battery if lay-over exceeds four hours.

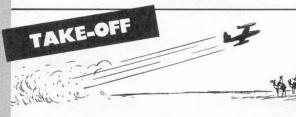


Drain fuel tank sump of condensate frequently. Under prolonged freezing conditions a small amount of ice or snow gets into the fuel tanks each time the airplane is serviced. When there is sufficient rise in temperature due to placing the airplane in a hangar or to warmer weather, these crystals melt, resulting in water in the system. Regular and frequent drainage especially under thawing conditions, is the best method of preventing ice in the fuel lines when the airplane is again subjected to freezing weather. Keeping the tanks as full as possible when the airplane is parked will also help to reduce moisture condensation.

HOT WEATHER AND DESERT PROCEDURES



- 1. All metal surfaces exposed to the sun are burning hot to touch. Wear gloves to prevent burns.
- Make all possible ground checks before starting the engine.
- 3. If operating in sandy country, ascertain that air filters, instrument filters, and oil filters have been cleaned for each flight.
- Check seals and tires to ascertain that they are not blistered or show other evidences of deterioration.
- Run the engine on the ground only as long as is necessary. Don't run-up engines to windward of other planes, personnel or ground installations.



1. If ground is sandy or dusty, avoid taking off in the wake of another airplane.

2. Cockpit heat and vent switch; PRESSURE position unless high humidity causes cockpit to fill up with fog. If so take-off with heat and vent switch in RAM.

Note

Take-off distances will be longer because the air is less dense during warm weather.



Do not climb the airplane at less than flying speed specified in the climb chart.



Because hot air is less dense than cold air, true stalling speed will be greater and additional distance will be required for landing.



 If in sandy country, close and cover all openings to keep sand out. Cover windshield and canopy to prevent sand scratches.

2. Keep canvas covers on the windshield and canopy whenever the airplane is parked in the sun. If this is not done, the sun's heat will soften and distort the transparent plastic. Malfunctioning of instruments and communications equipment will also result.

If blowing sand is not a hazard, keep canopy and selected access doors open to permit air circulation.



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TABLE A-1. AIRSPEED INSTALLATION CORRECTION TABLE

AIRSPEED INSTALLATION CORRECTION TABLE

Model: F-84G Engine(s) J35-A-29

ADD CORRECTI	ND FLAPS UP ON TO CORRECTED DING TO OBTAIN CAS	ADD CORRECTI	O FLAPS DOWN ON TO CORRECTED DINGS TO OBTAIN CAS
IAS (MPH)	Correction (MPH)	· IAS (MPH)	Correction (MPH)
150	+4	120	+12
200	+2	130	+10
250	0	140	+9
300	—1	150	+8
350	-3	160	+7
400	5	170	+6
450	-6	180	+5
500	—8		
550	-10		
600	—12		

Remarks:

Data Based On: Flight Test Data As Of: 12 June 1951

INTRODUCTION.

To facilitate preflight and inflight mission planning, two standard types of operating data charts are presented. The first type provides airspeed corrections. The second type shows performance during normal operation, with various weight configurations, and the instructions necessary to attain this performance. All data pertain to NACA standard ambient temperatures unless otherwise indicated. Most of the charts are applicable in nonstandard atmosphere if the recommended calibrated airspeed (CAS) values are maintained unless a deviation in calibrated airspeed is necessary to avoid violating engine limits. This rule is necessary because performance is greatly dependent on Mach No, which at each pressure altitude is dependent on CAS alone. Fuel quantities are given in pounds so that the charts can be used when the engine is operated with either JP-1, JP-3 or gasoline lowest grade available.

AIRSPEED INSTALLATION CORRECTION TABLES.

In order to obtain correct airplane speeds, several corrections must be applied to the airspeed indicator reading. The first correction is made for the error in the individual instrument. This value is noted on the instrument calibration card and when applied to the instrument reading provides indicated airspeed (IAS). The second correction is for airspeed installation error. This correction is taken from table A-1, and when applied to the indicated airspeed (IAS) provides a calibrated airspeed (CAS). The third correction is for compressibility error. This correction is taken from table A-2, and when applied to calibrated airspeed provides true indicated airspeed (TIAS). Mutiplying the true indicated airspeed by the square root of relative density (ratio of ambient to standard sea level density) provides true airspeed (TAS). Vectorially adding wind velocity to true airspeed provides ground speed.

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TABLE A-2. COMPRESSIBILITY CORRECTION TABLE

COMPRESSIBILITY CORRECTION TABLE

Add Correction From Calibrated Airspeed To Obtain Equivalent Airspeed

Pressure	CAS - MPH											
Altitude -	150	200	250	300	350	400	450	500	550	600		
5000	0	0	-1	-1	-2	-3	-4	-5	-6	-8		
10,000	0	-1	-2	-3	-4	-6	-8	-10	-13	-17		
15,000	0	-1	-3	-4	-7	-10	-13	-17	-22			
20,000	-1	-2	-4	-6	-10	-14	-19	-25				
25,000	-1	-3	-5	-9	-13	-19	-26					
30,000	-2	-4	-7	-12	-18	-25						
35,000	-2	-5	-10	-16	-24							
40,000	-3	-7	-13	-20								

Remarks:

SAMPLE PROBLEM.

For purposes of explaining the use of the Airspeed Installation Correction Table and the Compressibility Correction Table, consider the airplane flying at 25,000 feet and an airspeed indicator reading of 350 miles per hour. Since the airplane is not equipped with an outside air temperature indicator, determine the ambient temperature at 25,000 ft from the Density Altitude chart which will be -35°C.

Airspeed Indicator Reading	350 mph
Correction for Instrument Error	-
(from instrument calibration	
` card)	—2
Indicated Airspeed (IAS)	348 mph
Correction for Installation Error	-
(from Airspeed Installation	
Correction Table)	-3
Calibrated Airspeed (CAS)	-3 345 mph
Correction for Compressibility Error	•
(from Compressibility	
Correction Table)	-13
True Indicated Airspeed (TIAS)	332 mph
Correction for Air Density	•
(from Density Altitude Chart)	X1.49
•	495 mph

The last two steps can be eliminated with the use of an airspeed computer. Use CAS and true free air temperature with a Type D-4 or Type G-1 airspeed computer to determine true airspeed (TAS) of 495 mph. When using the dead-reckoning computer (Type AN 5835-1), the CAS (345 mph) must be corrected for compressibility which gives TIAS (332 mph). Use the dead-reckoning computer and the value of 332 mph and -35°C to determine the true airspeed (TAS) of 495 mph.

TAKE-OFF CHART.

Ground run distance and total distance to clear a 50-foot obstacle are tabulated for both normal and assisted take-off with two or four 14 second 1000 pound jato units. Jato cut-in speeds are tabulated on separate charts which are to be used in conjunction with the corresponding take-off chart. Data is presented for the maximum fuel weight for several configurations including external stores and at several pressure altitudes and ambient temperatures. Ambient temperature is included among the variables because take-off distance is critically dependent on this quantity. Values on the charts may be interpolated for intermediate altitudes and temperatures. Set airplane altimeter to 29.92 and read pressure altitude. With air temperature in degrees centigrade as obtained

from the field weather station and pressure altitude, enter chart and determine take-off distance. In the event of an assisted take-off determine the air speed at which the jato units should be ignited from the jato cut-in speed chart. In order to obtain the distance shown the take-off technique explained in Section II must be employed.

CLIMB CHART.

From the climb chart can be determined the best climb speed, fuel consumed, time to climb, distance covered and rate of climb for military power. A fuel allowance for start, taxi, take-off and acceleration to climb speed is listed at sea level. Fuel requirements at other altitudes include this allowance plus the fuel needed to climb from sea level. Fuel required for an in-flight climb from one altitude to another is the difference of the tabulated fuel required to climb to each altitude from sea level. Time and distance covered during an in-flight climb may be obtained in the same manner. The recommended climb speeds should be maintained in order to obtain tabulated rates of climb. Higher or lower climb speeds will result in lower rates of climb. Climb data is presented for the highest and lowest fuel weights for several configurations at the altitudes shown. Data for intermediate weights may be interpolated.

DESCENT CHART.

The descent chart presents rates of descent, distance covered, time required, fuel consumed and airspeed (CAS) for maximum range descents with minimum rpm at which engine operation can be maintained. Data is based on retracted speed brake to provide best economy in the descent. To minimize fuel consumption, the lowest allowable fuel pressure is used. Data is presented for a constant Mach No. descent for several landing configurations at altitudes from normal service ceiling to sea level. Neither the fuel or time tabulated includes any allowance for loitering while awaiting landing clearance, for taxiing after landing, or for any navigational error. Additional allowances for these considerations must be made. The fuel, time, and air-distance values for inflight descents from one altitude to another are merely the differences in values tabulated for the initial and final altitudes concerned.

LANDING CHART.

Landing distance for several pressure altitudes and gross weights sufficiently bracketing those anticipated for normal service is tabulated in the Landing Distance Chart. Only standard ambient temperatures are represented, since landing distance is not greatly affected by this quantity.

MAXIMUM ENDURANCE CHART.

The Maximum Endurance Chart presents the airspeeds, fuel flow and percent of maximum rpm for maximum endurance flight. Data is presented at altitudes from sea level to the service ceiling for each configuration and for several weights in each configuration.

COMBAT ALLOWANCE CHART.

The Combat Allowance Chart presents fuel flow at normal thrust and at maximum thrust from altitudes from sea level to combat ceiling.

MAXIMUM CONTINUOUS POWER CHART.

The Maximum Continuous Power Chart presents the percent of maximum rpm, calibrated airspeed, true airspeed and fuel flow for maximum continuous power operation at altitudes from sea level to the highest probable flight altitude. Data is presented for several configurations and for various weights in each configuration.

FLIGHT OPERATION INSTRUCTION CHARTS.

The Flight Operation Instruction Charts are provided to facilitate flight planning. They show the range of the airplane at maximum range airspeeds and the procedure required to obtain this range. The charts contain columns for each 5000 foot increase in altitude up to the maximum altitude at which the rate of climb is 300 fpm with maximum continuous rpm. On line opposite available fuel in the upper half of the chart, ranges are shown for each initial altitude. In general, two range values are quoted for each altitude and fuel quantity. One is for continued flight at the initial altitude and one for the maximum range obtainable by climbing to a higher altitude. The charted ranges do not include fuel consumed and distance covered during warm-up, take-off, and initial climb at the start of a flight. However, fuel used and distance covered during letdown or during in-flight climb to an optimum altitude are taken into account. The lower half of each chart presents operating procedure to obtain the ranges quoted in the upper half. When altitude is changed, operating instructions in the column according to the new altitude must be used if the ranges listed are to be obtained.

Under different wind conditions, ranges (in ground miles) are varied by the effect of wind on ground speed. Let-down distances are affected for the same reason. Recommended CAS also may change in order to maintain the most favorable ground miles per gallon. To facilitate range computation under wind conditions, the operating procedure in the lower half of each chart contains instructions for various winds at each altitude listed. Ground miles in a wind are obtained by multiplying chart air miles by the range factor found opposite the effective wind at the cruising altitude. Thus, range factors may be used to determine the best altitude for cruising when there is a known wind difference at different altitudes.

Although a wind may be from any direction with respect to the airplane course, it may be expressed as an effective wind. An effective wind has the same effect on the airplane ground speed as if it were a straight head wind or tail wind. In other words, the wind component in the direction of the airplane heading is the effective wind. For example, a 100-mph wind at 45 degrees to the course is an effective head wind of approximately 75 mph. If the airplane true airspeed is 400 mph, the true ground speed is approximately 325 mph.

The approximate rpm values quoted on any one chart are based on the gross weight equal to the high limit of the chart weight band. If the recommended CAS values are maintained, the rpm values will decrease slightly as the gross weight decreases. No allowances are made for navigational errors, combat, formation flight, landing, or other contingencies. Such allowances must be made as required.

PRE-FLIGHT RANGE PLANNING.

Select the applicable Flight Operation Instruction Chart. Determine the amount of fuel available for flight planning. Available fuel is equal to the total amount in the airplane before starting the engine minus the amount needed for warm-up, taxi, take-off, initial climb, and necessary reserves. Select a figure in the fuel column equal to, or less than, the amount available for flight planning. Interpolate if desired.

To determine maximum range at a given altitude-move horizontally right or left to the desired altitude column. Multiply the range value thus obtained by the correct range factor and add the distance covered in initial climb to obtain total range with a given wind at altitude. Fly according to the instructions in the lower half of the chart, changing charts if external tanks are dropped. To fly a given distance, determine range factors for the effective winds at altitudes to be considered. From the desired distance subtract the miles covered in climb. Divide the resultant figure by the range factor to obtain miles to be covered in the cruise and descent. Enter the chart as described under preflight range planning. Move horizontally right or left to a range figure which exceeds the calculated air distance to be covered in cruise and descent. Fly according to the instructions for the altitude so obtained, changing charts if external tanks are dropped.

If altitude, wind or external load does not remain reasonably constant, break the flight up into several sections and plan each section separately.

IN-FLIGHT RANGE PLANNING.

To use the charts in flight, determine altitude, available fuel, and effective wind. Available fuel is equal on board minus necessary reserves. Enter the appropriate Flight Operation Instruction Chart at a fuel quantity equal to or less than the available fuel. Move horizontally right or left to the applicable altitude column. From the ranges and wind factors listed, determine the altitude at which the flight will be continued. For continued cruising at the present altitude, refer to the instructions directly below. When changing charts if external tanks are dropped, refer to cruising instructions on the new chart at the altitude of flight. To obtain the range shown at optimum altitude when flying at a given altitude, climb immediately according to the recommended climb procedure. For cruising instructions at the new altitude refer to the lower half of the chart in the column under the new altitude. When changing charts if external tanks are dropped, refer to cruising instructions on the new chart at the new altitude of flight.

SAMPLE PROBLEMS BASED ON JP-3 FUEL.

PROBLEM 1.

To illustrate use of the charts for planning a flight, suppose an airplane must be ferried 900 statute miles. For unexpected difficulties, a general reserve of 900 pounds (140 gallons JP-3 fuel) is considered necessary.

From the Flight Operation Instruction Charts, it is apparent that drop tanks must be carried; however, it is desired to keep the tanks. Use of 230-gallon drop tanks will give a maximum fuel capacity of 902 gallons x 6.5 (pounds per gallon JP-3 fuel) or 5860 pounds. The initial, known conditions are as follows:

Required range	900 statute miles
	40 mph head wind at
	30,000 feet and below
	80 mph head wind at
	35,000 feet

From the Climb Chart (figure A-8) and the Flight Operation Instruction Chart for 230-gallon Drop Tanks (figure A-29), the following data are obtained:

gur	e A-29), the following	g data ar	e obtained	:
1.	Cruising altitude	20,000	25,000	35,000
2.	Fuel capacity, pounds	5,860	5,860	5,860
3.	Reserve fuel, pounds	900	900	900
4.	Fuel used to altitude,			
	pounds (climb at			
.]	100% rpm)	835	960	1,295
5.	Available cruise fuel,			
	pounds (2-3-4)	4,125	4,000	3,665
6.	Statute miles in climb	- 41	57	113
7.	Cruise and descent			
	distance (Interpolate			
	as necessary)	1,020	1,100	1,240
8.	Range, zero wind			
	(6 + 7)	1,061	1,157	1,353
9.	Range factor	.90	.90	.85
10.	Ground miles (8 x 9)	955	1,040	1,150

Therefore, the flight can be made at 20,000 feet or higher. The cruise airspeed at 20,000 feet for a 40 mph head wind would be 350 mph. CAS and the letdown would begin at 25 statute miles from destination.

PROBLEM 2.

Suppose that during the descent at the end of this theoretical flight, the pilot has reached 5000 feet when he learns that the field is closed and he must use an alternate airport some 120 statute miles farther on. Fuel remaining is only the 900 pounds originally planned for general reserve. Reference to the Flight Operation Instruction Chart for 230-gallon Drop Tanks (figure A-31) shows that with the existing head wind and the empty tanks still on, available range with 1000 pounds of fuel is approximately 150 (165 x .9) statute miles at 5000 feet or 210 (265 x .80) statute miles at optimum altitude (40,000 feet) with no reserve for landing. It is evident, therefore, that the empty drop tanks should be jettisoned immediately. Reference to the Flight Operation Instruction Chart for No External Load (figure A-35) shows that even with

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out the drop tanks only 155 (170 x .9) miles can be covered at 5000 feet with 1000 pounds of fuel and a 40 mph head wind. However, by climbing immediately to 35000 feet (optimum altitude) at 100% rpm, a range of 285 miles with zero wind or 230 (285 x .8) miles with existing 80 mph head wind can be attained. At 35000 feet the cruise condition will be 295 mph CAS, 1340 pounds per hour fuel flow, 420 mph ground speed, and letdown begun 95 miles from destination. Since the required range is only 120 statute miles, the difference between 230 and 120 miles is the reserve which, expressed in time, is 16 minutes (110 miles + 420 mph G.S. = .26 hours or 16 minutes). The corresponding fuel reserve is 350 pounds (.26 hours x 1340 pounds per hour = 350 pounds). However, this was figured for 1000 pounds of fuel at 5000 feet and only 900 pounds

were available, so the landing reserve will be 100 pounds less, or 250 pounds. In other words, judging from this sample problem, when you have to get all you can out of the fuel available, climb immediately to optimum altitude and, if necessary, jettison empty drop tanks.

MAXIMUM RANGE SUMMARY CHART.

The Maximum Range Summary Charts summarize the operating conditions for no wind flight entered on the Flight Operation Instruction Charts. These charts present calibrated airspeed, Mach No., miles per pound of fuel and approximate percent rpm for each weight and altitude shown in the Flight Operation Instruction Charts.

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1

AIRPLANE MODEL

TAKE-OFF DISTANCES

ENGINE MODEL

J35-A-29

F-84G-1RE and up

FEET

WITHOUT JATO

HARD SURFACE RUNWAY - NO WIND

HAND SURFACE RUNNAY - NU WIND												
CONFIGURATION	PRESS.	*) ⁰ F	66	o ^F	80	PF	10	v ^o F	120) ^o f	
AND GROSS WEIGHT	ALT. FT.	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLE AR 501	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 501	
OT EAN A COUR	5000	9520	14000	-	-	_	-	_	-	-	-	
CLEAN + four	4000	8610	12120	9540	14180	-	-	-	-	-	-	
External Tanks	3000	7860	10800	8720	12575	9780	15350	-		-	-	
22,242 Lb.	2000	7180	9700	7965	11210	8920	13560	9900	17400			
	1000	6530	8660	7240	9960	8110	11825	9075	14720	-	•	
	S.L.	5920	7670	6570	8750	7330	10200	8300	12100	9650	14940	
	5000	9550	14450	-	_	-		-	-		_	
GROUND	4000	8500	12425	9450	14725	i -	-		<u>-</u>	-	1	
SUPPORT	3000	7740	11000	8600	12900	9650	15950	-	-	-		
21,947 Lb.	2000	7080	9810	7880	11400	8800	13970	10015	18520	-	-	
	Loou	6470	8720	7185	10010	8000	12100	9100	15400	-	•	
	S.L.	5900	7650	6540	8720	7225	10300	8200	12400	9585	1563	
	5000	5980	7790	6620	8770	7390	10010	8350	11750	9640	1457	
CLEAN + two	4000	5420	6960	5990	7810	6660	8915	7550	10450	8730	1227	
faired tip tanks	3000	4970	6325	5500	7100	6110	8080	6915	9330	7955	1113	
18,645 Lb.	2000	4550	5780	5035	6460	5580	7340	6320	8440	7285	1004	
	1000	4150	5250	4600	5865	5100·	6640	5750	7610	6615	899	
	S.L.	3790	4760	4200	5300	4640	5960	521.5	6815	5980	797	
AT 33.33	SUU	3725	4620	4110	5160	4550	5800	5100	6610	5850	772	
CLEAN	4000	3365	4160	3720	4635	4125	5150	4600	5890	5250	684	
15,299 Lb.	3000	3100	3820	3415	4225	3780	4710	4210	5350	4800	620	
	2000	2830	3490	3120	3860	3460	4300	3850	4885	4400	564	
	1000	2590	3180	2850	3520	3165	3935	3510	4450	4025	512	
·	\$.L.	2380	2910	2610	3220	2885	3590	3200	4040	3680	465	

(1) 20° Wing Flaps.

- (2) Take-off without assistance.
- (3) Gross weights based on JP-3 or JP-4 fuel @ 6.5 lbs/gal.

DATA AS OF:

12 June 1951

#AMED ON: Flight Test

BASED ON JP-3 or JP-4 FUEL AED FLOWER HAVE NOT BEEN FLIGHT CHECKED

MCRE Form No. 239# (5 MAY 48)

SECURITY INFORMATION — RESTRICTED AN 01-65BJE-1

AIRPLANE MODEL F-84G-lRE and up

JATO TAKE-OFF DISTANCES

ENGINE MODEL

FEET

WITH 2 JATO UNITS

HARD SURFACE RUNWAY - NO WIND

CONFIGURATION	PRESS.	40	oF	Ďl) ^o f	904	PF .	10	υ ^O F	12	∪ ^a F
AND GROSS WEIGHT	ALT. FT.	GROUND ROLL	CLEAR 501	GROUND ROLL	CLE AR Su'	GROUND ROLL	CLEAR 501	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'
CLEAN + four	5000	8185	9630	9290	10920	-	<u>-</u>	-	_	-	-
External Tanks 22,642 Lb.	4600	7180	84,90	8085	9590	9250	10930	-	_	.	
	3000	6470	7700	7260	8650	8290	9820	9610	11370	-	_
	2000	5920	7035	6615	7880	7520	8900	8685	10275		
	1000	5415	6440	6020	7160	6800	8070	7 82 0	9250	9260	10970
	\$.L.	4940	5860	5450	6475	6100	7260	6980	\$280	8175	9705
GROUND SUPPORT	5000	8110	9660	9140	10870		-		-	-	
	4000	7100	8490	8010	9550	9150	10620		-	_	-
	3000	6375	7660	7200	8600	8220	9480	9580	11400	-	- .
22,347 Lb.	2000	5790	6950	6520	7800	7435	8 600	8600	10270	-	_
•	1 000	5250	6280	5900	7030	6700	7820	7760	9180	9200	10930
	\$.L.	4730_	5625	5300	6300	6000	7100	6900	8160	8080	9620
CLEAN + two	5000 4000	4760 4260	5570 4980	5400 4760	6320 5590	6080 5320	7100 6250	6810 5985	7970 7020	7705 6850	9010 8025
19.045 Lb.	3000	3880	4540	4300	5070	4780	5620	5370	6340	6200	7300
19,049 10.	2000	3530	43.60	3910	4625	4340	5120	4900	5780	565 0	6650
	Lovo	3205	3800	3550	4215	3940	4660	4450	5270	5125	6050
	S.L.	2900	3470	3215	3840	3560	4225	4015	4770	4620	5470
CLEAN	5000	2600	30 80	2900	3410	3200	3775	3580	4200	4080	4800
15,699 Lb.	4000	2380	2840	2650	3150	2920	3470	3230	3820	3650	4325
T3*033 TD*	3000	2190	2620	2420	2890	2680	31.80	2975	3510	3345	3970
	2000	2010	2410	2220	2670	2460	2940	2730	3250	3065	3650
	1000	1860	2215	2050	2450	2270	2700	2500	2980	2810	3350
	\$.L,	1700	2040	1890	2250	2090	2470	2300	2760	2585	3075

HOTES:

- (1) 200 Wing Flaps.
- (2) Take-off with two 14 second-1000 lb. JATO Units.
- (3) Gross weights shown for each configuration includes weight of JATO Units.
- (4) Gross weight based on JP-3 or JP-4 fuel @ 6.5 lbs/gal.

MATA AS OF: 12 June 1951

MARED ON: Flight Test

BASED ON JP-3, JP-4 FUEL RED FIGURES HAVE NOT DEEN FLIGHT CHECKED

MCRE Form No. 2398 (5 MAY 48) AIRPLANE MODEL

JATO CUT-IN SPEED

ENGINE MODEL

J35-A-29

F-84G-1RE and up

MPH

WITH 2 JATO UNITS

HARO SURFACE RUNWAY - NO WIND

CONFIGURATION	PRESS.		AMBIE	NT TEMPER	ATURE	
AND GROSS WEIGHT	ALT. FT.	40°F	60°F	80 °F	100 °F	120 °F
	5000	153	161	169	178	187
CLEAN + four	4000	146	154	162	172	180
External Tanks 22,642 Lb.	3000	139	147	155	165	173
	2000	132	140	149	158	166
	1000	125	135	143	151	159
	\$.L.	119	127	136	144	152
apaipa	5000	153	160	168	176	186
GROUND	4000	146	154	162	170	180
SUPPORT	3000	139	147	156	164	173
22,347 Lb.	2000	132	141	150	157	166
	1000	125	134	143	150	159
	S.L.	119	127	136	143	151
	5000	114	122	131	137	145
CLEAN + two	4000	107	115	123	131	138
faired tip tanks	3000	100	108	116	124	131
19,045 Lb.	2000	93	103	110	117	125
	1000	87	96	104	112	119
	S.L.	80	89	97	105	112
41 FAN	5000	67	75	84	92	100
CLEAN	4000	61	69	77	86	94
15,699 Lb.	3000	55	63	72	80	88
	2000	48	56	65	73	82
	1000	40	50	58	67	76
•	S.L.	33	43	51	60	69

NOTES:

- (1) 20° Wing Flaps.
- (2) Take-off with two 14 second-1000 1b. JATO Units.
- (3) Gross weights shown for each configuration includes weight of JATO Unit.
- (4) Gross weight based on JP-3, JP-4 fuel @ 6.5 lbs/gal.

DATA AS OF:

12 June 1951

BASED ON F

Flight Test

RED FIGURES HAVE NOT BEEN FLIGHT CHECKED

AIRPLANE MODEL F-84G-1RE and up

JATO TAKE-OFF DISTANCES

ENGINE MODEL J35-A-29

FEET

WITH 4 JATO UNITS

HARD SURFACE RUNWAY - NO WIND

CONFIGURATION	PRESS.	40	o _F	60	o _F	800	PF	10	0°F	120°F	
AND GROSS WEIGHT	ALT. FT.	GROUND ROLL	CLEAR 501	GROUND ROLL	CLE AR	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAF 50'
4	5000	6340	7250	7170	8130	8190	9225	9510	10680	-	-
CLEAN + four	4000	5625	6475	6350	7260	7225	8200	8325	9400	9970	1117
External Tanks	3000	5080	5880	5735	6600	6500	7420	7450	8450	8890	1003
23,102 Lb.	2000	4610	5365	5180	5985	5850	6725	6710	7650	7960	902
	1000	4160	4870	4670	5415	5260	6065	6000	6800	7070	806
	S.L.	3750	4400	4180	4885	4690	5440	5335	6150	6210	713
	5000	6100	7000	6875	7880	7810	8900	9015	10200	-	-
GROUND	4000	5460	6315	6160	7090	6985	7990	8020	9085	9480	1069
SUPPORT	3000	4970	5765	5600	6470	6335	7270	7250	8250	8550	969
22,807 Lb.	2000	4520	5270	5090	5890	5740	6615	6565	7480	7690	875
	1 000	4100	4790	4610	5350	5185	5990	5915	6750	6860	786
	S.L.	3710	4330	4160	4830	4660	5400	5285	6070	6090	700
	5000	3470	4040	3810	4425	4230	4900	4790	5500	5590	637
CLEAN + two	4000	3125	3640	3435	3990	3810	4420	4330	4985	5030	580
FAIRED	3000	2840	3310	3110	3630	3460	4030	3920	4550	4550	526
TIP TANKS	2000	2590	3020	2845	3310	3150	3670	3575	4135	4120	480
19,505 Lb.	1000	2360	2770	2590	3020	2850	. 3340	3230	3750	3730	435
A Service of	S.L.	2140	2520	2335	2740	2570	3015	2900	3390	3345	390
	5000	1875	2225	2035	2425	2225	2640	2400	2900	2790	326
CLEAN	4000	1725	2060	1870	2235	2050	2435	2240	2670	2565	298
16,159 Lb.	3000	1600	1915	1740	2070	1900	2250	2080	2475	2350	276
10,139 10.	2000	1500	1790	1630	1920	1750	2080	1945	2295	2165	254
	1000	1400	1670	1515	1790	1630	1940	1800	2115	2000	235
	S.L.	1300	1550	1410	1665	1515	1800	1650	1950	1830	217

- (1) 20° Wing Flaps.
- (2) Take-off with four 14 second-1000 Lb. JATO Units.
- (3) Gross weights shown for each configuration includes weight of JATO Units.
- (4) Gross weight based on JP-3, JP-4 fuel @ 6.5 lbs/gal.

DATA AS OF: 12 June 1951

BASED ON:

Flight Test

BASED ON JP-3, JP-4

RED FIGURES HAVE NOT BEEN FLIGHT CHECKED

MCRE Form No. 239B (5 MAY 48) AIRPLANE MODEL

JATO CUT-IN SPEED

ENGINE MODEL

J35-A-29

F-84G-1RE and up

MPH

WITH 4 JATO UNITS

HARD SURFACE RUNWAY - NO WIND

CONFIGURATION	PRESS.		AMBIE	NT TEMPER	ATURE	
AND GROSS WEIGHT	ALT. FT.	40°F	60°F	80 °F	100 °F	120 °F
CLEAN + four	5000	124	133	139	147	155
External Tanks	4000	118	126	133	141	149
23,102 Lb.	3000	111	119	127	134	143
25,102 10.	2000	104	112	120	128	137
	1000	98	105	113	121	130
	S.L.	92	99	107	115	124
	5000	123	130	138	145	153
GROUND SUPPORT 22,807 Lb.	4000	116	124	131	139	147
	3000	111	119	125	134	141
	2000	104	112	120	128	136
	1000	98	105	113	121	129
	S.L.	92	99	106	114	122
CLEAN + two	5000	83	89	97	105	114
faired tip tanks	4000	75	82	90	98	108
19,505 Lb.	3000	68	75	83	91	101
19,505 10.	2000	61	68	76	85	95
	1000	54	62	70	79	88
	S.L.	47	55	63	72	81
	5000	33	40	47	56	65
CLEAN	4000	27	33	41	50	59
16,159 Lb.	3000	20	28	35	43	52
	2000	13	21	28	36	45
	1000	7	. 14	21	29	39
	S.L.	1	8	15	23	32

NOTES:

- (1) 20° Wing Flaps.
- (2) Take-off with four 14 second-1000 lb. JATO UNITS.
- (3) Gross weights shown for each configuration includes weight of JATO UNIT.
- (4) Gross weight based on JP-3, JP-4 fuel @ 6.5 lbs/gal.

DATA AS OF:

12 June 1951

BASED ON

Flight Test

RED FIGURES HAVE NOT BEEN FLIGHT CHECKED

AIRPLANE F-84G-1RE	A SUPPLEMENT OF THE	3		75	MB CHA	20	ENGINE MODEL J35-A-29			
				F	OR MILITARY P	OWER				
		4 Pap av			PRESSURE			2001 X 1001 X		
		APPROXIMATE	•	CAS	ALTITUDE	CAS		APPROX IMA	TE	
RATE OF CLIMB	FI	ROM SEA LEY	EL	MPH	FEET	MPH	F	ROM SEA L	EVEL	RATE OF
100 A 100 A	DISTANCE	TIME	FUEL				FUEL	TIME	DISTANCE	CLIMB
Fround sup 1000 Bombs	port. C1 +8-5" HV	ARS. Gr	tanks +	2- AIRPLANE	CONFIGURATION & GR	DSS WEIGHT G	round supp	port. C.	lean + 2 ti	p tanks + ;
2680	0	0	385 (1)	300	SEA LEVEL	300	385 (1)	0	O O	3650
2180	10	2	580	290 280	5000	290	525	1.4	6	2970
1705	24	4.6	795	280	10,000	280	680	3.3	17	2430
1280	42	8.0	1045	270	15,000	270	845	5.5	30	1980
870	69	12.7	1345	255	20,000	255	1025	8.3	46	1550
425	115	20.8	1785	240	25,000	240	1225	12.6	68	1100
		***			30,000	220	1445	17.7	98	680
					35,000	200	1825	27.2	162	240
lean + 4-2 ross Wgt	30 Gal. E	xternal 7	l lanks	AIRPLANE	COMFIGURATION & GRO	DSS WEIGHT CL	ean + 4-239	Gal. E	xternal Ta	nks
3400	0	0	385(1)	375	SEA LEVEL	350	385 (1)	.870 lb.	0	5680
2820	11	1.6	545	365	5,000	340	480	1.0	6	4710
2290	24	3.6	715	350	10,000	330	575	2.1	19	4000
1840	39	6.0	895	330	15,000	310	675			THE RESERVE THE PARTY OF THE PA
1360	59	8.9	1090	310	20,000	295	785	3.4	23	3420
870	90	13.3	1345	290	25,000	275	900	5.1	32	2830
400	143	21	1705	270				7.1	45	2250
400	45	6.1	1105	210	30,000	250	1020	9.5	63	1650
					35,000	230	1365	13.1	88	1100
				AIRPLANE	LO.000 CONFIGURATION & GR		1305	19.3	126	520
					SEA LEVEL				П	
							1 7			
	-							-		
				AIRPLANE	CONFIGURATION & GR	SS WEIGHT				
					SEA LEVEL					
- 11				,						
			7.3							
ULTIPLY STATUT OTES:	E UNIIS BY .	or PUR CORVE	KSIUM IO RAU	IICAL UNITS					LE GEND	
(1)	Allowance accelerat Climb at	e for sta tion to c recommen	rt, taxi	, take-off	and			RATE OF C	- STATUTE MILE	R MINUTE
ATA AS OF: J				BASED O	N JP-3	FUEL				MCRE Form No. 239F (5 May 48)

Figure A-4. Climb Chart - (Sheet 1 of 2) F-84G-1RE thru -5RE

AIRPLAN F-84G-1RE				CL	IMB CHA	RT			J35-A-2	MODEL 29
-				1	FOR MILITARY F	OWER				
	10.00	ABBROYIMA			PRESSURE		I	APPROX IMA	TE	
		APPROXIMAT	t	CAS	ALTITUDE	CAS				
RATE OF CLIMB	DISTANCE	TIME	I	мРИ	FEET	MPR	FUEL	ROM SEA L	DISTANCE	RATE OF CLIMB
			FUEL	AIRPLANE	CONFIGURATION & GR	OSS WEIGHT C		1,000		
Clean + 2- Gross Wgt	18.645	Tip Tanka lb.	1				Gro	s Wet	14.253 lb.	231.0
5140	0	0	385(1)	425	SEA LEVEL	425	385(1)	0.8	6	7140 6120
1,250	7	1	495	405	5,000	405 385	540	1.6	13	5200
3600	16	2.3	595	385	10,000		620	2.6	20	4540
3050	27	3.6	710	360	15,000	360 335	700	3.8	29	3820
2420	11	5.4	835	335	20,000	315	785	5.2	40	3120
1950	57	7.6	960	315	25,000	285	880	7.0	53	2430
1380	77	10.7	1115	285	30,000	270	985	9.5	71	1750
770	113	15	1295	270	35,000	245	1110	13.2	100	1060
					40,000			17.0	200	
Clean Gross Wgt	15200 1	h		AIRPLANE	CONFIGURATION & GR	OSS MEIGHT C	ross Wgt.	13866 11	b.	
7120	0	1 0	1 385(1)	440	SEA LEVEL	440	385(1)	0	0	7960
6020	6	0.7	465	420	5.000	420	455	0.7	6	6770
5160	13	1.7	540	395	10,000	395	525	1.5	12	5850
4450	21	2.8	625	375	15,000	375	600	2.4	19	5070
3750	30	3.9	710	350	20,000	350	675	3.5	26	4300
	42	5.3	800	330		330	765	4.8	37	3550
3020 2330	56	7.2	895	305	25,000	305	830	6.3	49	2780
	78		1005	285	30,000	285	925	8.3	67	2000
1590 890	110	9.7	1150	255	35,000	255	1030	11.5	92	1230
0,0	110	13.0	11100		40,000 CONFIGURATION & GR					
					SEA LEVEL		The same of			
					72					
									0	
	1									
				AIRPLANE	CONFIGURATION & GR	SS WEIGHT				
					SEA LEVEL					
7							o and a second			
						1 1 1 1				
	-									
	11-11-11									
MULTIPLY STATE	UTE UNITS BY	.87 FOR CONV	ERSION TO HAUT	ICAL UNITS					LE GEND	
MOTES: (1) Al		for start	, taxi, ta		nd			TIME - MI RATE OF C CAS - CAI	OUNDS - STATUTE HIL	ER MINUTE PEED
BATA AS OF:Ju				BASED (ON JP-3 B NAVE NOT BEEN FLIG	FUEL BUT CHECKED -				NCRE Form No. 239F (5 May 48)

Figure A-4. Climb Chart - (Sheet 2 of 2) F-84G-1RE thru -5RE

PROXIMATE SEA LEVEL TIME TIME - MANUTES OF DESCENT	AIRPLAI	AIRPLANE MODEL		DE	SCE	DESCENT CHART	CHAF	77		ENGINE	MODEL
(1) Grees weighte based on fuel density of 6.5 lbe/gal. Airplane Configuration & Gross wt Esignt—5" HTA Rockets 6 — 15000. lb. FEIGHT—5" HTA Rockets 6 — 15000. lb. AIT. APPROXIMATE TO SEA LEVEL MPH FUEL TO SEA LEVEL MPH FUEL TIME TIME TO SEA LEVEL MPH FUEL TIME T	F-84G-1	RE thru-5RE			S	TANDARD DA	٨.			J35-A-29	
SEA LEVEL PRESS ALT	MOTES;	(1) Grass	weighte h		done.	4 of 5	170/001				
SEA LEVEL PRESS.			200		Terron Te	70 TO 60	TDS/SaT				20
SEA LEVEL CAS FT. CAS TO SEA LEVEL TIME FUEL MPH FUEL TIME TIME FUEL TIME TIME FUEL TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME TIME	Clean + tan Bombs + Ei	irplane confo-230 gal. t	iguration tip tanks	6 Gross W 2-1000 lb - 16908	•	PRESS.	A .	irplane co	nfiguratio	& Gross	wt.
SEA LEVEL CAS FUEL MPH FUEL TIME 1		A	PPROXIMATI	W		ALT.			APPR OX IMAT	ш	
11ME FUEL FUEL TIME	RATE OF	TC	SEA LEVE		CAS	-	CAS		SEA	i.	RATE OF
2.2 37 335 25000 1.5 24 370 20000 2.8 8 440 15000 2.8 8 4450 10000 2.8 8 4450 10000 2.8 8 4450 10000 2.8 8 6 1450 10000 2.8 8 6 1450 10000 2.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 6 1450 10000 3.8 8 8 1450 100000 3.8 8 8 1450 1000000 3.8 8 8 1450 1000000000000000000000000000000000	DESCENT	DISTANCE	TIME	FUEL			-	FUEL	TIME	DISTANCE	
2.2 37 335 25000 1.5 24 370 20000 .99 15 410 15000 .26 3 4450 10000 .26 3 490 5000 .87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal.						1,0000					
2.2 37 335 25000 1.5 24 370 20000 2.9 15 410 15000 2.6 3 4190 5000 0 0 535 LEVEL 2.87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal.						35000					
2.2 37 335 25000 1.5 24 370 20000 5.99 15 410 15000 2.6 3 4490 5000 0 0 535 LEVEL 0 0 0 535 LEVEL 87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal. CAS - CALIBRATED						30000					- 2
1.5 24 370 20000 .99 15 410 15000 .26 3 490 5000 0 0 535 LEVEL .87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1be/gal.	2100	19	2.2	37	335	25000					
-99 15 410 15000 -26 3 450 10000 -26 3 490 5000 -26 3 490 5000 -26 3 LEVEL	7500	13	1.5	77	370	20000					
•58 8 450 10000 •26 3 490 5000 SEA 0 0 535 LEVEL •87 FOR CONVERSION TO NAUTICAL UNITS FUEL - XHASKAGARIA DISTANCE - STATU TIME - MINUTES RATE OF DESCENT FUEL @ 6-5 1bs/gal.	9835	6	66.	15	110	15000					
.26 3 490 5000 SEA O 0 535 LEVEL .87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 lbs/gal. CAS - CALIBRATED	12730	2	•58	8	450	10000					
SEA SEA SEA SEA SEA SEA SEA SEVEL SEVEL STATE OF STATU DISTANCE - STATU DISTANCE - STATU DISTANCE - STATU TIME - MINUTES RATE OF DESCENT FUEL @ 6.5 1be/gal.	16380	2	•26	3	1,90	5000					
-87 FOR CONVERSION TO NAUTICAL UNITS LEGEND: FUEL - STANCE - STATU DISTANCE - STATU TIME - MINUTES RATE OF DESCENT FUEL @ 6.5 lbs/gal. CAS - CALIBRATED	20340	0	0	0	535	SEA LEVEL					
ON JP-3 FUEL @ 6.5 lbs/gal. CAS - CALIBRATED	MULTIPLY ST	July 1951		NVERSION TO	MAUTICAL U	NITS			ANCE -	ATUTE MILES	
1 = 1	BASED RED FIGURES	ON JP-3 HAVE NOT BEEN	I FLIGHT CHE	FUEL @ CKED	5.5 lbs/	gal.		2 2 2	0 1 1	F DESCENT - FT. PER MIN. CALIBRATED AIRSPEED STATUTE MILES PER HOUR	MCRE F

Figure A-5. Descent Chart (Sheet 1 of 3) F-84G-1RE thru -5RE

STANDARD DAY STANDARD DAY	AIRPLAI	AIRPLANE MODEL		D	SCF	LN	DESCENT CHART	RT		ENGINE	MODEL
ensity of 6.5 lbs/gal. PRESS. Clean+two-230 gal. faired tillow AlT. CAS TO SEA LEVEL TIME Loow 210 303 18.1 Loo 270 203 11.6 Loo 270 203 11.6 Loo 2000 300 12h 7.1 Loo 2000 370 Lt 2.8 Loo 2000 370 Lt 2.8 Loo 2000 270 Lt 2.0 2.0 2000 270 270 Lt 2.0	F-84G-1	RE thru-SRE	E)	V = -	8	TANDARD	DAY			J35-A-29	
PRESS	NOTES:	(1) Gros	ss weights	based on fi	vel dens	ity of 6	.5 lbs/ga	•			
ALT. CAS	Clean + two	irplane cor 5-230 gal.	nfiguration faired tip	& Gross w tanks + two	o-230	000	-	10000	onfigurations of fortuned	-8 !	t.
SEA LEVEL CAS	Eare Pyton	I called a	APPROXIMAT	, in		ALT.			APPROXIMAT	LE CALINES	
TIME FUEL			TO SEA LEVE		CAS	H.	CAS		1	EL	DATE OF
6.5 112 270 35000 270 203 18.1 4.9 83 300 30000 300 12h 7.1 2.2 34 370 20000 370 47 2.8 1.4 19 410 15000 410 27 1.0 8 10 450 10000 450 11 1.0 0 0 535 LEVEL 535 0 0 0 1.0	DESCENT	DISTANCE	TIME	FUEL	= E		Ē	FUEL	TIME	DISTANCE	
6.5 112 270 35000 270 203 11.66 4.9 83 300 30000 300 12h 7.1 2.2 34 370 20000 370 4,7 2.8 1.04 19 4,10 15000 4,50 11, 1.0 .8 10 4,50 10000 4,50 11, 1.0 .8 10 535 LEVEL 535 0 0 0 535 LEVEL 535 0 0 0 535 LEVEL 535 0 0 0 151ME - MINUTES RATE 0F DESCENT						1,0000	240	303	18.1	144	750
4.9 83 300 30000 300 12h 7.1 3.3 54 335 25000 335 77 4.5 2.2 34 370 20000 370 47 2.8 1.64 19 410 15000 410 27 1.0,7 .8 10 450 10000 450 14 1.0 .3 4 490 5000 490 6 .4 0 .9 0 535 LEVEL 535 0 0 0 .87 FOR CONVERSION TO NAUTICAL UNITS TIME - MINUTES TIME - MINUTES FUEL @ 6.5 1bs/gal.	1800	53	6.5	112	270	35000	270	203	11.6	94	750
3.3 54 335 25000 335 77 4.5 4.5 2.2 34 370 20000 370 47 2.8 2.8 1.0 450 10000 450 140 27 1.0 1.0 2 1.4 1.0 1.0 1.5 2.8 2.3 4 4.5 10000 4.5 2.4 1.5 2.8 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5	2350	40	4.9	83	300	30000	300	12h	7.1	58	1350
2.2 34 370 20000 370 47 2.88 1.4 19 410 15000 410 27 1.7 .8 10 450 10000 450 14 1.0 .3 4 490 5000 490 6 .4 .0 0 535 LEVEL 535 0 0 11 1.6GEND: FUEL XXXXXXQBXX FUEL @ 6.5 1bs/gal.	3500	27	3.3	574	335	25000	335	77	4.5	38	2250
1.0	4950	1.8	2,2	液	370	20000	370	147	2.8	24	3450
** 10	6850	12	1.4	19	017	15000	0TH	27	1.7	15	5100
0 0 535 LEVEL 535 0 0 0 0 535 LEVEL 535 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9200	7	89	10	450	10000	450	77	1.0	6	0012
SEA SEA O O 535 LEVEL 535 O O O S35 LEVEL 535 O O O O O O O O O O O O O O O O O O	12200	2	63	7	760	5000	1490	9	·h.	77	0526
-87 FOR CONVERSION TO NAUTICAL UNITS LEGEND: FUEL - XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	15400	0	0	0	535	SEA LEVEL	535	0	0	0	12400
1042	MULTIPLY ST DATA AS OF: BASED ON: E BASED	July 195. Setimates ON JP-3	.87 FOR CO	10 J	NAUTICAL I	UNITS			1 2 10	-XXXXXXGGCCEXXX POUND ICE - STATUTE MILES - MINUTES - FT. PER P CALIBRATED AIRSPEED	CRE Form 0. 239E 5 May 48)

Figure A-5. Descent Chart (Sheet 2 of 3) F-84G-1RE thru -5RE

P-8440-186 thru-582	AIRPLA	AIRPLANE MODEL		٥	DESCENT CHART	INT	CHA	RT		ENGINE	MODEL
1) Gross weights based on fuel density of 6.5 lbs/gel. Airplane configuration & Gross wt. RESS. Clean Airplane configuration & Gross wt. RESS. Clean AIT. CAS TO SEA LEVEL MPH FUEL TIME DISTANCE DISTAN	F-84G-	IRE thru-5Ri	(x)		S	TANDARD DA	AY			J35-A-29	
Compared to the configuration & Gross weights based on fuel density of 6.5 lbs/gel. Airplane configuration & Gross wt. Airplane configuration & Gross wt. AIT CAS	MOTES.										
SEA LEVEL PRESS Total Alirplane configuration & Gross wt.	MOIES:										
SEA LEVEL PRESS. Clean Airplane configuration & Gross wt.			ross weigh	based	on fuel	ensity of	6.5 lbs	/gal.			
RESS. CICam ALT. CAS FT. CAS	A	irplane con	figuration	& Gross	wt		×		onfiguratio	& Gross	t.
SEA LEVEL CAS FT. CAS TO SEA LEVEL RATE of SEA LEVEL	Clean			13699	lbs.	PRESS.	Clean			12802	. 203
SEA LEVEL CAS FI': CAS TO SEA LEVEL RATE ON SEA LEVEL RATE ON SEA LEVEL TIME DISTANCE DESCENTION SOLUTION LOCAL			APPROX IMAT	Ē		ALT.			APPR OX IMAT	E E	
Fuel Fuel Fuel Time Distance Descendence Des	RATE OF		O SEA LEVE	73	MPH	-	CAS				RATE OF
20.6 345 240 4000 240 371 22.1 175 650 13.6 236 270 35000 270 245 14.0 113 600 8.4 146 300 30000 300 145 8.2 68 1100 5.2 89 335 25000 335 86 5.0 42 1850 2.0 393 53 25000 370 51 3.1 26 3050 2.0 30 410 15000 410 29 1.2 1650 4650 1.0 15 15 1.0 9 6650 2.0 30 40 6 .5 4 9150 3.1 15 150 15 1.0 9 6650 3.2 6 150 6 .5 4 9150 3.2 6 15 1.0 0 0 0	DESCENT	DISTANCE	TIME	FUEL				FUEL	TIME	DISTANCE	DESCENT
13.6 236 270 35000 270 245 14.0 113 600 8.4 146 300 30000 300 145 8.2 68 1100 5.2 89 335 25000 335 86 5.0 42 1850 2.0 30 410 15000 410 29 1.9 16 4650 3.1 15 450 10000 450 15 1.0 9 6650 3.5 6 490 5000 490 6 .5 4 9150 3.7 FOR CONVERSION TO NAUTICAL UNITS 166ND: FUEL - 303300000000000000000000000000000000	750	164	20.6	345	240	1,0000	240	371	22.1	175	650
8.4 116 300 30000 300 115 8.2 68 1100 5.2 89 335 25000 335 86 5.0 42 1850 2.0 3.3 53 370 2000 370 51 3.1 26 3050 2.0 30 410 15000 410 29 1.9 16 4650 1.1 15 450 10000 450 15 1.0 9 6650 .5 6 490 5000 490 6 .5 4 9150 .87 6 490 5000 490 6 .5 4 9150 .87 6 490 5000 490 6 .5 4 9150 .87 6 535 12VEL 535 0 0 0 0 0 11600 .87 6 6 535 12VEL 13VEL <td>200</td> <td>110</td> <td>13.6</td> <td>236</td> <td>270</td> <td>35000</td> <td>270</td> <td>245</td> <td>14.0</td> <td>113</td> <td>009</td>	200	110	13.6	236	270	35000	270	245	14.0	113	009
5.2 89 335 25000 335 86 5.0 42 1850 2.0 3.3 53 370 20000 370 51 3.1 26 3050 2.0 30 410 15000 410 29 1.6 1650 1650 1.1 15 450 10000 450 15 1.6 9 6650 .5 6 490 5000 490 6 .5 4 9150 .0 0 535 LEVEL 535 0 0 11600 .87 0 0 0 0 0 11600 .87 0 0 0 0 0 11600 .87 0 0 0 0 0 11600 .87 0 0 0 0 0 0 0 .87 0 0 0 0 0 0 0	1150	69	4°8	346	300	30000	300	14.5	8.2	89	1100
3.3 53 370 20000 370 51 3.1 26 3050 2.0 30 410 15000 410 29 1.9 1.6 4650 1.1 15 1450 10000 4450 15 1.0 9 6650 3.5 6 490 5000 4490 6 .5 14 9150 0 0 535 1.6 1.6 535 0 0 0 11600 3.87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal.	1850	Ala	5.2	89	335	25000	335	98	5.0	42	1850
2.0 30 410 15000 410 29 1.9 16 4650 1.1 15 460 10000 450 15 1.0 9 6650 2.5 6 490 5000 490 6 .5 4 9150 2.87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal.	2950	28	3.3	53	370	20000	370	51	3.1	56	3050
1.1 15 1450 10000 1450 15.0 9 6650 2.5 6 1490 5000 1490 6 .5 14 9150 0 0 535 LEVEL 535 0 0 0 11600 2.87 FOR CONVERSION TO NAUTICAL UNITS FUEL @ 6.5 1bs/gal.	1450	17	2.0	30	410	15000	017	29	1.9	16	4650
SEA SEA	6250	10	1.1	15	450	10000	450	15	1.0	6	0599
SEA SEA 11600 .87 FOR CONVERSION TO NAUTICAL UNITS LEGEND: FUEL - 2023COGNECADES POUNDS DISTANCE - STATUTE MILES TIME - MINUTES RATE OF DESCENT - FT. PER MIN. CAS - CALIBRATED AIRSPEED S. C.	8600	77	70	9	1,90	5000	190	9	7.	17	9150
-87 FOR CONVERSION TO NAUTICAL UNITS LEGEND: FUEL - 3023CONCENDES FOUNDS DISTANCE - STATUTE MILES TIME - MINUTES RATE OF DESCENT - FT. PER MIN. CAS - CALIBRATED AIRSPEED S.	10900	0	0	0	535	SEA	535	0	0	0	00971
	MULTIPLY ST DATA AS OF: BASED ON:] BASED	ATUTE UNITS B JULY 1951 Estimates ON JP-3		SION T	@ 6.5 lbs,	JNITS /gal.			N O		585 Form 0. 239E

Figure A-5. Descent Chart (Sheet 3 of 3) F-84G-1RE thru -5RE

SOUND CLEAR GROUND GROUND CLEAR GROUND GROUND CLEAR GROUND GROUND CLEAR GROUND GROUN	990 90	BEST	BEST CAS APPROACH			HA	HARD SURFACE	OM I	WIND		
OP F ON GROUND CLEAR GROUND	WEIGHT LB.	POWER	POWER	AT SEA			,000	AT 4	,000		5000 7
50 1¼7 3040 4,550 3190 4,800 3375 5060 3580 00 137 2700 4,030 2870 4,250 2980 44,60 3160 00 126 2310 3510 2410 3650 2550 3810 2700 126 126 2310 3510 2410 3650 2550 3810 2700		MPH	MPH	GROUND	CLEAR 50'	GROUND	CLEAR 501	GROUND	CLEAR 50'	GROUND	CLEAR 50'
00 137 137 2700 4030 2870 4250 2980 4460 3160 00 126 2310 3510 2410 3650 2550 3810 2700	14850	741.	2412	3040	4550	3190	1,800	3375	5060	3580	5370
00 126 126 2310 3510 2410 3650 2550 3810 2700	13000	137	137	2700	4030	2870	4250	2980	1460	3160	1,740
	11000	126	126	2310	3510	2410	3650	2550	3810	2700	4050
	NOTES:				20				LEG	END	
(2) Distances based on landing technique shown in section II MPH - MILES PER HOUR		ances based	on landin	g techniqu	shown			Ī	1	PER HO	x
	DATA AS OF: Ju]	.y 1951									RE For
						BASED	ON IP-3	3			ACC ON

Figure A-6. Landing Chart - F-84G-1RE thru -5RE

MAXIMUM ENDURANCE

STANDARD DAY

MODEL: F84G-1RE thru-5RE

ENGINE(S) J35-A-29

APPROXIMATE

CONFIGURATION: Clean + Tip Tanks + eight -5" HVAR + two-1000 lb. Bombs.

CONFIGURATION: Clean + Tip Tanks + eight-5" HVAR + two-1000 lb. Bombs.

CAS

WEIGHT: 21947 1b.

WEIGHT: 20483 lb.

ALTITUDE

	CAS	APPRO	XIMATE
ALTITUDE	(MPH)	LBS/HR	% RPM
SEA LEVEL	205	2845	80
5000	230	2590	83
10000	230	2490	85
15000	235	2480	88

(MPH) LBS/HR % RPM 195 2710 79 SEA LEVEL 2470 215 81 5000 10000 84 215 2370 15000 220 2330 87 20000 240 2435 92 20000 220 2270 90 25000 240 2460 95 25000 220 2300 93 30000 30000 35000 35000 40000 40000 45000 45000 50000 50000 55000 55000

CONFIGURATION: Clean + Tip Tanks + eight -5" HVAR - two-1000 lb. Bombs.

CONFIGURATION: Clean + Tip Tanks + eight-5" HVAR + two-1000 lb. Bombs.

WEIGHT: 19019 1b.

WEIGHT: 17555 1b.

-,	01/ 100		and the state of t	All the same and t		Annual Control of the	
ALTITUDE	CAS (MPH)	APPRO LBS/HR	XIMATE % RPM	ALTITUDE	CAS (MPH)	APPRO LBS/HR	XIMATE % RPM
SEA LEVEL	185	2570	77	SEA LEVEL	175	2415	75
5000	200	2340	79	5000	185	2205	77
10000	200	2240	82	10000	185	2110	80
15000	205	2170	85	15000	185	2005	83
20000	200	2100	87	20000	185	1925	85
25000	200	2140	91	25000	180	1970	89
30000				30000 35000			
35000 40000				40000			
45000				45000			
50000 55000				50000 55000			

REMARKS:

1. Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)

MPH = STATUTE MILES PER HOUR TAS = TRUE AIRSPEED (MPH)

LB/HR = FUEL CONSUMPTION

FUEL GRADE: JP-3

FUEL DENSITY: 6.5 1bs/gal

DATA AS OF: July 1951

DATA BASIS: Estimates

MAXIMUM ENDURANCE

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + four-230 gal Tanks

CONFIGURATION: Clean + four-230 gal.

Tanks

WEIGHT: 22242 1b.

WEIGHT: 20768 1b.

ALTITUDE	CAS	APPRO	XIMATE	ALTITUDE	CAS	APPROXIMATE	
ALTITUDE	(MPH)	LBS/HR	% RPM	ALITIODE	(MPH)	LBS/HR	% RPM
SEA LEVEL 5000 10000	245 245 245	2600 2395 2250	78 80 82	SEA LEVEL 5000 10000	230 235 235	2460 2280 2140	76 79 81
15000 20000 25000	245 245 245	2140 2070 2065	85 87 90	15000 20000 25000	235 235 240	2030 1950 1930	84 86 89
30000 35000 40000				30000 35000 40000	240	1990	92
45000 50000 55000			2 A. A.	45000 50000 55000			- 1768) - 1768) - 2069

CONFIGURATION: Clean + four-230 gal Tanks

CONFIGURATION: Clean + four-230 gal tanks

WEIGHT: 19294 1b.

WEIGHT: 17820 1b.

2/2/4 200								
ALTITUDE	CAS	APPRO	XIMATE	ALTITUDE	CAS	APPROXIMATE		
ALTITUDE	(MPH)	LBS/HR	% RPM	ALITODE	(MPH)	LBS/HR	% RPM	
5000 10000	220 220 225	2325 2160 2025	7 5 7 7 80	SEA LEVEL 5000 10000	210 210 210	2190 2040 1910	72 75 78	
15000 20000 25000	225 225 230	1915 1830 1795	82 85 87	15000 20000 25000	215 220 220	1800 1710 1655	80 83 85	
30000 35000 40000	230	1815	90	30000 35000 40000	220 220	1655 1700	88 92	
45000 50000 55000				45000 50000 55000			9,855 6,285 09,02	

REMARKS:

CAS = CALIBRATED AIRSPEED (MPH)

MPH = STATUTE MILES PER HOUR

TAS = TRUE AIRSPEED (MPH)

LB/HR = FUEL CONSUMPTION

DATA AS OF: July 1951

FUEL GRADE: JP-3

DATA BASIS: Estimates

FUEL DENSITY: 6.5 lbs/gal

Figure A-7. Maximum Endurance Chart (Sheet 2 of 4) F-84G-1RE thru -5RE

MAXIMUM ENDURANCE

STANDARD DAY

MODEL: F84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + four-230 gal Tanks

CONFIGURATION: Clean + four-230 gal tanks

WEIGHT: 163/15 1b.

WEIGHT: 1/1870 1h.

	2.0111. 10,947 1178			WEIGHT: INTO TOS				
ALTITUDE	CAS APPROXI		XIMATE		CAS	APPROXIMATE		
ALITIODE	(MPH)	MPH) LBS/HR % RPM		ALITODE	(MPH)	LBS/HR	% RPM	
SEA LEVEL 5000 10000	200 200 205	2055 1920 1800	71 73 76	SEA LEVEL 5000 10000	185 190 190	1915 1800 1685	70 72 7h	
15000 20000 25000	205 210 210	1685 1590 1530	78 81 83	15000 20000 25000	195 200 205	1575 1475 1395	77 79 81	
30000 35000 40000	215 215	1500 1525	86 90	30000 35000 40000	205 205 195	1360 1375 1145	84 87 94	
45000 50000 55000				45000 50000 55000				

CONFIGURATION: Clean + two-230 gal Tanks | CONFIGURATION: Clean + two-230 gal Tanks

WEIGHT: 18645 1b.

WEIGHT: 17181 1b.

ALTITUDE	CAS	APPROXIMATE		ALTITUDE	CAS	APPROXIMATE		
ALITIODE	(MPH)	LBS/HR	% RPM	ALITIODE	(MPH)	LBS/HR	% RPM	
SEA LEVEL 5000 10000	215 225 235	2200 1990 1845	72 75 77	SEA LEVEL 5000 10000	205 220 225	2015 1870 1735	71 73 75	
15000 20000 25000	240 245 245	1720 1630 1550	80 82 84	15000 20000 25000	230 235 235	1620 1530 1445	78 80 82	
30000 35000 40000	245 240	1490 1505	87 90	30000 35000 40000	235 230	1380 1385	84 88	
45000 50000 55000			12003 S	45000 50000 55000			1791	

REMARKS:

CAS = CALIBRATED AIRSPEED (MPH) MPH = STATUTE MILES PER HOUR

(1) Multiply statute units by .87 to obtain nautical units.

TAS = TRUE AIRSPEED (MPH) LB/HR = FUEL CONSUMPTION

DATA AS OF: July 1951

FUEL GRADE: JP-3

DATA BASIS: Estima tes

FUEL DENSITY: 6.5 1bs/gal

MAXIMUM ENDURANCE

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + two-230 gal Tanks

CONFIGURATION: Clean + two-230 gal tanks

WEIGHT: 15717 1b.

WEIGHT: 14253 1b.

-) T T O 0		10.				
ALTITUDE	CAS	APPRO	XIMATE	ALTITUDE	CAS	APPROXIMATE	
ALITIODE	(MPH)	LBS/HR	% RPM	ALTITUDE	(MPH)	LBS/HR	% RPM
SEA LEVEL	200	1850	69	SEA LEVEL	195	1680	67
5000	210	1740	71	5000	200	1595	69
10000	215	1630	73	10000	205	1510	71
15000	220	1530	76	15000	210	1430	74
20000	220	1440	78	20000	210	1340	76
25000	220	1350	80	25000	210	1250	78
30000	220	1275	82	30000	210	1165	80
35000	220	1270	86	35000	210	1145	84
40000	215	1350	91	40000	205	1190	88
45000				45000			
50000				50000			
55000				55000	e de	Talkan .	

CONFIGURATION: Clean

CONFIGURATION: Clean

WEIGHT: 15299 1b.

WEIGHT: 13866 1b.

ALTITUDE	CAS	APPRO	XIMATE	ALTITUDE	CAS	APPROXIMATE		
ALTITUDE	(MPH)	LBS/HR	% RPM	AEIIIODE	(MPH)	LBS/HR	% RPM	
SEA LEVEL	200	1770	68	SEA LEVEL	190	1660	67	
5000	210	1675	70	5000	200	1570	69	
10000	215	1585	73	10000	205	1485.	71	
15000	220	1490	75	15000	210	1400	73	
20000	225	1400	77	20000	215	1315	75	
25000	225	1310	79	25000	215	1235	78	
30000	225	1260	82	30000	215	1160	80	
35000	225	1255	85	35000	215	1140	83	
40000	255	1310	90	40000	240	1170	87	
45000				45000				
50000 55000		ST. III		50000 55000				

REMARKS:

CAS = CALIBRATED AIRSPEED (MPH)

MPH = STATUTE MILES PER HOUR

TAS = TRUE AIRSPEED (MPH)

LB/HR = FUEL CONSUMPTION

DATA AS OF: July 1951

(1) Multiply statute units by .87

to obtain nautical units.

DATA BASIS: Estimates

FUEL GRADE: JP-3

FUEL DENSITY: 6.5 lbs/gal

Figure A-7. Maximum Endurance Chart (Sheet 4 of 4) F-84G-1RE thru -5RE

COMB	AT ALLOWANCE CH	IART		
	STANDARD DAY			
MODEL: F-84G-1RE thru-5RE	ENGINE(S)	J35-A-29		
AT		REQUIRED PER MINUTE		
ALTITUDE FEET	95 % RPM (NORMAL POWER) MAX CONTINUOUS	100 % RPM (MILITARY POWER) 30 MINUTE LIMIT		
SEA LEVEL	91	12 0		
5000	8 2	105		
10000	73	92		
15000	64	81		
20000	57	69		
25000	49	59		
30000	42	50		
35000	35	41		
40000	28	33		
REMARKS:				
Clean + two-230 gal. Tip	Tanks. Gross Wgt.	16905 1b.		
DATA AS OF: July 1951	FUEL GRADE:	.IP_3		

Figure A-8. Combat Allowance Chart (Sheet 1 of 2) F-84G-1RE thru -5RE

FUEL DENSITY: 6.5 1bs/gal

DATA BASIS: Estimates

AT	FUEL RE POUNDS PE	QUIRED
ALTITUDE FEET	95 % RPM (NORMAL POWER) MAX CONTINUOUS	100 % RPM (MILITARY POWER) 30 MINUTE LIMIT
SEA LEVEL	92	122
5000	83	106
10000	74	94
15000	65	82
20000	57	70
25000	50	60
30000	42	51
35000	35	42
40000	28	34

Figure A-8. Combat Allowance Chart (Sheet 2 of 2) F-84G-1RE thru -5RE

FUEL GRADE: JP-3

FUEL DENSITY: 6.5 1bs/gal

DATA AS OF July 1951

DATA BASIS: Estimates

MAXIMUM CONTINUOUS POWER STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

lb. Bombs + eight-5" HVAR	CONFIGURATION: Clean + two-tanks + two-1000 lb. Bombs + eight-5" HVAR WEIGHT: 20483 lb.

							,		
ALTITUDE	% RPM		APPROXIMA	TE	ALTITUDE	0/ 0044	APPROXIMATE		
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL	95	415	415	5080	SEA LEVEL	95	420	420	5090
5000	95	390	420	4540	5000	95	390	420	4550
10000	95	365	420	3970	10000	95	370	420	3980
15000	95	335	415	3470	15000	95	340	420	3480
20000	95	300	400	3030	20000	95	305	410	3060
25000	74				25000				3
30000		and the second			30000		1000		
35000					35000				
40000					40000				
45000					45000		- 5X-7-E		-5-
50000					50000				
55000					55000				

CONFIGURATION: Clean + two tanks + two-1000 1b. Bombs + eight-5" HVAR

WEIGHT: 19019 1h

CONFIGURATION: Clean + two tanks + two-1000 lb. Bombs + eight-5" HVAR

WEIGHT: 1.7555 1h.

WEIGHT.	VEIGHT: 19019 10.				WEIGHT: 1/999 10.					
ALTITUDE	0/ 0014	-	PPROXIMA	TE	ALTITUDE	0/ 00//	A	APPROXIMATE		
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR	
SEA LEVEL 5000 10000	95 95 95	420 395 375	420 425 425	5090 4560 3990	SEA LEVEL 5000 10000	95 95 95	425 395 380	425 425 430	5100 4570 3990	
15000 20000 25000	95 95 95	345 310 275	425 420 405	3480 3080 2650	15000 20000 25000	95 95 95	350 325 290	430 430 420	3490 3100 2720	
30000 35000 40000					30000 35000 40000		-			
45000 50000 55000					45000 50000 55000					

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

MPH = STATUTE MILES PER HOUR TAS = TRUE AIRSPEED (MPH) LB, HR = FUEL CONSUMPTION

CAS = CALIBRATED AIRSPEED (MPH)

DATA AS OF: July 1951 DATA BASIS: Estimates

FUEL GRADE: JP-3 FUEL DENSITY: 6.5 1bs/gal

MAXIMUM CONTINUOUS POWER

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + four tanks

CONFIGURATION: Clean+four tanks

WEIGHT: 22242 1b.

WEIGHT: 20768 1b.

	TO 8			The second section is a second second						
330	W. Talenda		APPROXIM	ATE	0.00	0/ 004	APPROXIMATE			
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR	
SEA LEVEL	95	505	505	5290	SEA LEVEL	95	505	505	5290	
5000	95	470	505	4750	5000	95	480	505	4750	
10000	95	445	505	4190	10000	95	450	505	4190	
15000	95	415	505	3700	15000	95	415	505	3700	
20000	95	365	495	3245	20000	95	370	500	3260	
25000	95	335	485	2820	25000	95	340	490	2790	
30000				0.8267	30000	95	305	470	2360	
35000				N 200 1	35000			100	1	
40000				07/3844	40000	1 1		LY S		
45000				J725	45000				35.44	
50000				FIG.	50000			1 29	100	
55000				Table 1	55000					

CONFIGURATION: Clean + four tanks

CONFIGURATION: Clean + four tanks

WEIGHT: 19294 1t.

WEIGHT: 17820 1b.

WEIGHT: T	7274 TC.				WEIGHT: I	LOSO TO			
	Table -	-	APPROXIM	ATE		0/ 884	A	PPROXIMA	ATE
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL 5000 10000	95 95 95	505 480 450	505 510 505	5010 4 7 50 4190	SEA LEVEL 5000 10000	95 95 95	505 480 450	505 510 510	5020 4760 4200
15000 20000 25000	95 95 95	415 380 345	510 500 495	3700 3270 2800	15000 20000 25000	95 95 95	415 380 345	510 505 495	3710 3270 2810
30000 35000 40000	95	305	480	2380	30000 35000 40000	95 95	305 265	485 455	2380 1965
45000 50000 55000					45000 50000 55000				ALTON Y

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)
MPH = STATUTE MILES PER HOUR
TAS = TRUE AIRSPEED (MPH)
LB, HR = FUEL CONSUMPTION

DATA AS OF: July 1951 DATA BASIS: Estimates FUEL GRADE: JP-3
FUEL DENSITY: 6.5 1bs/gal

MAXIMUM CONTINUOUS POWER

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean+four tanks

CONFIGURATION: Clean + four tanks

WEIGHT: 16,345 1b.

WEIGHT: 14870 1b.

		20			WEIGHT.	TO TO			
ALTITUDE	0/ 0044		APPROXIM	ATE		Ovcip. A L	A	PPROXIMA	TE
ALIHODE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL 5000 10000	95 95 95	505 480 450	505 510 510	5025 4770 4210	SEA LEVEL 5000 10000	95 95 95	510 480 450	510 510 510	5030 4770 4210
15000 20000 25000	95 95 95	415 380 345	510 505 500	3710 3280 2810	15000 20000 25000	95 95 95	415 380 345	510 505 500	3720 3290 2820
30000 35000 40000	95 95	310 270	485 465	2400 1990	30000 35000 40000	95 95	310 280	490 480	2400 2000
45000 50000 55000					45000 50000 55000				

CONFIGURATION: Clean + two tanks

CONFIGURATION: Clean + two tanks

WEIGHT: 18645 16.

WEIGHT: 17181 1b.

ALTITUDE	0/ 0044	-	APPROXIM	ATE			A	PPROXIMA	ATE
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL 5000 10000	95 95 95	570 540 495	570 575 565	5400 4900 4350	SEA LEVEL 5000 10000	95 95 95	570 540 495	570 575 565	5400 4920 4360
15000 20000 25000	95 95 95	460 420 380	560 555 540	3850 3380 2920	15000 20000 25000	95 95 95	460 420 380	560 555 545	3860 3390 2920
30000 35000 40000	95 95	340 305	530 520	2490 2100	30000 35000 40000	95 95	345 305	535 520	2490 2100
45000 50000 55000					45000 50000 55000				COLUMN TO THE PARTY OF THE PART

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)
MPH = STATUTE MILES PER HOUR

TAS = TRUE AIRSPEED (MPH)

LB HR = FUEL CONSUMPTION

DATA AS OF: July 1951 DATA BASIS: Estimates

FUEL GRADE: JP-3
FUEL DENSITY: 6.5 1bs/gal

Figure A-9. Maximum Continuous Power Chart (Sheet 3 of 4) F-84G-1RE thru -5RE

MAXIMUM CONTINUOUS POWER

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + two tanks

CONFIGURATION: Clean + two tanks

WEIGHT: 15717 1b.

WEIGHT: 14253 1b.

WEIGHT: 17	ITI TOO				WEIGHT. IL		The second second		
		,	APPROXIMA	ATE		0/ 5511	A	PPROXIMA	TE
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL 5000 10000	95 95 95	570 540 495	570 575 570	5420 4930 4370	SEA LEVEL 5000 10000	95 95 95	570 540 500	570 575 570	5420 4940 4370
15000 20000 25000	95 95 95	460 420 380	560 555 545	3860 3400 2920	15000 20000 25000	95 95 95	460 420 380	565 560 545	3870 3400 2930
30000 35000 40000	95 95 95	345 305 265	535 520 505	2500 2100 1670	30000 35000 40000	95 95 95	345 305 265	540 520 510	2500 2100 1680
45000 50000 55000					45000 50000 55000				

CONFIGURATION: Clean

CONFIGURATION: Clean

WEIGHT: 15299 1b.

WEIGHT: 13866 1b.

WEIGHT: 1	.7477 IU.				WEIGHT: 1				
			APPROXIM.	ATE		0/ 5514		PPROXIMA	TE
ALTITUDE	% RPM	CAS	TAS	LB HR	ALTITUDE	% RPM	CAS	TAS	LB HR
SEA LEVEL 5000 10000	95 95 95	600 560 520	600 595 585	5740 4990 4420	SEA LEVEL 5000 10000	95 95 95	600 560 520	600 595 585	5740 4990 4420
15000 20000 25000	95 95 95	480 430 395	580 570 565	3915 3430 2980	15000 20000 25000	95 95 95	480 435 395	585 575 570	3830 3430 2990
30000 35000 40000	95 95 95	355 315 275	555 535 525	2530 2130 1710	30000 35000 40000	95 95 95	355 315 280	555 535 530	2540 2130 1720
45000 50000 55000		-			45000 50000 55000				

REMARKS:

(1) Multiply statute units oy .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)
MPH = STATUTE MILES PER HOUR
TAS = TRUE AIRSPEED (MPH)
LB HR = FUEL CONSUMPTION

DATA AS OF: July 1951 DATA BASIS: Estimates FUEL GRADE: JP-3
FUEL DENSITY: 6.5 lbs/gal

E Form	•	AIRPLANE MODEL(S)	E MOL)EL((\$		I	FLIGHT OPERATION INSTRUCTION	0	ER	ATION	NO	S	TRU	CTI	NO	2	030	EXTERNAL LOAD ITEMS	RNA	07	8	LEM	100
oM sedili	ENG	F-84G-1RE thru-5RE ENGINE(S) J35-A-29	thru-5RE J35-A-29				CHAI	CHART WEIGHT LIMITS 21947	IT LIMIT	5 2191	5 5	1	5	20483		POUNDS	N	skets.	ANOCHE OF ENGINES OPERATING: 1	OPER.	4 Z-TO	1 2	+ squo	8-5" H
INSTI less the gations altitud other a rectly instruc on bos sary al	RUCTION han fuel a le and rest altitude of below. Fo tions in a urd subtrat illowances.	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or gational errors, formation flight, etc.). Move horizontally right or left to section according to present altitude and read rotal range available (no wind) by crusing at that altitude or by climbing to an order altitude of maximum range. For a flight at initial altitude, operating instructions are given directly below. For a flight at higher altitude, climb immediately to desired altitude and read crusing instructions in appropriate crusing altitude section. (B) FLIGHT PLANNING—From initial fuel months of the new control and climb to desired crusing altitude and read or the sary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	G CHART ruise (fue f. etc.). M vailable (n gge. For a f gher altitu ising altitu is for take-o	(A) II ove hori ove hori ove wind) flight at de section of and c	N FLIG pard minimizantally by cru initial initial ion. (B) cl.mb to	(A) IN FLIGHT – Select on board minus allowan wind) by crusing at that gight at initial altitude, ope gight at initial altitude, ope e section, (B) FLIGHT is f and climb to desired crusi FLIGHT above, adding in	ect figure vances f left to se hat altit yperating desired T PLAN ruising a	figure in fuel column equal to or cess for reserve, combat, navi- to section according to present altitude or by climbing to an- rating instructions are given di- zired altitude and read cruising 2. ANNING — From initial fuel ing altitude and all other neces- nitial climb distances to range	lumn equading to climbing to climbing ns are gind read of rom init all other tances to	t, navi- present to an- ven di- cruising ial fuel r neces-			NOTES on flight it is nect climb mu distance	: Range is requiri essary to ay be red and fuel	s shown ing more o observe quired to I. Climb	at optime than on the optime o	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	des are due to e sing altit n range. are inclu	maximum xternal conde on ea All range ded where	. In order character character character character climbs	ler to or tion or t, i.e., w include are india	gross we gross we hen chan allowanc cated.	uximum ight ch nging ch es for d	range ange), arts a escent
									1	TOW LOW		JE.	ALTITUDE					-				Γ		
IF YC	IF YOU ARE AT	AT S. L.		-	IF Y	IF YOU ARE	AT 5000	,00		F YO	IF YOU ARE AT 10000'	AT 100	,000	-	IF Y	OU ARE	IF YOU ARE AT 15000'	, ò	L	H	<u>_</u>	IF YOU ARE AT 20000	F AT 2	à
R	RANGE IN AIRMILES	IRAILES	FUEL		~	RANGE IN	AIRMILES	S		RA	RANGE IN AIRMILES	AIRMILE	S		92	RANGE IN AIRMILES	AIRMILES		I E		2	RANGE IN AIRMILES	AIRMIL	Sis
BY CRUISING AT S. L.	1000 FT.	IT. BY CRUISING T. AT OPT. ALT.	T. L.BS		BY CRUISING AT 5000'	1000 1000	ALT.	BY CRUISING AT OPT, ALT.	400	Y CRUISING AT 10000"	3 OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	in	Y CRUISING AT 15000'	0	OPT. ALT. BY 1000 FT. AT	BY CRUISING AT OPT. ALT.	2	-	CRUISI T 2000	0 OPT.	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.
						8)	ANGE FI	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA	LUDE ALL	OWANG	ES FOR	PRESCRI	BED CLIM	B & DESC	ENT TO	SEA LEVEL)	7			-		-		
575	20	815	5857		(630)	20		(835)	5	(720)	20	-	(850)		(780)	20		(865)	5857	2	(860)	20	-	
565	50	800	2800	+	(615)	50		(815)	5	(502)	20		(830)		(160)	20		(845)	5800	0	(840)	20		0
545	50	775	2600		595	20	18	230	9	(589)	20		(805)		(01/2)	20		(820)	2600	0	(815)	20		
76.7	02	750	2400		580	20	0.01	265	9	099	20		780		(27)	20		(262)	2700	0	(062)	20		
510	50	720	5200		555	50		740	a)	635	20	,	755		069	20		770	5200	0	(292)	20		1
1490	50	569	2000		535	20		710	40	615	20		725		599	20		740	2000		(735)	20		-
170	50	670	14800		515	20		685	m	280	20		200		01/9	20		715	1,800		710	20		,
450	50	079	14600	-	1,95	20	+	655	20	565	20	+	675	+	615	20	+	685	1600		089	20		
off	20	950	9गगग		1480	50		635	T/V	550	20		059		595	50		599	9गोग		099	20		
CRU	CRUISING AT	r S. L.	-	H	5	CRUISING	AT 5000	,00	1	CRUI	CRUISING A	AT 10000'	À	+	CRL	IISING	CRUISING AT 15000'		1	+	٥	TA SUBSINE	1	3
Ц	APPROXIMATE	XIMATE		L	L	APP	ROXIMATE	J.		L	APP	APPROXIMATE	TE	+	-	APP	APPROXIMATE		EFFEC.	_	, L	DAIISIA	Approximately	3
CAS. IPM	LB/HR G. S.	S. FACTOR DIST.		CAS.	S. 189.M	18/HR	G. S. PA	RANGE DOWN FACTOR DIST.	\$ Y	* 4	18/HR	5.5.	RANGE DO	DOWN CAS.	\$ 4 <u>8</u>	LB/HR	G. S. FAC	RANGE DOWN FACTOR DIST.	TIVE	CAS	% Maga	LB/HR	6.5	RANGE DOWN FACTOR DIST
			120 HW	>															120 HW	300	98	2980	285	.7 10
			80 HW	>			-		335	8	3305	305	ο° εν	315	5 93	3145	310 .	8. 10	80 HW	w 295	907	2900	31.5	
340 88 3	3635 300	- 6° 0	40 HW	w 335	89	3530	350	o. 70	325	16	3220	335	6.0	310	26 0	3065	340 °	00 10	40 HW	w 295	75	2900	355	9 15
330 87 3	3530 330	0 1e0 -	0	335	89	3530	360 1	1.0 5	315	96	3135	365 1	50 00	310	26 0	3065	380 1.0	0 10	0	295	76	2900	395	1,0 15
320 86 3	3425 360	0 1.1	40 TW	320	88	3380	385	1,1	315		31.35	105	1,1 5	300	0 91	2985	410 1.1	1 10	WT 04	285	93	2795	420	1,1 15
			80 WT	>					310	89	3050	435 1	1.2 5	300	72	2985	450 1°5	2 10	WT 08	285	93	2795	760	1,2 15
1	+		120 IW	4	-		-	-											120 TW	285	93	2795	500	1.3 20

Figure A-10. Flight Operation Instruction Chart (Sheet 1 of 8) F-84G-1RE thru -5RE

NO. OF ENGINES OPERATING: 1	IF YOU ARE AT 45000'	BY CRUISING OPT. ALT. BY CRUISING AT 45000" 1000 FT. AT OPT. ALT.				CRUISING AT 45000	APROXIMATE	% LS/HR G.S. FACTOR DOWN							EFFECTIVE WIND — HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = RANGE IN AIRMILES (Zero Wind) G.S. — GROUND SPEED IN STATUTE MILES PER HR CAS — CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR — TOTAL FUEL CONSUMPTION — POUNDS PER HR () — RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE. BASED ON 10.2 FUEL BASED ON 10.3 FUEL
NO. OF	-	FUEL BY CI AT			_	2000	TIVE	WIND CAS.	120 HW	H.		WT 04	WT 08	120 TW	IEGEND IW, HEADWI ROUND DIST ANGE IN AIF IN STATUT IRSPEED IN IRSPEED IN RENTHESIS EL FROM E
	-					- 55		DOWN W	120	8 8	0	4	8	120	IND - HI IND
П	,00001	GE IN AIRMILES OPT. ALT. BY CRUISING 1000 FT. AT OPT. ALT.				,000	ATE	RANGE D							EFFECTIVE WINI RANGE FACTOR = G.S GROUND SP CAS - CALIBRATE LB/HR - TOTAL I () - RANGE IN ONLY WITH
	IF YOU ARE AT 40000	RANGE IN AIRMILES NG OPT. ALT. BY O' 1000 FT. AT	VEL)			CRUISING AT 40000'	APPROXIMATE	0.5.							EFFEC RANG G.S. – (CAS – LB/HB () – OI
	YOU A	RANGE ING OI	O SEA LE			RUISING	1	LB/HR							1 1 2 (282)
EXT. LOAD	Ŧ	BY CRUISING AT 40000"	SCENT TO			0	H	CAS. RPM		1	H				of available holding 335 e airmiles 100 % RPM start letdown a 80 MPH x x 80 PH CAS with airmiles from
	,	BY CRUISING AT OPT, ALT.	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	Tag				DOWN DIST.							EXAMPLE If you are at 5000 feet with 5000 lbs, of available fuel, you can fly 55 statute airmiles by holding 335 iPH CAS. However, you can fly 710 statute airmiles by immediately climbing to 20000 feet using 100 % RPM At 20000 feet cruise at 295 MPH CAS and start letdown LS statute airmiles from destination. With a 80 MPH headwind the range at 2000 feet will be 710 x . 80 headwind the range at 2000 feet will be 710 x . 80 his wind and start letdown 10 statute airmiles from this wind and start letdown 10 statute airmiles from
3 LB.	35000	RMILES I. BY CI AT O	SCRIBED			35000'	APPROXIMATE	S. FACTOR							000 lbe airmiles airmiles 10 stat feet usin H CAS nation. Wwill be 7 state atute
20483	IF YOU ARE AT 35000'	RANGE IN AIRMILES	S FOR PRE			CRUISING AT 35000'	APPRO	LB/HR G. S.							EXAMPLE feet with 5000 lbs. statute airmiles by ou can fly 710 statut g to 20000 feet using e at 295 MPH CAS am illes from destination. With immiles. Gruise at 295 MPH CAS are in the statute of the sta
0	IF YOU	BY CRUISING OPT. ALT. AT 35000' 1000 FT.	OWANCE			CRUIS		* ***							EXAMPLE If you are at 5000 feet with 5000 lbs, of tuel, you can fly 535 statute airmites by holy ippl. CAS. However, you can fly 710 statute by immediately climbing to 20000 feet using 10 At 20000 feet cruise at 295 MPH CAS and ats a statute airmites from destination. With a headwind the range at 20000 feet will be 710 or 570 statute airmites. Cruise at 295 MPH this wind and start letdown 10 statute airmites.
21947			ODE ALLC					CAS.							at 5000 in fly 5 Howeve tely clim feet clim feet can a stutte ind start
LIMITS	ý	BY CRUISING AT OPT. ALT.	JRES INCL					IGE DOWN							If you are at 5000 fuel, you can fly 53 iPH CAS. However, by immediately climb by the AT 20000 feet crul 15 statute ail headwind the range at headwind the range at this wind and start this wind and start this wind and start
CHART WT. LIMITS	AT 30000'	AIT. BY C	25 15 15 15 15 15 15 15 15 15 15 15 15 15			AT 30000	APPROXIMATE	G. S. FACTOR							The True of the Part of the Pa
CHAR	IF YOU ARE	36 NO 100	(RA)			CRUISING A	APPR	0 ин/яг						1	1 J
29	IF YO	BY CRUISING AT 30000"				CRUI		* 44							nits. nly. vvigation .BS GA
ENG. J35-A-29		P A				L	L	C.A.S.			-	Š.		- 5	autical un e wind o ding, ni equired. y of 6.5 I BS, GAL.
ENG.		FUEL				73333	TIVE	WIND	120 HW	40 HW	0	WT 04	WT 08	120 TW	obtain ne e effective for lan etc. as re etc. as re etc. as consistent of 6.5 Lk
1-51G.	25000′	BY CRUISING AT OPT. ALT.				2000,		RANGE DOWN FACTOR DIST.							Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.
MOD.	IF YOU ARE AT 25000'	RANGE IN AIRMILES				CRUISING AT 25000'	APPROXIMATE	HR G. S.							Climb at 100 % RPM Multiply statute units by Read lower half of chart of Make additional allow errors, combat, formation Chart weight limits based Fuel flow based on fuel of
AIRPLANE MOD.	YOU,	SING O				CRUISIN		% LS/HR							
AIR	=	BY CRUISING AT 25000"						CA.S.						1	1 4 4 4

Figure A-10. Flight Operation Instruction Chart (Sheet 2 of 8) F-84G-1RE thru -5RE

Figure A-10. Flight Operation Instruction Chart (Sheet 3 of 8) F-84G-1RE thru -5RE

HIGH ALTHUDE ING-230 GAL, TAP TAR KS + Z-1000 LD, Bomb s+5-5" HVA ROCKets. 29 CHART WT. LIMITS 20183 TO 19019 18. EXT. LOAD NO. OF ENGINES OPERATING: 1	NOTE AT ADDRESS AS A DESCRIPTION AS A DE		OPT. ALT. BY CRUISING BY CRUISING OPT. ALT. BY CRUISING BY CRUISING BY CRUISING BY CRUISING BY CRUISING 1000 FI. AT 35000 1000 FI. AT 0PT. ALT. AT 40000 1000 FI. AT 70PT. ALT. AT 45000	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)			CRUISING AT 30000' CRUISING AT 35000' CRUISING AT 40000' CRUISING AT 45000'	APPROXIMATE	8 LAVIR G.S. PATOR DIST. AND DAWN CAS. BPM LAVIR D.S. FACTOR DIST. BPM LAVIR G.S. FACTOR DIST.	130 HW	WH 08	40 HW	0	AT OF	WT 08	120 TW	If you are at 5000 feet with 4000 lbs. of available	Tuel, you can ny 1133 Statilta airmiles by holding 413	10e, you can ny 425 statute armies by holding 315 NPH CAS. However, you can fly 575 statute airmiles by immediately climbing to 20000 feet using 100 % RPM At 20000 feet cruise at 285 MPH CAS and start lerdown	10et, you can ny 422 statute armies by holding 315 NPH CAS. However, you can fly 575 statute airmiles by immediately climbing to 20000 feet using 100 % RPM At 20000 feet cruise at 285 MPH CAS and start letdown 15 steptyte airmiles from destination With a 10 NDH	Het, you can ny 425 statute airmiles by holding 345 Res.—GROUND SPEED IN STATUTE MILES PER HR CAS.—CALIBRATED AIRSPEED IN STATUTE MILES PER HR CAS.—CALIBRATED AIRSPEED IN STATUTE MILES PER HR LE/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTHESIS AVAILABLE LE statute airmiles from destination. With a 40 MPH ONLY WITH FUEL FROM EXTERNAL SOURCE.	NPH CAS. However, you can fly \$775 statute NPH CAS. However, you can fly \$775 statute by immediately climbing to 20000 feet using 100 % RPM At 20000 feet cruise at 285 MPH CAS and start letdown 15 statute similes from destination. With a \$10 MPH NPM CAS.—GROUND SPEED IN STATUTE MILES PER HR LB/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE.	17PH CAS. However, you can fty 575 statute airmites by holding 31.5 17PH CAS. However, you can fty 575 statute by minites by immediately climbing to 20000 feet using 100 % RPM At 20000 feet cruise at 285 MPH CAS and start letdown IS statute airmites from destination. With a LO MPH headwind the range at 20000 feet will be 575 x , 900 or 520 statute airmites. Cruise at 285 MPH CAS with
ENG. J35-A-29	Ş	FUEL	BY CRUISING O AT 30000'				CRUISING			120 HW	80 HW	40 HW	0	WT 0#	WT 08	120 TW	btain nautical units. effective wind only.	of tailding, tiavigational	tc. as required. density of 6.5 LBS/GAL. 6.5 LBS/GAL.	tc. as required. density of 6.5 LBS/GAL. f 6.5 LBS/GAL.	tc. as required. density of 6.5 LBS/GAL. f 6.5 LBS/GAL.	tc. as required. density of 6.5 LBS/GAL. f 6.5 LBS/GAL.	tc. as required. density of 6.5 LBS/GAL. f 6.5 LBS/GAL.
F-840-1RE thru-5RE AIRPLANE MOD.	WOODE AT SECUL	RANGE IN AIRMILES	BY CRUISING OPT. ALT. BY CRUISING AT 25000" 1000 FT. AT OPT. ALT.				CRUISING AT 25000'	APPROXIMATE	CA.S. BPM LB/HR Q.S. PACTOR DIST.								1 Climb at 100 % RPM 2 Multiply statute units by .87 to obtain nautical units. 3 Read lower half of chart opposite effective wind only.		errors, combat, formation flight etc. as required. 5 Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.				

Figure A-10. Flight Operation Instruction Chart (Sheet 4 of 8) F-84G-1RE thru -5RE

ITEMS Bombs+8-5" HVA		ange nge), rrts a scent		, www	3	BY CRUISING AT OPT. ALT.		1,65 hho		380	350	320	255	235	3	3 1	RANGE DOWN FACTOR DIST.	.7 10	8.8	35 %	1,0 15	1,1 15	1.2 15	1.h 20
ITEMS Bombe+8-5		maximum range weight change), hanging charts a nnces for descent		AT 20	AIRMILE	ALT. B	\vdash		+						AT 20000	A PPROVINATE	G. S.	290	320	34.5	375	115	L Oth	1,80
		ain max oss weig n chang owance: ted. DING		IF YOU ARE AT 20000Y	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		25 25	, ,	25 25	25	25.	25 53	25	- CNISHIAD		LB/HR	2770	2700	2600	2535	2535	2430	2430
LOAD	NG: 1	to obta e., whe lude all indicat		IF YO	Z Z	NY CRUISING AT 20000		0 10		0.30	10	30.3	2 10		100		* **	9%	93	35	16	16	8	8
IAL bet2-1	PERATI	guration chart, i ues incl mbs are				BY CR AT 2		450	000	365	335	305	245	230			CA.S.	305	300	285	280	280	270	270
Two-230 Gal. Tip Tanks42-1000 LB.	ENGINES OPERATING: 1	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING			FUEL	LBS.		2964	0090	2400	2200	2000	1600	1482		EFFEC.	TIVE	120 HW	80 HW	40 HW	0	WT 04	WT 08	120 TW
9	OF ENC	are man to exter altitude age. All ncluded		Γ		SING									T		LET DOWN DIST.		10	10	10	10	10	
#0-230	NUMBER OF	itudes it (due ruising num rar el are ir NS NO		2000,	ES	BY CRUISING AT OPT. ALT.		1,25	300	365	335	305	240	220	,000	ATE	RANGE		e0	6	1.0	1.1	1,3	
FA		num alt		IF YOU ARE AT 15000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	a	30.30	1	0.30	10	20.2	10	1,0	AT 15000	APPROXIMATE	6.5		310	335	365	395	425	
Z	POUNDS	t optim than on the opti obtain a istance		U ARE	NGE IN		EA LEVE	25 25	100	25 52	25	25	1 2	25	CRUISING		18/HR		2910	2800	2725	2650	2575	
FLIGHT OPERATION INSTRUCTION CHART	2	hown a more baserve to red to climb d		IF YO	RA	BY CRUISING AT 15000'	AT TO S	380	355	330	300	275	220	×	CRU		# WW		8	12	8	89	88	
	25	anges s quiring ry to ol e requi fuel. C		L			DESCEN	3 %	3	, m	3	275	1 22	205	\perp	1	C.A.S.		315	305	295	285	275	
5	TO 17555	ES: R ights re necessa o may b nce and	M			BY CRUISING AT OPT. ALT.	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	0.0	١,			10.10	. 10				DOWN DIST.		w	w	w	w	w	
		NOT on fi it is climb dista	E	0000	KES		CRIBED (014	280	350	320	285	225	205	ò	MATE	RANGE		00	6.0	1.0	1,1	1,2	
CHART			ALTITUDE	IF YOU ARE AT 10000	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	OR PRES	25 25	20	2 20	25	. 25	25	25	AT 10000	APPROXIMATE	si O		300	325	355	380	1/10	
돌판	01.9	5-1-1-1 MT 1 M		OU AR	ANGE		ACES FC		L		-				CRUISING	*	LB/HR		3090	2965	2885	2765	2685	
2	TS 19	jual to car, nav preservage to an given d cruisin itial fue er neces to rang	LOW	IF Y	ex	BY CRUISING AT 10000'	LLOWAR	370	395	3 8	275	250	500	190	S.	F	# MA		06	89	88	87	98	
9	IT LIM	lumn eq rding to climbir ns are nd read rom in I all oth			L		LUDE A		L						+	-	3		330	315	310	295	285	
5	CHART WEIGHT LIMITS 19019	figure in fuel column equal to or ces for reserve, combat, navi- to section according to present altitude or by climbing to an- ating instructions are given di- aired altitude and read crusing PLANING—From initial fuel initial climb distances to range nitial climb distances to range				BY CRUISING AT OPT. ALT.	RES INC	395	365	335	305	270	210	190			E DOWN			w	70	w		
Ī	HART	igure in es for to secti altitude atting in irred alt LANNI ng altit		IF YOU ARE AT 5000'	MILES		JE FIGU							***	2000	XIMATE	RANGE			6.	1.0	1.1		
	-	- Select final allowance of the control left of the control left to destroy to destroy to destroy to destroy ired cruisi adding in		RE AT	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	(RANC	25 25	25	25	25	200	52	25	1G AT	APPROX	6.5			3240 310	3145 340	3010 365		
		inus al inus al y right uising a altitude diately) FLIC o desire		YOU /	RANGE			_			-				CRUISING A		LB/HR			-	314			
ŝ		N FLIC Dard m izontall) by cr initial ion. (B cl.mb to HT ab		=		BY CRUISING AT 5000		325	290	265	245	220	180	165	ľ	H	* 4	_		5 88	5 87	5 86		
EL		(A) I on bo ove hor ove hor ove wind flight at de, clim de sect off and I FLIG		H	L		_		-	_	-				+		D CAS.	3	*	w 325	315	305	>	>
AIRPLANE MODEL(S)	29	HART be (fue (tc.). Mable (n For a fur aftitude g altitude r take-			FUEL	LBS.		2964	2600	2400	2200	2000	1600	1482		EFFEC.	WIND	120 HW	80 HW	40 HW	0	WT 04	80 TW	120 TW
	J35-A-29	or crui flight, e ge avail r range. rt highe cruisin uired fo				BY CRUISING AT OPT. ALT.											DOWN DIST.			1	1	i		
AIRPLANE	E(S)	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or fear than fuel available for cruize (fuel on band minus allowances for reserve, combat, navigational errors, formation flight ext.). Move horizontally right or left to section according to present altitude and read total range available (no wind) by cruning at that altitude or by climbing to an rectly below. For a flight at higher altitude, elimb immediately to desired altitude and read cruising instructions in appropriate cruning altitude section. (B) FLIGHT PLANNING – From initial fuel on board aubtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.		S. L.	ILES			380	350	350	285	255	195	175	1	ATE	RANGE			60	1.0	1.1		
A. 1.9.18.	ENGINE(S)	TONS. for read to le of min appropriect for a		A	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		25 25	52	52	25	10.10	10	10	CRUISING AT S. L.	APPROXIMATE	8.			285	315	355		
ßi.	4	than fundament for the strict of the sand and serious serious sand aultowarms.		IF YOU ARE	ANGE		-	es es	ev.	61	67	25 25	25	25	HISING	AP	LB/HR			3320	3215	3215		H
E to I seed	48	INST7 less th gationa altitud other rectly instruc on bos sary al		IF Y	2	BY CRUISING AT S. L.		295	260	240	220	200	160	150	CR	Ц	N N			88	85	85		
CRE Form	260					À		44 .48		7.7							S. S.			325	315	315		

Figure A-10. Flight Operation Instruction Chart (Sheet 5 of 8) F-84G-1RE thru -5RE

See A 25000 Fue Fue RANGE See A 25000 Fue Fue RANGE See A 30000 Tool Tool A 30000 Tool	19019	TO 17555 LB.	EXT. LOAD	04				-		
F YOU A	IF YOU	U ARE AT 35000'		200			Ž	NO. OF ENGINES OPERATING: 1	NES OPER	ATING: 1
SANGE IN AIRWILES TUEL RANGE				IF YOU ARE AT 40000'	R AT 400	, 00.		IF YO	IF YOU ARE AT 45000'	45000′
25 - 2964 25 - 2800 25 - 2600 25 - 2400 25 - 2200 25 - 2200 25 - 1800 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600	BY CRUISI AT 3500	RANGE IN AIRMILES NG OPT. ALT. BY CRI	BY CRUISING BY C AT OPT. ALT.	BY CRUISING OP AT 40000' 10	RANGE IN AIRMILES NG OPT. ALT. BY CRUISING O' 1000 FT. ALT.	CRUISING OPT. ALT.	FUEL	BY CRUISING AT 45000	RANGE IN AIRMILES NG OPT. ALT. BY	BY CRUISING AT OPT, ALT
25 - 2964 25 - 2800 25 - 2600 25 - 2200 25 - 2200 25 - 1800 25 - 1600 25 - 1482 CRUISING AT 25000' EFFEC. CRUISING	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEYEL)	ES FOR PRESCRIBED C	LIMB & DESCEN	AT TO SEA LEY	(1)		LBS.			
25 - 2600 25 - 2400 25 - 2400 25 - 2200 25 - 1800 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600 25 - 1600					ĭ					
2600 24,000 2200 1800 1600 1482 11482 True AP										
25 - 2400 25 - 2200 25 - 1800 25 - 1600 25 - 1600 25 - 1462 25 - 1462 CRUISING AT 25000 EFFEC. True APPROXIMATE TO APPROXIMATE										
25 - 2000 25 - 1800 25 - 1600 25 - 1600 25 - 1482 CRUISING AT 25000 EFFEC. CRUISING										
25 - 2000 25 - 1800 25 - 1600 CRUISING AT 25000' EFFEC. CRUISING			1	1	1		1			
25 – 1600 25 – 1482 CRUISING AT 25000 EFFEC. CRUISING										
CRUISING AT 25000' EFFEC. CRUISING APPROXIMATE TAVE APPROXIMATE TAVE APPROXIMATE APPROXIMA				STATE OF THE PARTY						
EFFEC. CRUISING										
TIVE	CRUIS	CRUISING AT 35000'	+	CRUISING	CRUISING AT 40000'	ò		CRUIS	CRUISING AT 45000	15000
		APPROXIMATE	-	×	APPROXIMATE		EFFEC.	-	APPROXIMATE	IMATE
CAS. 1894 18/11 G.S. TACTOR DOWN WIND CAS. 1894 18/11 G.S. TACTOR	DOWN CAS. RPM.	LB/HR G. S. FACTOR	DOWN CAS.	% LB/HR	, 0	RANGE DOWN FACTOR DIST.	WIND	CAS. IPM	LB/HR G. S.	RANGE DOWN FACTOR DIST.
285 95 2645 295 °7 15 120 HW							120 HW			
280 94 2610 330 .8 15 80 HW							80 HW			
270 93 2485 350 °9 20 40 HW							40 HW	- 10 F1		
270 93 2485 390 1.0 20 0							0			
270 93 2485 430 1.1 20 40 TW							WT 04			
260 92 2420 460 1.º2 25 80 TW							WT 08			
260 92 2420 500 1.04 25 120 TW							120 TW			
1 Climb at 100 % RPM 2 Multiply statute units by 81 to obtain nautical units. 3 Read lower half of chart opposite effective wind only. 4 Make additional allowances for landing, navigational FPR CAS. 5 Chart weight limits based on fuel density of 6.5 LBS GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow based on fuel density of 6.5 LBS/GAL. 7 Constitution flow flow flow flow flow flow flow flow	at 100 an fly Hower tely cli feet e range tatyte	EXAMPLE 500 feet with 2000 lbbs, of available 250 statute airmiles by holding 310 ver, you can fly 285 statute airmiles mbing to 25000 feet using 100 % RPM cruise at 270 MPH GS and stert letdown airmiles from destination. With a 10 MPH st 25000 feet will be 285 x .90 s airmiles Cruise at 270 MPH GS with rt letdown 20 statute airmiles from	of available of available 310 (the airmiles \$100 % RPM ind start letdown ha \$10 MPH \$85 \times 90 MPH	ole LO M M M M M m	EFFECTI RANGE F G.S. – GR CAS. – CA LB/HR – () – RA ONL'	VE WIND - ACTOR = OUND SPE LIBRATED TOTAL FU NGE IN P	LEGEND CROUND RANGE II RANGE II A AIRSPERSTEL SEL CONSI	LEGEND EFFECTIVE WIND - HW, HEADWIND, TW, TAILWIND - RANGE FACTOR = GROUND DISTANCE (Effective Wind) GROUND SPEED IN ATRMILES (Zero Wind) GS GROUND SPEED IN STATUTE MILES PER HR GS CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE RANGE ONLY WITH FUEL FROM EXTERNAL SOURCE	W, TAILWII Effective W (Zero Wine UTE MILE POUNDS ABLE AL SOUR	Mar
DATA AS OF: July 1951 BASED ON: Estimates destin	rtion. RED FIGURES	RED FIGURES HAVE NOT BEEN FLIGHT CHECKED:	LIGHT CHECKE	ä	BASED ON JP-3	O OF-	FOEL			No.

Figure A-10. Flight Operation Instruction Chart (Sheet 6 of 8) F-84G-1RE thru -5RE

Г			T	T	T	ET.			Г		T		T	T	DOWN DIST.	10	7,5	73	25	Z	20	20
	S* HVA	range inge), arts a secent		,000	S	BY CRUISING AT OPT. ALT.	235	190	,	1			8	TE	200	10	60	0,	1.0	1,1	1.2	1.4
EMS	abe+8-	ximum ight cha ging chi		IF YOU ARE AT 20000	RANGE IN AIRMILES								CRUISING AT 20000	APPROXIMATE	wi 0	285	315	340	370	395	435	1,65
5	. Bor	ain ma oas wei rn chan lowance ted.		JU ARE	NGE IN	OPT. ALT. 1000 FT.	25	25	1	1			SING	APP	LB/HR	2610	2545	24,50	2390	2290	2290	2225
LOA	1000 I	to obt n or gr le, who lude al e indica		IF YO	RA	BY CRUISING AT 20000'	0	10	20	09			2	L	* 4	93	92	12	96	89	89	88
AL	PERATI	order chart, ilues inc mbs are		L		PY CF	230	185	125	9					Ç	300	295	285	275	265	265	255
EXTERNAL LOAD ITEMS	Two-230 Gal. Tip Tenks+2-1000 Lb. Bombe+8-5" HVA Rockets. NUMBER OF ENGINES OPERATING: 1	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum crusing altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING			FUEL	LBS.	1482	1200	800	700			0.000	Errec.	WIND	120 HW	80 HW	40 HW	0	40 TW	WT 08	WT 021
	Gal.	are may to exter altitude nge. All ncluded FUEL				ISING . ALT.									DOWN DIST.		10	10	10	10	10	
	Two-230 Rockets. UMBER OI	titudes t (due ruising num rat el are it		5000	LES	BY CRUISING AT OPT. ALT.	220	170	1	1			, 000	ATE	RANGE		00	6.	1.0	1,1	1.3	
L	ž	num alt		IF YOU ARE AT 15000	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	VEL)	25					CRUISING AT 15000	APPROXIMATE	6.55		36	330	355	395	415	
Z	POUNDS	than or the option obtain istance		U ARE	NGE IN		EA LEVE	2		1			SING	AP	18/HR		2780	2670	2560	2560	2415	
E	δ	hown a more baerve red to Climb d		IF YO	AZ	BY CRUISING AT 15000'	205 205	165	011	55			CRU	Ц	S W		8	89	88	88	87	
SUC.	16090	anges s quiring ry to ol e requi l fuel. C		L			DESCEN	ī	7				L	L	\$ ¥3		310	300	285	285	270	
ST	70 16	TES: Rights re necessa b may b nce and	E			BY CRUISING AT OPT. ALT.	205	160							DOWN DIST.		w	N	70	'n	w	
Z	–	NOT on fi it is climl dista	T	10000	ILES		CRIBED	П	1	11			ò000	MATE	RANGE		00	6.	1.0	1,1	1.3	
0	CHART		LOW ALTITUDE	IF YOU ARE AT 10000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	OR PRES	25	1	,			CRUISING AT 10000	APPROXIMATE	0		295	320	345	375	405	
RAT	C 2321	ge stell give to	N	OU AI	RANGE		NCES F	\dashv		-			NISIN		LB/HR		2975	3 2850	7 2730	2650	2570	
FLIGHT OPERATION INSTRUCTION	AITS 3	wances for reserve, combat, navi- left to section according to present that altitude or by climbing to an- operating instructions are given di- office and altitude and read crusing IT PLANNING – From initial fuel ruising altitude and all other neces- ag initial climb distances to range	10	ī.	0.50	BY CRUISING AT 10000'	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	155	100	20			Ü	Ц	CAS. RPM		325 89	315 88	300 87	290 86	280 85	\exists
0	HT LIA	olumn ee, com ording y climb ons are and rea From i			_		CLUDE	-		-			H	h	DOWN CA		77		\dashv		22	\dashv
E	CHART WEIGHT LIMITS	in fuel crasery tion acc de or b instruct lititude VING – itude ar		ò		BY CRUISING AT OPT. ALT.	3URES IN	145	1	1			ò		FACTOR DI			20	70	70	_	\forall
교	CHAR	figure inces for t to sec t altitue rating essired a PLANP sing altituitial of the sing altituitial of		E AT 5000'	IRMILES		-35F —						AT 5000	APPROXIMATE	G. S. FAC			6° 50	1.0	5 1.1	-	4
		- Select allowar nt or lef at tha ude. ope ily to d IGHT red crui		ARE /	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	(RA)	25	1	1			1000	APPRO	LB/HR G			10 305	20 335	30 365		\forall
		IGHT- minus ally righ cruising al altitu mediate B) FL to desi		IF YOU AR	RANG	ISING 200,							CRUISING	1	NA IS		-	87 3110	86 3020	85 2930	-	+
8		IN FL board orizont id) by at initi imb im ction. (d cl.mb GHT		-		BY CRUISING AT 5000'	165	135	8	115				Н	CAS.			320 8	310 8	300	T	1
AIRPLANE MODEL(S)		INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, naviational errors, formation flight, etc.). Move hortzontally right or left to section according to present altitude and read total range available (no wind) by cruising at that altitude or by climbing to another altitude of maximum range. For a flight at initial altitude, operating instructions are given distructions in appropriate cruising altitude section. (B) FLIGHT PLANNING—From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.		Г	FUEL	LBS.	1482	1200	800	001			EFFEC.	TIVE		120 HW	80 HW	40 HW	1		% ₹	120 TW
E	-5RE	GCHAI ruise (1, etc.). vailable ge. For gher alt saing alt for tal		H			7	Ti		_			-			120	8	4	0	4	8	120
AN	F-84G-1RE thru-5RE ENGINE(S) J35-A-29	USIN(e for con flight range av num ran nt at hij ate crui equired		,		BY CRUISING AT OPT. ALT.	175	130						1	IGE DOWN TOR DIST.			1	1	1	-	\dashv
IRP	S4G-1R	IS FOR vailable ormatic ormatic ormatic ormatic or maxim r a figh ppropri: t fuel r Then u		AT S. I	RMILES			-		1		27.1	r S. L.	APPROXIMATE	G.S. FACTOR			6.0	320 1.0	355 1.1		4
«	ENG	fuel a errors, fund reactude of low. For na in a subtrace.		ARE /	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	25	25	1				CRUISING AT	APPRO	_			3200 280	\rightarrow			+
:05 Au	(Rev. 1 M	INSTRU less than gational e altitude a altitude alti rectly bel instruction on board on board aary allow		IF YOU ARE	RANG	$\overline{}$		1					CRUISI	-	RPM LB/HR				3200	3150	1	-
01 3 6C	MCRE 1	27 24 25 4 2 4 2		-		BY CRUISING AT S. L.	150	120	90	70		u.		Ц	. 24.			320 85	320 85	315 84		+
	ausk					-			-	-				_	Ú			m	3	m	_	

Figure A-10. Flight Operation Instruction Chart (Sheet 7 of 8) F-84G-1RE thru -5RE

IIGH ALTITUDE Two-230 Gal. Tip Tanks+2-1000 lbs. Box TO 1600 IB. EXT. LOAD	10 16090 LB.	IF YOU ARE AT 35000' IF YOU ARE AT 40000'	RUISING BY CRUISING OPT. ATT. BY CRUISING BY CRUISING OPT. ATT. AT 35000' 1000 FT. ATT. AT OPT. ATT. TAT. AT OPT. ATT. BY CRUISING OPT. B	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)					CRUISING AT 35000' CRUISING AT 40000' CRUISING AT 45000'	APPROXIMATE APPROXIMATE TIVE	LET % 14/HR G.S. PACTOR DOWN CA.S. RPM 14/HR G.S. PACTOR DOWN DIST.	120 HW	WH DE	40 HW	0	WT 09	WT 08	120 TW	EXAMPLE ou are at 5000 feet with 1200 lbs, of available you can fly 135 statute airmiles by holding 310 CAS. However, you can fly 11k5 statute airmiles mmediately climbing to 25000 feet using 100% RPM	-	LE/HK - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE	LEVING TOTAL FUEL CONSUMPTION - POUNDS PER HR ()-RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE	LEVING TOTAL FUEL CONSUMPTION - POUNDS PER HR ()-RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE	LEVING TOTAL FUEL CONSUMPTION - POUNDS PER HR ()-RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE	ind start ledown ()—RANGE IN PARENTHESIS AVAILABLE ()—RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE. HPH CAS with	ith a 10 MPH 11,5 x .90 MPH CAS with
CHART WT. UMITS 17555 TO 16000 IB	16090	AT 30000' IF YOU ARE AT 35000'	BY CRUISING BY CRUISING OPT. ALT. AT OPT. ALT. AT 35000' 1000 FT.	FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIA							C.A.S. RPM 18/HR G.S. FACTOR								EXAMPLE If you are at 5000 feet with 1200 lbs. fuel, you can fy 135 statute airmites by 18 MPH CAS. However, you can fy 115 statute by immediately climbins to 2000 feet with	At 95000 feet critics at 945 WDU CAS and	At 25000 feet cruise at 265 MPH CAS and start letdown 20 statute airmiles from destination. With a Lio MPH	At 25000 feet cruise at 265 MPH CAS and 20 statute airmites from destination. With headwind the range at 25000 feet will be 11,5	At 25000 feet truite at 265 MPH CAS and 20 statute airmiles from destination. With a headwind the range at 25000 feet will be 145	At 25000 feet cruuse at 265 MPH CAS and 20 statute sirmiles from destination. With a headwind the range at 25000 feet will be 11,5	or intercented times at 265 MPH CAS and At 25000 feet cruise at 265 MPH CAS and 20 statute airmise from destination. With headwind the range at 25000 feet will be 11,5 or 130 statute airmise. Cruise at 265 MP	At 25000 rest using 2 2000 rest using 2 2000 rest using 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
ENG. 135_8_20 CHART V	432-A-65	IF YOU ARE AT	BY CRUISING OPT. ALT. AT 30000' 1000 FT.	11482	1200	800	700		CRUISING AT 30000		MIND C.A.S. 189M 18/HR G.S.	120 HW		40 HW	0	WT 04	WL 08	120 TW	Cimb at 100% RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL.	v of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.	y of 6.5 LBS/GAL.
F-84G-IRE thru-5RE AIRPLANE MOD.		IF YOU ARE AT 25000'	BY CRUISING OPT. ALT. BY CRUISING AT 23000" 1000 FT. AT OPT. ALT.	245	1	135	59		CRUISING AT 25000'	APROXIMATE	C.A.S. RPM 18/HR G.S. FACTOR DOWN	280 94 2470 290 07 15	93 2410 320 .8	265 92 2320 345 .9 20	265 92 2320 385 1.0 20	250 91 2200 405 1.1 20	250 91 2200 445 1。2 25	210 90 2140 475 1.44 25	1 Climb at 100% RPM 2 Multiply statute units by 87 to obtain nautical units. 3 Read lower half of chart opposite effective wind only. 4 Make additional allowances for landing, navigational errors, combact formation flight etc. as required. 5 Chart weight limits based on fuel density of 6.5 LBS GAL.							

Figure A-10. Flight Operation Instruction Chart (Sheet 8 of 8) F-84G-1RE thru -5RE

2 Jo D60		AIR	AIRPLANE MODEL(S)	MOD	EL(S)			FE	FLIGHT		ERA	OPERATION INSTRUCTION	Z	STR	SUC.	101	7		ш	EXTERNAL LOAD ITEMS	AL	LOAI	D ITE	SE	
MCRE I Me. 23 Shoet I (Rev. I M	# W	F-84G-1RE	F-84G-1RE thru-5RE ENGINE(S) J35-A-29	-5RE				CHART WEIGHT LIMITS	WEIGHT	LIMITS	C 222/12	CHART	=	TO 20768	5	NO.	OS	Four-	230 Ga	Four-230 Gal, Tanks carried entire distance. NUMBER OF ENGINES OPERATING.	Carri	ed ent	ire di	tance	
INS less gatio	TRUCTI than fue wal error ude and r	IONS Free availant for forms	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, navigational errors, formation flight, etc.). Move horizontally right or left to section according to present thicke, and read total range available (no wind) by cruising at that altitude or by climbing to another altitude or patimum names. For a flight at initial altitude one-raino instructions are somen designations.	CHART: uise (fuel etc.). Mov uilable (no	(A) IN I on board e horizon wind) b	FLIGHT 1 minus ntally rig y cruisin y cruisin	T - Select allowanght or left ig at that	figure in ces for it to section altitude	fuel colu. reserve. nn accord or by cl	mn equa combat, ling to pi limbing t	navi- esent o an-		NOT on fi it is	res: Ra lights red necessar b may by	unges sho quiring n y to obse	wn at a nore that erve the	optimum optimul	hart (due m cruising	are ma	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range of sights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum crusing altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for description	n order guration chart, i.e.	to obta or gro	in maxir as weigh	num ran it change ig charts	9 (° a s
rectly instruc on bos sary al values.	y below. uctions is oard subs allowances.	For a lin appro	rectly below. For a flight at higher altitude, climb immediately to desired altitude and read crusing arturnitions in appropriate crusing affitude section. (B F EIGHT PLANNING—From initial fuel on board aubtract fuel required for takeoff and climb to desired crusing altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	her altitude ing altitude for take-off as for IN	e section.	(B) F) nb to der above.	LIGHT I	PLANNI PLANNI Sing altitu	NG - Fr	read cr om initia ill other i	uising I fuel neces-		dista	ance and	fuel Cli	mb dist.	A CONT	fuel are	included O FUEI	distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	mbs are	indicat	DING	000	Ĭ
										1	LOW	ALT	ALTITUDE	DE											
14	IF YOU ARE AT S.	E AT S	S. L.			IF YOU ARE		AT 5000'			F YOU	IF YOU ARE AT 10000'	10000			IF YOU	ARE A	YOU ARE AT 15000'				F YOU	YOU ARE AT 20000	AT 2000	6
	RANGE IN AIRMILES	A AIRMIL	ES	FUEL		RAN	RANGE IN All	AIRMILES			RANG	RANGE IN AIRMILES	MILES			RANG	RANGE IN AIRMILES	RMILES		FUEL		RAN	RANGE IN AIRMILES	RMILES	
BY CRUISING AT S. L.	_	OPT. ALT. 1000 FT.	BY CRUISING AT OPT, ALT.	. I.BS.	AT AT	BY CRUISING AT 5000'	OPT. ALT. 1000 FT.	-	BY CRUISING AT OPT. ALT.	× *	AT 10000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRUISING AT 15000'		OPT. ALT. 1000 FT.	$\overline{}$	BY CRUISING AT OPT. ALT.	LBS.	BY CRI	BY CRUISING AT 20000'	OPT. ALT. 1000 FT.	T	BY CRUISING AT OPT. ALT.
1055	25	20	1970	8847	E	(1190)	(RANGE	IGE FIGUR	(1990)	DE ALLO	LLOWANCES (1380)	FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL) (1990) (1380) 25 (2005) (1525) 25	SCRIBED ((2005)	DESCENT TO (1525)	TO SEA 25)	LEVEL) 25	(2025)	(5)	881.7	(1745)	5	25	2	(30)(5)
1040	25	10	1950	8800	(3115)	75)	25	(1)	(1970)	(13	(1365)	25	Ö	1990)	(1510)	(01	25	(2005)	(5)	8800	(1720)	(0)	25		(2025)
1020	25.25	10.10	1915	8600	11	1150	25 25	нн	1935	25	1335	25	77	1955	24,80 24,415	88 53	25	1970	025	8400	(1690)	5)	25	55	(1990)
975	25	10	1835	8200	10	1095	25	1	1860	12	1275	25	75	1875	21415	25	25	1895	50	8200	1620	0	25		1915
950	22 23	10.10	1800	7800	10	1070	25 25		1820	77 77	1245	25	HH	1830	1385	20.0%	25	1855	75 70	9000	1585	10.0	25 25		1875
905	52		1720	7600	10	0101	25	П	1740	H	5811	25	1,	1760	1320	50	25	1775	25	2600	1515	20	25		1800
885	25	10	1680	74,31	1005	%	52	-	1705	7	3911	52	Ħ	1730	1290	0,	25	1750	0,0	74,31	1485	10	25	г	1765
Ö	CRUISING	AT S.	L.	EFFEC	L	CRUI	CRUISING AT	T 5000′			CRUISING		AT 10000'			CRUISING		AT 15000′				CRUIS	CRUISING AT 20000'	20000	
1	APP	APPROXIMATE					APPRO	APPROXIMATE				APPROXIMATE	CIMATE				APPRO	APPROXIMATE		EFFEC			APPRC	APPROXIMATE	
CAS. BPM	LB/HR	5.0	RANGE DOWN FACTOR DIST.		CAS.	New 12	LB/HR G. S.	S. FACTOR	E DOWN R DIST.	C.A.S.	% RPM 18/	LB/HR G. S.	FACTOR	DOWN DIST.	CAS.	RPM CG.	LB/HR G.:	S. FACTOR	DOWN POIST.	WIND	CAS	N W W	LB/HR G.	G. S. FACTOR	SE DOWN OR DIST.
			7).	120 HW																120 HW	34.5	120	2640 3	340 o.7	
				80 HW						370	89 29	2950 345	9	97	355	90 27	2745 355	80	10	80 HW	345	91	2640 30	380 °8	35
\rightarrow	3450	350	60	40 HW	380	88	3200 365	60	w	360	88 28	2850 370	60	10	355	90 27	2745 395	6° 50	IJ	40 HW	330	90	2525 4	6° 001	20
+	-	380	1.0	0	365	-	3085 390	0°1 0	w	360	88 28	2850 410	1.0	10	340	89 26	2650 420	100	25	0	330	90	2525 14	140 1.0	20
370 85	3270	017	101	40 TW	355	98	3005 420	1,1	ın	350	87 27	2780 lilio	1,1	30	औ०	89 26	2650 460	1,1	15	40 TW	330	90 2	2525 148	480 1.1	20
				W 74						350	87 27	2780 480	1.2	10	330	88 25	2590 490	1°5	20	₩1 08	320	89 2	2440 50	505 1.2	25
-				120 TW								-					-			120 TW	320	89 2	2140 51	545 1.3	25
								10000		The Personal Property lies		-				-	-		1			1	-	-	

Figure A-11. Flight Operation Instruction Chart (Sheet 1 of 12) F-84G-1RE thru -5RE

	G:1	,00,	0720	AT OPT. ALT.					1			T		ò		RANGE DOWN FACTOR DIST.								H H H Shoot Shoot Shoot Shoot Sold Shoot Sold Shoot Sold Shoot Sho
	RATIN	NT 450	IRMILES 7	¥					+			+		45000	APPROXIMATE	G. S.		-	-	+		-		VIND- VIND Wind) IR LES P S PER IRCE
	NO. OF ENGINES OPERATING:1	IF YOU ARE AT 45000'	RANGE IN AIRMILES	1000 FT.										ING AT	APPR	LB/HR G				1				, TAILV Effective (Zero W S PER I JTE MI POUND NBLE AL SOL
	ENGIN	IF YOU	RAN											CRUISING		* #								ND, TW
tance.	O. OF		RAI RV CRIISING	AT 45000'												25.								ADWIN DISTA N AIR? N AIR? SUMPT SUMPT ESIS A
Tanks carried entire distance.	ž		130	LBS.								1		79399	TIVE	WIND	120 HW	80 HW	40 HW	0	40 TW	WT 08	WT 021	LEGEND EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS.—GROUND SPEED IN STATUTE MILES PER HR GS.—CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE. BASED ON JP—3 FUEL
ed ent			Č.	ALT.					1			1		T		LET DOWN DIST.								WIND-OR = OR ERATED ALFU FULL FULL FULL FULL FULL FULL FULL
Carri		,0000	ES AY CRISS	AT OPT. ALT.										,000	ATE	RANGE								EFFECTIVE WIN RANGE FACTOR G.S.—GROUND SI CAS.—CALIBRAT LB/HR.—TOTAL ()—RANGE IN ONLY WITH BASED ON JP-3
Larins		IF YOU ARE AT 40000'	RANGE IN AIRMILES	E.	7			-1-	1			1		CRUISING AT 40000	APPROXIMATE	G. S.								EFFEC RANGE G.S. – C CAS – C LB/HR ()–1
URI.		U ARE	NGE IN	8	A LEVEL				1					SING	API	LB/HR								
rour-230 Gal.	9	IF YO	RAN	AT 40000'	T TO SE		4							CRU		* 44								it i Mesose
Fou	EXT. LOAD			N I	DESCEN								- 1			25							50	of available holding 34,0 ce airmiles 100 % RPM start letdown a 80 MPH 55 x 8 HH CAS with airmiles from
4	EX		9	AT OPT. ALT.	LIMB &											DOWN DIST.								EXAMPLE JUGO feet with 8µ00 1Ds. of available 1µ15 statute airmiles by holding 3µ0 cever, you can fly 1935 statute airmiles climbing to 25000 feet using 100 % RPM airmiles from destination. With a 80 NPH ge at 25000 feet will be 1935 x .8 be airmiles. Cruise at 325 NPH CAS with teart letdown 25 statute airmiles from
5	18.	35000	ILES BY CO.	AT OP	RIBED C									,0005	WATE	RANGE								EXAMPLE Statute Statute
	9920	IF YOU ARE AT 35000'		00 FT.	R PRESC				T					AT 35000	APPROXIMATE	S. O								MPLE with 84,00 lbe te aimiles the aimiles fly 1935 8tb 5000 feet us 50 MH CAS 52 MH CAS 61 MB 61 MB 62 MB 63 MB 64 MB 65 MB 64 MB 66 MB 6
	TO 20768	OU AR	ANGE -	5 2	CES FO			_	+			+		CRUISING	*	LB/HR								EXAMPLE tatute with 8L tatute u can fly 15 to 25000 at 325 MPP es from destin 5000 feet v miles. Cruise lown 25 st
MIGH ALIIIUDE		IF Y	8 4	AT 35000' 1000 FT.	LOWAN									CR		* 4		_	-			+		EX 15000 feet fly 11415 stat flowers, you co y climbing to feet cruise at airmise fi airmise fi airmise fi feange at 2500 tatte airmith
	222h2			*	LUDE AI				+			4		L		\$ C \$ \$				-				at 1. S. Howe feet class the range of the ra
	IMITS	ò	243116	AT OPT. ALT.	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)											GE DOWN OR DIST		_					I	EXAMPLE If you are at 15000 feet with 8400 lbbs, of available fuel, you can fly 1145 statute airmiles by holding 34,0 MPH CAS. However, you can fly 1935 statute airmiles by immediately climbing to 25000 feet using 100 % RPM At 25000 feet ruise at 325 MPH CAS and start letdown 30 statute airmiles from destination. With a 80 MPH headwind the range at 25000 feet will be 1935 x .8 or 1550 statute airmiles. Cruise at 325 MPH CAS with this wind and start letdown 25 statute airmiles from destination.
	WT.	AT 30000'	AIRMILES	. ¥	SE FIGU				4			1		AT 30000	APPROXIMATE	RANGE FACTOR								fue MP MP des
	CHART WT. LIMITS			1000 FT.	(RAN										APPRO	LB/HR G. S.				-				
	6	IF YOU ARE	RANGE IN	.000	T				1			1		CRUISING		3 34		-	-	+				GAL.
	J35-A-29	=	2	AT 30000'												54.5								l units. d only. naviga d. .5 LBS/ AL.
	ENG. J.		FUEL	LBS.		8800	9600	8400	8200	8000	7800	7600	7431		TIVE	WIND	120 HW	80 HW	40 HW	0	₩ 07	%T 08	WT 021	tein nautical units. effective wind only. or landing, navigationa required. density of 6.5 LBS/GAL. f 6.5 LBS/GAL.
		-	9					- mes	1					-	Γ	DOWN DIST.	25	25	25	8	28	35	35	to obta osite eff es for ght etc. 1 fuel de iity of 6
u-5RE		25000	ILES	AT OPT. ALT.										2000	NATE	RANGE	7.	80	60	1.0	1,1	1,2	1.3	RPM nits by .87 chart opp allowanc mation of s based of t fuel dens
F-840-1RE thru-5RE	MOD.	IF YOU ARE AT 25000'	RANGE IN AIRMILES	1000 FT.		22 23	25	25	25	25	25	25	25	4G AT 25000'	APPROXIMATE	8 0 8 0	2620 365	2540 390	2540 4.50	2540 470	2430 490	24.30 530	24.30 570	Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.
84g-	AIRPLANE MOD	YOU	RANG	200					+			+		CRUISING		% 18/48		-		-				limb at Kultiply Read lov Kake a rrors, CK Thart we hart we have I hart we
,~	AIRP	=		AT 25000'		(1885)	(1830)	(1795)	(1760)	1720	1685	1645	1610	1		CAS.	335 93	325 92	325 92	325 92	310 91	310 91	310 91	- 4 8 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8

Figure A-11. Flight Operation Instruction Chart (Sheet 2 of 12) F-84G-1RE thru -5RE

F-840-178 thru-588 CHART WEIGHT LIMITS 20068 TO 2001 POLINE	ANE MODEL(S) thru-5re J35-A-29	ANE MODEL(S) thru-5re J35-A-29	ODEL(S)	ODEL(S)		FLIGHT	FLIGHT	FLIGHT	- I	0 1	PE	CH	CHART	Z º	NSTRI	UCT	NO S		Four-23	20 Gel.	Four-230 Gal, Tenks carried all the way.	AL L	OAD I	TE the wa	SW .	
INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, navigational errors, formation flight, etc.). Move horizontally right or left to section according to present other entroits from the seat total range evailable (no wind) by cruising at that altitude or by climbing to another altitude of maximum range. For a flight at initial altitude, operating instructions are given distruction in appropriate cruising altitude section. (B) FLIGHT pLANNING—From initial fuel on board aubtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	TIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel coftuel available for cruise (fuel on board minus allowances for reserver oros, formation flight, etc.). Move horizontally right or left to section accorded to a reason of the desired selected in the selection accorded to a range available (no wind) by cruising at that altitude or by ude of maximum range. For a flight at initial altitude, operating instruction w. For a flight at higher altitude, climb immediately to desired altitude as in appropriate crusing altitude section, (B) FLIGHT PLANNING – Fubbrack fuel required for take-off and cl.mb to desired crusing altitude and altitude and altitude and altitude and altitude and cl.mb to desired crusing altitude and altitude and altitude and altitude and cl.mb to desired crusing altitude and cl.mb desired crusing altitude and altitude and altitude and altitude and altitude and cl.mb desired crusing altitude and altitude	S FOR USING CHART: (A) IN FLIGHT – Select figure in fuel colusible for cruise (fuel on board minus allowances for reservermation flight, etc.). Move horizontally right or left to section account and a range available (no wind) by cruising at that altitude or by maximum range. For a flight at initial altitude, operating instruction a flight at higher altitude, climb immediately to desired altitude appropriate cruising altitude section. (B) FLIGHT PLANINIOL - F propriate for take-off and climb to desired cruising altitude setting.	NG CHART: (A) IN FLIGHT – Select figure in fuel coloruse (fuel on board minus allowances for reserve pth. etc.). Move horizontally right or left to section acconvaniable (no wind) by cruising at that altitude or by ange. For a fight at initial altitude, operating instruction higher altitude, climb immediately to desired altitude an using altitude section. (B) FLIGHT PLANNING – Fed for take-off and climb to desired crusing altitude said.	MAT: (A) IN FLIGHT – Select figure in fuel col (fuel on board minus allowances for reserve). Move horizontally right or left to section acco- for for wind) by crusising at that altitude or by or a flight at initial altitude, operating instruction altitude, climb immediately to desired altitude an altitude section, (B) FLIGHT PLANNING – F take-off and cl.mb to desired crusing altitude and for IN FLIGHT above, adding initial climb disk	IN FLIGHT – Select figure in fuel control and allowances for reserve horizontally right or left to section accoming by cruising at that altitude or by it at initial altitude, operating instructio climb immediately to desired altitude and climb to desired altitude and climb to desired altitude and climb to desired attitude and climb to desired attitude and climb to desired attitude and ald Limb to desired crussing attitude and AIGHT above, adding initial climb dist	JGHT – Select figure in fuel coming allowances for reserve allowances for reserve retuining at that altitude or by all altitude, operating instruction and altitude operating instruction and altitude and IB FLIGHT PLANNING – Fro desired altitude and thowe, adding initial climb distributed.	Select figure in fuel collidowances for reserve to felt to section acconst that that altitude or by at that altitude or by to desired altitude any to desired altitude and CHT PLANNING - Fed cruising altitude and iding initial climb disk	gure in fuel color section accolor section accolor ting instruction accolor and an accolor and accolor	0 0 0 0 0 0 0 0 0 0	lumn e compression de	qual to bat, name of prese ng to a given of cruisin nitial function to receive to range			NOTE on fligl it is ne climb r	S: Rang hts requ ccessary may be r e and fu	ges showr iring moi to observ required t lel. Climb	n at opti re than ce the op to obtain distance	imum al one char otimum (a maxii e and fu	tritudes a rt (due t cruising a mum ran rel are in	re max o extern altitude ge. All i cluded i	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	order to uration thart, i.e. tes inclu the are ii	obtain or gross when le allow odicated	maxim weight changing chances for L	change) change) charts a	
											LOW		E	ALTITUDE	ш											
IF YOU ARE AT S. L.	S. L. IF YOU ARE	S. L. IF YOU ARE						5000′			IF Y	IF YOU ARE AT 10000'	E AT 1	,0000		F	IF YOU ARE AT 15000'	E AT 1	5000			<u> </u>	You	ARE A	YOU ARE AT 20000	1
	FUEL RANGE IN	FUEL RANGE IN	FUEL RANGE IN	RANGE IN				AILES			-	RANGE IN AIRMILES	A AIRMIL	ES			RANGE IN AIRMILES	N AIRMI	LES	Π	FUEL		RANG	RANGE IN AIRMILES	MILES	
BY CRUISING OPT. ALT. BY CRUISING BY CRUISING OPT. ALT. BY CRUISING AT S. L. 1000 FT. AT OPT. ALT. LIBs. AT 5000 1000 FT. AT OPT. ALT.	AT OPT. ALT. LBS. AT 5000' 1000 FT.	AT OPT. ALT. LBS. AT 5000' 1000 FT.	LBS. AT 5000' 1000 FT.	BY CRUISING OPT. ALT. AT 5000' 1000 FT.	OPT. ALT. 1000 FT.	OPT. ALT. 1000 FT.	ij ii	_	27		AT 10000	O O O	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	-	BY CRUISING AT 15000'	O O	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	SING ALT.	LBS.	BY CRUISING AT 20000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	UISING T. ALT.
30 1680 7431 1005 30 1705 1165 30 1730 1290	1680 7431 1005 30	7431 1005 30	7431 1005 30	1005 30	(RANGE	(RANGE	NGE	E FIGURES INCL	ū		1165	NCES FO	OR PRESCR	RIBED CLIA	IMB & DE	SCENT TO	SEA LEV	LEVEL)	1750		7431	71,85		30	346.1	3
30 1640 7200 965 30 1660	1640 7200 965 30	7200 965 30	7200 965 30	965 30	30	30		1660			1125	111	28	1680		1255		30	1700		7200	0क्षा		8	1715	, 2
1600 7000 940 30	1600 7000 940 30	7000 940 30	940 30	940 30	30	30		1620			1095		8	1640		1220		30	1660		2000	11,05		30	1675	100
1560 6800 915 30	1560 6800 915 30	6800 915 30	30	30	30	30		1580			1065	***	30	1600	_	1190		30	1620		0089	1370		30	1635	32
30 1515 6600 890 30 1535	1515 6600 890 30	6600 890 30	890 30	890 30	30	30	+	1535		+	1035	6.7	30	1560		1155	-	30	1580		0099	1330		30	1595	35
30 11/15 64,00 865 30 11/95	14.75 64.00 865 30	64,00 865 30 6200 84,0 30	865 30	865 30	8 8	8 8		14.95			1005	en e	30	1515		1125		30	1535		00179	1295		30	1550	0,0
1390 6000 815 30	1390 6000 815 30	6000 815 30	815 30	815 30	30 %	30 %		0141			950	1 (1)	3 8	14.30		1055		9 8	1450		0009	1260		8 8	0121	9.0
30 1375 5944 810 30 1400	1375 5944 810 30	5944 810 30	810 30	810 30	8			14,00			076	(1)	30	11,20		1050		30	०५५६		5944	1215		8	11460	9
CRUISING AT S. L. FFFFC. CRUISING AT 5000"	AT S. L. CRUISING	CRUISING	CRUISING	CRUISING				5000			S	CRUISING	AT 10000	, 000	+	2	CRUISING AT 15000'	AT 15	,000	T	T		- Killsin	CRUISING AT 20000	20000	
П	TIVE	TIVE	IVE		APPROXIMATE	APPROXIMATE	APPROXIMATE	MATE	П		Ц	V	APPROXIMATE	ATE	T	Ц	Y	APPROXIMATE	MATE	T	EFFEC.	-		APPROXIMATE	CIMATE	
LB/MB G.S. FACTOR DOWN WIND CA.S. RPM LB/MR G.S. FACTOR DOWN	G.S. FACTOR DIST. WIND C.A.S. RPM 18/HR G.S. FACTOR DOWN	PACTOR DIST. WIND CA3. RPM 18/HR G.S. FACTOR DIST.	WIND CA.S. RPM LB/HR G.S. RANGE DOWN	C.A.S. RPM L8/HR G.S. FACTOR DIST.	RPM LB/HR G. S. FACTOR DIST.	LB/HR G.S. FACTOR DIST.	G. S. FACTOR DIST.	RANGE DOWN FACTOR DIST.	-	CAS.	S. RP. S.	LB/HR	si Ö	RANGE D	DOWN C. DIST.	CAS. RPM	A LB/HR	8	RANGE D	DOWN DIST.	WIND	CAS.	% LB/HR	A	RANGE	DOWN DIST.
120 HW	120 HW	120 HW	120 HW	20 HW																-	120 HW	335	90 2h	24,30 325	100	N
WH 08			80 HW	80 HW						370	0 88	2870	345	89	10	355 89	9 2670	355	90	25	80 HW	335	90 2h	24,30 365	80	3
3360 350 °.9 = 40 HW 380 87 3140 365 °.9 5	350 °.9 = 40 HW 380 87 3140 365 °.9	.9 - 40 HW 380 87 3140 365 .9	40 HW 380 87 3140 365 °.9	380 87 3140 365 °.9	87 346 365 °9	3140 365 °9	365 09	\dashv		370	0 88	2870	385	60	10 3	34,5 88	8 2610	385	6.	25	40 HW	325	89 23	2380 395	60	20
380 1.0 - 0 370	380 1.0 = 0 370 86 3060 395 1.0	- 0 370 86 3060 395 1 _o 0	370 86 3060 395 1.0	370 86 3060 395 1.0	86 3060 395 1.0	3060 395 1.0	395 1.0	00		350	0 87	2700	1,00	ToO	10 3	34,5 88	8 2610	425	1.0	73	0	325	89 23	2380 435	100	20
3190 410 1.1 - 40 TW 355 85 2945 420 1.1 5	410 1.1 - 40 TW 355 85 2945 420 1.1	- 40 TW 355 85 2945 420 1.1	40 TW 355 85 2945 420 1.1	355 85 2945 420 1.1	85 2945 420 1.1	2945 420 1.1	h20 1.1		200	350	0 87	2700	offi	1,1	10 3	330 87	7 2515	1450	1,1	35	WT 04	325	-	+	+	20
WT 08	WT 08	WT 08	W1 08	W 1W						335	98	2600	797	1.2	10 3	330 87	7 2515	1490	1,2	1,51	WT 08	315	88 2295	95 500	1.2	25
120 TW	120 TW	120 TW	120 TW 120 TW	20 TW						4	-			1	-	-				-	120 TW	315	88 22	2295 5lao	1,3	25

Figure A-11. Flight Operation Instruction Chart (Sheet 3 of 12) F-84G-1RE thru -5RE

1	F-846-1RE thru-5RE	E thr	u-SRE	×							5	A	Ξ	HIGH ALTITUDE	£4	our-zy	Gal.	SING	arried	Four-230 Gal. tanks carried all the way.	ay.			
AIRPL	AIRPLANE MOD	٥		ENG.	J35-A-29	-29	CHAR	CHART WT. LIMITS	IMITS	20768		TO 19294	76	18.	EXT. LOAD	AD	-		-	۷	NO. OF ENC	ENGINES OPERATING:	PERATII	₹G: 1
IF Y	IF YOU ARE AT 25000'	AT 2	2000	-		IF YC	IF YOU ARE A	AT 30000'	o,		IF Y	IF YOU ARE AT 35000'	AT 35	,000		IF YOU	IF YOU ARE AT	T 40000	٥,		IF.)	IF YOU ARE AT 45000'	AT 45	,000
~	RANGE IN AIRMILES	AIRMIL	ES	FUEL	3	RA	RANGE IN A	AIRMILES			oż.	RANGE IN AIRMILES	AIRMILE	S		RAN	RANGE IN AIRMILES	RMILES		FUEL	_	RANGE IN AIRMILES	AIRMILE	S
BY CRUISING AT 25000'	4G OPT. ALT. 1000 FT.	ALT. FT.	BY CRUISING AT OPT. ALT.	LBS.	BY CR AT 3	BY CRUISING AT 30000'	OPT. ALT. 1000 FT.	T. ATC	8Y CRUISING AT OPT. ALT.		BY CRUISING AT 35000'	1000 1000	OPT. ALT. B 1000 FT. A	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000"	OPT. ALT. 1000 FT.	T. AT	BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 45000'		OPT. ALT. B	BY CRUISING AT OPT. ALT.
							(RAP	JGE FIGU	RES IN	CLUDE AL	LOWAN	ICES FOR	PRESCRIL	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	& DESCEP	AT TO SE	(LEVEL)							
1610	8		1780	7431	1745	115	30													7431				
1570	30	+	1740	7200	1710	10	8	-		4		-								7200				
1530	38		1695	7000	1665	65	8													2000				
1490	30	7	1655	9800	1625	25	30													9089				
1450	30	1	1615	0099	1585	85	30	+		+		-	+					+		0099		-	1	
1410	30		1570	9700	1540	10	30													00 [†] 19				
1330	8 8		1530	9000	1495	20 20	2 %													9000				
1320	30		21,475	5944	OTT	01	30		1 2	-				1 3						5944				
3	CRUISING AT 25000'	AT 25	,000	-	L	CRU	CRUISING AT	AT 30000'		+	CR	CRUISING AT 35000'	AT 350	8	1	CRUIS	CRUISING AT 40000'	40000			S	CRUISING AT 45000	1 3	è
-	APPR	APPROXIMATE	ATE	TIVE			APPRO	APPROXIMATE		-	-	APP	APPROXIMATE	TE			APPRO	APPROXIMATE		EFFEC.		APP	APPROXIMATE	TE
CAS.	LB/HR	25	RANGE DOWN FACTOR DIST.	850	ÇAS	* 4	LB/HR G	G. S. FACTOR	GE DOWN OR DIST.	\$ 5 \$	\$ 4 dg	LB/HR	S. S.	RANGE DOWN FACTOR DIST.	3	3 4	LB/HR G. S.	S. FACTOR	GE DOWN		CAS. RPM	LB/HR	8 0	FANGE DOWN FACTOR DIST.
320 92	2365	340	.7 25	120 HW	290	94	2210 34	7° 046	7 30	0										120 HW				+
310 91	2310	370	.8 25	80 HW	290	76	2210 38	8. 088	35	10										80 HW				
310 91	2310	마이	.9 25	40 HW	290	116	2210 420	6. 0	9 35	10										40 HW				
310 91	2310	450	1.0 30	С	290	94	2210 46	09'	07 0											0				
310 91	2310	061	1,1 30	₩T 0#	285	93	2190 49	1.1	1 45	10										WT 04				
300 90	2235	515	1.2 35	WT 08	285	93	2190 535	1,2	5 1/5	10								+		WT 08				
300 90	2235	555	1.3 35	120 TW	285	66	2190 575	5 1.3	3	-										120 TW				
1 4 8 4 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Climb at 100 % RPM Multiply statute units by Read lower half of climb Make additional allow errors, combat, formation Chart weight limits based Fuel flow based on fuel.	100 % atute u half of itional itional ht limit ht limit assed or	Climb at 100 % RPM Multiply statute units by .87 to obtain nautical units. Read lower hall of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS GAL. Fuel flow based on fuel density of 6.5 LBS GAL.	obtain nau te effective for land etc. as rec sel density	utical uni wind on ling, nav quired. of 6.5 Ll S/GAL.	its. ly. rigation BS GA	L.	If y fuel MPI MPI At LO head or this	If you are at tuel, you can MPH CAS. He you can MPH CAS. Ho you mediately at 30000 Us statute headwind the re resident in swind and files wind and statute this wind and files wind and files wind and statute this wind and statute.	tan fly S. Howe at left clips feet clips feet clips it feet sange statut and stand s	5000 f 1190 e ver, you imbing t cruise e airmile e airmile rt letde	EXAMPLE If you are at 15000 feet with 6800 lb fuel, you can fly 1190 statute airmiles MPH CAS. However, you can fly 1620 st by immediately climing to 30000 feet us At 30000 feet cruise at 290 MPH CAS. Lo statute airmiles from destination. Wheadwind the range at 30000 feet will be or 1295 statute airmiles. Cruise at 29 mpH his wind and start letdown 35 statute	6800 airm 1620 O feet MPH C MPH construction eet will be uise at a tatul	by h hatting 1 and selection of MPP 1620	of available holding 34,5 tre airmiles tre airmiles star letdown a 80 MPH ON The Star letdown airmiles from ai	in www.	RA RA CAN	NGE F. NGE F. CARC S-CAL (HR- ONLY)	VE WINE ACTOR = NUND SPI IBRATE FOTAL F VGE IN WITH	LEGEND GROUND RANGE II RANGE II SED IN ST. OLL CONSPENDEL CONSPENDEL FRC	LEGEND EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = GROUND DISTANCE (Effective Wind) GAS.—GROUND SPEED IN ATRUITES (Zero Wind) GAS.—CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE	rw, Tall E (Effecti ES (Zero LES PER TUTE N I – POUN ILABLE	WIND We Wind Wind) HR ILLES 1 DS PEI	239C H H H H H H H H H H H H H H H H H H H
DATA	DATA AS OF. J	July	July 1951	BASED ON: Estimates	4. Estin	nates		dest	destination.	200	D FIGU	RES HAVE	NOT 8	=	T CHECK		ed .	SEU O	BASED ON JP-3	FUEL				No

Figure A-11. Flight Operation Instruction Chart (Sheet 4 of 12) F-84G-1RE thru -5RE

Part	013	:06 Ye	A	AIRPLANE MODEL(S)	ME	MODE	L(S)	-	3	L	GHI	0	PER	ATI	NO	INS	TRU	CTI	NO				EXTERNAL		OAI	LOAD ITEMS	SW	
NOTESTED COLUMN CHART CALON IN PLICATI Scient figure in fuel column equal to or flights in the figure and include for crues, claim being in preventable for crues, claim being introverse and include and credit below. For a fight at infall attitude, experient, claim being instructions in appropriate cruining attitude, experient, claim being and all other races are given districted attitude and race fruiting attitude an	I seed2	Me I , wear)	F-84G	ME(S) J3	74-5RE	. 6			100	CHARI	WEIGH	IT LIMIT	S 19	CH Ser	ART	Б	17820		POUND		Wr-230	Gal.	Tan kas c	arried PERATIN	all t	he way		
FYOL ARE AT S. L FYOL ARE AT SOCY FYOL ARE AT	U = # # P F E P # 2	ISTRUC se than tional er ittude an her altitude an truction truction board s y allows	fuel averrors, for and read of the solution of	S FOR USI aliable for rmation fli total range maximum a flight at a flight at propriate c fuel requii	SING CI or cruise light, etc le avails range. I t higher t higher cruising irred for	HART: (, C.) Move c.) Move c.) Move c.) Move for a flight altitude, t altitude take-off a for IN FI	A) IN I n board t horizo vind) b ht at in climb i section.	FLIGH d minu ntally r yy cruss itial alt mmedia (B) F nb to de	T - Selecting at the selection of the se	th figure for the second at altitumerating desired a desired a desired a formula for the second	in fuel colling the colling account to account to account the colling and the	umn equentials of compared and the sare good and read and read all other and compared and the sances to compared and the comp	ual to or tt, navi- present g to an- iven di- cruising ial fuel r neces- o range			NOTES on fligh it is nec climb m distance	Essary to and fue and fue	ss shown ing mor o observ equired t	at opti e than c e the op o obtain distance	mum a one chai timum a maxi e and fu	tritudes and (due tricusing mum ran rel are in NS NO	are max to exter altitude ige. All reluded FUEL	dimum. In nal confi on each range val where cli	guration chart, id lues incli mbs are	or gro or gro or gro indicate	in maxi ss weigl changi wances ed.	maximum range weight change), hanging charts a inces for descent	nge e), s a ent
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340 85 2565 470 1.2 10 325 86 2380 480 1.2 15	80	_	_	1,1	1	40 TW	360					350		2630	Off				-	_	1,1	15	40 TW	310	87 2	2160 4	455 1.1	1 20
			81			WT 08						3/10		2565		70.000	_				_	15	WT 08	310	87 2	2160	495 1.2	25 25
	_					120 TW											-						120 TW	310	87 2	2160 5	535 1.3	3 25

Figure A-11. Flight Operation Instruction Chart (Sheet 5 of 12) F-84G-1RE thru -5RE

AIRPL	AIRPLANE MOD.	D.		ENG.	J35-A-29	5	HART W	CHART WT. LIMITS	19294	2	17820	18.	EXT. LOAD	0				NO. OF EN	ENGINES OPERATING: 1	OPERATII	7G: J
F	IF YOU ARE AT		25000	-	IF.	IF YOU ARE		AT 30000'		IF YOU	IF YOU ARE AT 35000'	T 35000′		IF YOU ARE AT 40000	ARE AT	40000		-IF	IF YOU ARE AT 45000"	R AT 4	,000
	RANGE IN AIRMILES	AIRMIL	ES	LOEL		RANGE IN	N AIRMILES	ES		RAN	RANGE IN AIRMILES	MILES		RANG	RANGE IN AIRMILES	HLES	<u> </u>		RANGE	RANGE IN AIRMILES	S
BY CRUISING AT 25000'	4G OPT. ALT.		BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 30000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 35000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	ο ⊢.	BY CRUISING AT 45000'		OPT. ALT. B	BY CRUISING AT OPT. ALT.
						0	RANGE	FIGURES INC	LUDE ALL	OWANCE	S FOR PRE	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	& DESCENT	TO SEA L	EVEL)				H		
1320	30	_	27772	5944	والبلد	_											5944				
1290	30		21415	5800	ordi	-											5800				
1250	30	_	0071	2600	1360												2600				
1210	8	_	1360	5700	1320												2700		-		
1170	30	+	1320	5200	1275	+	1		4								5200		+		
1130	39		1270	2000	1230												5000				
1085	8		1230	008	1185											3.	1,800				
1000	9	+	11.85	00917	0/11	+	1							1			1,600		-		
1015	8	and the same of th	1150	1458	0111												17728				
5	CRUISING AT 25000'	AT 250	,00,	79999	S.	CRUISING	AT 30000	,000	L	CRUISING		AT 35000'	L	CRUISING AT		40000′	H	U	CRUISING AT	AT 45000	ò
_	APP	APPROXIMATE	TE	TIVE		AP	APPROXIMATE	ATE			APPRO	APPROXIMATE			APPROXIMATE	MATE	TIVE		*	APPROXIMATE	11
CAS. IPM	LB/HR	8	RANGE DOWN FACTOR DIST.		CAS. RPM	LB/HR	9	RANGE DOWN FACTOR DIST.	C. R.	1 4	LB/HR G.S.	S. FACTOR DIST.	C.A.S.	RPM LB/HR	A. O. S.	RANGE DOWN FACTOR DIST.		CAS	% LB/HR	6.8	RANGE DOWN FACTOR DIST.
320 91	2245	340	°7 25	120 HW	295 93	2125	345	.7 30									120 HW				
310 90	21.95	370	.8 25	80 HW	295 93	2125	385	.8 35						87	1		80 HW				
310 90	21.95	410	.9 25	40 HW	290 92	2060	217	.9 35								N	40 HW	_			
310 90	2195	450	1.0 30	0	290 92	2060	455	1.0 40									0				
295 89	2100	1,70	1,1 30	40 TW	290 92	2060	495	1,1 45						_			WT 04				
295 89	2100	510	1.2 35	WT 08	290 92	2060	535	1,2 45									80 TW				
295 89	2100	550	1.3 35	120 TW	290 92	2060	575	1,3 50									120 TW				
- 5	Climb at]	100 % RPM	RPM							EX	EXAMPLE				1344	CTIVE WIN	LEGEND	ON CANADA	Tur.		
- 4 8 4 8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	fultiply stated lower lake additions, combart weigh uel flow be	atute us half of littional bat, form	Multiply statute units by .87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigarerors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	obtain nat te effective for land etc. as rec el density of 6.5 LB?	Multiply statute units by 37 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	onal		If you are at 15000 feet with fuel, you can fty 960 statute MPH CAS. However, you can fty by immediately climbing to 30000 At 30000 feet cruise at 290 H 40 statute airmiles from dess	at 150 an fly 9. Howeve itely clim feet c	t 15000 feet fly 960 stat flowever, you ca ly climbing to feet cruise at airmiles fr	with 51 ute 1 and 1 30000 290 MPI	If you are at 15000 feet with 54,00 lbg, of available fuel, you can fly 960 statute airmites by holding 330 MPH CAS. However, you can fly 1325 statute airmites by immediately climbing to 30000 feet using 100% RPM At 30000 feet cruise at 290 MPH CAS and start ledown blo statute airmiles from destination. With a 80 MPH	of available olding 330 airmiles 100 % RPM tart letdown 80 MPH	0401	RAN(G.S CAS- LB/H ()-	GROUND S CALIBRAT CALIBRAT R - TOTAL R - RANGE IN	D-HW, GROU RANG PEED IN ED AIRSI FUEL CO	EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS.—GROUND SPEED IN STATUTE MILES PER HR LB/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTIESIS AVAILABLE ()—RANGE IN PARENTIESIS AVAILABLE	TW, TA CE (Effec LES (Zerc IILES PE ATUTE N - POUJ AILABLE	LWIND Live Wind Wind) R HR MILES F	ER HR
								headwind the range at 30000 feet will be or 1060 statute airmiles. Cruise at 29 this wind and start letdown 35 statute destination	he range statute and stari	at 30000 airmiles. t letdown	o feet w	feet will be 1325 x .8 Cruise at 295 MPH CAS with 35 statute airmiles from	5 x .8 PH CAS with airmiles from		BASE	BASED ON JP-3	FUEL 3		c Turing	OORGE	CRE Form 10, 239C set 2 of 2 1 May 50
DATA	DATA AS OF. THUT TOET	Trilar		01000				destingtion.													N

Figure A-11. Flight Operation Instruction Chart (Sheet 6 of 12) F-84G-1RE thru -5RE

AIRPLANE MODEL(S) FLIGHT OPERATION INSTRUCTION CHAPT
J35-4-29 CHART WEIGHT LIMITS
INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or gational errors, formation flight, etc.). Move horizontally right or left to section according to present altitude and read total range waitable (no wind) by crusing at that altitude or by climbing to an other altitude of maximum range. For a flight at initial bitude, operating instructions are given directly below. For a flight at higher altitude, climb immediately to desired altitude and read crusing instructions in appropriate crusing altitude section. (B) FLIGHT PLANNING – From initial fuel on band subtract fuel required for take-off and climb to desired crusing altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.
IF YOU ARE AT 5000'
FUEL RANGE IN AIRMILES
BY CRUISING OPT. ALT. BY CRUISING AT 5000' 1000 FT. AT OPT. ALT.
(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)
575 30
4000 550 30 970
3800 520 30 925 3600 495 30 875
34:00 465 30 830
3200 中心 30 780
3000 415 30 730
2972 415 30 720
CRUISING AT 5000'
TIVE
WIND C.A.S. RPM IB/HR G.S. FACTOR DOWN
120 HW
HW 355
0 355 85 2815 380 l.e o 5
40 TW 355 85 2815 420 1.1 5
80 TW
120 TW

Figure A-11. Flight Operation Instruction Chart (Sheet 7 of 12) F-84G-1RE thru -5RE

4 2	F-Out-Like tarta-5rds	מתת-חווים	9	0149	1	1	TOANG	111		-00	,	1		1	1	1					- I			
5	AIRTAINE MOD.			SNS.	ENG. J35-A-29		CHAR	CHARL WI. LIMITS	- 1	17620	2	16345	rg.	EXI.	I. LOAD				ł	Ö	OF ENC	OF ENGINES OPERATING: 1	PERATI	IG 1
IF YC	IF YOU ARE A	AT 25000'		200	=	T YOU	IF YOU ARE AT 30000'	30000		-	F YOU	IF YOU ARE AT 35000'	35000			IF YOU	IF YOU ARE AT 40000	40000			F	IF YOU ARE AT 45000	E AT 45	2000
RA.	RANGE IN AIRMILES	IRMILES		i n		RANG	RANGE IN AIRMILES	MILES			RANC	RANGE IN AIRMILES	MILES			RANG	RANGE IN AIRMILES	WILES	Г	FUEL		RANGE IN AIRMILES	A AIRMILE	SS
BY CRUISING AT 25000'	1000 FT.		BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 30000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	ISING ALT.	BY CRUISING AT 35000	O	OPT. ALT. 1000 FT.	BY CR AT OF	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		I.BS.	BY CRUISING AT 45000'	0. 100	OPT. ALT. B	BY CRUISING AT OPT. ALT.
							(RANG	E FIGURE	SINCLUI	DE ALLOY	WANCES	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	SCRIBED (CLIMB & L	DESCENT	TO SEA	(EVEL)					L		
1015	8	1150	20	1458	1110	0	39												4	1458		-		
960	%	1095	56	1,200	1050	0	30				1						B		7	4200		_		
915	30	1045	145	7000	1000	0	30												7	0007		-		
875	30	1000	8	3800	096	0	30												~	3800		_		
830	8	6	955	3600	016		30				1								~	3600		-		
062	30	85	506	3400	865	10	30												~	3400		_		
745	30	60	855	3200	820	0	30												M	3200		_		
202	30	80	810	3000	775	10	30												ň	3000				
569	90	60	805	2972	765	10	30												2	2972				
CRU	CRUISING AT 25000	25000	T			CRUISING		AT 30000'	T		CRUISI	CRUISING AT 35000'	35000′			CRUISI	CRUISING AT 40000	40000,	\dagger	T	8	CRUISING AT 45000	AT 450	8
L	APPRO	APPROXIMATE	T	TIVE			APPROXIMATE	MATE	T	-		APPROXIMATE	CIMATE				APPROXIMATE	IMATE	T	EFFEC.	-	AP	APPROXIMATE	TE
* 5	LB/HR G.	G. S. FACTOR	E DOWN	MIND	3	SP. LB.	LB/HE G. S.	RANGE	DOWN DIST.	CA.S.	* MAN	LB/HR G. S.	RANGE FACTOR	E DOWN	3	# RP.M. LB,	18/HR G. S.	200	LET V DOWN DIST.	WIND	CA3. RPM	18/4	si O	RANGE DOWN FACTOR DIST.
06	21.00	330 °7	25	120 HW	295 9	92 29	2750 345	7.	30								-		12	120 HW	-			F
68	2075 3	365 .8	25	WH 08	295 9	92 21	2450 385	80	35		-						-			80 HW				
89	2075 b	6° 507	98	40 HW	290 9	91 2	2160 415	60	35										_	40 HW				
88	2005 lt	η30 1°0	8	0	290 9	1 16	1960 455	1.0	η											0				
88	2005 14	470 1.1	32	WT 04	280 9	90 1.	1750 485	1.1	145										1	40 TW				-
88	2005 5:	510 1.2	35	WT 08	280 9	90 1/	1610 525	1,2	145							-11-				WT 08				
87	1959 51	540 1.3	140	120 TW	275 8	89 11	255 O97L	1.3	22								-		12	120 TW		1		
1 Clin 2 Mus 3 Res	Climb at 100 % RPM Multiply statute units by Read lower half of chart i Make additional allow errors. combat. formation	O % RPh ute units b alf of chart onal allo	M vy.87 to o t opposite wances	Climb at 100 % RPM Multiply statute units by .87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required.	tical units wind only ng, navig	rational		If you fuel, y	are at ou can	EXAMP If you are at 15000 feet with finel, you can fty 680 statute would have you can fty Angewer will can fty and fty However will can fty and fty However will can fty fty However will can fty	EX Feet () Statu	3 "	3800 lbs.	3800 lbs. of available airmiles by holding 325	available		EFF RAN G.S.	ECTIVE W GE FACTO	TIND - F	LEGEND TW, HEAROUND ROUND ANGE IN	LEGEND EFFECTIVE WIND – HW, HEADWIND, TW, TAILWIND – GROUND DISTANCE (Effective Wind) RANGE FACTOR = RANGE IN AIRMILES (Zero Wind) G.S. – GROUND SPEED IN STATUTE MILES PER HR	FW, TAI E (Effect ES (Zero LES PER	LWIND ive Wind Wind)	l a
r. F. C.	art weight	limits bas ed on fuel	density of	Chart weight limits based on fuel density of 6.5 LBS GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	of 6.5 LB	S GAL		by immedia At 30000 LO statut headwind th or 770 st	hy immediately clim At 30000 feet c LO statute headwind the range or 770 statute this wind and star	hiring the property climbing to 30000 At 30000 feet cruise at 290 M stabute airmites from dest headwind the range at 30000 feet from 770 stabute airmites. Cruis wind and start letdown 35 s	ing to iise at miles fr. 30000 airmiles	hy immediately climbing to 30000 feet using 100% RPM. At 30000 feet cruise at 290 MPH CAS and start letdown luce stabute airmites from destination. With a 80 MPH headwind the range at 30000 feet will be 965 x = 80 or 770 stabute airmites. Cruise at 295 MPH CAS with this wind and start letdown 35 stabute airmites from this wind and start letdown 35 stabute.	Of feet using NO MPH CAS and destination. With a feet will be 965 Cruise at 295 MF 35 statute	ng 100 and start ith a 8/ 5/65 × 5/MPH C	100% RPM start letdown a 80 MPH × 80 PH CAS with airmiles from		CAS LB//	CAS - CALIBR LB/HR - TOT. ()-RANGE ONLY WI	RRATED A TAL FUE E IN PAI WITH FUI	L CONSI RENTHI EL FRO	CAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR - LOTAL FUEL CONSUMPTION - POUNDS PER HR ()-RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE BASED ON JD-3 WHET.	TUTE I	MILES I	H H H H H H H H H H H H H H H H H H H
	Charles and an area	700					_	destination.	tion.											-				Per

Figure A-11. Flight Operation Instruction Chart (Sheet 8 of 12) F-84G-1RE thru -5RE

ALTITUDE	AIRPLANE MODEL(S) P-84G-1RE thru-5RE ENGINE(S) 135-A-29	NRPLANE 84G-1RE thru-	LANE E thru- J35-A-		MODE SRE 29	EL(S)			CHAR	FLIGHT OPERATION INSTRUCTION CHART WEIGHT LIMITS 16345 TO 14870 POUN	T LIMIT	PER 3 163	CH	ATION CHART	NS o	NSTRL TO 14,870	CTI	ON	n n	Four-230		Tenks o	EXTERNAL LOAD ITEMS Four-230 Gal Tanks carried all the way.	OAD all th	ITEN	S	
FOUND AFE AT 3000T FOUND AFE AT 15000T	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or less than fuel svailable for cruise (fuel on board minus allowances for reserve, combat, naviational stational errors, formation flight, etc.). Move horizontally right or left to section according to present aftitude and read total range available (no wind) by cruising at that altitude or by climbing to anrectly below. For a flight at higher altitude, coperating instructions are given distructiona in appropriate cruising altitude section. (B) FLIGHT PLANNING—From mittal fuel mobard aubtract fuel required for take-off and climb to desired cruising altitude and read cruising any allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	NS FOR USING CHART: (A) IN FLIGHT available for cruise (fuel on board minus formation flight, etc.). Move borizontally rid dtotal range available (no wind) by cruisin f maximum range. For a flight at initial altiture a flight at higher altitude climb immedia ppropriate cruising altitude section. (B) F ct fuel required for take-off and climb to de true the transparent of the formation of the for	USING CHART; (A) IN FLIGHT in fight of for cruise (fuel on board minus on flight, etc.). Move the corrotally risage available (no wind) by cruising un range. For a flight at initial altit at higher altitude, climb immedia ate cruising altitude section. (B) F vequired for take-off and climb to desert of the first of	CHART: (A) IN FLIGHT see (tuel on board minus ster). Move borizontally ril lable (no wind) by crusis For a flight at initial alti- re altitude, climb immedia g altitude section. (B) F re take-off and climb to de stor IN FLIGHT above.	A) IN FLIGHT on board minuss e horizontally ri- mind by crusisi- ht at initial attial climb immedia section. (B) F and climb to de TIGHT above.	FLIGHT on the state of the stat	Latinar of	- Sele allow ght or l ng at th tude. of tely to LIGHT sired or adding	ct figure ances fo eft to see nat altitu perating desired PLAN uising alt	in fuel col r reserve, ction accor de or by instruction altitude an VING - Fi intude and	umn equ comba rding to climbing hs are g nd read rom init all othe	t. navi present to and to and to and iven di cruising ial fuel r neces-			NOTES on fligh it is nec climb m distance	: Range ts requir essary to lay be re and fue	s shown ing mor o observe quired t	at optin e than or e the opti o obtain i distance	num alti ne chart imum cr a maxim and fuel	tudes ar (due to uising al um rang l are inc	e maxim externa iitude oo e. All ra luded wi	num. In al configu n each c nnge valu here clim	order to uration o thart, ie., les includ ubs are in	obtain r gross when cl e allowa dicated.	maximu weight nanging nces for	m range change), charts a descent	
This column												NO.		E	ION.	lul.									1		
Automatic	IF YOU ARE AT S. L.	S. L.		IF YOU	IF YOU	IF YOU	Z	ARE		ò		IF YO	U ARE	AT 10	,000	H	F	YOU ARE		,000		Г	F	YOU	ARE AT	20000	
Name	LES FUEL	FUEL			RANG	RANG	S I		AIRMILES	Sec.		RA	INGE IN	AIRMILE	S.			RANGE IN	AIRMILE	s		FUEL		RANGE	IN AIR	MLES	
NAME FIGURES INCLINDE ALLOWANCES FOR PRESCRIPED CLIMB & DESCRIPT TO SEA LEVEL) 155 1760 12972 635 355	BY CRUISING OPT. AIT. BY CRUISING BY CRUISING AT 5.000 FT. AT OPT. AIT. LBS. AT 5000	BY CRUISING AT OPT. ALT. LBS. AT 5000'	BY CRUISING LBS. AT 5000'	BY CRUISING LBS. AT 5000'					ALT.	Y CRUISING T OPT. ALT		10000			BY CRUIS.	_	Y CRUISII AT 15000			SY CRUISI AT OPT. A	NG LT.		BY CRUIS AT 200	0 - 0	PT. ALT. 000 FT.	P I	CRUISING OPT. ALT.
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Sign High	35 660 2800 385	2800	2800	-	385	85	1	35	1	089	7	091	3	30	700	1	510		52	715	2	800	9	1	35	740	0
Sign	610 2600	2600	2600		360	9	_	35		630	7	25	m	70	9		475	m	70	599	2	009	595		35	069	0
1		2400	2400		330	30		3		280	***	368	3	w	595		1440		30	019	2	001	520		32	640	
1	35 500 2200 305	2200	2200	-	305	35	+	35	+	525		960	(1)	20	570	+	1,000		75	560	2	500	1,80	+	35	580	0
1	450 2000	2000	2000		280	80		35		170		130	m'	10	490	_	370	6	70	510	2	000	1440		35	530	
350 250 250 35 350 280 280 35 370 1486 330 35 350 35 350 35 350 35 35	1800	1800	1800		250	20	_	35		η50	4-1	000	m'	10	435		330		35	455	-	800	700	i	32	475	
330 350	35 340 1600 225	1600	1600	+	225	25	+	35	1	360	,,,	593	(6)	2	380	+	295	477	32	1000	7	009	360	+	35	h 20	
APPROXIMATE	35 310 11/86 210	9817	9817		210	10		5		330	W	520	W.	N	350		280	<i>m</i>	25	370	-	786	330		35	390	
Carrollous Lange	CRUISING AT S. L. CRUISI	S. L.	8	8	CRUISI	CRUISI	- ISI		AT 500	ò	L	CRU	SING	AT 100	,000	t	Ü	MISING	AT 150	è	+	T	ľ	RUISIN	G AT	,0000	1
6.8 PANGE DOWN CAS. ** IB/HE G.S. RACTOR DIST. CAS. ** IB/HE G.S. RACTOR DOWN CAS. ** IB/HE G.S. RACTOR DOWN CAS. ** IB/HE G.S. RACTOR DIST. CAS. ** IB/HE G.S. RACTOR DOWN CAS. ** IB/HE G.S. RACTOR DOWN CAS. ** IB/HE G.S. RACTOR DOWN CAS. RACTOR DIST. CAS. RACTOR		TIVE						APP	ROXIMAT		_		API	PROXIMA	NTE	П	Н	AP	PROXIMA	TE	П	T. F.	H		APPROX	MATE	
355 -9 5 355 86 2555 365 -8 10 350 87 2430 350 -8 15 80 HW 320 87 2080 350 48 15 80 HW 320 87 2080 350 420 15.0 HW 320 87 2080 350 420 HW 320 87 2080 470 HW 320 87 2080 470 HW 320 87 2080 HW 320 HW	CAS. NPM	RANGE DOWN WIND C.A.S. RPM	DOWN WIND C.A.S. RPM	WIND CAS. RPM	* #	* #	18/H	-	_		_		LB/HR														DOWN DIST.
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355 .9 5 355 86 2555 365 .9 10 330 86 2315 370 8.9 15 40 HW 320 87 2080 390 410 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	WH 08	80 HW	80 HW	80 HW							365		2620	335	8.			_	n Para	89	_			- 6	100		25
385 1.0 5 340 85 2460 390 1.0 10 330 86 2315 410 1.0 15 18 10 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	3180 345 °.9 - 40 HW 370 86 28	.9 - 40 HW 370 86	- 40 HW 370 86	нw 370 86	98	_	N			_	355		2555	365	6.		-	-	mev.	6.0	_	¥			1000		20
420 1.1 5 340 85 2460 430 1.1 10 315 85 2200 430 1.1 15 40 TW 305 86 1980 450 450 450 450 1.2 10 315 85 2200 470 1.2 15 80 TW 295 85 1910 475 475 475 475 475 475 475 475 475 475	3060 370 1.00 - 0 360 85 2	l.0 - 0 360 85	- 0 360 85	360 85	85	_	CA	-			340		2460		1.0			-	410	1.0	15			-			20
84 24.00 460 1.2 10 315 85 2200 470 1.2 15 80 rw 295 85 1910 475	3060 410 1.1 - 40 TW 355 84 2	1.1 - 40 TW 355 84	- 40 TW 355 84	355 84	87	_	CI			S-151//	340		2460	-	1,1	_			430	1,1		-		-			20
295 85 1910 515	WT 08	WT 08	W 108	W 108					-		330		2400		1.2			- 110		1,2	_						25
	120 TW	120 TW	WT 021	120 TW											2		_				12			1000			25

Figure A-11. Flight Operation Instruction Chart (Sheet 9 of 12) F-84G-1RE thru -5RE

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			200			-8°						
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35 725 74,0 35 35 675 685 35 35 620 635 35 35 570 585 35 35 460 4,75 35 35 425 44,0 35	5 725 740 35 685 35 620 635 35 75 75 75 75 75 75 75 75 75 75 75 75 75	5 725 740 35 6 675 685 35 6 620 635 35 5 570 585 35 5 530 35 6 1475 35 7 1460 1475 35 8 1425 1440 35 AT 30000 CRUISING AT 35000' CRUISING AT 35000'	725 740 35 35 35 35 35 35 35 3	5725 7140 35 55 56 56 57 56 57 57 5	S	S	S	5 725 740 35	S		S	S
570 635 570 585 515 530 460 475 425 440	620 635 3 570 585 3 515 530 3 1460 1475 3 1425 1440 3	5 620 635 35 55 570 585 35 56 515 530 35 515 530 35 35 515 530 35 35 515 515 515 515 515 515 515 515 5	5 620 635 35 55 55 55 55 55 5	570 585 35 35 35 35 35 35 3	S S S S S S S S S S	5 620 635 35 5 515 585 35 5 1460 1475 35 1460 1475 35 1425 1440 35 AT 30000* CRUISING AT 35000* PROXIMATE APPROXIMATE 6.3. AANGE DOWN AT APPROXIMATE 6.3. AANGE DOWN AT APPROXIMATE 335 -7 30 265 91 1750 340 -7 140 365 -8 35 260 90 1710 370 -8 145 405 -8 140 260 90 1710 -9 50 430 1-0 40 260 90 1710 -9 50 430 1-0 40 260 90 1710 -0 55	5 620 635 35 Residence 635 35 Residence Residence 1475 35 Residence	5 620 635 35 R 5 515 585 35 R 5 515 530 35 R 5 1460 1475 35 R 5 1425 1410 35 R 5 1425 1410 35 R AT 30000 AT 30000 APPROXIMATE APPROXIMATE 6.3 IANGE DOWN L IANGE DOWN L 6.4 IANGE DOWN L IANGE DOWN L 6.5 IANGE DOWN L IANGE DOWN L <td>5 620 635 35 Residence 635 35 Residence Residence 35 Residence Residence</td> <td> S S S S S S S S S S</td> <td> S S S S S S S S S S</td> <td> S S S S S S S S S S</td>	5 620 635 35 Residence 635 35 Residence Residence 35 Residence	S S S S S S S S S S	S S S S S S S S S S	S S S S S S S S S S
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१५५० १५५०	5 440 35 AT 30000' CRUISING AT 35000' CRUISING	5 1425 144の 35 AT 30000 CRUISING AT 35000 CRUISIN PROXIMATE APPROXIMATE	AT 30000' AT 30000' APPROXIMATE APPROXIMAT	AT 3000V AT 3000V APPROXIMATE APPROXIMATE G.S. PACTOR DOWN C.A.S. RPM 18/HR G.S. PANGE DOWN C.A.S. RPM 18/HR G.S. PANGE DOWN C.A.S. PACTOR DIST. C.A.S. PANGE DOWN C.A.S. RPM 18/HR G.S. PANGE DOWN C.A.S. PR. RPM 18/HR C.A.S. PANGE DOWN C.A.S. PANGE	AT 3000V AT 3000V APPROXIMATE 6.5 PANOR DOWN CA.5 PAN LAIVING DOWN CA.5 PANOR DOWN CA.5 PAN	AT 30000' APPROXIMATE G. S. PACTOR DOWN CAS. RPM LB/HR G. S. PACTOR DUST. G. S. PACTOR DOWN CAS. RPM LB/HR G. S. PACTOR DUST. G. S. PACTOR DOWN CAS. RPM LB/HR G. S. PACTOR DUST. G. S. PACTOR DUST. G. S. PACTOR DUST. G. S. PACTOR DUST. APPROXIMATE APPROXIMAT	AT 300001 AT 300001 AT 300001 AT 300001 APPROXIMATE G. S. PANGE DOWN LET APPROXIMATE G. S. PANGE DOWN CAS. BW. Us/NE G. S. PACIOS DIST. 335 %T 30 265 91 1750 340 %T 40 % 445 % 440 % 50 % 1710 410 %9 50 % 445 % 640 %		AT 300001 AT 300001 AT 300001 AT 300001 APPROXIMATE G. S. ALANGE DOWN LET APPROXIMATE G. S. ALANGE DOWN CAS. R.M. LAVINE G. S. PACTOR DIST. 335 %-T 30 265 91 1750 340 %-T 40 %-T	AT 30000 AT 30000 AT 35000 CRUISING AT 35000 CRUISING AT 35000 CRUISING AT 35000 CA3. RACTOR District Constitution District	AT 30000 CRUISING AT 35000 CRUISING APPROXIMATE a. 8 AND E DOWN CAS. BPM IS A ACTOR DIST. 335 a.7 30 265 91 1750 340 a.7 40 365 a.8 35 260 90 1710 370 a.8 45 405 a.9 40 260 90 1710 410 a.9 50 470 1a.1 45 260 90 1710 420 1a.2 65 470 1a.2 45 255 89 1670 520 1a.2 65 550 1a.3 50 255 89 1670 560 1a.3 70 AND	AT 30000' AT 30000' AT 30000' APPROXIMATE G. S. PANGE LET APPROXIMATE G. S. PANGE DOWN CA.S. R.M. LA/HB G. S. PANGE DOWN CA.S. LA/HB G. S. PANGE DOWN CA.S. R.M. LA/HB G. S
	AT 30000' CRUISING AT 35000' CRUISING AT	AT 30000' CRUISING AT 35000' CRUISING AT PROXIMATE APPROXIMATE APPRO	AT 30000	AT 30000' CRUISING AT 35000' CRUISING AT PROXIMATE 6.5. PACTOR DOWN CAS. RPM LIJ/HE G.S. PACTOR DIST. 9.35 o.7 30 265 91 1750 340 o.7 40	AT 30000Y PROXIMATE 6.5. PARIOR DOWN CAS. PR. LET R. CAS. PR. LEJ/HE C.5. PARIOR DOWN CAS. PARIOR	AT 30000Y PROXIMATE 6.3 ARANGE DOWN C.A.S. REAL 3357 3.0 2.65 9.1 17.50 34.09 14.5 14.5 14.5 14.5 14.5 14.5 14.5 14.5	PROXIMATE APPROXIMATE AP	CRUISING AT 35000Y	AT 30000 AT 30000 AT 35000 AT 35000 AT 30000 AT 3000 AT 30000 AT 300000 AT 30000 AT 300000 AT 30000 AT 30000 AT 30000 AT 30000 AT 30000 AT 30000 AT 300000 AT 3000000 AT 3000000 AT 3000000 AT 3000000 AT 3000000 AT 3000000 AT 30000000 AT 300000000 AT 3000000000 AT 3000000000000 AT 300000000000000000000000000000000000	A	AT 30000	AT 30000' CRUISING AT 35000' CRUISING PROXIMATE G. S. PANGE DOWN C.A.S. PR. LEVIR G. S. PANGE DOWN C.A.S. PANGE DOWN C.

Figure A-11. Flight Operation Instruction Chart (Sheet 10 of 12) F-84G-IRE thru -5RE

V . II . D .	ENGINE(S) J35-A-29	1-29				CHADT		LIMITS	CHART WEIGHT LIMITS 14870	0		TO 13305	v	Pour						com-co came tempo caritad all vio se .		
֡	R USING	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT less than fuel available for cruise (fuel on board minus	(A) IN	FLIGHT d minus	C - Select	figure in	WEIGH fuel colu reserve,	figure in fuel column equal to or ces for reserve, combat, navi-	I to or navi-	×	ON	TES: Ri	inges sho	wn at o	TO 13395 POUNDS NUMBER OF ENGINES OPERATING: 1 NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change).	UMBER altitudes	OF ENG are max fo exter	NUMBER OF ENGINES OPERATING: n altitudes are maximum. In order to o chart (due fo external configuration or	ERATING order to uration o	obtain r	naximun veight c	range
a fig	ion flight, range ava mum range ght at high riate cruisi required f use chart	stational errors formation flight, etc.). Move horizontally right or left to section according to present alktitude and read total range available (no wind) by cruising at that altitude or by climbing to another altitude of maximum range. For a flight at initial altitude, operating instructions are given this restly below. For a flight at higher altitude, climbing mediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING—From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	wind) the form of	ontally rivitial alti- immedia r. (B) F. mb to de-	ght or le ng at tha tude. op ttely to d LIGHT sired crui adding	ft to secti it altitude reating in esired alt PLANNI ising altitu	on according to by control of the struction itude and NG - Frunde and mb dists	to section according to present altitude or by climbing to an- sired altitude and read cruising "LANNING—From initial climp altitude and all other necessing altitude and all other necessing altitude and all other necessing altitude distances to range	resent to an- en di- uising il fuel neces- range		chin dist	s necessa. nb may k ance and	ry to obs e require fuel. Cli DATA	d to obt mb dista BELOW	it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	cruising cimum ra fuel are i	altitude nge. All ncluded	on each range val where clir RESERV	hart, i.e., les includ lbs are in E FOR	when che allowardicated.	anging of oces for G	harts a descent
								17	LOW	ALT	ALTITUDE	DE										
AT S.	L	L	L	IF YOU	IF YOU ARE	AT 5000′			F YOU	IF YOU ARE AT 10000'	10000		Ĺ	F YOU	IF YOU ARE AT 15000'	15000′	Г		=	IF YOU ARE AT 20000'	RE AT	20000
RANGE IN AIRMILES	8	FUEL		RAN	RANGE IN AIRMILES	IRMILES			RANG	RANGE IN AIRMILES	SMILES			RANG	RANGE IN AIRMILES	MILES		FUEL		RANGE	RANGE IN AIRMILES	LES
OPT. ALT. BY 1000 FT. AT	BY CRUISING AT OPT. ALT.	G LBS.	BY C	BY CRUISING AT 5000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.		BY CRUISING AT 10000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.		BY CRUISING AT 15000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	JISING T. ALT.	LES.	BY CRUISING AT 20000	O P	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.
					(RA)	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	RES INCL	UDE ALLO	WANCE	S FOR PRE	SCRIBED	CLIMB &	DESCENT	TO SEA	(EVEL)							
	310	1486	23	270	35	m'	330	250	0	35	<u></u>	350	280		35	370	0	98†⊓	330		35	390
-	235	1200	H	170	35	20	250	200	0	35	27	270	230		35	290	0	1200	270		35	310
	135	8	Ħ	311	*	7	14.5	135	10	35	1,6	165	155		35	180		800	185		35	200
-	35	004		99	50		9	02		50		2	80		20	85	10	1,00	100		20	
CRUISING AT S. L.		7	L	CRU	CRUISING A	17 5000			CRUISI	CRUISING AT 10000'	10000			CRUISING		AT 15000'	T			CRUISING AT 20000	3 AT 2	,000
APPROXIMATE		1			APPR	APPROXIMATE				APPRO	APPROXIMATE				APPROXIMATE	IMATE	I	EFFEC.	-		APPROXIMATE	WTE
G. S.	RANGE DOWN FACTOR DIST.		CAS.	% Mark	LB/HR G.	S. FACTOR	SE DOWN OR DIST.	5	* HPM	LB/HR G.S.	S. FACTOR	SE DOWN	CAS	RPM LB/	LB/HR G. S.	RANGE	DOWN DIST.	WIND	CAS.	N LB/HR	si 0	RANGE DOWN FACTOR DIST.
		120 HW																120 HW	330 87	2045	350	50
		80 HW	_		,			365	86 26	2600 340	8.	3 10	345	86 26	2600 34.5	00	23	80 HW	315 86	2761	345	00
3ho	60	40 HW	365	85 2	2785 35	350 °9	70	350	85 24	24.75 360	6.	10	330	85 24	2475 370	6.0	25	40 HW	315 86	1975	385	6.
380 1	1.0 -	0	365	85 2	2785 39	390 1.0	w	350	85 24	2475 400	0 1.0	10	330	85 24	2475 410	100	35	0	305 85	1905	6 1/10	1°0
3020 410 1	1.1	WT 04	355	84 2	2715 420	1.1	25	340	84 24	2415 430	1,1	10	31.5	84 24	2415 430	1,1	25	WT 04	305 85	1905	1450	1,1
-		WT 08						325	83 23	2320 455	1.2	10	315	8h 2h	2415 455	1.2	75	WT 08	290 Bh	1810	1,70	1.2 25
		120 TW												-	_	_	}		_	Ī	_	

Figure A-11. Flight Operation Instruction Chart (Sheet 11 of 12) F-84G-1RE thru -5RE

	E-84(3-11/8	E-840-1RE thru-5RE				1			HE		ALTITUDE	JOE	Fo	Four-230 Gal.		Tanks carried	ried all	the way.	у.			
AIR	AIRPLANE MOD.	OD.		ENG	ENG. J35-A-29	-29	CHART	CHART WT. LIMITS	5 14.870		TO 13395		18.	EXT. LOAD	AD				Ž	NO. OF ENGINES OPERATING: 1	INES O	FRATIN	(G: 1
<u>u</u>	IF YOU ARE AT 25000	RE AT	25000	9		IF YOU ARE		AT 30000′		IF YO	IF YOU ARE AT 35000'	AT 350	,00		IF YOU	IF YOU ARE AT 40000	40000			IF YO	IF YOU ARE AT 45000'	AT 45	,000
IY CRUIS		IN AIRM	ALES BY CRUISING			RAP	N BE		-	R	RANGE IN AIRMILES	AIRMILES	THE STREET		RAN	RANGE IN AIRMILES	WILES	0	FUEL	2	1 Z -	AIRMILE	8
AT 25000		1000 FT.	AT OPT. ALT.	LBS		AT 30000'	2	AT OPT. ALT.	2	AT 35000 1000 FT. AT OPT. ALT.	0001	FT. AT	OPT. AL	2 4	AT 40000	1000 FT.	A O C	AT OPT. ALT.	I.BS.	AT 45000	3 OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.
							(RANG	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	-	ALLOWAN	CES FOR P	RESCRIBE	D CLIMB	& DESCE!	AT TO SEA	(LEVEL)						-	
360		35	110	98 ^t T		400	32	425		०गग	35	- 6							98ألا				
295		35	330	1200		330	35	345		360	35								1200				
200		35	220	88		225	*	235		250	35			-					800				
110	60	52		001		125	30			135	75							1 51	001				
	CRUISING AT 25000'	AT 2	2000	25555	-	CRUISING	<	T 30000	H	CRU	CRUISING AT 35000	T 35000	6	L	CRUIS	CRUISING AT 40000	40000		T	CRU	CRUISING AT 45000"	1 4500	ď
	×	APPROXIMATE					APPROXIMATE				APPR	APPROXIMATE				APPROXIMATE	IMATE	188	EFFEC.		APP	APPROXIMATE	1
CAS.	SPM LB/HR	0.5	RANGE DOWN FACTOR DIST.	WIND	CAS	N N	LB/HR G.S.	RANGE	DOWN C.	CAS. RPM	18/HE C	G. S. FAC	RANGE DOWN FACTOR DIST.	3	* * *	LB/HR G.S.	RANGE	DOWN DIST.	WIND	CAS. BPM	LB/HR	0. S.	RANGE DOWN FACTOR DIST.
305 87	7 1880	320	.7 25	120 HW	w 285	88	1720 330	20	30 2	260 91	1590	330	o7 45					13	120 HW				18
305 87	7 1880	360	8. 25	80 HW	w 270	87	1645 350	00	35 2	260 91	1590	370	.8 50				_		80 HW				
290 86	2 1795	380	9 25	40 HW	w 270	87	1645 390	6.	35 21	245 90	1502	385	.9 50				-		40 HW				
290 86	5 1795	420	1,0 30	0	270	87	1645 430	1.00	ho 21	245 90	1502	J25 1.	1.0 55						0				
280 85	1730	544 0	1,1 30	WT 04	260	86	1585 455	1,1	140 21	245 90	1502	1,65 1,1	1 60						WT 04				-
280 85	1730	1485	1.2 35	WT 08	v 260	98	1585 495	1.2 h	1,5 21	240 89	3485	500 1.2	2 65		I				WT 08				
280 85	1730	525	1,3 35	MT 021	260	86	1585 535	1.3 5	50 21	2ho 89	14.85	540 1.	1,3 70						WT 021				
-	Climb at 100 % RPM	100	% RPM								EXAMPLE	M	Bk S			EFF	ECTIVE	WIND	LEGEND HW, HE	LEGEND LEGEND	W TAT	CANTA	
4 w 4 N	Multiply Read low Make a errors, cc Chart we Fuel flow	statute ver half ddittions ombat, f sight lim v based v	Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make: additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	o obtain n ite effectii s for lar tt etc. as r iuel densit y of 6.5 L	ve wind a nding. n required. y of 6.5 BS/GAI	nnits. only. LBS GAI	T .1	If you are fuel, you MPH CA by immed At 3500 55 stat headwind or 230 this wind	can fly can fly is. How liately of fee utte the ran the rand statut	If you are at 15000 feet with 1200 lbs. fuel, you can fly 230 statute airmiles by MPH CAS. However, you can fly 290 statutb by immediately climbing to 35000 feet using At 35000 feet cruise at 24,5 MPH CAS and 55 statute airmiles from destination. With headwind the range at 35000 feet will be 290 or 230 statute airmiles. Cruise at 260 M this wind and start letdown 50 statute	230 statute airmiles by holver, you can fly 290 statute mbing to 35000 feet using 11 cruise at 245 MPH CAS and strainfies from destination. With a airmiles from destination with a sirmiles. Cruise at 260 MPH airmiles. Cruise at 260 MPH airmiles a	with 1200 lbs., by the airmies by he for airmies by he for 200 statute 5000 feet using 245 MPH CAS and statute art 260 MPI 50 statute at 260 MPI 50 statute at	be. s by ho atute sing 1 s and st With a 290 60 MPH	with 1200 1be, of available ute airmiles by holding 330 m fty 290 stactute airmiles 35000 feet using 100% RPM 24,5 MPH CAS and start letdown om destination. With a 80 MPH of feet will be 290 x x,8 c. Cruise at 260 MPH CAS with 50 stactute airmiles from	M H H H	RAN G.S. CAS LB/()	RANGE FACTOR: G.S GROUND SP CAS - CALIBRATE LB/HR - TOTAL! () - RANGE IN ONLY WITH	TOR = ND SPEI SRATED TAL FU E IN P. WITH F	RANGE IN ST. AIRSPEL EL CONS RENTH JEL FRC	RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS GROUND SPEED IN AIRMILES (Zero Wind) GS CALIBRATED ARSPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE BASED ON 19-3 HIER	S (Zero ES PER TUTE M - POUNI LABLE NAL SO	WIND Wind) HR ILES P OS PER	22 Form HW
DAT	DATA AS OF, July 1951	July	1951	BASED O	BASED ON: Estimates	mates		destination.		RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.	ES HAVE	NOT BEE	N FLIGH	T CHECK	Ö								oM shoo

Figure A-11. Flight Operation Instruction Chart (Sheet 12 of 12) F-84G-IRE thru -5RE

CTION: fuel an errors, for and read itude of ilow. For one in an		SINGCE				ļ	CHART	CHART WEIGHT LIMITS	CHART WEIGHT LIMITS	223	CHART	F	0	20768		CHART TO 20768 POUNDS		ur-230 nks ca MBER C	Gal.	Four-230 Gal, Tanks-Pylon tanks Tanks carried entire distance, NUMBER OF ENGINES OPERATING: 1	Jon talistand	nks dr	tanks dropped & Tip nnce. ING:1	Thp	150
ances.	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or gate than fuel available for cruize (fuel on board minus allowances for reserve, combai, navigational errors, formation flight, etc.). Move horizontally right or left to section according to present alititude and read total range available (no wind) by cruising at that altitude or by climbing to answher alititude of maximum range. For a flight at initial altitude, operating instructions are given discretly below. For a flight at higher altitude, climb immediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING.—From initial fuel on board aubstract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	or cruise flight, etc ge availal range. F it higher cruising rired for chart as	HART: (A tifuel on tiple (no with for a flight altitude of altitude of take-off a for IN FL	to IN FI board horizon ind) by t at init climb in section. Ind climb in section. Ind climb in IGHT	LIGHT minus tally rig cruising inal altit nmediate (B) FL b to desi	- Select allowand bt or left g at that ude. oper ely to de IGHT F	figure in ces for to section altitude rating in sired alt PLANNI sing altitude rating in certain altitude rating altitude rating altitude ratinal climitial climitial climitial ces section ces section altitude rating r	t figure in fuel column equal to or nees for reserve, combat, navi- ft to section according to present tra altitude or by climbing to an- reating instructions are given di- eleried altitude and read crusing PLANNING – From initial fuel ising altitude and all other neces- initial climb distances to range	mn equa combat, ling to p limbing t are giv I read cr I read cr om initia	navi- resent to an- en di- uising Il fuel neces- range	A Barrier		NOTES on fligh it is nec climb m distance	: Range ts requir tessary to tay be re and fue DA	ss shown ing mor ing mor o observequired to the standard to th	at opti	mum al	titudes a t (due t ruising s num ran el are in NS NO	re max o exter- iltitude ge. All cluded FUEL	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel are included where climbs are included. DATA BELOY CONTAINS NO FUEL RESERVE FOR LANDING	order t uration chart, i.e ues inclu nbs are	o obtair or gross or gross when de allov indicated	maximit weight changing vances for 1.	im range change) charts a r descent	
									1	LOW		E	ALTITUDE	ш											1
IF YOU ARE AT	AT S. L.				IF YOU ARE		AT 5000			F YOU	IF YOU ARE AT 10000	AT 10	, 000		Ħ	IF YOU ARE AT 15000	E AT	5000′				F YOU	ARE A	IF YOU ARE AT 20000	
RANGE IN AIRMILES	RMILES		FUEL		RANG	RANGE IN A	AIRMILES			RAN	RANGE IN AIRMILES	AIRMILE	s			RANGE IN AIRMILES	N AIRM	LES		FUEL		RANG	RANGE IN AIRMILES	MILES	
OPT. ALT. 1000 FT.	T. BY CRUISING F. AT OPT. ALT.	UISING T. ALT.	LBS.	BY CR	BY CRUISING AT 5000'	1000	ALT. BY FT. AT	BY CRUISING AT OPT. ALT.	¥ ¥	r CRUISING AT 10000"	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	60	BY CRUISING AT 15000'		OPT. ALT. 1000 FT.	BY CRUI AT OPT	CRUISING OPT. ALT.	LBS.	BY CRUISING AT 20000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	JISING T. ALT.
20	0000	9	100	(4.3	(3.33 €)	(RAN	AGE FIGU	NGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB &	UDE ALLO	JOWANC (1595)	ES FOR	PRESCRI	BED CLIMB	WB & DE	DESCENT TO SEA LEVEL)	SEA LE	/EL)	(6)	(36)65)	881.7)(1	(1080)	20	6)	(2)()(2)
2 2	2350	2 00	8800	33	(1300)	25 5	-	(2370)	2.5	(1510)	3 %		(2390)	00	(2715)	_	2 5	(24	(5042)	8800	()	(1955)	25 2	, 8	(2425)
25	2315	5	8600	72	1275	25	-	2335	5	(0841)	25		(2355)	(5)	(1685)		25	(2370)	(02	8600	(1)	(1925)	25	(2)	(2390)
25	2275	22	8400	12	1245	25		2300		24,55	25	+	2315	20	1650		25	23	2330	8400	(1)	(1890)	25	(%	(2350)
25	2240	03	8200	12	1220	25		2260		1420	25		2280	9	1620		25	22	2295	8200	11	1855	25	CV.	2305
25	2200	8	8000	11	1195	25		2220		1390	25		2240	01	1590		25	22	2255	8000	17	1820	25	~	2275
22	2160	95	7800	77	1170	20		2180		1360	25		2200	0	1555		25	22	2215	7800	Н	1785	22	6/8	2240
25	2120	50	0092	7	1145	25		27/10		1330	25	1	2160	0	1525	+	25	2775	75	2600	1	1750	25	2	2200
25	2085	98	7431	Ħ	1120	25		2105		1305	25		2125	10	1495		25 .	21/15	57	7431	.1	1720	25	CI.	2165
CRUISING AT	T S. L.	T			CRUI	CRUISING A	AT 5000'			CRUI	CRUISING AT 10000'	100	è	t	0	CRUISING AT 15000'	AT 1.	2000,	Г	-		CRUISING	NG AT	20000,	1
APPRO	APPROXIMATE		EFFEC			APPRO	APPROXIMATE				APP	APPROXIMATE	NTE		H		APPROXIMATE	WATE		TIME	ľ		APPRO	APPROXIMATE	
LB/HR G.S.	S. FACTOR	LET DOWN DIST.	A NA	CAS.	% RPM LI	LB/HR G.	G. S. FACTOR	GE DOWN OR DIST.	3	* * *	LB/HR	6.5	RANGE D	DOWN C	C.A.S. RPM	A LB/HR	6.5	RANGE	LET DOWN- DIST.	WIND	CAS.	W WAR	LB/HR G. S.	RANGE FACTOR	DOWN DIST.
			120 HW					-												120 HW	345	91	2640 3	340 °.7	N
			80 HW					-8	370	89	2950	345	0	97	355 90	2745	5 355	80	9	80 HW	345	16	2640 3	380 °8	H
3450 350	6.0	. 1	40 HW	380	88	3000	365 .9	- N	360	88	2850	370	60	90	355 90	27/15	5 395	6.0	73	40 HW	330	06	2525 la	6° 00'1	20
3360 380	30 1.0	1	0	365	87	3085 3	390 1.0	70	360	88	2850	0TH	1.0	10	340 89	2650	50 420	1.0	25	0	330	06	2525 la	lyto 1.0	20
3270 410	10 101		WT 0%	355	98	3005	1,20 1,1	2	350	87	2780	Offi	1.1	10	340 89	2650	09/1 09	1.1	IJ	40 TW	330	90	2525 la	1,80 1.1	20
			WT 08						350	87	2780	1,80	1.2	10	330 88	3 2590	067 00	1,2	20	WT 08	320	89	2140 5	505 1.2	20,

Figure A-12. Flight Operation Instruction Chart (Sheet 1 of 4) F-84G-1RE thru -5RE

1	AIRPLAP	AIRPLANE MOD.		ENG	ENG. J35-A-29	CHART	CHART WT. LIMITS	22212	5	20768	18.	EXT. LOAD				Z	NO. OF ENGINES OPERATING: 1	SINES O	PERATIN	1 5
1000 TI, 11	IF YO	U ARE AT	25000	9	IF YC		30000	19	IF YOU	ARE AT	35000	7	YOU AR	E AT 40	2000		IF)	YOU ARE	AT 45	,000
1900 11 11 12 12 13 14 15 15 15 15 15 15 15	RA	AGE IN AIR	AILES	100	Z Z		MILES		RANC	SE IN AIRM	IILES		RANGE IN	4 AIRMILE	15	FUEL		NANGE IN	AIRMILE	
2155 55	Y CRUISING AT 25000	OPT. ALT. 1000 FT.			BY CRUISING AT 30000'	1000 1000			35000	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		NG OPT	ALT. B	r CRUISING r OPT. ALT.		BY CRUISIN AT 45000	0 0	ALT. BY	CRUISIN
12.55 55 55 56 56 56 56 56						(RANC	FIGURES INC	CLUDE ALL	OWANCES	FOR PRESC	RIBED CLIMB &	DESCENT TO	SEA LEVE	3				-	t	
2005 25	(23/12)	25	0	8847												8847		2		
1965 25	(2125	25		8800												8800			-	
1965 25	(2090)	25		8600												Akm		-	+	
1965 25	(2055)	25		8400					- 10							8400				
1935 25	(6060)	63	0	0020				+	1				+	1		8200		-	-	
1909 25	1985	25 25		8000												8000				
CRUISING AT 23000	1905	25		2600							1					7800				
CRUISING AT 25000 CRUISING AT 30000 CRUISING AT 300000 CRUISING AT 30000 CRUISING AT 300000 CRUISING AT 30000 CR	1870	50		74.31									-	-		7431		-	\dagger	
CRUISING AT 2800° CRUISING AT 3000° CRUISING AT 300° CRUISI																		-		
The color with color	CRUIS	SING AT 2	5000′	2333	CRUI	1	30000		CRUISIR	NG AT 3	5000	Ö	SUISING	AT 4000	0	I	a	USING	AT 4500	,
Wind Street Str		APPROXIL		TIVE		APPROX	IMATE			APPROXIA	WATE		API	PROXIMAT		EFFEC.	-	APP	ROXIMAT	, m
12 12 12 13 15 10 14 15 15 15 15 15 15 15	2 t		RANGE		* 14 48		RANGE		_		RANGE DOWN FACTOR DIST.					AIND	1	LB/HR	G. S. PAC	NGE DOWN
22 2340 390 86 25 80 HW 20 40 HW 20 20 20 20 20 20 20 2	93			120 HW												120 HW				-
22 2340 1/30 6.9 25 40 HW 40 HW 62 2340 1/20	2 2		4.0	80 HW												80 HW				
24.20 470 1.0 30 40 1.1 30 40 1.2 35 35 3.2 3.	22	_		40 HW								7				40 HW				-
21 2430 530 1a.2 35 80 TW 91 2430 530 1a.2 35 80 TW 92 2430 530 1a.2 35 80 TW 93 TW 94 TW 95 To 1a.3 35 120 TW 95 To 1a.3 35 120 TW 1 ESPECTIVE WIND - HW. HEADWIND. 1.W. TAILWIND - HW. HEADWIND 1.W. TAILWIND - HW. HEADWIND 1.W. TAILWIND - HW. TAILW	35	_		0												0			+	+
21 24,30 570 1a.2 35 80 TW 12 24,30 570 1a.2 35 80 TW 12 24,30 570 1a.2 35 80 TW 12 24,30 570 1a.2 35 80 TW 13 24,30 570 1a.2 35 120 TW 14 24,30 570 1a.2 35 120 TW 15 24,30 570 1a.2 35 120 TW 16 24,30 570 1a.2 35 120 TW 18 24,30 570 1a.2 35 120 TW 19 165 120 TW 19 120 TW 19 165 120 TW 19 165 120 TW 19 165 120 TW 19 165 120 TW 19	16			WT 04												3			+	+
1 Climb at	컶	_		WT 08										Ì		2 6				
Climb at00 % RPM Multiply statute units by. 87 to obtain nautical units. Read dictional allowances for landing, anyigational control of the statute airmiles below based on fuel density of 6.5 LBS/GAL. Read dictional allowances for landing, anyigational soluwances for landing any of 6.5 LBS/GAL. A 25000 feet will be 2330 x8 The land based on fuel density of 6.5 LBS/GAL. A 25000 feet will be 2330 x8 ONLY WITH FUEL FROM EXTERNAL SOURCE. BEFECTIVE WIND - HW, HEADWIND. 1 W, TAILWIND - RAILWIND - W, TAILWIND - RAILWIND - W, TAILWIND - RAILWIND - M, TAILWIND - CAS - CALLBRATED AIRSPEED IN STATUTE MILES PER HR LBMR - TOTAL FUEL CONSUMPTION - POUNDS PER HR LBMR - TOTAL FUEL CONSUMPTION - POUNDS PER HR CAS and start ledown 2 5 statute airmiles from destination. With a long of 1865 statute airmiles. Cas - CALLBRATED AIRSPEED IN STATUTE MILES PER HR LBMR - TOTAL FUEL CONSUMPTION - POUNDS PER HR LBMR - TOTAL FUEL CONSUMPTION - POUNDS PER HR CAS and start ledown 2 5 statute airmiles from destination. With a land start ledown 2 5 statute airmiles from the similar of the similar from the si	16			120 TW				1						7		120 TW				
CO SUBLICE STRINGS TROW	The contract of the contract o	b at \$100 of the control of the cont	% RPM units by .87 to 10 (chart opposite allowances rmation flight tits based on fue in fuel density of	obtain naut e effective v for landii etc. as requ el density o of 6,5 LBS,	tical units. ng. navigation iired. f 6.5 LBS/GAL		If you are fuel, you con MPH CAS, by immedia At 25000 30 statut beadwind the fuel are so that wind a the fuel wind a the fuel are so that wind a the fuel are so that wind a the fuel are so the fuel are so that wind a the fuel are so that wind a the fuel are so that wind a the fuel are so that	at 150c an fly 16 However itely climi of feet cr ie range al e range al	EXA EXA Do feet 1 So statu t, you can bing to 2 uise at 3 rimiles from t 25000 t 25000 airmiles	with 8400 ute airrute airrute airrute 33(25000 fee 325 MPH C m destination feet will conse at 25 steel 25 steel airrute 35 s	o lbs. of miles by holding by statute et using 100 CAS and start on. With a E 330 x 2330 x 235 y PPP C.	available ng 340 airmiles % RPM letdown to MPH 8		EFFECT: RANGE F AS - GR AS - CA B/HR -) - RA ONL	VE WIND ACTOR = DUND SPE LIBRATEI TOTAL FI NGE IN F	LEGEND LEGEND CROUND RANGE II ED IN ST. AIRSPER IEL CONS ARENTHI	ADWIND, 1 DISTANCE N AIRMILE N ATUTE MIL UMPTION UMPTION M EXTERN	W, TAIL S (Effectives S (Zero VES PER MILE) POUNT ABLE NAL SOI	WIND - WIND - WIND - Wind) HR ILES PER OR PER	2 of 2 H H H H H H H H H H H H H H H H H H

Figure A-12. Flight Operation Instruction Chart (Sheet 2 of 4) F-84G-IRE thru -5RE

	Fou
FLIGHT OPERATION INSTRUCTION	PUADT

	inces. Then use chart as for IN FLIGHT above, adding initial climb distances to range	inces. Then use chart as for IN FLIGHT above, adding initial climb distances to range	FLIGHT OPERATION INSTRUCTION F-846-1RE thru-5RE CHART WEIGHT LIMITS 20768 TIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or torus (rule) on based minus allowances for reserve, combat, navi-ore, formation flight, etc.). Move horizontally right or left to section according to present de research to observe the opticine and by cruising at that altitude or by climbing to an-ode of maximum range. For a flight at initial altitude, climb instructions are given distance and fuel. Climb dista	FOUR-230 Gal Tanks. Pylon tanks distance. To 1929µ POUNDS NUMBER OF ENGINES OPERATING: 1 NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain on flights requiring more than one chart (due to external configuration or gross it is necessary to obtain maximum range. All range values include allow distance and fuel climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDII	FOUR-230 Gal Tanks. Pylon tanks dropped & Tip Tanks carried entire distance. TO 1929L POUNDS NUMBER OF ENGINES OPERATING: 1 NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum range. All range values include allowances for descent distance and fuel climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING
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											0	N N	H	LOW ALTITUDE	E				7							
IF YC	IF YOU ARE AT S.	AT S	, L	L		IF YO	IF YOU ARE AT 5000'	AT 50	. 00		IF Y	OU AR	TE AT	IF YOU ARE AT 10000'			F YOU	ARE ,	IF YOU ARE AT 15000'	ò			IF YO	IF YOU ARE AT 20000	AT 200	ò
2	RANGE IN AIRMILES	AIRMIL	ES	FUEL		RAP	RANGE IN AIRMILES	AIRMILE	S		~	RANGE IN AIRMILES	IN AIRA	AILES			KAN	RANGE IN AIRMILES	IRMILES		FUEL		RAN	RANGE IN AIRMILES	IRMILES	
BY CRUISING AT S. L.	G OPT. ALT. 1000 FT.	ALT.	BY CRUISING AT OPT. ALT.	G LES.	BY C	BY CRUISING AT 5000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.		BY CRUISING AT 10000"	-	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CR	BY CRUISING AT 15000	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	LBS.		BY CRUISING AT 20000	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.
							(RA	NGE F	(RANGE FIGURES INCLUDE ALLOWANCES	LUDE A	LOWA	NCES FC	OR PRES	FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	LIMB & C	SCENT	TO SEA	(LEVEL)								
995	30		2085	7431	_	1120	30		2105		1305		200	2125	10	2671	32	8		27/15	7431	17	1720	8		2165
026	30	-51	2040	7200	1095	56	30		2060		1275		30	2080	0	1,460	99	30		2700	7200	76	1675	8		2115
546	30	W.	2000	7000	1065	59	30		2020		1240		30	2040	0	1425	25	30		2060	7000	77	0191	8		2075
930	8		1960	9		1040	30		1,980		1210		30	2000	0	1390	06	8		2020	0089	76	1605	8		2035
900	20		1910	999		2101	38		1935		11.85		30	1960	0	1360	8	30		1980	0099	57	1570	38		1995
850	10		1820	6200	_	596	15	10	1845		1125		50	1865	10	1295	56	25		1885	9700	7	7495	25		1905
820	1			11/165		930	'		1		1080			1		1250	20	1			5944	7	2441	1		1
O. C.	CRUISING AT S.	AT S.	دا	2333	+	CRL	CRUISING AT 5000'	AT 50	, 00	+	5	CRUISING AT 10000'	TA S	10000			CRUIS	ING A	CRUISING AT 15000'	, h	1	1	CRUI	CRUISING AT 20000	- 1 200 L	ò
	APPR	APPROXIMATE	\TE	L STA			APPR	APPROXIMATE	TE	-	Н		APPROXIMATE	CIMATE				APP	APPROXIMATE		1		Ц	APP	APPROXIMATE	ш
CAS. BPM	LB/HR	89	RANGE DOWN FACTOR DIST.		3	* 1	LB/HR C	6.5	RANGE DOWN	T. CAS	S. RPA	LB/HR	0.5	FACTOR	DOWN DIST.	25	* 44	LB/HR	G. S. FAC	RANGE DOWN FACTOR DIST.		3	* 4	LB/HR	0 2 2 2	RANGE DOWN
3	7			120 HW	2																120 HW	335	8	2430	325	o7 15
	nfi			80 HW	2		H			3	370 88	2870	0 345	89	10	355	89	2670	355 °	8 15	80 HW	335	8	2430	365	8.
390 87	3360	350	60	40 HW	₩ 380	87	3170	365	6.0		370 88	2870	0 385	6.	10	345	88	2610	385	9 15	40 HW	325	89	2380	395	9 20
380 86	3275	380	1.0	0	370	86	3060	395	1.0 5		350 87	2700	0017 0	0 10	10	345	88	2610	425 1.0	0 15	0	325	89	2380	435	1.0 20
370 85	31.90	410	1.1	40 TW	w 355	85	2945	420]	1.1 5		350 87	2700	० १५०	1.1	10	330	87	2515	1,50 1,1	1 15	40 TW	325	89	2380	1,75	1,1 20
				WT 08	>					w,	335 86	2600	997 0	1,2	10	330	87	2515	490 1.º2	2 15	₩T 08	30.5	88	2295	500	1.2 25
			8-	120 TW	>	9															120 TW	315	88	2295	540	1.3 25

Figure A-12. Flight Operation Instruction Chart (Sheet 3 of 4) F-84G-1RE thru -5RE

(Rev. I May 50; MCRE Form No. 239C Sheet 1 of 2

F-(F-840-1RE thru-5RE	ru-SRE					Ĭ	HIGH ALTITUDE	TIT	E E	Four-23	Four-230 Gal. Tanks. Pyl carried entire distance.	Four-230 Gal. Tanks. Pylon tanks dropped & Tip tanks carried entire distance.	anks drop	ped & Thp t	canks		
AIRPL	AIRPLANE MOD.		ENG.	J35-A-29	CHARI	CHART WT. LIMITS	20768	TO 19	19294 LB.		EXT. LOAD			_	NO. OF ENGINES OPERATING:	INES OPE	RATING	
F	IF YOU ARE AT	T 25000′	9	<u></u>	IF YOU ARE AT 30000'	T 30000'	4	IF YOU ARE AT 35000'	AT 35000'		IF YC	IF YOU ARE AT 40000'	40000′		IF YC	IF YOU ARE AT 45000'	AT 4500	
		PMILES			GE	AIRMILES	1	RANGE IN AIRMILES	AIRMILES	9	RA	RANGE IN AIRMILES	MILES	FUEL	2	RANGE IN AIRMILES	IRMILES	
BY CRUISING AT 25000'	1000 FT.	. BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 30000'	02	BY CRUISING AT OPT. ALT.	BY CRUISING AT 35000'	SING OPT.	OPT. ALT. BY CRUISING 1000 FT. AT OPT. ALT.	UISING 7. ALT.	BY CRUISING AT 40000"	OPT. ALT. 1000_FT.	BY CRUISING AT OPT. ALT.	LBS	BY CRUISING AT 45000'	OPT. ALT. 1000 FT.	T. AT O	BY CRUISING AT OPT. ALT.
	1				(RAN	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	UDE ALLOW	ANCES FOR P	PRESCRIBED C	CLIMB & DE	SCENT TO SE	EA LEVEL)				L	H	
1870	8 8	21.85 2140	7200	2095	8 8	1 1	1 1			2 8				7431		1 3	7	
1790	30	2095	7000	2015	30	1			-					70007	13		+	
1750	30	2055	0089	1970	30	r								9				
1770	30	2015	0099	1930	99	,								0099			-	
1630	30	1930	9500	1840	28	t							d	6200				
1580	1	1	१११६५	1780	1	1								5944			-	
CR	CRUISING AT 25000	25000	73333	D	CRUISING AT	AT 30000'		CRUISING AT 35000'	T 35000'		CRUI	CRUISING AT 40000	40000		CBIII	CRIISING AT ASODO	150000	
3	APPROXIMATE	IMATE	TIVE		APPROX	PROXIMATE		APPR	APPROXIMATE		-	APPROXIMATE	IMATE	EFFEC.	-	APPRO	APPROXIMATE	-
CAS. BPM.	LB/HB G. S.	EANGE DOWN		CAS. RPM	4 18/ня G.S.	RANGE DOWN	CAS.	N LB/HR C	G. S. FACTOR	DOWN DIST.	CAS. RPM	LB/HR G. S.	RANGE DOWN	Q NIA	CAS. RPM.	LB/HR G.	G. S. FACTOR	E DOWN
320 92	2365 340	.7 25	120 HW	290 94	2210 340	06 7 30								120 HW			+	-
310 91	2310 370	.8 25	80 HW	290 9h	2210 380	. 8 35		1						80 HW				
310 91	2310 410	-9 25	40 HW	290 94	2210 420	.9 35								40 HW				
310 91	2310 450	1.0 30	0	290 94	2210 460	1.0 40								0				-
310 91	2310 490	1,1 30	WT 04	285 93	2190 495	1,1 45								WT 04			-	-
		1.2	WT 08	285 93	2190 535	1.2 45								WT 08				_
300 80	2235 555	1.3 35	120 TW	285 93	2190 575	1.3 50								WT 021				
DATA PURE	1 Climb at 100 % RPM 2 Multiply statute units by 3 Read lower half of chart 4 Make additional allow errors, combat, formation 5 Chart weight limits based Puel flow based on fuel d DATA AS OF: July 1951	f 7.87 to opposition vances n flight d on fu	obtain nautica e effective win for landing, etc. as require el density of 6, of 6,5 LBS/GL	virel units. wind only. g. navigational iired. /GAL.	ional 3AL.	EXAMP) If you are at 10000 feet with fuel, you can fly 12h0 statute MPH CAS. However, you can fly by immediately climbing to 30000 At 30000 feet cruise at 290 bf0 statute airmites from der headwing the range at 30000 fee or 1630 statute airmites. Cru this wind and start letdown 35 destination.	100 fly lower lower lower range actual sta	EXAMPLE ou are at 10000 feet with 7000 lbg, of available you can fly 12h0 statute aimiles by holding 350 H CAS. However, you can fly 20h0 statute aimiles mediately climbing to 30000 feet using 10000 RPM 30000 feet using 10000 RPM 30000 feet will be 20h0 x 80 wind the range at 30000 feet will be 20h0 x 80 il630 statute aimiles from destination. With a 80 MPH wind and start leidown 35 statute aimiles from wind and start leidown 35 statute aimiles from instion.	AMPLE with 7000 lbe, of available ute airmiles by holding 350 0000 feet using 100% RPM 200 MPLGS and start letdown om destination. With a 80 MPH feet will be 2010 x .80 feet will be 2010 x .80 is Cruise at 290 MPLGAS with 35 statute airmiles from	7000 lbs., of available airmiles by holding 350 2040 statute airmiles feet using 100% RPM PH CAS and start letdown nation. With a 80 MPH will be 2040 x 80 at 290 MPHCAS with tatute airmiles from CAT area.	available 12 350 airmiles airmiles 12 10 MPH 12 80 80 80 80 850 810 810 810 810 810 810 810 810 810	EFF RAN G.S. CAS LB/1 ()	LEGEND RANGE FACTOVE WIND—HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS.—GROUND SPEED IN STATUTE MILES PER HR GS.—CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR—TOTAL FUEL CONSUMPTION—POUNDS PER HR ()—RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE RASED ON JP—3 FUEL	LEGEND D-HW, HE, GROUND FEANGE IN FEED IN STV ED AIRSPEE FUEL CONS PARENTHI FUEL FROE	ADVIND, TV AIRMILES ATUTE MILE ED IN STATUTE SUMPTION - ESIS AVAIL.	W, TAILW (Effective S (Zero Will ES PER HI U'YE MIL POUNDS ABLE AAL SOUR	Wind) Wind) Wind) R ES PER H RCE	Mo. 2390C R R R Short 2 of 2 C R R R R R R R R R R R R R R R R R R
DATA	S Of July		MASED ON:	BASED ON: Estimates	gs S	40 statute headwind the or 1630 s this wind ar destination.	atul stal	airmiles from destination. With a 80 MPH sign at 30000 feet will be $20\mu 0 \times 80$ with airmiles. Cruise at 290 MPHCAS with start letdown 35 stacute airmiles from RED FIGURES HAVE NOT BEEN FIIGHT CHECKED.	tination. Wit t will be 201 se at 290 statute	tha 80 kg x s o MPHCAS airmiles	MPH 80 ; with from CKED:		BASE	ONLY WITH ONLY WITH BASED ON JP-3	()-KANGE IN PAENTH ONLY WITH FUEL FRO BASED ON JP-3 FUEL	()-RANGE IN PARENTHESIS AVAIL ONLY WITH FUEL FROM EXTERN BASED ON JP-3 FUEL	ONLY WITH FUEL FROM EXTERNAL SOUS	PARENTHESIS AVAILABLE FUEL FROM EXTERNAL SOURCE. FUEL FUEL

Figure A-12. Flight Operation Instruction Chart (Sheet 4 of 4) F-84G-1RE thru -5RE

Four-230 Gal. Tanks - Pylon & Tip Tanks dropped when empty. POUNDS NUMBER OF ENGINES OPERATING: 1	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING		IF YOU ARE AT 15000'	RANGE IN AIRMILES	VG OPT. ALT. BY CRUISING BY CRUISING OPT. ALT. BY CRUISING 7 1000 FT. AT OPT. ALT. LBS. AT 20000 1000 FT. AT OPT. ALT.	SEA LEVEL)) 25 (24,70) 88 4.7 (2030) 25 (24,90)) 25 (24,50) 88 00 (2005) 25 (24,70)	25 (25 2340 8200 1905 25	25 2260 8000 1870 25 2280 25 2285 25 2220 7600 1890 25 2245	25 2190 7431 1770 25 2210	1	CRUISING AT 13000 EFFEC. CRUISING AT 20000 APPROXIMATE	LE/HR G. S. FACTOR DIST. LE/HR G. S. FACTOR DIST.	120 HW 34,5 91 264,0 34,0 .7 15	2745 355 .8 10 80 HW 345 91 2640 380 .8 15	2745 395 . 9 15 40 HW 330 90 2525 400 .9 20	2650 420 1.0 15 0 330 90 2525 440 1.0 20	2650 460 1.1 15 40 TW 330 90 2525 480 1.1 20	
FLIGHT OPERATION INSTRUCTION CHART WEIGHT LIMITS 22242 TO 20768 POUNI	tanges shown equiring more ary to observe be required to d fuel. Climb DATA BEI		IF Y	~	BY CRUISING AT 15000	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	(1760)	(2171)	1650	1620	1525	1	5	CAS. RPM		355 90	355 90	340 89	340 89	
INST	NOTES: It on flights r it is necessal climb may distance an	ALTITUDE	,0000	LES	BY CRUISING AT OPT. ALT.	RIBED CLIMB	24,50	24,00	2325	2285 2245 2205	2170	7000	AATE	RANGE DOWN FACTOR DIST.		.8 10	.9 10	1.0 10	1.1 10	
ATION CHART		ALTI	IF YOU ARE AT 10000	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	FOR PRESC	25 25	25	2 2	25 25	25		APPROXIMATE	LB/HR G. S.	4	2950 345	2850 370	2850 410	2780 1440	
ERA Cl		MO7	IF YOU	RANG	Y CRUISING AT 10000'	OWANCES	(1555)	(01510)	1450	1420 1390 1360	1335		CKUISING	* 4		89	88	88	87	
O T	lumn equi combat, climbing to J climbing ns are gii nd read co rom initii all other tances to	-			60	TUDE ALL	ਰ ਰੋ	57	- 7	AHH	1	+		T. CA.S.		370	360	360	350	
FLIGHT OPERA CHART WEIGHT LIMITS 22242	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or beat than fuel available for cruise (fuel on board minus allowances for reserve, combat, navisational errors, formation flight, etc.). Move horizontally right or left to section according to present altitude and read total range available (no wind) by cruising at that altitude on by climbing to another altitude of maximum range. For a flight at initial altitude operating instructions are given disparted being the cruising mediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING - From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude and all other necessal allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	See Con-	. ,000	S	BY CRUISING AT OPT. ALT.	GURES INC	(2435) (2415)	2380	2305	2265 2225 2185	2150	200	MATE	RANGE DOWN FACTOR DIST.			9.	1.0 5	1.1 5	
CHAS CHAS	Select figure lowances for lower figure or left to set to that altitute to desired liMT PLAN deruising a ding initial		NE AT 5000"	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	(RANGE F	25 25	25	0 %	25 25 25	25	1	₹ S	si 0			965 0	390	η50	
	GHT – S ninus all lly right ruising a 1 altitude redistely 3) FLIG to desirec	11177111	IF YOU ARE	RANGE	SING				SHOWSHIE				CKUISING	RPA LB/HR			88 3200	87 3085	86 3005	
<u>s</u>	IN FLI board n orizontal orizontal at initial mb imm ction. (E		=		BY CRUISING AT 5000'		(1340)	1300	1245	1220	SALL			CAS.			380 8	365 8	355 8	
AIRPLANE MODEL(S) -84G-IRE thru-5RE GINE(S) 335-A-29	ART: (A) (fuel on win a flight inflittude sel alke-off and or IN FLI(No or other		FUEL	LBS.		8847 8800	8600	8200	8000 7800 7600	7431		EFFEC.	WIND	120 HW	80 HW	40 HW 3	0	40 TW 3	,
LE M nru-5RE i-A-29	NO CH, cruise ght, etc.) ght, etc.) ght, etc. higher a ruising a red for tred for tred for the sart as fo										-	1	T	DOWN DIST.			1	ī	,	
AIRPLANE M F-84G-IRE thru-5RE ENGINE(S) J35-A-29	FOR USI liable for nation flip val range aximum r flight at opriate c uel requir		S. L.	ILES	BY CRUISING AT OPT, ALT.		2015	2360	2285	2245 2205 2165	2130		S. L.	3 A O	5	H	6.	1.0	1,1	
AIR F-840	rions port form ore, form read to the of me of the		RE AT	IN AIRM	OPT. ALT. 1000 FT.		W W	10.1	0 10	10 10 10	100		AT N	6.5			350	380	0TH	
	than funder and response and response and response and response and response court as allower es.	100	IF YOU ARE AT	RANGE IN AIRMILES	8° 2	-	22 23	12.5	0 %	25.25	25	-	CRUISING	· s		34	3450	3360	3270	
Mo. 339C Shoet 3 of 3 (Rev. 3 Mey 50)	INSTR bes the gations attitude other a rectly instruc- on bose sary all		*		BY CRUISING AT S. L.		1190	1155	1110	1085 1065 1040	1020		-	CAS. 89.8			390 87	380 86	370 85	•

Figure A-13. Flight Operation Instruction Chart (Sheet 1 of 4) F-84G-1RE thru -5RE

Z	AIRPLANE MOD.	ANE MOD.	ENG.	J35-A-29	CHAR	CHART WT. LIMITS	22242	TO 20768	992	20768 LB. EXT	EXT. LOAD				NO. OF EN	OF ENGINES OPERATING:1	RATING:1
YOU	IF YOU ARE AT 25000	25000		IF YO	IF YOU ARE A	AT 30000'	_	IF YOU ARE AT 35000'	RE AT 3	-	IF YC	IF YOU ARE AT 40000	40000			IF YOU ARE AT 45000'	AT 45000'
Z,	RANGE IN AIRMILES	AILES	FUEL	2	RANGE IN AI	AIRMILES		RANGE	RANGE IN AIRMILES	ES	RA	RANGE IN AIRMILES	MILES	E E		RANGE IN AIRMILES	URMILES
BY CRUISING AT 25000	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 30000'	G OPT. ALT. 1000 FT.	T. BY CRUISING		BY CRUISING OPT. ALT. AT 35000 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRUISING AT 40000	3 OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	- G	BY CRUISING AT 45000	1000 F	OPT. ALT. BY CRUISING 1000 FT. AT OPT. ALT.
					(RAN	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	UDE ALLOW	VANCES FO	R PRESCR	BED CLIMB & D	SESCENT TO SE	EA LEVEL)					-
(21.75)	25 25	1 1	8847 8800		7									8847			
(21h0)	25		9600											8600			
(2020)	25 25	ť	8900					- 1						8200			
5035	25		800						T					800			
1995	2 % %	,	7800											7800			
1920	52	1	7431					+						7432			-
CRUIS	CRUISING AT 25000"	15000	FREEC	CRL	CRUISING AT	AT 30000'		CRUISING AT 35000	AT 350	òo	CRU	CRUISING AT 40000	40000		S	CRUISING AT 45000	45000
	APPROXIMATE		TIVE		APPRC	APPROXIMATE		4	APPROXIMATE			APPROXIMATE	63	TIVE		APPR	APPROXIMATE
2 2	LB/HR 0. S.	RANGE DOWN PACTOR DIST.	QNIM	CAS. IPM	18/нв О.	G. S. PACTOR DIST.	CAS.	RPM LB/HR	0.5	RANGE DOWN FACTOR DIST.	CAS BPM	18/HR G. S.	RANGE DOWN FACTOR DIST.	WIND	CAS. IPM	LB/HR	G. S. PACTOR
93 20	2620 365	.7 25	120 HW											120 HW			
92 29	2540 390	.8 25	80 HW											80 HW			
92 29	2540 430	.9 25	40 HW											40 HW			
92 29	2540 470	1.0 30	0											0			
91 21	2430 490	1,1 30	AT 04											WT 04			
91 21	24,30 530	1,2 35	%T 08							_				WT 08			
91 2	24,30 570	1.3 35	WT 021											120 TW			
Climb	Climb at 100 % RPM Multiply statute units by	Cimb at 100 % RPM Multiply statute units by .87 to obtain nautical units.	obtain naut	ical units.	5	16 von 187		EXAMPLE	IPLE			EFF	ECTIVE WIL	LEGEND ND - HW, HE, GROUND	LEGEND LEFECTIVE WIND - HW, HEADWIND, TW, TAILWIND RANGE BARGE CERECION WIND	TW, TAILY E (Effective	VIND -
Make errors Chart Fuel 1	lower half additions combat, f weight lim low based	Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational serons, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	for landir etc. as requell density of of 6.5 LBS	vind only. g. navigatio. iired. f 6.5 LBS/GA	E 4	It you are at 10000 rest with 0000 libs. Itel, you can fly 1120 statute airmiles by MPH CAS. However, you can fly 2285 statut by immrediately climbing to 25000 feet uning At 25000 feet cruise at 325 MPH CAS and 30 statute airmiles from destination. With headwind the range at 25000 feet will be 228, or 1830 statute airmiles. Cruise at 325 MPH can be airmide.	of war are at 10000 rear with 0000 1200 of 1, you can fly 1120 statute airmites by how the CAS. However, you can fly 2285 statute immediately climbing to 25000 feet using 10 25000 feet using 10 25000 feet using 10 25000 feet using 25000 feet using 25000 feet using 25000 feet will be 2285 diwind the range at 25000 feet will be 2285 fight 1380 statute airmiles. Cruise at 325 MPH.	o statuta you can fi ng to 2500 ise at 321 miles from 25000 airmiles. C	the airmiles for 2000 feet unit 0000 feet will be 2000 feet	OUX reset with 5000 LOS. or available 1120 statute airmiles by holding 360 ver, you can fly 2285 statute airmiles mining to 25000 feet using 100% RPM cruise at 325 MPH CAS and start leddown airmiles from destination. With a 80 MPH s at 25000 feet will be 2285 x .80 e airmiles. Cruise at 325 MPH CAS with the leddown to a simple cruise at 325 MPH CAS with	or available holding 360 100 % RPM 1	GSS- CAS ()	GE FACTOR - GROUND (- CALIBRA' - RA - TOTAL - RANGE I ONLY WIT	= RANGE SPEED IN S FED AIRSP FUEL CO N PARENT H FUEL F	GSGROUND SPEED IN STRUTE MILES (Zero Wind) GSGROUND SPEED IN STATUTE MILES PER HR LGAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR LGAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE R ONLY WITH FUEL FROM	ES (Zero W LES PER H YTUTE MII I - POUND ILABLE RNAL SOU	LES PER HR S PER HR
	100					destination.			ב סומו			BASI	BASED ON JP-3	3 FUEL			No

Figure A-13. Flight Operation Instruction Chart (Sheet 2 of 4) F-84G-1RE thru -5RE

Four-230 Gal. Tanks - Pylon & Tip Tanks dropped when empty. POUNDS NUMBER OF ENGINES OPERATING: 1	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING
INSTRUCTION TO 1929t POUNDS	NOTES: Ranges shown at optimum on flights requiring more than one it is necessary to observe the optimular may be required to obtain a distance and fuel. Climb distance a DATA BELOW CO
CHART WEIGHT UNITS 20768 TO 19294 POUND	Select figure in fuel column equal to or allowances for reserve, combat, navitor of left to section according to present f at that alitude or by climbing to anode, operating instructions are given divity to desired alitude and read cruising IGHT PLANNING—From initial fuel red cruising alitude and all other necessadding initial climb distances to range
AIRPLANE MODEL(S) F-84G-1RE thru-5RE ENGINE(S) J35-A-29	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or seast than fuel available for cruise (fuel on board minus allowances for reserve, combat, naviational errors, formation flight, etc.). Move horizontally right or left to section according to present aktitude and read total range available (no wind) by cruising at that altitude or by climbing to another altitude of maximum range. For a flight at initial altitude, operating instructions are given directly below, for a flight at higher altitude climb immediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING—From initial fuel on board aubtract fuel required for take-off and cl.mb to desired cruising altitude and all other neversary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.
McRE Form Me, 339C Sheet I of 2 (Rev. I May 50)	INSTE less the gations gations a strind other a rectly instituted on boat on boat wall values.

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I I	hang	hart	desc	
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NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range	on flights requiring more than one chart (due to external configuration or gross weight change),	it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a	climb may be required to obtain a maximum range. All range values include allowances for descent	distance and fuel. Climb distance and fuel are included where climbs are indicated.
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4	0	- 24	U	0

IF Y	IF YOU ARE AT		S. L.	_		1 1	IF YOU ARE	RE AT 5000	,000		1	YOU A	IF YOU ARE AT 10000	10000		4	IF YOU ARE	ARE AT	AT 15000			=	YOU	IF YOU ARE AT 20000	20000	
2	RANGE IN AIRMILES	N AIRM	LES	FUEL		-	RANGE IN	N AIRMILES	ES			RANGE	RANGE IN AIRMILES	HES			RANG	RANGE IN AIRMILES	MILES		FUEL		RANG	RANGE IN AIRMILES	AILES	
BY CRUISING AT S. L.	9 0	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	I.BS.		BY CRUISING AT 5000'	-	ALT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 10000"	SNO	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRUISING AT 15000'	SING	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	LES.	BY CRUISING AT 20000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	JISING
					_			(RANGE	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	CLUDE	ALLOW	NOCES	FOR PRES	CRIBED C	LIMB &	DESCENT	TO SEA	LEVEL)								
1020	a.	30	2130	7431	-	2411	161	30	2150		1335	-	39	23	2170	1525	16	39	CA	2190	7431	1770		200	22.	2210
566		30	2085	7200	+	1120		30	2105	-	1305	1	30	23	2125	1490		3	2	21/12	7200	1725		30	27	2160
970		30	2045	7000	Н	1090	15.3	30	2065		1270		30	20	2085	1455		30	N	2105	7000	1690		30	277	2120
955		30	2005	6800	7	1065	1*1	30	2025		1240		28	20	2045	11,25	16	9	CA	2065	9	1655		8	2080	90
925		20	1955	0099	-	Office	-1	30	1980		1215		30	20	2005	1390	_	R	C/	2025	0099	1620		8	20	20h0
875		10	1865	6200		066	-1	15	1890		1155		20	15	1910	1325		25	Н	1935	6200	1545		25	1950	20
850	-		1	मग65		955			,		0111		1	1		1280	-	1	'		5944	1490		1	.1.	
S.	CRUISING AT	AT S	1,		+	0	CRUISING	G AT 5000	,000	+	0	MISIN	CRUISING AT 10000	,ò000			CRUISIP	CRUISING AT 15000	15000				CRUISI	CRUISING AT 20000	0000	
Ц	AP	APPROXIMATE	ATE			Ц	Y	APPROXIMATE	ATE		H		APPROXIMATE	MATE		ľ		APPRO	APPROXIMATE		EFFEC.			APPROXIMATE	IMATE	
CAS. 8PM	18/HE	si o	RANGE DOWN FACTOR DIST.		D CAS.	S. M. W.	LB/HR	ş; 0	RANGE DO	DOWN C.	CAS. RPM	M LB/HR	0.5.	RANGE	DOWN DIST.	CAS.	RPM LB/	LB/MR G.S.	S. FACTOR	LET DOWN DE DIST.	WIND	CAS.	% RPM LB/HR		RANGE	DOWN
				120 HW	3																120 HW	335	2 06	2430 3%	325 °.7	35
				80 HW	*						370 8	88 2870	70 345	80	10	355	89	2670 3	355	8.	80 HW	335	90	24,30 34	365 °8	73
390 87	3360	350	6.	40 HW	w 380	0 87	3140	365	6.	10	370 8	88 2870	70 385	60	10	34.5	88	2610 3	385	.9 15	40 HW	325	89 2	2380 39	395 °9	20
380 86	3275	380	1.0	0	370	98 0	3060	395	1.0	2	350 8	87 2700	00 1100	1.0	10	345	88 2	2610 4	425 1.0	0 15	0	325	89 2	2380 4.	435 1.0	20
370 85	3190	410	1.1	WT 04	₩ 355	5 85	2945	1,20	1,1	20	350 8	87 2700	00 1/10	1,1	10	330	87 2	2515 4	1,50 1,1	1 15	40 TW	325	89 2	2380 1/7	475 1°1	20
				WT 08	*						335 8	86 2600	991 00	1,2	10	330	87 2	2515 4	1,90 1,2	2 15	₩T 08	315	88 2	2295 50	500 1.2	25
				120 TW	>				y d	-		_									30.00	315	SR S	990K	50013	26

Figure A-13. Flight Operation Instruction Chart (Sheet 3 of 4) F-84G-1RE thru -5RE

F-84G	F-840-1RE thru-5RE	ru-SRE														The second second		The second second			
AIRPLANE MOD	MOD.		ENG.	J35-A-29	1-29	CHARI	CHART WT. LIMITS		20768	5	TO 19294	.81	EXT. LOAD	LOAD				NO.		NES OPE	OF ENGINES OPERATING: 1
IF YOU ARE AT 25000	ARE AT	25000	9		IF YOU ARE		AT 30000'		=	F YOU	IF YOU ARE AT 35000'	35000		IF YC	IF YOU ARE AT 40000	T 40000			IF YC	IF YOU ARE AT 45000'	T 45000'
EANG	RANGE IN AIRMILES	ULES			ZN.	Z 35	AIRMILES			RANG	RANGE IN AIRMILES	WILES		RA	RANGE IN AIRMILES	RMILES		FUEL	R	RANGE IN AIRMILES	RMILES
BY CRUISING O AT 25000' 1	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	LBS.	PY C	BY CRUISING AT 30000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRUISING AT 35000'	JISING S000'	OPT, ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000'	OPT. ALT. 1000 FT.	AT OF	BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 45000'	OPT. ALT. 1000 FT.	F. BY CRUISING AT OPT. ALT.
						(RAN	GE FIGUR	ES INCLU	DE ALLON	WANCES	FOR PRES	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	MB & DES	CENT TO SE	EA LEVEL)					L	
1920	38	2230	7200	21	2145 2105	3 %												7200			
1840	30	O.L.C	7000	000	2065	20	-						-				T	2002	18		-
	30	2100	9	20,	2020	2 8												0099			
1760	30	2060	98	19	1980	30							-					0099			
1680	30	1975	9500		1890	30												9500			
1630		1	5944	1330	30	30					a V			7.8	R X			5944		1 2 2	
CRUISING	IG AT 25000	2000	2332	L	CRUISING		AT 30000	T		CRUISIN	CRUISING AT 35000'	35000	-	CRUI	CRUISING AT 40000	40000	T	T	CRU	CRUISING AT 45000	45000
1000	APPROXIMATE		TIVE			APPROXIMATE	XIMATE				APPROXIMATE	IMATE	-	-	APPROXIMATE	KIMATE	T	EFFEC.	-	APPRO	APPROXIMATE
SPM LB/HR	9 0	EANGE DOWN PACTOR DIST.	AIN	CAS	* Wall	18/ня О. S.	S. FACTOR	E DOWN	CAS.	RPM LB/HR	9 9	RANGE	DOWN CA	CAS. IPM	L8/HR G.S.	RANGE	DOWN DIST.	WIND	CAS. RPM	LB/HR G.S.	S. FACTOR DOWN
92 23	2365 340	.7 25	120 HW	230	94 22	2210 340	7. 0	30		3	150							120 HW		-	
91 23	2310 370	.8 25	80 HW	290	94 23	2210 380	9.	35									I	80 HW			
91 23	2310 410	9 25	40 HW	290	94 22	2210 420	6.0	35										40 HW			
91 23.	2310 450	1.0 30	0	290	94 22	2210 460	0 1.0	ηo					-					0			
91 23	2310 490.	1,1 30	WT 04	285	93 21	2190 495	5 1.1	145										WT 04			
90 22	2235 515	1,2 35	¥T 08	285	93 21	2190 535	5 1.2	145					-			4		WT 08			
90 22	2235 555	1,3 35	120 TW	285	93 21	2190 575	5 1.3	50										120 TW			
1 Climb at 100 % 2 Multiply statute u 3 Read lower half of 4 Make additional errors, combat, for 5 Chart weight limit Fuel flow based or DATA AS OF: JULIV	Climb at 100 % RPM Multiply statute units by Read lower half of chart Make additional allow errors, combat, formation Chart weight limits based Fuel flow based on fuel of AS OF. July 1953	PRPM c that to say to c that to positive by 87 to c that to proposition allowances mation flight is based on fuel density in fuel density in the control of	obtain nautical units. e effective wind only. for landing, navigatio etc. as required. el density of 6.5 LBS GAL. of 6.5 LBS/GAL.	wind on the state of 6.5 L. S/GAL.	its. vigational BS GAL.		If yo fuel, MPH by im At 3 140 s heady or 1 or 1 this this destin	EXAMF If you are at 10000 feet with fuel, you can fly 1270 statute MPH CAS. However, you can fly by immediately climbing to 3000 At 30700 feet cruise at 290 At 30700 feet cruise at 290 At 30700 feet strain from d headwind the range at 30000 is not 1670 statute airmiles. Cr this wind and start letdown 35 destination.	EXAMPLE 10000 feet with 7000 lbg, of available fly 1270 statute airmites by holding 350 lowever, you can fly 2085 statute airmite by climbing to 30000 feet using 1.00 % RPM feet cruise at 200 HPHCAS and start ledown airmite from destination. With a 80 HPH range at 30000 feet will be 2085 x .80 thite airmites Cruise at 290 HPH CAS with start letdown 35 statute airmites from airmites from the company of the c	feet v O stati O stati you can ng to in see at miles fro 30000 airmiles.	EXAMPLE If you are at 10000 feet with 7000 11 fuel, you can fiy 1270 statute airmiles MPH CAS. However, you can fiy 2085 at by immediately climbing to 30000 feet us At 30700 feet cruise at 290 MPHCAS LIQU statute airmiles from destination. Neadwind the range at 30000 feet will be or 1670 statute airmiles. Cruise at 2 fits wind and start letdown 35 statute destination.	EXAMPLE If you are at 10000 feet with 7000 lbs, of available file, you can fly 1270 statute airmiles by holding 350 MPH CAS. However, you can fly 2085 statute airmiles by immediately climbing to 30000 feet using 1.00 % RPM At 30700 feet cruise at 290 HPHCAS and start letdown lyo statute airmiles from destination. With a 80 HPH headwand the range at 30000 feet will be 2085 x ,80 or 1670 statute airmiles. Cruise at 290 HPH CAS with this wind and start letdown 35 statute airmiles from	Libe, of available es by holding 350 attatute airmiles using 1.00 % RPM S and start letdown With a 80 HPH a 2005 x .80 290 HPH CAS with	vvailable 350 350 350 350 350 350 350 350 350 350	RAN G.S. CAS LB/ ()	EFFECTIVE WIND. RANGE FACTOR = G.S GROUND SPE CAS CALIBRATEL LB/HR - TOTAL FI () - RANGE IN F ONLY WITH F	WIND - COR = 1 COR	LEGEND HW, HE, SROUND RANGE II D IN STA AIRSPER EL CONS RENTHI	LEGEND RANGE FACTOR = GROUND DISTANCE (Effective Wind) G.S GROUND SPEED IN STATUTE MILES PER HR CAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE E S S S S S S S S S S S S S S S S S S	W, TAILW (Effective) (Zero Wis UTS PER HI UTS PER HI POUNDS ABLE	NND- NADD- CES PER HR 10.239C

Figure A-13. Flight Operation Instruction Chart (Sheet 4 of 4) F-84G-1RE thru -5RE

RESTRICTED AN 01-65BJE-1

EXTERNAL LOAD ITEMS Two-230 Gal. Tiptanks Carried Entire Distance ER OF ENGINES OPERATING: 1	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	- representative	AT 20000'	RANGE IN AIRMILES	ALT. BY CRUISING FT. AT OPT. ALT.	(1845)	(1810)	(1760)	1705	1660	1500	1480	24,35	CRUISING AT 20000'	APPROXIMATE	G. S. FACTOR DOWN	360 .70 20	385 .80 20	l ₄ 25 °90 25	465 1.00 25	485 1,10 25	525 1.20 30	200 00 100
LOAD ITEMS Carried Entire Dis	in maxi na changi owances ed.		IF YOU ARE	IGE IN	OPT. ALT. 1000 FT.	×	35	×	×	××	3 70	35	35	SING	APPI	LB/HR	2050	1985	1985	1985	1900	1900	0000
arried AG:	to obta or gre e., when ude all indicat		IF YO	RAN	BY CRUISING AT 20000	2)	(0	(5	0	20.0	0	0	70	CRU		**	18	%	98	98	85	85	20
AL I	order juration chart, i.d. ues incl nbs are	The state of			BY CR	(३१५५८)	(01/11)	(1365)	1320	1285	1180	1130	1095			CAS.	360	350	350	350	335	335	1
EXTERNAL LO Two-230 Gal. Tiptanks Carr NUMBER OF ENGINES OPERATING:	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain ma on flights requiring more than one chart (due to external configuration or gross we it is necessary to observe the optimum cruising altitude on each chart, i.e., when chan climb may be required to obtain a maximum range. All range values include allowance distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	Constant of the last		FUEL	LBS.	5857	5800	2600	5400	5200	1,800	0091	भूगा	2000	THE C.	WIND	120 HW	80 HW	40 HW	0	WT 04	WT 08	
EX 30 Ga	re maxi o exterr ltitude ge. All r cluded v				SING ALT.	6	<u></u>	10	0	20.3	0.0	0	10			LET DOWN DIST.		35	35	35	35	35	
Two-2	tudes a (due to uising a uising a um rang I are inc		,000	s	BY CRUISING AT OPT. ALT.	(1835)	(1800)	1745	1690	1635	1520	1460	Stale	ò	ATE	RANGE	1	.80	°90	1,00	1,10	1,20	
N N	um alti chart num cr maxim and fue NTAIN		AT 15000	RANGE IN AIRMILES		370	100	10	10	20.3	0.30	10	w	CRUISING AT 15000'	APPROXIMATE	6. 5.		385	425	1450	760	515	
ON	optimi han one he optim btain a stance a		U ARE	N 357	OPT. ALT. 1000 FT.	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL) 35 (1775) (1080) 35 (1800) (1250) 35	35	35	m'	76 7	n, m,	35	35	SING	AP	LB/HR		2315	2335	2240	2240	5912	
E 8	nown at more to serve to ced to o limb dii		IF YOU	RA	Y CRUISING AT 15000'	(1250)	(1225)	1185	2112	2011	1020	980	950	CRU	Ц	# W W		98	98	85	85	178	
FLIGHT OPERATION INSTRUCTION CHART WEIGHT LIMITS 18645 TO 17181 POUN	nges sh quiring y to ob e requir fuel. Cl	1			BY CB	DESCEN (12)	17	7	н	н,	4 7			L	L	C.A.S.		375	375	365	365	355	
STRU 17181	SS: Raghts recessar eccessar may be	W.			I. ALT.	LIMB &	(55)	15	9	07	2 8	01	26			DOWN DIST.		10	10	10	10	10	
¥ º	NOTI on flig it is n climb distan		,0000	ES	BY CRUISING AT OPT. ALT.	RIBED CLIME (1800)	(1765)	1715	1660	1610	1500	Other	1395	ò	AATE	RANGE		.80	° 90	1,000	1,10	1,20	
CHART 18645		ALTITUDE	IF YOU ARE AT 10000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	R PRESC	35	35	35	75. 5	4 14	35	35	CRUISING AT 10000'	APPROXIMATE	6.5		390	425	ाग	1,80	505	
CH Seeks			U ARE	NGE IN	-	CES FO								IISING	Y	LB/HR		2655	2600	2485	2485	2400	
S S	t, navi- t, navi- present t to an- iven di- cruising ial fuel r neces-	LOW	IF YO	2	BY CRUISING AT 10000'	(1080)	(1060)	1030	066	096	920	850	820	S	Ц	* 4		87	98	85	85	180	
FLIGHT OP	mn equ comba ding to limbing s are gi d read om init all othe					UDE AL	3					L		L	L	3		170	375	385	385	370	
HT	esserve. n accord or by c rruction ude and de and nb disti	1			BY CRUISING AT OPT. ALT.	GURES INCL (1775)	1740	1690	1635	1580	1470	21415	1370			E DOWN			7/	w	w		
LIG	for ri for ri section ltitude ing inst ed altit ANNIN g altitudial clin		5000	AIRMILES		E FIGUR	T.	ñ	77	7	27	7	a	AT 5000'	MATE	RANGE			°60°	1,00	1,10		
- 5	elect fig owances r left to that a operat to desir HT PL cruisin ing init		¥	- 33	OPT. ALT. 1000 FT.	(RANG	35	35	35	26.1	24 25	35	35		APPROXIMATE	9.5			5 415	0 435	5 465		
	HT - Sanus allor right o saing at lititude. Ilititude. FLIGI desired desired ve. addi	1	IF YOU ARE	RANGE IN	138 150		+					-	-	CRUISING		LB/HR			2995	2860	2795		
	FLIGI red mir contally by cru nitial a immed on. (B) I.mb to	1	F		BY CRUISING AT 5000'	(930)	910	880	850	820	790	730	302	0	Ц	S. RPM.		_	98	88	3 84		_
EL(S	(A) IN on boa on boa e horiz wind) ght at i climb e sectio		L	L	۵`		+	_			- 1	-		-	L	CAS.	>	>	v 425	707	1000	_	_
AIRPLANE MODEL(S) 846-188 thru -588 IGINE(S) J35-A-29	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, navigational errors, formation flight, etc.). Move horizontally right or left to section according to present allitude and read total range available (to wind) by cruising at that allutude or by climbing to another allitude of maximum range, For a flight at initial allitude, operating instructions are given directly below. For a flight at higher allitude, climb immediately to desired allitude and read cruising instructions in appropriate cruising allitude section. (B) FLIGHT PLANNING—From initial fuel on board aubtract fuel required for take-off and climb to desired cruising allitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.			FUEL	LBS.	5857	5800	2600	51,00	5200	5000 1,800	1,600	भूगा	2000	EFFEC	WIND	120 HW	80 HW	40 HW	0	40 TW	WT 08	
NE MO ru -5RB J35-A-29	ING Clight, et cruis ight, et e availt range. t higher cruising ired foo thart as	18			CRUISING OPT. ALT.	1760	1725	1675	1620	1565	1510	1340	1350			LET DOWN DIST.			E	1	ì		
AIRPLANE M F-840-1RE thru -5RE ENGINE(S) J35-A-	OR US tal rang ximum flight a opriate sel requ	1	S. L.	LES	BY CRUISING AT OPT, ALT.	17	17	16	Ä	17	44	1	1	S. L.	ATE	RANGE			06°	1,00	1,10		
AIRPI F-84G-1RE ENGINE(S)	IONS F ra, form read to r of me For a n appratract fu		₹	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	32	35	35	25	70	25 25	35	32	AT S	APPROXIMATE	6.5			415	1,30	1,60		
E, W	RUCT han fun all erro altitudi below. ctions i and sub illowand	Section 1	IF YOU ARE	INGE IN			1		, ,,,		. 1 111	-		CRUISING AT	AP	18/HR			3345	3160	3085		
Sheet I of 2 (Rev. I May 50)	INSTI less th gations altitud other instruc on bos eary all	1	IF Y	5	BY CRUISING AT S. L.	820	805	780	750	720	670	Ollo	950	Ü	L	* 40			87	85	84		
MCRE Form					PA A	80	-	7		-	0 0					SA3			455	1,30	420		

Figure A-14. Flight Operation Instruction Chart (Sheet 1 of 8) F-84G-1RE thru -5RE

2-230 Gal. Tip Tanks Carried Entire Distance	NO. OF ENGINES OPERATING: 1	IF YOU ARE AT 45000'	BY CRUISING OPT. ALT. BY CRUISING AT 45000' 1000 FT. AT OPT. ALT.									CRUISING AT 45000'		C.A.S. RPM LB/HR G.S. FACTOR DIST.								LEGEND LEGEND LEFECTIVE WIND – HW, HEADWIND, TW, TAILWIND – RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS. – GROUND SPEED IN STATUTE MILES PER HR CAS – CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR – TOTAL FUEL CONSUMPTION – POUNDS PER HR		0
arried 1		-	LBS.		5857	5800	2,600	2900	2000	0097	91111		EFFEC.		120 HW	80 HW	40 HW	0	WT 04	%T 08	120 TW	LEGEND CHW, HE, GROUND RANGE II EED IN STA	FUEL P	
anks Ca	1	ò	ILES BY CRUISING AT OPT. ALT.			-								GE DOWN	-	-						EFFECTIVE WIND. RANGE FACTOR = G.S GROUND SPE CAS CALIBRATEI LB/HR - TOTAL FI	WITH	
Tip T	I	AT 4000	IRMILES LT. BY T. AT	+		+		+				40000	APPROXIMATE	S. FACTOR		1		-				FECTIV NGE FA GRO S-CAL	ONLY	
30 Gal.	I	IF YOU ARE AT 40000'	RANGE IN AIRMILES NG OPT. ALT. BY O' 1000 FT. AT	LEVEL)								CRUISING AT 40000	APPRO	LB/HR G.	\vdash	T				-		RA G.S CA.		
		IF YOU	BY CRUISING AT 40000"	TO SEA					,			CRUIS		RPM R								0 10		
EXT. LOAD			BY CR	DESCENT			Ы							C.A.S.								of available olding 385 airmiles	80 MPH	3
	1	,	PT. ALT.	CLIMB &			1.							DOWN DIST.	75	80	85	95	1,10 105	1,20 110	1,25 120	E of available of available simmiles by holding 385 555 statute armile feet using 100% RPM	airmiles from destination. With a 80 MPH at 35000 feet will be 1555 x85	TO THE MAN JOSE
	9	35000	MILES BY CF	SCRIBED						1		35000′	IMATE	RANGE	57.0	28%	96° 5	2 1,000				XO 1bs irmiles 25 stat feet usir	ation. W	200
H ALTITUDE	1	ARE AT	RANGE IN AIRMILES NG OPT. ALT. BY CRUISING 1000 FT. AT OPT. ALT.	FOR PRE								¥	APPROXIMATE	. S.	1760 375	25 405	25 1445	25 4.85	25 525	90 555	90 595	EXAMPLE eet with 500 tratute a can fly 15% or 15% o	n destina	
HIGH 8645 TO	2	IF YOU ARE AT 35000'		VANCES	(1890)	(1855)	(1800)	(1690)	1635	3	1520	CRUISING		N LB/HR	92 17	91 1725	91 1725	91 1725	91 1725	0691 06	90 1690	EXA feet v stati you can	95 statute airmiles from the adwind the range at 35000	2000
18645		-	BY CRUISING AT 35000	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	(18	(18	25	(16	16	1	ម្ភា ដ			CAS.	290	285	285	285	285	275	275	EXAMPLE If you are at 10000 feet with 5000 lbs of available fuel, you can fly 920 statute airmiles by holding 385 MPH CAS. However, you can fly 1595 statute airmiles by immediately climbing to 35000 feet using 100% RPM AT 37000 feet using 100% RPM	ange at	- 4
ITS			SING	SINCLUE	(58	(0)	(00)	06	0, 0	3	22 52	T		DOWN DIST.	145	20	55	9	65	70	75	are at CAS. H.	95 statute	or 1390 statute
CHART WT. LIMITS		AT 30000'	BY CRUISING AT OPT. ALT.	FIGURE	(1885)	(1850)	(1800)	1690	1580	1	1520	,0000	AATE	RANGE	e.75	. 85 58°	06°	1,00	1,10	1,20	1,25	If you fuel, y. MPH by imm	95 st	27 7 29
HART		10000	GE IN AIRMILES OPT. ALT. BY 1000 FT. AT	(RANGE	35	35	35 35	35	75 75	3	35	3 AT 30000	APPROXIMATE	8	365	501 0	5 4.35	5 475	515	555	585	1 - 1814		
	1	IF YOU ARE		+	-	-				+		CRUISING		18/HE	89 1770	89 1770	8 1735	8 1735	88 1735	3 1735	1695	ional		
-A-29		<u>=</u>	BY CRUISING AT 30000'		(1780)	(1740)	(1690)	1580	1525		1370		H	C.A.S. RPM	310 8	310 8	300 88	300 88	300 8	300 88	295 87	l units. d only. navigat d. 5 LBS/(M.		
ENG. J35-A-29	-	FUE		T	5857	8	88	8	8 8	+	00 94	1	TIVE	WIND	120 HW 3	80 HW 3	40 HW 3		40 TW 3	80 TW 3	120 TW 2	n nautical ctive win landing, s require sity of 6		
	-	<u>"</u>		+	58	5800	5600	5200	5000	+	917171	- 2					_	0	_	_		o obtair site effec s for it etc. a fuel den		
-5RB	-	2000	BY CRUISING AT OPT. ALT.		(1860)	(1830)	(1780)	1670	1615		1505	,000		RANGE DOWN FACTOR DIST.	°70 30	.80 35	°90 35	1,00 40	1,10 45	1,20 45	1,30 50	Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.		
R-84G-1RE thru -5RB		IF YOU ARE AT 25000	RANGE IN AIRMILES NG OPT. ALT. BY TOOM FT. AT		35	35	35 35	35	25 25		X X	CRUISING AT 25000	APPROXIMATE	9	365	395	435	1,75	767	535	575	100 % RPM statute units by extatute units by lditional allow mbet, formation ght limits basec based on fuel d		
F-84G-1RE th		YOU A	9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	-				-		+		UISING	*	LB/HR	1955	1915	1915	1915	1835	1835	1835	Climb at Multiply a Read lowe Make ad Mare ad errors, con Chart weij		
F-8 AIRPL		H	BY CRUISING AT 25000"		(1580)	(1550)	(1500)	1400	1350		1250	S.		CAS. BPM	335 88	330 87	330 87	330 87	33.5 86	315 86	315 86	5 4 3 2 1 5 4 3 2 1 7 2 4 8 8 C		

Figure A-14. Flight Operation Instruction Chart (Sheet 2 of 8) F-84G-1RE thru -5RE

INST less gation altitu other rectly instru		Torse B	INSTRUCTIONS FOR USING CHART:	CHART: (Ė	CHART WEIGHT LIMITS	שווי דוונ		17181		2	TO 15717	7	POUNDS	_	UMBER	OF EN	NUMBER OF ENGINES OPERATING:	PERATIN	IG: 1			230 GaL, TIP TANKS CATTIGG ENTITY DISTANCE OF ENGINES OPERATING: 1
on bos sary al values.	rRUCTIC than fuel nal errors, de and re attitude v below. F actions in hard subtr	avail form of man For a l appre	gational errors, formation flight, etc.). Move horizontally right or left to section according to present attitude and read total range available (to wind) by crusings at that situtude or by climbing to another attitude of maximum range. For a flight at initial altitude, operating instructions are given directly below. For a flight at higher altitude, climb immediately to desired altitude and read crusing an authority and abstractions from in appropriate crusing altitude section. (B) FLIGHT PLANNING—From initial fuel on board aubtract their required for take-off and climb to desired crusing altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	ilable (no) For a flig er altitude, ng altitude or take-off as for IN F	on bos on bos on bos wind) ght at climb: sectio and cl	(A) IN FLIGHT – Select on board minus allowar wind) by crusing at tha wind) by crusing at tha gight at initial altitude, ope e, climb immediately to de te section. (B) FLIGHT f and climb to desired cru FLIGHT above, adding	HT - Se right or right or ssing at lititude. fiately t FLIGH desired	wances r left to that alt operatir o desire AT PLA cruising	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, navisational errors, formation flight, etc.). Move horizontally right or left to section according to present altitude and read total range available (no wind) by cruising at that altitude on by climbing to an reach below. For a flight at higher altitude, operating instructions are given dispertions in appropriate cruising altitude section. (B) FLIGHT PLANNING – From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	column ve. con cording y climb ions are and res From	equal to hast. no to pressing to pression ad cruis initial further necession to rare to rare to rare to the	oor an- di- ing uel es- nge		NOT on fli it is r climb distar	ES: Ra ghts rec necessar may by ice and	nges show luiring m y to obsei required fuel. Clim DATA E	ore than to obtain to obtain the dista	ptimum n one ch optimum ain a ma: nce and CONT	altitudes art (due cruising kimum ra fuel are i	are ma to exter altitude ange. All included	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	n order t guration chart, i.e. lues inclu imbs are	or gross or gross the when ide allow indicated	to obtain maximum range n or gross weight change), e.e., when changing charts a lude allowances for descent indicated.	maximum range weight change), hanging charts a ances for descent	
											TOW		ALTITUDE	TUE	H											-
F	IF YOU ARE AT S.	1	S. L.		L	IF Y	IF YOU ARE	1000	AT 5000′		4	IF YOU ARE AT 10000	RE AT	10000		A.	YOU	IF YOU ARE AT 15000'	15000′				IF YOU	IF YOU ARE AT 20000	20000	-
2	RANGE IN AIRMILES	AIRMIL	1 00	FUEL		2	RANGE IN	1	LES			RANGE	RANGE IN AIRMILES	ILES			RANG	RANGE IN AIRMILES	MILES	3.	FUEL		RANG	RANGE IN AIRMILES	AILES	
BY CRUISING AT S. L.	IG OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	LBS.	١ ا	BY CRUISING AT 5000	9	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	80	BY CRUISING AT 10000	NING NO.	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRUISING AT 15000'		OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 20000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	UISING T. ALT.
								(RANGE	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	ACLUDE	ALLOW	ANCES F	OR PRES	CRIBED C	LIMB &	DESCENT	TO SEA	LEVEL)								
620	35	3.0	1350	शामा	8 1	705		35	1370		820		35	13	1395	950		35	77	21/12	9गगग	1095	56	35	35,412	25
580	75	1.	1275	1,200	-	599	-	35	1300	+	780	-	35	13	1320	006		35	13	1340	4200	1040	017	35	1360	0
260	1 75	100	1220	7000		01/9		32	1220	-	740		32	12	1240	860		35	12	1280	1,000	6	066	35	1300	0
530	35	10	2711	3800		909		35	1155		705		35	12	1200	815		35	12	1225	3800	o.	01/6	32	1240	0
200	35	10	1095	3600		575		35	1120		670		35	7	0411	775		35 %	17 7	3971	3600	0	895	35	1180	30
1,50	X X	10 10	1035	3500		515		F F	1035		600		2 25	77	1080	690		3 %	1 2	1000	3200	0 00	800	3 2	1060	2 0
415	35	10	006	2964	-	1480	-	35	925		555	14	35	6	076	0179		35	6	096	2964	7	74.5	35	985	32
												A IT											Y I			
ő	CRUISING	AT S.	7.7	2555	L	Ü	CRUISING	0.00	AT 5000′	-	0	CRUISING AT 10000'	G AT 1	,0000			CRUISII	CRUISING AT 15000'	15000′		73333		CRUISI	CRUISING AT 20000	20000	
H	APP	APPROXIMATE	ATE	1	L	Ц	1	APPROXIMATE	MATE	1	H	-	APPROXIMATE	IMATE			1	APPROXIMATE	XIMATE		TIVE			APPROXIMATE	IMATE	
CAS. RPM	LB/HR	6.5	RANGE DOWN FACTOR DIST.		C.A.S.	* 1	18/HR	si S	RANGE DO	DOWN C.	CAS. III	% LB/HR	9 0	RANGE	DOWN DIST.	\$4	* KPW	LB/HR G. S.	RANGE FACTOR	DOWN PIST.	WIND	C.A.S.	West La	LB/HR G. S.	RANGE FACTOR	E DOWN
				120 HW	_																120 HW	355	86 1	1975 3	355 .70	20
				80 HW	_						1,000	86 2550	50 380	08°	10	375	86	2260 38	385 .80	25	80 HW	355	86 1	1975 3	395 .80	20
130 87	3120	390	- 06°	40 HW	1,10	98 0	5 2830	001 0	06°	20	390	85 2465	507 59	06.	10	370	85	2210 0125	.90	0 15	40 HW	340	85 1	1890 14	06. 211	25
115 86	3005	415	1,000	0	1,00	0 85	5 2765	5 430	1,00	w	390	85 2465	571 59	1,00	01 0	370	85 2	2210 455	25 1,00	0 15	0	340	85 1	1890 4	455 1.00	25
395 84	2860	435	1,10 -	WT 04	385	5 84	2640	1,50	1,10	w	370	84 2355	55 465	01*10	01 0	355	84 2.	2135 480	30 1,10	0 15	40 TW	340	85 1	1890 4	01°1 567	25
				WT 08	200						365	83 2325	25 500	07 1.20	01	355	84 2	2135 520	20 1,20	25	WT 08	340	85 1	1890 5	535 1,20	8
_				-									_	_	_			-			955 SHE	_				

Figure A-14. Flight Operation Instruction Chart (Sheet 3 of 8) F-84G-1RE thru -5RE

25000' FUEL AILES AT OPT. ALT. LBS. 11460 14446	J 35-A-	一十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二			L	-	1		Two-230 Gal. Tip Tanks Carried Entire Distance	Gal.	10 Tanks C	arried En	cire Dista	nce		
	000000	CHART	CHART WT. LIMITS	17181	2	15717	L8.	EXT. LOAD	Q				NO. OF EN	OF ENGINES OPERATING:	PERATIN	G: 1
п э	FY	IF YOU ARE AT	AT 30000'	ī.	IF YOU ARE AT 35000'	E AT 35	,0005		IF YOU	IF YOU ARE AT 40000	40000		11	IF YOU ARE AT 45000'	AT 45	ò
7		GE IN	AIRMILES		RANGE IN	RANGE IN AIRMILES	S		RANG	RANGE IN AIRMILES	AILES	T.E.		RANGE IN AIRMILES	AIRMILE	5
	BY CRUISING AT 30000'	JOOD FT.	BY CRUISING AT OPT. ALT.	BY CRUISING AT 35000'	SING OPT	OPT. ALT. B 1000 FT. A	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	LBS.	BY CRUISING AT 45000'	4G OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.
	1370	(RANG	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL) 35 11/175 11/10	DE ALLOW.	ANCES FOI	R PRESCRI	BED CLIMB	& DESCEN	T TO SEA	LEVEL)		9गाग	9 2	1 4-		
1,000		1												1		
1385 4200	1300	35	13/00	2700								1,200				
	1185	35	1280	1280								3800				
	1130	25	1220	1220								3600				
1080 3200	1070	35	1160	1160								3200				
1005 2964	07/6	35	1020	1030			14			. 2	2 33	2964	1 E	4.4		
0.000	Ce		,0000		RUISING	AT 350	, 00	1	CRUISIP	4G AT	0000		ď	UISING	17 4500	6
TIVE		APPROXI	MATE		AP	PROXIMA	TE			APPROX	MATE	- EFFEC-		APP	ROXIMAT	
DOWN WIND	CAS. PPA	LB/HR G. S.	RANGE DOWN	2. A.S.	MA LB/HR	. S	RANGE DOWN	\$ 5 Y	RP.M. LB.		RANGE		CAS. 89M	LB/H	0. S.	SANGE DOWN FACTOR DIST.
30 120 HW	305 88	1665 360	.70 lt5	280 8	1590	360	.70 75			-	180	120 HW	13		+	1
35 80 HW	305	1665 400	.80 50	280 8	1590	700	.80 80					80 HW				
35 40 HW	300 87	1630 430	.90 55	280 8	1590	01/1	.90 85					40 HW				
0 04	300 87	1630 470	1,00 60	280 8	1590	1480	1,00 95					0				+
145 40 TW	300 87	1630 510	1,10 65	275 8	1555	510	_	10				₩ 04				-
MT 08 7W	300 87	1630 550	1,20 70	275 8	1555	550						W 74				-
50 120 TW	290 86	1595 580	1,30 75	275 8	1555	590						WT 021				
7 to obtain nai posite effective cree for land light etc. as re- infuel density nity of 6.5 LB	utical units. e wind only any gate of 6.5 LBS/GAL.	onal AL.	If you are a fuel, you can MPH CAS. I by immediate At 3000 95 statute headwind the or 1000 this wind an destination.	t 10000 fly 740 flowever, y ly climbin feet cruisa airm range at statuteai d start let	EXAMI feet with statute rou can fly g to 3500 e at 280 illes from d 35000 fr irmiles. Cr tdown 80	PLE airm airm 7 1240 N feet MPH C, lestination eet will b uise at	by arturn and With Vith 30 M	f availableding 390 airmile NO% RPP air letdow 80 MPH x x s 80 CAS with miles from miles from airmine	*0 # X E # F	EFFI RAN G.S CAS LB/F	CCTIVE WIN SE FACTOR CREUND SI CALLINE RANGE IN NLY WITH	LEGEN D - HW, H GROUN E GROUN E RANGE PEED IN SEE ED AIRSPI FUEL CON PARENT FUEL FE	EADWIND, ODISTANCE IN ALEMIC ATUTE MI SED IN STATEMENT SUMPTION SED IN STATES AVAILON EXTER	TW, TAIL EE (Effecti EES (Zero LES PER TTUTE M 1 - POUN ILABLE RNAL SO	WIND- We Wind Wind) HR IILES P DS PER	CRE Form HR
	FFFEC. TIVE WIND 135 80 HW 35 80 HW 35 40 HW 35 40 TW 145 80 TW 140 Obside effective cree for land light etc. as refusing the effective cree for land lensing and for land lensing and the lensing	NING AT 25000 EFFEC. APPROXIMATE TIVE TIVE APPROXIMATE STANCE DOWN WIND C.A.S. PERFOX ACTION DOWN DO	CRUISING APA BW 1665 BW 1665 BW 1665 BW 1665 BW 1630 BW 163	NG AT 300000 APPROXIMATE LT	NG AT 300000 APPROXIMATE LT	NG AT 300000 APPROXIMATE LT	NG AT 300000 APPROXIMATE LT	APPROXIMATE	APPROXIMATE	NG AT 30000	NG AT 30000	NG	NG	NG	NG	NG AT 30000Y APPROXIMATE APPROXIMATE

Figure A-14. Flight Operation Instruction Chart (Sheet 4 of 8) F-84G-1RE thru -5RE

Sher.	F-84G-1RE	F-84G-1RE thru-\$RE ENGINE(S) J35-A-29	840-1RE thru-\$RE IGINE(S) J35-A-29	(2)		0	FLIGHT OF	EIGHT	LIMITS	7.1721	HAR	2	STRI	OPERATION INSTRUCTION CHART TO 14253 POUNI	POUNDS	S	Two-2	30 Gal	EXTERNAL LOAD ITEMS Two-230 Gal. Tip Im ke Carried Entire Distance. NUMBER OF ENGINES OPERATING: 1	IAL L	Cr. 1	ITE Antire	MS Distanc	
INSTRUC's less than igational erralitude and other altiture rectly below instructions on board as sary allows values.	fuel available fuel available fuel available fuel fuel fuel fuel fuel fuel fuel fu	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, naviational equal for the fuel section according to present altitude and read total range available (no wind) by cruising at that altitude or by climbing to an restly below. For a signan mange, For a fight at initial situate, operating instructions are given distructions in appropriate cruising altitude section. (B) FLIGHT PLANNING – From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude section. (B) FLIGHT PLANNING – From initial fuel on board subtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	CHART: (Just on the control of the c	A) IN F n board n board horizon vind) by ht at ini climb ir section. and cl.m	LIGHT minus ntally rig ruisin ruisin tial altit mmediat (B) FI nb to des	allowanc ght or left gat that ude oper- cely to des LIGHT Pi irred cruisi adding in	igure in further to section altitude of atting instrument ined altituding atting in the control of a little of a l	el colun serve, c accordi r by cli uctions ide and 3 - Fror e and all	on equal ombat, and to pre mbing to pre are given read cru in initial other ne ces to re	to or sent an- sing fuel fuel sces-		NOT on fli it is r climb distan	ES: Rancessar; may be ice and	nges sho uiring m to obse required fuel. Clirt	wn at of or the rive the 1 to obts nb distan	ptimum n one ch optimun nin a ma nce and CONT,	NOTES: Ranges shown at optimum altitudes on flights requiring more than one chart (due it is necessary to observe the optimum cruising climb may be required to obtain a maximum radistance and fuel. Climb distance and fuel are it DATA BELOW CONTAINS NO	are may to exter altitude inge. All included	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climba are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	order transcription chart, i.e. ues inclumbs are i	o obtain or gross , when de allow ndicatec	maximi weight changing ances fo	im range change), charts a r descent	
									12	MOT	ALTITUDE	IN THE	E											1
IF YOU ARE	₹	S. L.			IF YOU ARE	J ARE AT	7 5000′		H.	YOU	IF YOU ARE AT 10000'	10000			YOU	ARE AT	IF YOU ARE AT 15000'				IF YOU ARE	ARE A	AT 20000	
RANGE	RANGE IN AIRMILES	ILES	FUEL		RAN		AIRMILES			RANG	RANGE IN AIRMILES	WES			RANG	RANGE IN AIRMILES	MILES		FUEL		RANG	RANGE IN AIRMILES	MILES	-
BY CRUISING OF	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	LBS.	BY CF	BY CRUISING AT 5000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRU AT 10	Y CRUISING AT 10000'	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.	BY CRU AT 150	Y CRUISING AT 15000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	I. ALT.	LES.	BY CRUISING AT 20000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	JISING T. ALT.
511	140	900	2964	179	480	(RANC	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	S INCLU	DE ALLOV	VANCES	FOR PRES	CRIBED CLI	CLIMB &	DESCENT 64,5	TO SEA	LEVEL)	98		2964	745		140	980	
390	140	845	2800	180	450	017	850	0	525		βto	890	0	970	1	Orti	910		2800	705	T	940	930	
365	ργ	785	2600	24	420	140	785	10	1,90		βo	820	0	570		0 [†]	840	-	2600	655		9	870	0
340	140	720	2400	38	390	017	740	0	450		ρţο	760	0	530		140	780		2400	610		βto	800	0
310	07	650	2200	* *	360	017	689	0.0	410) -	017	069	0 0	1.1.5		01	720		2200	560		07	740	0.0
250	29	520	1800	, %	295	04	550	0.0	350		01	260	00	100		04	280		1800	155		0	909	
225	04	1,50	1600	26	265	077	1,80	0	305		ρţο	1,90	0	360		ηq	510	0	1600	J'on		140	535	100
205	07	OLY	1482	22	24.5	p ^t o	ाग	0	285		017	1,50	0	335		017	1,70	6	1482	380		017	1,90	0
CRUISING	¥	S. L.	0333		CRU	CRUISING AT	AT 5000'			CRUISING		AT 10000′			CRUISING	4G AT	AT 15000′		0.00		CRUISI	CRUISING AT 20000'	20000	
	APPROXIMATE	AATE	E EFFE			APPRO	ROXIMATE		ľ		APPROXIMATE	IMATE		ľ		APPROXIMATE	KIMATE		EPPEC.			APPRO	APPROXIMATE	
CAS. RPM 18/HR	R G. S.	RANGE DOWN FACTOR DIST.		CAS.	RPM LI	LB/HR G.S.	RANGE FACTOR	LET / DOWN DIST.	CA3.	% LB/HR	HR G. S.	RANGE	LET DOWN DIST:>	CAS	76 18/	LB/MR G. S.	RANGE FACTOR	DOWN DIST.	WIND	CA.S.	* M4	LB/HR G. S.	RANGE FACTOR	DOWN DIST.
			120 HW																120 HW	355	86	1929 3	355 .70	20
			80 HW						395	85 2h	2145 370	°80	10	375	85,	2180 380	08°	35	80 HW	350	85 1	1,888	385 .80	20
86 3150	0 400	- 06°	40 HW	110	85	2785 400	06.0	30	395	85 2L	श्री द्रापिट	06°	10	360	848	2110 405	%	35	40 HW	335	18	1825 4:	06° متبا	25
85 3080	10 430	1,000	0	1,00	84 2	2690 425	5 1,00	W,	375	84 2335	35 430	1,000	10	360	84 2:	2110 0112	5 1.00	35	0	335	84 3	1825 1	1,50 1,00	25
84 3010	0917 0	1,10 -	40 TV	700	84	2690 465	5 1,10	w	375	84 23	2335 470	1.10	10	345	83 20	2015 465	5 1.10	35	40 TW	325	83 1	1765 475	75 1,10	25
			WT 08						360	83 22	2230 490	1,20	10	345	83	2015 505	5 1.20	25	WT 08	325	83 1	1765 5	515 1,20	8
			120 TW			-											1000		200	315	00	2206	KI.O. 1 20	20

Figure A-14. Flight Operation Instruction Chart (Sheet 5 of 8) F-84G-1RE thru -5RE

	ATING: 1	YOU ARE AT 45000	MILES	BY CRUISING AT OPT. ALT.						To the second					(3000)	CIMATE	RANGE DOWN								LECEND EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— GROUND DISTANCE (Effective Wind) GS GROUND SPEED IN ATRMILES (Zero Wind) GS GROUND SPEED IN STATUTE MILES PER HR CAS CALIBRATED ARSPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE BASED ON JP-3 FUEL M A N N N N N N N N N N N N N N N N N N
	ENGINES OPERATING:	ARE AT	RANGE IN AIRMILES	OPT. ALT. 1000 FT.								N. P. A.			CRUISING AT 45000	APPROXIMATE	HR 0.5		-				No.		TAILWI fective Win Fer Hr PER HR DUNDS LE
	NGINE	IF YOU	RANG					Ŧ			Ī				CRUISIN	-	SPA US/HR					_			C. TW., 'WCE (E) ILES (Z) MILES (Z)
Carried Entire Distance.	9	-		BY CRUISING AT 45000												r	3		Ī	Ŧ					ADWINI DISTAR N AIRM ATUTE ED IN S UMPTI WE EXI
d Entra	NO.		FUE	LBS.		2964	2800	2600	2400	2200	2000	1800	1600	2841		TIVE	AIN	120 HW	80 HW	40 HW	0	WT 04	WT 08	120 TW	LECEND EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— RANGE FACTOR = GROUND DISTANCE (Effective Wind) GS GROUND SPEED IN STATUTE MILES PER HR CAS CALIBRATED ARSPEED IN STATUTE MILES PE LAHR - TOTAL FUEL CONSUMPTION - POUNDS PER () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE. BASED ON JP-3 FUEL
1			Г	SING ALT.			T								T	Γ	DOWN DIST.	110	120	135	31/15	155	165	180	VIND-OR = 1 OR ER
1 611973		40000	ES	BY CRUISING AT OPT. ALT.											, 000	ATE	RANGE	.75	.80	%	1,000	1,10	1,20		EFFECTIVE WINI RANGE FACTOR: G.S GROUND SI CAS - CALIBRATI LB/HR - TOTAL: () - RANGE IN ONLY WITH
dri		AT 4	AIRMIL	OPT. ALT. 1000 FT.	3	90	04	l _k o	90	0	Org	l _k o	l _k o	ργο	AT 40	APPROXIMATE	si O	370	101	1,50	064	530	260	900	EFFEC RANGE G.S G CAS - C CAS - C C CAS - C C C C C C C C C C C C C C C C C C C
		IF YOU ARE AT	RANGE IN AIRMILES		EA LEVEL)	-17	7	77	7	140	N N	de la	7	d,	CRUISING AT 40000	AP	LB/HR	1485	1485	1485	34.85	24.85	14.55	14.55	
780-570	AD.	IF YC	2	BY CRUISING AT 40000'	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA	9	20	0	25	0	10	0	0	0	CRU		* 4	89	89	89	89	89	88	88	775 775 Wm wm ith
1	EXT. LOAD				DESCEN	1060	1005	940	875	810	745	680	019	570			3	255	255	255	255	255	250	250	0 lbs. of available miles by holding 375 statute arimiles by CAS and start letdown ion, with a 80 MPH c 590 x .80 t 255 MPH CAS with attute airmiles from attute airmiles from
4	E)			BY CRUISING AT OPT. ALT.	LIMB &												DOWN DIST.	22	85	8%	98	507	9	57	lbs. of iles by holdi iles by
ALIIIUUE	LB.	35000	MLES		CRIBED O	1040	986	925	860	795	730	099	9	550	5000′	MATE	RANGE	°75	.80	%	1,00	1,10	1,20	1.25	EXAMPLE DOOD feet with 2000 lbbs, of available 375 statute airmiles by holding 375 statute airmiles by holding 375 sver, you can fly 630 statute airmiles fimbing to 40000 feet using 100 % RPM cruise at 255 MPH CAS and start letdown airmiles from destination. With a 80 MPH (set 400000 feet will be 630 a similes. Cruise at 255 MPH CAS with art letdown 120 statute airmiles from art letdown 120 statute airmiles from
	14253		RANGE IN AIRMILES	OPT. ALT. 1000 FT.	OR PRES	07	Off	ρţ	140	9	017	ρή	100	ηo	CRUISING AT 35000	APPROXIMATE	5	360	1,00	435	475	515	545	585	E 63 6 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
	10	IF YOU ARE AT	ANGE		CES FO		-		+			-			UISING	1	IB/HR	기기	다	1459	14.59	14.59	1428	1428	EXAMPLE eet with 20 atute 1 can fly 6 to 40000 to 40000 fort vonise miles. Cruise own 120 i
		IF Y	-	Y CRUISING AT 35000'	LOWAR	1030	51.6	910	84.5	780	720	059	70 70	577	S	-	1 4	88	88	87	87	87	98	98	EXAMPLE If you are at 10000 feet with 200 fuel, you can fly 375 statute APH CAS. However, you can fly 639 by immediately climbing to 1,0000 At 1,0000 feet cruise at 255 MPH LLS statute airmiles from destinant headwind the range at 1,0000 feet with 6505 statute airmiles. Cruise this wind and start letdown 120 s
dha	15717			60	LUDE A	9	6	0	80	7	-	9	w	JV.	L		CAS	280	280	275	275	275	270	270	# th
	IMITS	'n		BY CRUISING AT OPT. ALT.	RES INC	1020	026	006	840	022	710	019	580	535			DOWN DR DIST.	5 45	200	55	8	%	2	75	If you are at fuel, you can if fuel, you can if MPH CAS. Ho by immediately by immediately at the statute headwind the re or 505 statuth and this wind and
	CHART WT. LIMITS	AT 30000'	AIRMILES		FIGUR	10	0,	6	ಹ	7	7	9	7/	in	30000	IMATE	FACTOR	.75	.80	° 90	1,00	1,1	1.2	1.3	If you fuel, MPH by im At L. 11,5 heads or 5, this
	CHART		N AIR	OPT. ALT. 1000 FT.	(RANG	017	100	100	40	140	140	70	ργ	ρţο	-	APPROXIMATE	si 0	355	395	1 425	1465	064	530	565	
		IF YOU ARE	RANGE IN	920			-	1	-			+			CRUISING A		18/нв	1562	1562	1530	1530	1480	1480	11,62	onal AL.
	J35-A-29	<u>=</u>		BY CRUISING AT 30000'		945	895	835	775	77.0	650	590	530	1,95	Ü	-	S. S. M. M.	87	87	98	8	70	85	8,	nits. only. avigati LBS/G
				T()		_	\vdash	-	-		+	-			L		CA.S.	300	300	295	295	285	285	280	utical u e wind o ling, n quired. of 6.5 iS/GAL
	ENG.		ig.	LBS.		2964	2800	2600	2400	2200	2000	1,800	1600	1482	7333	TIVE	WIND	120 HW	80 HW	40 HW	0	WT 04	% ¥L	120 TW	btain na effective for Janc tc. as re I density f 6.5 LB
	1			ISING . ALT.				100									DOWN DIST.	30	35	140	140	145	45	50	87 to o pposite mes flight on fue ensity o
u-5RE		25000	ILES	BY CRUISING AT OPT. ALT.		1010	950	890	820	760	069	620	550	515	2000	WTE	RANGE	0.70	.80	°90	1.0	1,10	1,20	1,30	Climb at 100 % RPM Multiply statute units by .87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.
F-846-19E thru-5RE	90.	IF YOU ARE AT 25000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		07	910	07	04	100	100	040	04	10	CRUISING AT 25000'	APPROXIMATE	6. 5.	355	385	425	1445	180	520	550	Climb at 100 % RPM. Multiply statute units by Read lower half of chart of Make additional allow errors, combat, formation Chart weight limits based Fuel flow based on fuel of
840-11	AIRPLANE MOD	OU AR	ANGE	0 2		-	1	7	7	7	7	-	7	7	JISING	¥	LB/HR	1765	1728	1728	1655	1635	1635	1600	mb at ultiply s ad lowe ike add ors, con ors, con est weig
ga,	AIRPLA	IF Y	2	Y CRUISING AT 25000'		830	785	735	680	630	570	520	091	1,30	CRL		SP. M. M.	87	98	98	55	78	84	83	2 Mu 2 Mu 3 Res 4 Ma 5 Cha
			÷.	BY C		00	7	7	0	9	ın	w	7	77			3	330	320	320	310	305	30%	295	

Figure A-14. Flight Operation Instruction Chart (Sheet 6 of 8) F-84G-1RE thru -5RE

MCRE Form No. 239C Sheet 1 of 2 (Rev. 1 Mey 50	FNG	AIRPLANE MODEL(S) F-840-JRE thru-5RE ENGINE(S) J35-A-29	ANE MOD thru-SRE J35-A-29	EL((S		CH A	FLIGHT OPERATION INSTRUCTION CHART WEIGHT LIMITS 12,253 TO 12788 POUNT	T O	PER S 1425	SE SE	NA TA	NS o	TRU	CT	ON	Z	EXTERNAL LOAD ITEN Two-230 Gal Tanks - Carried all the way. NUMBER OF ENGINES OPERATING: 1	ENGIP	ERN - G	EXTERNAL LOAD ITEMS 1 Tanks - Carried all the ver. ENGINES OPERATING: 1	OAD LL th	ITEI	MS.	
INSTE less th gations gations altitud other s rectly instruct on bos sary al	RUCTIOI han fuel ual errors, ual errors, altitude o below. Fe ctions in a ard subtra	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or less than fuel available for cruise (fuel on board minus allowances for reserve, combat, naviational equal professor of the section according to present altitude and read total range available (no wind) by cruising at that altitude or by climbing to an reserve of maximum range. For a flight at initial situate, operating instructions are given disperted below. For a flight at higher altitude, climb immediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING — From initial fuel on baard subtract fuel required for take-off and climb to desired cruising altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	NG CHART: cruise (fuel fut, etc.). Mc available (m ange. For a fi higher altitud using altitud ed for take-o art as for IN	(A) I l on bo ove hor o wind flight at de secti de secti of FLIGI	N FLIGI ogad mir izontally) by crui t initial a ib immec ion. (B)	HT - Sel nus allow right or right or sing at altitude, diately to FLIGH FLIGH desired c	lect figur wances left to s that altii operating o desired T PLAP ruising s	for reserve for reserve ection acc tude or by g instruction altitude a NNING - F altitude and	lumn equading to climbing ns are g nd read read rom init all other tances to	th navi- present g to an- iven di- cruising rial fuel r neces- o range		Annual Species	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climb are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	Ranges s requiri ssary to y be req and fuel. DA'	shown ng more observe juired to Climb	at optin than or the opti obtain distance	num alti	sges shown at optimum altitudes are maximum. In order to obtain mauring more than one chart (due to external configuration or gross we to observe the optimum cruising altitude on each chart, i.e., when chan required to obtain a maximum range. All range values include allowance fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	externa externa itude on e. All ra uded wi	num. In il configu n each c nge valu here clim	order to tration o hart, i.e., es includ bs are in	obtain r gross when e allow dicated	maxim weight hanging ances fo	um rang change) charts :	
										LOW		E	ALTITUDE												
IF YO	IF YOU ARE AT	AT S. L.		H	IF Y	IF YOU ARE	E AT 5000'	,000		IF YO	IF YOU ARE AT 10000'	AT 100	,000	-	IF Y	IF YOU ARE AT 15000'	AT 15	,000	H	Γ	=	Ϋ́O	ARE A	IF YOU ARE AT 20000	1.
2	RANGE IN AIRMILES	VIRMILES	FUEL	٠.	ex.	RANGE IN	A AIRMILES	ES		RA	RANGE IN AIRMILES	AIRMILE	S		92	RANGE IN AIRMILES	AIRMIL	S	I	FUEL		RANG	RANGE IN AIRMILES	MILES	
BY CRUISING AT S. L.	G OPT. ALT. 1000 FT.	LT. BY CRUISING T. AT OPT. ALT.	ALT. LBS.		BY CRUISING AT 5000'	1000 J	ALT.	BY CRUISING AT OPT. ALT.	-	Y CRUISING AT 10000'		OPT. ALT. B	BY CRUISING AT OPT. ALT.	80	Y CRUISING AT 15000'	100	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		LBS.	BY CRUISING AT 20000'	_	OPT. ALT. 1000 FT.		BY CRUISING AT OPT. ALT.
			.00			9	RANGE F	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	TUDE ALL	LOWAN	CES FOR	PRESCRI	BED CLIM	8 & DESC	ENT TO	SEA LEVE	(1)								
205	100	170	1482		245	140	0	1,30	2	285	017		1,50		335	140	0	475	-	1482	375		100	1495	30
195	10	380	7700	+	235	100	0	100	2	270	100		425	+	320	4	140	1415	7	1400	360	1	140	1465	20
24/5	100	240	1000		165	140	0	265	Н	195	700		285		235	100	0	305		1000	255		140	325	10
58	30	315	009	223	100	30	0	130	7	120	8		150		041	8	0	165		89	160		35	185	10
30	10	30	500		35	10	0	35		145	10		J 8 11		50	20	0	55		500	9		50		
CRI	CRUISING A	AT S. L.	03333	-	0	CRUISING	3 AT 5000'	,000	-	CRU	CRUISING AT 10000'	AT 100	,ò6	\vdash	CRI	CRUISING	AT 15000'	, 000	H		ľ	CRUISIP	CRUISING AT 20000'	20000,	L
	APPRO	APPROXIMATE			Ц	APP	PROXIMATE	NTE	-	Ц	AP	APPROXIMATE	TE	+	Н	A	APPROXIMATE	ATE	П	EFFEC.	۲		APPROXIMATE	KIMATE	
CAS. RPM	18/HR G	G.S. FACTOR	DOWN WIND	D CAS.	\$ M. W.	LB/HR	0.5	RANGE DOWN FACTOR DIST.	T. CAS	* 44	LB/HR	6.5	RANGE DO	DOWN CAS.	S HE	LB/HR	s; 0	RANGE DO	DOWN V	WIND	CA.S.	% RPM LB/HR	HR G. S.	RANGE FACTOR	E DOWN
			120 HW	3	- 20														2	120 HW	365	86 15	365 3161	07.0	20
			80 HW	*					395	85	2380	370	.80	10 375	5 85	2150	385	.80	25	80 HW	355	85 18	1880 395	.80	25
415 84	2940 37	375 °90	0 40 HW	w 1400	0 84	2635	385	°90 5	385	84	2330	1000	.90 I	10 365	5 84	2080	410	06°	F.	40 HW	340	84 18	1800 115	5 .90	25
400 83	2840 bc	η 1°00 1°00	o 0	385	5 83	2540	1,10	1,00 5	370	83	2250	425 1	1,000	10 355	5 83	2015	435	1,000	35	0	325	83 17	1720 4.35	5 1,00	25
1,00 83	2840	01.0 044	WT 04 0	₩ 385	83	2540	1,50	1,10 5	355	82	27/10	1415 1	1,10	10 330	0 82	1898	1,50	1,10	15	WT 04	325	83 17	1720 475	5 1,10	-
			80 TW	*					355	82	27/10	185	1,20 1	10 330	92	1898	1,90	1,20	25	WT 08	-		1620 490	0 1,20	8
			120 TW	3	-				4					-	-				-12	WT 021	305	82 16	1620 530	0 1.30	30

Figure A-14. Flight Operation Instruction Chart (Sheet 7 of 8) F-84G-1RE thru -5RE

						7 P	ALIIIONE				1	INC-CO COTO	2 18 2	4		
J35-A-29	29	CHART	CHART WT. LIMITS	14253	Q	12788	18.	EXT.	LOAD	-			z	NO. OF ENGINES OPERATING:1	NES OPE	RATING
=	YO	IF YOU ARE AT	AT 30000′	Ā.	IF YOU A	ARE AT 35000	35000		IF Y	IF YOU ARE	A	40000′		IF YO	OU ARE	IF YOU ARE AT 45000'
	RA.	RANGE IN AIRA	AIRMILES		RANGE	RANGE IN AIRMILES	LES		~	RANGE IN AIRMILES	AIRMIL	ES	FUEL	3	RANGE IN AIRMILES	RMILES
BY CRUISING AT 30000'	SING 80.0	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	BY CRUISING AT 35000"	0 - 0 00,00	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	T.BS.	BY CRUISING AT 45000'	OPT. ALT. 1000 FT.	T. BY CRUISING
		(RANG	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	UDE ALLOW	ANCES FO	OR PRESC	RIBED CLIM	IB & DES	CENT TO	SEA LEVE	(1					
760		100	535	545		140	555	_	570	l _k o	0		1482			
1,65		07	505	515	1	ho	525	-	5115	Jio		25. 12	27,000			
340		07	365	375		07	380	-	395	70	0		1000			
210		07	220	235		01/1	235		255	ON			009			
80		30	98	96		35							200	FE	N.A.	
	IS I	CRUISING AT	AT 30000'	Ĺ	CRUISIN	CRUISING AT 35000	2000	H	2	CRUISING AT 40000	AT 40	,000	0333	CRU	CRUISING AT 45000	45000
		APPROXIMATE	IMATE			APPROXIMATE	AATE			Y	APPROXIMATE	ATE	TIVE		APPR	APPROXIMATE
CAS. RPM		LB/HR G.S.	RANGE DOWN FACTOR DIST	CAS.	RPM LB/HR	6.5	RANGE D	DOWN C.	CAS. RPM	LB/HR	6.5	RANGE DOWN FACTOR DIST.	WIND	CAS. RPM	18/HR G	G. S. FACTOR
		-			-					1295	350	-	120 HW			
		Vac.					100			1295	390		80 HW			
290 84		1480 420	.90 55	270 85	2 1320	0 425	8 06°	85 245	98	1295	430	.90 135	40 HW			+
290 84		0917 00171	1,00 60	270 85	5 1320	5917 0	1.00 9	95 245	98	295	h70	1,00 145	0			-
290 84		1400 500	1,10 65	270 85	5 1320	505	01.1	105 245	98	1295	510	1,10 155	40 TW			
280 83		1400 520	1,20 70	270 85	5 1320	545	1,20	110 245	98	1295	550	1,20 170	80 TW			
280 83		1370 560	1,30 75	270 85	5 1320	585	1,30	20 245	98 9	295	590	1,30 180	120 TW			
Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat. formation flight etc. as required. Chart weight limits based on fuel density of 65 LBS GAL. Fuel flow based on fuel density of 65 LBS GAL.	GA	J.	EXAMPLE If you are at 15000 feet with 1000 lbs. fuel, you can fly 235 stat. te airmiles by 1 WPH CAS. However, you can fly 305 statute by immediately climbing to 1,0000 feet using 1 At 1,0000 feet will be 305 or 245 statute airmiles. Cruise at 245 MI this wind and start letdown 120 statute	at 15000 in fly 235 However, tely climbin feet crui se airr te range at te range at	EXA: feet w stati.tyou can sit to bloom in les from in	LE 30 30 Stime et we mise 0 S S O S S	EXAMPLE [15000 feet with 1000 lbs., of available fig 255 stati.te airmiles by holding 255 flowever, you can fig 305 statute airmiles 15 flowever, you can fig 305 statute airmiles from destination. With a 80 HPH airmiles from destination. With a 80 HPH range at 10000 feet will be 305 x .80 tute airmiles. Cruise at 245 HPH CAS with distant letdown 120 statute airmiles from	1bs, of available lies by holding 255 tayute airmiles using 100 % RPM AS and start letdown n. With a 80 HPH cas 305 x 80 245 MPH CAS with ute airmiles from ute	of available olding 355 armiles armiles armiles and ant letdown 80 MPH x & 80 MPH CAS with rimiles from		EFFEC RANG G.S.—(CAS.— LB/HI ()— O	EFFECTIVE WIND RANGE FACTOR = G.S GROUND SP CAS CALIBRATE LB/HR - TOTAL F () - RANGE IN ONLY WITH BASED ON JP-3	LEGEND LEGEND L-HW, HE, GROUND GROUND RED IN ST. CD AIRSPET TUEL CONS PARENTH FUEL FRC	LEGEND EFFECTIVE WIND - HW, HEADWIND, TW, TAILWIND - RANGE FACTOR = GROUND DISTANCE (Effective Wind) G.S GROUND SPEED IN STATUTE MILES PER HR CAS - CALBRATED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE BASED ON JP-3 FUEL EFFECTIVE WIND - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE EFFECTIVE BASED ON JP-3 FUEL	W, TAIL) (Effectiv S (Zero W ES PER) TUTE M - POUNT LABLE NAL SOI	VIND – Wind) Find Find Find Find Find Find Find Find

Figure A-14. Flight Operation Instruction Chart (Sheet 8 of 8) F-84G-1RE thru -5RE

et 3 19C		AIRPI	LANE	AIRPLANE MODEL(S)	(S)		F	FLIGHT OPERATION INSTRUCTION	노	OPE	RAT	NO	Z	STR	Fon	NO	1		EX	ERN	EXTERNAL LOAD ITEMS	OAD	TEN	2	
Mecass Me. 23 Shoot 1 (Rev. 1 M		F-84G-1RE ENGINE(S)	E thru-5RE	5RE 4-29			O	CHART WEIGHT LIMITS	EIGHT L	IMITS	18645	CHART Sus	<u>و</u>	17181	d	POUNDS		Two-230 Gal. Tip Tanks - Tip Tenks empty NUMBER OF ENGINES OPERATING: 1	ENGIN	Tanks	- Tip	n kg	dropped when	d when	
INSTI less the gation attitud others rectly institut on bose on bose sary al	than fuel onal errori ude and ri ude and ri ri altitude ly below. I uctions in opera subtra allowance es.	INSTRUCTIONS FOR USING CHART: see than fuel available for cruise (fuel gational errors, formation flight, etc.). Mo- shiftude and read total range available (no other altitude of maximum range. For a fi- sectly below. For a flight at higher altitud marturctions in appropriate cruising altitud on board subtract fuel required for take-of any allowances. Then use chart as for IN values.	e for crui on flight, u on flight, u range avai um range ht at high ate cruisir required fi	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or gates than fuel a svailable for cruise (fuel on board minus allowances for reserve, combat, navigational errors, formation flight, etc.). Move horizontally right or left to selection according to present athitude and read total range waitable (no wind) by cruising at that altitude or by climbing to anready below. For a flight at initial altitude, operating instructions are given directly below. For a flight at higher altitude, climb immediately to desired altitude and read cruising instructions in appropriate cruising altitude section. (B) FLIGHT PLANNING – From initial fuel sary allowance. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.	on board board board board board board board board but at in climb i section.	(A) IN FLIGHT on board minus ve horizontally rig wind) by crusing ight at initial altitu e, climb immediate le section. (B) FL and cl.mb to dess FLIGHT above.	- Select fi allowance that or left g at that ude opera ely to des JGHT Pi ired cruisii	-Select figure in fuel column equal to or allowances for reserve, combat, naving for feet to section according to presenting at that altitude or by climbing to another operating instructions are given disely to desired altitude and read crusing alt.JCHT PLANNING - From initial fuel nired cruising altitude and all other necessadding initial climb distances to range	erve, co accordin by clin actions a le and r i - From and all	mequal to imbat, n ig to pred hbing to re given ead cruis initial i	avi- mavi- man- di- di- ling luel ces- nge		NOTE on flig it is no climb distanc	S: Ranghts requirecessary may be it and fu	ges shown iring mot to observ required i	n at optii re than o re the opt to obtain distance	num alt ne chart imum cr a maxim and fue	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climb are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	e maxim external titude on e. All rar luded wh	um. In config. I config. I each cl inge valu iere clim	order to tration o hart, i.e., es includ be are in	obtain i fross when ch e allowa dicated.	maximu weight hanging nces for	m range change), charts a descent	
						1				LOW		ALTITUDE	12	ш	1								1		
1	IF YOU ARE AT	w	L			IF YOU ARE	7000	AT 5000'		=	IF YOU ARE AT 10000'	RE AT 1	,0000		1	IF YOU ARE	E AT 15000'	2000	-	T	<u></u>	IF YOU ARE AT 20000	RE AT	20000	
	RANGE IN AIRMILES	AIRMILES		FUEL		RANC	RANGE IN AIR	AIRMILES			RANGE	RANGE IN AIRMILES	LES			RANGE IN AIRMILES	I AIRMIL	ES	1	FUEL		RANGE	RANGE IN AIRMILES	ULES	
BY CRUISING AT S. L.	4G OPT. ALT. 1000 FT.	24	OPT. ALT.	LBS.	BY C	BY CRUISING AT 5000	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 10000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 15000	NG OP	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		ĽB.	BY CRUISING AT 20000		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	JISING
							(RANG	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA	INCLUD	E ALLOW.	ANCES FC	OR PRESC	RIBED CL	IMB & DE	SCENT TO	SEA LEVEL)	£)					\vdash			
845	32		1805	5857	(955)	2)	35	(1820)	(0	(0111)		35	(1845)	5)	(1280)	35	35	(1880)		5857	(元)	(0	35	(18)	(1890)
835	35	1	1770	5800	935	10	35	1785	20	(1090)		35	(1805)	2)	(1255)	150	30	(1845)	+	5800	(1460)	16	35	(1855)	55)
810	35	-	1720	2600	905	16	35	1735	25	1060	1000	35	1755	30	1215	35	10	1795		2600	(उप्पार)	()	35	(18	(1805)
780	1 2	1	1665	5400	875	20	35	1675	25	1020		35	1705	10	27.71	35	10	1735		5400	1365	10	35	1755	52
750	15 F	A :	1615	5200	845	ж.	35	1625	20.	066		35	1655	30	1135	35	10	1675	20	5200	1320	-	35	1695	56
(2)	5 3	H 1	1555	2000	815	10.	32	1575	20	950		35	1595	20	1095	35	10	1625	u\	2000	1275		35	16	1645
660	8	7	1495	71800	785	2	35	1515	2	915		35	1545	20	1055	35	10	1565	7	1,800	1225	10	35	1585	85
670	W W	аа	रोगार १	911111 0091	755	10 C	35	1465	W 0	850		35.35	14.85 1440	10.0	1010	X X	10.10	1505	7.7	91111	27.11		35.55	1525	25
2	CRUISING AT	AT S. L.	Control of the last		L	CRUISING	1000	AT 5000′	T	-	CNISHIAD	AT 10000	ò	T	18	A SAME	77 78	3	+	1	ľ				T
	APPR	M		EFFEC.			10	IMATE	1	1	Y Y		ATE	+	-	PANISION	APPROXIMATE	ST.	T	EFFEC.	1	CRUISING AT 20000	G AT 2000	0000	T
CAS	LB/NR	0.8. PACTOR	IOR DOWN TOR DIST.	WIND	3	% RPM 18,	LB/HR 0. S.	RANGE	DOWN C	CAS. RPM	M LB/HR	si O	RACTOR	DOWN C	CAS. RPM	18/18		108	DOWN W	WIND	44	MAN LB/HR	9 9	PACTOR	DOWN DIST.
				120 HW															120	120 HW 3	360 8	87 2050	980	20	8
		1		80 HW					7	110 87	2655	390	80	10 3	375 86	2315	385	8.	35	80 HW 3	350 8	86 1985	5 385	80	20
455 87	3345	6. 514	- 6	40 HW	1425	86 25	2995 415	6.	10	375 86	5600	425	6.0	10 3	375 86	2315	h25	.9	35	¥	350 8	86 1985	5 1425	6.	25
_	-	430 1.0	-	0	1,05	85 26	2860 435	1.0	20	385 85	24,85	077	1,00	1.0	365 85	2240	450	1.0 15	0		350 8	86 1985	5 465	1.0	25
420 84	3085	1,1 094	-	40 TW	700	84 27	2795 1465	1.1	20	385 85	2485	1,80	1.1	10 3	365 85	2240		1,1 15		40 TW 3;		85 1900	1	-	25
				% 74 M ≥ 1					4-1	370 84	24,00	505	1.2	10 3	355 84	2165	515	1,2 15	-	80 TW 33	335 8	85 1900	0 525	10.00	8
-		-		120 TW				5 (11)								5			120	120 TW 33	335 8	85 1900	995 0	1.3	8
											The state of the s		-	on the second	The state of the last	The Person Name of Street, or other Person Name of Street, or	Distance of the last		The state of the s	1			-		

Figure A-15. Flight Operation Instruction Chart (Sheet 1 of 4) F-84G-1RE thru -5RE

	. 1	ó	1	BY CRUISING AT OPT. ALT.					T	4					DE DOWN								2 of 2 H 70 H
	ATING	4500	MILES	AT O					1		1		45000	KIMATE	EANGE FACTOR								NUD -
	OF ENGINES OPERATING:	IF YOU ARE AT 45000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.									¥	APPROXIMATE	9	-							LEGEND EFFECTIVE WIND – HW, HEADWIND, TW, TAILWIND – GROUND DISTANCE (Effective Wind) GS. – GROUND SPEED IN AIRMILES PER HR CAS. – CALIBRATED AIRSPEED IN STATUTE MILES PER HR CAS. – CALIBRATED AIRSPEED IN STATUTE MILES PER HR () – RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE ONLY WITH FUEL FROM EXTERNAL SOURCE ONLY WITH FUEL FROM EXTERNA
	GINES	YOU ,	RANGE			-	+		+		+		CRUISING		A LB/HR						_		TW, T CE (EA LES (Z IILES I ATUT N - PO VILABI
	OF EN	Ħ		BY CRUISING AT 45000'									0	-	C.A.S. RPM		-				-	-	WIND SIRMI AIRMI UTE M UN ST IN ST MPTIO IS AV,
:	Ö	_			_	7	0	0 0	0	0 0	0	9	+		_	3	3	3		>	2	>	LEGEND TW, HEAD SOUND DI NNGE IN TRSPEED CONSUIT CONSUIT ERNALES ERNTHES
			100	LBS		5857	5800	2000	5200	1,800	7,600	9गुगा		TIVE	WIND	120 HW	80 HW	40 HW	0	WT 04	WT 08	NT 021	LEG GROU EED IN D AIRS UEL C PAREL FUEL
				JISING T. ALT.				4							DOWN DIST.						1		LEGEND FECTIVE WIND -HW, HEADWIND, TW, TAI ROE FACTOR = RANGE IN AIRMILES (Zero S GROUND SPEED IN STATUTE MILES PEI S CALIBRATED AIRSPEED IN STATUTE II /HR - TOTAL FUEL CONSUMPTION - POUN - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL S
		40000	LES	BY CRUISING AT OPT. ALT.									ò000	AATE	FACTOR								CTIVE E FAC GROU CALIE R - TO RANG
	1	E AT	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	EL)								AT :40000	APPROXIMATE	8								EFFE RANG G.S. – CAS – LB/H
	1	IF YOU ARE AT	ANGE		RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)		-		+		+		CRUISING	4	LB/HR						Ľ		
	AD	IF YO	2	BY CRUISING AT 40000'	ZT TO S								2		\$ \$ E								885 885 PM wwn ith
	EXT. LOAD				DESCEN		L						L	L	CA.S.								EXAMPLE OO feet with 5000 lbs. of available 550 statute airmiles by holding 385 fer, you can ffy 1595 statute airmiles mbing to 35000 feet using 100 % RPM cruise at 285 MPH CAS and start letdown airmiles from destination. With a 80 MPH airmiles from destination. With a 80 MPH at 35000 feet will be 1595 x .800 s airmiles. Cruise at 285 MPH CAS with
8	â			JISING T. ALT.	LIMB &										DOWN DIST.	75	8	82	95	105	110	120	of of tute tute of tute of tale star of tale o
201112	18	35000	ILES	BY CRUISING AT OPT. ALT.	RIBED C	1	1	0 E	1	1 1	1	1	2000	NATE	RANGE	°75	.85	.90	1,00	1,10	1,20	1,25	EXAMPLE feet with 5000 lbs. tratute aimiles by ou can fly 1595 statut it to 35000 feet using et 285 MPH CAS an illes from destination. With lifes from destination. With 15000 feet will be 15 foot foot flower at 285 mmles. Cruise at 285
0 00	177.81	IF YOU ARE AT 35000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	R PRESC	35	30	e 36	363	8 18	35	35	CRUISING AT 35000'	APPROXIMATE	9	375	1005	1415	1,85	525	555	595	feet with 5000 lbt statute airmiles you can fly 1595 stute ng to 35000 feet us lise at 285 MPH CAS miles from destination. Will 55000 feet will be airmiles. Cruise at 28
. 1	0	OU AR	INGE I		CES FOI	6.1			-	-, -,	ļ.,		ISING	A	IB/HR	1760	1725	1725	1725	1725	1690	1690	EXAMPLE atute can fly 1 1 2 3500 o 3500 o 3500 feet vinise.
		IF YO	8	r CRUISING AT 35000"	OWAN	(07/61)	(1905)	(1795)	(1740)	1630	1570	1525	CRL		# Wall	35	16	16	16	12	8	96	EXAMPLE If you are at 10000 feet with 500 lbs, of thei, you can fly 950 statute airmiles by how they fly they statute by immediately climbing to 35000 feet using 10 at 35000 feet using 10 at 35000 feet using 10 at 35000 feet using 10 statute airmiles from destination. With a headwind the range at 35000 feet will be 1595 or 1280 statute airmiles. Cruise at 285 MPI
9	18645			¥ *	UDE ALL	C	□.	2 5	0			-	L		3	290	285	285	285	285	275	275	If you are at 10000 fuel, you can fly 950 fuel, you can fly 950 by immediately climbir At 3570 feet cruis 95 statute airn to 1280 statute
	0.00			JISING T. ALT.	S INCL	30)	(56	(2)	33	1625	59	1520			DOWN DIST.	1,5	S	55	9	99	2	22	EXA If you are at 10000 feet viuel, you can fly 950 statut THI CAS. However, you can by immediately climbing to 35 At 35700 feet cruise at 2 95 statute airmiles fron or 1280 statute airmiles fron or 1280 statute airmiles.
	CHART WT. LIMITS	30000	ILES	BY CRUISING AT OPT. ALT.	FIGURE	(1930)	(1895)	(1795)	1735	16.16	1565	15	0000	MATE	RANGE	°75	· 85	06°	1,000	1,10	1,20	1,25	If yo fuel, MPH by irr At 31 95 s heady or 11 or
	HART V	IF YOU ARE AT 30000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	RANGE	35	35	5 75 5	35	3 2	35	35	AT 30000'	APPROXIMATE	o,	365	1,05	435	475	515	555	585	
	Û	OU AR	ANGE	9 2		-	-		-		1		CRUISING	4	LB/HR	1770	1770	1735	1735	1735	1735	1695	onal AL.
	-29	IF Y	2	BY CRUISING AT 30000'		(1830)	(1795)	(1685)	1630	1520	3460	1420	S.		* 4	89	89	88	88	88	88	87	nits. nnly. avigati LBS G
	J35-A-29			PA PT											CAS	310	310	300	300	300	300	295	wind comming named of 6.5 S/GAL
	ENG.	1	FUEL	LBS.		5857	5800	2000	5200	7000	7,600	9444	2000	TIVE	NIN N	120 HW	80 HW	40 HW	0	WT 04	WT 08	120 TW	obtain nau effective for land etc. as rec il density of 6.5 LB
	1			ALT.		6		2.0			1	_	T		DOWN DIST.	28	35	35	η	145	15	20	87 to c pposite ances flight on fue ensity
1-5RE		25000	ILES	BY CRUISING AT OPT. ALT.		(3061)	(1875)	(1775)	1715	1605	1545	1500	2000	WATE	RANGE	7.0	60	60	1.0	1,1	1.2	1.3	Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. Chart weight limits based on fuel density of 6.5 LBS GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.
F-840-1RE thru-SRE	VOD.	IF YOU ARE AT 25000	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		35	35	K 16	16	24 24	35	35	G AT 25000	APPROXIMATE	0.5	55 365	1915 395	1915 435	15 475	1835 495	1835 535	1835 575	Climb at 100 % RPM Multiply statute units by Read lower half of chart of Make additional allow errors, combat, formation Chart weight limits based Fuel flow based on fuel d
840-1	AIRPLANE MOD	YOU A	MANGE	9,		_	-	-	-		+	2000	CRUISING	-	A LB/HR	1955	_		1915		_		Climb a Multiply Make Prors, c
E.	AIRPL	IF.		BY CRUISING AT 25000		(1630)	(1600)	(1550)	1450	1350	1300	1265	0	-	* 5	88	0 87	0 87	0 87	5 86	86	98	
				¥ 4											3	335	330	330	330	33.5	325	325	

Figure A-15. Flight Operation Instruction Chart (Sheet 2 of 4) F-84G-1RE thru -5RE

			T	T	T	SING ALT.	T		T			T		T		T	T	DOWN	20	20	25	25	25	8	30
d when		range lange), narts a lescent		1	AI ZOOO	BY CRUISING AT OPT. ALT.		11,80	1465	1405	1345	1285	1225	11.05	1	ò	TE	TOR	7.	80	0,0	1,0	1,1	1.2	1,3
LOAD ITEMS		maximum range weight change), hanging charts a ances for descent		1	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		10	1,0	10	10	100	10	1		CRUISING AT 20000	APPROXIMATE	8, 9	355	395	415	455	495	535	260
O Spiral	ч	rtain mi rroas we ben chai illowanc ated.		TON SI	NGE IN	0 0		35	38	35	35	35	35	. 8	20	SING	AP	LB/HR	1975	1975	1890	1890	1890	1890	1830
100	ING.	r to ob on or g i.e., wh clude a re indic		3	5 3	BY CRUISING AT 20000		0/11	1130	1085	1035	985	046	84,5	785	CRU	L	* 44	98	98	85	85	85	85	81,
NAL	DPERAT	In order figuration chart, alues in limbs at tVE FC		L		P. A.	L	-14	7	Ä	H		0,			L		CA.S.	355	355	340	340	340	340	330
EXTERNAL LOAD ITEMS Two-230 Gal. Tip Tanks - Tip Tanks dropped when	empty. NUMBER OF ENGINES OPERATING:	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climb are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	1		FUEL	LES.		911111	11/100	1,200	000₹	3800	3600	3200	2938	0.00	EFFEC	WIND	120 HW	80 HW	40 HW	0	WT 0#	% ¥L 08	120 TW
E O	OF EN	are ma to exte altitude nge. All ncluded	l	Г		IISING F. ALT.		0	100	10	10	20	0	10				LET BOWN DIST.		35	15	15	25	25	
Two-23	empty.	titudes t (due rruising mum ra el are i NS NO		5000	LES	BY CRUISING AT OPT. ALT.		11,60	SULLE	1385	1325	1265	1200	1085	1	, 000	ATE	RANGE		80	6.	1.0	1,1	1.2	
-	ž	num al ne char imum c a maxii and fu		TA 3	A AIRMI	OPT. ALT. 1000 FT.	(1)	35	35	35	35	35	20	0	15	AT 15000'	APPROXIMATE	6.5		385	11.5	455	1,80	520	
Z	POUNDS	at optin than o the opt obtain distance		IF YOU ARE AT 15000'	RANGE IN AIRMILES		SEA LEVI	m	~	m	2	6	35	8		CRUISING	AF	LB/HR		2260	2210	2210	21.35	2135	
E	ă.	shown g more observe uired to Climb		IF Y	2	BY CRUISING AT 15000'	NT TO	980	0	0	25	10	70	0	20	CRU		1 1		98	85	85	87	84	
3	15717	Sanges equiring ary to c be requ d fuel. DAT		L			, DESCE	98	970	930	885	845	805	720	599	L	Ļ	3		375	370	370	355	355	
ST	TO 15	TES: F flights r necession may be may	DE			BY CRUISING AT OPT. ALT.	CLIMB 8	0 पेर्गा	1425	1365	1305	1240	1180	1065				DOWN DIST.		10	10	10	10	9	
FLIGHT OPERATION INSTRUCTION		NO.	ALTITUDE	IF YOU ARE AT 10000'	AILES		FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	77	77	13	13	12	7	10	1	AT 10000'	MATE	RANGE		80	0,	1.0	1,1	1.2	
ATION			1	RE AT	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	OR PRES	35	35	35	35	35	35	25	10		APPROXIMATE	ő		0 380	5 405	5 1415	5 465	5 500	
A S	18171	or or or or or or or or or or or or or o		V no.	RANGE		NCES F	1 2								CRUISING	0	LB/HR		2550	2465	2465	2355	2325	
PE		qual to bat, na to prese ing to a given d cruisi ditial fu	LOW	F	0.57	BY CRUISING AT 10000"	ALLOWA	850	845	810	770	735	200	630	580	ŭ	Ц	S. RPM		98 0	0 85	0 85	0 81	5 83	\dashv
F	HT LIA	olumn e com ording y climb ons are and rea From it dall ot istances			-		CLUDE	-		_	+	-				H	T	T. CAS.		700	390	390	370	365	\dashv
3	CHART WEIGHT LIMITS	reserv reserv tion acc de or by nstructi tritude IING – trude an		ò		BY CRUISING AT OPT, ALT.	URES IN	1420	Sotu	1345	1285	1225	0911	1045			-	GE DOWN OR DIST.			w	70	7/		-
교	CHART	figure i to sect t altituc rating i resired a PLANN sing alti		AT 5000	AIRMILES		IGE FIG		-			-		П		T 5000'	ROXIMATE	S. FACTOR			6.0	0 1.0	1.1		4
		allowan at or lef at tha at tha de. ope ly to de IGHT red crui				OPT. ALT 1000 FT.	(RANGE	35	35	35	35	35	35	50	ın		APPRO	. O. S.			2830 400	2765 430	2640 450		-
148		minus ally righ retuising eruising al akitu mediate B) FL to desi		IF YOU ARE	RANGE IN						1		F			CRUISING	-	RPM LS/HR			86 28	1	_		+
(S)		IN FL board orizonts orizonts at initial imb imp ction. (ction. (GHT a		1		BY CRUISING AT 5000'		730	720	069	999	630	9	540	200			CAS.			410 B	1,00 85	385 84		\forall
AIRPLANE MODEL(S)		INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT — Select figure in fuel column equal to or gate than fuel available for cruse (fuel on board minus allowances for reserve, combat, navigational errors, formation flight etc). Move horizontally right or lett to section according to present altitude and read total range available (no wind) by cruising at that altitude or by climbing to an altitude of maximum range. For a flight at initial altitude, operating instructions are given directly below. For a flight at higher altitude, climb immediately to desired altitude and read crusing attutude section. (B) FLIGHT PLANNING—From initial fuel on board aubtract fuel required for take-off and climb to desired crusing altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range		Г	FUEL	LBS.		9गगग	00	8	8	8	8	8	38	EFFEC.	TIVE	MIND	120 HW	80 HW	WH OF	~	¥L 04	¥L 08	2
E	-5 RE	CHAR wise (f wise (f allable ge. For ther alti sing alt for tak		H			_	77	1400	1,200	7000	3800	3600	3200	2938	1			120	8	\$	0	4	8	MT 021
AN	J35-A	USING for cr n fight, ange av um rang t at hig te cruited required				BY CRUISING AT OPT. ALT.		1400	1385	1325	1265	1200	офг	1025			-	DOWN DIST.			1	1	1		-
RP	F-SUG-IRE thru-5RE ENGINE(S) J35-A-29	S FOR vailable ormatio total r maxim a flight yproprist t fuel r Then us		AT S. L.	EMILES	ATC		7	H	H	7	H	7	7	1	S. L.	MAIE	FACTOR		å	6.0	1,0	1.1		
4 5	ENG	fuel arrors, found read and read of ow. For subtract ances.		ARE A	RANGE IN AIRMILES	OPT. ALT. 1000 FT.		35	35	32	35	35	30	15	SL	IG AT	APPROXIMATE	0.5			0 390	5 415	0 435		-
OS YOME I	'APW'	INSTRUC less than gational er altitude ar other altit rectly belo instruction on board is sary allow		IF YOU ARE	RANGE					-	+				-	CRUISING AT	-	LB/HR			3120		2860		1
o. 239C	N N	N se		₩.		BY CRUISING AT S. L.		64,5	079	019	585	260	530	175	435	-	1	15 N N N N N N N N N N N N N N N N N N N			0 87		85		4
mrof 38	MC					á	. 2	i i										CA.S.		15	430	415	395		

Figure A-15. Flight Operation Instruction Chart (Sheet 3 of 4) F-84G-1RE thru -5RE

	F-84G-	F-840-1RE thru-5RE	ru-SRE											1										- 1
AIRP	AIRPLANE MOD	00		ENG.	J35-A-29	-29	CHART	CHART WT. LIMITS		17181	Q	15717	18.	EXT	EXT. LOAD		-			Ö	OF ENGINES OPERATING.	INES O	PERATIN	G. 1
H.	IF YOU ARE AT 25000'	RE AT	5000			IF YOU ARE		AT 30000'		=	YOU	IF YOU ARE AT 35000'	35000		=	IF YOU A	YOU ARE AT 40000	40000		-	IF Y	IF YOU ARE AT 45000'	AT 450	,000
	RANGE IN AIRMILES	N AIRM	LES	1 1 1 1		RAN	RANGE IN AIR	AIRMILES			RANG	RANGE IN AIRMILES	AILES			RANGE	RANGE IN AIRMILES	ILES		1302	2	RANGE IN AIRMILES	AIRMILES	
BY CRUISING AT 25000'	O O	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.	0 -: 88.7	BY CR	BY CRUISING AT 30000'	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 35000'	SING	OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		BY CRUISING AT 40000'		OPT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.		LBS.	BY CRUISING AT 45000'	OPT. ALT. 1000 FT.	ALT. BY FT. AT	BY CRUISING AT OPT. ALT.
	-			-			(RANGE	E FIGURES	INCLUD	E ALLOW	ANCES	FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL)	CRIBED CL	LIMB & DI	ESCENT	O SEA LI	EVEL)	1						
1265		35	1500	91/1/1	11,20	50	35	1520		1525		35	1			E			7	9गगा				
1250		3%	11,85	14,00	OLAL	01	35	1505		1510		35	1						77	00111		L	+	
1200		35 %	1365	1,000	1350	000	35	1385		1390		35 35	1 1						7 7	1,200				
1100	+	35 6	1305	3800	1235	35	35	1325		1330	1	35	1						E .	3800				
1045		35	1250	3600	11.85	35	35	1270		1270		35	1						<u> </u>	3600				
940	+	35	1125	3200	1060	9	35	2,411		1150	1	35	1						E.	3200		-		
870		25	1	2938	8	586	30	1.		1070		35	1						2	2938				
1	CRUISING AT 25000'	AT 2	3000		L	CRUISING		AT 30000'	T		CRUISI	CRUISING AT 35000'	35000			CRUISIN	CRUISING AT 40000	,0000	-	2333	CRU	CRUISING AT 45000	AT 4500	ò
-	1	APPROXIMATE	WIE	TIVE			APPROXIMATE	IMATE				APPROXIMATE	IMATE				APPROXIMATE	WATE		TIVE		AP	APPROXIMATE	TE .
3	% LB/HR	s; 0	RANGE DOWN FACTOR DIST.		77	* 4	18/HR G. S.	RANGE	DOWN DIST	24	% KB W (B)	LB/НВ G.S.	RANGE	DOWN DIST.	CAS.	RPM LB/HR	AR G. S.	RANGE	DOWN V	WIND	CAS. RPM	LB/HR	G. S. PA	RANGE DOWN FACTOR DIST.
330 8	87 1855	360	.7 30	120 HW	305	88	1665 360	L° C	115	280	89 15	1590 360	L. (75					12	120 HW				
330 8	87 1855	2 1,000	.8 35	80 HW	305	88	1665 400	80	20	280	89 15	1590 1,00	8.	80					80	80 HW				
320 8	86 1795	5 425	.9 35	40 HW	300	87	1630 430	6. 0	55	280	89 15	1590 lulo	6.0	85					7	40 HW				
320 8	86 1795	5 465	1.0 40	0 0	300	87	1630 470	0 100	09	280	89 1.5	1590 480	1.0	95						0				
320 8	86 1795	5 505	1.1 45	WT 04	300	87	1630 510	1,1	99	275	88 1.5	1555 510	1.1	105					7	WT 04				
320 8	86 1795	5 545	1,2 45	WT 08	300	87	1630 550	0 1.2	70	275	88 15	1555 550	1,2	077					00	WT 08				
310 8	85 1738	8 570	1.3 50	0 120 TW	290	98	1595 580	0 1.3	75	275	88 15	1555 590	1,3	120					12	WT 021				
-484 2	Climb at Multiply Read lon Make I Errors, c. Chart we Fuel flor	t 100 y statute wer half additions ombat, f eight lim w based	1 Climb at 100 % RPM 2 Multiply statute units by .87 to obtain nautical units. 3 Read lower half of chart opposite effective wind only. 4 Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. 5 Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.	to obtain no osite effective es for lan ght etc. as n grup of 6.5 Li	obtain nautical units. e effective wind only. for landing, navigatio etc. as required. el density of 6.5 LBS/GAL. of 6.5 LBS/GAL.	uits. nly. vvigation .BS/GA.	د ة	If you are fuel, you or MPH CAS, MPH CAS, by immedia At 35000 95 statuth headwind the or 1045 st this wind detrination.	If you are at 1000 fuel, you can fly 77 MPH CAS. Howeve, by immediately clim At 35000 feet or 95 statute headwind the range a or 1045 statute this wind and start this wind and start this wind and start this wind and start	EXAM If you are at 10000 feet with fuel, you can fly 770 statute MPH CAS. Howeve., you can fly 55000 feet cruise at 280 ps statute airmiles from 6 headwind the range at 35000 for 10LS statute airmiles. Or 10LS statute airmiles. Continuity with a statute airmiles. Continuity and and start letdown 80 ethins wind and start letdown 80 ethins airmiles.	EXAMPLE OCCO feet with LOCO lbe, of available 770 statute airmiles by holding 390 eve., you can fly 1305 statute airmiles ilmbing to 35000 feet using 100% RPM airmiles from destination. With a 80 MPH ge at 35000 feet will be 1305 x .80 the airmiles. Cruise at 280 MPH CAS with teart letdown 80 statute airmiles from	PLE PLE	tPLE th hood lbs. of a in airmiles by holdin in airmiles by holdin in 1305 statute COO feet using 100 CO MPL CAS and start destination. With a 80 feet will be 1305 x Cruise at 280 MPH C	000 1bs. of available airmiles by holding 390 395 statute airmiles fer using 100% RPM H CAS and start letdown nation. With a 80 MPH will be 1305 x .80 s at 280 MPH CAS with attute airmiles from	of available holding 390 to armiles start letdown a 80 MPH OS x .80 PPH CAS with airmiles from		EFF RAN G.S. CAS LB/1 ()	EFFECTIVE WIND RANGE FACTOR = G.S. GROUND SPE CAS CALIBRATEE LB/HR - TOTAL FU ()-RANGE IN F ONLY WITH F BASED ON JP-3	WIND - I OR = G OR = R OR SPEEI RATED / CAL FUE E IN PAI ITH FU	LEGEND HW, HE, ROUND ANGE I ANGE I LESPE	LEGEND EFFECTIVE WIND - HW, HEADWIND, TW, TAILWIND- RANGE FACTOR = GROUND DISTANCE (Effective Wind) GROUND DISTANCE (Effective Wind) GS GROUND SPEED IN STATUTE MILES PER HR GS CALIBRATED AIRSPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR () - RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE. BASED ON JP-3 FUEL	FW, TAI E (Effect ES (Zero LES PEI TUTE ! - POUN LABLE RNAL S(LWIND Wind) R HR MILES I IDS PEI	MCRE Form No. 239C Sheet 2 of 2 Sheet 2 of 2 Sec. 1 May 50)

Figure A-15. Flight Operation Instruction Chart (Sheet 4 of 4) F-84G-1RE thru -5RE

BP4 BP4 MC	r w	-84G-15	F-84G-1RE thru -5RE ENGINE(S) J35-A-29	AIRFLANE MODEL(S) 846-1RE thru -5RE 461NE(S) J35-A-29		_		T A	FLIGHT OPERATION INSTRUCTION CHART WEIGHT LIMITS 15299 TO 13866 POLINI	5	S 15299	CHART	ZZ	2 6	1386		8		None	EXTE	None None None None	2	8	TEM	40
INSTI bees th gationu altitude other i rectly instruc on bose serry al	TRUCTI(than fuel nal error de and re altitude r below. I ctions in and subt	ONS FO I available to format wad total of maxin For a flight ract fuel se. Then	NE USING ble for crution flight, I range ava mum rang ght at high riste cruisi required f	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT – Select figure in fuel column equal to or less than fuel available for cruize (fuel on board minus allowances for reserve, combat, navisational stational errors, formation flight, etc.). Move horizontally right or left to section according to present altitude and read road range available (no wind) by cruizing at that altitude or by climbing to another altitude of maximum range. For a flight at initial altitude, operating instructions are given distructions in appropriate cruizing altitude, climb immediately to desired altitude and read cruizing instructions in appropriate cruizing altitude section. (B) FLIGHT PLANNING – From initial fuel on board aubtract fuel required for take-off and climb to desired cruizing altitude and all other necessary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range	(A) IN on bose wind) ght at ii climb section	FLIGI rd min ontally by cru nitial a immed mb to T abov	HT - Sele nus allown right or I sing at th lititude, of liately to FLIGHT desired cr	ct figurances feft to se the set altit perating desired busing se initial	r in fuel col or reserve, ection acco ude or by instruction altitude an INING – Br Ititude and climb dist	umn equading to climbing to climbing to climbing to climbing to climbing to climbing as are gare and rom init	th navi- present f to an- iven di- cruising in al fuel r neces-		Z 5 ≈ 5 ÷	OTES: fights is neces mb may	Ranges requiring sary to or be required and fuel.	shown g more beerve iired to Climb d	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on flights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	um altitument crumaximum umaximum fuel	des are due to sing alti m range. are inclu	maximur external tude on e All rang ided wher	are maximum. In order to obtain maximum range to external configuration or gross weight change), alittude on each chart, i.e., when changing charts a mgc. All range values include allowances for descent ncluded where climbs are indicated. FUEL RESERVE FOR LANDING	er to o ion or i, i.e., w nclude are indii	gross we hen charallowanc cated.	eximum night ch nging ch	range ange), arts a escent
										1	MO7	100	ALTITUDE	E E						1					
IF Y	IF YOU ARE AT	E AT S.	ı		L	IF Y	IF YOU ARE	AT 5000	ò		IF YOU	IF YOU ARE AT 10000'	1000	6	F	IF Y	IF YOU ARE AT 15000	AT 15	è	F	F	1	1		
2	RANGE IN AIRMILES	AIRMILE	S	FUEL		2	RANGE IN	AIRMILES	S		RAN	RANGE IN AIRMILES	RMILES		-	5	RANGE IN AIRMILES	AIRMILES		I I		- 2	RANGE IN AIRMILES	AIRMIL	2000
BY CRUISING AT S. L.	G OPT. ALT. 1000 FT.	ALT. 8	BY CRUISING AT OPT. ALT.	LBS.	¥ ×	BY CRUISING AT 5000'	0-1	ALT.	BY CRUISING AT OPT. ALT.	BY AT	AT 10000'	OPT. ALT. 1000 FT.	T. AT	BY CRUISING AT OPT. ALT.	G BY C	Y CRUISING AT 15000	G OPT. ALT. 1000 FT.	F	BY CRUISING AT OPT. ALT.	C LBS		BY CRUISING AT 20000	0 0	OFT. ALT. 1000 FT.	BY CRUISING AT OPT. ALT.
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420	017	0	905	2800	1	1480	100		920		(555)	140	\$	(546)	9)	(932)	140		(596)	2800	8	(22)	l _k o	0	(980)
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330	ργ	0	705	2200		375	100		720	11	435	100	-	740	ת זע	500	017		760	2200	2 2	58 66	07	-	780
300	017	0	635	2000		340	Pio I		559		700	η	9	519	14	455	017	-	069	2000	8	51/10	017		710
240	017	00	760	1600		275	04		580		360	017	- W	530	3 60	370	01		550	1800	8 8	1,35	04	0.0	640
220	707	0	off	1169		255	017		1,60		295	l _k o	77	1,80	~	340	017		200	11/69	96	700	017	1	520
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			-	%T 08				-		365	81 21	2150 49	1,95 1,2	2 10	365	82	2040	530 1	1,2	J.S 80 TW	W 34.5	83	1775	540	1,2 30
7	1	-		120 TW				-	-										-	120 TW	W 340	88	1760	575	7.3 30

Figure A-16. Flight Operation Instruction Chart (Sheet 1 of 4) F-84G-1RE thru -5RE

		,000		BY CRUISING AT OPT. ALT.											à	F	RANGE DOWN FACTOR DIST.								1) PER HR R HR	RE Form 0, 239C or 2 of 2 1 May 50)	eys N
CMITAGE OBENITATIONS	EKALIN	IF YOU ARE AT 45000'	RANGE IN AIRMILES	TT AT			-								AT 45000	APPROXIMATE	8.0								CWIND Wind) Wind) R HR AILES	OURCE	
000	5	J ARE	Z Z	OPT. ALT. 1000 FT.											CRUISING A	APP	LB/HR								W, TAII (Effecti S (Zero ES PER POUR	ABLE VAL SC	
200	ENGIN	IF YOU	RAN	BY CRUISING AT 45000											CRU		* 50			1					ND, T. ANCE. EMILE: F. MIL. STAT	XTER	
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1	Ž	<u> </u>	100	LBS.		2867	2800	2600	2400	2200	2000	1800	1600	1469		TIVE	WIND	120 HW	80 HW	40 HW	0	WT 04	WT 08	120 TW	LEGEND EFFECTIVE WIND - HW, HEADWIND, TW, TALLWIND - GROUND DISTANCE (Effective Wind) GROUND SPEED IN ATRAILES (Zero Wind) GS GROUND SPEED IN STATUTE MILES PER HR LB/HR - TOTAL FUEL CONSUMPTION - POUNDS PER HR)-RANGE IN PARENTHESIS AVAILABLE ONLY WITH FUEL FROM EXTERNAL SOURCE, SET ON 19-3 FIFEL	
	I	\sqcap		SING ALT.								T			T		DOWN DIST.	135	150	160	175	130	500	215	WIND TOR = ND SPE	WITH FU	9
	1	0000	ES	BY CRUISING AT OPT. ALT.		1	0	٠	8	1	1		0	1	,000	ATE	RANGE	°75	.85	%	1.0	1.1	1.15	1.25	CTIVE REFAC GROUN CALIB	ONLY ONLY	5
		IF YOU ARE AT 40000		OPT. ALT. 1000 FT.	3						0	_			CRUISING AT 40000'	APPROXIMATE	si Ö	390	1,30	1,65	505	SILS	585	950	EFFE RANG G.S CAS - LB/H		DAGE
Mone	NODS	U ARE	NGE IN		A LEVEL)	약	70	017	07	04	100	100	Off	Off	ISING	A	18/HR	1485	1485	1470	1470	1470	14.70	14.55			
1	او	IF YO	RA	BY CRUISING AT 40000'	DESCENT TO SEA	(1095)	(1050)	(986)	(016)	(845)	780	715	64,5	585	S	L	* 4	8	8	정	22	16	22	8	to 5 miles	with one	
1	EXT. LOAD			₽ ¥	DESCEN		07)	5)	5)	8)	-						3	270	270	265	265	592	265	560	of available olding 405 airmiles	a 80 MPH x 80 PH CAS with	
	Ĭ			JISING T. ALT.	LIMB &	(1080)	(1030)	(596)	(895)	825	092	069	950	575			E DOWN	8	98	105	311	125	130	077	by hol	7ith a 675	
	9	35000	ILES	BY CRUISING AT OPT. ALT.	RIBED	(10	(10	6)	8)	8			_		2000,	MATE	RANGE	°7°	.85	0,	1.0	1,1	1,15	1,25	2000 lbs of available airmiles by holding 4,05 675 statute airmiles for the similes of the simil	destination. We feet will be Cruise at 270	
ארוווסגו	13866	IF YOU ARE AT 35000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB &	10	100	lao lao	ηo	01	140	017	017	017	CRUISING AT 35000'	APPROXIMATE	0	380	1,20	1460	200	535	575	615	N 2 4 8	0 6 7	
	2	OU AF	ANGE	90	ICES FO	_		-	-						NISIN		E N	11,60	11,60	17,60	37760	1450	1450	1450	EXA feet w tatuto ou can t to Lu	iles fron 10000 rmiles.	
5		IF Y	~	BY CRUISING AT 35000	LOWAR	(1070)	(1050)	(950)	(880)	820	750	685	615	570	0	-	3 M	89	89	89	89	88	98	88	EXAMPLE If you are at 10000 feet with 2 fuel, you can fly 400 statute MPH CAS. However, you can fly 6 by immediately climbing to 40000	At 1,0000 leet cruise at 2, 175 statute airmiles fron headwind the range at 1,000 or 51,0 statute airmiles. This wind and start letdown	
	15299			_	LUDE A			+		_		_	_		+	+	L N I	55 295	60 295	65 295	70 295	75 290	80 290	85 290	e at 1 can fly S. How	atute a the range s statute	
	IMITS	o,		BY CRUISING AT OPT. ALT.	RES INC	(1065)	(1015)	(056)	880	815	745	675	509	260			RANGE DOWN FACTOR DIST.	275 5	.85		-				you as el, you PH CA	At 40000 les 175 statute headwind the ran or 540 statu this wind and s	
	MT.	AT 30000	AIRMILES	¥¥	GE FIGU		5	-			-				3000	APPROXIMATE	G. S. FAC	.° 588		6° 091	000 1.0	530 1.1	570 1.2	600 1.3	228	₹ 7	
	CHART WT. LIMITS		E N A	OPT. ALT. 1000 FT.	(RAN	100	10	ργ	100	100	Pro Pro	100	01	017	S S	APPRO	0 H	1585 38	1570 420	1570 46	1570 50	1540 53	1540 57	1510 60	120		
		YOU	2 T																								
	5-A-29	<u>=</u>		BY CRUISING AT 30000'		(985)	(01/6)	(870)	810	750	685	620	560	515		1	3	325	320	320	320	315	310	36	cal units ind only g, navi ired. 6.5 LB	Ty.	
	ENG. J35-A-29		FUEL	LBS.		2867	2800	2600	2000	2200	2000	1800	1600	99/11	T	EFFEC.	WIND	120 HW	80 HW	40 HW	0	WT 04	WT 08	120 TW	Climb at 100 % RPM Multiply statute units by 87 to obtain nautical units. Read lower half of chart opposite effective wind only. Make additional allowances for landing, navigational errors, combact formation flight etc. a required. Chart weight limits based on fuel density of 6.5 LBS/GAL.	f 6.5 LBS/	
		H	Г	E N	+			1			T				\dagger	T	DOWN DIST.	28	35	35	100	017	15	20	87 to ol pposite inces f fight e	ensity o	
		2000	ES	BY CRUISING AT OPT. ALT.		(1045)	(1000)	(036)	865	795	725	655	585	Sho	2000	TATE	200	27.			1.0	1,1			Climb at 100 % RPM Multiply statute units by . Read lower half of chart of Make additional allows errors, combat, formation Chart weight limits based	on fuel d	
F-846-1RE thru 5RE	OD.	IF YOU ARE AT 25000'	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	1	9	01	C	01	9	lio.	100	07	01/1	MOOSE TA CHISHIS	A DOOD A MANAGE	0.3	5 385		_	2617 0	525	To the		t 100 r statute ver half additions ombat, f	w based	
LRE th	AIRPLANE MOD	OU AR	ANGE	o P	+			+	_	-	+		_	-	-	1	3	1775	_		1740	1705			Multiply Read lov Make s	Fuel flo	
-840-	AIRPL	7	-	IY CRUISING AT 25000		(870)	(830)	(000)	a L	2 99	9	2),5	1,85	1,50	3	-	3 to 1	98	_		5 85	18	_	_			
(SE4				P A		,		1			1						545	3,0	350	345	34.5	34.0	305	325		1000	_

Figure A-16. Flight Operation Instruction Chart (Sheet 2 of 4) F-84G-1RE thru -5RE

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E		ximum ight chu ging ch	-	1	AT 20	AIRMILE	ALT.			+		+		-	AT 20000	APPROXIMATE R G. S. FAC	380	707		+	465 I.		545 1.
9	н	ain ma oas wei n chan lowance ted.			IF YOU ARE AT 20000	RANGE IN AIRMILES	OPT. ALT. 1000 FT.	2	07	-	3 6	2		1	CRUISING A	APPR LB/HR	1885 3	1825 4			1360		1750 5
LOA	Š	to obt n or gr i.e., whe lude all r indica			F 70	R	N CRUISING AT 20000	6	330	200	120				CRUIS	* WAN	85 1	84	84, 1		8 3 1		83 Д
AL	PERAT	n order guration chart, lues inc mbs are		L			BY CR	,	1 m	6		1		1		CAS	375	365	365	_	_	_	320
EXTERNAL LOAD ITEMS	NUMBER OF ENGINES OPERATING:	NOTES: Ranges shown at optimum altitudes are maximum. In order to obtain maximum range on fights requiring more than one chart (due to external configuration or gross weight change), it is necessary to observe the optimum cruising altitude on each chart, i.e., when changing charts a climb may be required to obtain a maximum range. All range values include allowances for descent distance and fuel. Climb distance and fuel are included where climbs are indicated. DATA BELOW CONTAINS NO FUEL RESERVE FOR LANDING	1			FUEL	LBS.	1469	1200	800	001			1	EFFEC.	TIVE	120 HW	80 HW	40 HW	0	WT 04		80 TW
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Z		num alt			¥	AIKMIL	F.F.	170	0		0				061 14	G.S. FACI		170	1,50	1,65	+	_	
Z	POUNDS	than or the opti obtain distance		1	PANCE IN LIBERTS		100	(RANGE FIGURES INCLUDE ALLOWANCES FOR PRESCRIBED CLIMB & DESCENT TO SEA LEVEL) 40 460 295 40 40 40 40 40 40 40 40 40 40 40 40 40	140	Pop	39			9	CKUISING AT 15000	LB/HR		2175	2175	2060	2060	1075	212
FLIGHT OPERATION INSTRUCTION CHART		thown thown the beserve ired to Climb d		2	2 8	×	AT 15000'	340 S	280	130	100				CKO	* ž		18	84	83			
Z	12432	langes sequiring ary to o be requ		L	1		PY V	DESCEN	2	1	Ä		14.8			3		1,00	400	375	375	360	3
ST	10	NOTES: R on flights rit is necesse climb may l	DE L			9	AT OPT. ALT.	CLIMB &	20	10	0					DOWN DIST.		10	10	10	10	10	2
= -		NOT on fit is clim dista	ALTITUDE	,0000	IFS I	2	AT O	CRIBED CL	385	235	100		1	ò	MATE	RANGE		°80	°90	1,00	1,10	1,20	- Hall
ATION	9		E	IF YOU ARE AT 10000	RANGE IN AIRMILES	1 1	1000 FT.	DR PRESO	140	35	25			AT 10000		6.5		405	1445	455	1,75	1,95	
E C	13866	545444	N N	OU AR	ANGE	2	5 =	ACES FO				-	8 6	CRITISING	1	LB/HR		2460	2460	2310	2210	2105	
PE	ITS	qual to bat, nave o prese or prese ng to a given of cruisir initial further necesto range.	LOW	F		CPLIISIN	AT 10000'	295	245	165	85			i a	-	* 2		817	87	83	82	81	_
0	HT LIM	lumn econding the climbin are are nd read from in tall other tances			-		× ×	LUDE A				-	7.1	L	-	C.A.S.		425	425	395	380	365	
3	CHART WEIGHT LIMITS	fuel correservation accorrection accorrection titude a lind and imp distribution imp distribution distribution accorrection and and also also and also also and also and also also and also also and also also also and also also also also also also also also				CRUISIN	AT OPT. ALT.	URES INC	360	215	85					E DOWN R DIST.			w	w	70		
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	\dashv	Select i llowanc or left at that le. oper y to des GHT P ed cruis	1		RANGE IN AIRMILES	PT. ALT	1000 FT.	(RANG	07	35	25			1 1-	×	s, s			1115	01/1	465		
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ŝ	1	IN FLI oeard n rizontal () by cr t initial nb imm rison. (E cl.mb t	18	IF		Y CRUIS	AT 5000'	255	210	140	70			ľ	Н	S RPM			84	83	82		
DEL		f: (A) love ho ho wind hight a right a	8	_		_	+	6	0	0	0	+		H		CAS	> :	>	v 425	115	1,000	_	_
AIRPLANE MODEL(S)	A-29	CHART ise (fue etc.). M ilable (i ilable (i r. For a er altitu ng altitu or take-			FUEL	LBS.		1469	1200	800	001				TIVE	WIND	120 HW	¥ 08	40 HW	0	40 TW	80 TW	120 TW
ANE thru	J35-A-29	ISING for cru fight, the same at high e cruisii				BY CRUISING	T. ALT.	0		10	10					DOWN DIST.			1	1	1		
AIRPLANE M F-84G-1RE thru -5RE	ZE(S)	INSTRUCTIONS FOR USING CHART: (A) IN FLIGHT - Select figure in fuel column equal to or gational eavailable for cruize (fuel on board minus allowances for reserve, combat, navigational errors, formation flight, etc.). Move horizontally right or left to section according to present allitude and read total range available (no wind) by cruising at that altitude or by climbing to an other altitude of maximum range. For a flight at initial altitude, operating instructions are given distructions in appropriate cruising altitude, climb immediately to desired altitude and read cruising in appropriate cruising altitude section. (B) FLIGHT PLANNING - From initial fuel asary allowances. Then use chart as for IN FLIGHT above, adding initial climb distances to range values.		S. L.	AILES	BY CF	AT OF	01/1	3%	195	75		8 3	S. L.	ATE	FACTOR			06°	1,000	1,10		
F-84G	ENGINE(S)	fuel avirons, for rors, for de of n w. For a in app intract		IF YOU ARE AT	RANGE IN AIRMILES	OPT. ALT.	00 FT.	Dr.	017	35	20			AT S	APPROXIMATE	si o			390	415	1450		
	4	than I than I than I than I than I than I the sny in altitu		YOU A	MANGE		2				-	-		CRUISING AT	AP	18/нв			2885	2785	2785		
No. 239C Sheet 1 of 2 ev. 1 Mey 5	(祖)	INSTR less the gations altitude other a rectly t instruct on boar sary all		4		8Y CRUISING	AT S. L.	220	180	120	9			č		* 44				82	82		
MCRE Form	۲					*				-			2 2			CAS			430	415	415		

Figure A-16. Flight Operation Instruction Chart (Sheet 3 of 4) F-84G-1RE thru -5RE

	EXT. LOAD None NO. OF ENGINES OPERATING: 1	IF YOU ARE AT 40000' IF YOU ARE AT 45000'	RANGE IN AIRMILES BY CRUISING BY CRUISING OPT. AT. BY CRUISING IT. BY CRUISING AT 45000' 1000 FT. AT OPT. AIT. LES. AT 45000' 1000 FT. AT OPT. AIT.	FI. AT OPT. ALT. LBS. AT 45000' 1000 FT. 1469 1200	340 800 1.85 4,00	CRUISING AT 40000' CRUISING AT 45000'	APPROXIMATE TIVE APPROXIMATE	LET % LE/HR G. S. FACTOR DIST. RPM IS/HR G. S. FACTOR DIST. RPM IS/HR G. S. FACTOR DIST.	85 260 89 1310 380 °75 135 120 HW	260 89 1310 420 .8	105 260 89 1310 460 .9 160 40 HW	1 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	130 260 89 1310 580 1.2 205 an rw	215	EFFECTIVE WIND—HW, HEADWIND, TW, TAILWIND— (800 lbs of available RANGE FACTOR = RANGE IN AIRMILES (Zero Wind) (235 statute airmiles by holding 395 (235 statute airmiles CAS - CALIBRATED IN STATUTE MILES PER HR (235 statute airmiles CAS - CALIBRATED IN STATUTE MILES PER HR (248 CAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR (259 CAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR (360 lbs of available CAS - CAS - CALIBRATED AIRSPEED IN STATUTE MILES PER HR (370 cas - CALIBRATED AIRSPEED IN STATUTE MILES AIRSPEED IN STATUTE MILES AIRSPEED IN STATUTE MILES AIRSPEED IN STATUTE M
HIGH ALTITUDE	13866 TO 124,32 LB.	IF YOU ARE AT 35000'	BY CRUISING OPT. ALT. BY CRUISING OPT. ALT. BY CRUISING 1000 FT. AT 35000	AT 35000' 1000 FT. DE ALLOWANCES FOR PRESS \$70	320 I ₄ 0 325	CRUISING AT 35000'	APPROXIMATE	VN C.A.S. RPM LB/HR G.S. FACTOR	380 °.75 87 380 °.75	295 87 1340 420	295 87 1340 460 .9	00 12 C. C. L. C.	285 86 1315	285 86 1315 610	EXAMI 10000 feet with y 1.55 statute as vever, you can fly climbing to 3500 et cruise at 295 et cruise at 295 et cruise at 37000 flore at 37000 flore at 37000 flore at 37000 flore at 370000 flore at 37000 flore at 370000 flore at 37000 flore at 37000 flore at 37000 flore at 37000 flore at
	J35-A-29 CHART WT. LIMITS	IF YOU ARE AT 30000'	BY CRUISING OPT. ALT. BY CRUISING AT 30000" AT OPT. ALT.	9	290 luo 305 155 35 155	CRUISING AT 30000	APPROXIMATE	CA.S. RPM LB/HR G.S. FACTOR DOWN	320 86 1475 380 .75 55	86 1475 420 .8	320 86 14.75 4460 .9 65 07 0.1 284 0.11 20 70	20 AC. 12	85 1430	310 85 1430 605 1.3 85	nits. nnly. avigational LBS/GAL.
	ENG. J.		LESS.	. 00	800	1	TIVE		120 HW	¥	WH 04	+	M M	120 TW	train nautic effective win or landing c. as requir density of (6.5 LBS/C
F-846-1RE thru -5RE	AIRPLANE MOD.	IF YOU ARE AT 25000"	BY CRUISING OPT. ALT. BY CRUISING AT 25000 1000 FT. AT OPT. ALT.	1000 FT.	255 40 290 135 35 140	CRUISING AT 25000'	APPROXIMATE	% LS/HR G. S. PACTOR DOWN	85 1690 380 .75 30	85 1690 420 .8	85 1690 460 69 40 1625 180 1.0 ho	1 1 1	1625 560 1.2	83 1575 585 1.3 50	1 Climb at 100 % RPM 2 Multiply statute units by .87 to obtain nautical units. 3 Read lower half of chart opposite effective wind only. 4 Make additional allowances for landing, navigational errors, combat, formation flight etc. as required. 5 Chart weight limits based on fuel density of 6.5 LBS/GAL. Fuel flow based on fuel density of 6.5 LBS/GAL.
L	1		BY CR	4 36	1 23	L		CAS.	350	350	335	335	335	320	

Figure A-16. Flight Operation Instruction Chart (Sheet 4 of 4) F-84G-1RE thru -5RE

MAXIMUM RANGE SUMMARY CHART

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Two tanks + two-1000 lb.

Bombs+eight-5" HVAR

CONFIGURATION: Two tanks + two-1000 1b. Bombs + eight-5" HVAR

ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM
SEA LEVEL	330	.43	.0935	87	SEA LEVEL	320	.42	.0952	86
5000	335	.48	.1020	89	5000	315	.46	.1050	87
10000	315	.50	.1165	90	10000	310	.48	.1190	89
15000	310	.53	.1240	92	15000	300	.52	.1290	91
20000	295	.56	.1360	94	20000	285	.54	.1410	93
25000					25000				
30000					30000			,	
35000					35000				
40000					40000				
45000					45000				
50000	X 2 X 3	777			50000				

CONFIGURATION: Two tanks + two-1000 lb.

Bombs + eight-5" HVAR

CONFIGURATION: Two tanks + two-1000 lb.

Bombs + eight-5" HVAR

GROSS WEIGHT: 19019 1b.

GROSS WEIGHT: 17555 1b.

			COLUMN TO SERVICE AND ADDRESS OF THE PARTY O		A				
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM
SEA LEVEL	315	.41	.0980	85	SEA LEVEL	320	.42	.1000	85
5000	315	.46	.1080	87	5000	310	.45	.1110	86
10000	310	.48	.1230	88	10000	300	.47	.1265	87
15000	295	.51	.1340	90	15000	285	.49	.1387	88
20000	280	•53	.1480	91	20000	275	.52	.1550	90
25000	270	.58	.1570	93	25000	265	.57	.1660	92
30000					30000				
35000					35000				
40000					40000		W 10 13		
45000					45000				
50000					50000				

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH) MPH = STATUTE MILES PER HOUR

MI/LB = STATUTE MILES PER POUND

DATA AS OF: July 1951 DATA BASIS: Estimates

FUEL GRADE: JP-3

FUEL DENSITY: 6.5 1b/gal

MAXIMUM RANGE SUMMARY CHART

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + four-230 gal. tanks | CONFIGURATION: Clean + four-230 gal tanks

GROSS WEIGHT: 22242 1b.

GROSS WEIGHT: 20768 1b.

CKC33 WEI	O				OKO33 WER	,	00 700		
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LR	APPROX % RPM
SEA LEVEL	380	.50	.1010	86	SEA LEVEL	380	.50	.1160	86
5000	365	.52	.1265	87	5000	370	.53	.1290	86
10000	360	.56	.1440	88	10000	350	.54	.1480	87
15000	340	.58	.1585	89	15000	345	.59	.1630	88
20000	330	.62	.1742	90	20000	325	.62	.1830	89
25000	320	.68	.1850	92	25000	310	.65	.1945	91
30000	-	-		-	30000	290	.68	.2080	94
35000					35000				
40000					40000				
45000					45000	(4)			
50000					50000				

CONFIGURATION: Clean + four-230 Gal. tanks | CONFIGURATION: Clean + four-230 tanks

GROSS WEIGHT: 19294 1b.

GROSS WEIGHT: 17820 1b.

GKO22 MEI	O	74 IU.			GKO33 WEIG	3111.	The second secon		
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM
SEA LEVEL	375	•50	.1180	85	SEA LEVEL	375	.50	.1200	85
5000	370	.53	.1320	86	5000	355	.51	.1350	85
10000	350	.54	.1520	86	10000	345	.54	.1565	86
15000	330	.57	.1680	87	15000	325	.56	.1725	86
20000	320	.61	.1920	88	20000	315	.59	.1990	87
25000	310	.65	.2050	90	25000	295	.62	.2145	88
30000	290	.67	.2190	92	30000	290	.67	.2320	91
35000					35000				
40000					40000				
45000				100	45000				
50000				1000	50000				

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH) MPH = STATUTE MILES PER HOUR

MI, LB = STATUTE MILES PER POUND

DATA AS OF: July 1951 DATA BASIS: Estimates

FUEL GRADE: JP-3 FUEL DENSITY: 6.5 1b/gal.

Figure A-17. Maximum Range Summary Chart (Sheet 2 of 4) F-84G-1RE thru -5RE

MAXIMUM	RANGE	SUMMARY	CHART
	11 6 8 6 6 5 F	CO CO B A S B B A S B B B A S B B A S B B B A S B B B A S B B B A S B B B B	

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Clean + four-230 gal tanks | CONFIGURATION: Clean + four-230 gal tanks

GROSS WEIGHT: 16345 1b.

GROSS WEIGHT: 14870 1b.

OKO33 WEI			-		GRUSS WEI	0111. 140	(O TD*		
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX
SEA LEVEL	370	.49	.1210	84	SEA LEVEL	380	•50	.1225	85
5000	360	.51	.1375	85	5000	365	.52	.1400	85
10000	340	.53	.1585	85	10000	350	.54	.1615	85
15000	330	.57	.1770	86	15000	330	.57	.1817	85
20000	305	.58	.2070	86	20000	305	.58	.2152	85
25000	295	.61	.2245	87	25000	290	.61	.2340	86
30000	270	.63	.2460	88	30000	270	.63	.2615	87
35000	260	. 68	.2630	90	35000	245	.64	.2830	90
40000	36				40000			000	,,
45000					45000				
50000					50000				

CONFIGURATION: Two-230 gal. Tip Tanks

CONFIGURATION: Two-230 gal . Tip Tanks

GROSS WEIGHT: 18645 1b.

GROSS WEIGHT: 17181 1b.

					TOKOGO WEI		OT TO		
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM
SEA LEVEL	430	.57	.136	85	SEA LEVEL	415	.55	.138	86
5000	405	.57	.152	85	5000	400	.57	.156	85
10000	385	.60	.177	85	10000	390	.61	.181	85
15000	365	.63	.201	85	15000	370	.63	.206	85
20000	350	.66	.234	86	20000	340	.64	.241	85
25000	330	.69	.248	87	25000	320	.67	.259	86
30000	300	.70	.274	88	30000	300	.69	.289	87
35000	285	.73	.282	91	35000	280	.73	.302	89
40000					40000			- 50- 1	
45000					45000				
50000					50000				

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)
MPH = STATUTE MILES PER HOUR

MI/LB = STATUTE MILES PER POUND

DATA AS OF: July 1951

DATA BASIS: Estimates

FUEL GRADE: JP-3

FUEL DENSITY: 6.5 1b/gal

MAXIMUM RANGE SUMMARY CHART

STANDARD DAY

MODEL: F-84G-1RE thru-5RE

ENGINE(S) J35-A-29

CONFIGURATION: Two-230 Gal Tip Tanks

CONFIGURATION: Two-230 Gal Tip Tanks

GROSS WEIGHT: 15717 1b.

GROSS WEIGHT: 14253 1b.

GROSS MEIGHT: TOTT TO.					GROSS WEIGHT: 14277 10.						
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM		
SEA LEVEL	430	•57	.140	85	SEA LEVEL	400	.53	.141	83		
5000	400	.57	.158	84	5000	385	.55	.162	83		
10000	375	.59	.184	84	10000	370	.58	.189	83		
15000	360	.62	.211	84	15000	355	.60	.216	83		
20000	335	.64	.247	84	20000	325	.62	.253	83		
25000	310	.64	.269	85	25000	315	.66	.280	84		
30000	295	.69	.304	86	30000	290	.68	.321	84		
35000	275	.72	.326	87	35000	270	.70	.352	85		
40000	255	.74	.330	89	40000	245	.71	.363	86		
45000					45000						
50000					50000						

CONFIGURATION: Clean

CONFIGURATION: Clean

GROSS WEIGHT: 15299 1b.

GROSS WEIGHT: 13866 1b.

GROSS WEIGHT: 15299 10.					GROSS WEIGHT: 13000 10.						
ALTITUDE	CAS (MPH)	MACH NO.	MI/LB	APPROX % RPM	ALTITUDE	CAS (MPH)	MACH NO.	MI, LB	APPROX % RPM		
SEA LEVEL	435	.57	.147	84	SEA LEVEL	415	.55	.149	82		
5000	420	.61	.167	84	5000	415	.59	.171	83		
10000	405	.63	.193	84	10000	395	.63	.197	83		
15000	390	.67	.221	84	15000	375	.65	.226	83		
20000	370	.69	.259	85	20000	365	.69	.266	84		
25000	345 *	.72	.285	85	25000	335	.70	.296	84		
30000	320	.74	.319	87	30000	310	.72	.339	85		
35000	295	.75	. 342	89	35000	295	.75	.373	87		
40000	265	.76	. 344	91	40000	260	.76	.381	89		
45000					45000				NOTE OF		
50000					50000		Ti sai	A - 5			

REMARKS:

(1) Multiply statute units by .87 to obtain nautical units.

CAS = CALIBRATED AIRSPEED (MPH)
MPH = STATUTE MILES PER HOUR
MI LB = STATUTE MILES PER POUND

DATA AS OF: July 1951
DATA BASIS: Estimates

FUEL GRADE: JP-3
FUEL DENSITY: 6.5 1b/gal

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