SECTION VIII
CREW DUTIES

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PURPOSE.

The purpose of this section is to provide a compact collection of material wherein each crew member can readily determine his duties in relation to the accomplishment of the over-all mission. Instructions relating to crew duties do not include information which is already covered in other sections.

CREW COORDINATION.

Coordination of actions within a crew is of prime importance. Each crew member must be constantly on the alert and should notify the responsible crew member of any deviation or discrepancy. Prior to flight, the pilot must insure that all crew members are thoroughly familiar with all aspects of the assigned mission as pertains to their crew specialty.

Note

It is imperative that both pilots be thoroughly familiar with the descent, approach, missed approach, landing pattern, altitudes and obstructions at both destination and alternate airfields. Current FLIP Terminal and Area Arrival charts must be studied. The pilot not actually flying the aircraft will closely monitor all descents and approaches and will immediately notify the pilot at the controls of any deviation from published procedures.

Prior to accomplishment of any of the following, verbal coordination between applicable crew members will be required when:

a. Control of aircraft is transferred between pilot and copilot.

b. Changing power settings.

c. A crew member goes off oxygen and when he resumes oxygen use during flight, when oxygen is required.

d. The pilot intends to perform any critical maneuver, at which time all crew members will be secured in their respective positions.

e. The spraying operation is being accomplished.

Each crew member will acknowledge that the intended course of action is understood. All applicable crew positions, when practical, should monitor all communications outside the aircraft by use of the mixer switches during takeoffs, landings, and instrument approaches. Extreme care must be exercised by the pilots, when leaving seats, to avoid inadvertent operation of switches or controls on the pedestal or overhead panel.

CREW COORDINATION WHILE SPRAYING. (A) (B)

During spraying operations it is imperative that the crew be thoroughly briefed prior to each spray mission and that details of each crew member's duties be thoroughly understood prior to takeoff. When flying at the minimum altitudes necessary for spraying operations, each crew member should know exactly what to do during both normal and emergency procedures. It is the responsibility of the pilot to plan and conduct the detailed crew briefing.

During actual spray runs, the pilot must devote full time to flying the aircraft; therefore, most of the duties which are normally performed by the pilot, become the responsibility of the copilot. Coordination of these duties should be accomplished by use of interphone - even between the pilot and copilot. It should be positively stated by the pilot exactly when the copilot assumes the responsibility as well as exactly when the pilot again takes over after the spray runs. Responsibilities may vary slightly, due to the nature of the mission, but generally the pilot must plan crew coordination so that his full attention may be given to actually flying the aircraft during the spray runs.

PILOT.

In addition to the normal operational duties and functions required of the pilot as outlined in Section II, the pilot will be responsible for assuring:

a. That, prior to spray mission, the aircraft has been properly loaded.

b. That the mission folder is complete and he has received an adequate briefing for the assigned mission.

c. That assigned individual preflight duties are completed.

d. That the crew is briefed on classification of the mission, length of stay, route to be flown, load, and detailed explanation of the mission.

The briefing should include emergency instructions and procedures for bail-out, ditching and crash landing. A check should be accomplished to ascertain that each crew member has identification tags and that any special equipment required to accomplish the mission is aboard.

e. That passengers are briefed in accordance with PASSENGER BRIEFING.

f. That crew and passengers comply with customs regulations.

g. That individual postflight duties are completed.

h. That the Form 781, mission reports, and records are complete.

PASSENGER BRIEFING.

Prior to take-off the pilot or his representative will brief passengers on the following items as applicable to the mission being flown.

1. Aircraft commander's name.

2. Route, ETE, weather, aircraft altitude.

3. Seats, safety belts, and movement in aircraft.

   Passengers will be briefed to remain seated with safety belts fastened during take-off, landing, taxi operations and at other times when directed by the pilot or other crew members.

4. Smoking.

   Smoking will be at the discretion of the pilot. Smoking will not be permitted until after take-off and will be discontinued during letdown for landing. At no time will smoking be allowed on the ground within 50 feet of the aircraft.

5. Location of relief tubes.

6. Air sickness.

   Air sickness bags and ear plugs will be

8-2A and 8-2B deleted

provided for passengers who request them. Passengers will be responsible for removing them from the aircraft after the flight.

7. Electronic devices.

   Passengers having electrical or electronic devices shall not use them during flight.

8. Opening the doors.

   Doors will not be opened in the air or on the ground by anyone except an authorized crew member.

9. Use of parachutes and survival equipment.

   a. Passengers will be fitted with parachutes in accordance with command directives.

   b. If parachutes are required, the wearing and use of the parachute will be explained.

   c. Passengers will be briefed on the location and use of survival equipment.

10. Bail-out.

   a. Signals - Prepare for bail-out-three short rings; bail-out-one long ring. Bell will be sounded after engine start for audibility test.

   b. Exits - Cargo ramp and door, aft troop doors, bail-out chute.

   c. Don emergency gear, exposure suits, boots and warm clothing.

11. Crash landing.

   a. Signals - Prepare for crash landing - six short rings; brace for impact - one long ring. One long ring during all ground operations or immediately after take-off.

   b. Remain seated until aircraft stops.

   c. Exits - Forward entrance door (if propeller not turning), cargo ramp and door, aft troops doors, overhead hatches, and emergency exit windows.

   d. Exit quickly without panic; take survival gear and warm clothing.

   e. Move to a safe distance from the aircraft.

12. Ditching.

   a. Signals - Prepare for ditching - six short rings; brace for impact - one long ring.

   b. Remove sharp objects from pockets and don life vests and exposure suits.

   c. Remain seated until aircraft stops; there may be two separate impacts.

   d. Exits - Overhead ditching hatches.

   e. Demonstrate fitting and use of life vests.

13. Questions.

COPILOT.

The copilot will aid the pilot in any way, when directed, to accomplish the assigned mission. He should be able to assume full command, if the occasion arises. He and the pilot must be virtually interchangeable.

NAVIGATOR.

The navigator will aid the pilot in all matters pertaining to flight planning and navigation and will perform any other duties assigned by the pilot. He will maintain the highest possible level of proficiency in all types of navigation employed in accomplishing the mission of the organization.

a. Assemble all materials and data necessary for complete mission planning.

b. Perform a thorough preflight inspection of all navigation equipment.

c. Know the position of the aircraft at all times, utilizing all available aids to navigation.

d. Maintain a current and accurate record of the flight and keep the crew informed of flight progress.

e. Prepare necessary position reports.

Note

Underlined items indicate a response is required.

BEFORE ENTERING THE AIRCRAFT.

1. Mission planning - Completed.
2. Navigation antennas - Checked.

ON ENTERING THE AIRCRAFT.

1. Professional and personal equipment - Stowed.
2. Form 781 - Checked.
3. Instrument calibration cards - Checked.

4. LORAN - Off.
5. Light switches - Off.
6. Oxygen equipment - Checked.
7. Driftmeter - Checked.

   Check that the driftmeter is locked in the retracted position, the gyro is caged and the switch OFF.

8. Navigational publications - Checked.

   Check that letdowns, enroute charts and celestial publications are current.

INTERIOR INSPECTION—POWER ON.

1. Lights - Checked.
2. Interphone - Checked.
3. Gyro magnetic compass system - Checked.
   a. Wait at least three minutes after application of power for the gyro to reach operating speed, to level, and to synchronize with magnetic north.
   b. Observe the indicator and compare this indication with the actual heading of the aircraft.
4. Periscopic sextant and mount - Checked (if applicable).

   To check mount alignment, use the following method:

   Check the relative bearing of each wing tip. The sum of these bearings should equal 360°. Correction is one-half the difference between the sum of the bearings and 360°.

   Note

   Mount alignment can change each time the overhead hatch is opened.

5. LORAN - On. Calibration checked, then Off.

BEFORE STARTING RECIPROCATING ENGINES.

1. Oxygen - Checked.

BEFORE TAKE-OFF.

1. Time hack - Checked.

   Do not block entrance to the crew compartment during ground operations.

2. Occupy forward troop seat.
3. Safety belt - Secured.

AFTER TAKE-OFF—CLIMB.

1. Occupy navigator's seat.
2. Time of take-off - Recorded.
3. Periscopic sextant - As required.
4. Driftmeter - As required.
   a. Turn on switch at navigator's station.
   b. Driftmeter switch - ON.
   c. Driftmeter - Extended.

CRUISE.

1. Level-off time and position - Recorded.
2. Heading - Deviation check.
3. Position reports - As required.
4. Driftmeter - Checked (if applicable).

DESCENT.

1. Periscopic sextant - Stowed.
2. Driftmeter - Retracted, caged, and OFF.
3. LORAN - OFF.
4. Navigator's seat - Secured.

BEFORE LANDING.

1. Occupy forward troop seat.
2. Safety belt - Secure.

BEFORE LEAVING THE AIRCRAFT.

1. Form 781 - Discrepancies recorded.
2. Electrical switches - As required.

8-4A and 8-4B blank deleted

ASSAULT PROCEDURES.

Before Take-Off.

1. Safety belt - Secured.

FLIGHT MECHANIC.

The flight mechanic must be proficient in the inspection, servicing, minor repair, preflight and operation of the systems of the aircraft. He must also be familiar with cruise control and have thorough knowledge of all normal and emergency procedures. His primary duties are:

a. Accomplish the preflight checks to determine the aircraft's status.

b. Maintain a flight mechanic log as directed.

c. Perform required in-flight repairs.

d. Accomplish those items on the aircrew checklist for which he is responsible and other duties as directed by the pilot.

LOADMASTER.

The loadmaster will perform the following duties and other duties as directed by the pilot. Items marked with a dot (•) will be accomplished for loading nuclear weapon cargo in addition to the general loading checklist. He must have a thorough knowledge of emergency procedures in which he has specific duties. He will assist the flight mechanic as required during normal and emergency operations.

Note

Underlined items indicate a response is required.

PREFLIGHT.

Exterior Inspection.

1. Chocks - In place.
2. Ground wire - Installed.
3. Fire extinguisher - In place.

Interior Inspection (Left Side)

1. Aircraft status - Checked.
2. Static line retriever - Secured.
3. First aid kits (4) - Current inspection, sealed.
4. Seats/seat belts - As required.
5. Oxygen bottle/mask - Checked.

   Do not connect firefighter mask to bottle, except in an emergency.
6. Litter posts - Secured.
7. Litter straps - Secured.
8. Main landing gear lock pin stowage case - Checked.
9. Main landing gear lock pin - Installed.
10. Troop door - Check.
11. Seats/seat belts - As required.
12. Litter straps - Secured.
13. First aid kits (2) - Checked.
14. Cargo door uplock pin - In place.
15. Ramp emergency release "T" handle - Down.
16. Ramp support link - Checked.

Tail Section.

1. Ditching ladders - Secured.
2. Maintenance ladder - Secured (with a MC-1/CGU-1B cargo strap).
3. Cargo door emergency release handle - Locked and safetied.

Right Side.

1. First aid kits (2) - Checked.
2. Cargo door uplock pin - In place.
3. Ramp emergency release "T" Handle - Down.
4. Ramp support link - Checked.
5. Crash axe - Checked/secured.
6. T.O. 1-1B-40 - Checked.
7. Load adjuster - Checked.
8. Seats/seat belts - As required.
9. Auxiliary loading ramps - Checked/secured.
10. Ramp/cargo door control panel - Normal.
11. A-20 Fire Extinguisher - Checked/secured.
12. Litter straps - Secured.
13. Troop door - Check.

14. Hydraulic reservoir - Check fluid level and for leaks.
15. Main landing gear lock pin - Installed.
16. Seats/seat belts - As required.
17. First aid kits (4) - Checked.
18. Litter posts - Secured.
19. Oxygen bottle/mask - Checked.

    Do not connect firefighter mask to bottle, except in an emergency.

20. Load assist pulley - Checked/secured.
21. Static line retriever - Secured.

Forward Bulkhead (Station 120).

1. A-20 Fire extinguisher - Checked/secured.
2. Nose gear lock pin - Installed.
3. Crash axe - Checked/secured.
4. Main landing gear emergency crank handle - Secured.
5. Oxygen recharger assembly - Secured.
6. Sanitation bags and ear plugs - Aboard.
7. Sanitation protectors - Aboard.
8. Cargo tiedown equipment - Check quantity and serviceability.

Crew Compartment.

1. Oxygen bottles (2) - Checked.
2. First aid kit (1) - Checked.
3. A-20 Fire extinguisher - Checked/secured.

Power On Inspection.

CAUTION

Assure that the landing gear lever is in the down position before applying power to aircraft.

1. Battery switch - On.
2. Hydraulic selector switch - Auto.
3. Secondary bus switch - Monitor.
4. Cargo compartment master switch - Red/White position.
5. Cargo ramp/door - Operational check.
6. Interphones - Checked (all in cargo compartment).
7. Cargo compartment domelights - Checked.
8. Hydraulic selector switch - Off.
9. Secondary bus switch - Normal position.
10. Cargo compartment master switch - Off.
11. Battery switch - Off.
12. Jump lights - Checked (red and green).
13. Alarm bell - Checked.
14. Enter discrepancies in AFTO Form 781A.

Prior to Loading.

• 1. Aircraft parked in designated areas and separation maintained - Checked.

2. AF Form 365F - Completed through item 11.
3. Load preplan - Completed.
4. Aircraft in level attitude - Checked.
5. Cargo ramp and door - As required.

• 6. Fire department - Notified.

Assure two-way tower communications, if fire-fighting vehicle not standing by at the aircraft during loading.

• 7. Two 50 lb. CO^2 or one 10 gallon CB fire extinguisher - In place.

8. Manifest - Checked.

• 9. Loading crew briefed and security guard - Posted.

10. Hand signals - Briefed to drivers.
11. Cargo inspections - Completed.

•12. Placard installed - As required.

•13. Winch cable (completely unwind). Inspect for kinks, breaks, and security of attachment to cable hook.

CAUTION

Change winch cable if kink or a broken wire is found.

After Loading.

1. Cargo tiedown - Completed.

   Cargo restrained in accordance with T.O. 1C-123B-9.

2. Cargo ramp and door - As required.

CAUTION

The cargo door and ramp control levers shall be checked to insure that they are in the normal position.

3. Loose equipment - Secured.

4. Form 465F and manifest - Completed, submit to pilot.

BEFORE STARTING RECIPROCATING ENGINES.

1. Oxygen - Checked.

STARTING RECIPROCATING ENGINES.

1. Scan both reciprocating engines while they are being started.

ENGINE WARM-UP.

1. Ramp and troop doors - Closed.

TAXIING.

1. Taxi area - Clear rear.

ENGINE RUN-UP.

1. Anti-icing/deicing equipment - Checked.

2. Engine and nacelles - Checked.

   The engines and nacelles will be visually checked for leaks and security.

BEFORE TAKE-OFF.

1. Main gear pins - Removed, doors closed.

   The loadmaster will remove the gear pins and stow them, check tires and brake assemblies for general condition and evidence of overheating, close the access doors and advise the Flight Mechanic when the action is completed.

2. Scan jet engines during start - Checked.

3. Doors and hatches - Secured.

4. Passenger seat belts - Checked.

5. Tiedown - Checked.

6. Cargo compartment - Secured.

7. Safety belts - Secured.

8. Pressure relief device - Open or removed, as required.

AFTER TAKE-OFF - CLIMB.

1. Engines, nacelles and cargo compartment - Checked.

   The loadmaster will check the engine nacelles, landing gear, gear doors and cargo compartment. This check will be made every 30 minutes during flight.

2. Tiedowns - Checked.

3. Cargo compartment - Checked.

CRUISE.

1. Passenger comfort - Checked.

2. Tiedowns checked every hour or as required - Completed.

3. Cargo leakage - Checked.

DESCENT.

1. Landing gross weight - Checked.

2. Passengers and cargo compartment - Secured.

   Alert passengers for landing. Seated with safety belts and no smoking.

3. Equipment and cargo tiedowns - Checked.

4. Safety belt - Secured.

BEFORE LANDING.

1. Landing gear - Visually checked down.

2. Safety belts - Secured.

AFTER LANDING.

1. Main gear pins - Installed.

BEFORE LEAVING THE AIRCRAFT.

Prior to unloading nuclear cargo all dot (•) items contained in Prior to Loading Checklist will be accomplished.

1. Offload/onload - As required.
2. Tiedown rings - As required.

   When tiedown rings are not required install floor plugs.
3. Equipment - Checked/stowed.
4. Cargo compartment - Cleaned.
5. Enter discrepancies in Form 781.
6. Electrical switches - As required.

ASSAULT PROCEDURES.

Before Take-Off.

1. Cargo ramp, doors and hatches - Closed.
2. Safety belts - Secured.

PASSENGER BRIEFING.

Prior to take-off the pilot or his representative will brief passengers on the following items as applicable to the mission being flown.

1. Aircraft commander's name.
2. Route, ETE, Weather, aircraft altitude.
3. Seats, safety belts, and movement in aircraft.

   Passengers will be briefed to remain seated with safety belts fastened during take-off, landing, taxi operations, and at other times when directed by the pilot or other crew members.
4. Smoking.

   Smoking will be at the discretion of the pilot. Smoking will not be permitted until after take-off and will be discontinued during letdown for landing. At no time will smoking be allowed on the ground within 50 feet of the aircraft.
5. Location of relief tubes.
6. Air sickness.

   Air sickness bags will be provided for passengers who request them. Passengers will be responsible for removing them from the aircraft after the flight.
7. Electronic devices.

   Passengers having electrical or electronic devices shall not use them during flight.
8. Opening the doors.

   Doors will not be opened in the air or on the ground by anyone except an authorized crew member.
9. Use of parachutes and survival equipment.

   a. Passengers will be fitted with a parachute and the wearing and use of the parachute will be explained.

   b. Passengers will be briefed on the location and use of survival equipment.
10. Bail-out.

    a. Signals: Prepare for bail-out - Three short rings; Bail-out - One long ring.

    b. Exits - Cargo ramp and door, aft troop doors, bail-out chute.

    c. Don emergency gear, exposure suits, boots and warm clothing.
11. Crash landing.

    a. Signals: Prepare for crash landing - Six shorts rings; Brace for impact - One long ring. One long ring during all ground operations or immediately after take-off.

    b. Remain seated until aircraft stops.

    c. Exits - Forward entrance door (if propeller not turning), cargo ramp and door, aft troop doors, overhead hatches, and emergency exit windows.

    d. Exit quickly without panic; take survival gear and warm clothing.

    e. Move to a safe distance from aircraft.
12. Ditching.

    a. Signals: Prepare for ditching - Six short rings; Brace for impact - One long ring.

    b. Remove sharp objects from pockets and don life vest and exposure suits.

    c. Remain seated until aircraft stops: there may be two separate impacts.

    d. Exits - Overhead ditching hatches.

    e. Demonstrate fitting and use of life vests.
13. Questions.

SPRAY SYSTEM OPERATOR. (A) (B)

The spray system operator must be thoroughly familiar with the servicing, filling, minor repair, opera-

tion, and cleaning of spray systems. His primary duties are to:

a. Accomplish pre-flight checks to assure spray system is operational.

b. Load systems with chemicals as required to complete the mission.

c. Assist with calibration to assure system accuracy.

d. Operate systems in flight or on the ground and perform minor repairs.

e. Flush and clean systems after mission unless major maintenance is needed and system cannot be cleaned.

f. Comply with checklist requirements of normal crew position assigned.

SECTION IX

ALL-WEATHER OPERATION

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INSTRUMENT FLIGHT PROCEDURES

FUNCTION.

The function of this section is to set forth the proper techniques and procedures for all-weather operation that necessarily supplement rather than differ from those instructions for normal operation covered in Section II. Although some repetition is necessary in obtaining emphasis, clarity, or continuity of thought, the scope of this section is affected by various climatic conditions. Special problems related to all-weather operation are discussed in Section VII.

INSTRUMENT FLIGHT.

In presenting the various phases of instrument flight, no attempt has been made to set forth a statement of specific instrument techniques. Rather, a checklist of functions which demand consideration and compliance is supplied. Refer to appropriate Technical Orders, Training and Instrument Manuals for proper operation of navigation and communication equipment which form the basis of instrument flight. The aircraft is provided with normal instrumentation and navigational equipment allowing the use of such navigational aids as Radio Range, ADF, VOR, TACAN and ILS. The air-ground communication systems furnish the pilot with necessary equipment to utilize DF, Radar Surveillance and Ground Control Approach procedures.

WARNING

With partial or complete loss of the ME-1A Compass Amplifier, it is possible to have erroneous indications on the pilot's heading indicator, the ID-249 and the ID-250. There will be no "OFF" flags or warning lights displayed.

Note

This aircraft is a Category B aircraft for the purpose of instrument approaches.

BEFORE FLIGHT.

The necessary flight planning and review of performance data is to be accomplished prior to flight. Notations of instrument conditions suspected and forecast along the proposed route of flight are of prime importance.

TAXIING.

Complete the taxi checklist as prescribed in Section II observing operation of magnetic compass, heading indicators and turn-and-slip indicators during turns.

BEFORE TAKE-OFF.

a. Upon receiving clearance for take-off, align the aircraft in the center of the active runway with nose wheel centered.

b. Attitude indicators - align miniature aircraft 1/2 bar width below the horizon bar.

c. Heading indicators - cross check with magnetic compass and rotate heading pointer to top index of the compass card.

INSTRUMENT TAKE-OFF.

Maintain directional control by visual reference as long as possible. Gradually bring the heading indicator into the crosscheck as visual references are lost. As the computed take-off speed V_{to} is attained, establish a pitch change of approximately 3-1/2 bar widths on the attitude indicator. Landing gear is retracted only after a definite climb indication is attained. Complete remaining items and systems check as set forth in Section II, AFTER TAKE-OFF-CLIMB.

INSTRUMENT CLIMB.

Use normal climb procedures and airspeeds. Climbing turns involving an angle of bank in excess of 30° are considered steep turns and are not recommended for instrument flight.

INSTRUMENT CRUISING FLIGHT.

While flying through visible moisture, particular attention should be paid to the use of pitot heat and carburetor heat. Apply carburetor heat as necessary to maintain carburetor air temperatures within limits (Refer to CARBURETOR AIR TEMPERATURE LIMITS, Section V and CARBURETOR ICING, Section VII). All anti-icing equipment should be turned on prior to entering icing conditions rather than waiting for an accumulation of ice to build on the structures.

DESCENT.

Use normal descent procedures and airspeeds. Prior to letting down through overcast, use carburetor heat as required. During precipitation, start windshield wiper operation before reaching final approach.

Note

- Manifold pressure should be maintained at approximately one inch Hg for every 100 rpm to prevent excessive engine bearing loads.

- When flying in hot, humid climates, the heater should be turned on 15 minutes prior to descent so heat will be available for windshield defogging.

HOLDING.

The aircraft should be flown in a manner consistent with fuel conservation and comfortable control. The following is a recommended configuration: landing gear UP, flaps UP, IAS 130 knots.

INSTRUMENT APPROACHES.

Flight characteristics during instrument approaches do not differ from those encountered during normal visual flight. See figures 9-1 and 9-2 for typical approach procedures.

MISSED APPROACHES.

Advance power as required and establish a pitch change on the attitude indicator which results in a positive rate-of-climb.

TALAR INSTRUMENT APPROACH.

Flight characteristics during TALAR instrument approach do not differ from those encountered during normal visual flight. A typical beam pattern for a TALAR approach is shown in figure 9-2A.

NON-PRECISION APPROACHES

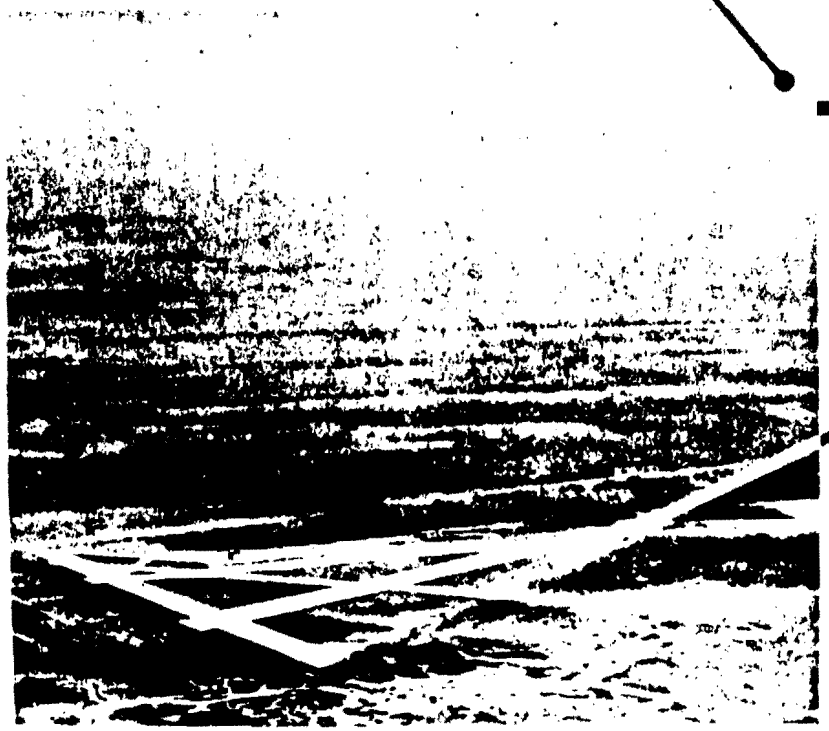
—typical—

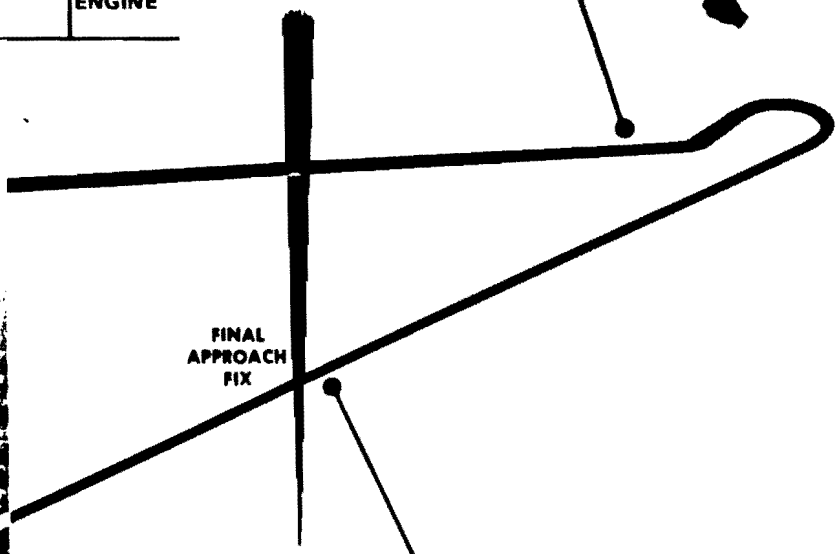
OUTBOUND FROM INITIAL APPROACH FIX

CHECKLIST	AIRSPEED	POWER	GEAR	FLAPS	
BEFORE LANDING	130 KNOTS	2400 RPM	DOWN	UP	TWO ENGINES
BEFORE LANDING	115 KNOTS (MIN)	2600 RPM BELOW 2600 RPM OR AS REQUIRED	DOWN	UP	ONE ENGINE

PRIOR TO INITIAL APPROACH FIX

CHECKLIST	AIRSPEED	POWER	FLAPS	
DESCENT	130 KNOTS	AS REQUIRED	UP	TWO ENGINES
DESCENT	115 KNOTS (MIN)	2600 RPM BELOW 2600 RPM OR AS REQUIRED	UP	ONE ENGINE





FINAL APPROACH FIX

CHECKLIST	POWER	AIRSPEED	GEAR	FLAPS	
BEFORE LANDING	2400 RPM	120 KNOTS	DOWN	AS DESIRED	TWO ENGINES
BEFORE LANDING	2600 RPM	115 KNOTS (MIN)	DOWN	AS DESIRED	ONE ENGINE

Figure 9-1

NOTE . . . This is a typical diagram which is not meant to show the intended flight path but does indicate a chronological order for the items to be performed. These items may be performed before, but in no case later than the point indicated on the diagram.

Refer to appendix for appropriate airspeeds at various gross weights.

PRECISION APPROACHES

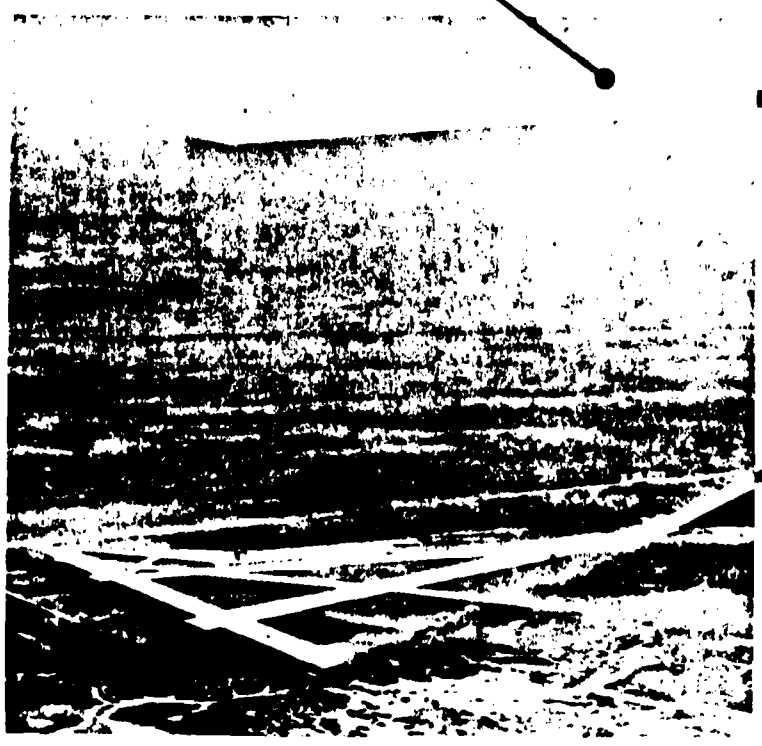
—typical—

PRIOR TO OUTER MARKER/DOWNWIND

CHECKLIST	AIRSPEED	POWER	FLAPS	
DESCENT	130 KNOTS	AS REQUIRED	UP	TWO ENGINES
DESCENT	115 KNOTS (MIN)	2600 RPM BELOW 2600 RPM OR AS REQUIRED	UP	ONE ENGINE

OUTBOUND/DOWNWIND

CHECKLIST	AIRSPEED	POWER	GEAR	
BEFORE LANDING	130 KNOTS	2400 RPM	DOWN	TWO ENGINES
BEFORE LANDING	115 KNOTS (MIN)	2600 RPM	DOWN	ONE ENGINE



INBOUND/BASE LEG

AIRSPEED	
120 KNOTS	TWO ENGINES
115 KNOTS (MIN)	ONE ENGINE

PRIOR TO INTERCEPTING GLIDE PATH

AIRSPEED	FLAPS	GEAR	
110 KNOTS (MIN)	TAKE-OFF	DOWN	TWO ENGINES
115 KNOTS (MIN)	AS DESIRED	DOWN	ONE ENGINE

NOTE
FLAPS AS DESIRED WHEN LANDING IS ASSURED

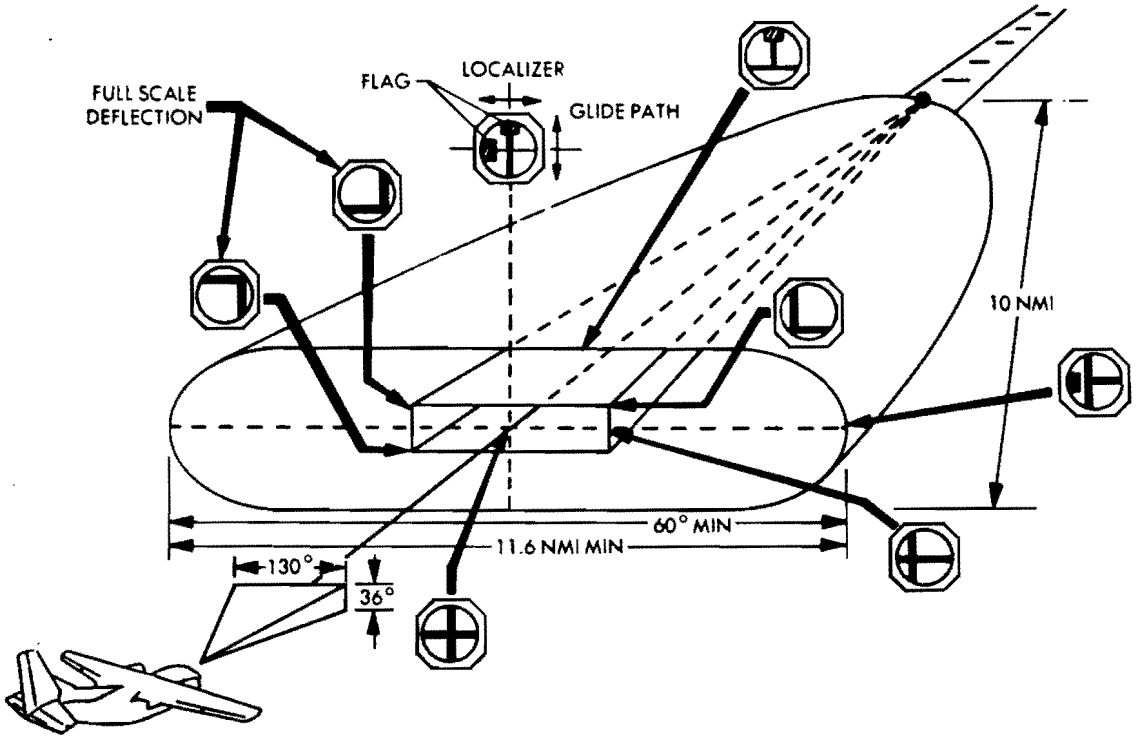
Figure 9-2

NOTE . . . This is a typical diagram which is not meant to show the intended flight path but does indicate a chronological order for the items to be performed. These items may be performed before, but in no case later than the point indicated on the diagram.

Refer to appendix for appropriate airspeeds at various gross weights.

TALAR BEAM PATTERN

(As Displayed on ID-249 Indicator)



APPROACH VIEW

Figure 9-2A

ICE AND RAIN

OPERATION IN ICE AND RAIN.

Ice and rain pose special problems in the operation of the aircraft. Visibility is limited; traction and directional control during take-off, landing, and ground handling are adversely affected; radio interference is increased; and there is a tendency to greater physical and mental discomfort on the part of the crew members and passengers. However, the most dangerous aspect of rain stems from the possible formation of ice and the resulting alteration of the flight characteristics of the aircraft. To meet as many of these problems as possible, the aircraft incorporates design features and auxiliary equipment. Both the pilot's and copilot's windshields are equipped with windshield wipers. The windshields, side windows, and pilot's lower windows include defrosting heat passages. On C-123K aircraft, the pilot's and copilot's windshields are electrically heated. Twelve static dischargers are installed to discharge electrical charges accumulated when flying through rain or ice. An efficient, two heater, heating and anti-icing system supplies heat for the defrosting of cockpit transparent areas, the anti-icing of wing, fin, and horizontal stabilizer leading edges, and for the comfort of the crew and passengers. Electrical anti-icing equipment prevents ice formation on propeller blades. Anti-icing for the jet engine pod air inlet area is supplied by compressor bleed air and electrical power from the flight emergency bus. Bleed air is also applied to the jet engine bullet nose and variable vanes to prevent the formation of ice on these areas. Electrical heating elements prevent ice formation on the pitot tubes or angle of attack transmitter. Engine exhaust manifold heated air is available for adjusting carburetor air temperature to prevent carburetor icing. Operation of these systems is described in Sections IV and VII. Additional information and specific procedures are given under COLD WEATHER PROCEDURES in this section. Planning and preparation for operation in rain and ice conditions should be accomplished in advance whenever possible. Windshield wipers, heating system, radio equipment and navigation aids should be thoroughly tested before take-off.

WARNING (A) (B)

Though spray operations are not normally conducted in icing conditions, it should be noted that spray aircraft may be ferried in various configurations. Icing conditions should be avoided if any external spray equipment is installed.

TAKE-OFF.

If ice is anticipated turn ON pitot heat.

Only under the most urgent conditions would a take-off be made when icing at take-off is known. When icing conditions are anticipated immediately after take-off, wing anti-icing temperature should reach 76°C to 85°C before take-off.

CAUTION

Excessive anti-icing operation on the ground can cause buckling of the wing skin due to expansion and subsequent contraction.

If carburetor heat has been used in engine warm-up but is not to be used for take-off, allow two minutes operation in COLD for stabilization of automatic mixture control. Make certain the nose wheel is centered before starting the roll. If icing conditions are suspected, flight with external drop tanks installed is not recommended since a build-up of ice may occur on the unheated drop tanks and pylons. This will produce a drop in airspeed as well as moderate buffeting and sluggishness of the controls. As soon as the build-up of ice is detected, the pilot should attempt to locate an ice-free altitude.

Note

If the jet engine anti-icing system is turned ON during take-off, a slight decrease in total thrust may be anticipated.

CRUISING FLIGHT.

Known or suspected icing conditions should be avoided if possible. If it is determined that icing conditions cannot be avoided, wing and tail anti-icing heat and jet pod anti-icing should be applied immediately.

CAUTION

Do not open inlet doors unless visual inspection insures that the pod doors and engine inlet lips are free of ice buildup. If ice is present, deice prior to engine start. Immediately after start, jet engines must be operated at 70% or above to insure adequate anti-icing to the compressor inlet ports.

It is desirable to apply wing and tail anti-icing heat for a period of 15 minutes prior to entering an icing zone. This permits the flight surfaces to heatsoak. By this means rapid evaporation is accomplished, freezing "runback" over the surfaces is held to a minimum, and ice film formation impeded. The anti-icing equipment is more effectively used for the prevention of ice formation than as a deicer. Deicing equipment should be put into operation as soon as the

possibility of ice formation is encountered. If an ice build-up is observed or if restriction of aileron movement is felt during possible icing, start the aileron pneumatic deicing system and place the heater primary selector switch in ANTI-ICE. If ice formation on flight surfaces persists, immediately change flight path or altitude to leave the icing zone. Carburetor air temperature should be kept under observation and the anti-icing temperature checked periodically.

WARNING

When operating in icing conditions, maintain an airspeed of 150 KIAS or more.

APPROACH.

In icing conditions, holding operation should be kept to a minimum. At any time that ice formation results in a loss of 15 to 20 knots airspeed, a change in altitude or other corrective action is necessary. Maintain enough power to avoid cooling engines excessively.

In the event of windshield heater failure or windshield wiper malfunction, the clear view window located on the pilot's and copilot's side may be opened to obtain an unobstructed view.

WARNING

Ice formation, particularly on airfoils, causes higher stalling speeds (due to loss of lift), added weight and increased drag. Stall warning buffet occurs closer to actual stalling speed and provides less forewarning of a stall. Consequently, normal approach and landing speeds must be increased enough to compensate for the effects of ice on the aircraft.

LANDING.

Care should be exercised when landing on ice. The long flat unbroken stretches of snow or ice make depth perception difficult. It should be kept in mind that the usual tendency is to over-estimate the altitude of the aircraft from visual observation. If there are no visible landmarks from which a perspective can be obtained, extreme caution should be exercised to prevent undershooting the runway.

When landing and applying reverse thrust on icy runways, apply power to both engines equally to prevent unbalanced thrust on one engine forcing the aircraft to slide sideways. The nose gear alone will not hold the aircraft in a straight line; power will have to be balanced in either reverse or normal pitch. The pilot should be prepared for a blinding reverse prop wash on a runway covered with light snow or standing water.

Note

Reverse thrust should not be used unless required, and applied with caution when landing on slippery runways.

TURBULENCE AND THUNDERSTORMS

SEVERE TURBULENT AIR PENETRATION.

Flight through the areas of severe turbulence associated with thunderstorm activity should be avoided. Whenever marginal conditions are indicated, or doubt exists as to the severity of unknown weather conditions, thorough preplanning with the weather forecaster must be accomplished. Careful planning and good judgment must be exercised and capabilities realized before areas of weather activity are entered or circumnavigated.

WARNING

The potential danger of thunderstorms is statistical history. Never enter them by choice.

APPROACHING THE STORM.

The aircraft must be prepared prior to entry into a zone of turbulent air.

a. Adjust props for approximately 2100 rpm for gyroscopic stability.
b. Mixtures - RICH.
c. Pitot heater - ON.
d. Carb air - As required.
e. Throttles adjusted as necessary to obtain optimum penetration speed - 60 knots above power-off stall speed. Refer to Figure 6-4.
f. Check flight instruments for proper settings.
g. Safety belt and harnesses tightened (check with crew members and passengers).
h. Turn off any radio equipment rendered useless by static.
i. At night, turn crew compartment lights full bright to minimize blinding effect of lightning.

CAUTION

Do not lower flaps or gear as this will result in a loss of aerodynamic efficiency.

IN THE STORM.

a. Airspeed - After penetration airspeed is established, trim the aircraft for this speed. Severe turbulence will cause large and often rapid variations in indicated airspeed. DO NOT CHASE THE AIRSPEED.

b. Attitude - The attitude of the aircraft becomes the primary reference in areas of extreme turbulence. After establishing the aircraft attitude and trim setting for the penetration airspeed, use the attitude indicator as the primary instrument. DO NOT CHANGE THE TRIM SETTINGS after the proper attitude has been established. Fly this attitude during turbulent conditions. Maintain control as near neutral as possible to avoid exaggerating the flight conditions by overcontrolling. DO NOT USE SUDDEN OR EXTREME CONTROL INPUTS. Extreme gusts will cause large attitude changes, but smooth and moderate use of the elevator will re-establish the desired attitude. Be very conscious of tendencies to overcontrol with the rudder at this time. Attempt to maintain neutral rudder at all times.

c. Altitude - Severe vertical gusts may cause appreciable altitude variations. Allow altitude to vary. Sacrifice altitude to maintain the desired attitude and airspeed. DO NOT CHASE THE ALTIMETER.

d. Power - After penetration airspeed is established, change power setting ONLY IN CASE OF EXTREME AIRSPEED VARIATIONS.

e. Heading - Maintain original heading. Do not make any turns unless absolutely necessary.

Jet Engine Flame-out.

Marginal jet engine performance, and in some cases flame-out, can occur while penetrating turbulent air masses. This can result from ingestion of high density rain, icing of the air inlet cowling and guide vanes, or from unsatisfactory air induction. The rapid changes of inlet air pressure and excessive angles of attack often associated with severe turbulence contribute to the latter cause of poor performance.

CAUTION

Flying in turbulence or hail may increase inlet distortion. At higher altitudes, this distortion can result in engine surge and possible flame-out. However, normal air restarts may be accomplished as outlined in Section III, Emergency Procedures.

In view of the preceding, areas of turbulent air, hail storms, and thunderstorms should be avoided whenever operation of the jet engines is essential for safety of flight.

NIGHT FLYING

OPERATION AT NIGHT.

Night flying presents the same problems as instrument flying. If possible, perform both interior and exterior inspection during daylight hours. It is imperative that flashlights be stowed aboard the aircraft. Each crew member should have a flashlight available for immediate use in emergencies.

a. Check operation of all interior and exterior lights. Make certain that spare bulbs are available.

b. To reduce windshield reflection, adjust crew compartment and instrument lights to desired brilliance.

c. The effectiveness of exhaust glare may be appreciably lowered by proper use of interior lights in the crew compartment.

COLD WEATHER PROCEDURES

CAUTION

Actuation of the cowl flaps and oil cooler should be held to a minimum until the engine has either been preheated or reached operating temperature (40°C oil temperature and 100°C CHT), if not, damage to cowl flaps and oil cooler actuators may result.

COLD WEATHER CONDITIONS.

The following discussion and instructions apply when temperatures of 32°F (0°C) or below are anticipated. Procedures for icing conditions are covered under ICE AND RAIN, this section.

WHITE-OUT.

A condition known as white-out is often encountered in cold weather areas covered with snow. This condition is caused by suspended ice crystals or water particles in the atmosphere. It appears to the eye as a white blur when looking at the snow or as a gray or white color in the sky when found in the upper atmosphere. Light which may be shining upon the area is diffused thereby eliminating any shadows. This condition normally exists in subfreezing temperatures, and is rarely found with clear skies and tematures above freezing. It often takes a trained eye to distinguish a white-out condition. Occasionally a white-out will exist only on the surface of the snow and perhaps a foot or two above the snow level, much as a very thin ground fog. This is a dangerous phenomena for the pilot who intends to fly low over the area or attempt a landing. The diffusion of light destroys depth perception, and visual reference to the snow will be futile. Operation in these conditions should be avoided except in emergencies. Aside from the lack of depth perception, the glare encountered in an area where ice and snow exists as far as the eye can see, especially during a white-out, is intolerable without sun glasses. Snow blindness will result if they are not worn.

PREPARATION FOR FLIGHT.

Proper performance of the aircraft in cold weather demands extraordinary care in maintenance, planning, inspection and operation. The ability of coldness to penetrate renders all areas of the aircraft both external and internal susceptible to its effects. Experience has led to the development of established procedures which minimize the adverse effects of cold weather upon the aircraft.

Winterization.

In the case of transfer of an aircraft from a warmer climate, all possible winterizing preparations should be made while the aircraft is in the warmer climate. Fittings and fasteners, especially those of the fluid, electrical and control systems should be snugged in anticipation of loosening from contraction. Plastics and flexible materials such as flexible tubing and insulation should be inspected and replaced, if aging is evident, since coldness increases the brittleness of these parts. All heating systems and protective covers should be provided and thoroughly checked. Winterization of the aircraft should be completed as soon as the aircraft arrives in the cold climate before the system becomes permeated by cold.

Planning.

Familiarization of all crew members with cold weather preflight, inflight and postflight procedures is necessary. Planning for the best use of time assumes special importance in that preheating may be carried on simultaneously with the removal of ice and snow, servicing and inspection; electronic equipment may be allowed to warm-up while the engines are warming. Proper oil dilution and other specialized shut-down procedures after flight are imperative under cold weather conditions.

Preheating.

Engine preheating will be necessary at temperatures below 32°F (0°C) if oil dilution was not accomplished at the last shutdown. If the temperature is below 0°F (-18°C), preheating will be necessary even if oil dilution was performed.

a. If the temperature is as low as -20°F (-29°C), 30 minutes preheat should be sufficient.

b. If the temperature is below -20°F (-29°C), 45 minutes should be sufficient.

Heat is applied by attaching nacelle shields or covers and supplying hot air through flexible ducts from ground heaters or the aircraft's heating system. After preheating for the prescribed length of time, make a crankability test by holding the starter switch ON (ignition OFF, mixture IDLE CUT-OFF). The engine should turn over approximately 50 rpm if preheat has been sufficient. Another indication of adequate preheating is free flow of oil from the oil system "Y" fitting when the drain is opened.

In addition to warming the engines prior to starting, heat should be applied to the battery, instruments, and electrical equipment before electrical power is turned on. Tires may have to be dislodged by careful application of heat or overinflation.

CAUTION

Do not use heat in addition to overinflation to dislodge tires. If overinflation is used, do not exceed 1-1/2 times the normal tire pressure. Inspect wheel rim for cracks before overinflating and warn personnel to stand clear of wheel. Reduce tire pressure to normal after the tires are freed.

Brakes may also have to be heated if the parking brake handle was left ON since the last shutdown. If frozen, direct heat should be applied to the brake discs and cylinders. When the APU is to be used, it will require preheating if the outside air temperature is below -10°F (-23°C). If the temperature is below -30°F (-34°C), as much as 20 minutes preheat may be required. Once the APU is started, it should be run at IDLE until thoroughly warmed up. The aircraft heating system may be used to warm the interior of the aircraft and defrost the windshields, but should not be operated on battery power alone.

CAUTION

Excessive heat may cause failure of the pilot's and copilot's windshield if applied rapidly. Refer to HEATING, VENTILATING, AND ANTI-ICING SYSTEM, Section IV for windshield defrosting procedure.

If external power is not available, wait until either APU or engine-driven generator power is available to operate the heating system.

Removal Of Snow And Ice.

WARNING

Failure to remove snow and ice accumulated on the aircraft while on the ground can result in serious aerodynamic and structural effects when flight is attempted. Depending on the weight and distribution of the snow and ice, take-off distances and climb-out performance can be adversely affected. The roughness, pattern, and location of the snow and ice can affect stall speeds and handling characteristics to a dangerous degree. In flight, structural damage has also resulted due to vibration induced in flight by unbalanced loads of unremoved accumulations. These hazards can be eliminated by removing the snow and ice from the propellers, wings, fuselage, and tail before flight is attempted. Sweep off snow or frost. Ice should be removed by ground heaters or deicing fluid.

Hot water should not be used unless the aircraft is sheltered in a warm hangar as additional ice may form and aggravate the difficulty.

Carefully check the interior of the nose wheel well for ice or snow in the cables and controls beneath the crew compartment floor. Check the fuel tank vents, and crankcase breathers, for freedom from frozen condensate, and check the engine fuel drains for free flow.

ENGINE STARTING.

In cold weather starts, engine crankability and fuel vaporization are the primary factors that must be considered. Engine crankability is dependent upon the viscosity of the oil in the engine; the proper use of oil dilution or engine preheat or both (if temperatures are low enough to warrant the use of both) will maintain the oil in a sufficiently viscous state to permit the engine to be turned over with the starter. The diverter-segregator valve system permits a 30% dilution of the oil in six minutes. A "boil-off" period is accomplished prior to take-off to reduce the dilution percentage. Fuel vaporization during an engine start is dependent upon the temperature of the fuel entering the cylinders as well as the temperature of the cylinders, themselves. Engine preheat, in addition to aiding crankability, will raise the temperature of the cylinders. Although not every cylinder will be heated equally (as is also the case in cylinder cooling), preheat will aid in improved fuel vaporization at low ambient temperatures. Fuel vaporization is, of course, no problem when heated fuel is used for starting. The hot fuel prime system provides fuel heated to approximately 90°C which eliminates fuel vaporization difficulties. Just prior to starting engines, remove the nacelle covers and disconnect heat ducts. This should be the last operation before starting engines.

CAUTION

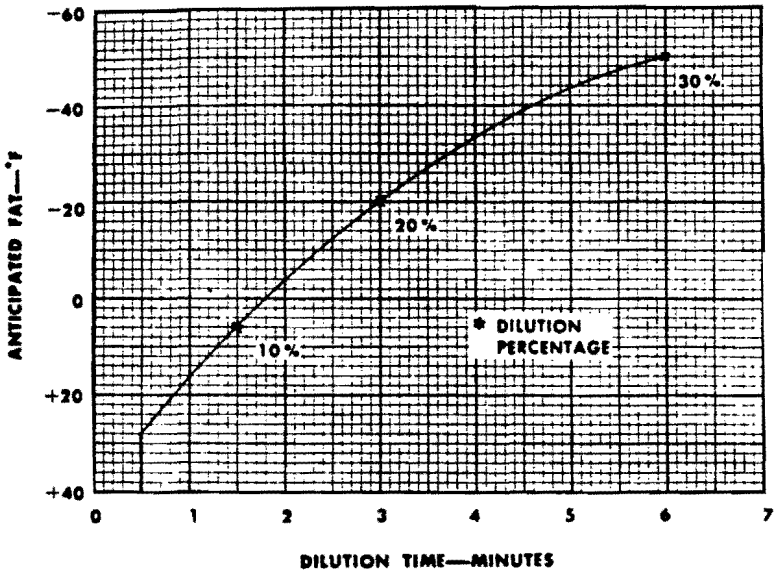
If the temperature is below -40°F (-40°C), the hot fuel prime system should be actuated 20 seconds prior to cranking the engine in order to heat the fuel adequately. When this is done, primer fuel is fed into the carburetor and, subsequently, the blower. It is important that the engine blower drains be free and open since this fuel, if not drained off, could cause a liquid lock when the engine is cranked over to start.

Note

Insure cowl flaps are open and carb air is in cold position prior to engine start.

a. Open the throttle slightly more than required for a normal start.

b. Hold the hot fuel prime switch until maximum hot prime temperature is reached, then release.



DATA BASIS: ENGINE TEST

DATA AS OF: 1 NOVEMBER 1956

OIL DILUTION . . .

times-percentages

Figure 9-3

c. Check that fuel flow from the blower drains has ceased before energizing the starter and ignition.

d. When draining has ceased, crank the engine and energize ignition in the normal manner but continue to use the hot fuel prime switch for priming when temperature is below $0^{\circ}F$ or using normal prime when temperature is above $0^{\circ}F$. This will insure an adequate supply of heated fuel for starting. If the engine has not started after one minute of cranking, allow the starter to cool for one minute before attempting another start.

Note

Moisture forms quickly on spark plugs during cold starts. After three or four unsuccessful attempts, remove at least one spark plug from each of the engine cylinders and heat to dry points. Attempt to start engine immediately after replacing the spark plugs.

e. After the engine fires, continue priming as necessary to achieve smooth engine operation. When the engine is running smoothly, move the mixture lever to RICH and apply carburetor heat to assist in fuel vaporization and reduce backfiring.

CAUTION

A backfire with the heat doors closed may result in damage to the doors.

If no oil pressure is noted after 30 seconds, shut down the engine and investigate.

Note

Oil pressure may be abnormally high immediately after starting. No damage to engine will occur due to high oil pressure. As the oil temperature increases, the pressure should return to normal. Do not increase engine rpm until both oil temperature and pressure are within limits.

WARNING

Dilution solenoid may stick in the open position subsequent to diluting. If this occurs, dilution will continue when the engines are started again. Observe the fuel and oil pressures closely when starting engines, and before take-off to be sure that dilution solenoid is closed. If any spewing of oil, low oil pressure, or high cylinder head temperatures are noted after take-off, land and investigate the cause of trouble. If sticking of the dilution solenoid is suspected, flick the oil dilution switch and check for a slight drop in fuel pressure. A drop in pressure indicates the valve was closed.

WARM-UP AND GROUND TESTS.

The engine warm-up should be commenced at 800 to 1000 rpm until the oil pressure becomes steady and within limits. Throughout the warm-up procedure fuel pressure and oil pressure should be observed carefully for indications of the oil dilution valve sticking open. As the engine warms up, increase rpm and maintain an oil temperature above 50°C to evaporate as much fuel from the oil as possible. If dilution time was less than three minutes, take-off may be accomplished after normal engine run-up. If dilution time was greater than three minutes (or if the engines had been started and diluted several times without intervening flights), operate the engines at 1000 rpm until oil temperature reaches 40°C; then, operate engines at 1500 rpm with the oil temperatures at 70° -75°C for 30 minutes before take-off. This procedure will reduce the fuel content to 10% or less. However, since some fuel is still remaining in the oil, the possibility of spewing under adverse conditions still exists.

Note

Check operation of the windshield wipers and windshield defrosting system. If windshield glass is dry, limit the wiper check to one full sweep (across and back) to avoid scratching the glass.

TAXIING.

If taxiing on snow or ice, check the wheels visually shortly after beginning to move to make certain they are rotating, not sliding. If taxiing in company with other aircraft, maintain a greater than normal interval to avoid snow or slush thrown back by the preceding aircraft, and reduce speed. Turning on snow or ice requires differential engine power in addition to nose gear steering since the nose gear has a tendency to slide sideways when nose gear steering alone is used. All turns on snow or ice should be commenced with very slow speed, otherwise the engine power needed to assist in turning may result in excessive speed and skidding. If skidding occurs or is anticipated, careful use of differential thrust (increased on the inside of the turn) will aid in turning without adding additional speed.

WARNING

In cold weather, make certain all instruments have warmed-up sufficiently to insure normal operation. Check for sluggish instruments during taxiing.

BEFORE TAKE-OFF.

Check that oil temperature is at least 40°C and cylinder head temperature is 100°C. Perform the ignition system and power check in the normal manner, but remember that lower rpm than usual may result, because of increased air density. Place carburetor air levers in the COLD position at least two minutes before take-off unless heat is necessary for smooth engine operation.

If carburetor heat is to be used for takeoff, set as follows:

a. Set throttles to field barometric pressure.

b. Adjust carb heat to maintain 15°C.

c. Check CAT immediately after takeoff and adjust as necessary.

Note

Insure oil temperature reaches and maintains 55° prior to start of takeoff. Watch for diverter segregator valve malfunctions (see Section VIII).

TAKE-OFF.

In sub-standard temperatures, maximum power is reached at a reduced manifold pressure due to the increased air density. Consequently, in order to avoid exceeding the power limitations on the engine, power settings should not exceed those listed in Appendix I. Be alert for oil discharge from the engine breathers on take-off. This condition is usually caused by excessive oil dilution and may be remedied by reducing power and rpm. If oil discharge continues, a landing must be made immediately.

AFTER TAKE-OFF—CLIMB.

After taking off from an icy or slush-covered runway, and after reaching a safe altitude, operate the landing gear and wing flaps through several complete cycles to prevent their freezing in the retracted position. If precipitation is encountered or if icing conditions are anticipated immediately after take-off, turn ON the pitot tube heaters, aileron deicing system, wing and tail anti-icing and propeller deicing system. Observe the oil temperature gages carefully, and manually control the temperature between 70°C and 80°C during climb. If oil spewing occurs after take-off and cannot be remedied by reducing power and rpm, or by opening the cowl flaps, land as soon as possible.

CAUTION

It is possible to cause congealing of the oil in the cooler by using excessive door opening. If this occurs, the door should be closed to heat the oil.

DURING FLIGHT.

In icing conditions, use carburetor heat as necessary to maintain carburetor air temperature within limits.

Note

At low power settings, low cylinder head and carburetor air temperatures will result in inefficient fuel vaporization and distribution which will in turn cause rough engine operation. Placing the mixture lever in RICH may smooth out a rough engine, but proper use of carburetor heat is preferable because of better fuel economy.

Check the propeller governor every half hour by increasing engine speed 200-300 rpm.

Do not rely on AN/APN-22 altimeter indication wnen flying over areas covered by large depths of snow and ice. Indication is unreliable under these conditions. Refer to Radar Altimeter, AN/APN-22, Section IV.

DESCENT.

Temperature inversions occur frequently in the arctic and the ground air may be 15 to 30 degrees colder than the upper air. Under such conditions every precaution must be taken to maintain a cylinder head temperature of at least 100°C and an oil temperature of 40°C during descent. If necessary, landing gear and flaps should be lowered and descent made with a higher engine power setting.

LANDING.

Landing the aircraft in arctic weather conditions requires a cautious attitude of concentration to avoid the various hazards often encountered in such climates. Aside from extremely cold temperatures, the crew should be constantly aware of the widely different conditions that may be encountered at different times of day or from one area to another. The long, flat, unbroken stretches of snow or ice encountered in the polar regions make depth perception difficult under even the best conditions of visibility. Whiteout conditions of any kind should be avoided, and a landing made only in case of extreme emergency.

a. Turn on windshield wipers prior to using reverse thrust when landing on a wet or slush-covered runway.

b. Place oil temperature switches in COLD so that oil will cool sufficiently to permit dilution.

c. Carburetor air levers in HOT position while taxiing.

CAUTION

Upon reversing propellers, apply only enough power to decelerate the aircraft without obstructing vision by blowing snow. Although presenting no serious control problem, the use of reverse pitch to shorten the landing roll will invariably cause a temporary loss of visibility even on runways appearing to have no loose snow. The loss of visibility occurs near the end of the roll.

STOPPING THE ENGINES.

When a cold weather start is anticipated, the engine oil should be diluted as follows:

a. Operate engines at 800-1000 rpm.

b. Nacelle tank boost pump switches - HI.

c. Allow oil temperature to decrease below 50°C before diluting.

d. Hold oil dilution switch ON for recommended length of time in accordance with the Oil Dilution Chart, Figure 9-3, for the anticipated temperature.

Note

A dilution period longer than six minutes results in no predictable increase in dilution percentage of the circulating oil. For this reason, six minutes is established as the maximum dilution time.

e. If oil temperature rises above 50°C before dilution is completed, stop the engine and allow the oil to cool well below 40°C; then restart and continue diluting. If the oil temperature is allowed to rise above 50°C, the heat of the oil will evaporate the fuel, thus rendering the dilution ineffective. Do not allow oil pressure to fall below 25 psi at any time while diluting.

f. At the end of the dilution period, stop the engine while holding the dilution switch ON until the blades stop turning. This step is necessary to prevent undiluted oil from entering the engine.

g. After engines have stopped, service the oil tanks.

Note

Indicate oil dilution time period in Form 781.

CAUTION

When servicing oil tanks do not remove the hopper cap, because the addition of oil in the hopper will reduce the percentage of dilution.

BEFORE LEAVING THE AIRCRAFT.

a. Refuel the aircraft to minimize condensation in the fuel tanks.

b. Drain condensate from fuel and oil drains before it freezes.

c. If the aircraft is to remain more than four hours in freezing temperatures, remove the battery and stow it in a warm place.

d. Install oil immersion heaters, if available.

CAUTION

To avoid damaging oil tank linings, only those heaters equipped with perforated shields should be used in self-sealing oil tanks. Clean heater elements to avoid introducing foreign material into the oil supply.

e. Install protective covers to guard against accumulation of ice, snow, or frost.

f. Roll the aircraft onto double layers of greaseproof wrapping paper to prevent the tires from freezing to the ground. Sand may also be used for this purpose. Be sure to apply four ice chocks for each aircraft. Main wheels should be chocked in front and back.

g. An arctic mooring kit, if available, should be used for securing the aircraft at remote sites or landing areas where high winds are prevalent and tie-down facilities are not available.

h. Make certain parking brake is OFF.

i. When the aircraft is parked for the night, leave some aperture, such as a window, partly open. If this is not done, lack of air circulation within the compartment will cause frosting of the windows.

HOT WEATHER AND DESERT PROCEDURES

A few special operating instructions are necessary during hot weather and desert operations except the close monitoring of all temperatures, and use all available cover to reduce sand ingestion.

Note

It is desirable to hold pre-take-off cylinder head temperatures to 170°C or less (150°C is preferable). High cylinder head temperatures may result in spark plug misfiring as well as power loss (approximately 30 BHP per 20°C rise).

WARNING

- Use of the carburetor air filters restricts airflow sufficiently to reduce MAP as much as 2 to 2.5 inches Hg at full throttle.
- Filter position of the carb air levers should be used for all desert ground operations except engine start.