ABOUT THIS MANUAL

VERSION: 20 DECEMBER, 2007

WARNING: THIS MANUAL IS DESIGNED FOR MICROSOFT® FSX USE ONLY. DO NOT USE FOR FLIGHT.

The 'C-130 X-perience' FLIGHT MANUAL is organized into four Parts:
Each Part is provided as a separate Acrobat® PDF document available via:

Click START > Programs > Captain Sim > C-130 X-perience' > Manuals >

Part I – User' Manual
Part II – Systems and Equipment

Part III – Normal Procedures - this document

Part IV – Flight Characteristics and Performance Data

FOR GENERAL INFORMATION ON THE 'C-130 X-PERIENCE' PRODUCT PLEASE USE WWW.CAPTAINSIM.COM .
THIS MANUAL PROVIDES ADDITIONAL INFORMATION ONLY, WHICH IS NOT AVAILABLE ON THE WEB SITE.

'C-130 X-PERIENCE' FLIGHT MANUAL

PART III – NORMAL PROCEDURES

CONTENTS

CHAPTER 1 - INSPECTIONS, CHECKLISTS, AND PROCEDURES

INSPECTIONS AND PROCEDURES

PREPARATION FOR FLIGHT

AIRCRAFT STATUS CHECK

The pilot in command and the flight engineer will review previous discrepancies to ensure that the aircraft is safe for flight. The flight engineer will ensure that the aircraft has been serviced with the required amount of fuel, oil, and oxygen for the assigned mission. It is the responsibility of the pilot in command to ensure that all required inspections are completed. The aircrew inspections are based on the assumption that these inspections have been completed. Therefore, duplicate inspections and system checks have been eliminated, except for items required in the interest of safety.

CHECKLISTS

The pilot in command is responsible for ensuring that all preflight checks are complied with. The actual accomplishment may be delegated as required. Starting with the Before Start checklist, the remaining checklists in this section are of the challenge type. Checklist items marked with a double asterisk (**) are to be performed on the first flight of the day. Only circled/boxed items need be checked when taxiing back for take-off after landing with all engines operating and crewmembers remaining at their crew positions. The copilot reads the item in the checklist aloud as a challenge, and the response listed is given by the crewmember indicated. When more than one crewmember has the same response to the same item, each crewmember subsequent to the initial crewmember responding need respond only with his crew position. Before answering a challenge which indicates a complete control panel, the responsible crewmember will check that all switches and controls on the panel are in the positions indicated in the response. When the response is listed "as required," or "as desired," the crewmember will respond by stating the present operating Status of the system. The codes: P,CP, FE, N, RO, O, FM, FA, GC, and LM stand for pilot, copilot, flight engineer, navigator, radio operator, observer, flight mechanic, flight attendant, ground controller, and loadmaster, respectively. In the event one crewmember is not on board, his duties will be assumed by another. In the event a navigator (N) is not on board, the flight engineer (FE) will respond to the navigator checks.

THRU-FLIGHT OPERATIONS

When the aircraft is flown on the same mission and no maintenance or servicing is required, it is unnecessary for the preflight checks to be performed after the first flight of the day. When maintenance or servicing is required, only those items or systems affected need be checked prior to the next flight. The checklists have been designed so, for thru-flight operation, the flight crew may begin with the Before Start checklist to assure a safe flight.

ENTRANCE

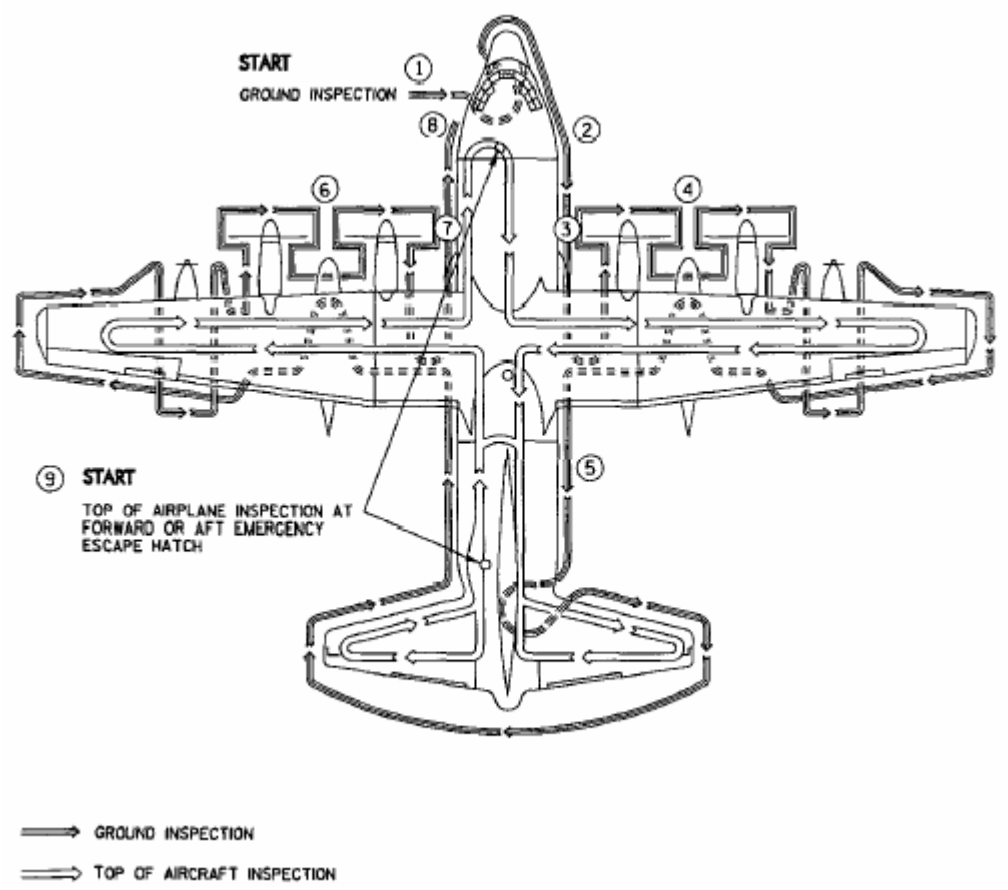
Prior to entering the aircraft to commence the preflight cheeks, the flight engineer will check:

1. Chocks - IN PLACE.
2. External power - IN PLACE.
3. Dust excluders and duct plugs - REMOVED.

EXTERIOR INSPECTION

WALK AROUND INSPECTION

Conduct a walk-around inspection following the route shown:



Workstands or a ladder will be required to accomplish the check of the engine inlet air ducts, the engine exhaust areas, external tank caps, refueling pods, the fire extinguisher bottle charge, and auxiliary fuel tanks magnetic dipstick.

1. Nose section - CHECKED.

    a. Crew entrance door.
    b. Battery compartment.
    c. External power.
    d. Pitot/pitot-static masts.
    e. Radome and nose exterior.
    f. Nose gear down lock and wheel well areas.
    g. Brake accumulator pressures.

2. Forward fuselage, right side and bottom - CHECKED.

    a. Oxygen filler.
    b. Flight deck air conditioning intake and exhaust.
    c. Exterior structure general condition.
    d. Static air ports.
    e. Anti-collision/strobe light.

3. Right wheel well area and center fuselage - CHECKED.

    a. Cargo compartment air conditioning intake and exhaust.
    b. Right main landing gear, wheel well area, landing gear door attachment.
    c. Exterior structure general condition.

d. Auxiliary fuel tank cavity drains.

4. No. 3 and No. 4 engine nacelles, external fuel tank, propellers, and right wing - CHECKED.

   a. Nacelle exterior structure general condition, fluid leaks.
   b. Engine inlet air ducts.
   c. Propeller spinners and blades general condition.
   d. Fuel tank vents for external obstructions.
   e. External fuel tank cap and tank structure general condition, fuel leaks.
   f. Refueling pod (if installed) for security, fluid leaks, and general condition.
   g. Refueling pod (if installed) for type of drogue (high speed or low speed).
   h. Refueling pod (if installed) accumulator aircharge and surge suppressor aircharge (Checked/within limits).
   i. Engine exhaust areas.
   j. Flap, aileron, tab, wing skin.

5. Aft fuselage and empennage - CHECKED.

   a. Exterior structure general condition.
   b. Paratroop doors.
   c. ATO units (if required).
   d. Cargo ramp and cargo door.
   e. Tail structure and control surfaces.
   f. Fuselage tank vent.

6. No. 2 and No. 1 engine nacelles, external fuel tank, propellers, and left wing - CHECKED.

   a. Liferafts.
   b. Nacelle exterior structure general condition, fluid leaks.
   c. Engine inlet air ducts.
   d. Propeller spinner and blades general condition.
   e. External fuel tank cap and tank structure general condition, fuel leaks.
   f. Refueling pod (if installed) for security, fluid leaks, and general condition.
   g. Refueling pod (if installed) for type of drogue (high speed or low speed).
   h. Refueling pod (if installed) accumulator aircharge and surge suppressor aircharge (checked, within limits).
   i. Engine exhaust areas.
   j. Flap, aileron, tab, wing skin.

7. Left wheel well area and center fuselage - CHECKED.

   a. Air deflector door area.
   b. Left main landing gear, wheel well area.
   c. Landing gear door attachment.
   d. Fire extinguisher bottle charge.
   e. Exterior structure general condition.
   f. Auxiliary fuel tank cavity drains.
   g. Auxiliary fuel tank magnetic sight gauge.

8. Forward fuselage, left side and bottom - CHECKED.

   a. Exterior structure general condition.

9. Top of aircraft - CHECKED.

WARNING

All necessary safety precautions should be observed. Conducting this inspection during high winds or other severe weather conditions can be dangerous. Under these circumstances, the pilot may waive this inspection.

CAUTION

Keep in mind that this is a pressurized aircraft and that skin damage is dangerous. Use extreme care at all times to avoid scratching or denting the aircraft skin while walking on the fuselage.

   a. Dry bay areas for leaking of fuel or hydraulic fluid.
   b. Fuel servicing accomplished; tank caps for security.
   c. Emergency equipment access panels for security.
   d. Wing, fuselage, empennage, control surfaces, and flaps general condition.

e. Antennas for security.
f. Escape hatches external release handles for condition and fit.
g. Anti-collision/strobe light.

INTERIOR INSPECTION

During the interior inspection the pilot will make sure that the fuselage fuel tank or cargo and loose equipment is secured and that lights are functioning.

1. Crew entrance area - CHECKED.

2. Cargo compartment area - left side - CHECKED.

3. Ramp area - CHECKED.

    a. Left side anchor line and anchor arm.
    b. Left side ramp locks.
    c. Left side ramp telescoping arm.
    d. Left side cargo door locks.
    e. Right side cargo door locks.
    f. Right side ramp telescoping arm.
    g. Right side ramp locks.

4. Cargo compartment area - Right Side - CHECKED.

COCKPIT INSPECTION

This inspection was designed to provide a systematic method of checking the position of each switch, valve, or item in preparing the aircraft for operation. This inspection is to be completed by the flight engineer during the preflight. All other checklists will be completed by challenge and reply.

1. Preflight/aircraft records - COMPLETED.

2. Navigator panel – SET.

    a. All radios and radar equipment – OFF.

3. Pilot and copilot side shelves – SET.

    a. Windshield wipers - PARK/OFF.
    b. Alarm bell, jump signal - CHECKED/OFF.
    c. Air deflector doors - CLOSED/OFF.
    d. Propeller governor control switches - NORMAL.
    e. Feather valve - VALVE.
    f. FEATHER OVERRIDE buttons – OUT.
    g. Radar - OFF.

4. Anti-icing and de-icing switches - SET.

    a. NESA - OFF.
    b. NACELLE PREHEAT - OFF.
    c. PROP & ENG ANTI-ICING MASTER – AUTO.
    d. PITOT HEAT - OFF.
    e. ENGINE INLET AIR DUCT ANTI-ICING - OFF.
    f. PROPELLER ICE CONTROL - OFF.
    g. Wing/empennage anti-icing - OFF.
    h. ENGINE BLEED AIR - OFF.
    i. WING ISOLATION VALVES - NORMAL.

5. Air conditioning control panel - SET.

    a. CARGO COMFT and FLT STA temperature controls - OFF AUTO/NORMAL..
    b. Air conditioning master switch - OFF.
    c. CARGO COMPT and FLIGHT STA temperature controls - OFF/NORMAL.
    d. Underfloor heat switch - OFF.
    e. EMERGENCY DEPRESSURIZATION switch - NORMAL.

6. Electrical control panel (if no power on aircraft) - SET.

    a. Generators/inverters - OFF.
    b. BUS TIE/GND BUS TIE (some aircraft) switch - UNTIED.
    c. BATTERY switch - OFF.
    d. Exterior/interior lights - OFF.
    e. Landing/taxi lights - OFF.

7. Fuel control panel - SET.

    a. Dump switches – OFF.
    b. Fuel BOOST PUMP switches - AS REQUIRED.
    c. AUX and EXT TANK PUMP switches - OFF.
    d. CROSSFEED valve switches - OPEN.
    e. CROSSFEED SEPARATION valve - AS REQUIRED.
    f. BYPASS valve switches - CLOSED.

8. Fire emergency control handles – IN.

9. Control surface boost shutoff switches - ON/SAFETIED.

10. Landing gear lever - DOWN.

11. Clocks -WIND/SET.

12. Hydraulic control panel – SET.

    a. ENGINE PUMP switches - ON.
    b. BOOST PUMP switches - OFF.
    c. BRAKE SELECT switch - EMERGENCY.
    d. AUX PUMP switch - OFF.
    e. ANTI-SKID switch - OFF.

13. ADS panel switch - OFF.

14. Condition levers, throttles – GRD STOPIGRD IDLE.

15. TEMP DATUM CONTROL VALVES switches - AUTO.

16. Synchrophase master switch - OFF.

17. Radar and IFF - OFF.

18. All radios - OFF.

19. Nose landing gear pin, ground wire, pitot covers - REMOVED.

BEFORE START

1. Cockpit inspection - COMPLETED (FE).

2. Passenger brief - AS REQUIRED (P).

3. Electrical control panel - SET (FE).

    a. External ac power switch - EXT AC PWR (IF AVAILABLE).
    b. External dc power switch - EXT DC PWR OR BATTERY AS AVAILABLE.
    c. Bus tie switch - AS REQUIRED.

4. Radios - ON (CP).

5. Fire emergency control handles, test panels and warning lights - IN/CHECKED (P) (CP) (FE).

    a. Fire emergency control handles pushed in.
    b. Place the turbine overheat switch in the TEST position. Check that the warning lights flash. Release the switch to NORMAL.

c. Place the engine fire test switch in the TEST position. Check that the warning lights in the engine and APU fire emergency handles and the master fire warning light glow steadily. Release the switch to NORMAL.
d. Position the nacelle overheat warning switch to TEST. Check that all four warning lights illuminate. Release the switch to NORMAL.

6. Clear GTC and props - CLEAR/FIRE GUARD POSTED (GC/FM).

7. Start GTC - STARTING (FE).

Note

Do not open GTC bleed air valve until the on-speed light has illuminated.

8. Bleed air system - CHECKED/SET (FE).

Note

The bleed air pressure gauge can be used to check the bleed air system. Use the following steps to check out the system with external ac or dc power and with air supplied by the GTC.

a. Check that system pressure is minimum of 35 psi. Failure to reach this pressure indicates that some valve in the system has not closed, that a duct is leaking, or that the compressor output is low.
b. Close the GTC bleed air valve.
c. The time required for a pressure drop in the system, from 30 to 15 psi, shall be no less than 8.5 seconds.
d. Place all engine bleed air switches to OFF.
e. Open the GTC bleed air valve as necessary.

9. ATM GEN - AS REQUIRED (FE).

10. Exterior, interior, anti-collision/strobe lights - AS REQUIRED (P) (CP) (FE).

11. Inverters - SET (FE).

a. Copilot inverter switch - ESSENTIAL AC BUS/ESS AV AC BUS.
b. AC INST & ENGINE FUEL CONTROL INVERTER switch - ESSENTIAL DC BUS.

12. Standby attitude indicator - CHECKED (P)

a. Unlock and cage the gyro and observe that the wanting flag is out of view and that the indication is completely stabilized within 3 minutes.
b. Place the STBY ATTD switch to the INS BUS position and observe that the warning flag remains out of view.
c. Adjust the caging knob to obtain desired pitch presentation.

Note

If the desired pitch trim adjustment cannot be obtained, the indicator may be installed improperly. Do not recage the indicator to correct pitch attitude misalignment.

d. Place the STBY ATTD switch to OFF and observe that the warning flag appears.
e. STBY ATTD indicator gyro – CAGED AND LOCKED

13. Fuel quantity and distribution – CHECKED (P) (FE).

14. Fuel enrichment switches - OFF (P).

15. Oil cooler flaps - AS REQUIRED (CP).

Note

At 27 °C and above the oil cooler flaps should be in the OPEN/FIXED position for starting.

16. Hydraulic control panel - SET (CP).

Note

If utility system hydraulic pressure is indicated after the auxiliary hydraulic pump is turned on and before starting No. 2 engine. a malfunction of the hydraulic ground test valve is indicated. The interconnect valve may still be open.

a. BRAKE SELECT switch - EMERGENCY.
b. AUX PUMP switch - ON/PRESSURE UP.
c. ANTI-SKID switch - OFF.
d. ENGINE PUMP switches - ON.
e. SUCTION BOOST PUMP switches - ON/LIGHTS OUT.

17. Parking brake - SET/REMOVE CHOCKS (P).

18. Oxygen - CHECKED/NORMAL/100%/OFF/(ALL).

19. Ground idle buttons - LOW (FE).

Note

After the first engine is started and stabilized at low speed ground idle and all engine instruments indicate normal, reset the engine to normal ground idle and allow engine to stabilize. Use this engine as starting air source for other engines.

20. Flap lever - SET (CP).

Note

Set flap lever to correspond with flap position indicator.

21. Chocks, nose pin - REMOVED (GC/FM).

STARTING ENGINES

The MSFS 2004 normal engine starting sequence is 1, 2, 3, 4.

1. Clear No. 1 engine - NO. 1 CLEAR (GC/FM); TURNING NO. 1 (P); ROTATION NO. 1 (GC/FM).

   a. Engine bleed air switch - OPEN.
   b. Condition lever - RUN.
   c. Hydraulic pump and pressure - PRESSURE UP/CHECKED (CP).
   d. Low speed ground idle button - AS DESIRED (P) (FE).
   e. Engine generator switch - ON (PE).

2. DC power switch - BATTERY (FE).

3. Clear No. 2 engine - NO. 2 CLEAR (GC/FM); TURNING NO. 2 (P); ROTATION NO. 2 (GC/FM).

Note

Repeat steps 1a-e for all engines.

4. ATM GEN – ON

5. Air conditioning master switch – NOPRESS (FE).

6. External power and ground equipment Removed - CLEAR (GC/FM).

7. Clear No. 3 engine - NO. 3 CLEAR (GC/FM); TURNING NO. 3 (P); ROTATION NO. 3 (GC/FM).

8. Clear No. 4 engine - NO. 4 CLEAR (GC/FM); TURNING NO. 4 (P); ROTATION NO. 4 (GC/FM).

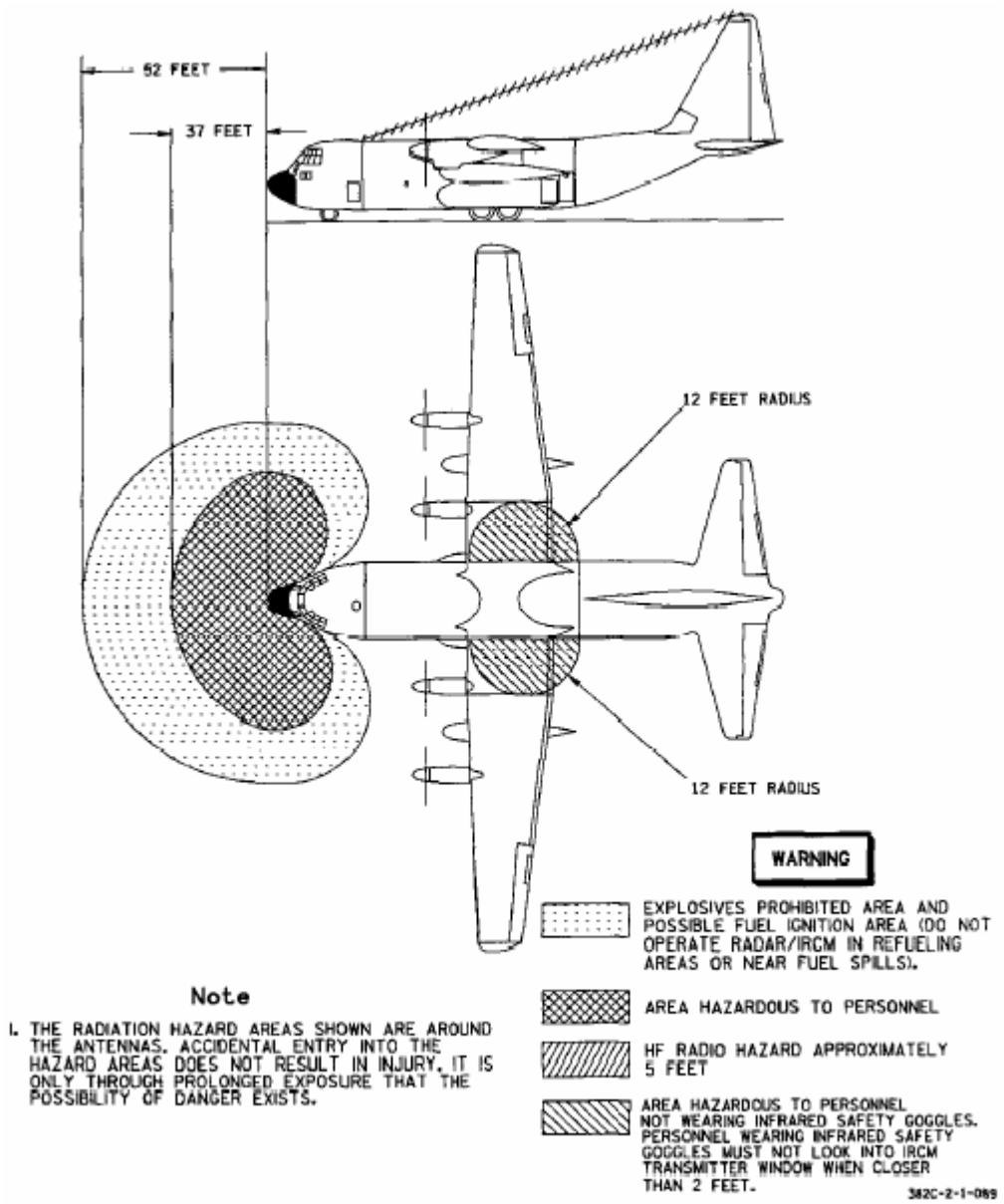
9. Engine bleed air switches - SET (FE).

10. Fuel CROSSFEED valve switches-SET (FE).

BEFORE TAXI

The ground operation of each engine should be held to a minimum to conserve fuel. Whenever possible, face the aircraft into the wind during ground operation. Under prolonged ground engine operation at high ambient temperatures, engine oil temperature must be monitored constantly. If temperatures approach the upper limit, throttle settings must be increased to improve air circulation.

1. Fuel enrichment switches – OFF (P).
2. Wing and empennage anti-icing indicators - NORMAL/LIGHTS OUT (FE).
3. Radios, radar, navigation equipment, and IFF - ON/STBY (P) (CP) (N/FE) (RO).
4. Compass systems and heading indicators CHECKED/SET - (N/FE) (P) (CP).



5. Flaps - 50 PERCENT (CP).

Move the wing flaps to 0 percent, then to 100 percent, then back to 50 percent. Note normal operation of rudder boost system.

6. Ground equipment - CLEAR (P) (CP) (GC/FM).

7. Crew aboard - ABOARD, DOORS CLOSED, CHECKED (FMGC).

8. Hydraulic quantities and pressures – CHECKED (CREWMEMBER, CP).

9. AUX PUMP switch - ON (CP).

TAXI

Excessive oil temperatures and overheated brakes may be interrelated during ground operation. If throttles are advanced to provide better oil cooling, the higher thrust may increase the taxi speed and require the pilot to drag the brakes. If oil temperatures exceed limits, engine life is adversely affected, if brakes are overheated, wheel failures and brake tires may result.

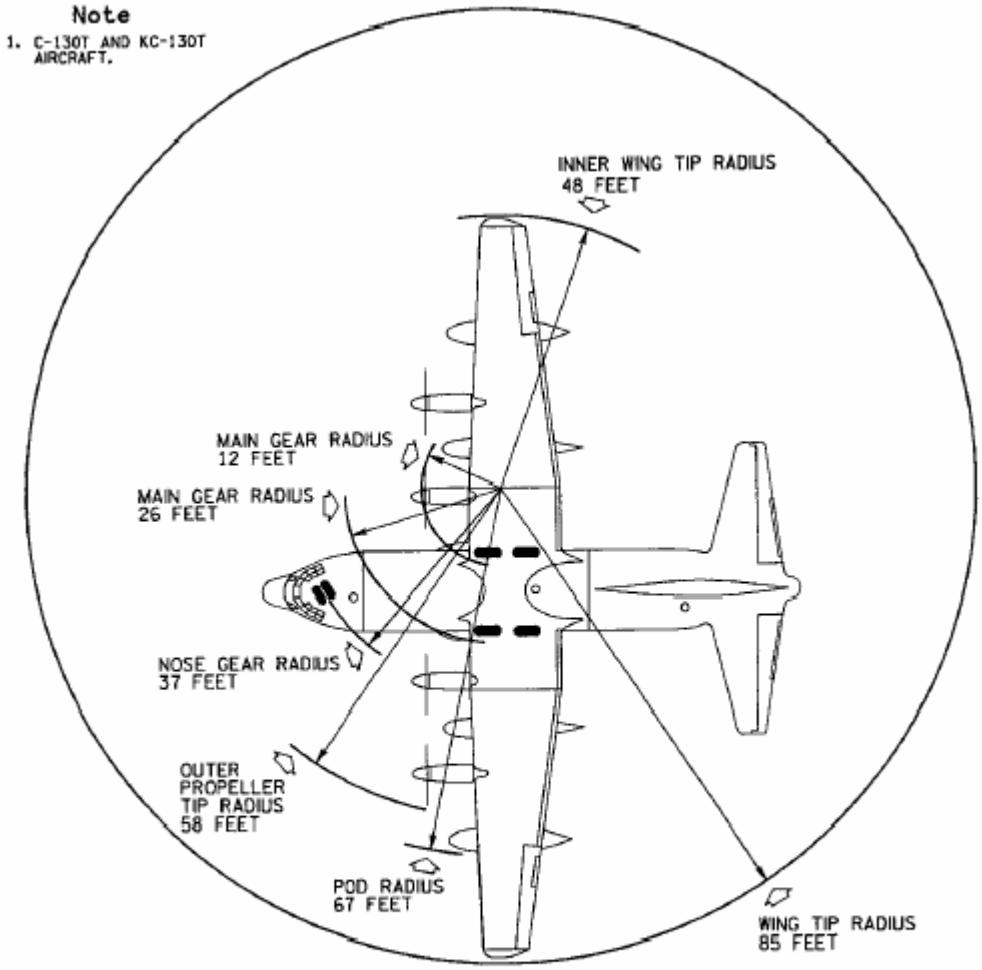
Avoid the use of brakes as much as practicable during taxiing, particularly after a landing which involved braking. Care should be taken not to ride the brakes by inadvertent toe pressure. Placing the heels on the floor should preclude inadvertent brake application. Skidding or skipping of the nose wheel may develop when the aircraft is turning, because of either wet pavement or an aft center of gravity. These conditions can be prevented by avoiding abrupt steering changes or by asymmetrical power. Light to moderate brake application may be used to assist in turning the aircraft.

After turning, move the aircraft approximately 5 feet in a straight line to realign the main landing gear.

CAUTION

- Landing gear and tire damage may result if any attempt is made to pivot on a locked wheel.
- Turning with brakes locked on one side or pivoting is prohibited. While turning the aircraft, avoid hard or abrupt brake application or braking to a stop since damage to the landing gear and/or supporting structure may result.
- Because of landing gear loads and aircraft taxi load factors when taxiing over soft terrain, extreme caution must be exercised and very low taxi speeds observed.

MINIMUM SPACE AND CLEARANCE REQUIRED FOR TURNING C-130 AIRCRAFT



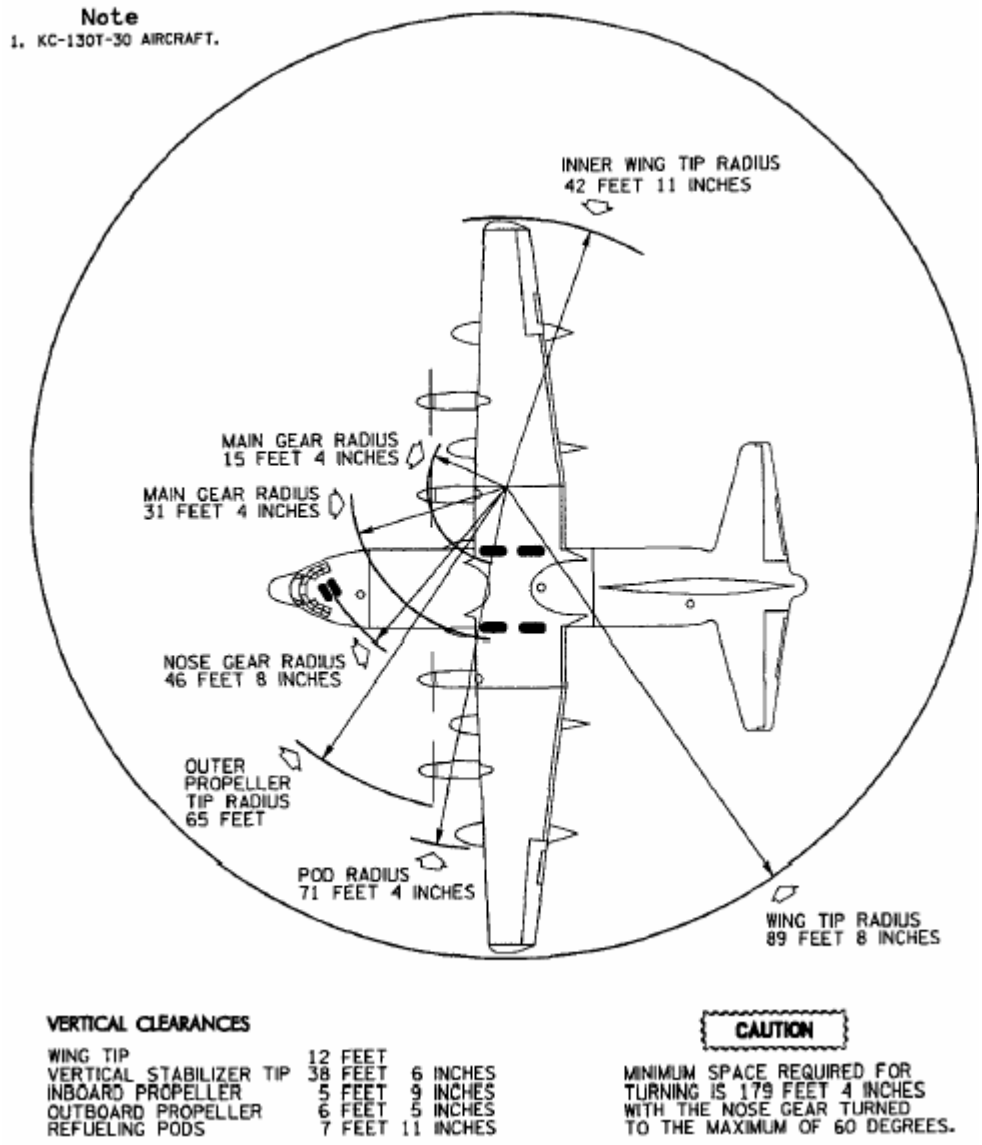
VERTICAL CLEARANCES

WING TIP	12 FEET	
VERTICAL STABILIZER TIP	38 FEET	6 INCHES
INBOARD PROPELLER	5 FEET	9 INCHES
OUTBOARD PROPELLER	6 FEET	5 INCHES
REFUELING PODS	7 FEET	11 INCHES

CAUTION

MINIMUM SPACE REQUIRED FOR TURNING IS 170 FEET WITH THE NOSE GEAR TURNED TO THE MAXIMUM OF 60 DEGREES.

MINIMUM SPACE AND CLEARANCE REQUIRED FOR TURNING C-130 AIRCRAFT



1. Brakes (Check the emergency brake system. Switch to the normal brake system and check with anti-skid OFF and ON) - CHECKED/ ANTI-SKID ON (P) (CP).

CAUTION

Do not switch from EMERGENCY to NORMAL brake system until the aircraft is clear of obstructions or stopped.

2. Aux hydraulic pump switch - AS REQUIRED (CP).
3. Flight instruments and altimeters - CHECKED (P) (CP) (N/FE).
4. Low-speed ground idle - AS REQUIRED (FE).
5. Generators and loads - ON/CHECKED (FE).
   a. DC power switch - BATTERY.
   b. Place the ATM generator to the OFF position and note that No. 2 generator assumes the essential ac bus load.
6. Ice detection system - CHECKED/RESET/AUTO (FE).

a. Place the warning icing conditions test switch in the No. 2 position. Note that the icing conditions on light illuminates. Wait at least 12 seconds, during which the icing conditions on light should remain illuminated. Place the PROP & ENG ANTI-ICING MASTER switch to the RESET position and note that the icing conditions on light is extinguished.

CAUTION

Do not hold the warning icing conditions test switch in the No. 2 or No. 3 position longer than 5 seconds. The test cycle may be repeated once, but then wait 5 minutes for the ice detector to cool before performing this teat sequence again. Failure to comply can result in damage to the ice detector probe.

b. Place the warning icing conditions test switch in the No. 3 position and note that the icing conditions on light illuminates. Wait at least 12 seconds during which the icing condition on light should remain illuminated. Continue with step c during the self test cycle.

Note

The following procedure can be omitted if the outside air temperature (OAT) is above 27 °C. However, the check should be performed prior to reaching cruise altitude.

CAUTION

When the aircraft is on the ground, do not operate the propeller anti-icing or de-icing for an engine that is not running. The engine must be running in order to dissipate the heat generated by the heating elements to prevent damage to the elements. Never operate the system for more than two cycles while the aircraft is on the ground. Anti-icing and de-icing may be used for a propeller feathered in flight.

c. Check propeller blade, spinner, and spinner base as follows:

CAUTION

Never operate the propeller anti-icing and de-icing for more than two cycles while the aircraft is on the ground.

8. Crossfeed system - PRIMED, CHECKED (FE).

a. Place the No. 4 BOOST PUMP switch to ON. The No. 4 LOW PRESS warning light should be extinguished.
b. Open the No. 4 crossfeed valve, Crossfeed manifold pressure should be 15 to 24 psi. After No. 4 pump is checked, leave No. 4 boost pump on and press the crossfeed PRIMER button for 30 seconds.
c. Open all crossfeed valves and crossfeed separation valve from right to left. All LOW PRESS lights should be extinguished. Pressure should be 15 to 24 psi. Place No. 4 BOOST PUMP switch to OFF.
d. Place No. 1 BOOST PUMP switch to ON. All LOW PRESS lights should be extinguished. Pressure should be 15 to 24 psi. Close No. 1 crossfeed valve. Pressure should drop to zero.
e. Place No. 2 BOOST PUMP switch to ON. Pressure should be 15 to 24 psi. Close No. 2 crossfeed valve. Pressure should drop to zero.
f. Place left auxiliary BOOST PUMP switch to ON. Pressure should be 28 to 40 psi. Close left auxiliary tank crossfeed valve. Pressure should drop to zero. Open left bypass valve. Pressure should be 28 to 40 psi. Close the left bypass valve. Pressure should drop to zero.
g. Place left FWD external BOOST PUMP switch to ON. Pressure should be 28 to 40 psi. Close crossfeed separation valve. Pressure should drop to zero. Close left external tank crossfeed valve. Open and close crossfeed separation valve. Pressure should be zero.
h. Place right FWD external BOOST PUMP switch to ON. Pressure should be 28 to 40 psi. Close right external tank crossfeed valve. Pressure should drop to zero. Open right bypass valve. Pressure should be 28 to 40 psi. Close right bypass valve. Pressure should drop to zero.
i. Place right auxiliary BOOST PUMP switch to ON. Pressure should be 28 to 40 psi. Close right auxiliary tank crossfeed valve. Pressure should drop to zero.
j. Place No. 3 BOOST PUMP switch to ON. Pressure should be 15 to 24 psi. Close No. 3 crossfeed valve. Pressure should drop to zero.
k. Place No. 4 BOOST PUMP switch to ON. Pressure should be 15 to 24 psi. Close No. 4 crossfeed valve.

CROSSWIND TAXIING

The aircraft can be taxied, with four engines operating, in a 30-knot, 90° crosswind by use of nosewheel steering and rudder control only. Taxiing, with four engines operating, can be accomplished in crosswinds up to a 60-knot, 90° crosswind by use of nosewheel steering, rudder and aileron control differential braking, and differential power. Turns to a crosswind heading should be performed with great caution and at slow speeds to prevent centrifugal force from aiding the wind in tipping the aircraft. Statically, the aircraft is capable of withstanding a 70-knot, 90° crosswind without tipping over.

BACKING THE AIRCRAFT

The aircraft should not routinely be parked in a location that requires a backing operation. When backing is necessary use the following procedures:

1. Ensure the maneuvering area is free of all debris which could cause damage to the aircraft or injury to personnel, and that there is sufficient clearance to safely operate the aircraft.
2. Position a crewmember on ICS at the ramp control panel and open the cargo door. This crewmember shall provide guidance to the pilot during the backing operation to ensure aircraft remains clear of obstacles and on the designated taxi surface.

Note

All backing instructions will be thoroughly briefed by the flight crew prior to backing the aircraft. References for turns will be in relation to the tail towards the No. 1 or No. 4 engine.

3. Reverse symmetrical propellers simultaneously.

CAUTION

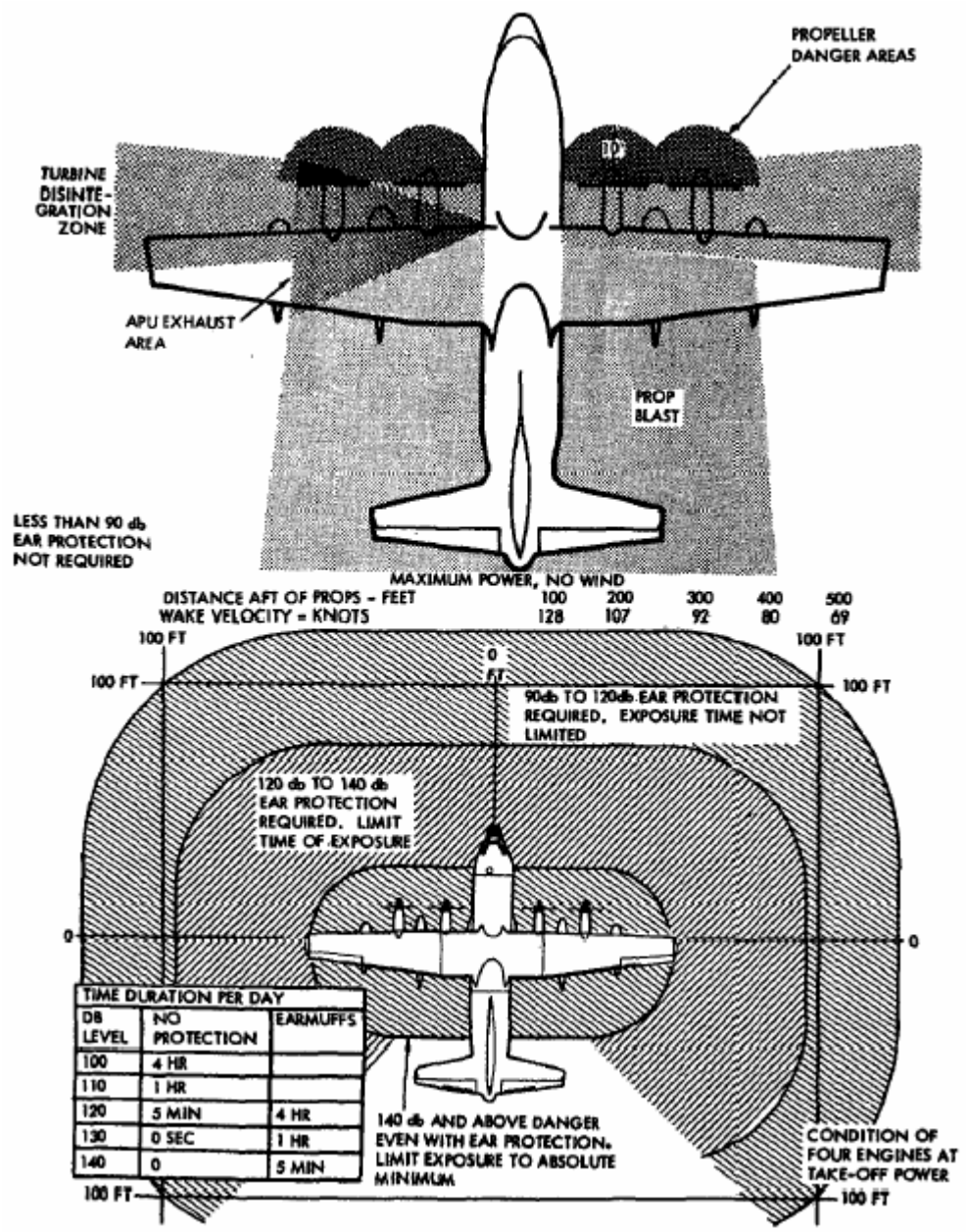
Simultaneous full reverse power on all engines may lift the nose wheels off the ground.

4. Use forward thrust to stop the backward movement of the aircraft. After backing or turning, taxi the aircraft approximately 5 feet forward in a straight line to realign the main landing gear.

CAUTION

Avoid use of brakes while the aircraft is backing because of the possibility of damaging the airframe structure.

5. When backing the aircraft, monitor engine oil temperate closely.



BEFORE TAKE-OFF

1. Windows, doors, and hatches - SECURED (ALL).
2. Flaps - 50 PERCENT (P) (CP).
3. Hydraulic quantities - CHECKED (CREWMEMBER).
4. Fuel control panel - SET (FE).

    a. All fuel tank BOOST PUMP switches (tanks containing fuel) - ON.
    b. Crossfeed valve switches - CLOSED.
    c. SPR DRAIN switch - OFF.

5. Air conditioning and pressurization - SET (FE).
6. Ratios and instrument switch panel - SET.
7. Flight controls – CHECKED (P) (CP).

Note

If restricted or jammed flight controls are detected or suspected during ground operation, no attempt should be made to free the controls, but a light pressure should be held against the restriction or jam while a thorough inspection of the flight control system is conducted.

8. Engine instruments - CHECKED (P) (CP) (FE).

9. Temp datum control valve switches - AUTO OW.

10. Synchrophase master switch - OFF (FE).

11. Propeller governor control switches - AS DESIRED (CP).

12. Trim tabs - SET (P).

13. Autopilot - DISENGAUGED (P).

14. Electrical control panel - SET (FE).

    a. Generators - CHECKED.
    b. ATM generator - OFF/OFF, STOP.
    c. DC bus tie switch - NORMAL.

15. GTC control panel - SET (FE).

16. Seat belts and shoulder harness -SET (ALL).

17. Passengers - SET (LM/FM).

18. Crew briefing - COMPLETE (P).

    a. Minimum control speed.
    b. Take-off speed.
    c. Refusal speed.
    d. Pilot intentions - Should an emergency arise prior to or after refusal.
    e. Challenge crew - Their understanding of clearance, instrument departure.
    f. Specifics where applicable - Critical field conditions, ATO. snow, deep puddles on the runway, obstacle take-off, overload gross take-off, etc.
    g. State "Standard crew briefing" Reference Part IX of this manual.

Note

The remainder of the Before Take-Off checklist should be accomplished just prior to take-off.

19. Exterior lights - SET (FE) (CP).

20. Flight instruments, alt, and radar alt - CHECKED/SET (P) (CP) (N/FE).

21. Oil cooler flaps - AUTOMATIC (CP).

22. IFF, DME - AS REQUIRED (CP).

23. NAV SEL panels - AS REQUIRED (P) (CP).

24. Anti-skid test-COMPLETED (FE).

25. Anti-icing control panel - SET (FE).

    a. NESA windshield switches - NORMAL.

CAUTION

When operating the cold start switch, do not exceed the operating limits of 5 seconds ON, 10 seconds OFF. Do not operate the cold start switch with the NESA switch in the HI position. To do so may cause the windshield panels to be damaged.

Note

If the ambient temperature is higher than 27 °C, do not operate NESA on the ground. Turn NESA to NORMAL just prior to take-off. If the temperature of the glass is below -43 °C, the NESA control system will not function automatically, and the cold-start switch must be used to raise the temperature of the glass into the normal operating range. Except when the ambient temperature is extremely low, pitot heat should not be left on while the aircraft is in the runup position for an extended period.

b. PITOT HEAT switches - ON.

c. PROP & ENG ANTI-ICING - AS REQUIRED.

26. Propeller reversing - CHECKED (P) (FE).

Note

Reverse propellers in symmetrical pairs, and check that rpm, torque, fuel flow, and TIT are within limits. Check reverse power differential between engines; if greater than 1,000 inch-pounds, compensate for differential during subsequent reverse operation and record on the aircraft records.

27. Lineup check- COMPLETE (P) (CP) (FE).

a. Flaps - 50 PERCENT.
b. Trim-SET.
c. Attitude indicators - ON/INDICATING NORMAL.
d. Compass heading - ALIGNED WITH RUNWAY.

TAKE-OFF

The following paragraphs discuss normal, maximum effort and obstacle clearance, and crosswind take-offs. Use the performance charts as necessary to predict aircraft performance for any take-off. Refer to Part I for aircraft limitations.

Note

When take-off performance is critical, cabin pressurization and air conditioning bleed should be turned off prior to take-off to utilize maximum power available.

NORMAL TAKE-OFF

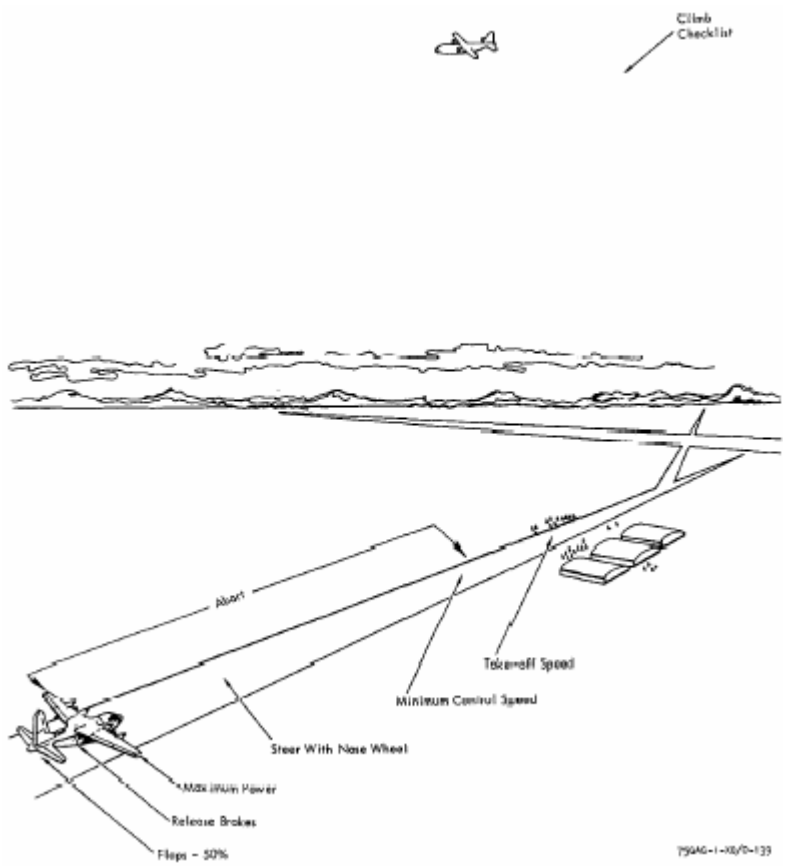
The throttles are gradually advanced toward maximum power. The crew will monitor the engine instruments to advise the pilot so that maximum allowable power is not exceeded during take-off. Normal take-off is made with 50 percent flaps. Any time maximum performance is desired, maximum power should be applied before the brakes are released. A rolling take-off is permitted provided maximum power is established within 5 seconds after either brake release, or aircraft is cleared for take-off.

CAUTION

Under low ambient temperature conditions, the throttles must not be placed in the TAKE-OFF position without monitoring the torquemeters because it is possible to exceed the maximum allowable torque before reaching the TIT. In addition, increasing ram effect during take-off will increase torque for any fixed TIT. This means that torque must either be set below maximum allowable when setting power for take-off or must be reduced as airspeed builds up.

During the take-off, the pilot will set take-off power and maintain directional control with the nose wheel steering until rudder controls become effective (50 to 60 KIAS). Concurrently, the copilot shall hold the control column forward, keeping the wings level with the ailerons and monitor throttle positions. As speed increases, tie pilot maintains control of the aircraft by coordinated use of the flight controls, according to the circumstances of speed, crosswinds, and runway conditions. The copilot will announce "MINIMUM CONTROL" (at air minimum control speed) and "REFUSAL" (at refusal speed). The word "ABORT" will be used to refuse a take-off any time prior to refusal speed. This will be spoken over the interphone system by any crewmember detecting a discrepancy that would affect a safe flight.

TAKE-OFF AND INITIAL CLIMB PATTERN



Note

- If the aircraft is loaded to an aft center of gravity, forward pressure on the control column will aid in steering effectiveness.
- For a smooth transition to take-off attitude, rotation of the aircraft should be started approximately 5 knots below the take-off speed or at the minimum control speed, whichever is greater.

MAXIMUM EFFORT TAKE-OFF AND OBSTACLE CLEARANCE

Note

- If the runway or runway environment require maximum effort performance, all engine bleed air should be shut off.

The following procedures apply to MAXIMUM EFFORT TAKE-OFFS AND OBSTACLE CLEARANCES:

1. Flaps - 50%

2. The throttles are set to achieve maximum power and indications are cross checked with computed engine performance data.

Note

On surfaces where the brakes will not hold the aircraft at maximum power settings, release the brakes then expeditiously apply maximum power as required.

3. Brake release - Brake release should be called to initiate timing for acceleration time check, if required. Airspeed/timing will be called by the designated crew member to confirm proper acceleration.

4. The copilot will announce decision speed, maximum effort take-off, VMC or refusal speed as required.

Note

Maximum effort minimum field length take-off will disregard minimum control speed.

5. Rotate the aircraft at the appropriate airspeed to get the aircraft off the ground. Once airborne, establish a normal take-off attitude and retract the gear. Accelerate and establish a normal climb attitude. Minimum flap retraction speed is obstacle clearance speed plus 10 KIAS.

6. For obstacle clearance climb performance, make a maximum effort take-off. As the aircraft accelerates (airborne) and attains obstacle clearance climb speed, rotate the aircraft to maintain that airspeed until the obstacle is cleared. The minimum flap retraction speed is obstacle clearance speed plus 10 KIAS.

7. Upon completion of the maximum effort and/or obstacle clearance procedure, lower the nose to a normal take-off attitude and climb out normally.

Note

All normal take-off aircrew coordination/responsibilities apply to maximum take-offs.

CROSSWIND TAKE-OFF

Crosswind take-offs, with regard to directional control of the aircraft, are made essentially the same as normal take-offs. Initially, the pilot maintains directional control with nose wheel steering and differential power while the copilot maintains a wing-level attitude with the ailerons. In higher crosswinds, a greater amount of differential power and ailerons must be applied. After lift-off, the line of flight should be aligned with the runway until crossing the airfield boundary.

CLIMB

As soon as airborne (and at the command of the pilot), retract the landing gear. When a safe altitude is reached, and at no less than 20 KIAS above take-off speed, retract the flaps.

WARNING

When the flaps are retracted at or near minimum flap retraction speed, the aircraft will lose lift and tend to sink. The pilot should react by increasing the angle of attack (pulling the nose up) and continue accelerating at climb speed. Flap retraction should not be performed during steep turns with a power reduction because of the danger of stall at flap retraction speed. The effect of flap retraction on available rudder boost pressure and subsequent increase in minimum control speed should also be considered.

Note

Retracting the landing gear and flaps simultaneously will result in slower than normal operation of both, and may cause the hydraulic low-pressure warning light to come on.

After airborne, accelerate to the desired climb speed as determined from the performance charts.

Note

In order to prevent excessively nose high attitudes and to allow for better visibility during VFR climbs, climb speeds greater than performance chart data are desirable.

1. Gear, flaps, lights - CHECKED (CP).
2. Synchrophase master switch - AS DESIRED (FE).
3. Pressurization - SET (FE).
5. Anti-icing and de-icing - SET (FE).

CAUTION

Because of generator loading, do not operate prop anti-icing and inflight refueling system simultaneously.

Note

Leading edge anti-icing shall be checked on the first flight of the day. Turn the wing and empennage anti-icing on until a temperature rise is noted on the indicators. This will eliminate any moisture in the system. The wing and empennage check will be coordinated with the pilot.

6. Fuel control panel - AS DESIRED (FE).

DESCENT

Note

Flight idle engine torque in slow-speed descent and approach speeds may go negative and cause an NTS signal on one or more engines. This will cause an rpm and power fluctuation resulting in a yawing condition on the aircraft. To correct this condition, move the throttle(s) forward to bring engine torque out of NTS range. The use of wing and empennage antiicing may further decrease flight-idle torque.

1. Crew - BRIEFED (P).

    a. Approach.
    b. Terrain.
    c. Weather.
    d. Missed approach/lost comm.

2. Passengers/cargo - BRIEFED/SET (LM/FM).

3. Pressurization - SET (FE).

4. All altimeters - SET (P) (CP) (N/FE).

WARNING

Altimeters will be set to station pressure (QNH) if available when transiting the transition level. Altimeters may be set when above, hut cleared through the transition level. The descent checklist shall not be completed until the QNH has been set.

NORMAL DESCENT

This type of descent is made by retarding all throttles to flight idle with gear and flaps retracted and descending at maximum level flight (VH) speeds. The normal descent chart presented in the performance data is based on maximum level flight (VH) speeds..

MAXIMUM RANGE DESCENT

This type of descent is made by retarding all throttles to flight idle with gear and flaps retracted and descending at maximum lift over drag speeds as presented in the performance chart. This type of descent will provide a moderate rate of sink (approximately 1,500 fpm) for en route letdown.

RAPID DESCENT

Gear and Flaps Retracted

The highest rates of descent are obtained by retarding all throttles to flight idle with gear and flaps retracted and descending at maximum allowable speeds. The rapid descent chart with gear and flaps retracted is based on maximum allowable speeds for 35,000 pounds of cargo or less. See appropriate performance chart.

Gear and Flaps Down

At slow airspeeds, the highest rates of descent are obtained by retarding all throttles to flight idle, decreasing airspeed to flap placard speed (145 knots), and extending landing gear and full flaps. Descend at 145 knots. See appropriate performance chart.

APPROACH

1. Fuel control panel – SET (FE).
2. Seat belt and shoulder harness - SET (ALL).
3. Altimeters, radar alt - SET (P) (CP) (N/FE).
4. NAV SEL switch - AS REQUIRED (P) (CP).
5. OIL COOLER FLAPS - AS REQUIRED (CP).
6. HUD system (some aircraft) - AS REQUIRED (P, CP).

BEFORE LANDING

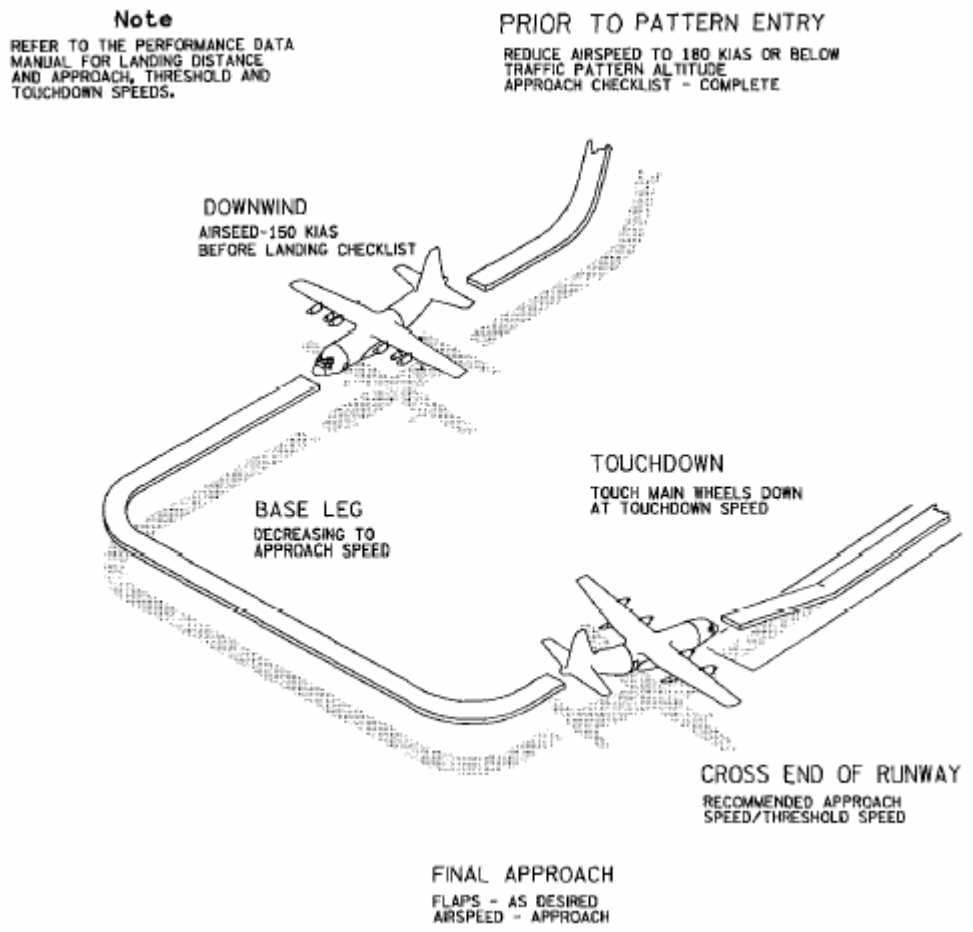
1. Flaps – AS REQUIRED (P) (CP).

CAUTION

Landing flap settings less than 50 percent may be used for emergencies only; tail will contact the ground. Touchdown at greater than 6 ° pitchup attitude will greatly exacerbate tail contact with the ground.

2. LANDING GEAR - DOWN/CHECKED/CENTERED (P) (CP) (FE).
3. Hydraulic pressures - CHECKED (CP).
4. Exterior lights - SET (CP, FE).
5. Synchrophase master switch - OFF (FE).
6. Pressurization - SET (FE).
7. Anti-skid test - COMPLETE (FE).
   a. Check that all four anti-skid test lights illuminate after wheel rotation stops.
   b. Place test switch in FWD position. All four lights should go out.
   c. Release test switch to OFF position. The two FWD lights should illuminate momentarily. After 2 to 3 seconds, all four lights should illuminate and remain illuminated.
   d. Place test switch in AFT position. All four lights should go out.
   e. Release test switch to OFF position. The two AFT lights should illuminate momentarily. After 2 to 3 seconds, all four lights should illuminate and remain illuminated.
8. Auxiliary pump - AS REQUIRED (CP).

LANDING



TRAFFIC PATTERN

Every landing should be planned according to runway length available and the general prevailing operating conditions. Normal landings should also be planned so as to use all of the available runway length to promote safe, smooth, and unhurried operating practices; to preclude abrupt reverse power changes; and to save wear and tear on brakes. On final approach/tuning final, begin deceleration from computed 50 percent approach speed, be selected to 100 percent flaps approximately 0.75 to 0.5 nm and 300 to 500 feet AGL from touchdown to attain 100 percent threshold speed at runway threshold. Touchdown shall be planned at the speed computed from the appropriate landing speed chart. After the main wheels touch down, lower the nose wheel smoothly to the run- way before elevator control is lost. When the main and nose landing gear are firmly on the ground, the copilot must hold forward pressure on the control column and maintain a wing-level attitude with ailerons, as needed. Concurrently, the pilot maintains directional control and decelerates the aircraft through the coordinated use of the rudder, differential power, nose wheel steering, and differential brakes according to the speed, wind, and runway conditions. Reverse thrust is applied by moving the throttles from FLIGHT IDLE and then into REVERSE range in coordination with nose wheel steering. Brakes must be checked during the landing roll.

Note

Excessively slow movement of the throttles from the FLIGHT IDLE to the GROUND IDLE detents will cause wing rock and/or swerve on landing rollout if symmetrical low pitch stops do not retract simultaneously because of slight differences in rigging or asymmetric retardation of the throttles.

Propeller Reversing

Every landing should be planned as though reverse thrust were not available. After landing, the nose gear should be touched down as soon as practicable, and the propellers reversed after the nose gear has touched. Do not use the brakes more than necessary, as sustained braking will result in overheating the brake assemblies. On a long runway, allow the aircraft to roll until it loses speed. Check the brakes, before reaching the end of the runway, to ensure that braking action is available.

WARNING

The failure of one or more propellers to reverse may result in complete loss of directional control. After touchdown, if the throttles are moved to the reverse range with a movement which is too rapid, it is possible to lose control of the aircraft before a propeller malfunction can be detected. The movement from the flight range to the reverse range should be made at a reasonable rate which will permit detection of a malfunction, such as failure of the low pitch stop to retract. At the first indication of directional control difficulties during reversing, immediately return all throttles to ground idle. Maintain directional control with flight controls, differential braking, and nose wheel steering as required. After identifying the affected propeller, symmetrical propellers may be reversed and the affected engine shut down while it is in ground idle. Rudder, differential power and brakes are the primary means of direction control. During the final stage of landing roll, reduce reverse thrust if conditions permit, to prevent debris from causing restriction to visibility or engine damage.

CAUTION

Propeller reversing with an unbalanced fuel load can cause an extreme wing-low attitude and undesirable control characteristics.

Normal Reverse Thrust Landing

The following procedure is recommended for a normal reverse thrust landing:

1. When the nose wheel contacts the ground, the copilot holds the control column forward to ensure steering control. The copilot also holds wings level. Flaps should not be brought up until clearing the duty runway. Any deviation from this will be specifically briefed prior to landing by the pilot in command.

2. The pilot pulls all four throttles back to the REVERSE range and steers with the steering wheel. Although propeller reversing is most effective at the higher speeds, reversing propellers at speeds of 115 KIAS or above could result in engine flame out.

3. After the aircraft has slowed down, and reverse thrust is no longer needed, the pilot will use the throttles in ground operating range as necessary for taxiing.

CROSSWIND LANDING

Check maximum allowable crosswind components for landing from the appropriate crosswind chart. Use normal final approach speeds if wind is steady. When winds are gusty, a slight increase in approach airspeed is recommended. (At the lighter gross weights it is advisable to use only 50 percent flaps in order to touch down main gear first at these touchdown speeds which are higher than normally recommended.) Immediately after the main wheels touch down, force down the nose wheels and hold in firm contact by use of the elevators. During roll-out, control the aircraft directionally by use of the following methods listed in order of preference: aileron and rudder control, nose wheel steering, differential braking, and differential power. The upwind wing has a tendency to rise when reverse thrust is applied. Since this tendency is especially pronounced if flaps are extended 100 percent, flaps should be raised before applying reverse power on landing in severe crosswinds.

CAUTION

An engine-out condition may add difficulty to a crosswind approach and landing by adding to the drift and weather cocking.

GUST CORRECTION

Increase rotation speed, take-off speed, threshold speed and landing speed by the full gust increment, not to exceed 10 knots.

Note

Use of a correction factor for gusts or other accelerations which may affect the aircraft should be undertaken with consideration of all the factors involved. If a correction is required to compensate for a given gust velocity, the value of the correction must be the same regardless of wind direction. This is true because the objective is to provide a safety margin for maneuver loads while flying the aircraft through a series of accelerations. The accelerations can be equally severe whether they are produced by headwind, crosswind, or tailwind. However, since a pilot cannot estimate the frequency or timing of gusts with practical accuracy, it is possible for the aircraft to arrive at the flare point with gust correction added during an intend when gusts have stopped momentarily. Under such conditions, the distance consumed dissipating

excess airspeed could move the touchdown point farther down the runway than planned. Therefore, whenever a correction factor is added for gusts or other accelerations, the pilot must be prepared to accept a correspondingly higher approach speed with the possibility of increased landing distance. If stopping distance available beyond the maximum estimated touchdown point is marginal, the pilot should select a longer runway or proceed to an alternate base.

WIND SHEAR

Wind shear is a complex phenomenon. It can affect the airplane in all phases of flight, but is most critical during the approach and landing phase. Wind shear can exist as a rapid change in wind velocity and direction as well as vertical air movement. There are certain conditions which indicate the possibility of wind shear being present. As a general rule, the amount of shear is greater ahead of warm fronts although the most common occurrences follow the passage of cold fronts during periods of gusty surface winds. When a temperature change of 10 °F or more is reported across the front or if the front is moving at 30 knots or more, conditions are excellent for wind shear. In addition, when thunderstorms are present in the area of intended landing, the possibility of encountering wind shear is increased. The power required, vertical speed, and pitch attitude, used in conjunction with the wind reported on the ground, provide an indication of potential wind shear.

In relation to a known surface wind, be alert for:

1. An unusually steep or shallow rate of descent required to maintain glidepath.
2. An unusually high or low power setting required to maintain approach airspeed.
3. A large variation between actual and computed ground speed.

When a reported surface wind would not justify an increased airspeed (for example: calm wind on the surface), but wind shear is suspected, adjustment of approach speed may be used to provide an increased speed margin. The following are two wind shear phenomena which are commonly found on final approach.

Decreasing Headwind

Initial reaction of the airplane when suddenly encountering a decreasing headwind (or an increasing tailwind) is a drop in indicated airspeed and a decrease in pitch attitude resulting in a loss of altitude. The pilot must add power and increase pitch to regain the proper glidepath. Once speed and glidepath are regained, however, prompt reduction of power is necessary. It will now require less power and a greater rate of descent to maintain the proper profile in the decreased headwind. If the initial corrections of increased power/pitch are not promptly removed after regaining glidepath and airspeed, a long landing at high speed will result.

Increasing Headwind

The initial airplane reaction to an increasing headwind (decreasing tailwind) is an increase in indicated airspeed and an increase in pitch attitude resulting in a gain in altitude. The pilot should reduce pitch and power to regain the proper glidepath. As glidepath is regained, the pilot must immediately compensate for the increasing headwind by increasing pitch and power. It will now require more power and a decreased rate of descent to maintain the proper profile. Be very cautious in making reductions of power and pitch to avoid a low-power, high-sink condition which could lead to a correction through the glidepath from which a recovery could not be made.

WARNING

If the airplane becomes unstable on final approach due to wind shear and the approach profile can not be promptly reestablished, a go-around should be immediately accomplished.

NO-FLAP LANDING

1. Obtain approach, threshold, and touchdown speeds from performance charts.

2. Fly a normal landing pattern using the no-flap speeds.

3. Do not perform a flare which results in a hold-off type landing; instead allow the aircraft to fly onto the runway. Touch down on main gear and slowly lower the nose gear to the runway.

CAUTION

If the touchdown is at lower than chart speeds, it is possible for the aft end of the fuselage to contact the ground during the touchdown phase of landing.

4. When applying reverse thrust at high speed, pull the power lever in reverse slowly.

5. Longer ground tolls will result from the higher touchdown speeds. Refer to appropriate performance chart for predicted ground roll.

MINIMUM RUN LANDING

All procedures for a normal landing apply to a maximum effort landing except touchdown is planned between 100 and 300 feet past the threshold. In no case shall the touchdown be greater than 500 feet, if utilizing minimum length runways. Additionally, upon touchdown and with all landing gear firmly on the deck, promptly apply full reverse thrust and minimize nose gear loads with elevator back pressure.

CAUTION

Extremely rapid throttle movement from flight idle to maximum reverse may cause power loss and/or engine flameout above 115 Kts.

LANDING ON WET RUNWAYS

The anti-skid braking system and reverse thrust capabilities minimize the normal hazards associated with wet runways. Directional control should be maintained by the coordinated use of rudder and ailerons, differential power, differential braking, and nose wheel steering. Heavy reliance on differential braking and/or nose wheel steering for directional control should be avoided since their effectiveness, as a function of friction available, will be greatly reduced. In addition, the nose wheel may exhibit a tendency to skid when turned at a speed higher than taxi speed.

CAUTION

If airfield conditions are such that deep puddles of water will be encountered during the early part of the landing roll out, nose wheel touchdown may be delayed until the later pan of the roll out.

Note

If deep water puddles have been encountered with the nose wheel on the runway during the early part of the landing roll, the contour of the aft nose wheel well door, and particularly the aft edge of the door should be inspected for damage prior to the next take-off.

LANDING ON ICY RUNWAYS

Operation of the aircraft on ice is hazardous and should be attempted only when necessary. Caution must be exercised when landing or taxiing on ice. Use of nose gear steering should he minimized and used with caution. Taxi speed must be slow and taxi turns should be planned for large radius turns. Directional control can be maintained with asymmetrical power and nose wheel steering at taxi speeds, and with asymmetrical power and rudder at speeds above rudder effectiveness. Touchdown should be made from a power approach at the minimum safe speed possible. Hold the nose wheel "off" as long as possible to obtain maximum aerodynamic drag. Braking after lowering the nose wheel must be made with caution. Use symmetrical power and reverse thrust to brake and prevent sudden yawing and skidding. It is very difficult for the pilot to sense that the wheels are skidding. Landing on ice-covered runways should not be attempted if existing crosswinds will require large crosswind approach or taxiing correction applications.

TOUCH AND GO LANDING

Touch and go landings require a significant element of caution because of the many actions which must be executed while rolling on the runway at high speed or while flying within the immediate proximity of the ground. Touch and go landings should be made only when authorized or directed by the major command concerned. The actions required during touch and go landings are divided into three categories: on the runway, climb, and before landing.

Note

If repeated touch and go landings are planned, leave the landing gear extended to cool the wheels and brakes.

On the Runway

1. Flaps - 50 PERCENT (P/CP).
2. Trim tabs - SET FOR TAKE-OFF (P/CP).
3. Throttles - AS REQUIRED (P/CP).

WARNING

If an abort is necessary, power settings, airspeed, and runway length remaining shall be considered before attempting the abort.

CAUTION

Overtorque and/or overtemp during touch and go landings are/is highly possible due to rapid throttle movement unless the engine instruments are closely monitored. Therefore, 15,000 in. lbs. of torque or 1,000° C TIT, whichever occurs first is the recommended power settings during touch and go landings.

Note

- The flight engineer shall monitor engine instruments and should assist the pilot by giving engine power calls.
- Add power should be called when power stops advancing anytime prior to reaching 15,000 in. lbs. of torque or 1,000 °C TIT, whichever occurs first.
- Good power should be called when power settings reach 15,000 in. Ibs. of torque or 1.000° C TIT, whichever occurs first.
- Check power should be called anytime power exceeds 17,000 in. lbs of torque or 1,050 °C TIT, whichever occurs first.

After Take-Off

1. Landing gear, flaps - AS REQUIRED (CP).
2. Landing lights control panel - AS REQUIRED (CP).

Before Landing

1. Flaps - AS REQUIRED (CP).
2. Landing gear - DOWN/CHECKED/CENTERED (P) (CP) (FE).
3. Hydraulic system - PRESSURES CHECKED (CP).

GO-AROUND

When a go-around is being considered, the crew should be alerted as soon as possible, the use of full flaps delayed, and airspeed kept higher than normal.

When a go-around is decided upon, proceed as follows:

1. Give the command "Go-around" to crew.
2. Advance the throttles as required.
3. Direct copilot to set flaps to 50 percent (when speed and altitude permit).

WARNING

Retracting flaps from 100 percent to 50 percent will increase stall speed. Without proper power and attitude corrections, sink rate will also increase. This is particularly noticeable at lower than normal airspeeds. If safe altitude and airspeed are not attained, inadvertent touchdown and/or stall may occur.

4. Direct the copilot to raise the landing gear when certain that the aircraft will not touchdown.
5. After the above procedure has been accomplished, proceed with normal take-off procedures.

AFTER LANDING

1. Flaps - AS REQUIRED (CP).
2. All unnecessary communication and electrical equipment, IFF - OFF (CP) (FE) (RO) (N/FE).
3. Radar - STANDBY (P) (FE/N).
4. Air conditioning/pressurization - NO PRESSURE (FE).
5. Auxiliary hydraulic pump – AS REQUIRED (CP).
6. Anti-icing/de-icing - OFF (FE).
7. Fuel control panel - SET (FE).
8. Start GTC – SET (FE).
    a. GTC control switch – START, RUN.
    b. Bleed air valve switch – AS REQUIRED.
9. Electrical control panel – SET (FE).
    a. ATM generator - ON/CHECKED.
    b. DC bus tie switch -TIED.
10. Window - OPEN (CP).

SECURE

CAUTION

- During ground stop procedure, do not move the engine condition lever from GROUND STOP to RUN while the engine is still rotating.
- Engine shutdown when taxi speed, wind velocity, or a combination of both is greater than 20 knots may result in damage to the safety coupling. When practical, shut down engines when stopped or at a slow taxi speed.

Note

On engine shutdown, if the drip valves are working normally, some fuel will be seen draining from the drain mast. In the event of no drip, the pilot will wait until the propeller has ceased rotation and motor the engine to 25 percent rpm with the starter, with the condition lever in GROUND STOP.

1. Parking brake - SET (P).
2. Flaps -AS REQUIRED (CP).
3. Shutdown, NTS check-COMPLETE (FE).

The copilot shall place the feather valve and NTS check switch in the NTS position. The copilot shall cut the engines one at a time by placing the condition lever to GROUND STOP. The flight engineer shall observe the engine instruments and the pilot and copilot shall observe drip valve operation where possible.

Note

- When practical, engines should be shut down from low-speed ground idle.
- NTS lights may not illuminate when shutting down engines from low-speed ground idle.
- NTS lights may not illuminate when shutting down engines from low-speed ground idle, a recheck of the NTS shall be made prior to the next flight.

4. Oil cooler flap switches - AS REQUIRED (CP).
5. Radar - OFF.
6. Air conditioning - OFF (FE).

7. Bleed air switches - OFF (FE).

8. Electrical panel - SET (FE).

    a. Engine generator switches - OFF.
    b. Inverters - OFF.

9. Fuel panel - SET (FE).

    a. Fuel BOOST PUMP switches - OFF.
    b. Crossfeed valve switches - CLOSED.

10. Temp datum control switches - NULL (FE).

11. Oxygen-NORMAL/100%/ OFF (ALL).

12. Hydraulic control panel - SET (CP).

    a. Engine pump switches - ON

CAUTION

The engine pump switches are to be left in the ON position after engine shutdown. If the switches are left in the OFF position, pressure buildup due to thermal expansion of hydraulic fluid may cause the suction line hydraulic firewall shutoff valve to fail.

    b. SUCTION BOOST PUMP switches - OFF.
    c. ANTI-SKID switch - OFF.
    d. Auxiliary hydraulic pump switch - OFF.

13. ATM generator - OFF (FE).

14. GTC control panel-SET (FE).

    a. Bleed air valve switch - CLOSE.
    b. GTC control switch - STOP.

15. Radios – OFF (CP) (LM/RO).

16. Wheels – CHOCKED (FM/GC).

17. Parking brake -- RELEASED (P).

18. Interior/exterior lights - SET (CP) (FE).

    a. All cockpit lights off – OFF.

Note

For night operations, leave the thunderstorm lights ON until the flight crew has exited the cockpit. The flight engineer shall secure these lights immediately prior to securing the battery.

    b. All exterior lights OFF.
    c. Emergency exit light extinguish switch DEPRESSED.

21. DC bus tie and battery – SET (FE).

    a. DC bus tie switch - NORMAL.
    b. DC power switch - OFF.
    c. DC voltmeter switch - MAIN DC.

Note

If the dc voltmeter switch is left in the BAT position for an extended length of time, the output of the battery will be decreased.

BEFORE LEAVING THE AIRCRAFT

1. Nose landing gear ground safety pin, pitot covers, air conditioning dust plugs, and engine-duct plugs – INSTALLED.
2. External power and ground equipment DISCONNECTED.
3. Doors and ramp – AS REQUIRED.
4. Aircraft battery – DISCONNECTED.
5. Aircraft records – COMPLETE.

CRUISE ENGINE SHUTDOWN

Engine shutdown may be performed during cruise flight to achieve optimum fuel economy in order to meet mission requirements. Refer to appropriate performance charts for range information.

WARNING

Operating in the freezing range with visible moisture present may cause icing that will prevent starting of shut down engines.

CAUTION

- Do not place the engine condition levers in any position other than FEATHER, RUN, or AIR START during flight. Stopping or hesitating between the FEATHER, RUN, or AIR START positions can result in undesirable operation of the engine-propeller system.
- NTS check should be accomplished on one engine at a time.

1. Crew – NOTIFY (P).
2. Synchrophase master switch – OFF (FE).
3. Propeller governor control switch – MECH GOV (CP).
4. Feather valve and NTS check switch - VALVE (CP).
5. Airspeed - BELOW 180 KIAS (P).
6. NTS check-COMPLETE (FE).

CAUTION

If NTS action is not observed by 1860 inch-pounds, advance the throttle, and return the engine to normal operation. Record the malfunction in the aircraft records. If the NTS is operative, continue the procedure for engine shutdown.

Note

Torque should decrease and the highest negative torque value should be noted. NTS action should begin at -1260 (+/-600) inch-pounds as indicated by an increase in torque and the blinking of the NTS light each time the feather valve has moved to the feather position. During the NTS check, torque fluctuations to positive 500 inch-pounds (maximum) are considered normal.

a. Throttle - 4,000 IN/LB OR MORE (P).
b. Wing and empennage anti-icing - ON (FE).
c. Engine bleed air switch (engine being checked) OVRD (FE).
d. Engine bleed air switch (other engines) - OFF/ ONE AT A TIME (FE).
e. Slowly retard throttle observing decrease in torque value until NTS action is observed - OBSERVED (FE).
f. Advance throttle into positive torque range - ADVANCED (P).
g. NTS check - CHECKED (CP/FE).
h. Wing and empennage anti-icing - OFF (FE).
i. Engine bleed air switches – ON (FE).

7. Throttle of engine to be shut down - FLIGHT IDLE (P).
8. Engine condition lever - FEATHER (CP).

WARNING

When pulling a condition lever to FEATHER, pull it all the way to the detent to ensure that the propeller is fully feathered when the engine fuel is shut off. If the lever is left at mid-position, and the NTS is inoperative, an engine decoupling is possible.

5. Fuel boost pump – OFF (FE).
6. Engine generator switch - SET (FE).
7. Propeller feather override button – OUT (CP).
8. Throttle of engine shut down – FULL FORWARD (P).
9. Oil cooler flap – CLOSED/FIXED (CP).
10. Engine bleed air switches on operative engines – ON (FE).
11. Synchrophase master switch – RESET AS NECESSARY (FE).
12. Fuel management – CHECKED (FE).

AIR START PROCEDURE

Before restarting an engine that has been shut down in flight, be sure that the TIT for that engine has dropped below 200 °C. Temperature higher than 200 °C will increase the likelihood of a hot start. Never move the throttle below the FLIGHT IDLE position in flight. The position of the engine condition lever is assumed to be FEATHER. The engine will normally come up to speed more rapidly if the airspeed is reduced to 180 knots or less. (Refer to Part I, Chapter 4, for engine limits during start.)

CAUTION

- Do not attempt to restart an engine which was shut down because of evidence of fire. Do not attempt to restart an engine which was shut down because of fire warning without evidence of tire, or any other engine malfunction unless, in the opinion of the pilot, a greater emergency exists.
- Do not attempt to restart an engine with an inoperative NTS except in case of a greater emergency. Prior to air start of an engine on which the NTS has been previously determined to be inoperative, reduce the airspeed to 130 KIAS and the altitude to below 5,000 feet.

1. Fire handle - IN (CP).
2. Throttle - SET APPROXIMATELY 1 INCH ABOVE FLIGHT IDLE (P).
3. Fuel boost pump switch - ON (FE).
4. Oil cooler flap switch - AUTOMATIC (CP).
5. Fuel enrichment switch - NORM (P).
6. Propeller governor control switch - MECH (CP).
7. NTS check switch - VALVE (CP).
8. Temp datum control valve switch - AUTO VW.
9. Condition lever- AIR START (CP).

CAUTION

- If, during an air start at 10 percent rpm, the flight engineer has not called NTS, the copilot will return the condition lever immediately to FEATHER. A second start attempt is not recommended unless in the opinion of the pilot a greater emergency exists.
- Normal light off should occur by the time engine rpm reaches 30 percent. If the engine does not light off prior to teaching 40 percent rpm, discontinue the start and return the condition lever to FEATHER immediately.

Note

- Hold the condition lever in AIR START until light off, then release to RUN. Monitor engine instruments as on a ground start. Monitor the NTS check light for an NTS indication as indicated by blinking of the light.
- If normal air start cannot be accomplished because of failure of the propeller to rotate and the blade angle change is indicated by illumination of NTS light, an emergency start may be attempted by placing the bleed air switch to OPEN and using the engine starter to help unlock the propeller brake.

10. Generator switch - RESET/ON (FE).

11. Fuel enrichment switch - OFF (P).

12. Engine bleed air switch - ON (FE).

13. Prop governor control switch - NORMAL (CP).

14. Sync master switch - AS REQUIRED (FE).

15. Engine instruments - WITHIN LIMITS (FE).

NIGHT FLYING

The aircraft presents no particular problems when night flying. The aircraft lighting system is excellent in the cockpit, fuselage, and exterior. In addition to the following, all procedures recommended for day VFR and IFR flights shall apply to night flying.

1. The landing lights should be used for ah take-offs and landings so that they will be on in the event of any directional or control problems on the deck.

WARNING

Turn landing lights off prior to retraction. Failure to do so may result in spatial disorientation.

Note

Reflections of the anti-collision/strobe light on clouds may cause vertigo.

FUEL MANAGEMENT

Fuel management is accomplished by positioning switches on the main fuel control panel. Fuel muting is governed by fuel tank section and crossfeed valve positioning. Fuel gauges on the panels indicate quantities in each tank, and a totalizer on the main fuel control panel indicates total fuel remaining in the wing tanks. An additional check of fuel quantities may be made by keeping a log based on engine fuel flow and time.

To crossfeed fuel from a heavy tank, proceed as follows:

1. Crossfeed valve (heavy tank) - OPEN.

2. Crossfeed separation valve OPEN.

Note

The crossfeed separation valve switch must be placed to the flow position (open) when feeding fuel from tanks in one wing to engines on the other wing.

3. Crossfeed valve (light main tank(s)) - OPEN.

4. Boost pump switch (tight main tank(s)) - OFF.

When trimming is complete:

5. All main BOOST PUMP switches - ON.

6. All crossfeed valves - CLOSED.

7. Crossfeed separation valve – CLOSED.

8. Depress crossfeed primer button.

WING TANKS TO ENGINES FUEL FLOW

Design of the fuel system allows tank-to-engine or crossfeed-to-engine fuel flow. Tank-to-engine routing is normally used at all times when fuel is being taken from the main tanks. Crossfeed-to-engine muting is used when using fuel from the external tanks or auxiliary tanks, when trimming the aircraft, or in other special uses. Although static head pressure is sufficient to force fuel from the wing tanks through the system under most conditions, boost pump operation is recommended at all times. The following procedures are recommended for fuel management, using only the wing tanks:

Take-Off and Approach

To obtain the correct fuel flow for take-off and approach:

1. Place all main tank boost pumps in the ON position.
2. Turn all crossfeed valve switches to the CLOSED position. (This places all engines on tank-to-engine fuel routing.)
3. Crossfeed separation valve - CLOSED.

Cruise

As the auxiliary fuel tanks have only one fuel pump, it is recommended that auxiliary fuel be used before external fuel on long-range missions without fuel in the fuselage tank. In the event of an auxiliary tank pump failure, this procedure would ensure sufficient fuel to return to the point of departure. Fuel management constraints must be adhered to during cruise when fuel is carried in the fuselage tank. On short range missions, it is recommended that fuel be used from the external tanks before the auxiliary tanks to preclude landing with fuel in the external tanks.

CAUTION

When operating with less than 6,000 pounds of total fuel in the main fuel tanks, place the crossfeed valve switch to open and the BOOST PUMP switch to ON for all tanks containing fuel; place the crossfeed separation valve switch to open. When fuel quantity of any main tank is less than 1,000 pounds, the engine being fed by that tank will be placed on crossfeed operation.

1. Place No. 4 crossfeed valve switch to the flow position. Crossfeed manifold pressure should be 15 to 24 psi.

2. Depress the crossfeed PRIMER button for 30 seconds.

3. Place No. 4 crossfeed valve switch to the no-flow position.

4. Open the crossfeed separation valve.

5. Ensure that the left auxiliary/external tank BOOST PUMP switch is ON. Place the left auxiliary/external tank crossfeed valve switch to the flow position. Crossfeed manifold pressure should be 28 to 40 psi.

6. Place the No. 2 engine crossfeed valve switch to the flow position. When satisfied that No. 2 engine is operating satisfactorily, place the No. 1 engine crossfeed valve switch to the flow position.

Note

When opening the main tank crossfeed valves, observe fluctuation of fuel pressure for indication that the valve has opened. Monitor TIT, torque, and fuel flow for approximately 1 minute.

7. When satisfied that No. 1 engine is operating satisfactorily, place the crossfeed separation valve to the no-flow position.

8. Repeat steps 5 and 6 for the right auxiliary/external tank and No. 2 and No. 1 engines.

9. When the desired amount of fuel has teen used, or when the tank empty light illuminates, place the crossfeed valve switches to the no-flow position.

C-130 CHECKLIST

NORMAL PROCEDURES

Only grey boxed items need be checked when taxiing back from take-off after landing with all engines operating and members remaining at their positions.

BEFORE START		
1	COCKPIT INSPECTION	COMPLETED (FE)
2	PASSENGER BRIEF	AS REQD (P)
3	ELECTRICAL CONTROL PANEL	SET (FE)
4	RADIOS	ON(CP)
5	FIRE EMER CTRL HANDLES, TST PNLS, WARNING LIGHTS	IN/CHKD (P) (CP) (FE)
6	CLEAR GTC AND PROPS	CLEAR/FIRE GUARD POSTED (GC/FM)
7	START GTC	STARTING (FE)
8	BLEED AIR SYSTEM	CHKD/SET (FE)
9	ATM GEN	AS REQD (FE)
10	EXTERIOR, INTERIOR, ANTI-COLLISION/ STROBE LIGHTS	AS REQD(P) (CP) (FE)
12	INVERTERS	SET (FE)
13	STBY ATTD IND	CHKD (P)
14	FUEL QTY AND DIST	CHKD (P) (FE)
15	FUEL ENRICHMENT SWITCHES	OFF(P)
16	OIL COOLER FLAPS	AS REQD (CP)
17	RAMP AND DOOR SEL	6N, NEUT (FM/LM) (FE)
18	HYDRAULIC CONTROL PANEL	SET (CP)
19	PARKING BRAKE	SET/REMOVE CHOCKS (P)
20	OXYGEN	CHKD/NORMAL/ 100%/OFF(ALL)
21	GROUND IDLE BUTTONS	LOW (FE)
22	FLAP LEVER	SET (CP)
23	CHOCKS, NOSE PIN	REMOVED (GC, FM)

STARTING ENGINES		
1	CLEAR NO. 1 ENGINE	NO. 1 CLEAR (GC/FM); TURNING NO. 1 (P); ROTATION NO. 1 (GC/FM)
2	ATM GEN	ON/CHKD (FE)
3	DC POWER SWITCH	BATTERY (FE)
4	CLEAR NO. 2 ENGINE	NO. 2 CLEAR (GC/FM); TURNING NO. 2 (P); ROTATION NO. 2 (GC, FM)
5	AIR COND MSTR SWITCH	NO PRESS (FE)
6	EXT PWR/GRND EQUIP REMOVED	CLEAR (GC/FM)
7	CLEAR NO. 3 ENGINE	NO. 3 CLEAR (GC/FM); TURNING NO. 3 (P); ROTATION NO. 3 (GC. FM)
8	CLEAR NO. 4 ENGINE	NO. 4 CLEAR (GC/FM); TURNING NO. 4 (P); ROTATION NO. 4 (GC/FM)
9	ENGINE BLEED AIR SWITCHES	SET (FE)
10	FUEL CROSSFEED VALVE SWITCHES	SET (FE)

BEFORE TAXI		
1	FUEL ENRICHMENT SWITCHES	OFF(P)
2	WING AND EMPENNAGE ANTI-ICING INDICATORS	NORMAL/LIGHTS OUT (FE)
3	RADIOS, RADAR, NAV EQUIP, IFF	ONISTBY (P) (CP) (N/FE) (RO)
4	COMPASS SYSTEM, HDG IND	CHKD/SET(N/FE) (P) (CP)
10	FLAPS	50 PERCENT (CP)

11	GROUND EQUIPMENT	CLEAR (P) (CP) (GC/FM)
13	CREW ABOARD	ABOARD, DOORS CLOSED, CHKD (FM/GC)
14	HYD QUANTITIES/ PRESSURES	CHKD (CRMBR, CP)
15	AUX PUMP SWITCH	ON (CP)

TAXI		
1	BRAKES	CHKD/ANTI-SKID ON (P) (CP)
2	AUX HYD PUMP	AS REQD (CP)
4	LOW-SPEEDGROUND IDLE	AS REQD (FE)
5	GENERATORS AND LOADS	ON/CHKD (FE)
6	ICE DETECTION SYS	CHKD/RESET/AUTO (FE)
8	CROSSFEED SYSTEM	PRIMED, CHKD (FE)

BEFORE TAKE-OFF		
1	WINDOWS, DOORS, HATCHES	SECURED (ALL)
2	FLAPS	50 PERCENT (P) (CP)
5	AIR COND/PRESSURIZATION	SET (FE)
6	RADIOS AND INST SWITCH PANEL	SET (P) (CP)
7	FLIGHT CONTROLS	CHKD (P) (CP)
8	ENGINE INSTRUMENTS	CHKD (P) (CP) (FE)
9	TO CTRL VALVE SWITCHES	AUTO(FE)
10	SYNCHROPHASE MASTER SWITCH	OFF (FE)
11	PROP GOV CTRL SWITCHES	AS DESIRED (CP)
12	TRIM TABS	SET (P)
13	AUTOPILOT	DISENGAUGED (P)
14	ELECTRICAL CONTROL PANEL	SET (FE)
15	GTC CONTROL PANEL	SET (FE)
16	SEAT BELTS, SHOULDER HARNESS	SET (ALL)
17	PASSENGERS	SET (LM/FM)
18	CREW BRIEFING	COMPLETE (P)
19	EXTERIOR LIGHTS	SET (FE) (CP)
20	FLT INST, ALT, RAD ALT	CHKD/SET (P) (CP) (N/FE)
23	OIL COOLER FLAPS	AUTOMATIC (CP)
24	IFF, DME	AS REQD (CP)
25	NAV SEL PANELS	AS REQD (P) (CP)
26	ANTI-SKID TEST	COMPLETED (FE)
27	ANTI-ICING CONTROL PANEL	SET (FE)
29	PROPELLER REVERSING	CHKD (P) (FE)
30	LINEUP CHECK	COMPLETE (P) (CP) (FE)

CLIMB		
1	GEAR, FLAPS, LIGHTS	CHKD (CP)
2	SYNCHROPHASE MASTER SWITCH	AS DESIRED (FE)
3	PRESSURIZATION	SET (FE)
4	WINGS/ENGINES. HYD QTYS	CHKD (CRMBR)
5	ANTI-ICING/DE-ICING	SET (FE)
6	FUEL CONTROL PANEL	AS DESIRED (FE)

DESCENT		
1	CREW	BRIEFED (P)
2	PASSENGERS/CARGO	BRIEFED/SET (LM/FM)
4	PRESSURIZATION	SET (FE)
5	ALL ALTIMETERS	SET (P) (CP) (N/FE)

APPROACH		
1	FUEL CONTROL PANEL	SET (FE)
2	SEAT BELT AND SHOULDER HARNESS	SET (ALL)
5	ALTIMETERS, RADAR ALT	SET (P) (CP) (N/FE)
6	NAV SEL SWITCH	AS REQD (P) (CP)
7	OIL COOLER FLAPS	AS REQD (CP)

BEFORE LANDING		
1	FLAPS	AS REQD (P) (CP)
2	LANDING GEAR	DOWN/CHKD/ CENTERED (P) (CP) (FE)
3	HYDRAULIC PRESSURES	CHKD (CP)
4	EXTERIOR LIGHTS	SET (CP, FE)
5	SYNCHROPHASE MASTER SWITCH	OFF (FE)
6	PRESSURIZATION	SET (FE)
8	ANTI-SKID TEST	COMPLETE (FE)
9	AUXILIARY PUMP	AS REQD (CP)

TOUCH AND GO LANDING

On The Runway		
1	FLAPS	50 PERCENT (P, CP)
2	TRIM TABS	SET FOR TAKE-OFF (P/CP)
3	THROTTLES	AS REQD (P, CP)

After Take-Off		
1	LANDING GEAR, FLAPS	AS REQD (CP)
2	LANDING LIGHTS CONTROL PANEL	AFTER TAKE-OFF

Before Landing		
1	FLAPS	AS REQD(CP)
2	LANDING GEAR	DOWN/CHKD/CENTERED (P, CP, FE)
3	HYD SYSTEM	PRESSURES CHKD (CP)

After Landing		
1	FLAPS	AS REQD (CP)
3	ALL UNNECESSARY COMM/ELECT EQUIP, IFF	OFF (CP) (FE) (RO) (N/FE)
4	RADAR	STANDBY (P) (FE/N)
7	AIR COND/PRESS	NO PRESSURE (FE)
8	AUXILIARY HYDRAULIC PUMP	AS REQD (CP)
9	ANTI-ICING/DE-ICING	OFF (FE)
10	FUEL CONTROL PANEL	SET (FE)
11	START GTC	SET (FE)
12	ELECTRICAL CONTROL PANEL	SET (FE)
13	WINDOW	OPEN (CP)

CRUISE ENGINE SHUTDOWN

1	CREW	NOTIFY (P)
2	SYNCHROPHASE MASTER SWITCH	OFF (FE)
3	PROPELLER GOVERNOR CONTROL SWITCH	MECH GOV (CP)
4	FEATHER VALVE AND NTS CHECK SWITCH	VALVE (CP)
5	AIRSPEED	BELOW 180 KIAS (P)
6	NTS CHECK	COMPLETE (FE)
7	THROTTLE OF ENGINE TO BE SHUT DOWN	FLIGHT IDLE (P)
8	ENGINE CONDITION LEVER	FEATHER (CP)
9	FUEL BOOST PUMP	OFF (FE)
10	ENGINE GENERATOR SWITCH	SET (FE)
11	PROPELLER FEATHER OVERRIDE BUTTON	OUT (CP)
12	THROTTLE OF ENGINE SHUT DOWN	FULL FORWARD (P)
13	OIL COOLER FLAP	CLOSED/FIXED (CP)
14	ENGINE BLEED AIR SWITCHES ON OPERATIVE ENGINES	ON (FE)
15	SYNCHROPHASE MASTER SWITCH	RESET AS NECESSARY (FE)
16	FUEL MANAGEMENT	CHKD (FE)

AIRSTART PROCEDURES

1	FIRE HANDLE	IN (CP)
2	THROTTLE	SET APPROX 1" ABOVE FLT IDLE (P)
3	FUEL BOOST PUMP	ON (FE)
4	OIL-COOLER FLAP	AUTO (CP)
5	FUEL ENRICHMENT	NORM (P)
6	PROP GOV CONT	MECH (CP)
7	NTS CHECK	VALVE (CP)
8	TD CONT VALVE	AUTO (FE)
9	COND LEVER	AIRSTART (CP)
10	GENERATOR	RESET/ON (FE)
11	FUEL ENRICHMENT	OFF (P)
12	ENG BLEED-AIR	ON (FE)
13	PROP GOV CONT	NORM (CP)
14	SYNC MSTR SWITCH	AS REQD (FE)
15	ENG INST	WITHIN LIMITS (FE)

EMERGENCY PROCEDURES

CRITICAL ITEMS (GREY BOXED) MUST BE COMMITED TO MEMORY

ENGINE SHUTDOWN PROCEDURES

1	CONDITION LEVER	FEATHER (CP)
2	FIRE HANDLE (IF FIRE, NAC O/H, VISIBLE FLUID LEAK OR THROTTLE CONTROL CABLE FAILURE IND	PULLED (WHEN REQD) (CP)
3	FIRE EXT (IF FIRE OR NAC O/H IS IND)	DISCHARGED (WHEN REQ) (CP)
4	FLAP LEVER	AS REQD (CP)
5	LANDING GEAR LEVER	AS REQD (CP)
6	PROPELLER	FEATHERED (LM/FA)
7	ENG BLEED AIR SWITCH	OFF (FE)
8	GENERATOR SWITCHES	TRIPPED/OFF (FE)
9	FUEL BOOST PUMP SWITCH	AS REQD (FE)
10	CROSSFEED VALVE SWITCH	AS REQD (FE)
11	PROP GOV CONT SWITCH	MECH GOV (CP)
12	PROP FEATHER OVRD BUTTON	OUT (CP)
13	SYNCHROPHASE MASTER SWITCH	REST AT NECES (FE)
14	TD VALVE	NULL (FE)
15	THROTTLE	FULL FWD (P)
16	OIL COOLER FLAP SWITCH	CLOSED/FIXED (CP)

GTC FIRE (GROUND EMERGENCY)

1	GTC FIRE HANDLE	PULLED
2	FIRE EXTINGUISHER	DISCHARGED (IF REQUIRED) (CP)
3	EVACUATE THE AIRCRAFT	(ALL)

GROUND EVACUATION

1	CREW/PASSENGERS	NOTIFIED (P)
2	PARKING BRAKE	SET (P)
3	TOWER	NOTIFIED (CP)
4	FIRE HANDLES/COND LEVERS	PULLED/FEATHER (CP)
5	AC/DC SW	OFF (FE)
6	ALARM BELL	1 LG RING (P, CP)
7	EVACUATE	(ALL)
8	CHOCK AIRCRAFT	AS REQD (RO/LM/FM/OBS/FA)

GTC FIRE INFLIGHT

1	GTC FIRE HANDLE	PULLED (CP)
2	FIRE EXTINGUISHER	DISCHARGED (IF REQUIRED) (CP)
3	ATM GEN	OFF (FE)
4	GTC CONT SWITCH	STOP (FE)
5	GTC BLEED AIR VALVE SWITCH	CLOSED (FE)

FUEL DUMPING

1	ADVISE AIR TRAFFIC CONTROL FACILITY OF INTENTIONS TO DUMP FUEL	
2	FUEL SYSTEM	TANK-TO-ENGINE
3	DUMP VALVE SWITCHES	OPEN

4	DUMP PUMP SWITCH	DUMP POSITION FOR EACH TANK FROM WHICH FUEL IS TO BE DUMPED
5	FUEL QUANITY INDICATORS	MONITOR CLOSELY
6	FUEL DUMP SWITCHES	OFF WHEN FUEL QUANITY HAS BEEN DECREASED AS REQD
7	DUMP VALVE SWITCHES	NORM

WING FIRE

1	CROSSFEED VALVE SWITCHES	CLOSED (FE)
2	ENG HYD & SUCTION BOOST PUMPS	OFF (CP)
3	WING ISOLATION VALVES & ENG BLEED AIR VALVES	CLOSED (FE)
4	WING ELEC EQUIP	OFF (FE)
5	IF NECESSARY SIDESLIP ACFT	(P)
6	LAND ACFT AS SOON AS POSSIBLE	(P)

FUSELAGE FIRE/SMOKE AND FUME ELIMINATION

1	OXYGEN	ON/100% (ALL)
2	PRESSURUATION	EMER DEPRESS
3	DESCENT	AS REQD (P)
4	EXTINGUISH THE FIRE	AS REQD (ALL)
5	ENG BLEED AIR SWITCHES	OFF (FE)
6	AIRCONDITIONING MASTER SWITCH	AUX VENT (FE)
7	PARATROOP DOORS/AFT ESCAPE HATCH	OPEN (LM)
8	FLT STA EMER ESCAPE HATCH	OPEN (AS REQD) (FE)

IN-FLIGHT DOOR WARNING

1	SEATBELTS	FASTENED (ALL)
2	OXYGEN	AS REQD (ALL)
3	DEPRESSURIZATION	BEGIN DEPRESS (FE)
4	DESCENT	AS REQD (P)
5	DOORS	CHKD (FE,O)
6	MASTER DOOR WARNING LIGHT SWITCH	OFF (FE,O)

RAPID DECOMPRESSION

1	OXYGEN	ON/100% (ALL)
2	PRESSURIZATION	AS REQD (FE)
3	DESCENT	AS REQD (P)

CHAPTER 2 – ALL-WEATHER OPERATIONS

INTRODUCTION

This section contains only those procedures that differ from or are in addition to the normal operating instructions, except for some repetition necessary for emphasis, clarity, or continuity of thought.

INSTRUMENT FLIGHT PROCEDURES

The aircraft is completely equipped for the use of all standard radio navigational and flight aids. It is the responsibility of the pilot to ensure that each crew member is thoroughly briefed on the exact procedures he is expected to follow during all phases of aircraft operation. In planning IFR flights, remember that fuel requirements at low altitudes are greater than at higher altitudes. If required to land under IFR conditions, additional allowance must be made for letdown and holding procedures. Follow the normal take-off and cruise procedures for instrument flight procedures. During take-off, use a 4° to 7° nose-up pitch attitude on the ADI to allow the aircraft to fly off the ground.

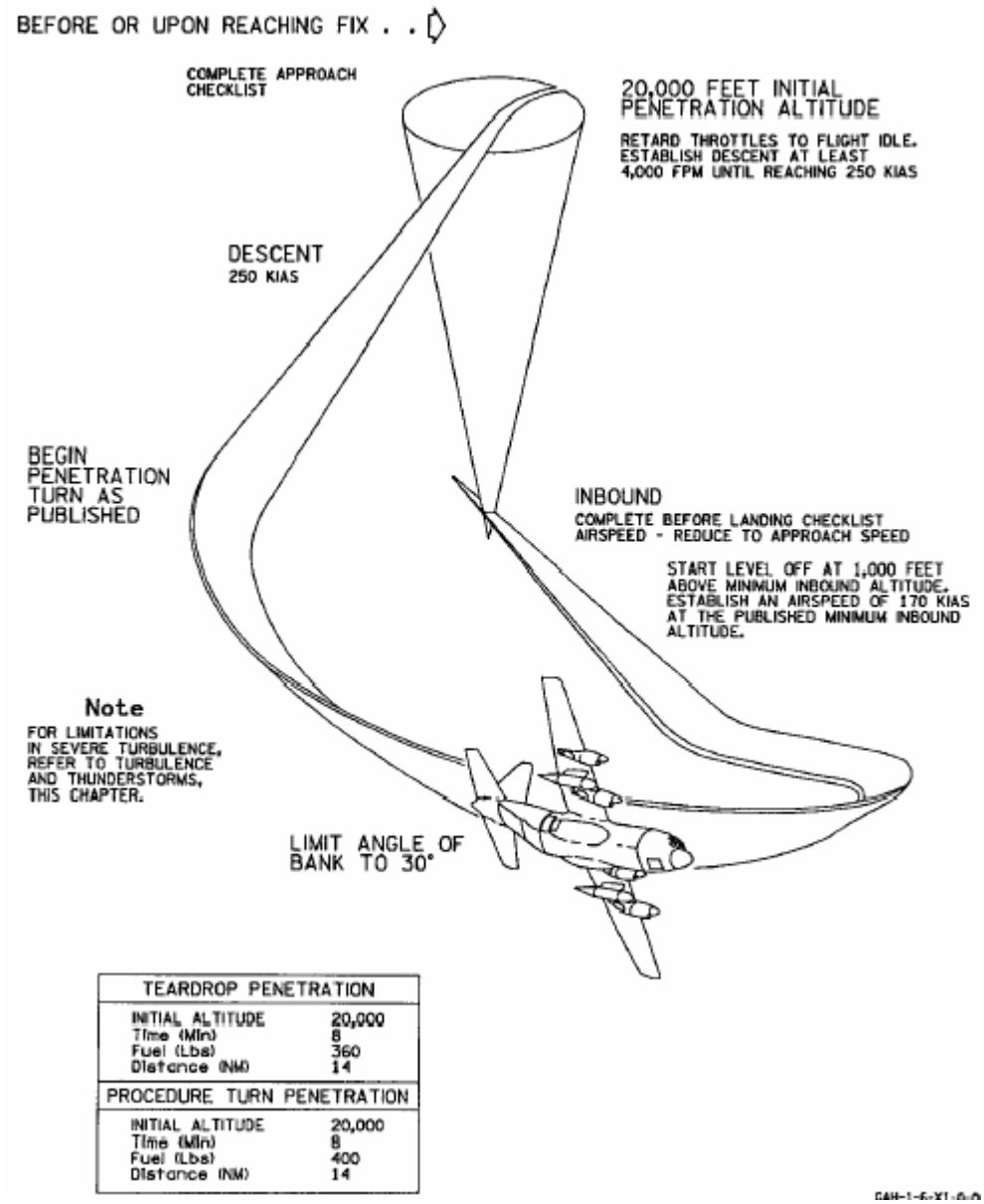
HOLDING

Conduct holding operations at 170 KIAS. If maximum endurance is required, conduct holding operations at maximum endurance airspeed plus 20 KIAS according to instructions from the airway traffic controller. This airspeed permits holding to be accomplished at a constant power setting and allows turns to be executed with little, if any, loss of airspeed. Any loss of airspeed may be regained when level flight attitude is resumed.

PENETRATIONS

Penetrations may be accomplished in this aircraft, making certain that the current airspeed limitations are adhered to. Handling characteristics are very good and pitch attitude is not extreme.

TYPICAL PENETRATION



TEARDROP PENETRATION	
INITIAL ALTITUDE	20,000
Time (Min)	8
Fuel (Lbs)	360
Distance (NM)	14
PROCEDURE TURN PENETRATION	
INITIAL ALTITUDE	20,000
Time (Min)	8
Fuel (Lbs)	400
Distance (NM)	14

The recommended procedure is as follows:

1. Before or upon reaching fix, complete the Approach checklist.

2. Begin the penetration at holding airspeed from the appropriate radio fix, in the clean configuration, by retarding throttles to FLIGHT IDLE and smoothly establish descent at least 4,000 fpm until reaching the penetration airspeed.

Note

During penetration, turbulence may be encountered without warning.

3. Follow the published penetration procedure.

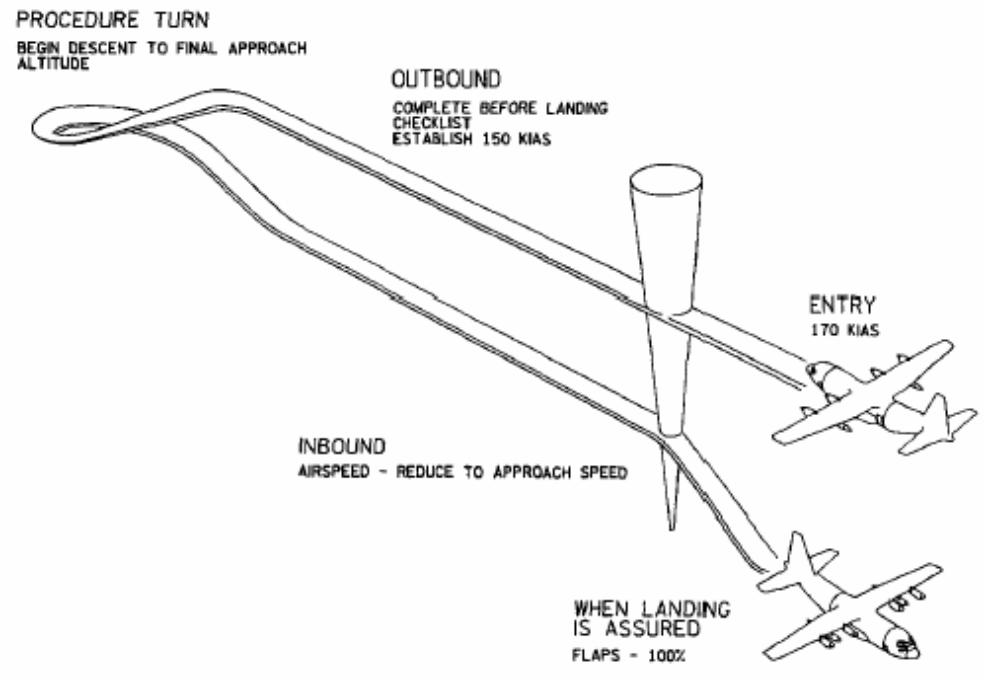
4. Start level-off 1,000 feet above the published minimum inbound altitude, and establish an airspeed of 170 KIAS.

5. Complete the Before Landing checklist prior to reaching the fix. Allow the airspeed to decrease to approach speed and execute an approach.

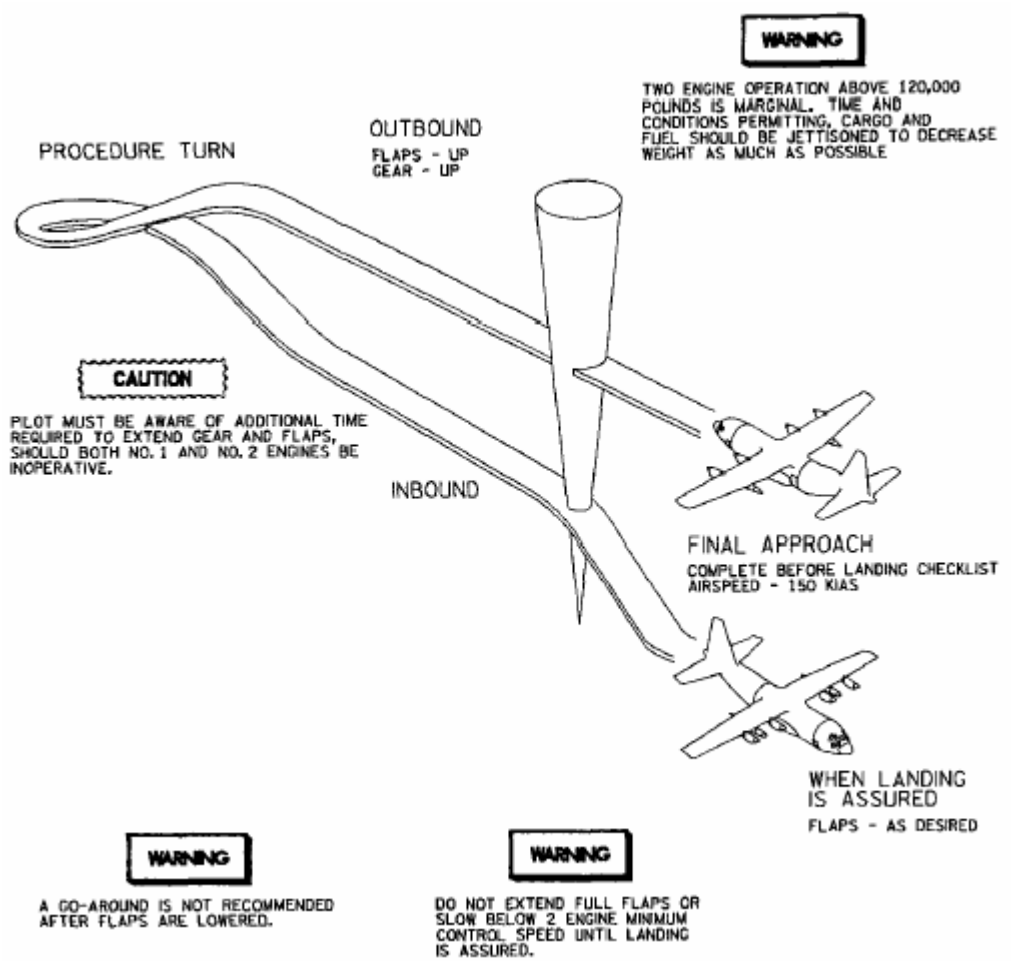
INSTRUMENT APPROACHES

All conventional systems of instrument approach may be used. Flight characteristics during instrument approaches do not differ from those encountered during normal visual flight. Normally, 170 knots IAS is used for entry. Airspeed after the Before Landing checklist is initiated will be commensurate with the approach and aircraft gross weight. Do not reduce to approach airspeed until on final approach to the station or fix.

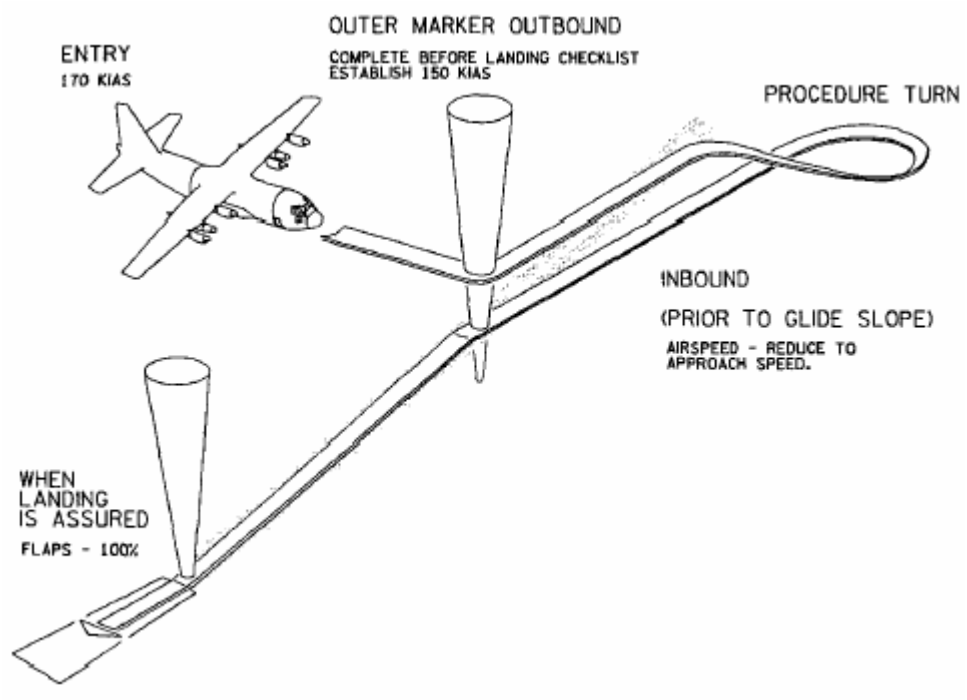
TYPICAL INSTRUMENT APPROACH - FOUR OR THREE ENGINES - NDB, VOR, OR RANGE PROCEDURES



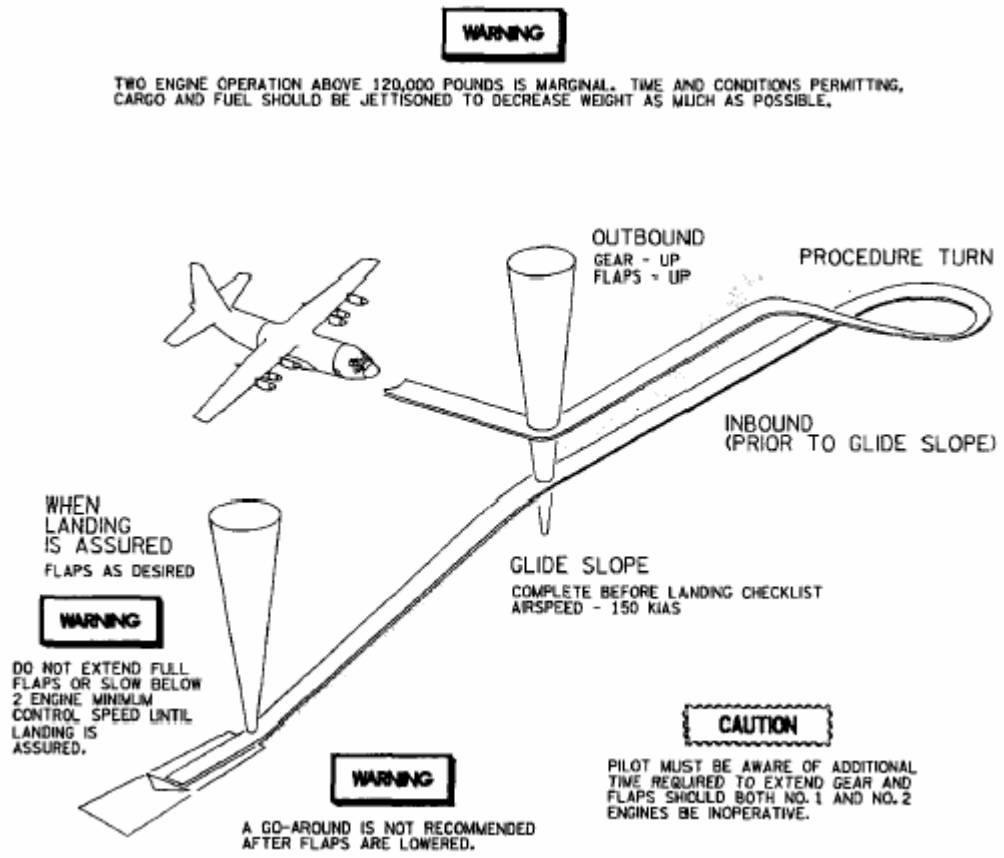
TYPICAL INSTRUMENT APPROACH -TWO ENGINES - NDB, VOR OR RANGE PROCEDURES



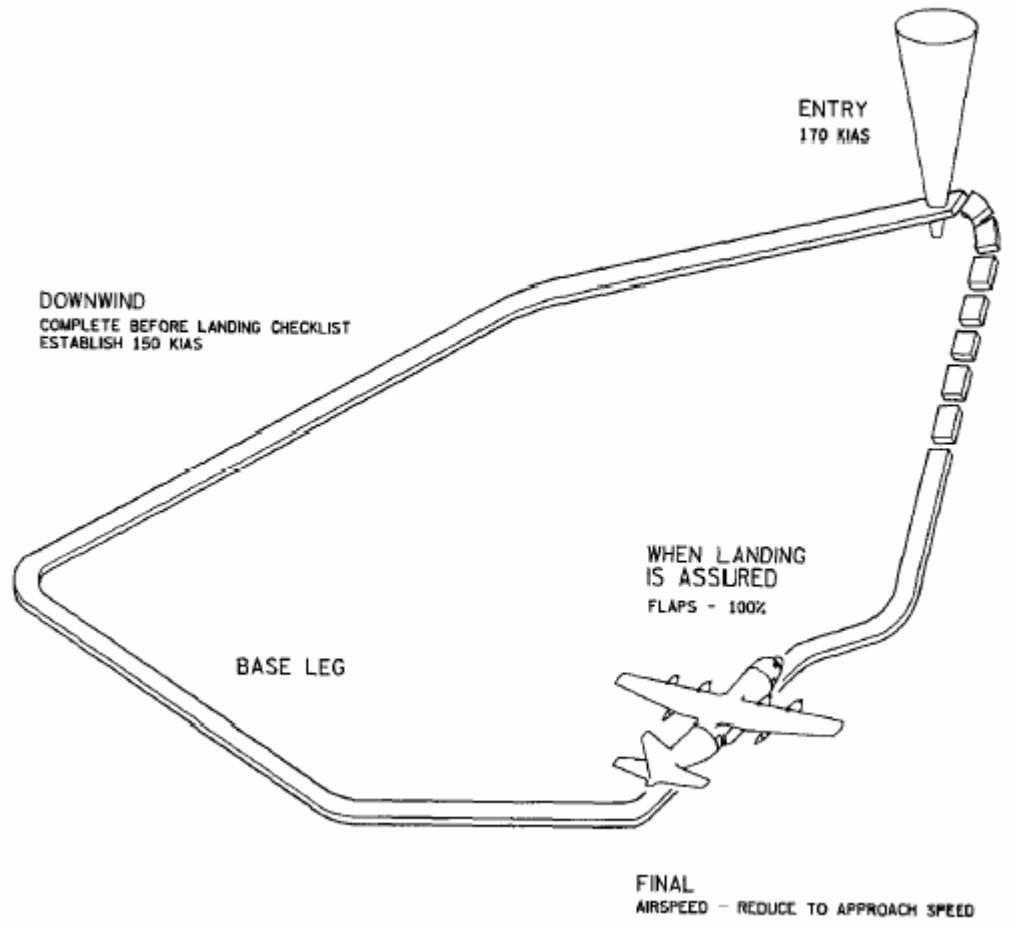
TYPICAL ILS - FOUR OR THREE ENGINES



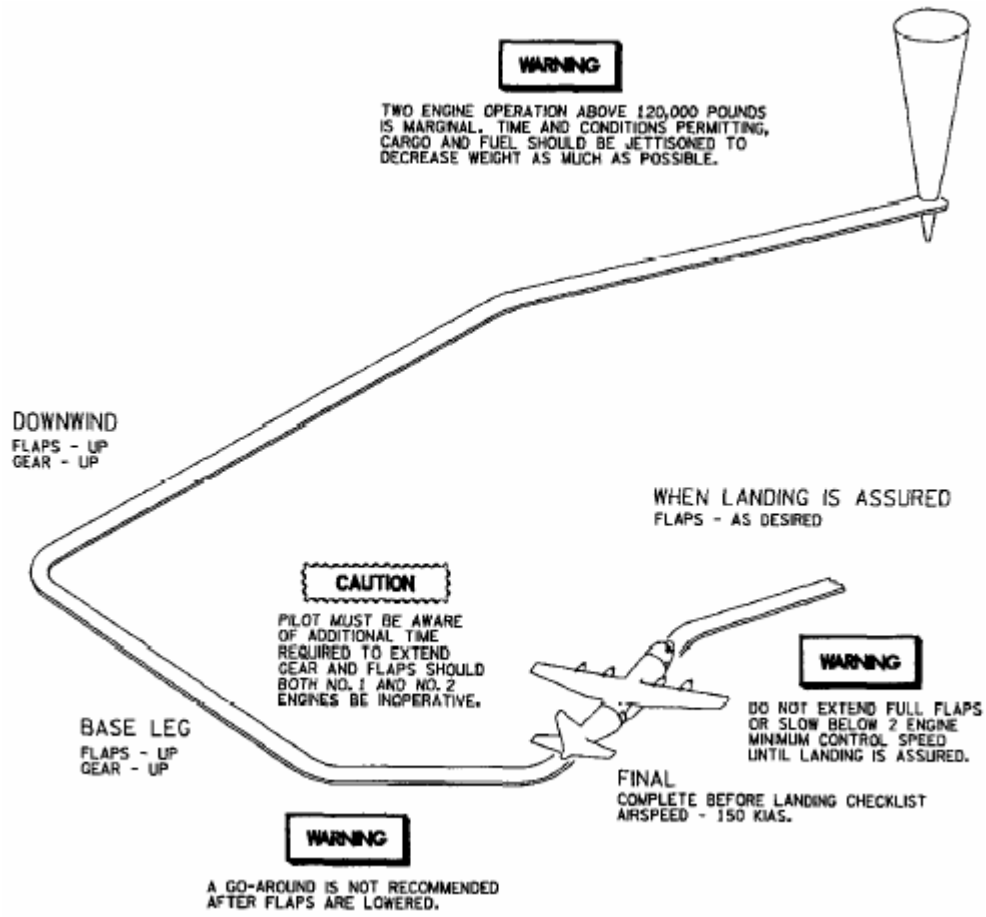
TYPICAL ILS - TWO ENGINES



TYPICAL RADAR APPROACH PATTERN - FOUR OR THREE ENGINES

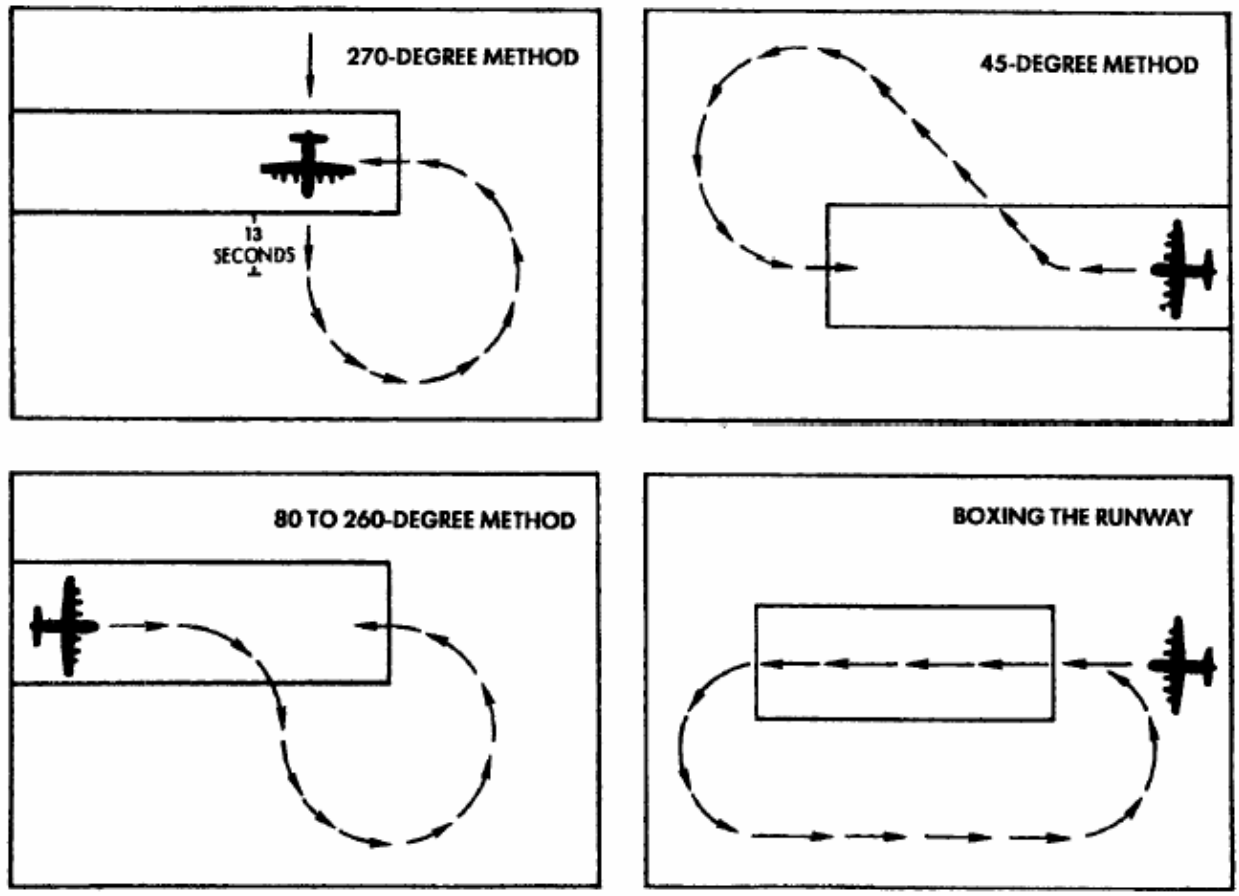


TYPICAL RADAR APPROACH PATTERN - TWO ENGINES



CIRCLING APPROACH

In the event it becomes necessary to make a circling approach to align the aircraft with the runway, maintain 150 KIAS or computed approach speed, whichever is higher, until intercepting a normal landing profile. When on final approach, select the desired final flap setting and proceed with a normal landing, one of the following runway offset methods may be used:



1. 270° METHOD: The 270° method may be used when it is practical to cross the runway at 90° from the low approach course of the aircraft. The runway is crossed at a 90° angle. Fly this heading for approximately 13 seconds, then make a standard rate turn to the runway heading.

2. 450° METHOD: The 45° method consists of a standard rate turn to a heading 45° from the downwind heading for 40 seconds and then make a standard rate turn to the runway heading.

3. 80° to 260° METHOD: The 80° to 260° method consists of a standard rate turn of 80° from the downwind heading, rolling out of this turn and into a standard rate turn to the runway heading.

4. BOXING RUNWAY METHOD: Boxing the runway is basically a closed traffic pattern made by flying down the runway, making a standard 180° turn, and then another 180° turn to the runway heading.

ICE AND RAIN

Avoid icing conditions whenever possible. The biggest danger caused by ice accumulation is the reduced aerodynamic efficiency of the aircraft. Increased drag and diminished lift because of airfoil deformation and loss of thrust because of lowered propeller efficiency and engine power are typical results. Specifically, ice accumulation may have the following effects:

1. Increased lift-off speed and increased stalling speed. Higher take-off, landing, and minimum flight speeds are then required.

2. Reduced rate-of-climb ability of the aircraft.

3. Increase power requirement, causing increased fuel consumption and decreasing range and endurance.

4. Impaired control response.

5. Reduced engine power caused by obstruction of engine inlet air duct.

If cruise must be made in icing conditions, consideration must be given to the effect of using bleed air from the engines for anti-icing system. Use of bleed air for anti-icing will reduce speed, and thus range, for any power setting. Meanwhile, it is recommended that altitude be changed, when possible, until icing no longer occurs. If climbing to a non-icing altitude is not possible, a check of fuel flow versus groundspeed should be made to determine if range or radius of action will complete the mission. Although the leading edge is capable of full evaporative, continuous anti-icing, it has been found more satisfactory to use the system exclusively as a deicing system by operating it periodically to remove accumulated ice. The empennage system is exclusively an anti-icing system. Operation in this manner presents no problem with "run-back". The aircraft can penetrate icing conditions if the procedure given below is followed:

1. Select the least severe altitude, from the standpoint of icing conditions, consistent with mission objectives and the traffic or combat conditions. Consider OAT, nature of clouds, type of icing (rim, clear) anticipated or being encountered, and the duration of icing.

2. Fly with the PROP & ENGINE ANTI-ICING MASTER switch in the AUTO position.

3. Place the PROPELLER ICE CONTROL switch in the ON position.

4. Place the ENGINE INLET DUCT ANTI-ICING switch in the ON position.

Note

When icing conditions are encountered, the anti-icing system for the above operates automatically, providing steps 2 through 5 have been accomplished. When the warning icing condition ON light is illuminated, make frequent visual checks of wing leading edges.

5. Deice the wing leading edges whenever the ice appears to be 3/8 to 3/4 of an inch thick, although little performance penalty has been noted when far heavier loads of ice have teen allowed to build up. Deicing switches should be turned on until wing leading edges are clean, then turned off. This will normally require 20 seconds or less of on time. For the empennage, leave the switch on as an anti-icing system. The use of bleed air from only one or two engines is not recommended.

6. When icing conditions no longer exists, turn the PROP & ENG ANTI-ICING MASTER switch to the RESET position. When turned to the RESET position, all anti-icing systems except wing and empennage are turned off automatically. The WING and EMPENNAGE ANTI-ICING switches must be manually turned off.

CAUTION

Avoid high angles of attack during periods of transition from icing to melting conditions and/or ice shedding for the center wing section. Maintain a straight and level flightpath until all ice has been shed from the center wing section. If ice is shed from the center wing section when the aircraft is at high angles of attack, it is very likely the shedding ice will strike the horizontal stabilizer and possibly cause extensive damage to the stabilizer leading edge.

7. Delay extension of flaps and landing gear until absolutely necessary (e.g., until the aircraft gear). Move the MAIN LANDING GEAR DRIVE switch to HI-TORQUE before attempting to lower the landing gear. While flying through icing conditions, watch the leading edge anti-icing current indicators to make certain that the anti-icing equipment is working properly. Make frequent visual checks of wing leading edges,

engine inlet air duct leading edges, and propellers in the landing pattern. This will help to avoid excessive ice accumulation on the flaps and landing spinners. If leading edge anti-icing/deicing is seen to be inadequate for preventing ice accumulation, seek a less severe icing level.

WARNING

If possible avoid prolonged flight in freezing rain, particularly at low airspeeds with corresponding higher angles of attack, as there is a possibility of ice accretion on the upper inside surface of the engine inlet air ducts and other areas that are not normally exposed and that are not anti-iced. Ice may accumulate on areas of the wing that are not anti-iced in quantities sufficient to cause loss of control.

CLEAR AIR ICING

Engine inlet air duct icing in clear ah is possible in some combinations of temperature and humidity, depending on the engine power setting and the airspeed. This icing is caused by the sudden drop in temperature resulting from pressure loss in the engine inlet air duct. Such icing is indicated to the pilot by a falling torquemeter indication. If torquemeter indication falls for no apparent mason, assume that engine inlet air duct icing is occurring. Turn the PROP & ENG ANTI-ICING MASTER switch to the MANUAL position, and place the ENGINE INLET AIR DUCT ANTI-ICING switch in the ON position. If falling torquemeter indication is observed, take the following action immediately.

1. Increase airspeed to the maximum consistent with continuous operation, to increase ram pressure in the air duct.

2. Seek an altitude that is less likely to produce air duct icing.

RAIN

Rain has no adverse aerodynamic effect on the aircraft. At cruise speeds, however, visibility through the windshields will be reduced by streaking as the windshield wipers are ineffective at speeds above 180 KIAS.

TURBULENCE AND THUNDERSTORMS

Rain has no appreciable aerodynamic effects on the aircraft. At cruise speeds, however, visibility through the windshields will be reduced by streaking as the windshield wipers are ineffective at speeds above approximately 180 KIAS.

Flying under conditions of extreme turbulence, such as through thunderstorms, must be avoided whenever possible. When flying under conditions of low visibility, clear passage around or between thunderstorms can usually be found with the navigation and search radar. The possibility remains, however, that a storm cannot be dodged, or that flight through storm may be a matter of military necessity.

WARNING

Flight through thunderstorms or other conditions of extreme turbulence should be avoided whenever possible.

Recommended airspeed for penetration into thunderstorms is 65 knots above power-off stall speed, not to exceed 180 KIAS.

Note

The autopilot may be used and, in some cases, is desirable. The altitude hold mode should be disengauged and the autopilot not assisted or overpowered in the autopilot mode. If autopilot cannot control attitude, disengauge and fly manually.

DESERT PROCEDURES

Desert operation generally means operation in a very hot, dry, dusty, often windy atmosphere. Under such conditions, sand and dust will often be found in vital areas of the aircraft, such as hinge points, bearings, landing gear shock struts, and engine cowling and intakes. Severe damage to the affected parts may be caused by the dust and sand. Position the aircraft so that propwash will not expose other aircraft, personnel, and ground equipment to blown sand or dust. The necessary operations under such conditions are given in the following paragraphs.

BEFORE ENTERING THE AIRCRAFT

Perform a normal preflight inspection. Give special attention to the following:

1. Cool the flight station and special equipment compartments with portable coolers, if available.

Note

Use of the GTC for ground air conditioning may pull in quantities of sand and dust.

2. Inspect all control surface hinge and actuating linkage for freedom of sand and dust.
3. Inspect tires for proper inflation.
4. Inspect shock struts for cleanliness. Remove all protective covers and shields.

BEFORE STARTING ENGINES

Continue the normal preflight inspection of the aircraft. Give special attention to the following:

1. Inspect instrument panels, switches, and controls for freedom of sand and dust.
2. Operate all controls through at least two full cycles to ensure unrestricted operation.

TAXIING INSTRUCTIONS

Taxi the using care to avoid blowing sand or dust on other aircraft, personnel, or equipment. Use brakes as little as possible, to prevent overheating. The use of reverse thrust may blow sand and dust into the air directly in front of the engine intakes. In deep sand, use differential power, rather than nose wheel steering, for directional control. Minimize ground operation to avoid excessive sand and dust intake by the engines.

TAKE-OFF

Execute normal take-off and climb. Avoid take-off during sand or dust storms. if possible. Sand and dust will cause damage to internal engine parts. Take-off run is considerably increased and rate of climb decreased in high atmospheric temperatures. Refer to the appropriate performance charts.

Note

When take-off performance is not critical, use rolling take-off whenever possible in order to decrease time in adverse conditions.

CRUISE

Follow normal procedures for the operation of the aircraft. Avoid flying through dust or sand storms, when possible. Excessive dust and grit in the air will cause considerable damage to internal engine parts.

LANDING

Execute a normal approach and landing. Therefore, on very hot days, follow traffic and landing procedures strictly, and anticipate a longer landing roll. Avoid the use of reverse thrust, since reverse thrust may blow sand and dust into the air directly in front of the engine intakes.

STOPPING ENGINES

Make normal engine shutdown. As soon as the aircraft is parked, chock the wheels and release the brakes to avoid damage to brake components due to excessive heat generated while taxiing.

BEFORE LEAVING THE AIRCRAFT

Make a normal Before Leaving the Aircraft inspection, giving special attention to the following:

1. Have all protective covers and shields installed.

2. Except in dust or rainy weather, leave flight station windows and compartment doors open to ventilate the aircraft.

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