PARTIAL
FLIGHT MANUAL

USAF SERIES
C-130E
AIRCRAFT
(AN/APN-169A)

(F33657-68-C-1271)

THIS PUBLICATION INCORPORATES SAFETY SUPPLEMENTS T.O. 1C-130B-1SS-77 and -82.

SEE TECHNICAL ORDER INDEX T.O. 0-1-1-3 AND ITS SUPPLEMENTS FOR CURRENT STATUS OF FLIGHT MANUALS, SAFETY SUPPLEMENTS, OPERATIONAL SUPPLEMENTS, AND FLIGHT CREW CHECKLISTS.

THIS PUBLICATION IS INCOMPLETE WITHOUT T.O. 1C-130B-1 DATED 8 JULY 1969.

COMMANDERS ARE RESPONSIBLE FOR BRINGING THIS PUBLICATION TO THE ATTENTION OF ALL AIR FORCE PERSONNEL CLEARED FOR OPERATION OF SUBJECT AIRCRAFT.

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USAF

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FOREWORD

This partial flight manual has been prepared to include the information necessary for safe and efficient operation of the C-130E airplanes which have been modified to include the AN/APN-169A Intraformation Positioning Set; which is commonly known as the stationkeeper or SKE. This partial manual is incomplete without T.O. 1C-130B-1.

Differences in equipment and in operating techniques and procedures peculiar to this version of the C-130E airplane are included in this partial manual. Those phases of the airplane and equipment operation that are common both to the SKE-modified airplane and the basic cargo-troop carrying version are included in T.O. 1C-130B-1.

This partial manual is divided into 9 sections arranged in the same sequence as presented in T.O. 1C-130B-1. Each section of the partial manual clearly indicates which portions of T.O. 1C-130B-1 are applicable to the SKE-modified airplanes.

SECTION I

Description

Table of Contents

THE AIRPLANE.

All except the following is contained in T.O. 1C-130B-1.

MAIN DIFFERENCES.

Figure 1-1, main difference table, shows the differences between the airplanes before and after modification.

ELECTRICAL POWER SUPPLY SYSTEM.

All except the following is contained in T.O. 1C-130B-1.

The only changes in the electrical system are in the power distribution from both the ac and dc buses that supply power to Intraformation Positioning Set AN/APN-169A (SKE). (See figures 1-4 and 1-5 for power distribution and figures 1-6 through 1-8 for circuit breaker locations.)

INSTRUMENTS.

All except the following is contained in T.O. 1C-130B-1.

New instruments that have been added at the flight station are part of a system and are discussed in Section IV.

PITOT-STATIC INSTRUMENTS.

Altimeter-Encoder AAU-21/A.

The AAU-21/A altimeter-encoder is a mechanical pressure altimeter that provides a visual display of altitude and also provides a digital input, representing altitude, to the AN/APN-169A receiver/transmitter. The altimeter-encoder employs a counter-drum-pointer type altitude display, has a barometric setting system (displayed by a four-digit counter), has integral lighting, and a servo-driven encoder. The range of the altimeter-encoder is from −1000 to +38,000 feet. This unit is mounted in the navigation instrument panel and is connected to the static tubing on the right side of the airplane. The altimeter-encoder is supplied 115-volt, 400-cycle power from the main ac bus through the ALTM ENCDR circuit breaker on the copilot's upper circuit breaker panel. 28 volt dc is supplied from the main dc bus through the ALT ENCDR circuit breaker on the copilot's lower circuit breaker panel. An ac power loss exceeding 3 seconds duration will cause a red CODE OFF warning flag to appear in a window on the altimeter scale.

MISCELLANEOUS INSTRUMENTS.

Free Air Temperature Indicators.

The copilot's free air temperature gage has been moved to the pilot's instrumentation panel (20, figure 1-10).

Accelerometer

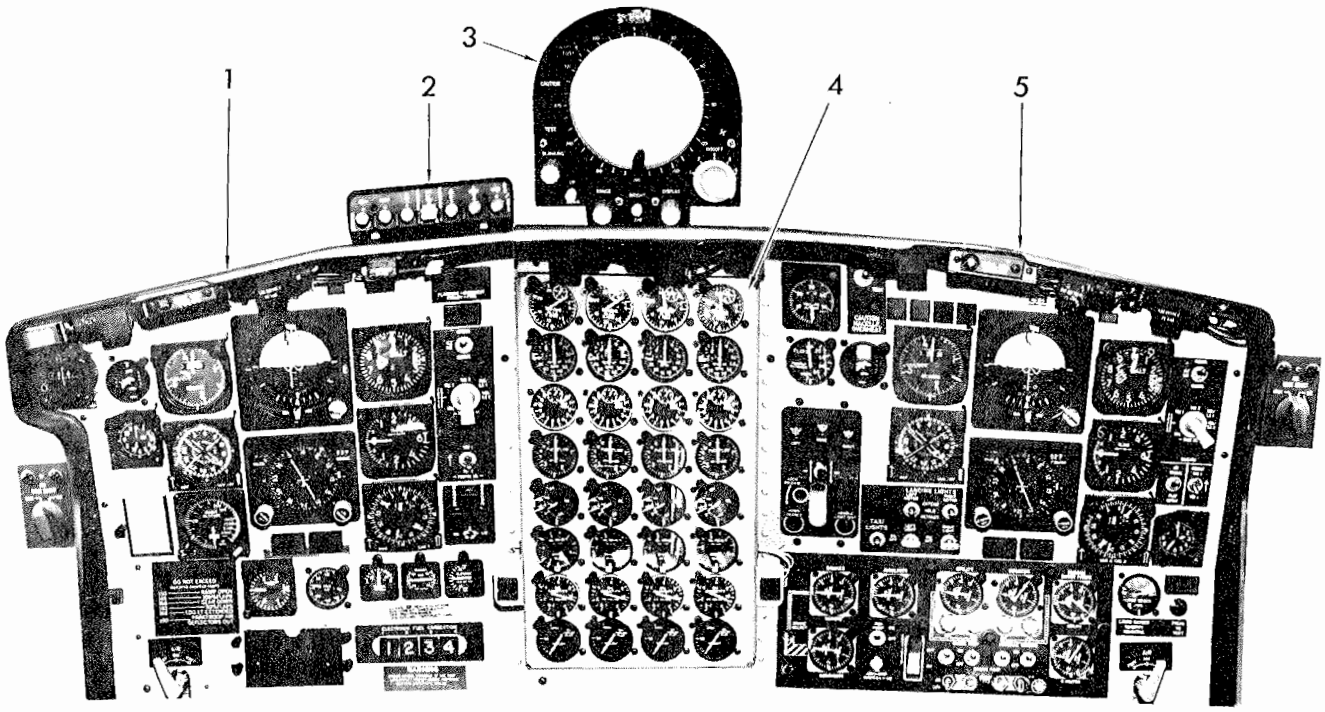
The accelerometer has been moved from the upper left corner to the bottom center of the pilot's instrument panel (22, figure 1-10).

Main Differences Table

BASIC AIRPLANE	STATIONKEEPING AIRPLANE
	AN/APN-169A Stationkeeping Electronics
AAU-8/A Altimeter	AAU-21/A Altimeter-encoder

Figure 1-1

Main Instrument Panel (Typical)

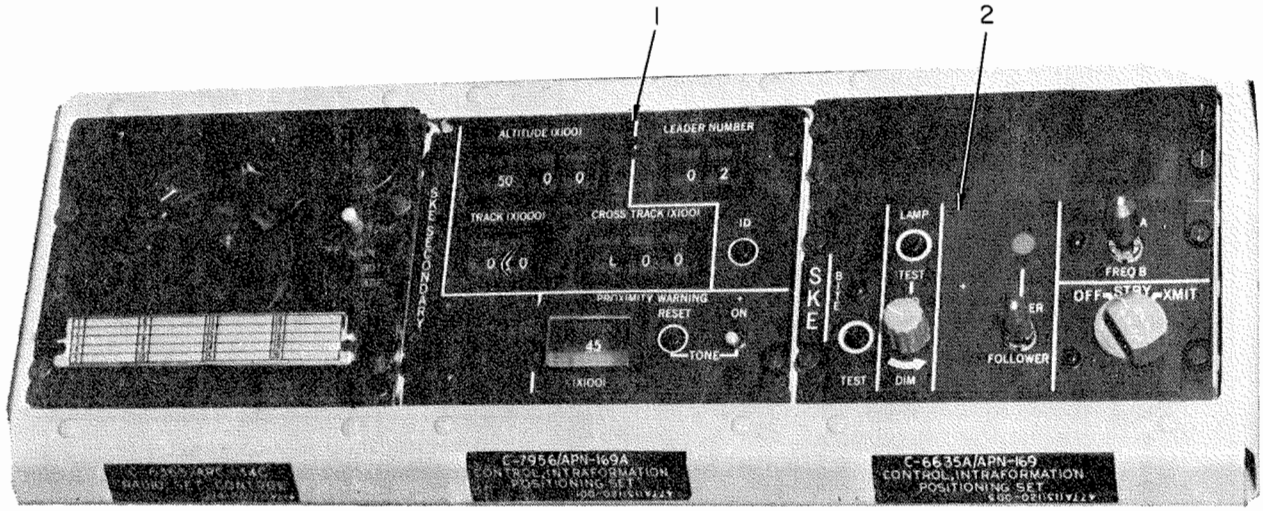


1. PILOT'S INSTRUMENT PANEL
2. FLIGHT COMMAND INDICATOR
3. PILOT'S RADAR STATIONKEEPER INDICATOR
4. ENGINE INSTRUMENT PANEL
5. COPILOT'S INSTRUMENT PANEL

546-1-1

Figure 1-2

Copilot's UHF Control Shelf



1. SKE SECONDARY CONTROL
2. SKE PRIMARY CONTROL

Figure 1-3

DC Power Distribution

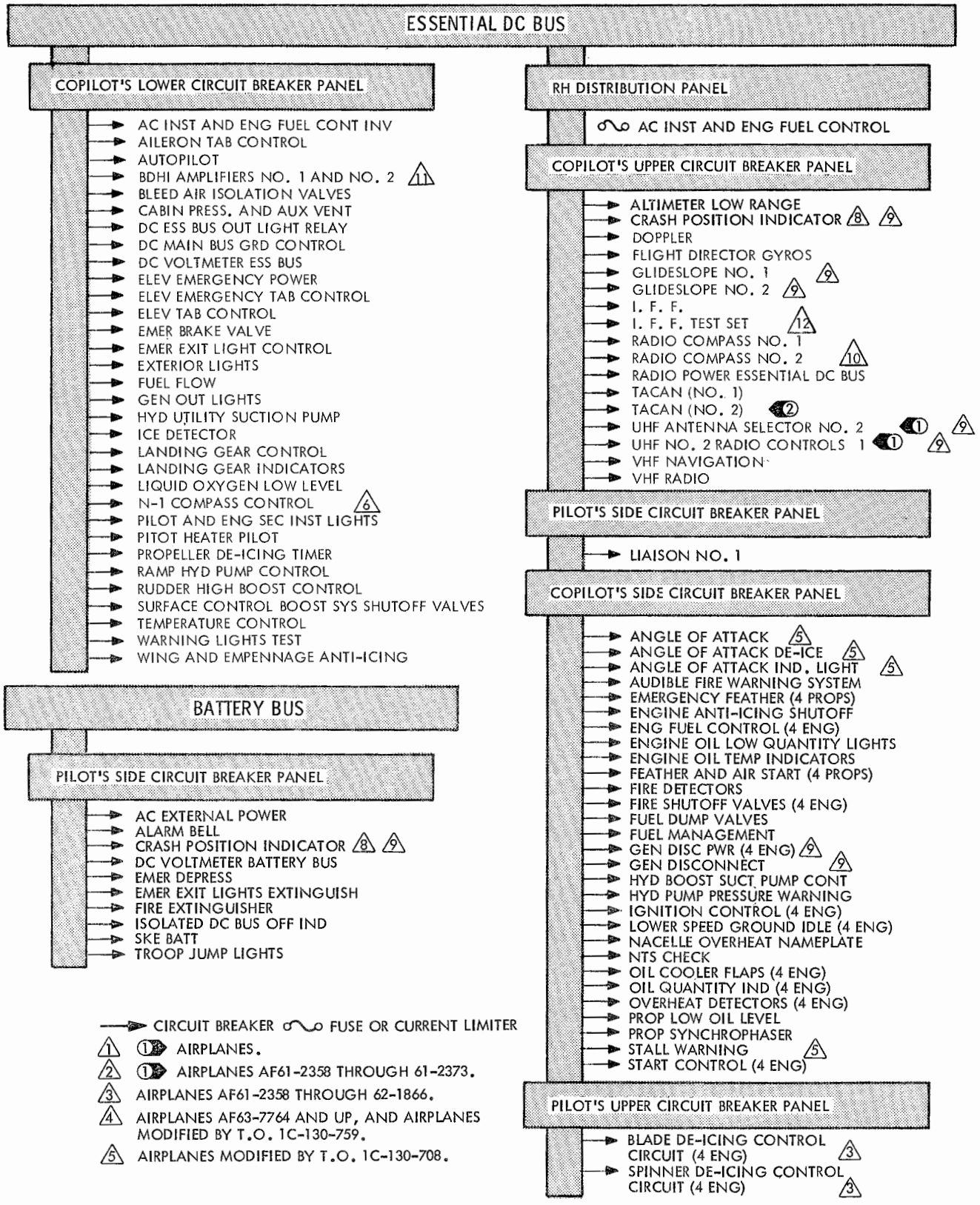
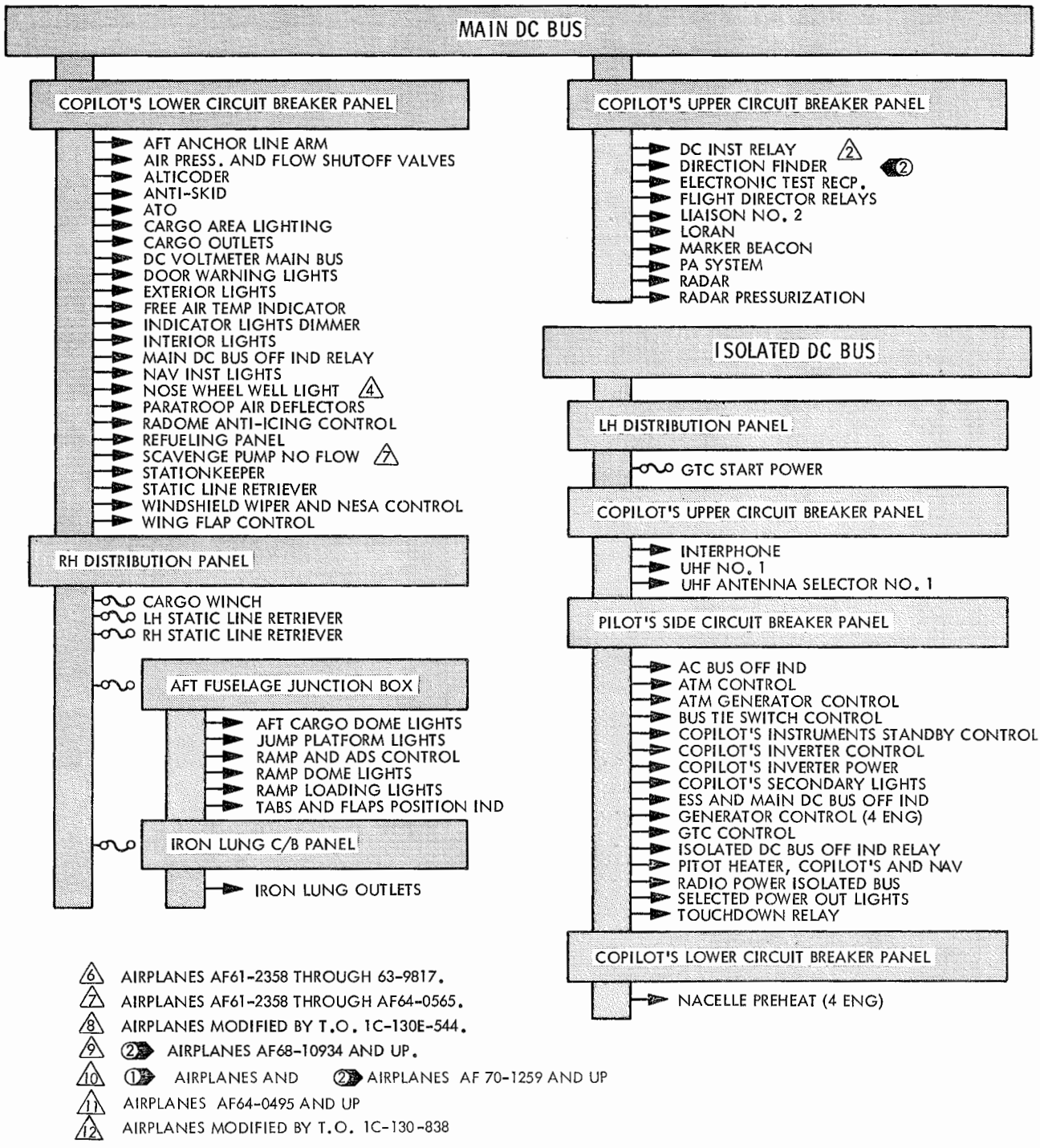


Figure 1-4. (Sheet 1 of 2)

DC Power Distribution (Cont)

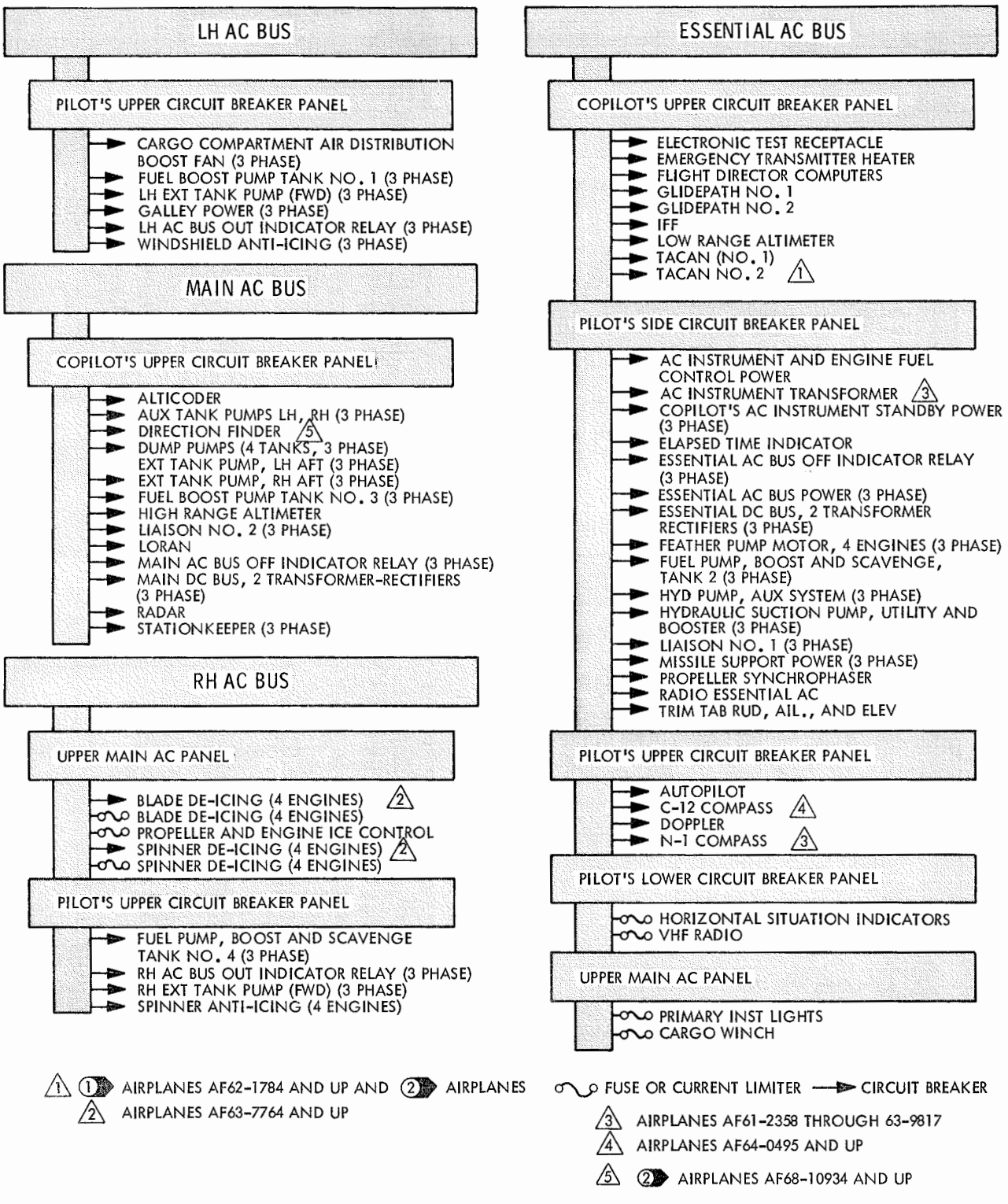


6 AIRPLANES AF61-2358 THROUGH 63-9817.
7 AIRPLANES AF61-2358 THROUGH AF64-0565.
8 AIRPLANES MODIFIED BY T.O. 1C-130E-544.
9 2 AIRPLANES AF68-10934 AND UP.
10 1 AIRPLANES AND 2 AIRPLANES AF 70-1259 AND UP
11 AIRPLANES AF64-0495 AND UP
12 AIRPLANES MODIFIED BY T.O. 1C-130-838

546-1-3 (2) A

Figure 1-4 (Sheet 2 of 2)

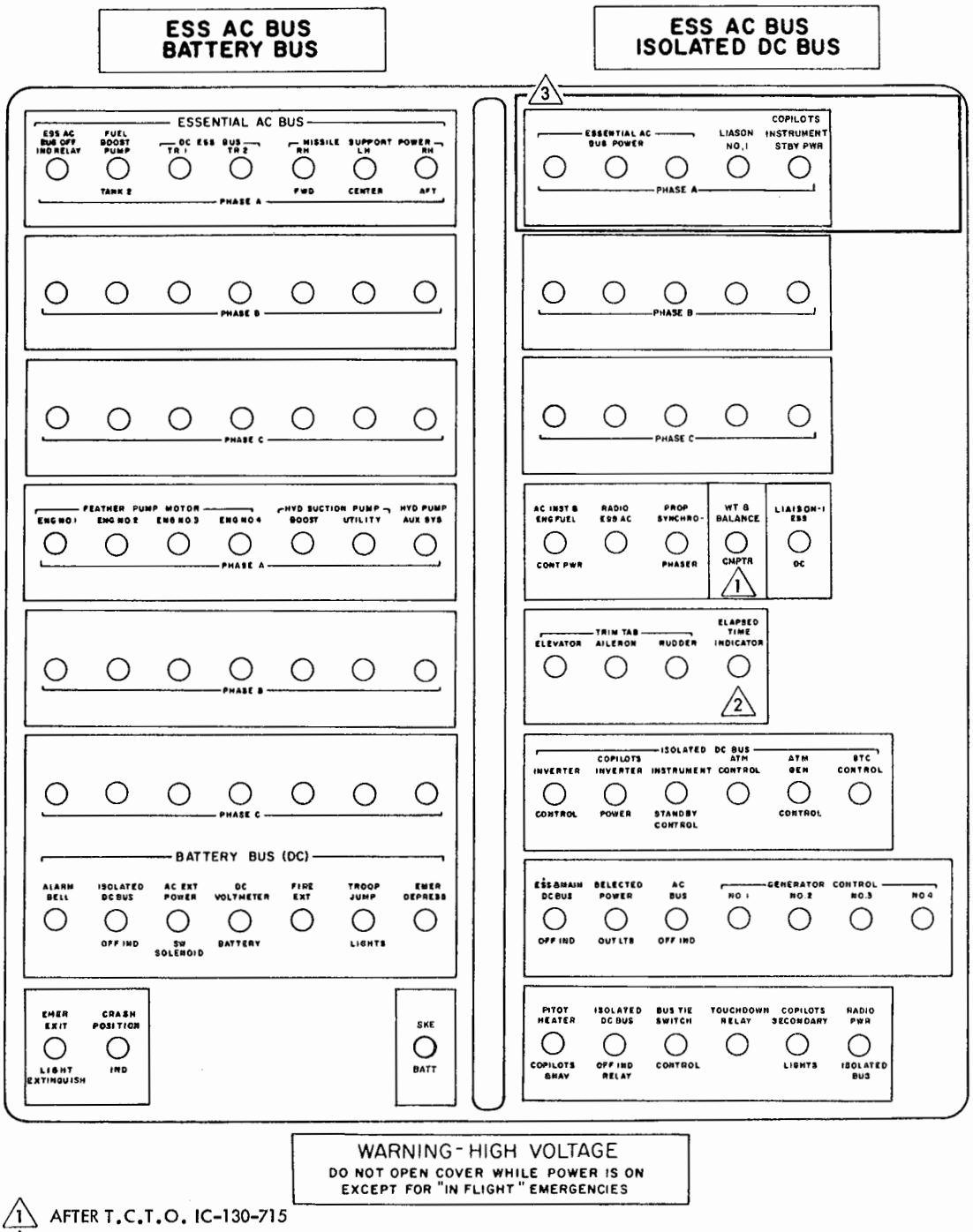
AC Power Distribution



546-1-4

Figure 1-5

Pilot's Side Circuit Breaker Panel



WARNING - HIGH VOLTAGE
DO NOT OPEN COVER WHILE POWER IS ON
EXCEPT FOR "IN FLIGHT" EMERGENCIES

1 AFTER T.C.T.O. IC-130-715

2 ON AIRPLANES AF61-2358 THROUGH 63-7893, ONLY.

3 AF64-495 AND UP AS SHOWN. ALL OTHERS IDENTIFIED AS BELOW (AFTER T.C.T.O. IC-130E-546).

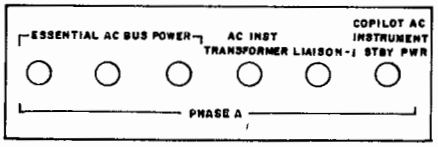
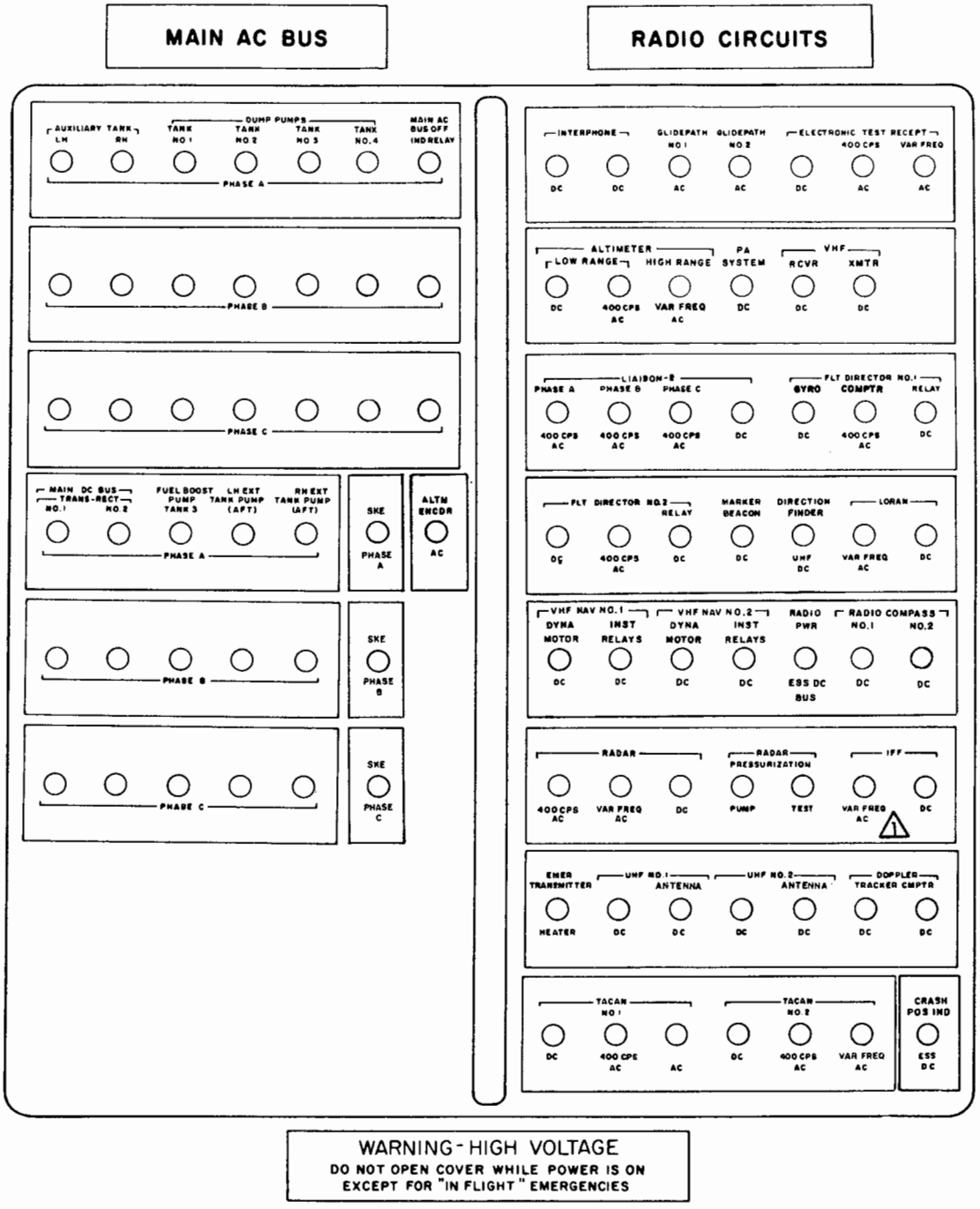


Figure 1-6

Copilot's Upper Circuit Breaker Panel

(C-130E AIRPLANES AF62-1784 THROUGH 64-18240)

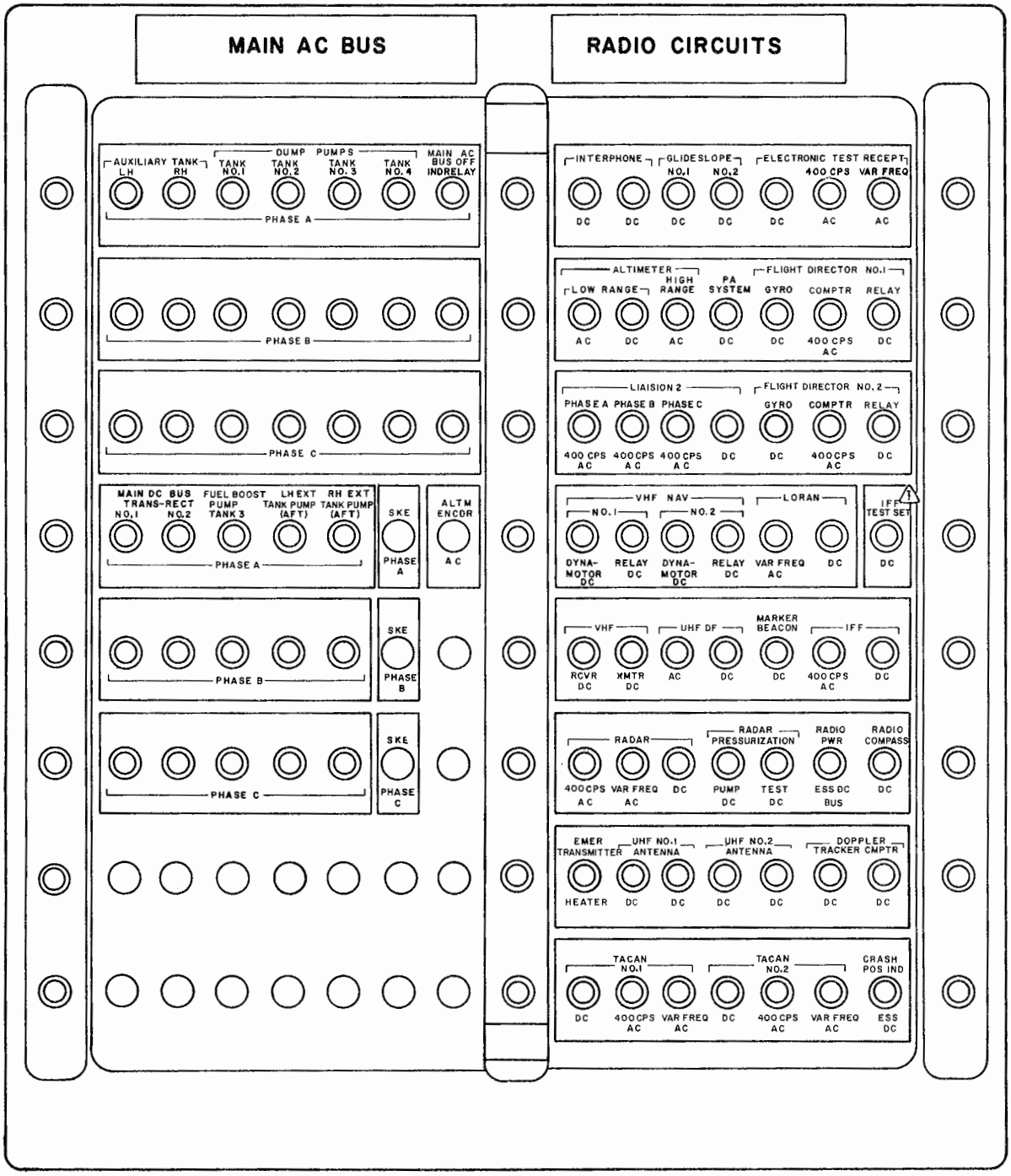


⚠1 ON AIRPLANES MODIFIED BY T.O. 1C-130-838, CIRCUIT BREAKER IDENTIFIED AS IFF 400 CPS AC. THIS ALSO INVOLVES ADDITION OF CIRCUIT BREAKER IDENTIFIED AS IFF TEST SET DC, WHOSE LOCATION WILL VARY

Figure 1-7. (Sheet 1 of 3)

Copilot's Upper Circuit Breaker Panel (Cont)

(C-130E AIRPLANES AF68-10934 THROUGH 69-6583)

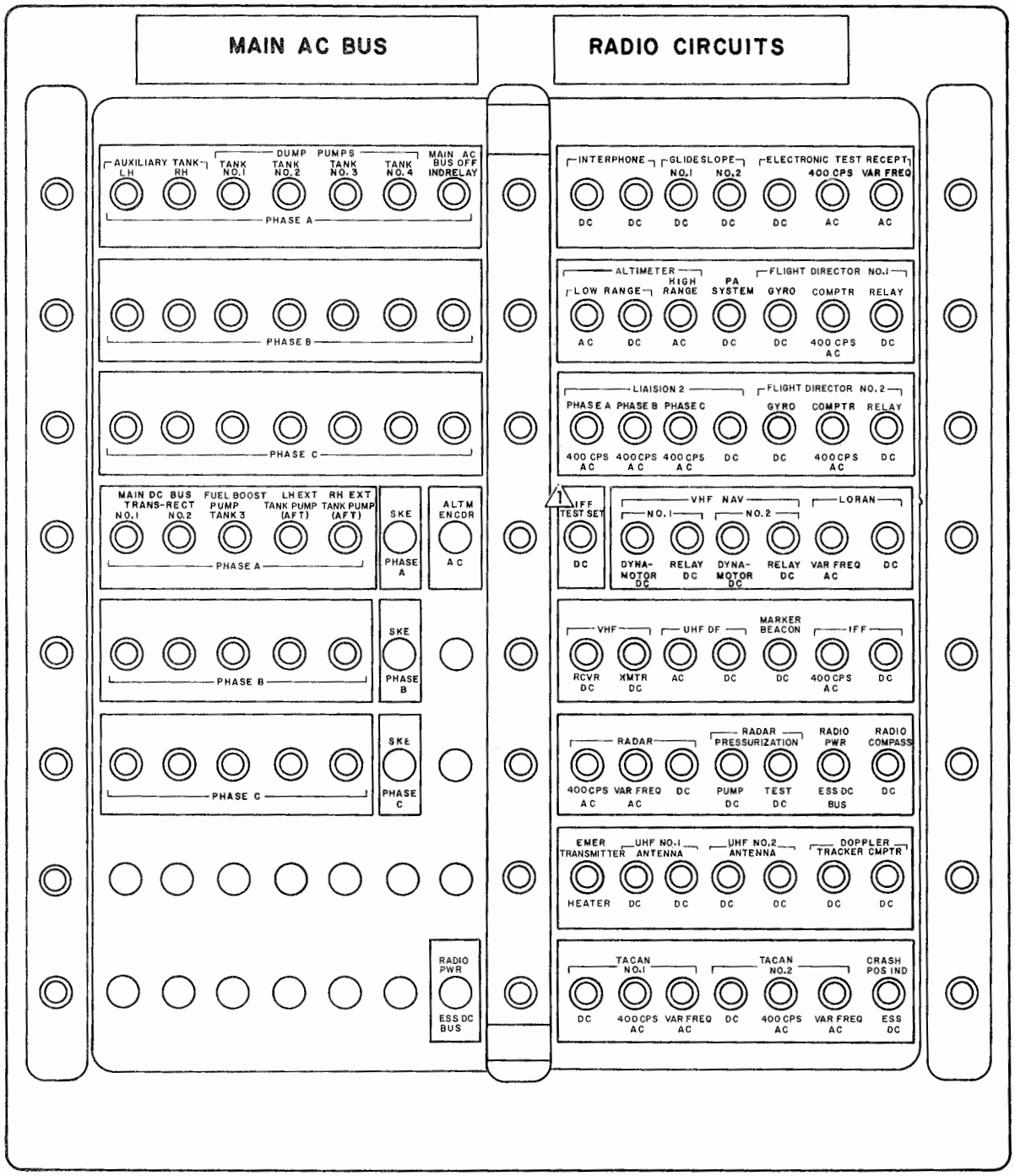


⚠ APPLICABLE ON AIRPLANES MODIFIED BY T.O. 1C-130-838
IFF TEST SET CIRCUIT BREAKER LOCATION WILL VARY ON SOME AIRPLANES

Figure 1-7. (Sheet 3 of 3)

Copilot's Upper Circuit Breaker Panel (Cont)

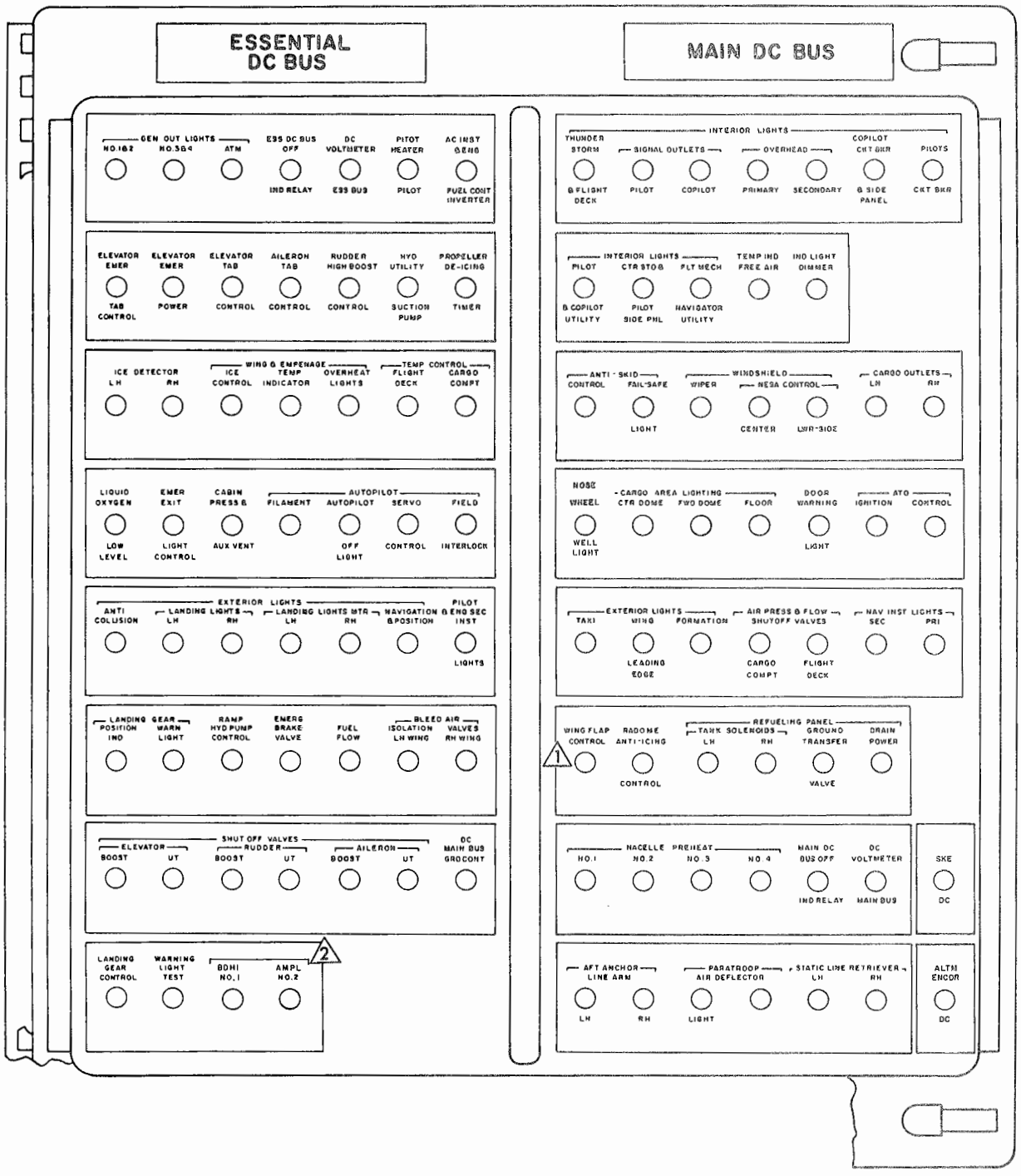
(C-130E AIRPLANES AF 70-1259 AND UP)



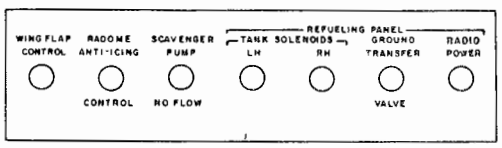
⚠1 AIRPLANES MODIFIED BY T.O. 1C-130-838

Figure 1-7. (Sheet 2 of 3)

Copilot's Lower Circuit Breaker Panel



1 AF61-2358 THROUGH 64-565 AND 64-569 CIRCUIT BREAKERS IDENTIFIED AS



2 AF64-495 AND UP AS SHOWN. ALL OTHERS IDENTIFIED AS

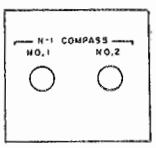
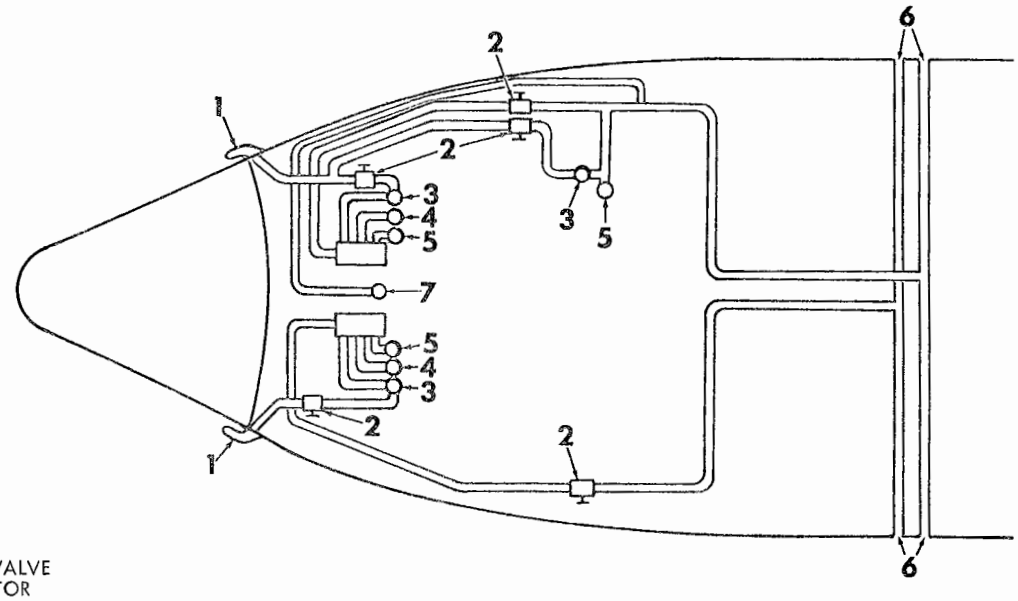


Figure 1-8

Pitot Static System

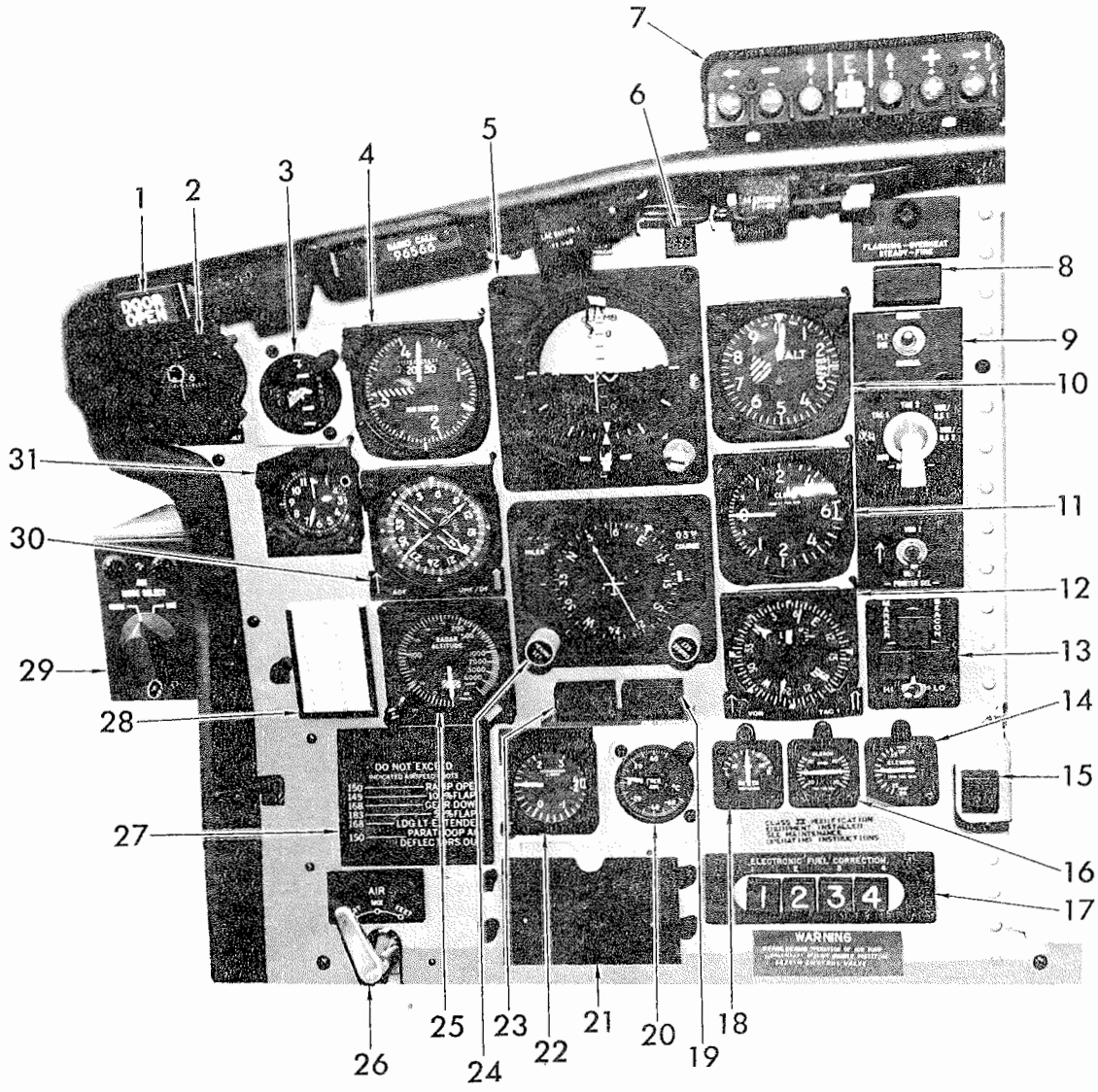


1. PITOT HEAD
2. MANUAL DRAIN VALVE
3. AIRSPEED INDICATOR
4. VERTICAL VELOCITY INDICATOR
5. ALTIMETER / ENCODER
6. STATIC PORTS
7. DIFFERENTIAL PRESSURE INDICATOR

546-1-10

Figure 1-9

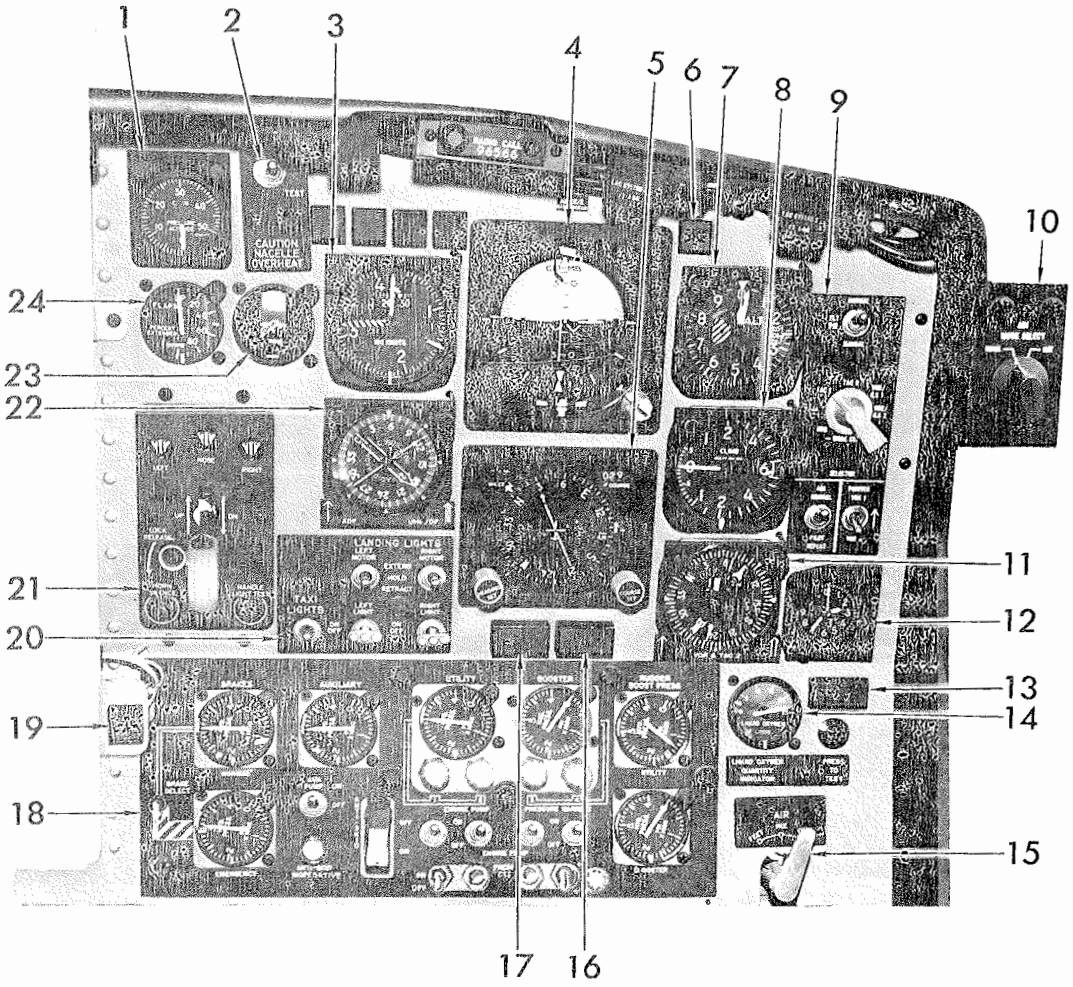
Pilot's Instrument Panel (Typical)



1. DOOR OPEN WARNING LIGHT
2. MAGNETIC COMPASS
3. RANGE INDICATOR
4. AIRSPEED INDICATOR
5. ATTITUDE DIRECTOR INDICATOR
6. SKE ON LIGHT
7. FLIGHT COMMAND INDICATOR
8. MASTER FIRE WARNING LIGHT
9. RADIO INSTRUMENTS SELECTOR PANEL
10. ALTIMETER
11. VERTICAL VELOCITY INDICATOR
12. BEARING DISTANCE HEADING INDICATOR (VOR, TAC 1)
13. MARKER BEACON CONTROL PANEL
14. ELEVATOR TAB POSITION INDICATOR
15. ENGINE LOW OIL QUANTITY WARNING LIGHT
16. AILERON TAB POSITION INDICATOR
17. ELECTRONIC FUEL CORRECTION PANEL
18. RUDDER TAB POSITION INDICATOR
19. BEAM COUPLER OFF LIGHT
20. FREE AIR TEMPERATURE INDICATOR
21. APPROACH SPEED PLACARD
22. ACCELEROMETER
23. AUTOPILOT OFF LIGHT
24. HORIZONTAL SITUATION INDICATOR
25. RADAR ALTIMETER
26. AIR DIVERTER
27. AIRSPEED LIMITATIONS PLACARD
28. MAGNETIC COMPASS CORRECTION CARD HOLDER
29. ADI MODE SELECTOR SWITCH
30. RADIO MAGNETIC INDICATOR (VOR 1, VOR 2/TAC)
31. CLOCK

Figure 1-10

Copilot's Instrument Panel (Typical)



1. CABIN ALTIMETER
2. NACELLE OVERHEAT WARNING PANEL
3. AIRSPEED INDICATOR
4. ATTITUDE DIRECTOR INDICATOR
5. HORIZONTAL SITUATION INDICATOR
6. SKE MODE LAMP
7. ALTIMETER
8. VERTICAL VELOCITY INDICATOR
9. RADIO INSTRUMENTS SELECTOR PANEL
10. ADI MODE SELECT SWITCH
11. BEARING DISTANCE HEADING INDICATOR (VOR/TAC2)
12. CLOCK
13. LIQUID OXYGEN LOW QUANTITY WARNING LIGHT
14. LIQUID OXYGEN QUANTITY INDICATOR
15. AIR DIVERTER HANDLE
16. COPILOT'S ADI REPEAT LIGHT
17. SELECTED NAV SYSTEM OFF LIGHT
18. HYDRAULIC CONTROL PANEL
19. PROP LOW OIL QUANTITY MASTER WARNING LIGHT
20. LANDING AND TAXI LIGHTS CONTROL PANEL
21. LANDING GEAR CONTROL PANEL
22. RADIO MAGNETIC INDICATOR (ADF, UHF/DF)
23. RANGE INDICATOR
24. WING FLAP POSITION INDICATOR

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Figure 1-11

SECTION II

Normal Procedures

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PREFLIGHT CHECK.

Enter the airplane flight station. Consult form 781 to find the status of the airplane. Check that the airplane has been serviced with the proper amounts of fuel, oil, and oxygen. It is the responsibility of the pilot to ensure that a preflight inspection has been performed as required by T.O. 1C-130B-6, Technical Manual Inspection Requirements.

Note

The aircrew inspection procedures outlined in this section are based on the assumption that maintenance personnel have completed all the requirements for preflight inspection in T.O. 1C-130B-6, Technical Manual Inspection Requirements. Therefore, duplicate inspection and operational check of systems by aircrew members have been eliminated, except for certain items required in the interest of flying safety. If the mission dictates, the Interior Inspections may be performed at any time during the preflight as long as steps 1, 2, and 3 of Before Exterior Inspections have been performed.

BEFORE EXTERIOR INSPECTION.

1. Prior to entrance	Checked
a. Wheel chocks	In place
b. Static ground wire	In place
c. External ac or dc power	In place
d. Nose gear lock	In place
e. Dust excluders and duct plugs	Removed
2. Form 781 and applicable publications	Checked
a. Status of aircraft	Checked
b. Fuel, oil and oxygen service	As required
3. Cargo compartment	Checked
a. Aft cargo door and ramp controls	NEUTRAL
b. Auxiliary hydraulic pump switch	OFF
c. Hydraulic reservoirs fluid level	Checked
d. Spare fluids	As required
4. Alarm bell and jump signals (copilot's side)	Checked
5. Feather valve and NTS check switch	VALVE
6. Stationkeeper	OFF
7. Portable oxygen bottle	Checked
8. Copilot's circuit breaker panels	Checked
9. Navigator's Station	Checked
a. Nose radome anti-icing	OFF
b. Radar function switch	OFF
c. Doppler	OFF
d. Clock	Checked
e. ALDIS lamp and lens	Checked
f. Flight deck refrigeration shut-off valve override handle	NEUTRAL
10. Pyrotechnic pistol mount	CLOSED
11. Periscopic sextant outlet	CLOSED
12. Upper main ac distribution panel	Checked
13. Life raft release handles	IN/safetied

14. Miscellaneous and emergency equipment	Checked
a. Escape rope	Checked
b. Emergency exit light/flashlight	ARMED
c. First aid kits	Checked
d. Fire extinguisher	Checked
e. Hand axe (some airplanes)	Checked
f. Retaining harness or parachute	Checked
15. Galley switches	Set
16. Crew entrance door jettison handle	Normal/safetied
17. Fuel governing check switches	NORMAL/safetied
18. Pressurization test valves	OPEN/safetied
19. Emergency depressurization handle	IN/safetied
20. Pilot's circuit breaker panel	Checked

Note

SKE BATT circuit breaker should be closed one hour before SKE operations to allow the station-keeper electronic clock to stabilize.

21. Portable oxygen bottle	Checked
22. Air-conditioning control panel	Set
a. Cargo compt and flight deck shutoff switches	NORMAL
b. Air-conditioning master switch	OFF
c. Cargo compt and flight deck temperature controls	OFF/NORMAL
d. Cargo underfloor heating switch	OFF
e. Emergency depressurization switch	NORMAL
23. Anti-icing control panel	Set
a. Nesa windshield switches	OFF
b. Nacelle preheat switches	OFF
c. Prop and engine anti-icing master switch	AUTO
d. Pitot heat switches	OFF
e. Engine inlet duct anti-icing switches	OFF
f. Propeller ice control switches	OFF
g. Wing and empennage anti-icing switches	OFF

24. Wing isolation and engine bleed air valve switches	Set
a. Wing isolation valve switches	NORMAL
b. Engine bleed air valve switches	CLOSE
25. Fuel control panel	Set
a. Dump switches	OFF/safetied
b. Fuel boost pump switches	OFF
c. No. 2 Crossfeed valve switch	OPEN
26. Clocks	Checked
27. Landing gear level	DN
28. Hydraulic panel	Set
a. Brake select switch	EMERGENCY
b. Aux pump switch	OFF
c. Engine pump switches	ON
d. Suction boost pump switches	OFF
29. ATO switch	SAFE
30. IFF	OFF/IP OUT
31. Emergency exit lights	Checked
a. DC power switch	BATTERY
b. Bus tie switch	TIED
c. Emergency lights	Out
d. DC power switch	OFF
e. Emergency lights	ON

Note

The bulbs of the emergency lights receive power from batteries contained within the lights. The check for bulb illumination should be accomplished as quickly as possible to conserve the batteries.

f. Emergency exit light extinguish switch	Depress
32. Electrical control panel	Set
a. Generator switches	OFF
b. Inverter switches	OFF
c. External ac power switch	EXT AC PWR (if available)

d. Bus tie switch	TIED
e. DC power switch	BATTERY

Note

External dc power may be used if external ac power is not available.

33. GTC control panel	Set
a. GTC door switch	OPEN
b. GTC control switch	OFF
c. Bleed air valve switch	CLOSED
d. Air turbine motor switch	STOP
34. Fire control handles and test panel	IN/checked
a. Fire emergency control handles	IN
b. Place the turbine overheat switch in the TEST position. Check that the warning lights in the engine fire emergency handles and the master fire warning light flash.	
c. Place the engine fire test switch in the TEST position. Check that the warning lights in the engine and GTC fire emergency handles and the master fire warning light glow steadily.	

Note

On [E] (1)> airplanes, press the audible warning test switch to TEST. Check that the speaker sounds and that the master fire warning light, and the lights in the No. 1 fire emergency handle glow steadily. Release the switch to NORM. The speaker should become silent and the lights should go out. Press the switch to SILENCE. Check that the speaker remains silent and that the master fire warning light glows steadily.

d. Position the nacelle overheat warning switch to TEST. Check that all four warning lights and placard light illuminate.	
35. Radio (UHF)	ON/checked
36. GTC clear	Clear
37. Start GTC and pressurize air manifold	On speed/pressure up

Note

Do not open GTC bleed air valve until on speed light illuminates.

CAUTION

Monitor the wing and empennage anti-icing indicators during operation of the GTC. A temperture rise indicates that an anti-icing valve is open, and the GTC should be shut down.

38. Bleed air system — Checked

Note

Anytime the bleed air system is being utilized, the overheat indicators and warning lights should be continuously monitored.

a. All propellers — Clean (with GC)

b. All systems using bleed air — OFF

c. Engine bleed air valves — OPEN

d. System pressure — Checked

Note

Check system pressure for a reading of 35 psi minimum. Failure to reach this pressure indicates that a valve in the system has not closed, that a duct is leaking, or that compressor output pressure is low.

e. GTC bleed air valve — CLOSED

f. System pressure leakage — Checked

Note

Time the drop from 30 to 15 psi. This time should not be less than 8.5 seconds.

g. Engine bleed air valves — CLOSED

h. GTC bleed air valve — As required

39. ATM and ATM generator — ON/checked

40. Interior lights — Checked

a. No smoking and seat belt lights (some airplanes) — Checked/ON

41. Inverter system — Checked

a. Turn each inverter control switch to the DC BUS position. The selected power off light should not illuminate when the inverters have stabilized. Check attitude indicators and TIT gages for power indication.

b. Place the voltage and frequency selector switch to the inverter position.

c. Check the copilot's inverter by placing the phase selector switch to A and B phase and reading the voltage and frequency on each phase.

d. Check the ac instrument and engine fuel control inverter by placing the phase selector switch to the C phase and reading the voltage and frequency.

e. Turn each inverter control switch to the AC BUS position. The selected power off light should not illuminate. The frequency and voltage cannot be read in this position. Check attitude indicators and TIT gates for power indications.

42. Generator disconnect (some [E] airplanes) — Checked

Note

Check that the disc fired light is not illuminated. Check the continuity of the firing mechanism by holding the gen disc test switch to TEST. The disc fired light should illuminate.

43. Fuel quantity and distribution — Checked

Note

Press the indicator test buttons and observe that the respective fuel quantity indicators move toward zero. Check the sum of the individual gates against the totalizer indication. Refer to FUEL MANAGEMENT in Section VII, T.O. 1C-130B-1, for distribution.

44. Fuel system — Checked

Note

When the ATM generator is used for supplying ac power, only the No. 2 boost pump will be operative.

a. Turn all crossfeed valve switches to vertical position, with exception of crossfeed separation valve.

b. Turn No. 1 boost pump on No. 1 and No. 2 low pressure lights should go out, No. 3 and No. 4 should stay on, and no pressure should be indicated on manifold pressure gage.

c. Open crossfeed separation valve. Check No. 1 boost pump pressure within limits. No. 3 and No. 4 low pressure lights go out.

d. Close No. 1 crossfeed valve. Deplete manifold pressure by depressing prime button. Turn No. 1 boost pump off.

Note

Crossfeed prime button may be depressed throughout the check to facilitate fuel pressure stabilization.

e. Turn No. 2 boost pump on, and check manifold pressure within limits. Close No. 2 crossfeed valve and deplete pressure. Turn No. 2 boost pump off.

f. Turn left aux boost pump on and check pressure. Close left aux crossfeed valve and deplete pressure.

g. Open left bypass valve. Check manifold pressure gage to ensure it has opened. Close left bypass valve and deplete the pressure. Turn left aux boost pump off.

h. Turn left external forward boost pump on. Check pressure within limits. Turn left external forward boost pump off and deplete the pressure.

Note

External tank boost pump pressures will be slightly lower than auxiliary boost pump pressures due to distance from crossfeed manifold.

i. Turn left external aft pump on. Check pressure within limits. Close left external crossfeed valve. Deplete pressure. Turn left external aft boost pump off.

j. Turn right external aft boost pump on. Check pressure within limits. Close right external crossfeed valve and deplete the pressure. Turn right external aft boost pump off.

k. Turn right external forward boost pump on. Open right bypass valve. Check pressure within limits. Close right bypass valve and deplete the pressure. Turn right external forward boost pump off.

l. Turn right aux boost pump on. Check pressure within limits. Close right aux crossfeed valve and deplete the pressure, and turn right aux boost pump off.

m. Turn No. 3 boost pump on and check manifold pressure within limits. Close No. 3 crossfeed valve and deplete the pressure. Turn No. 3 boost pump off.

n. Turn No. 4 boost pump on. Check pressure within limits. Depress crossfeed prime button for 30 seconds. Close No. 4 crossfeed valve and deplete the pressure. Turn No. 4 boost pump off and close the crossfeed separation valve.

45. Control surface boost shutoff switches — ON/safetied

46. Oil cooler flaps switches — OPEN/FIXED

a. Open the cooler flaps fully and return to fixed.

47. Flight director system — Checked

a. Set the ADI MODE SELECT switch to NORM.

b. Place the flt dir switch in the NORMAL position.

c. Place the mode select switch in HDG.

(1) All pointers and flag should be out of view.

(2) The course arrow should slave to the lubber line.

(3) The course selector window should indicate compass heading.

d. Place the flt dir switch in the MANUAL position.

(1) Set the heading marker to the airplane heading. The bank steering bar should center.

(2) Rotate the heading marker left and right. The bank steering bar should move in the same direction.

(3) Rotate the pitch trim knob up and down. The attitude sphere should deflect up and down respectively. Align the horizon bar with the miniature airplane.

48. Nesa windshield switches — Checked/OFF

WARNING

Do not check the temperature of a crazed outer glass with the bare hand.

a. Place the Nesa windshield switches in the NORMAL position, and check for heating by feeling the outside glass panels. Place the switches in the OFF position.

Note

If the ambient temperature is higher than 27°C (81°F), do not operate Nesa on the ground. If the ambient temperature is below this figure, turn Nesa to NORMAL. If the temperature of the glass is below −43°C (−45°F), the Nesa control system will not function automatically, and the coldstart switch must be used to raise the temperature of the glass into the normal operating range.

CAUTION

Do not exceed the operating limits of 5 seconds on, 10 seconds off when operating the cold-start switch.

49. Press-to-test lights — Checked

50. Oxygen system — Checked

51. All hydraulic systems pressure — Depleted

CAUTION

Pump brake pedals to deplate all hydraulic pressure before opening or closing ground test valve.

52. Hydraulic ground test valve — OPEN(GC)

a. Ramp and door controls — NEUTRAL

CAUTION

When positioning the hydraulic ground test valve to either the normal or interconnect position be sure the handle is moved through its full arc of travel and the internal ball detent in the valve engages. The engagement of the ball detent can be felt in the handle. If this is not done then excessive return line pressures can cause damage to hydraulic motors.

53. Aux hydraulic pump switch — ON

54. Brake selector switch — NORMAL

55. Flaps — Clear/DN 100%

56. Flight controls and trim tabs — Checked (with GC)

a. Check for free and correct movement of all flight controls.

b. Check direction and movement of all tabs and coordination with the indicators. Check the elevator tab override feature, OFF position, and emergency power.

57. Autopilot — Checked

a. Check that the radio beam coupler switch is in the GYRO PILOT position and the pilot control switch is in the OFF position.

Note

With the pilot control switch OFF, the servo engage switches should be in the DISENGAGED position and the altitude control switch should be in the OFF position. If they are not, a malfunction is indicated.

b. Check that the turn knob and aileron trim knob are centered and that the elevator tab power selector switch is in the NORMAL position.

Note

Placing the elevator tab power selector switch to NORMAL directs power to the elevator servo control. The elevator servo is rendered inoperative if the elevator tab power selector switch is positioned to OFF or EMERGENCY.

c. Center all flight controls.

d. Place the pilot switch in the ON position.

e. Check that the trim indicators on the pedestal controller are centered.

f. Place the servo engaging switches to the ENGAGE position.

CAUTION

In the following checks, hold the control wheel and rudder pedals to cushion movement against limit stops. Accomplish the checks as rapidly as possible to avoid prolonged servo effort and possible overheating.

g. Rotate the pitch knob forward and aft. The control columns should move forward and aft, and a deflection should be indicated on the elevator trim indicator.

Note

It may be necessary to apply a small force to the control wheel in the direction of pitch knob rotation to cause control wheel to move. Considerably more force on the control wheel in the opposite direction of pitch knob rotation will be required to override the autopilot and to check that movement is correct.

h. Rotate the aileron knob to the left and right. The control wheels should turn to the left and right, and a deflection should be indicated on the aileron trim indicator located on the autopilot controller.

i. Rotate the turn knob to the left and right approximately 45 degrees. The control wheels should turn to the left and right, the rudder pedals should move slowly in the direction of the turn, and a deflection should be indicated in the rudder trim indicator located on the autopilot controller.

j. Place the altitude control switch to the ON position and rotate the pitch knob. The control columns should not move.

k. Push either the pilot's or copilot's release switch. The pilot switch should trip to OFF, the altitude control switch should trip to OFF, the servo engaging switches should trip to DISENGAGE, and the autopilot light should start flashing.

CAUTION

Hold the servo engaging bar close to the servo switches when the pilot's or copilot's release switch is pushed to prevent breaking the servo switches.

l. Push the autopilot reset button to extinguish the autopilot OFF light.

58. Anti-skid test (some airplanes) — Completed

CAUTION

Do not attempt to test the Mark II anti-skid system while airplane is being taxied.

WARNING

After test switch is actuated to either forward or aft position, wait at least 3 seconds before selecting test switch to opposite set of wheels. A more rapid actuation of test switch could result in loss of brakes momentarily with normal brake system selected. Also faster actuation of test switch will result in erroneous test light indicators.

a. With anti-skid inoperative light out, fully depress and hold brake pedals.

b. Check that all four anti-skid test lights are out.

c. Place test switch in the FWD position and release. The two FWD lights should illuminate and then go out.

d. Place test switch in AFT position and release. The two AFT lights should illuminate momentarily and then go out.

e. Check to ensure that the test switch is in the OFF position.

59. Aux hydraulic pump switch — OFF

60. All hydraulic systems pressure — Depleted

61. Hydraulic ground test valve — CLOSED (GC)

62. Air deflector doors — Checked/CLOSED (with GC, if inflight use is anticipated)

63. Left exterior lights — Checked (with GC)

a. Empennage navigation lights

b. Navigation light

c. Anti-collision lights

d. Leading edge light

e. Landing light

f. Taxi lights

g. Wing tip taxi light (some airplanes)

64. Feather No. 1 and No. 2 propellers — Checked (with GC)

CAUTION

Do not perform a static feather check if the engine oil temperature is 0°C (32°F) or below. If a static feather check is not accomplished on preflight, it will be completed after engine shutdown prior to leaving the airplane.

Note

Feather valve check—Place the condition level in the FEATHER position. The blades should move to the feather position and the feather valve test light should illuminate. The propeller feather override button should pull in during the feathering operation and then pop out when the blades reach the feather position. The amber light in the feather override button should illuminate while the button is pulled in and should go out when the button pops out. If the button does not pop out, pull it out manually to shut off the pump. Record in Form 781. Maintenance action is required prior to flight.

65. Unfeather No. 1 and No. 2 propellers — Checked (with GC)

Note

Check that the throttle is in GROUND IDLE, and place the condition lever to AIR START until the blades stop in the ground idle position. Return the condition lever to GROUND STOP.

CAUTION

Do not exceed the propeller auxiliary pump operating time limit shown in Section V, T.O. 1C-130B-1.

Note

When coming out of feather, the blades will hesitate momentarily at the flight idle blade angle (during retraction of the low-pitch mechanical stops) before continuing to the ground idle blade angle position.

66. Pitot heat — Checked (with GC)

67. Feather No. 3 and No. 4 propellers — Checked (with GC)

Note

Follow procedures outlined in items 64 and 65 for feathering and unfeathering No. 3 and No. 4 propellers.

CAUTION

Do not perform a static feather check if the engine oil temperature is 0°C (32°F) or below. If a static feather check is not accomplished on preflight, it will be completed after engine shutdown prior to leaving the airplane.

68. Unfeather No. 3 and No. 4 propellers — Checked (with GC)

a. Return the feather valve and NTS check switch to NORMAL.

69. Right exterior lights — Checked (with GC)

a. Navigation light

b. Leading edge light

c. Landing light

d. Taxi lights

e. Lower navigation light

f. Formation lights — Checked (if inflight use is anticipated)

g. Wing tip taxi light (some airplanes) — Checked

70. Crash position indicator (some airplanes) — Checked

a. Depress the CHARGING TEST button. The release and beacon lights should illuminate if the batteries are being charged.

b. Connect a headset to the test jack receptacle.

c. Depress the XMIT TEST pushbutton. A short audible signal should be heard.

d. Remove the headset from the test jack receptacle.

Inspection Diagram

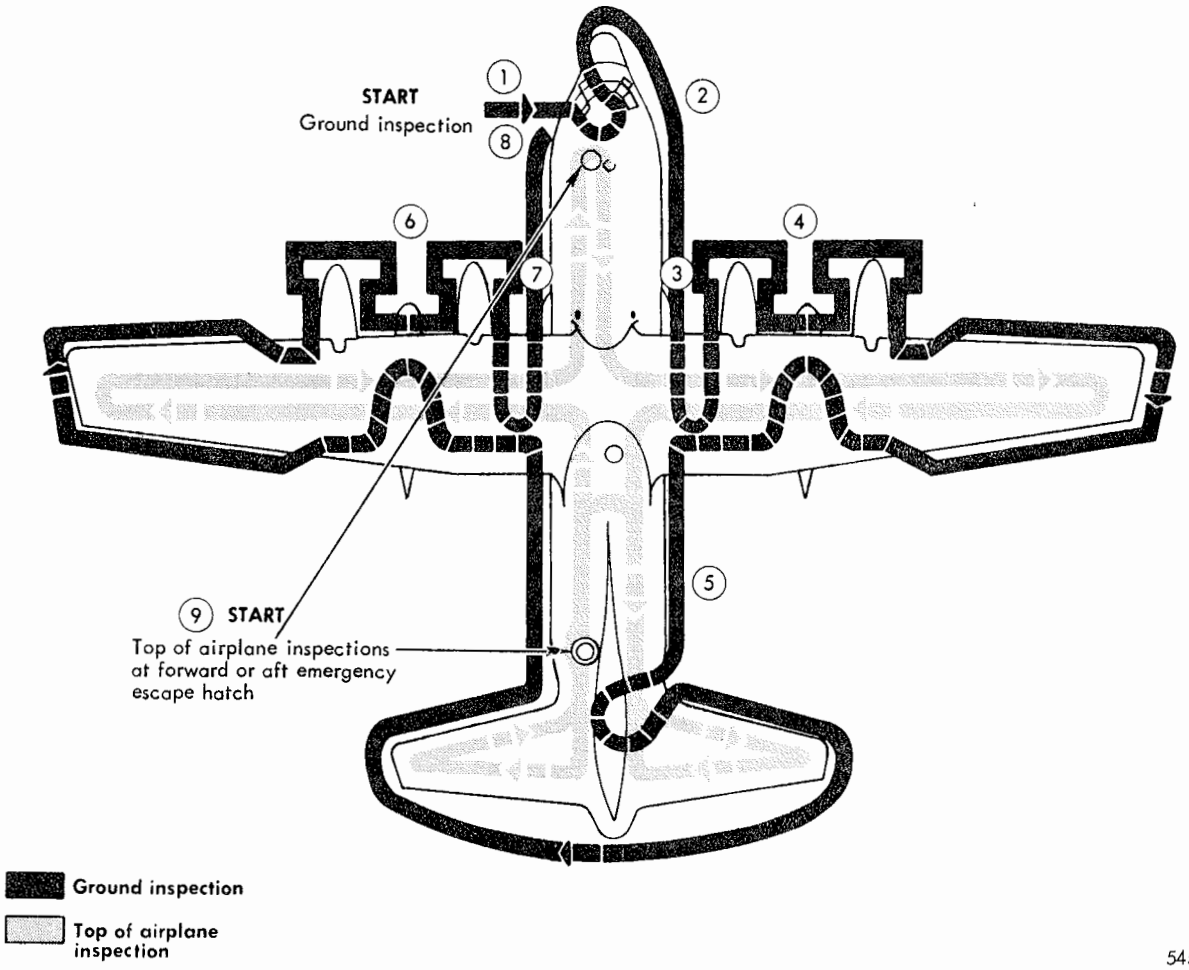


Figure 2-1.

71. Bleed air manifold isolation valve switches	Closed
72. All unnecessary equipment	OFF
73. Emergency exit light extinguish switch	Depressed

EXTERIOR INSPECTION.

Walk-Around Inspection.

Conduct a walk-around inspection, following the route in figure 2-1. Work stands or a ladder will be required when checking engine inlet air ducts, engine exhaust area, external tank caps, and auxiliary fuel tanks magnetic dipsticks.

1. Nose section	Checked
a. Crew entrance door	
b. Battery compartment	
c. NLG lock and wheel well area	

d. Brake accumulator pressures	
e. Pitot masts and heads	
f. Radome and nose exterior general condition	
2. Forward fuselage, right side and bottom	Checked
a. Oxygen filler valve	Closed
b. Flight deck air-conditioning intake and exhaust	
c. Exterior structure general condition	
d. Static air ports	
3. Right wheel well area and center fuselage	Checked
a. Cargo compartment air-conditioning intake and exhaust	
b. Right MLG, wheel well area, MLG door attachment	Secured
c. Single point refueling panel	
d. Air deflector door area	
e. Exterior structure general condition	
f. Auxiliary fuel tank magnetic sight gage (some airplanes)	
4. No. 3 and No. 4 engine nacelles, external fuel tank, propellers, right wing.	Checked
a. Nacelle exterior structure general condition and fluid leaks	
b. Engine inlet air ducts	
c. Propeller spinner and blades	
d. Engine exhaust areas	
e. External fuel tank cap and tank structure general condition, fuel leaks	
f. Flap, aileron, tab, and wing skin	
g. Life raft	
h. Angle of attack wing transmitter–(vane not bent, no visible damage) (some airplanes)	
5. Aft fuselage and empennage	Checked
a. Exterior structure	
b. Cargo ramp and aft cargo door	
c. Tail structure and control surfaces	
d. Tail skid	

6. No. 2 and No. 1 engine nacelles, external fuel tank, propellers, left wing — Checked

a. Life raft and emergency radio

b. Flap, aileron, tab, and wing skin

c. Engine exhaust areas

d. Propeller spinner and blades

e. External fuel tank cap and tank structure general condition, fuel leaks

f. Engine inlet air ducts

g. Nacelle exterior structure general condition and fluid leaks

7. Left wheel area and center fuselage — Checked

a. Hydraulic ground test valve safety pin

b. Air deflector door area

c. Fire extinguisher bottles charged — Checked/within limits

d. Left MLG, wheel well area, MLG door attachments — Secured

e. Exterior structure general condition

f. Auxiliary fuel tank magnetic sight gage (some airplanes)

8. Forward fuselage, left side and bottom — Checked

a. ATM inlet and exhaust

b. GTC area

c. Exterior structure general condition

d. Static air ports

e. Forward cargo door (some airplanes)

INTERIOR AND TOP OF AIRPLANE INSPECTION.

The items in this checklist will normally be accomplished by the flight engineer. The loadmaster will accomplish all items marked with an asterisk when he is included in the crew. During the interior inspection, make sure all cargo and loose equipment are secure.

1. Crew entrance area — Checked

a. Crew door latch mechanism

b. Crew door, master warning light shutoff switch — NORMAL

c. Radio and electrical equipment racks

d. Emergency exit light — ARMED/flashlight

*e. First aid kit

2. Cargo compartment area, left side	Checked
a. Interphone panel and light switches	
b. Forward cargo door master door warning light shutoff switch (some airplanes)	NORMAL
c. Forward cargo door locks (some airplanes)	

WARNING

It is possible to lock the forward cargo door handles with the bottom hooks unlocked. Under this condition, the door warning light will not illuminate. Visually check all locks and hooks for engagement.

d. NLG emergency extension valve	NORMAL/safetied
e. Forward cargo door control valve (some airplanes)	NEUTRAL
*f. First aid kits	
g. Emergency extension wrench (some airplanes)	Stowed
h. Utility hydraulic panel	
i. Left MLG and flap emergency engaging handles and handcrank	IN/stowed

CAUTION

The main landing gear emergency engaging handles should not be pulled while the airplane is on the ground.

j. Left bleed air manifold isolation valve	OPEN
k. Aileron hydraulic boost unit, flap motor, and autopilot servo	
*l. First aid kits	
m. Fire extinguisher	
n. Emergency exit light	ARMED/flashlight
o. Aft fuselage J-box circuit breakers	
*p. Aft fuselage light control switches	
q. Left paratroop door master door warning light switch	NORMAL
*r. Left paratroop door and up latch mechanism	
*s. Aft cargo compt interphone panel–jump light intensity switch	BRIGHT
*t. Left, aft oxygen regulator condition and pressure	

3. Ramp area	Checked
*a. Ramp and aft cargo door manual control valves	NEUTRAL
b. Auxiliary hydraulic system	
*c. Ramp and door locks and telescoping arms	
*d. Paratroop anchor lines and attachment arms	
e. Overhead escape hatch, escape rope, and emergency exit light	ARMED/flashlight
f. Cabin pressure safety valve	
g. Rudder and elevator boost units and autopilot servos	
h. Aft cargo door actuator attachment fittings, upper and lower	Checked
*i. Aft cargo door up-lock	Unlocked
*j. Fire extinguisher and hand axe	
4. Top of airplane	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

Use extreme care at all times to avoid scratching or denting the skin while walking on the fuselage.

a. Empennage, fuselage, wing, control surfaces, and flaps	
b. Dry bay areas for fuel or hydraulic fumes and leaks	
c. Oil servicing access panels	
d. Fuel tank caps	Secure
e. Emergency equipment access panels	Secure
f. Crash position indicator cover (some airplanes)	Checked

Note

Ensure that the beacon shutoff battery is removed.

g. Antennas	Secure
h. Radome general condition	
i. Escape hatches and release handles	Secure

j. Angle of attack wing transmitter (some airplanes)	Vane not bent, no visible damage
5. Cargo compartment area, right side	Checked
*a. Liferaft handles	IN/safetied
b. Right paratroop door, ramp and aft cargo door master door warning light shutoff switches	NORMAL
*c. Right, aft oxygen regulator condition and pressure	
*d. Right paratroop door and uplatch mechanism	
*e. First aid kits	
f. Emergency exit light	ARMED/flashlight
g. Overhead escape hatch, emergency light, escape rope, and depressurization hatch	ARMED/flashlight
h. CPI beacon shutoff battery	Stowed
*i. Portable oxygen bottle	
j. Right bleed air manifold isolation valve	OPEN
k. Right MLG emergency engaging handles and handcrank	IN/stowed

CAUTION

The main landing gear emergency engaging handles should not be pulled while the airplane is on the ground.

l. Booster hydraulic panel	
m. Side emergency exit	
n. Emergency exit light	ARMED/flashlight
*o. First aid kits	
*p. Oxygen regulators and portable bottle pressures	
q. Oxygen manually operated shutoff valve	Checked/ON
r. Overhead electrical equipment rack	
s. Fire extinguisher and hand axe	

COCKPIT CHECKLIST.

Note

This checklist will be completed by the flight engineer prior to the BEFORE STARTING ENGINES checklist. A crew member will remain at the airplane after completion of this checklist. If this checklist is completed and the airplane does not fly, complete the ENGINE SHUT-DOWN

checklist and the BEFORE LEAVING THE AIRPLANE checklist before securing the airplane.

1. NLG lock, pitot covers, dust excluders, and duct plugs	Removed
2. Navigator's panel	Set
a. Radome anti-icing switch	OFF
b. Radar function switch	OFF
c. Radar pressurization	OFF
3. IFF master switch	OFF/IP OUT
4. Stationkeeper	OFF
5. Circuit breakers	Checked
6. Landing gear lever	DN
7. Air-conditioning control panel	Set
a. Cargo compt and flight deck shutoff switches	NORMAL
b. Air-conditioning master switch	OFF
c. Cargo compt and flight deck temperature controls	OFF/NORMAL
d. Cargo underfloor heating switch	OFF
e. Emergency depressurization switch	NORMAL
8. GTC control panel	Set
a. GTC door switch	OPEN
b. GTC control switch	OFF
c. Bleed air valve switch	CLOSED
d. Air turbine motor switch	STOP
9. Anti-icing control panel	Set
a. Nesa windshield switches	OFF
b. Nacelle preheat switches	OFF
c. Prop and engine anti-icing master switch	AUTO
d. Pitot heat switches	OFF
e. Engine inlet duct anti-icing switches	OFF
f. Propeller ice control switches	OFF
g. Wing and empennage anti-icing switches	OFF
10. Engine bleed air valve switches	CLOSE
11. Fuel control panel	Set

a. Dump switches	OFF/safetied
b. Fuel boost pump switches	OFF
c. Crossfeed and bypass valve switches	CLOSED/No. 2 OPEN
d. Crossfeed separation valve	Closed
e. Aux tank pump switches	As required

CAUTION

If the auxiliary fuel tanks are filled to 5,500 pounds or more, turn the boost pumps on. It is possible to get considerable venting of fuel during taxi or flight unless the boost pumps are operating. Fuel vented during ground operation may be pulled into the tailpipe area of an inboard engine or fall into the vicinity of hot brakes. Inflight, heavy venting from the auxiliary vent masts may cause accumulation of fuel in the flap well.

12. Fire emergency control handles	IN
13. Paratroop control panel	Set
a. Air deflector door switches	OFF
b. Alarm bells and jump signals switches	OFF
14. Propeller control panel	Set
a. Feather valve and NTS check switch	NORMAL
b. Propeller feather override buttons	OUT
c. Propeller governor control switches	NORMAL
d. Propeller master trim knob	ZERO
15. Throttles	GROUND IDLE
16. Temp datum control valve switches	AUTO

CAUTION

It is not recommended that an engine be started with the temp datum control valve switches in the NULL position. If a start must be made with the temp datum control valve switch in the NULL position, the TIT should be closely monitored since over-temperature protection is not provided.

17. Oil cooler flaps switches	As required

BEFORE STARTING ENGINES.

Note

Consult form 781 for airplane status.

1. Passenger briefing (See Section VIII)	"As required"	P
2. Electrical control panel	"Set"	FE

a. Generator switches	OFF	
b. Inverter switches	OFF	
c. External ac power switch	EXT AC PWR (if available)	
d. Bus tie switch	TIED	
e. DC power switch	BATTERY	

Note

External dc power may be used if external ac power is not available.

3. Radio (UHF or VHF)	"ON"/"Checked"	CP

Note

VHF not operative at this time without external ac power.

4. Clear GTC	"GTC clear"	GC
5. Start GTC	"Set"	FE
a. GTC control switch	START/RUN	
b. Bleed air valve switch	OPEN/pressure up	

CAUTION

Do not open the GTC bleed air valve until the on speed light has illuminated. Monitor the leading edge temperature indicators. A rise in temperature indicates that an anti-icing valve is open and the GTC must be shutdown to prevent damage to a heated surface or fuel tank sealant.

6. ATM and generator	"As required"	FE

Note

If external ac power is available, the ATM should not be started at this time. The external ac power switch automatically goes to OFF when the ATM generator switch is placed to the ON position, regardless of whether the ATM and generator are operating.

7. Lights	"Set"	P, CP, FE
a. Interior	As required (ALL)	
b. Exterior	As required (FE)	
c. Landing	RETRACT or EXTEND/HOLD (CP)	
d. Taxi	As required (CP)	
8. Inverters	"Set"	FE
a. Copilot's inverter switch	ESSENTIAL AC BUS	

b. AC inst and engine fuel control inverter switch	ESSENTIAL DC BUS	
9. Fuel quantity and distribution	"Checked"	P
10. Fuel enrichment switches	"As required"	P

Note

When the engine indicates a TIT of 100°C or more, start with enrichment OFF. Do not select enrichment after the starter button has been actuated.

11. Ramp and door	"Closed"	GC

Note

If the ramp and door are open at this time, the ground control or loadmaster will close it while control of the auxiliary hydraulic pump can be maintained at the aft ramp and door control panel.

12. 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.

a. Brake select switch	EMERGENCY
b. Aux pump switch	ON/pressure up
c. Anti-skid switch	ON
d. Engine pump switches	ON
e. Suction boost pump switches	ON/lights out

CAUTION

Starting an engine with an inoperative suction boost pump may result in damage to the engine-driven hydraulic pump.

13. Parking brake	"Set/remove chocks"	P

Note

Depress pedals and monitor the emergency brake pressure gage for pressure drop as pedals are depressed.

Note

Direct ground control to remove chocks. No response will be required at this time.

CAUTION

To avoid engaging the brakes on only one side of the airplane when setting the parking brakes, the brake pedals must be firmly depressed, the parking brake handle pulled, and force maintained on the handle as the pedals are released. This condition requires extreme care since toe brakes are difficult to actuate and set because of the angle of the brake pedals to the operator's feet.

14.	Oxygen	"Set"	P, CP, FE, N, LM

Note

Each crew member should check his oxygen regulator, first with the diluter lever at NORMAL OXYGEN and then at 100 percent OXYGEN, by removing the mask and blowing gently into the oxygen hose as during normal exhalation. Resistance to blowing indicates that the system is functioning satisfactorily. Little or no resistance to blowing indicates a defective regulator or leaking mask-to-regulator tubing. Leave the regulator in the following positions:

	a. Emergency toggle lever	NORMAL	
	b. Regulator diluter lever	100%	
	c. Oxygen supply lever	ON	
	d. Oxygen mask	Connected	
15.	Ground idle buttons	"Set"	FE
	a. No. 1, 2, and 4	LOW	
	b. No. 3	NORMAL	

Note

If desired, any engine may be started in normal or low speed ground idle.

16.	Flap lever	"Set"	CP

Note

Set flap lever to correspond with flap position indicator.

17. Chocks	"Removed"	GC
18. Before Starting Engines checklist	"Completed"	CP

STARTING ENGINES.

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

1. Clear No. 3 engine	"No. 3 clear" "Turning No. 3"	GC P
a. Engine bleed air valve switch	OPEN	
b. Engine condition lever	RUN	

Note

Under low air density conditions (high temperature or high altitude) GTC mass output will be reduced to power the engine during a start for normal acceleration. If the ATM and generator are being utilized, turn the ATM generator to OFF and the ATM switch to STOP during the engine start. Once the engine is started, utilize the ATM generator or the No. 3 engine generator as desired for ac power.

Note

Do not perform a start if the TIT is above 200°C. If TIT is above 200°C, it may be brought below 200°C by motoring the engine with the starter while the condition lever is in GROUND STOP.

c. Engine starter button — IN

Note

The starter button should be held in for approximately 5 seconds, as the starter button holding coil is not energized until the starter valve has opened. The light in the starter button will glow. An rpm indication should be noted.

(1) The starting cycle is automatic and requires no further action if the engine accelerates smoothly and continuously, if turbine inlet temperature is normal, and if the engine stabilizes on speed within 1 minute. Monitor the engine instruments continuously during a start. Keep one hand on the condition lever and the other on the starter button of the engine being started, and be prepared to discontinue the start immediately if an abnormal indication is received. The ground controller will monitor the propeller and report if the propeller fails to, or ceases to rotate. If no rotation is indicated within approximately 5 seconds after pilot states "turning," the ground controller will state "negative rotation."

During normal start, the following sequence of events should be observed and called off on interphone by the flight engineer.

(a) Enrichment/fuel flow

(b) Ignition

(c) Oil pressure

(d) Hydraulic pressure

(e) Parallel

(f) Series

(g) Peak TIT

Note

Should a malfunction occur which would necessitate discontinuing the start, the FE, CP, or P will call out "Stop Start" and state the malfunction. When the engine is on speed the FE will ensure that the generator is developing voltage, turn the switch on, and state "Generator On." This indicates the CP is clear to continue the checklist.

CAUTION

If the engine does not light-off before 35 percent rpm is reached, discontinue the start. If the engine does light-off normally but does not accelerate smoothly to ground-idle rpm and a rapid increase in turbine inlet temperature is indicated, a stalled start is taking place. Discontinue the start (move the condition lever to GROUND STOP and pull out the starter button). Before attempting another start on that engine, motor the engine to approximately 25 percent rpm with the condition lever in GROUND STOP to remove the gases and unburned fuel from the turbine. Make the next start with the fuel enrichment switch in the OFF position.

(2) When the engine is at approximately 16 percent rpm, enrichment flow will be indicated, and light-off will follow. The secondary pump pressure light may illuminate momentarily, then go out. The light normally will illuminate again before the engine reaches 65 percent rpm.

CAUTION

If there is no positive indication of oil pressure from the reduction and power section by 35 percent rpm, immediately discontinue the start by placing the condition lever in GROUND STOP and pulling out the starter button.

Note

Trottles must not be moved out of GROUND IDLE detent during ground starting because the resultant increase in propeller blade angle might overload the starter, reducing the rate of engine acceleration.

CAUTION

After moving a condition lever to GROUND STOP, do not move the lever from this position until engine rotation has ceased. Moving a condition lever from GROUND STOP to RUN while the engine rpm is decreasing could result in damage to the engine. Do not reengage the starter until rotation has stopped completely.

(3) The starter button should pop out before the engine rpm reaches pull-out limit.

CAUTION

If the starter button does not pop out before the pull-out limit is reached, manually pull the button and place the condition lever in GROUND STOP and close the respective bleed air valve. If start was made in low ground idle, restart in normal ground idle. If the starter button does not pop out before the pull out limit, manually pull the button, place the condition lever in ground stop and close the respective bleed air valve. Record in Form 781.

(4) At approximately 65 percent rpm, the secondary fuel pump pressure light will go out.

Note

Refer to Section V for turbine inlet temperature and starter limits during engine start.

(5) The engine will accelerate to either normal ground idle rpm or low ground idle rpm in approximately 1 minute. If the engine does not stabilize on speed within 1 minute, discontinue the start.

d. Hydraulic pump and pressure — Pressure up/checked

Note

A positive hydraulic pressure indication should be noted by the time the engine is on speed, and the normal operating pressure should be indicated within 30 seconds after the engine is on speed. Check the No. 3 hydraulic pump by operating the flight controls. After the controls are stable, check

	the static pressure for normal limits. Similarly, check the hydraulic pump on each remaining engine after starting by operating the flight controls while the pump on that engine is the only source of pressure to its system.		
	e. Engine generator switch	"ON"	
2.	ATM and generator	"Checked/ON"	FE
	Note Check voltage and frequency of each phase of ATM generator and place the ATM generator switch to ON. The external ac power switch automatically goes to OFF when the ATM generator switch is turned ON. The ATM generator must be ON for low-speed ground idle operation since the engine-driven generators will be off the line. If the ATM generator fails, the low-speed ground idle idle buttons must be disengaged in order to prevent a drain on the battery.		
3.	DC power switch	"BATTERY"	FE
	Note The pilot may direct removal of ground equipment at this time.		
4.	Clear No. 4 engine	"No. 4 clear" "Turning No. 4"	GC P
	Note Repeat steps 1.a. through 1.e. for all engines.		
5.	GTC control panel	"Set"	FE
	a. Bleed air valve switch	CLOSED	
	b. GTC control switch	OFF	
	c. GTC door switch	CLOSED	
6.	Air conditioning master switch	"AIR COND NO PRESS"	FE
	Note After stabilization of the flight deck and cargo compartment temperatures, the temperature controls may be operated in auto or manual.		
7.	External power and ground wire	"Removed/clear"	GC
8.	Clear No. 2 engine	"No. 2 clear" "Turning No. 2"	GC P
9.	Clear No. 1 engine	"No. 1 clear" "Turning No. 1"	GC P

10.	Ground idle buttons	"As required"	FE

CAUTION

It is recommended that the engines be changed to normal ground idle operation by disengaging the low-speed ground idle buttons rather than by throttle movement. Movement of the throttles beyond the limits of 9 to 30 degrees coordinator angle at ambient temperatures above 27°C (81°F) may cause rpm stall and overtemperature. Should the low-speed ground idle buttons be inadvertently released with the throttles, return the throttles to ground idle; the engine should accelerate to normal ground idle rpm. When down-shifting from normal to low-speed ground idle, monitor the engine instruments and be prepared to shut down the engine if a stall, and/or overtemperature of 850°C or greater occurs.

11.	Crew aboard, doors closed	"Aboard/Closed/Checked"	
12.	Starting Engines checklist	"Completed"	CP

BEFORE TAXI.

(See Section V, T.O. 1C-130B-1, for engine limitations.)

Note

A positive flow check for those tanks containing fuel will be made during the BEFORE TAXI or TAXIING checklist.

Note

To avoid auxiliary tank venting operate at least one engine in normal ground idle to provide electrical power to operate the auxiliary boost pump when required.

1.	Stationkeeper	"As required"	CP
2.	Leading edge temperature	"Normal"	FE
3.	Compass systems and heading indicators	"Checked/set"	N, P, CP
a.	N-1 compasses (some airplanes)	Checked/Set	
(1)	Synchronizer	Synchronized	
(2)	Latitude correction pointer	OFF(Mag)/Local Latitude (Grid)	
b.	C-12 compasses (some airplanes)	Checked/Set	
(1)	Latitude N-S switch	Local latitude	
(2)	Latitude knob	Local latitude	

	(3) Mode selector switch	As required	
	c. The navigator will compare No. 1 and No. 2 compass headings.		
	d. State heading of the No. 1 compass.		
	e. The pilot will compare headings against the magnetic compass.		
4.	Radios and IFF	"ON/STDBY/Code set"	CP, N
	WARNING Visually check the hooks on the crew entrance door to see that they contact the eyebolts.		
5.	All warning lights	"Checked"	FE
6.	Flaps	"UP"	CP
7.	Hydraulic pressures and quantities	"Pressures Checked" "Quantities Checked"	CP LM
8.	Stationkeeper	Checked/As required	CP
	Note The stationkeeper BITE test will be performed before a stationkeeping flight only.		
	a. DIM control	CM	
	b. LAMP TEST pushbutton	Depress	
	c. ALTITUDE switch	00	
	d. TRACK switch	01	
	e. CROSS TRACK switch	L14	
	f. PROXIMITY WARNING (X100) switch	25	
	g. PROXIMITY WARNING TONE switch	ON	
	h. ADI MODE SELECT switch	"SKE"	P, CP
	i. BLANKING control	"CW"	P
	j. UP/DOWN switch	"Center"	P
	k. RANGE MARKS control	"CW"	P
	l. BRIGHT/DIM switch	"As required"	P
	m. DISPLAY LEVEL control	"CW"	P
	n. RANGE switch	1 ("1000")	P
	o. OFF/STBY/XMIT switch	XMIT	

p. BITE TEST pushbutton	Depress "TEST lamp illuminated" "MASTER LOST" "Proximity Warning"	 CP CP CP
q. PROXIMITY WARNING (X100) switch	"PW 1500" "Proximity Warning Zone"	CP
r. OFF flags	"Checked"	P, CP
s. ALTITUDE switch	"Altitude +100"	CP
t. ALTITUDE switch	"Altitude –100"	CP
u. CROSS TRACK switch	"L2400"	CP
v. CROSS TRACK switch	"L400"	CP
w. TRACK switch	"Track 2000"	CP
x. Position Indicators	"Checked"	P, CP
y. Flight Command Indicator	"Checked"	P
z. NO GO lamp	"Positive/Negative BITE"	CP
aa. OFF/STBY/XMIT switch	STBY momentarily; then XMIT	

Note

If the NO GO lamp lights, a possible malfunction exists in the stationkeeping system. In this event, rerun the complete BITE test.

bb. BITE test	"Complete"	CP
cc. Set SKE controls as briefed		P, CP

9. Angle of attack/stall warning system (some airplanes) — "Checked" — P, CP

a. Depress A/A TEST S/W fault indicator light on pilot's and copilot's panel to check operation of lamp.

b. Adjust pilot's and copilot's indicator lighting to a comfortable level using angle of attack indicator lighting control.

c. With flaps in full up position, place press-to-test switch in ANGLE OF ATTACK position. The pointers of the pilot's and copilot's indicator assemblies should deflect smoothly to $1.4V_s$ ±1 pointer width on the scale and the A/A TEST S/W fault indicator light should remain off.

d. With the press-to-test switch in the ANGLE OF ATTACK position, cycle the flaps to the full (100 percent) down position and return to full up position. The pointers of the pilot's and copilot's indicator assemblies should deflect smoothly and continuously to $1.25V_s$ ±2 pointer widths and then return to $1.4V_s$ ±1 pointer width.

e. Place press-to-test switch in the STALL WARNING position. The stall warning horn assembly should actuate the A/A TEST S/W fault indicator light should remain off.

Note

When the airplane is on the ground and the press-to-test switch is in the off position, there is no predictable position for the pointers of the indicator assemblies. The position of the pointers will correspond to the quiescent position of the wing transmitter vane.

10.	Altimeters	"Set/state setting"	P, CP, N

a. Obtain taxi clearance and altimeter setting.

WARNING

It is possible to set an altimeter in error by 10,000 feet. This happens when the barometric set knob is continuously rotated after the baro scale is out of view. The knob can be rotated until eventually the numbers will reappear in kollsman window from the opposite side. If the correct altimeter setting then is established, the altimeter will read in error by approximately 10,000 feet. As a pre-flight check, special attention should be given to the altimeter to make sure that the 10,000-foot pointer is indicating correctly.

11.	Before Taxi checklist	"Completed"	CP

TAXIING.

Skidding or skipping of the nose wheel may develop when the airplane is turning, either because of wet pavement or an aft center of gravity. These conditions can be prevented by avoiding abrupt steering changes or by asymmetrical power and brake applications.

CAUTION

Excessive or prolonged use of the brakes while taxiing will cause overheating of the brake assemblies with possible wheel failure and/or tire or brake fire resulting. Taxi speed can normally be controlled by use of minimum engine power and propeller reversing.

Use forward thrust to stop the airplane during reverse taxiing. After turning, taxi the airplane forward in a straight line approximately five feet to relieve the loads on the main landing gear.

CAUTION

The use of brakes during reverse taxiing should be gradual to prevent the airplane from setting on the tail.

Note

If during prolonged ground operation, oil temperature approaches the maximum limit, the throttle should be advanced toward FLIGHT IDLE to increase airflow through the coolers. The use of low speed ground idle will assist in keeping the oil temperature cooler.

CAUTION

When taxiing over rough terrain, extreme caution must be exercised and very low taxi speeds observed.

CAUTION

Turns with brakes locked on one side are prohibited. When possible, avoid braking in turns, since damage to landing gear and/or support structures may result. If a stop in a turn is required, record in Form 781. See figure 2-2 for the minimum space and clearances required for turning.

1. Brakes	"Checked"	P

Note

Check the emergency brake system. Switch to and check the normal brake system.

2. Aux hydraulic pump switch	"As required"	CP
3. Flight instruments	"Checked"	P, CP

Note

Check heading and turn and slip indicators for correct movement. Check airspeed and vertical velocity indicators for proper reading.

Note

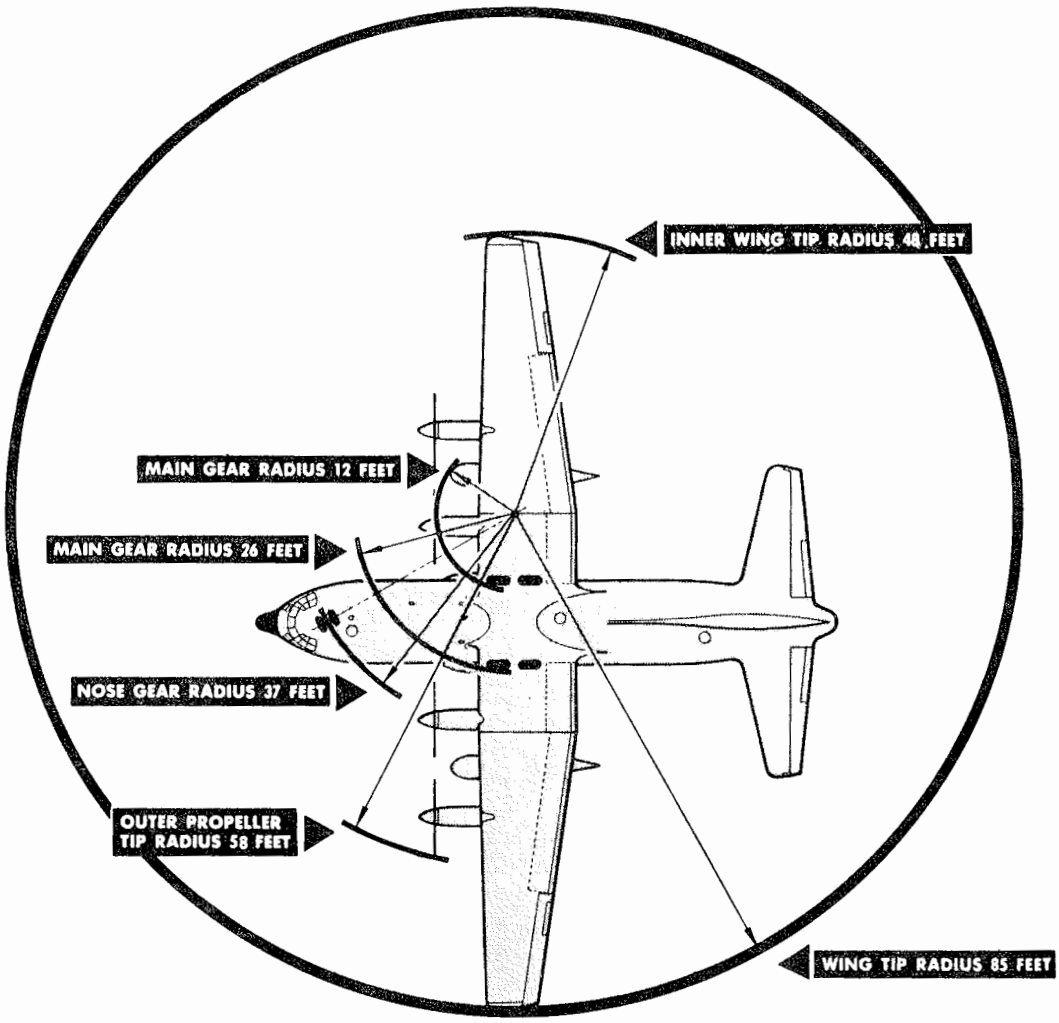
Items 4, 5, 6, and 7 will not be required on subsequent flight of the day.

4. Propeller reversing	"Checked"	P, FE

Note

The pilot will place symmetrical pairs of throttles in full reverse. Flight engineer will observe rpm within limits and advise pilot of symmetric

Turning Radii



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

CAUTION

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

1308-1-40-089

Figure 2-2.

torque differences of 1,000 inch-pounds or more. If greater than 1,000 inch-pounds, compensate as necessary for this differential during subsequent reverse operation and record in Form 781.

5. Generators and loads — "Checked" — FE

a. Place the ATM generator switch to the OFF position and note that the No. 2 generator assumes the essential ac bus load.

CAUTION

Do not exceed generator ground load limit. (Refer to Section V.)

b. Rotate the voltage and frequency selector to each engine generator position and note that voltage and frequency are within limits.

c. Rotate the phase selector switch to each phase position and check each engine generator loadmeter for an indication of a load within limits.

d. Check each TR unit loadmeter for an indication of a load within limits.

e. Place the ATM generator switch in the ON position.

6. Prop and engine anti-icing — "Checked" — FE

a. Place the ice detector test switch in the No. 2 position. Note that the ice detection light illuminates. Place the prop and engine anti-icing master switch to the RESET position and note that the ice light is extinguished.

b. Place the ice detector test switch in the No. 3 position and note that the ice detection light illuminates.

c. Place each engine inlet duct anti-icing switch in the ON position (one at a time) and note a slight torque decrease and/or TIT increase. Place the switches in the OFF position (one at a time) and note a slight torque increase and/or TIT decrease.

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

(1) Determine the position of the deicing timer by turning each propeller ice control switch (starting with No. 1) ON, then OFF until a load is indicated on all three ammeters (spinner anti-ice, spinner deice, and blade deice).

(2) Leave propeller ice control switch on until heating cycle is complete as noted by drop on the deicing ammeter.

(3) Turn next switch in sequence to ON, and check for an approximate 20 ampere increase in spinner anti-ice ammeter and 65 to 90 amperes on spinner and blade deice ammeters.

(4) Repeat step (3) for each succeeding propeller.

(5) When all propellers have been checked, place the prop and engine anti-icing master switch to RESET and note that the ice light is extinguished and there is no load on any of the anti-icing or deicing ammeters.

(6) Place all ice control switches–OFF.

Note

If the blade deicing ammeter falls below 65 amperes, do not fly into icing conditions.

CAUTION

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

7.	Fuel system	"Checked"	FE

Note

The above step is necessary only if not accomplished during the preflight checks.

8.	Taxiing checklist	"Completed"	CP

CROSSWIND TAXIING.

The airplane can be taxied in a 30-knot, 90-degree crosswind by use of nosewheel steering and rudder control only. Taxiing can be accomplished in crosswinds up to a 60-knot, 90-degree 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 airplane.

ENGINE RUNUP.

Note

The BEFORE TAKE-OFF checklist may be performed prior to ENGINE RUNUP checklist.

Engine runup will not be required on subsequent flights of the day by the same flight crew.

Select an area which is free of foreign objects. Head the airplane into the wind. (See figure 2-3 for danger areas.)

CAUTION

To prevent excessive stresses on the propeller, and to prevent wing lift and resultant severe structural damage due to a propeller contacting the ground, the airplane will be headed into the wind within 30 degrees of wind direction for engine power settings in excess of 7,000 inch-pounds torque when the wind velocity is in excess of 10 knots.

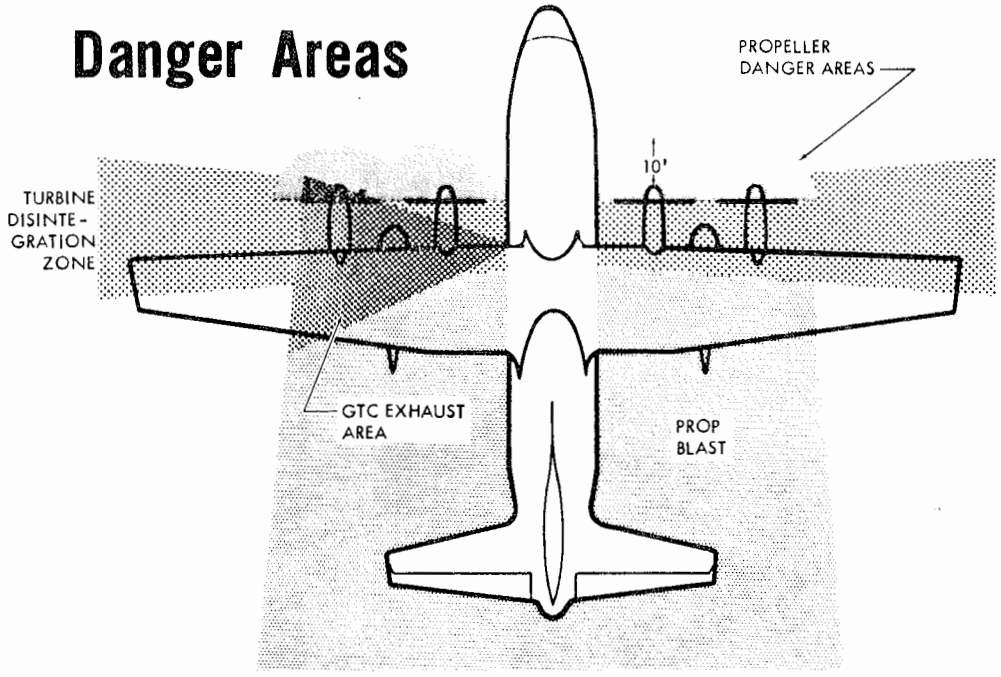


Figure 2-3.

CAUTION

When operating the airplane on either snow-covered surfaces at temperatures near freezing or on slippery surfaces, deviations must be made for engine and propeller check procedure. Check the engines in symmetrical pairs when necessary. Use reverse thrust on the remaining pair of engines to prevent the airplane from sliding forward. Brakes alone will not prevent the airplane from moving forward if each of the four engines is producing more than approximately 8,000 inch-pounds of torque. Avoid parking airplanes close together during ground tests. When runup must be conducted on slippery surfaces, do not attempt to make full power checks until the airplane is lined up on the runway, ready for take-off.

CAUTION

Do not run up all four engines to maximum power simultaneously. The thrust available may be sufficient to skid locked wheels and chocks. Do not run

up two engines on one side simultaneously. The thrust available is sufficient to skid the nose wheel sideways. Simultaneous full reverse power on all engines may lift the nose wheel off the ground.

1. Nose wheel and parking brake	"Centered/set"	P
2. Engine runup	"Complete"	FE

a. Ground idle rpm (within limits)–(FE)

b. Advance throttles from ground idle until they just drop into flight idle; check the torquemeter readings–(P, FE)

c. Set the throttles above 65° (lights out) or a minimum of 8,000 inch-pounds of torque–(P)

Note

Runup area wind conditions may cause excessive rpm fluctuations.

d. Check that engine rpm is within limits–(FE)

e. Place the propeller governing control switches in MECH GOV–(CP)

f. Check that engine rpm is within limits–(FE)

Note

If normal governing rpm was not within limits or if reindexing is desired, see Section VII. If reindexing is not desired, proceed with step g.

g. Place the propeller governing control switches in NORMAL GOV–(CP)

h. All engine instruments within limits–(FE)

WARNING

If engine instruments are not similar in fuel flow, TIT, or torque, with similar throttle position, a propulsion system malfunction may exist. Refer to Section VII for GROUND CHECKOUT OF THE TEMPERATURE DATUM CONTROL.

i. Retard all throttles to FLIGHT IDLE–(P)

Note

Torque should be at least 400 inch-pounds higher than those values observed in step b. If not, a propeller malfunction exists and maintenance action is required prior to flight (P,FE)

j. Flight idle rpm (within limits)—(FE)		
k. Retard all throttles to GROUND IDLE—(P)		
3. Engine Runup checklist	"Completed"	CP

BEFORE TAKE-OFF.

1. All exits	"Secure"	FE, LM
a. Windows	Closed (FE)	
b. Doors	Closed (LM)	
c. Hatches	Secured (FE, LM)	
d. Galley floor	UP (LM)	
2. Pressurization	"Set"	FE

Note

Set the cabin altitude on the controller to the desired altitude, but never less than field elevation.

3. Trim tabs	"Set"	P
a. Tab indicators	Checked	
b. Elevator tab power switch	NORMAL	
4. Autopilot	"OFF"	P
5. Flaps	"50%"	CP
6. Flight controls	"Checked"	P

Note

Restrain the control column when checking elevator movement to prevent the bob weight from slamming the controls against the stops.

7. Hydraulic pressures and quantities	"Pressure checked" "Quantities checked"	CP LM
8. Ground idle	"NORMAL"	FE
9. Electrical control panel	"Set"	FE
a. ATM generator and ATM	OFF/STOP	
b. Engine generators	ON	
c. AC instrument and engine fuel control switch	ESSENTIAL AC BUS	
d. Bus tie switch	NORMAL	

10. Anti-icing control panel	"Set"	FE
a. Nesa windshield switches	NORMAL	
b. Pitot heat switches	ON	
c. Prop and engine anti-icing	ON/AUTO	
11. Fuel control panel	"Set"	FE
a. Crossfeed valves	CLOSED	
b. Main tank boost pumps	ON	
12. Warning lights	"Checked"	FE
13. Crew briefing	"Completed"	P
a. Review take-off data		

Note

Only take-off data applicable to the conditions present need be briefed.

b. Signals for gear and flap retraction		
c. Copilot and flight engineer on actions required should an emergency arise during take-off.		
d. Departure procedures, radios and radar altimeter	As required	
14. Instruments	"Checked"	P, CP, FE
15. Lights	"Set"	FE, CP
a. Navigation	As required	FE
b. Anti-collision	ON	FE
c. Jump lights	OFF	CP
16. Wing tip taxi lights (some airplanes)	"Off"	CP
17. Wing tip taxi lights circuit breaker (some airplanes)	"Pulled"	FE
18. Safety belts and shoulder harness	"Fastened/unlocked" "Fastened/cabin secure"	P, CP, FE, N LM
19. Hot mike	"Set"	P, CP, FE, N
a. The pilot and copilot will set the control panels to LISTEN ON/TALK ON, all others will be set to LISTEN ON.		
20. IFF	"Set"	CP
a. Insert mode and code as briefed		
21. Oil cooler flaps	"AUTO"	CP
22. Before Take-off checklist	"Completed"	CP

AFTER TAKE-OFF.

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

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 illuminate.

After airborne accelerate to the desired climb speed as determined from T.O. 1C-130B-1-1, or use the following table to prevent excessive nose-high attitudes:

180 KIAS to 10,000 feet
170 KIAS to 15,000 feet
160 KIAS to 25,000 feet
Performance charts above 25,000 feet

1. Landing gear lever	"UP"	CP

Note

When the last main gear contacts the up limit switch, momentary flicker of the nose gear indicator may occur. Momentary flicker is considered normal and should not cause any adverse effect.

2. Flaps	"UP/rudder pressure checked"	CP
3. Hot mike	"OFF"	P, CP
4. Landing lights panel	"Set"	CP
a. Landing light switches	OFF	
b. Landing light motor switches	RETRACT/HOLD	
c. Taxi lights	OFF	
5. Synchrophase master switch	"ENG 2 or ENG 3"	FE

Note

Use of the prop resynchrophase switch should be limited to correct for an out-of-sync condition. Allow at least one minute between actuations of the switch to allow synchrophaser signals to stabilize.

6. Aux pump	"OFF"	CP
7. Pressurization	"Checked"	FE
8. Leading edge anti-icing	"As required"	FE

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.

Note

The wing and empennage check should be coordinated with the pilot.

9.	Pilot's radar altimeter	"As required"	P
10.	After Take-off checklist	"Completed"	CP

BEFORE LANDING PATTERN.

This check will be accomplished prior to traffic pattern entry and/or before commencing any type of instrument approach, or it may be accomplished during the initial penetration 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 airplane. To correct this condition, move the throttle(s) forward to bring engine torque out of the NTS range. The use of wing and empennage anti-icing will further decrease flight idle torque.

1.	Crew and passengers	"Briefed"	P, LM
	a. Approach		
	b. Altitude		
	c. Passengers		

Note

On descent prior to landing, the pilot will advise the flight engineer of the landing field elevation.

2.	Pressurization	"Set"	FE

WARNING

Cabin pressure will be zero for landing.

3.	Fuel control panel	"Set"	FE
4.	Temp datum control valve switches	"As required"	FE

Note

A landing is normally made with the temp datum control valve switches in the AUTO position. When the LOCKED position is used, it is recommended that the switches be placed in LOCKED with the engines operating at a stabilized turbine inlet temperature of 800°C or above and at an airplane altitude within 5,000 feet of field elevation.

5. Galley	"Set"	LM
a. Floor	Up	
b. Switches	Off	
6. Safety belt and shoulder harness	"Fastened/unlocked" "Fastened/cabin secure"	P, CP, FE, N LM
7. Landing data	"Checked"	P, CP, FE
8. Radar Altimeter	"Set"	P
9. Altimeters	"Set"	CP, P, N

WARNING

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

WARNING

On airplanes modified by T.O. 1C-130-838, the altimeter's internal vibrator may become inoperative due to internal failure or dc power failure. If this should occur, the 100-foot pointer may momentarily hang up when passing through 0 (12 o'clock position). Pilots should be especially watchful for this failure when their minimum approach altitude lies within the 800 to 1000 foot part of the scale (1800-2000 feet, 2800-3000 feet, etc.) and should use any appropriate altitude backup information available. The 100-foot pointer hang up can be minimized by tapping the case of the altimeter.

10. Angle of attack and stall warning system test (some airplanes)	"FUNCTION"	P

Note

Depress A/A TEST S/W fault indicator light to check operation of lamp. Place press-to-test

switch in the STALL WARNING position. The stall warning horn should actuate and the A/A TEST S/W fault indicator light should remain off. Place press-to-test switch in the ANGLE OF ATTACK position. Pointer should deflect to 1.4 V_s (±1) pointer width with flaps full up. A/A TEST S/W fault indicator light should remain off.

11.	Before Landing Pattern checklist	"Completed"	CP

BEFORE LANDING.

1.	Flaps	"As required"	CP
2.	Landing gear lever	"DN/indicators checked"	CP, P

CAUTION

Just prior to landing, the nose wheel steering indicator will be checked to ensure the nose wheel is not cocked.

Note

The landing gear position indicators are the primary system to indicate the position of the gear. The warning horn and light are backup systems.

Note

The pilot may lower the flaps and gear before calling for the Before Landing checklist.

3.	Landing light panel	"As required"	CP
4.	Hydraulic control panel	"Set"	CP

a. Brake select switch—Checked

b. Auxiliary hydraulic pump—As required

Note

Recharge the emergency brake system by turning the auxiliary hydraulic pump on until emergency brake pressure is within limits.

Note

Higher than normal emergency brake system pressure may be encountered in flight. However, this should not cause damage to the system.

WARNING

The auxiliary hydraulic pump must be turned on if any malfunction in the utility system is noted. The brake select switch must be placed in the EMERGENCY position in the event of utility system failure. On airplanes not modified by T.O. 1C-130-732 or T.O. 1C-130-794, do not select EMERGENCY brake position in flight. If emergency brakes are required select EMERGENCY after touchdown. A malfunctioning brake metering valve may cause locked brakes when emergency brakes are selected.

c. Hydraulic pressure—Checked

5. Anti-skid test (some airplanes)	"Completed"	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.		
6. Synchrophase master switch	"OFF"	FE
7. Hot mike	"ON"	P, CP
8. Before Landing checklist	"Completed"	CP

LANDING.

TOUCH AND GO LANDING.

Touch and go landings require a significant element of caution because of the many actions that 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, after take-off, and before landing. This procedure and checklist is designed for use when touch and go landings are being accomplished and the airplane remains in the traffic pattern area. Before the first touch and go, all normal checklists should be completed through the Before Landing Checklist. After the first touch and go, this checklist may be used until the airplane either departs the traffic pattern or makes a full stop landing. Once the airplane is on the runway the pilot will call for flaps 50 percent and the copilot will place the flap lever to the 50 percent position, reset the trim tabs, and check the flap indicator for a 50 percent indication. The pilot will then advance the power and continue with a normal take-off.

On the Runway:

1. Flaps	"50%"	CP
2. Trim tabs	"Set for take-off"	P/CP
3. Throttles	"As required"	P

After Take-off:

4. Landing gear and flaps	"As required"	CP
5. Landing light panel	"As required"	CP

Before Landing.

6. Flaps	"As required"	CP
7. Landing gear lever	"DN/indicators checked"	CP, P
8. Hydraulic pressures	"Checked"	CP

Note

Recharge the emergency brake system by turning the auxiliary hydraulic pump on until emergency brake pressure is within limits.

9. Touch and go checklist	"Completed"	

AFTER LANDING (AFTER COMPLETION OF LANDING ROLL).

Flight engineer items not requiring coordinated action may be accomplished by the flight engineer after the pilot has called for the After Landing checklist. This does not preclude response to the checklist when called by the copilot.

1. Flaps	"UP"	CP
2. Unnecessary equipment and SKE	"Set"	CP, N

Note

If own aircraft is functioning as master, the stationkeeper should remain on until all aircraft in formation have landed.

Note

Stationkeeper will not be turned off until completion of stationkeeping operations.

3. Radar/IFF	"OFF"/"Standby" for operational stops	N/CP

Note

Turn IFF to STBY as soon as possible after landing. This will eliminate signals from taxiing or parked airplanes which would otherwise block the controller's scope and interfere with the control of airborne airplanes.

Note

Classified IFF codes must be removed, or properly protected.

4. Pressurization	"No pressure"	FE
5. Electrical panel	"Set"	FE
a. ATM and generator	ON/checked	
b. Bus tie switch	TIED	
6. Ground idle	"As desired"	FE
7. Wing tip taxi lights circuit breaker (some airplanes)	"In"	FE
8. Lights	"Set"	CP, FE
a. Landing	As required (CP)	
b. Taxi	As required (CP)	
c. Navigation	As required (FE)	
d. Anti-collision	OFF (FE)	
e. Jump lights	Red (CP)	
9. Anti-icing control panels	"Set"	FE, N
a. Nesa windshield switches	OFF (FE)	
b. Pitot heat switches	OFF (FE)	
c. Prop and engine anti-icing and deicing switches	OFF/AUTO (FE)	
d. Wing and empennage anti-icing switches	OFF (FE)	
e. Radome anti-icing switch	OFF (N)	

Note

Steps 10 and 11 are not required on an operational stop unless all engines are to be shut down.

10. Fuel control panel	"Set"	FE
a. Fuel boost pump switches	OFF	
b. No. 2 crossfeed valve switch	OPEN	
11. Start GTC	"Set"	FE
a. GTC door switch	OPEN	
b. GTC control switch	START/RUN	
c. Bleed air valve switch	OPEN/pressure up	
12. After Landing checklist	"Completed"	CP

ENGINE SHUTDOWN.

Normally all four engines will remain running until the airplane is parked.

CAUTION

During ground stop procedure, do not move the engine condition lever from STOP to RUN while the engine is still rotating.

1.	Nose wheel and parking brake	"Centered/set"	P
2.	Radar altimeter	"OFF"	P
3.	Shutdown and NTS check all engines	"Complete"	CP

Note

If NTS lights do not illuminate when shutting down engines from low-speed ground idle, a recheck of the NTS system must be made before the next flight.

a. Place feather valve and NTS check switch in NTS position.

b. Place throttles in GROUND IDLE.

c. Place condition levers in GROUND STOP and observe zero fuel flow.

d. Observe the NTS lights, then return the feather valve and NTS check switch to NORMAL.

4.	Air-conditioning control panel	"Set"	FE
	a. Master switch	OFF	
	b. Under floor heat switch	OFF	
5.	Engine bleed air valve switches	"CLOSE"	FE
6.	Engine generator switches	"OFF"	FE
7.	Inverter switches	"OFF"	FE
8.	Oil cooler flap switches	"FIXED"	CP
9.	Temp datum control valve switches	"NULL"	FE
10.	Oxygen regulators	"Set"	P, CP, FE, N, LM
	a. Diluter lever	100%	
	b. Supply lever	OFF	
11.	Exit clearance	"Clear/insert chocks"	P

a. Jump lights	Green (After propeller rotation has stopped) (CP)	

Note

Direct the loadmaster or ground control to insert chocks. No response will be required at this time.

12. Hydraulic control panel	"Set"	CP

CAUTION

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

a. Suction boost pump switches	OFF	
b. Auxiliary hydraulic pump switch	OFF	
13. Chocks	"In place"	GC

Note

Chock main wheels only.

14. Parking brake	"Released"	P
15. Engine Shutdown checklist	"Completed"	CP

BEFORE LEAVING THE AIRPLANE

Make appropriate entries in the Form 781 covering any limits in the Flight Manual that have been exceeded during flight. Entries must also be made when, in the judgment of the pilot, the airplane has been exposed to unusual or excessive operations such as hard landings or excessive braking action during aborted take-offs. The flight engineers will complete the following items as required.

Note

The flight engineer will complete a brief general condition interior and exterior visual inspection prior to leaving the airplane.

CAUTION

Never install rig pins in the control system nor secure the flight deck controls as a means of locking the surfaces against wind gust. Otherwise, damage to the hydraulic booster and/or cable system is likely to result.

1. Lights	Set
a. Exterior	OFF

b. Interior	As required
c. Landing	RETRACT/HOLD/OFF
d. Jump lights	OFF
2. ATM generator and ATM	OFF/STOP
3. GTC control panel	Set
a. Bleed air valve switch	CLOSED
b. GTC control switch	OFF
c. GTC door switch	CLOSED
4. Radios	OFF
5. Bus tie switch	NORMAL
6. DC power switch and dc voltmeter switch	OFF/MAIN DC BUS
7. Emergency exit light extinguish switch	Depress
8. Nose lock and ground wire	Installed

CRUISE ENGINE SHUTDOWN.

This procedure is to be used only if authorized by the major air command, engine shutdown may be performed during cruise flight to achieve optimum fuel economy in order to meet mission requirements. Refer to T.O. 1C-130B-1-1, Part 5, for charts containing range information.

WARNING

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

1. Notify crew		P
2. Synchrophase master switch	"As required"	FE
3. NTS check	"Complete"	P

CAUTION

The NTS check should be accomplished on one engine at a time.

a. Feather valve and NTS check switch	VALVE
b. Propeller governing	MECH GOV
c. Throttle	4,000 in-lb torque or more
d. Wing and empennage anti-ice	ON
e. Bleed air valve (engine being checked)	OPEN
f. Bleed air valves (other engines)	CLOSED/one at a time

g.	Slowly retard throttle observing decrease in torque value	Observed	

Note

As torque decreases, read highest negative value. NTS should occur at −1260 (±600) inch-pounds. NTS action is indicated by an increase in torque and may fluctuate up to a positive 500 inch-pounds. NTS action should result in intermittent illumination of the valve check light.

h.	NTS check complete	All switches and controls normal	

CAUTION

If NTS action is not observed by −1860 inch-pounds, advance the throttle to normal operation. Turn off wing and empennage anti-ice, open the other engine bleed air valves and close the valve on the one being checked to ensure that NTS action is not needed and thereby preclude the possibility of propeller decoupling.

4.	Engine condition lever	"FEATHER"	CP

CAUTION

After shutdown of the first engine, allow the TIT to decrease to the restart TIT (200°C) prior to shutdown of the second engine.

5.	Engine bleed air valve switch	"CLOSE"	FE

Note

If starter, engine inlet scoop anti-icing, or oil cooler scoop anti-icing are required, the bleed air valve should be opened.

6.	Engine generator switch	"OFF"	FE
7.	Fuel boost pump switch	"OFF"	FE
8.	Throttle	"1 inch forward of FLIGHT IDLE"	P
9.	Synchrophase master switch	"Reset as necessary"	FE

Note

The above checklist is arranged in such a manner that the inoperative engine controls are set for immediate air starting by moving the condition lever to AIR START. See Section III for AIR START PROCEDURE.

10.	Cruise Engine Shutdown checklist	"Completed"	CP

TACTICAL TURNAROUND.

This checklist is provided for missions requiring rapid turnaround and is predicated on one or more engines operating in normal ground idle with one of the pilots and the flight engineer remaining at their respective crew positions. These procedures may be used when authorized by the major air command.

AFTER LANDING.

1. Flaps	"50%"	CP
2. Trim tabs	"Set"	P
3. Pressurization	"No pressure"	FE
4. Anti-icing control panels	"Set"	FE, N
a. Nesa	As required (FE)	
b. Pitot heat switches	As required (FE)	
c. Prop and engine anti-icing	OFF (FE)	
d. Wing and empennage anti-icing	OFF (FE)	
e. Radome anti-icing	OFF (N)	
5. Fuel Panel	"Set"	FE
6. Radar, IFF, and Stationkeeper	"Standby"	CP, N
7. Engine bleed valves	"Open"	FE
8. Shutdown engines	"As required"	CP
9. Crew briefing	"Complete"	P
a. Takeoff data		
b. Departure procedure		
10. After Landing checklist	"Completed"	CP

BEFORE TAKE-OFF.

1. Start engines	"Complete"	P

WARNING

Ensure propeller area is clear.

2. All exits and warning lights	"Checked"	FE, LM
a. Windows	Closed (FE)	
b. Doors	Closed (LM)	
c. Hatches	Secure (FE, LM)	
3. Radar, IFF, and Stationkeeper	"Set"	CP, N

4. Anti-icing control panel	"Set"	FE
a. Pitot heat	ON	
b. Nesa	NORMAL	
c. Prop and engine anti-icing	ON/AUTO	
5. Safety belt and harness	"Fastened/UNLOCKED" "Fastened/Cabin Secure"	P, CP, FE, N, LM
6. Engine bleed air valves	"As required"	FE
7. Before Take-off checklist	"Completed"	CP

AFTER TAKE-OFF.

Proceed with the normal AFTER TAKE-OFF CHECKLIST.

alert procedures

When the airplane is placed on alert status, the checklists that follow will be used as the master checklist. These checklists include the sequence of events to preflight, and they provide for cocking the airplane to allow scramble and continuation of flight in a minimum of time. In addition, checklists are included for a daily preflight, uncocking and taxi back.

PREFLIGHT.

Refer to the normal expanded checklists in this section, and accomplish the PREFLIGHT CHECK, and the COCKPIT checklist except for Item 1 of the COCKPIT checklist.

COCKING.

1. Electrical control panel	Set
a. Generator switches	OFF
b. Inverters	OFF
c. External ac power switch	EXT AC PWR (if available)
d. Bus tie switch	TIED
e. DC power switch	BATTERY/EXT DC PWR

Note

External dc power may be used if external ac power is now available.

2. UHF and VHF Radios	ON/as required
a. Hot mike	ON
3. Interior and exterior lights	Set/as required
4. Inverters	ON/checked

5. Hydraulic control panel	Set	
a. Brake select switch	EMERGENCY	
b. Aux pump switch	ON/pressure up	
c. Engine and suction boost pump switches	ON	
6. Oxygen	Checked/set	
7. Anti-collision light switch	ON	
8. Inverters	OFF	
9. External AC and DC power switches	OFF	
10. External power and ground equipment	As required	
11. Emergency exit light extinguish switch	Depress	
12. Mode 4 computer	Installed/codes set	

Note

On airplanes modified by T.O. 1C-130-838, ensure that the Mode 4 Computer is installed and appropriate codes are set.

SCRAMBLE.

1. NLG lock, pitot covers, dust excluders, and plugs	"Removed and stowed"	GC
2. Electrical control panel	"Set"	FE
a. Generator switches	OFF	
b. Inverter switches	OFF	
c. External ac power switch	EXT AC PWR (if available)	
d. Bus tie switch	TIED	
e. DC power switch	BATTERY	

Note

External dc power may be used if external ac power is not available.

3. Clear GTC	"GTC clear"	GC
4. Start GTC	"Set"	FE
5. ATM and ATM generator	"ON/checked"	FE
6. Inverters	"Set"	FE
7. Parking brake	"Set"	P
8. Wheel chocks	"Removed"	GC

9. Clear No. 3 engine	"No. 3 clear" "Turning No. 3"	GC P
10. External power and groundwire	"Removed/clear"	GC
11. Start ramaining engines (4, 2, and 1)	"Clear" "Turning No. 4, No. 2, No. 1"	GC P
12. GTC panel	"Set"	FE
a. Bleed air valve	CLOSED	
b. Control switch	OFF	
c. Door switch	CLOSED	
13. Radios, radar, IFF, SKE, and hot mike	"As desired"	P, CP, N
a. IFF (Airplanes modified by T.O. 1C-130-838)	STBY (CP)	
14. Electrical panel	"Set"	FE
a. ATM generator and ATM	OFF/STOP	
b. Engine generators	Checked	
c. AC instrument and engine fuel control switch	ESSENTIAL AC BUS	
d. Bus tie switch	NORMAL	
15. Crew aboard, doors closed	"Aboard/closed/checked"	LM
16. Start taxi	"Rolling"	P
17. Brakes	"Checked/NORMAL/ anti-skid ON"	P, CP
18. Hydraulic pressures and quantities	"Checked"	CP, LM
19. Flight instruments	"Checked"	P, CP

Note

Check heading and turn and slip indicators for correct movement. Check airspeed and vertical velocity indicators for proper reading.

a. Flight directors	Set	
b. Stall warning horn	Depress for horn actuation	
20. Fuel control panel	"Set for take-off"	FE
21. Anti-icing control panel	"Set"	FE
a. Nesa windshield switches	NORMAL	
b. Pitot heat switches	ON	
c. Prop and engine anti-icing and deicing switches	ON/AUTO	
22. Propeller reversing, engine generators and loads	"Checked"	P, FE

23. Altimeters	"Set"	P, CP, N
24. Warning lights	"Checked"	FE
25. Flight controls and trim tabs	"Checked/Set"	P
26. Flaps	"50%"	CP
27. Pressurization	"As required"	FE
28. Safety belt and shoulder harness	"Fastened/unlocked" "Fastened/cabin secure"	P, CP, FE, N, LM
29. Scramble checklist	"Completed"	CP

AFTER TAKE-OFF.

After take-off, refer to the normal expanded checklist in this section, and start with the AFTER TAKE-OFF checklist.

Note

The following phases of operation have no particular chronological identification, but they will have to be used while the airplane is on alert status as circumstances dictate.

DAILY PREFLIGHT.

Refer to the normal checklist and accomplish the EXTERIOR INSPECTION.

UNCOCKING.

Return to nonalert status. Refer to the normal expanded checklist in this section, and accomplish the AFTER LANDING and ENGINE SHUTDOWN checklists.

TAXI-BACK.

Return to alert status. Refer to the normal expanded checklist in this section and accomplish the After Landing and Engine Shutdown checklists. Complete the COCKPIT (except item 1) and COCKING checklists.

SECTION IV
Auxiliary Equipment

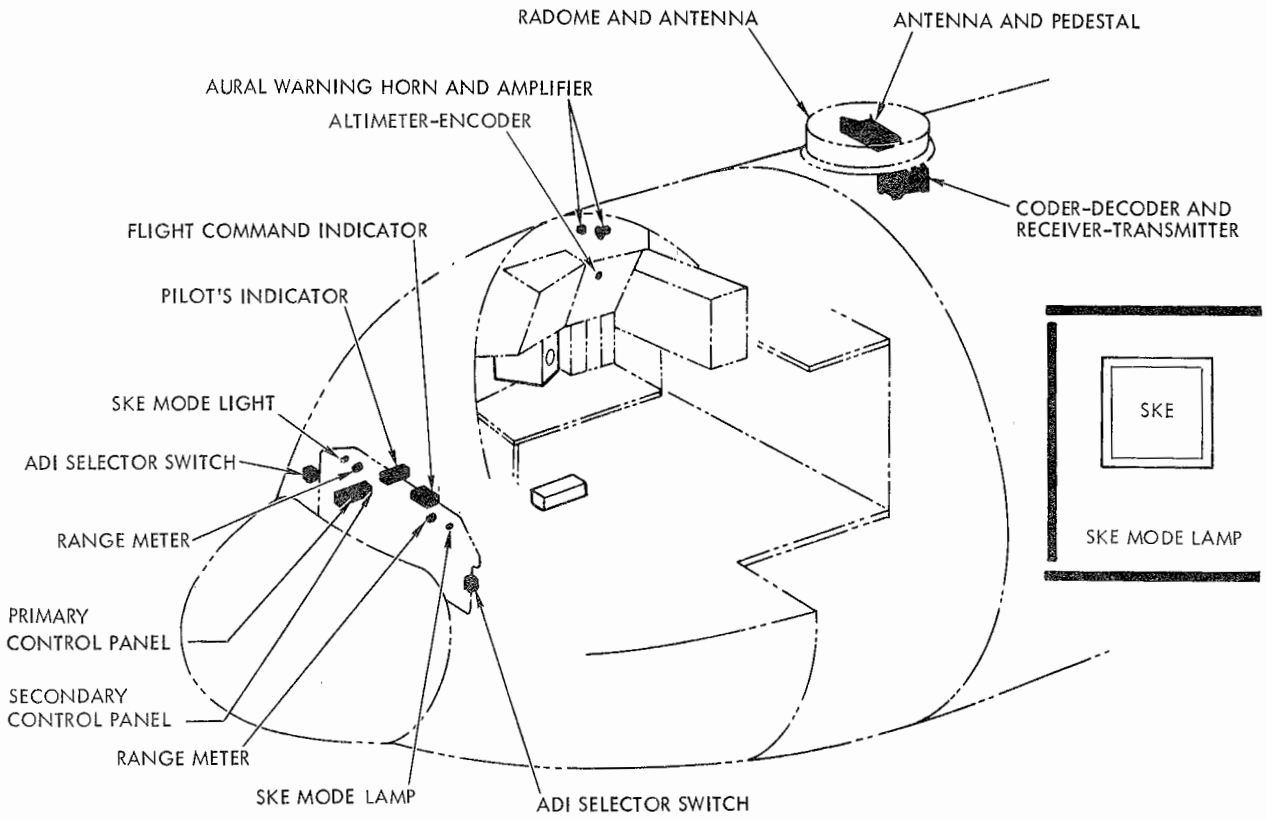
Table of Contents

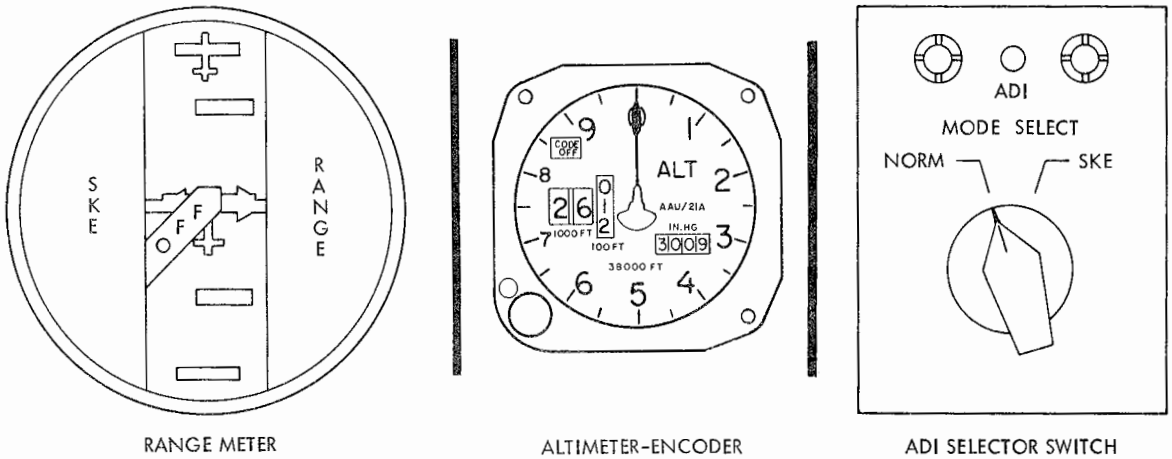
COMMUNICATION AND ASSOCIATED ELECTRONIC EQUIPMENT.

INTRAFORMATION POSITIONING SET AN/APN-169A.

Intraformation Positioning Set AN/APN-169A is a specialized lightweight system which allows up to 36 aircraft to maintain fixed separation between aircraft in formation, and to locate and identify each other during day and night flights under adverse weather conditions. The system performs three basic functions: (1) the display of stationkeeping information on an azimuth range indicator (ppi) situation display and/or track-while-scan (TWS) position data on a flight director display, (2) an integral signaling capability for the transfer of proportional and discrete data to facilitate coordinated changes of the flight path, and (3) an audio and visual alarm warning system (proximity warning) to signal the presence of an intruding aircraft within a selectable zone. The ppi display is one of the principal readout devices of the electronic system. This situation display is capable of indicating all aircraft within a 10-mile radius. The track-while-scan display provides the capability of maintaining X, Y, and Z positions with respect to any other one selected aircraft within 4 miles by manually setting track, cross-track, and altitude on the secondary control to a specific desired "offset" between aircraft. Position is maintained by flying the attitude director indicator (ADI) and stationkeeping range meter, while still

AN/APN-169A Component Locations





RANGE METER — ALTIMETER-ENCODER — ADI SELECTOR SWITCH

546-1-11A

Figure 4-1

maintaining all aircraft on the ppi. A data transfer function not only provides commands to and from specifically selected aircraft in the formation, but also provides the necessary data channel for altitude transfer. Each aircraft has the capability of performing the functions as either a "master" or "follower." One aircraft, which can be at any position in a formation, must function as a synchronization master while all others act as followers. If the master becomes inoperative for any reason, a master lost indicator on the azimuth and range indicator in all follower aircraft signals this condition. Any of the follower aircraft may then act as the master, as assigned in preflight planning.

Azimuth and Range Indicator (IP-797A).

The azimuth and range indicator (figure 4-2) contains all the circuits, controls and indicators necessary to display the information required for stationkeeping operation. This indicator must be installed when the aircraft is flying in a stationkeeping operation. The azimuth and range indicator (IP-797A) will be replaced by the indicator (IP-268/APN-59) when the aircraft is functioning in a nonstationkeeping operation. The indicator not being used will be stowed in a compartment at the navigator's station where it will be readily available if the aircraft function is changed. The indicator is equipped with a direct view storage tube (DVST) which provides two unique capabilities: the DVST can store the video in memory for a period of 0.1 to 60 seconds, thereby enabling the operator to retain the video information, and the DVST intensity which provides the operator with a variable video presentation bright enough for daytime operation.

BLANKING Control–Blanks out a variable width vertical corridor of range marks.

Range Ring–Adjusts azimuth range with target on display.

TEST Lamp–Glows amber when system is in BITE test mode.

CAUTION Lamp–Glows yellow when there is a possibility of incorrect display.

MASTER LOST Lamp–Glows red when transmission from the master aircraft is lost.

PROXIMITY WARNING Lamp–Glows red when another aircraft is within proximity warning range.

1/4, 2/8, 4/16, 8/32, 16/64 Lamps–Indicate range and range mark in 1000 feet. Upper figure represents range in 1000 feet and lower figure indicates range marks in 1000 feet.

RANGE X 1000 FT Switch–Selects one of five ranges: 1000, 2000, 4000, 8000 and 16,000 feet per range mark.

DISPLAY Control–Varies intensity of ppi display including range marks.

BRIGHT DIM Switch–Controls background brightness on ppi display.

RANGE MARKS Control–Controls brightness of range marks on ppi display.

Pilot's Indicator

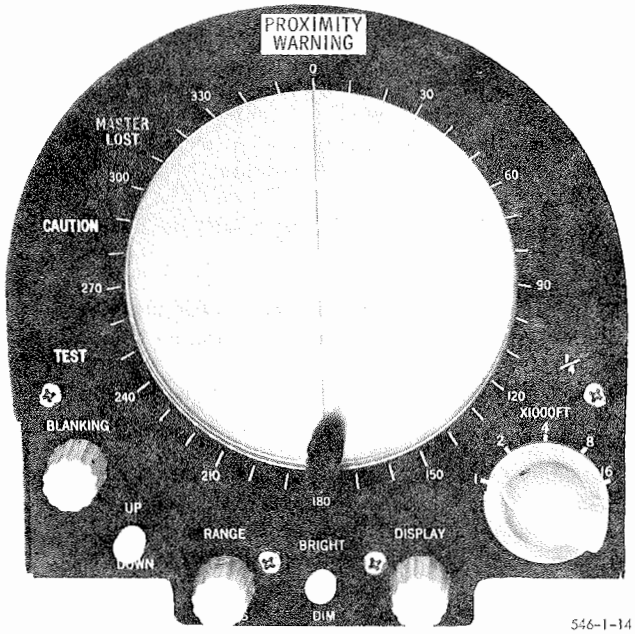


Figure 4-2

UP DOWN Switch–Adjusts position of center of display.

Primary Control (C-6635/A).

The primary control (figure 4-3) contains switches, indicators,

Primary Control

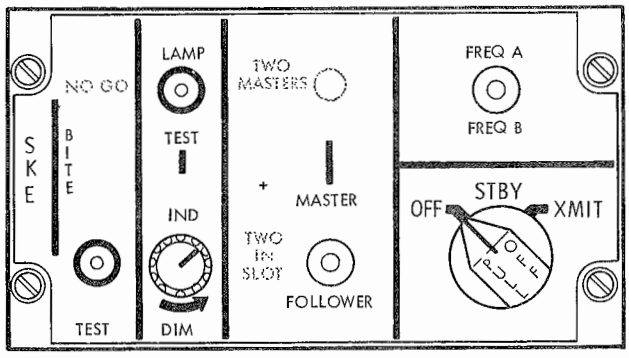


Figure 4-3

BITE TEST Switch–Initiates automatic BITE function when depressed.

NO GO Lamp–Illuminates (red) when the BITE circuitry fails to automatically program through the BITE sequence.

LAMP TEST Switch–Illuminates all status indicator lamps and the flight command indicator receive (REC) lamps when depressed.

TWO MASTERS Indicator–Illuminates when there are two or more masters (aircraft) on one frequency.

Master Indicator–Illuminates when aircraft is functioning as a master. Indicator lamp is blue.

FREQ A-FREQ B Switch–Selects operating frequency.

OFF-STBY-XMIT Switch–Applies power to system without transmitting in STBY position. Allows system to transmit in XMIT position and turns system off (except battery power to stabilization oscillator) in OFF position.

MASTER/FOLLOWER Indicator–Selects master or follower mode of system.

TWO IN SLOT Indicator–Illuminates when two stationkeeper aircraft on the same frequency are using the same time slot.

IND DIM Control–Controls dimming of all SKE control panel indicators.

Secondary Control (C-7956).

The secondary control (figure 4-4) contains the intraformation positioning readouts and other controls.

TRACK (X 1000) Switches–Select the in-track offset in 1000-foot increments from the leader aircraft.

Note

The TRACK (X 1000) switch is used in conjunction with the range meter, which has a display capability of plus or minus 1000 feet about the desired track offset position. The TRACK (X 1000) switch also changes the scale sensitivity of the cross-track display on the ADI vertical pointer at the 5000- and 10,000-foot positions. The maximum TRACK distance that can be set is 19 (X 1000) feet.

Secondary Control

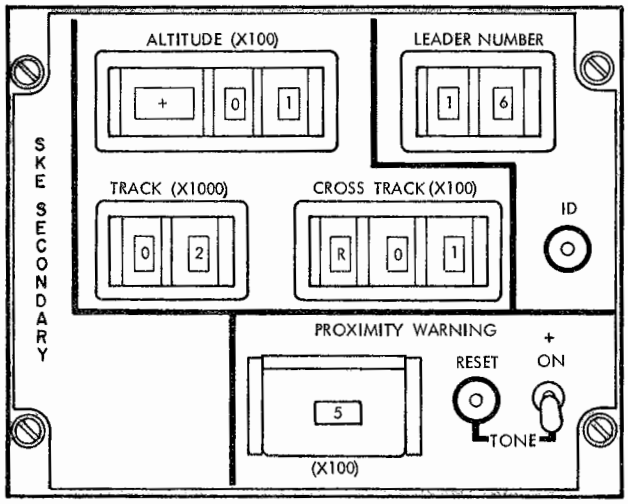


Figure 4-4

ALTITUDE (X 100) Switches–Select the desired altitude offset in 100-foot increments from the leader aircraft.

Note

The offset may be above the leader (+ prefix) or below the leader (– prefix). The scale factor on the glideslope indicator of the ADI is plus or minus 200 feet. A third prefix on the switch (50) disables the offset switches and changes the scale factor on the ADI from plus or minus 200 feet to plus or minus 5000 feet. The maximum offset that can be set above or below the selected leader is 29 (X 100) feet.

CROSS TRACK (X 100) Switches–Select the lateral offset in 100-foot increments from the leader aircraft.

Note

The CROSS TRACK (X 100) switch is used in conjunction with the ADI vertical pointer and has three scale sensitivities depending upon the setting of the TRACK (X 1000) switch. When the TRACK (X 1000) switch is set between 1000 and 4000 feet, the sensitivity is plus or minus 1000 feet; between 5000 and 10,000 feet it is plus or minus 2000 feet; and between 11,000 and 20,000 feet it is plus or minus 4000 feet. The vertical pointer is normally used as a command signal indicating steer left or steer right. The maximum offset that can be set for lateral offset from the selected leader is 49 (X 100) feet.

LEADER NUMBER Switches–Select leader aircraft by time slot number. Time slot numbers 01 through 09, 11 through 19, 21 through 29, and 31 through 39 can be selected.

ID Switch–Causes selected leader aircraft "blip" to be only aircraft observed on ppi display when depressed.

PROXIMITY WARNING (X 100) Switch–Selects the desired proximity warning range. In the OFF position, it disables the proximity warning capability. Desired proximity warning range can be selected in 5 (X 100)-foot increments from 5 (X 100) feet to 45 (X 100) feet.

PROXIMITY WARNING TONE Switch–Controls the warning tone on the ground only. The switch is bypassed by the landing gear auxiliary touchdown relay when the aircraft is airborne to prohibit disabling of the tone signal.

PROXIMITY WARNING TONE RESET Switch–Interrupts the warning tone for approximately 30 seconds when momentarily depressed.

Flight Command Indicator (ID-1686).

The flight command indicator (figure 4-7) provides front panel controls and indicators consisting of seven pushbutton type

switches with corresponding indicator lamps. The pushbutton switches, when depressed by the leader aircraft, will glow white [with the exception of E (execute) which is amber] to signify transmittal of a system command and the corresponding indicator at the follower aircraft will glow amber upon receipt of the command function. The flight command indicator provides the capability of transmitting and receiving the following functions: (1) standard rate left turn, (2) standard rate right turn, (3) minus (slow), (4) plus (fast), (5) let down, (6) climb, and (7) execute.

Flight Command Indicator Lamps—Glow amber for 12 to 16 seconds upon receipt of a command (only from leader selected).

Flight Command Switch—Glows white except E (execute) which is amber for 12 to 18 seconds to signify transmittal of a system command.

Range Indicator (ID-1728).

Range indicators, one each on the pilot's and copilot's instrument panels (figure 4-1), provide a visual presentation of own aircraft in relation to the aircraft selected as leader. The distance from the small airplane at the top of the indicator to the center of the indicator represents 1000 feet; the total distance from the top to the bottom of the indicator represents 2000 feet. A small airplane indicator positioned in the center of the display represents own aircraft when flying in the desired position. When the stationkeeper is not operating or the ADI select switch is in normal, a warning (OFF) flag extends into the center of the indicator.

Loudspeaker.

The loudspeaker, mounted over the flight engineer's station (figure 4-1) provides an aural warning coincident with the PROXIMITY WARNING lamp on the pilot's azimuth and range indicator.

SKE Mode Lights.

The SKE mode lights, one each mounted on the pilot's and copilot's instrument panel (figure 4-1), provide a visual indication of the stationkeeper operating status. These indicators illuminate when the ADI selector switches are in the SKE position.

ADI Selector Switch.

The ADI selector switches, one each on the pilot's and copilot's instrument panels (figure 4-1), provide switching functions associated with operation of the pilot's and copilot's attitude director indicators and range indicators using outputs of the stationkeeper. When both switches are in the NORM position, the range indicators are inoperative, and the attitude director indicators operate normally with the standard flight director system. When the pilot's ADI selector switch is placed to SKE, indicator lights and the displacement pointer flag, vertical pointer flag, vertical pointer, and displacement pointer inputs to the ADI are switched from the flight director system to the stationkeeper. When in the SKE position, the circuit to the horizontal pointer is interrupted causing the horizontal pointer to remain stowed. The copilot's ADI selector switch operates the same as the pilot's except the No. 2 flight director computer is used and the circuit to the copilot's ADI PILOT REPEAT switch is opened to prevent operation of the pilot repeat relay.

RECEIVER-TRANSMITTER.

The SKE receiver-transmitter (figure 4-5) is located in the overhead equipment rack in the cargo compartment. Essentially, the receiver-transmitter, R-T unit, provides rf circuitry necessary for the operation of the intraformation positioning set. Receiver-transmitter monitoring indicators listed below are located on the front panel.

LOPWR—An indicator lamp which glows green when transmitter power drops below specified level.

VSWR—An indicator lamp which glows amber when voltage standing wave ratio at transmitter output rises above specified level.

FREQ—An indicator lamp which glows blue when transmitter deviates from specified frequency.

OVERHEAT—An indicator lamp which glows red when internal temperature exceeds specified limit.

CODER-DECODER.

The SKE coder-decoder unit (figure 4-6), located in the overhead equipment rack in the cargo compartment adjacent to the receiver-transmitter, provides timing, encoding, decoding, and automatic gain control of the received signals. The coder-decoder also includes the range mark generator and range-time-to-voltage converter which furnish position information to the indicator. A stable crystal clock is contained within the coder-decoder. Indicators, meters, and controls are located on the front panel of the coder-decoder. The coder-decoder contains the following controls and indicators.

CHANNEL SELECT—A thumbwheel switch which selects individual time slot for the aircraft.

Stepper motor and dial assembly—Indicate shaft position of the potentiometer which controls voltage applied to the crystal-controlled clock.

CLOCK ADJUST—A potentiometer which provides manual frequency adjustment of the clock.

P—An indicator lamp which glows blue when clock dial is at either end of its travel.

C—An indicator lamp which glows green to indicate a malfunction of the coder-decoder.

V—An indicator lamp which glows amber when clock heater voltage drops below minimum requirements.

Receiver-Transmitter

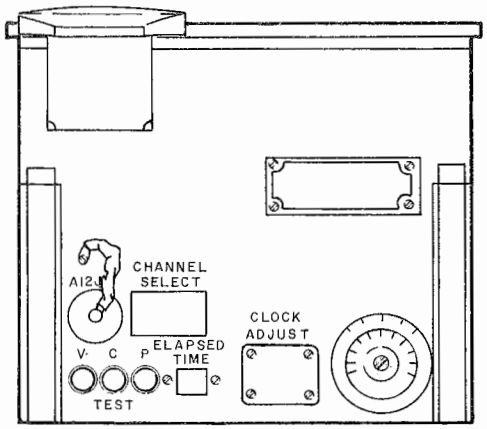


Figure 4-5

Coder-Decoder

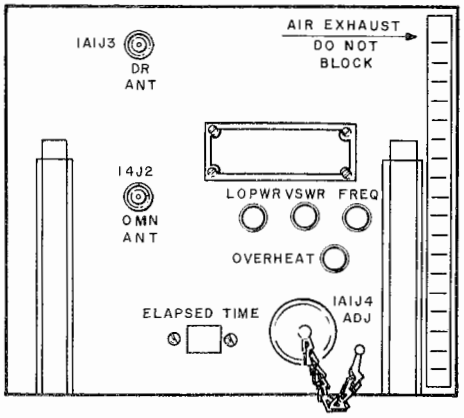


Figure 4-6

Flight Command Indicator

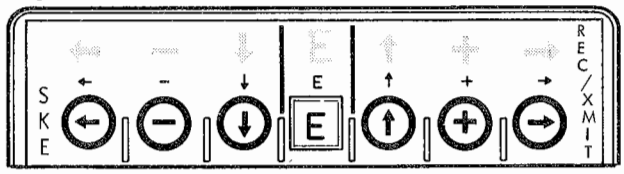


Figure 4-7

ANTENNA SYSTEM.

The antenna system comprises two antennas, a directional antenna with attached pedestal and an omni antenna, which are housed within a radome located on top of the fuselage just aft of the flight deck. Transmitting and receiving functions are accomplished by both antennas. One-way stationkeeping transmissions take place via the omni antenna. During part of the synchronization, transmission is via the directional antenna. The indicators within the cockpit are slaved electromechanically to the directional antenna by a resolver contained on the pedestal. The pedestal also contains an optical light source and amplifier circuitry for generating range mark time base. The array is driven by a pedestal-mounted drive motor and gear train which rotate the antenna through 360 degrees at a rate of 40 rpm.

NORMAL OPERATION.

Preflight Procedures.

Before placing the intraformation positioning set into operation, carry out a BITE test.

1. Set primary control switches and controls as follows:

   IND DIM control–CW
   LAMP TEST–Depress.

2. Observe that the MASTER, TWO MASTERS, TWO IN SLOT, and NO GO lamps on the primary control, the PROXIMITY WARNING, MASTER LOST, CAUTION, M, and TEST lamps on the pilot's indicators, and the REC lamps on the flight command indicator light.

3. Set secondary control switches and controls as follows:

   ALTITUDE (X 100) switch–00
   TRACK (X 1000) switch–01
   CROSS TRACK (X 100) switch–L14
   PROXIMITY WARNING (X 100) switch–25
   PROXIMITY WARNING TONE switch–ON.

4. Set ADI MODE SELECT switches on pilot's and copilot's instrument panels to SKE.

5. Set switches and controls on Pilot's Indicator as follows:

   BLANKING control–CW
   UP/DOWN switch–Center
   RANGE MARKS control–CW
   BRIGHT/DIM switch–As required
   DISPLAY LEVEL control–CW
   RANGE switch–1.

6. Set primary control switches and controls as follows:

   OFF/STBY/XMIT control–XMIT
   BITE TEST–Depress.

7. Observe that the following events occur:

   TEST lamp lights
   MASTER LOST lamp lights
   2000-foot range ring appears
   PROXIMITY WARNING lamp lights
   Strobe appears
   Horn sounds.

8. Set PROXIMITY WARNING (X 100) switch to 15.

9. Observe the following indications:

   PROXIMITY WARNING indications stop
   OFF flags remain out of sight
   Glideslope reads zero.

10. Set ALTITUDE (X 100) to +01 and observe that glideslope reads 100 feet up.

11. Set ALTITUDE (X 100) to –01 and observe that glideslope reads 100 feet down.

12. Observe that the bank steering bar is centered.

13. Set CROSS TRACK (X 100) to L24 and observe that the bank steering bar moves left.

14. Set CROSS TRACK (X 100) to L04 and observe that the bank steering bar moves right.

15. Set TRACK (X 1000) to 02 and observe that the range meter needle (airplane) moves up.

16. Depress each button on the flight command indicator and observe that each button and its respective REC legend lights.

17. Observe that NO GO lamp remains extinguished at end of BITE test.

18. Set OFF/STBY/XMIT switch to STBY momentarily; then back to XMIT.

Note

If the NO GO lamp lights, a possible malfunction exists in the stationkeeping system. Should this occur, rerun the complete BITE test.

Set the switches and controls as briefed for flight.

Inflight Procedures.

The following procedures cover inflight operation using several operating modes. These procedures require that all airplanes in the flight formation operate in accordance with a preflight plan. Each airplane in the formation will be assigned a time slot numbered consecutively from 1 to 39 (time slots 10, 20, and 30 are not assigned). It is usually advantageous to maintain a semipermanent assignment of these time slots to avoid confusion in later flights. The flight plan indicates which airplane is to function as the master aircraft. The other airplanes will then function as followers. Proper station-keeping is initiated when all follower airplane clocks are synchronized with that of the master. Perform the following steps for inflight sequence of operation.

MASTER AIRCRAFT IN FORMATION OPERATION.

Note

The intraformation positioning set clock operates from the aircraft battery. If the battery has been replaced just prior to flight, or if the SKE BATT circuit breaker has been left open, allow one additional hour for the clock to stabilize.

1. Set Slot Number switches on coder-decoder to time slot indicated in flight plan. Select briefed frequency.

CAUTION

The OFF/STBY/XMIT switch must be set to STBY or OFF when FREQ A/FREQ B switch position is changed.

2. Place OFF/STBY/XMIT switch in XMIT position and allow for a 2-minute warmup.

3. Set and hold MASTER/FOLLOWER switch on primary control to MASTER position until MASTER panel readout glows blue. Release MASTER/FOLLOWER switch.

Note

As soon as contact has been established with another aircraft in the formation, it will appear as a target on the screen.

ALL AIRCRAFT IN A SINGLE FORMATION OPERATION.

Note

The intraformation positioning set clock operates from the aircraft battery. If the battery has been replaced just prior to flight, or if the SKE BATT circuit breaker has been left open, allow one additional hour for the clock to stabilize.

Perform the following steps for all aircraft in a single formation operation.

1. Position all switches and controls as indicated on the flight plan.

CAUTION

The OFF/STBY/XMIT switch must be in STBY or OFF when the FREQ A/FREQ B switch position is changed.

2. Set OFF/STBY/XMIT switch to XMIT.

Note

As soon as contact has been established with another aircraft in the formation, it will appear as a target on the screen.

SINGLE AIRCRAFT JOINING ESTABLISHED FORMATION OPERATION.

Perform the following steps if you are a lone aircraft attempting to join an established formation.

1. Set CHANNEL SELECT switches on coder-decoder to time slot indicated in flight plan. Select briefed frequency.

2. Set LEADER NUMBER switches on secondary control to position established by the flight plan.

3. Set OFF/STBY/XMIT switch on primary control to XMIT and allow for a 2-minute warmup.

4. Set MASTER/FOLLOWER switch on primary control to FOLLOWER.

Note

As soon as contact has been established with another aircraft in the formation, it will appear as a target on the screen.

5. Set RANGE X 1000 FT switch on azimuth and range indicator at maximum range (16).

6. When within range of the formation master aircraft, the Intraformation Positioning Set AN/APN-169A will automatically synchronize with the master. Check that the master lost (ML) indicator has extinguished and identify the selected leader by use of the identification switch (ID). All targets should disappear from the PPI display except the selected leader aircraft "blip" for as long as the ID switch is depressed. After synchronization and identification of the selected leader, proceed with the flight plan.

RENDEZVOUS OF TWO FORMATIONS OPERATION.

Perform the following steps for rendezvous of two formations operation.

1. Rendezvous the two formations while maintaining separations as required.

Note

The two formations should be flying in close proximity to one another but separated by at least 1000 feet in altitude, one formation utilizing FREQ A and the other FREQ B. Each formation will have a master aircraft. The master aircraft of the joining formation will be the last aircraft to join the composite formation.

2. Establish sequence for joining formation; i.e., aircraft X is number 1, aircraft Y is number 2, etc.

3. Designated aircraft of the joining formation set OFF/STBY/XMIT switch on primary control to STBY and then select the frequency being used by the composite formation. Reset the OFF/STBY/XMIT switch to XMIT, set SEPARATION switch on pilot's control panel to maximum range (16) and check that the master lost indicators on the pilot's, copilot's, and navigator's indicators extinguish. Set LEADER NUMBER switch on secondary control to required position. Identify the selected leader aircraft "blip" on the PPI display by use of the ID switch.

4. Designated aircraft joins the composite formation after selecting flight plan briefed offsets on the secondary control panel utilizing approved aeronautical procedures and local requirements.

5. Successive aircraft join the formation in turn in accordance with steps 3 and 4.

Shut-Down Procedures.

To shut down the intraformation positioning set, set OFF/STBY/XMIT switch on primary control to OFF. All other switches may remain in their respective positions.

EMERGENCY OPERATING PROCEDURES.

Loss or Partial Loss of Presentation.

LOSS OF TARGETS ONLY.

Prolonged loss of targets may be the result of a malfunction in the display circuitry. Under these circumstances, the aircraft may stationkeep with the aid of the track-while-scan mode of operation. To check the operation of the track-while-scan mode, the pilot should perform a slight right and then left maneuver and observe the ADI indicator for the appropriate flight path responses. Check the intraformation positioning set indicator lamps for normal indications.

LOSS OF RANGE MARKS.

Normal stationkeeping may be maintained during absence of the range marks presentation by the operator making an approximation of range, by observing the target display with respect to the center of the presentation.

Proximity Warning.

The PROXIMITY WARNING indicator lights alert the pilot and crew that another SKE-equipped aircraft operating on the same frequency is within the PROXIMITY WARNING setting on the stationkeeper secondary control. The proximity warning indication is accompanied by an aural warning from the flight station loudspeaker. A visual display of the intruding aircraft is provided by a strobe marker on the pilot's indicator. The strobe extends from the zero range ring to the intruding aircraft. The pilot is required to take evasive action by changing his position in the formation or to warn the offending aircraft so that the other aircraft may perform the necessary maneuvers.

If the PW indicator and aural warning are actuated, perform the following:

1. Determine position of intruding aircraft from the pilot's indicator.

2. Change position to avoid a collision.

3. Notify formation aircraft of intrusion.

WARNING

When changing position to avoid a collision, use care not to move into the proximity warning range of other aircraft in the formation.

Figure 4-8 shows the radio and electronic equipment location. The antenna locations are shown in figure 4-9.

Warning Indications.

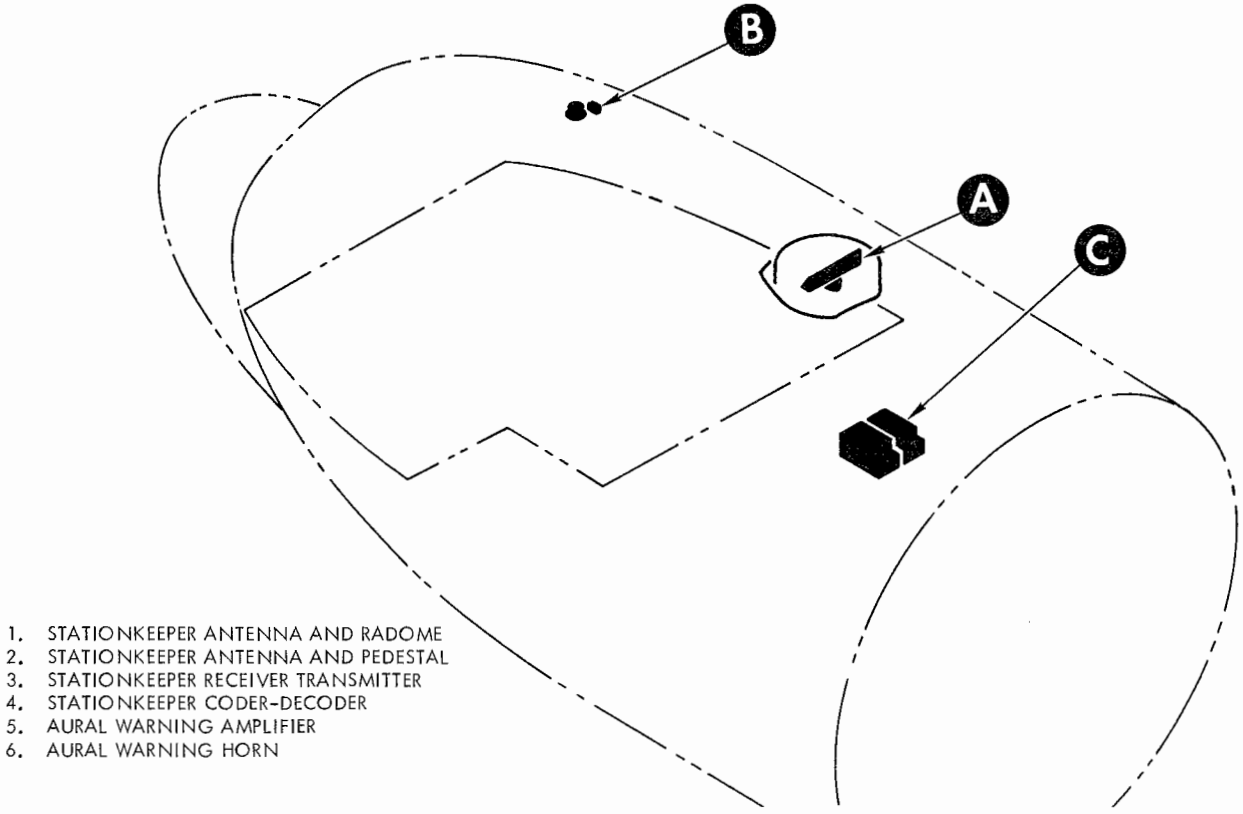
CAUTION.

The CAUTION indicator lights during system malfunction and marginal operation. The system may be operating normally with the CAUTION lamp illuminated; therefore, it is important that normal stationkeeping routine be maintained when the caution indicator first lights until an assessment of system operation is completed by pilot and crew, i.e., synchronization by observing CRT presentation for target drift, master lost by checking the master lost indicators, two in slot by checking the TWO IN SLOT indicator, and other indicator readouts.

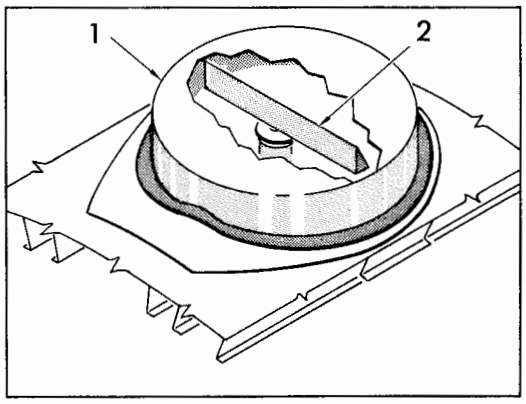
Note

During the BITE test the system stops stationkeeping and drops synchronization. If at all possible, avoid using BITE test during stationkeeping operation.

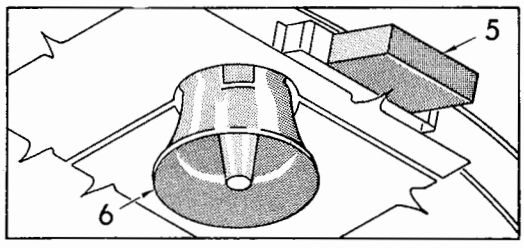
Radio and Electronic Equipment Installation



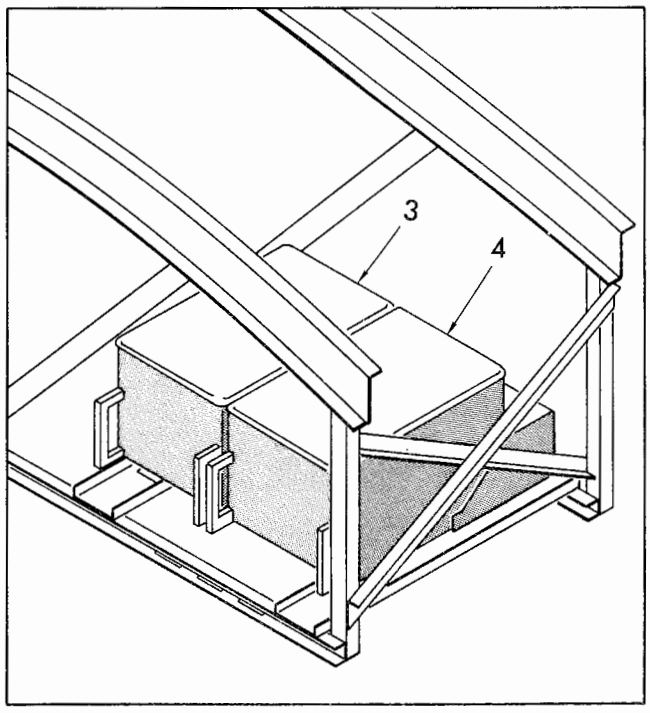
1. STATIONKEEPER ANTENNA AND RADOME
2. STATIONKEEPER ANTENNA AND PEDESTAL
3. STATIONKEEPER RECEIVER TRANSMITTER
4. STATIONKEEPER CODER-DECODER
5. AURAL WARNING AMPLIFIER
6. AURAL WARNING HORN



A FUSELAGE CROWN



B FLIGHT STATION OVERHEAD

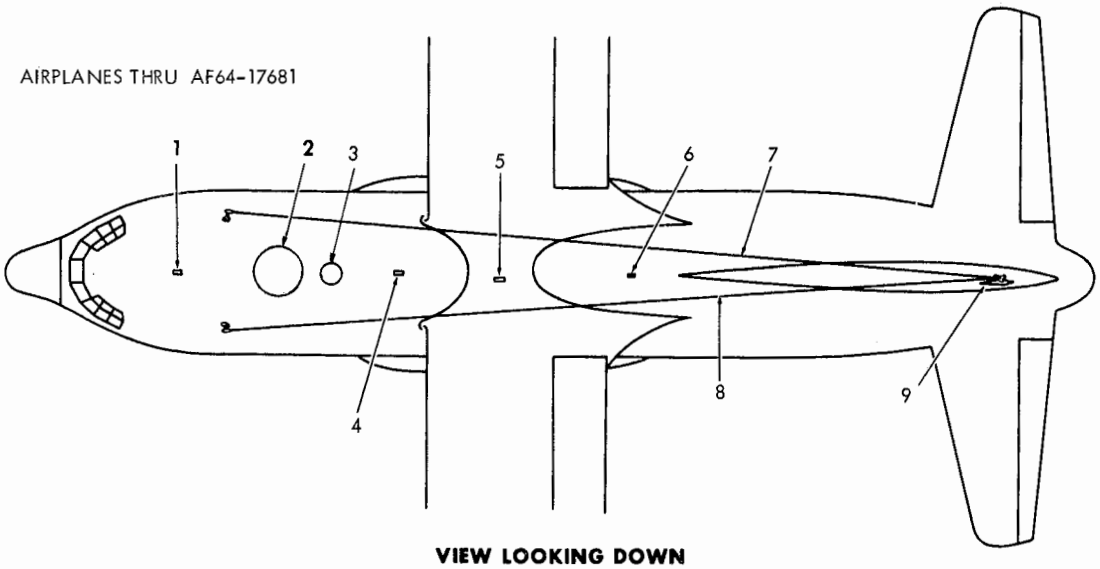


C FORWARD CARGO AREA OVERHEAD

546-1-12A

Figure 4-8

Antenna Locations



VIEW LOOKING DOWN

1. NO. 2 UHF COMMUNICATIONS (AN/ARC-34A)
2. INTRAFORMATION POSITIONING SET (AN/APN-169A)
3. IFF RADAR (AN/APX-25)
4. TACAN (AN/ARN-21 NO. 2)
5. TACAN (AN/ARN-21 NO. 1)
6. NO. 1 UHF COMMUNICATIONS (AN/ARC-34A)
7. LORAN AND LIAISON NO. 2 (AN/APN-70 AND COLLINS HF-102)
8. LIAISON NO. 1 (COLLINS HF-102)
9. VHF NAVIGATION (AN/ARN-14 NO. 1 AND 2)
10. SEARCH RADAR (AN/APN-59)
11. TALAR ANTENNA/RECEIVER (AN/ARN-97)
12. GLIDE PATH (AN/APN-67 NO. 1 AND 2)
13. HIGH-RANGE RADAR ALTIMETER RECEIVER (SCR-718 OR AN/APN-133)
14. DOPPLER RADAR (AN/APN-147)
15. VHF COMMUNICATIONS (COLLINS VHF-101)
16. LOW-RANGE RADAR ALTIMETER (AN/APN-22)
17. NO. 1 UHF COMMUNICATIONS (AN/ARC-34A)
18. MARKER BEACON (COLLINS 51Z-3)
19. HIGH-RANGE RADAR ALTIMETER TRANSMITTER (SCR-718 OR AN/APN-133)
20. TACAN (AN/ARN-21 NO. 2)
21. UHF DIRECTION FINDER (AN/ARA-25)
22. NO. 2 UHF COMMUNICATIONS (AN/ARC-34A)
23. RADIO COMPASS (AN/ARN-6 NO. 2)
24. RADIO COMPASS (AN/ARN-6 NO. 1)
25. LOW-RANGE RADAR ALTIMETER RECEIVER (AN/APN-150)
26. LOW-RANGE RADAR ALTIMETER TRANSMITTER (AN/APN-150)

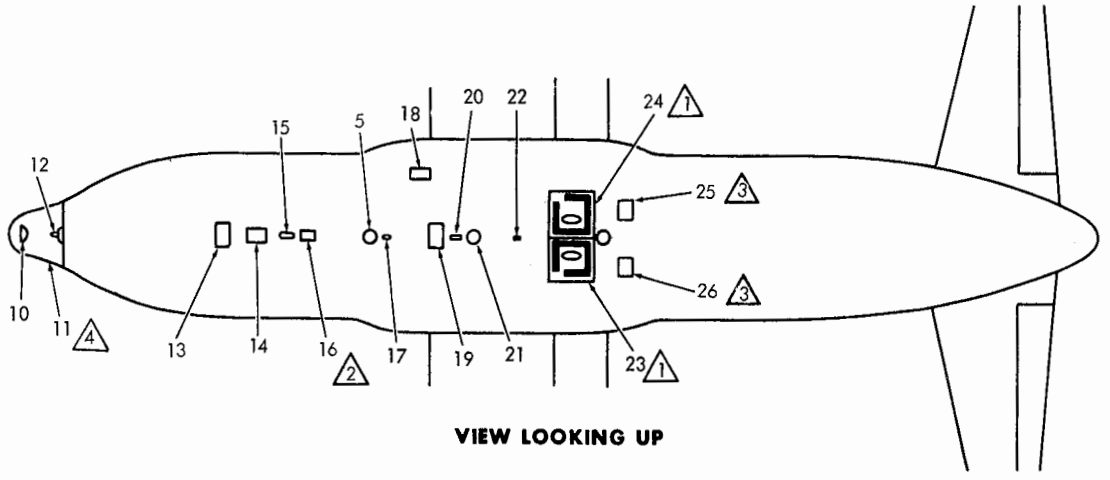
NOTE

△1 EACH RADIO COMPASS SYSTEM HAS A LOOP ANTENNA MOUNTED ABOVE A SENSE ANTENNA.

△2 AF61-2358 THROUGH 62-1866.

△3 AIRPLANES MODIFIED BY T.O. 1C-130E-524.

△4 AIRPLANES MODIFIED BY T.O. 1C-1301820



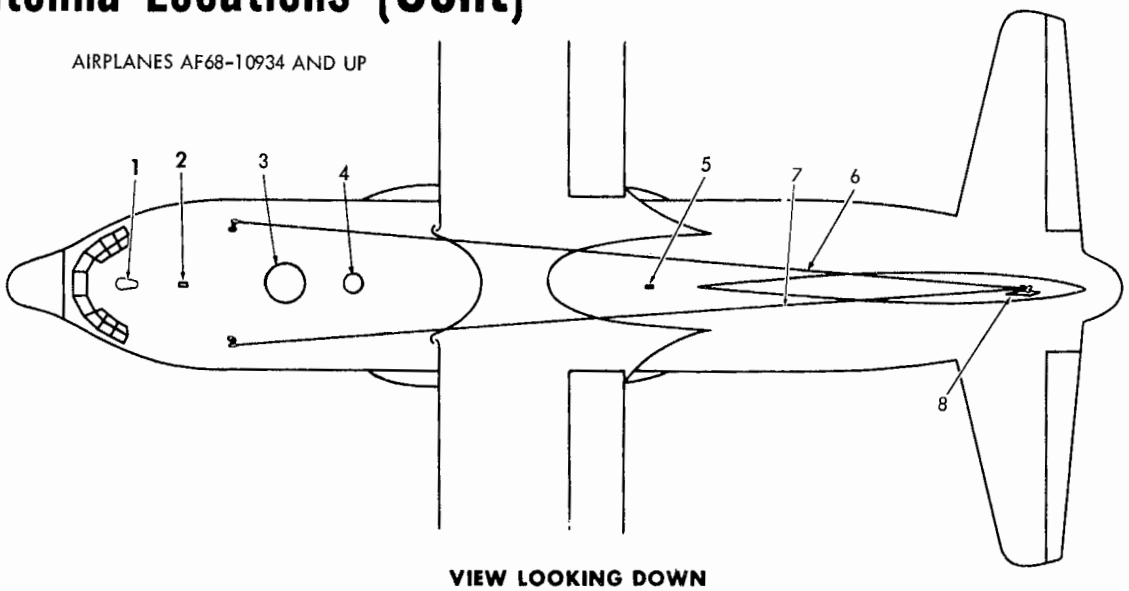
VIEW LOOKING UP

545-2-8-2 (1) A

Figure 4-9 (Sheet 1 of 2)

Antenna Locations (Cont)

AIRPLANES AF68-10934 AND UP



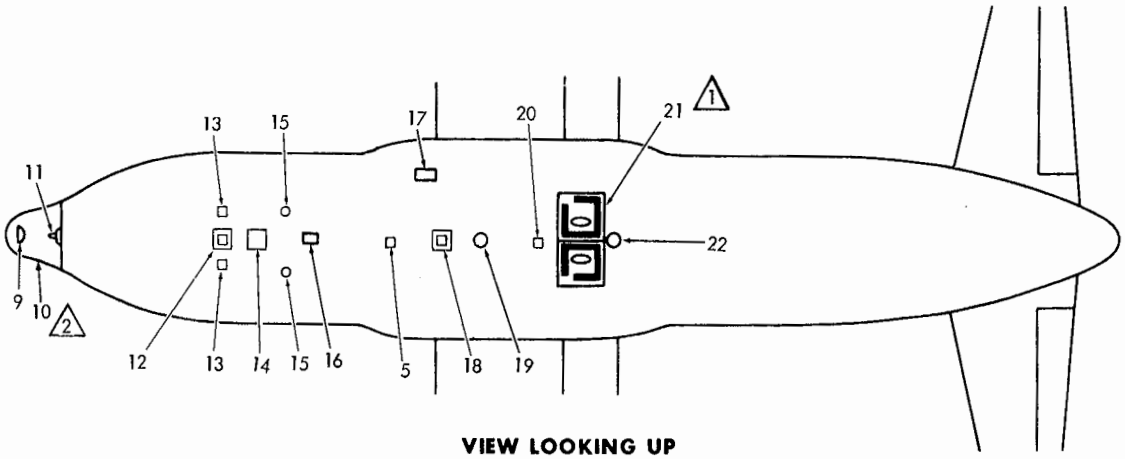
VIEW LOOKING DOWN

1. VHF COMMUNICATIONS (COLLINS VHF-101)
2. NO. 2 UHF COMMUNICATIONS (AN/ARC-34C)
3. INTRAFORMATION POSITIONING SET (AN/APN-169A)
4. IFF RADAR (AN/APX-25)
5. NO. 1 UHF COMMUNICATIONS (AN/ARC-34C)
6. LORAN AND LIAISON NO. 2 (AN/APN-70 AND COLLINS HF-102)
7. LIAISON NO. 1 (COLLINS HF 102)
8. VHF NAVIGATION (AN/ARN-14)
9. SEARCH RADAR (AN/APN-59)
10. TALAR ANTENNA/RECEIVER (AN/APN-97)
11. 51V-4 GLIDESLOPE
12. HIGH RANGE ALTIMETER RECEIVER (AN/APN-133)
13. LOW RANGE ALTIMETER (AN/APN-171)
14. DOPPLER RADAR (AN/APN-147)
15. TACAN RADIO (AN/ARN-21C)
16. VHF COMMUNICATIONS (COLLINS VHF-101)
17. MARKER BEACON (51Z-4)
18. HIGH RANGE ALTIMETER TRANSMITTER (AN/APN-133)
19. UHF DIRECTION FINDER (AN/ARA-50)
20. NO. 2 UHF COMMUNICATIONS (AN/ARC-34C)
21. RADIO COMPASS (AN/ARN-6) (LH ONLY)
22. IFF RADAR (AN/APX-25)

NOTE

1. THE RADIO COMPASS SYSTEM HAS A LOOP ANTENNA MOUNTED ABOVE A SENSE ANTENNA.

2. AIRPLANE MODIFIED BY T.O. 1C-130-820



VIEW LOOKING UP

545-2-8-2(2)A

Figure 4-9 (Sheet 2 of 2)

MASTER LOST.

The MASTER LOST indicator lights to warn of repeated absence of signals from the master aircraft in the flight formation. The system will remain closely synchronized without a master signal for 5 minutes under normal operating conditions. If prolonged absence of these signals occurs, consult the flight plan for a new master assignment.

TWO MASTERS.

The TWO MASTERS indicator on primary control lights to alert the pilots in the flight formation that two or more aircraft are on one frequency as master. The pilots must consult their flight plan to check for proper master assignment.

TWO IN SLOT.

The TWO IN SLOT indicator on primary control lights to warn the pilot that his aircraft is operating in the same slot as another aircraft. The pilot must consult his flight plan for proper slot assignment.