TM 1-1510-223-MTF

MAINTENANCE TEST FLIGHT MANUAL

ARMY MODEL RC-12N

DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE DISTRIBUTION IS UNLIMITED.

HEADQUARTERS
DEPARTMENT OF THE ARMY
28 FEBRUARY 1995

WARNING

A maintenance test flight is an exceptionally demanding operation and requires a thorough flight readiness inspection (PREFLIGHT). The flight readiness inspection is prescribed in TM 1-1510-223-10 operator's manual and must be completed prior to each maintenance test flight. Emergency procedures are found in the applicable -10 or checklist (-CL) and are not duplicated in this publication. Prior to each maintenance test flight, the pilot will contact maintenance/quality control personnel to determine the maintenance that has been performed. This manual should be used only by qualified maintenance test flight pilots as required in AR 95-1.

URGENT

TM 1-1510-223-MTF
C2

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 01 October 2009

MAINTENANCE TEST FLIGHT MANUAL

ARMY MODEL
RC-12N
AIRCRAFT

NSN 1510-01-361-5016

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TM 1-1510-223-MTF, 28 February 1995 is changed as follows:

1. Remove and insert pages as indicated below. A vertical bar in the margin indicates new or changed text material. A miniature pointing hand indicates an illustration change.

Remove pages	Insert pages
A – B	A – B
i – ii	i - ii
2-63 through 2-66	2-63 through 2-66.2 blank
5-5 through 5-8	5-5 through 5-8

2. Retain this sheet in front of manual for reference purposes.

3. This change incorporates SAFETY OF FLIGHT, OPERATIONAL, RCS CSGLD-1860 (R1), RC-12 SERIES AIRCRAFT, STALL WARNING SYSTEM TEST, C-12-04-02 MSG DTG 141200Z JUN 04.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
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URGENT

TM 1-1510-223-MTF
C1

CHANGE NO. 1

HEADQUARTERS
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MAINTENANCE TEST
FLIGHT MANUAL
FOR
RC-12N
AIRCRAFT

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Remove Pages	Insert Pages
- - - - - - -	A and B
i and ii	i and ii
1-3/(1-4 blank)	1-3/(1-4 blank)
5-1 and 5-2	5-1 and 5-2
5-9 and 5-10	5-9 and 5-10
- - - - - - -	5-10.1 and 5-10.2
5-11 and 5-12	5-11 and 5-12
- - - - - - -	5-12.1 and 5-12.2

2. Retain this sheet in front of manual for reference purposes.

TM 1-1510-223-MTF
C1

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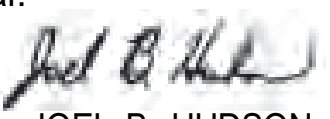

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TM 1-1510-223-MTF

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Dispose of superseded pages in accordance with regulations.

Note: Text affected by current revision/change indicated by a vertical bar in the outer margin.

DATES OF ISSUE FOR ORIGINAL AND CHANGED PAGES ARE:

Original	28 February 1995
Change 1	30 March 1999
Change 2	01 October 2009

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 182, CONSISTING OF THE FOLLOWING:

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b blank	0
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REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of any way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), direct to: Commander, U.S. Army Aviation and Missile Command, ATTN: SFAE-AV-AS-FW, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also send in your comments electronically to our e-mail address: troy.brown@redstone.army.mil or by fax 256-955-0837/DSN 645-0837. Instructions for sending an electronic 2028 may be found at the back of the Operator's Manual (TM 1-1510-223-10).

SECTION I. INTRODUCTION

1. Purpose. The purpose of this manual is to provide complete instructions for performing a maintenance test flight of RC-12N aircraft. For the specific conditions which require a general or limited maintenance test flight, refer to applicable FAR's and manufacturers' maintenance manuals.

2. Definitions.

a. Maintenance Test Flight. A functional test flight for which the primary purpose is to determine whether the airframe, powerplant, accessories, and other equipment are functioning in accordance with predetermined requirements while subjected to the intended environment.

b. Warnings, Cautions, and Notes. Warnings, cautions, and notes are used to emphasize important and critical instructions and are used for the following conditions:

An operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.

An operating procedure, practice, etc., which, if not strictly observed, will result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

3. General Information.

a. This manual covers only maintenance test flight of RC-12N aircraft and in no way supersedes any information contained in TM 1-1510-223-10 or -CL, but is to be used in conjunction with the -10 or -CL. Normal preflight and test procedures which are contained in the -10 or -CL may not be included. For the purpose of maintenance test flights only, this manual satisfies all the requirements of the -CL from Interior Check through Engine Shutdown.

b. Crew requirements are as specified in TM 1-1510-223-10.

4. Special Instructions.

a. Cargo and Passengers. Cargo and passengers are prohibited on maintenance test flights.

b. Forms and Records. Forms and records will be checked prior to the maintenance test flight to determine what maintenance has been performed and the type of maintenance test flight required (i.e., general or limited).

c. Configuration. The configuration of the aircraft should be determined prior to each maintenance test flight in order to determine performance parameters.

d. Post Test Flight Inspection. A thorough visual inspection will be performed to the extent necessary to ensure that deficiencies or short-comings that may have developed as a result of the maintenance test flight are detected.

e. References. When a maintenance test flight is required to ensure proper operation of a specific system(s), refer to the applicable maintenance manual for the limits of that system.

f. *Asterisked Checks.* An asterisk (*) prior to a check requires that the test flight check sheet be annotated with a specific reading. Also, a check mark (✓) for satisfactory performance, or an (X) for problem detected will be recorded and a short statement entered in the remarks block of the Check Sheet.

g. An (O) prior to a check indicates a requirement if the equipment is installed.

h. Maintenance Test Flight Check Sheet. The check sheet contained in Section V will be used for all test flights. When a test flight is performed to determine if specific equipment or systems are operating properly, completion of only that portion of the maintenance test flight check sheet applicable to the specific equipment or systems being tested is required. The aircraft test flight check sheets may be locally reproduced. Continuation sheets may be used when necessary. Items that prove to be unsatisfactory during the test flight and require corrective action shall be listed in the remarks block during flight and transferred to DA Form 2408-13-1 immediately after termination of the flight. The sheet will be attached to the DA Form 2408-13-1 upon completion. After accumulation of two or more sheets, the data should be reviewed to determine if trends are developing.

i. Free Air Temperature (FAT) and Outside Air Temperature (OAT). For the purposes of this manual, free air temperature (FAT) is to be considered the same as outside air temperature (OAT).

j. Effectivity Codes. The designator symbol CA is used throughout this manual to identify text, illustrations, and performance data for aircraft equipped with the Improved Constant Area Exhaust Stacks. The designator symbol IR identifies text, illustrations, and performance data for aircraft equipped with the Infra Red Reducing Exhaust Stacks. Data which has no icons applies to both.

SECTION II. MAINTENANCE TEST FLIGHT CHECKLIST

General. This section contains the maintenance test flight requirements peculiar to Army Model RC-12N aircraft. The requirements contained herein are established to ensure a thorough inspection of the aircraft before flight, during flight, and upon completion of the maintenance test flight. The right side of the checklist (troubleshooting reference) is cross indexed to the troubleshooting guides contained in Section III. A dash between references means 'through'; and a comma means 'and'. The references list the possible abnormal conditions, indications, or malfunctions which could be encountered while performing the procedure.

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT

* 1. Forms and records - Check.

* 2. Weight and balance - Maintenance test flight shall be conducted with full oil, full main tanks, full auxiliary tanks, two pilots, optional equipment, and ballast if required to remain within center-of-gravity limits. The average takeoff weight shall be 13,500 ±200 pounds or 15,000 ± 200 pounds for the maximum cruise power and speed check and stall flights. All other tests shall be conducted within normal weight limits.

* 3. Thorough flight readiness inspection in accordance with the requirements contained in TM 1-1510-223-10 - Performed.

* 4. Oxygen system - Check that oxygen quantity is sufficient for the entire mission, that crew masks operate normally,

PROCEDURE **TROUBLESHOOTING REFERENCE**

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

and that the diluter selector is set at 100%.

a. OXYGEN SUPPLY PRESSURE gages - Check.

b. SUPPLY control lever (green) - ON.

c. Diluter control lever - 100% OXYGEN.

d. EMERGENCY control lever (red) - Set to TEST MASK position while holding mask directly away from face, then return to NORMAL.

e. Oxygen mask - Put on and adjust.

f. EMERGENCY pressure control lever - Set to TEST MASK position and check mask for leaks, then return lever to NORMAL.

g. FLOW indicator - Check. During inhalation blinker appears, during exhalation blinker disappears. Repeat a minimum of 3 times.

h. Oxygen masks - Remove and store.

5. Seats, pedals, belts, harnesses - Check and adjust.

6. Flight controls - Check for free and correct movements.

7. PARKING BRAKE - Check. Confirm that brakes are set by applying additional toe pressure.

PROCEDURE	TROUBLESHOOTING REFERENCE

CAUTION

Do not force the elevator trim system past the limits which are shown on the PITCH TRIM indicator scale.

8. Elevator trim - Set to 0 (neutral).

CAUTION

Do not cycle LDG GEAR CONTR handle on the ground.

9. Gear- DN.
10. Keylock switch - ON.
11. Weather radar - OFF/SBY.

*12. Fuel control panel - Check the standby pumps and firewall valves as follows to ensure that they are powered through the essential bus:

a. BATTERY switch - OFF.

b. # 1 and # 2 STANDBY PUMP circuit breakers - Pull.

c. # 1 and # 2 FIREWALL VALVE circuit breakers - Pull.

d. # 1 and # 2 FIRE PULL handles - Pull to close firewall valve (listen for valve operation).

e. STANDBY PUMP switches - ON C41

(listen for pump operation).

f. BATTERY switch - ON. C7-11

g. # 1 and # 2 FUEL PRESS warning annunciators - Illuminated.

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

h. FIRE PULL handles - In.

i. # 1 and # 2 FUEL PRESS warning annunciators - Extinguished.

j. STANDBY PUMP switches - Off.

k. #1 and #2 FUEL PRESS warning annunciators - Illuminated.

l. # 1 and # 2 STANDBY PUMP circuit breakers - In.

m. # 1 and # 2 FIREWALL VALVE circuit breakers - In.

n. CROSSFEED valve switch - Set alternately to left and right system. Check that FUEL CROSSFEED light illuminates, and that the # 1 and # 2 FUEL PRESS annunciator lights are extinguished. C40

o. CROSSFEED valve switch - OFF.

*13. Fuel quantity indicators - Check as follows: B6-8

a. Fuel quantity indicator selector switch - MAIN.

b. Fuel quantity indicators - Compare indication. With full fuel tanks, left and right fuel quantity indicators must indicate within 82 pounds of each other with fuel quantity indicator selector switch set to MAIN.

c. Fuel quantity indicator selector switch - AUXILIARY.

d. Fuel quantity indicators - Compare indication. With full fuel tanks, left and right fuel quantity indicators

must indicate within 35 pounds of each other with fuel quantity indicator selector switch set to AUXILIARY.

*14. Pitot tubes (2), stall warning vane, heated fuel vents (2), and TAS temperature probe - Check as follows:

WARNING

Use caution when checking pitot tubes, stall warning vane, heated fuel vents, and TAS temperature probe for heat by feel. The heating elements in these items can produce enough heat to cause burns to personnel who touch them.

a. STALL WARN heat switch - ON. C55

b. PITOT heat switches (2) - ON.

c. FUEL VENT heat switches (2) - ON. C56

d. Left wing heated fuel vent - Check by feel for heat and condition.

e. Stall warning vane - Check by feel for heat and condition.

f. Left pitot tube - Check by feel for heat, condition, and free of obstructions. C33

g. Right pitot tube - Check by feel for heat, condition, and free of obstructions. C33

h. TAS temperature probe - Check by feel for heat and condition.

i. Right wing heated fuel vent - Check by feel for heat and condition.

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

j. STALL WARN heat switch - Off.

k. PITOT heat switches (2) - Off.

l. FUEL VENT heat switches (2) - Off.

CAUTION

Extend the ice vanes during ground operation to minimize foreign object damage (FOD) to the engine.

15. ICE VANE CONTROL switches - ON.

*16. Lighting systems - Check. Include position lights, recognition lights, landing/ taxi light, wing ice lights, beacons, emergency lights, and interior lights, then off. C39

NOTE

Place the EMERGENCY lights override switch in the TEST position and check the emergency lights (5) for illumination and intensity. A dim light indicates a weak battery pack which may not allow lights to turn off. At the completion of the check, cycle the switch from the TEST position to the OFF/RESET position and then to AUTO.

*17. HYD FLUID SENSOR TEST switch - Depress. Check HYD FLUID LOW annunciator light illuminates after approximately 2 seconds, and extinguishes after approximately 6 seconds. C22

*18. Engine fire protection system - Check as follows: C43-47

PROCEDURE		TROUBLESHOOTING REFERENCE
	a. ENG FIRE TEST switches - Hold switches to DET position, check that FIRE PULL handle warning annunciators and MASTER WARNING annunciators illuminate.	
	b. ENG FIRE TEST switches - Hold switches to EXT position, check that SQUIB OK and EXTGH DISCH annunciators and MASTER CAUTION annunciators illuminate.	
	NOTE If MASTER WARNING is canceled between tests, it may not re-illuminate.	
*19.	Stall and gear warning system - Check as follows:	C34,35
	a. STALL WARN TEST switch - TEST. Check that warning horn sounds.	
	b. LDG GEAR WARN TEST switch - TEST. Check that warning horn sounds and that the LDG GEAR CONTR handle warning lights illuminate.	C30
*20.	Flaps - Check in full down and full up positions.	C31, C32
21.	BATTERY switch - As required.	
*22.	Seat belts - Check for security and proper connections.	
*23.	Toilet - Check condition.	
*24.	Emergency equipment - Check that all required emergency equipment is available and that fire extinguishers and	

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

first-aid kits have current inspection dates.

O*25. Parachutes - Check secure and for current inspection and repack dates.

*26. Check all interior and exterior placards and markings.

*27. Trim tab travel and direction - Check. Operate trim tabs through the full range of travel, noting any excessive friction or binding. Check tab direction and neutral position at the control and the surface.

*28. Flight controls - Check operation and direction. Check movement of control surfaces for direction with movement of cockpit controls. Check for any abnormal friction or obstructions through full range of travel.

29. GPU - Connect as required. C12

30. Mission control panel switches - Check and set as required:

a. ANT STEERING selector switch - AUTO.

b. ANT ORIDE switch - AUTO.

c. MISSION CONTROL switch - AUTO.

d. TDOA system switch - As required.

e. DATA LINK HV switch - STBY.

f. DATA LINK ANT SEL switch - AUTO.

g. ASE SILENT switch - As required.

PROCEDURE	TROUBLESHOOTING REFERENCE

*31. ASE/ACS - Program and check.

a. Aircraft # I and # 2 INVERTER switches - ON.

b. AUTO PLT POWER switch - ON.

c. AVIONICS MASTER POWER switch - EXT PWR.

d. # 1 and # 2 EFIS POWER switches - ON.

e. ATT pushbutton selector switches (display controllers) - Press as required.

f. # I INV and # 2 INV three phase inverter control switches (mission control panel) - RESET, then ON.

g. BUS CROSS TIE switch - ON/AUTO.

h. Mode switch A (multifunction display) - Depress to select UTILITY mode page.

i. INS mode selector switch (INS mode selector panel) - STBY.

j. ASE BIT perform as required. (Ensure ASE is on before initiating BIT.)

(1) R2 line selection switch - Depress to select ASE BIT page.

(2) L1 line selection switch - Depress to select PULSE WARN BIT. (Initiates APR-39 BIT.) Wait for COMPLETE message to appear next to L1.

(3) L2 line selection switch - Depress to select CW WARN BIT. (Initiates APR-44 BIT.)

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

Wait for COMPLETE message to appear next to L2.

(4) L4 line selection switch - Depress twice within three seconds to initiate ALQ-156 test. ALQ-156 must be on for BIT.

(a) First depression - Boxes text and arms FLARE TEST.

(b) Second depression - Causes a flare fire pulse to be sent from ALQ-156 to the M-130 and flare count to be decreased by one. (If weight is on wheels a flare cannot be fired.)

(5) R1 line selection switch - Depress to select PULSE JAM BIT. (Initiates ALQ-136 BIT.) Wait for PASS text to appear next to R1.

(6) R2 line selection switch - Depress to select CW JAM BIT. (Initiates ALQ-162 bit.) Wait for PASS text to appear next to R2.

(7) R3 or R4 line selection switches - Depress as required. R3 increases volume, R4 decreases volume. Maximum volume is 15, off is 0.

k. Waypoint list - Build as follows:

(1) Mode switch B - Depress to select FLIGHT PLAN page.

(2) R4 line selection switch - Depress to select WAYPOINT LIST page.

(3) Waypoint string (line number, WPT ID, and LAT/LONG coordinates) - Enter into scratch-pad.

(4) R1 line selection switch - Depress to load selected waypoint into system.

l. Flight plan - Build as follows:

(1) WPT numbers - Enter into scratch-pad in order of desired use (up to nine).

(2) Mode switch B - Depress to select FLIGHT PLAN page.

(3) L1 line selection switch - Depress to select NEW FPLN. INS LOADING message will appear at the top of the display for 2 to 3 minutes, then flight plan will be usable.

m. TACAN list - Build as follows:

(1) Mode switch B - Depress to select FLIGHT PLAN page.

(2) R5 line selection switch - Depress to select NAV SETUP page.

(3) R3 line selection switch - Depress to select TACAN LIST.

(4) TACAN station information (list number, ID, channel number, latitude/longitude, and station elevation) - Enter into scratch-pad.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(5) R1 line selection switch - Depress to load into system.

(6) TACAN stations to be used for updating - Enter into scratch-pad.

(7) R4 line selection switch - Depress to select TACAN SELECT.

n. Pattern steering mode - Program as follows:

(1) Mode switch B - Depress to select FLIGHT PLAN page.

(2) R5 line selection switch - Depress to select NAV SETUP page.

(3) True bearing - Enter into scratch-pad.

(4) L1 line selection switch - Depress to enter BEARING.

(5) Leg length in NM - Enter into scratch-pad.

(6) L2 line selection switch - Depress to enter LEG LENGTH.

(7) L3 line selection switch - Depress to select LEFT or RIGHT.

(8) Offset distance in NM - Enter into scratch-pad.

(9) L4 line selection switch - Depress to enter OFFSET.

32. INS - Align as required (check INS LOADING message extinguished).

a. Mode switch B - Depress to select FLIGHT PLAN page.

b. R5 line selection switch (multifunction display) - Depress to select NAV SETUP page.

c. R5 line selection switch (multifunction display) - Depress to select INS SETUP.

d. If ALIGN POS NOT ENTERED is displayed, or align position needs to be changed, perform the following:

NOTE

N, S, E, W is not required before the LAT/LONG.

(1) L1 line selection switch - Depress. Position will load and ALIGN STATE: 9 will appear below coordinates.

(2) INS mode switch - ALIGN.

NOTE

INS BIT is not possible until readiness state 8 or below is obtained.

e. INS BIT - Perform as follows:

(1) INS/TCN pushbutton selector switch (display controller) - Depress to select INS.

(2) Single needle bearing pointer source selector switch - INS.

(3) Mode switch A (multifunction display) - Depress to select UTILITY page.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(4) RI line selection switch - Depress to select SYSTEM BIT page.

(5) R2 line selection switch - Depress to select INS BIT.

(6) NAV switch-indicator (flight director mode selector) - Depress.

(7) AP ENGAGE pushbutton switch - Depress and check the following indications:

(a) Multifunction display - Check that INS BATT, INS FAIL, and WAYPOINT ALERT are annunciated.

(b) EHSI - Check that single needle pointer indicates 30°, course deviation bar is displaced right, then single-needle pointer centering and course deviation bar displacing left. Check WPT alert annunciator illuminated.

(c) Control wheels - Follow course deviation bar.

(d) INS mode selector - Check that READY light (green) and BATT light (red) are illuminated.

(e) Mission annunciator panel - Check that INS UPDATE annunciator light (green) and NO INS

UPDATE annunciator light (yellow) are illuminated.

(8) Multifunction display - Check for COMPLETE text at R2.

NOTE

Failure codes will appear below COMPLETE text. Check action and malfunction codes for corrective action. Depressing R2 again may clear fault codes.

f. INS mode selector switch - NAV (when alignment state 5 or less has been reached). Then perform the following:

(1) Mode switch B - Depress to select FLIGHT PLAN page.

(2) R5 line selection switch - Depress to select NAV SETUP page.

(3) R5 line selection switch - Depress to select INS SETUP page.

(4) R3 line selection switch - Depress to change AUTO MIXING to TACAN, DL, GPS, or OFF as required.

(5) R2 line selection switch - Depress to select ROLL LIMIT ON or OFF as required.

(6) L3 line selection switch - Depress to select LEG CHANGES to MAN or AUTO as required.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

g. Multifunction display - Wait for INS LOADING message to extinguish. INS LOADING message will extinguish after 6 to 8 minutes. Complete autopilot/flight director check while waiting.

NOTE

While the INS LOADING message is illuminated on the multifunction display, the functions on the FLIGHT PLAN, NAV SETUP, ROUTES, TACAN LIST, INS SETUP, INS UPDATE STATUS, MONITOR, SYSTEM BIT - INS, and ASE RTU pages are inhibited.

h. Autopilot EFIS selector switch (above pilot's ADI) - AP EFIS 1.

*33. Pilot's and copilot's EFIS TEST switches - Depress. Verify the following indications:

a. Radio altimeter - Slews to 100 ± 10 feet.

b. EADI - DH display replaced with dashes.

c. EHSI - CRS select, HDG select, and GSPD displays replaced with dashes.

d. Caution and warning flags - All will be in view.

e. Pitch and roll command cue - Out of view.

f. Verify that audio alarm occurs within 5 to 6 seconds.

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

A localizer frequency must be tuned on both NAV receivers to annunciate ILS.

g. EADI - TEST appears in left center of display to indicate that flight director mode selector lamp test is good. FD FAIL will appear momentarily and be replaced by TEST in the left center of the EADI display to indicate a problem in the EFIS components or interconnection of the flight director computer.

NOTE

Preflight test of the composite mode will cause the same results as the above test, except the digital heading readout will be replaced with a red FAIL indication, and the expanded localizer scale and pointer will be removed.

Test is inhibited during glideslope capture.

*34. Flight director/autopilot preflight test.

a. BATTERY switch (overhead control panel) - ON.

b. Aircraft # l and # 2 INVERTER switches - ON.

c. AVIONICS MASTER POWER switch (overhead control panel) - ON or EXT PWR as required.

d. # 1 and # 2 EFIS POWER switches (overhead control panel) - ON.

e. AUTO PLT POWER switch (overhead control panel) - ON.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

f. RUDDER BOOST/YAW CONTROL TEST switch (pedestal extension) - RUDDER BOOST.

g. RADIO ALT switch (mission control panel) - ON.

h. Autopilot EFIS selector switch (instrument panel) - AP EFIS 1.

i. Altitude alerter - Check as follows:

(1) Pilot's altimeter - Set to field elevation.

(2) Altitude preselector - Set to more than 1000 feet above field elevation.

(3) Pilot's altimeter barometric set knob - Slowly increase pilot's altimeter setting.

(4) Altitude alerter annunciator and horn - Verify that the altitude alert annunciator on the pilot's altimeter illuminates and the altitude alerter horn sounds when the pilot's altimeter reading is approximately 1000 feet from the value set on the altitude select controller.

(5) Pilot's altimeter - Reset to field elevation.

(6) Altitude preselector - Reset to field elevation.

(7) Pilot's altimeter barometric set knob - Slowly increase pilot's altimeter setting.

(8) Altitude alerter annunciator and horn - Verify that the alti-

tude alerter annunciator on the pilot's altimeter illuminates and the altitude alerter horn sounds when the altimeter reading is approximately 250 feet from the value set on the altitude alert controller.

(9) Pilot's altimeter - Reset to current barometric altimeter setting or to field elevation.

j. Flight director/autopilot annunciators/alerter horns - Check as follows:

(1) SBY pushbutton switch indicator (flight director mode selector) - Depress for at least 5 to 8 seconds and verify the following indications:

(a) Flight director mode selector annunciators illuminate.

(b) Autopilot controller annunciators illuminate.

(c) All 8's illuminate on the altitude select controller.

(d) Altitude alert annunciator on pilot's altimeter illuminates.

(e) FD FAIL (amber) will be annunciated on the EADI.

(2) After the SBY pushbutton switch-indicator has been held depressed for 5 to 8 seconds, verify that:

(a) AP TRIM annunciator illuminates.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(b) Autopilot disconnect horn sounds

(3) SBY pushbutton switch indicator- Release.

(4) FD and ATT annunciations on the EADI - Check extinguished.

(5) TRIM annunciators (autopilot controller) - Check extinguished.

NOTE

Steady illumination of the TRIM UP or TRIM DN annunciator on the autopilot controller indicates that the autopilot automatic synchronization is not functioning correctly and that the autopilot should not be engaged in flight.

(6) TURN knob (autopilot controller) - Check in center detent position.

(7) ELEV TRIM switch (pedestal extension) - ELEV TRIM. Check ELEC TRIM OFF annunciator extinguished.

(8) RUDDER BOOST/YAW CONTROL TEST switch (pedestal extension) - RUDDER BOOST. Check RUDDER BOOST annunciator extinguished. (If RUDDER BOOST annunciator illuminates, cycle rudder boost/yaw control test switch to OFF then back to RUDDER BOOST.)

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

If the RUDDER BOOST annunciator is illuminated, yaw damper and rudder boost will not engage.

(9) Radio altimeter - Check valid on EADI.

NOTE

To perform the following checks, the air data computer must be valid and less than 60 knots, and the radio altimeter must be valid and less than 50 feet. These conditions must be satisfied to avoid tripping the autopilot servo monitors while overpowering the autopilot servos.

(10) Control wheel - Move to mid-travel.

(11) AP ENGAGE switch-indicator (autopilot controller) - Depress to engage autopilot and yaw damper. Check that AP ENGAGE and YD ENGAGE switch-indicators on the autopilot controller and the remote annunciators on the instrument panel are illuminated.

k. Autopilot elevator trim follow-up - Check as follows:

(1) Control wheel - Hold aft of mid-travel.

(2) Trim wheel (autopilot controller) - Should run nose down after approximately 3 seconds.

(3) TRIM DN annunciator (autopilot controller) - Check illuminated after 6 to 8 seconds.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(4) APFTRIM annunciators (instrument panel, above EADI's) - Check illuminated after approximately 15 seconds.

(5) Control wheel - Hold forward of mid travel.

(6) Trim wheel (autopilot controller) - Should run nose up after approximately 3 seconds.

(7) TRIM UP annunciator (autopilot controller) - Check illuminated after 6 to 8 seconds.

(8) AP/TRIM annunciators (instrument panel, above EADI's) - Check illuminated after approximately 15 seconds.

(9) AP & YDITRIM DISC switch (control wheel) - Depress to first level to disengage the autopilot/yaw damper.

l. Autopilot overpower check - Perform as follows:

(1) AP ENGAGE switch-indicator (autopilot controller) - Depress to engage autopilot and yaw damper. Check that AP ENGAGE and YD ENGAGE switch-indicators on the autopilot controller and the remote annunciators on the instrument panel are illuminated.

(2) Control wheel - Slowly overpower autopilot in pitch and roll axis.

(3) Rudder pedals - Slowly overpower yaw damper in both directions.

NOTE

If unable to overpower the autopilot in any axis, or if the autopilot or yaw damper disengages during the overpower check, use of the autopilot or yaw damper in flight is not recommended.

(4) AP & YDFTRIM DISC switch (control wheel) - Depress to first level. Check that autopilot and yaw damper disengage, AP ENGAGE and YD ENGAGE switch-indicators on the autopilot controller and remote annunciators above the EADI's flash 5 times.

(5) GO AROUND button (left POWER lever) - Depress. Check GA annunciator on EADI illuminates. Yaw damper will automatically engage and YD ENGAGE switch-indicator will be illuminated on the autopilot controller and the remote annunciators above the EADI's will be illuminated.

(6) AP & YD/TRIM DISC switch (control wheel) - Depress to first level. Check that yaw damper disengages and that YD ENGAGE switch-indicator on the autopilot controller extinguishes and the remote annunciators above the EADI's flash 5 times.

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(7) YD ENGAGE pushbutton switch-indicator (autopilot controller) - Depress. Check that yaw damper engages, and that YD ENGAGE switch-indicator on the autopilot controller and the remote annunciator on the instrument panel above the EADI's illuminates.

(8) RUDDER BOOST/YAW CONTROL TEST switch (pedestal extension) - TEST. Check that RUDDER BOOST annunciator above the EADI's illuminates, yaw damper disengages, YD ENGAGE switch-indicator on the autopilot controller extinguishes, and the YD ENG remote annunciators above the EADI's flash 5 times.

(9) YD ENGAGE pushbutton switch-indicator (autopilot controller) - Depress while holding rudder boost/yaw control test switch in TEST. Yaw damper should not engage.

(10) RUDDER BOOST/YAW CONTROL TEST switch - RUDDER BOOST. Check RUDDER BOOST annunciator extinguished.

WARNING

If the SBY annunciator on the flight director mode selector does not illuminate within 10 seconds after the avionics master switch is turned on, the autopilot has failed self-test and is considered inoperative and should not be used. Do not force the elevator trim system beyond the limits which are indicated on the ELEVATOR trim tab indicator.

m. Electric elevator trim - Check.

(1) ELEV TRIM switch - On.

(2) Pilot and copilot trim switches - Check operation.

WARNING

Operation of the electric trim system should occur only by movement of pairs of switches. Any movement of the elevator trim wheel while depressing only one switch element indicates a trim system malfunction. Turn the electric elevator trim control switch OFF and conduct flight by operating the elevator trim wheel manually. Do not use autopilot.

(3) Pilot and copilot. Check individual element for no movement of trim, then check proper operation of both elements.

(4) Check pilot switches override copilot switches while trim-

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

ming in opposite directions, and trim moves in direction commanded by pilot.

(5) Check trim disconnects while activating pilot and copilot trim disconnect switches.

(6) ELEV TRIM switch - OFF then on (ELEC TRIM OFF annunciator extinguishes).

35. BATTERY switch - As required.

INTERIOR CHECK

1. Cargo/loose equipment - Check secured.

* 2. Cabin/cargo doors - Test and lock:

a. Cabin door - Check closed and latched by the following:

(1) Safety arm and diaphragm plunger - Check position (lift door step

(2) Index marks on rotary cam locks (6) - Check aligned with indicator windows.

b. Cargo door - Check closed and latched by the following:

(1) Upper handle - Check closed and latched. (Observe through cargo door latch handle access cover window.)

(2) Index marks on rotary cam locks (4) - Check aligned with indicator windows.

(3) Lower pin latch handle - Check closed and latched. (Observe through cargo door lower latch handle access cover window.)

(4) Carrier rod - Check orange indicator aligned with orange stripe carrier rod. (Observe through window, aft lower corner.)

c. BATTERY switch - As required

NOTE

If unable to place BATTERY switch in the OFF position due to INS operation, CABIN DOOR annunciator light operation from the hot battery bus (step e) will not be verified.

d. Cargo door - Check closed and latched.

e. Cabin door - Close but leave unlatched. Check CABIN DOOR annunciator light illuminated.

f. Cabin door - Open. Check CABIN DOOR annunciator light extinguished.

g. BATTERY switch - ON. Check CABIN DOOR annunciator light illuminated.

h. Cabin door - Close and latch. Check CABIN DOOR annunciator light extinguished.

PROCEDURE	TROUBLESHOOTING REFERENCE

INTERIOR CHECK (CONT)

NOTE

The above procedures check both cargo and cabin door security provisions.

* 3. Emergency exit - Check secure and key removed.

* 4. Mission cooling ducts - Check open and free of obstructions.

* 5. Flare/chaff dispenser preflight test - Completed.

6. COMSEC keys - Loaded as required.

7. Crew briefing - As required.

BEFORE STARTING ENGINES

1. Seats, pedals, belts, harnesses - Adjust.

2. Flight controls - Check for free and correct movements.

3. PARKING BRAKE - Check. Confirm that brakes are set by applying additional toe pressure.

4. Oxygen system - Set as required.

5. Circuit breakers - Check in.

6. Overhead panel - Check and set.
   a. Light dimming controls - As required. C39
   b. Cockpit lights (3) - As required.
   c. CABIN AIR MODE SELECT switch - OFF.
   d. ENG INLET LIP HEAT switches - OFF.

e. ICE VANE POWER SELECT switches (2) - MAIN.

f. ICE VANE CONTROL switches (2) - ON.

g. ICE & RAIN switches - Off.

h. Exterior light switches - As required.

i. # 1 and # 2 EFIS POWER switches - Off.

j. AVIONICS MASTER POWER switch - As required.

k. AUTO PLT POWER switch - Off.

l. # 1 and # 2 INVERTER switches - As required.

m. Environmental switches - As required.

n. AUTOFEATHER switch - OFF.

o. # 1 AUTO IGNITION switch - Off.

p. # 1 ENG START switch - OFF.

q. BATTERY switch - As required.

r. GENERATOR switches (2) - OFF.

s. # 2 ENG START switch - OFF.

t. # 2 AUTO IGNITION switch - Off.

7. Fuel panel switches - Check.

a. STANDBY PUMP switches (2) - Off.

b. AUX XFER switches (2) - AUTO.

c. CROSSFEED switch - OFF.

PROCEDURE **TROUBLESHOOTING REFERENCE**

BEFORE STARTING ENGINES (CONT)

NOTE

Refer to operator's manual or aircraft placarding to determine conditions affecting standby compass headings.

* 8. Magnetic compass - Check for fluid, heading, and current correction card.

CAUTION

Do not move POWER levers below the flight idle gate with the engines not operating. Movement of the POWER levers below the flight idle gate with the engines not operating may result in bending and damage to control linkage.

9. Pedestal controls - Set.
   a. POWER levers - IDLE.
   b. PROP levers - As required.
   c. CONDITION levers - FUEL CUT-OFF.
   d. Flaps - As required.
10. Pedestal extension switches - Set.
   a. Avionics - As required.
   b. RUDDER BOOST switch - On.
   c. ELEV TRIM switch - On.
11. LANDING GEAR ALTERNATE EXTENSION pump handle - Stowed.

* 12. Free air temperature gage - Check. Note current reading.

13. Pilot's instrument panel - Check and set.

a. MIC switch - HEADSET.

b. GYRO switch - SLAVE.

c. SYM GEN REV switch - NORMAL.

d. Display controller - As required.

* e. Flight instruments - Check instruments for protective glass, warning flags, and static readings.

f. PROP SYN switch - OFF.

* g. Engine instruments - Check instruments for protective glass and static readings.

14. Copilot's instrument panel - Check and set.

* a. Flight instruments - Check instruments for protective glass, warning flags, and static readings.

b. MIC switch - HEADSET.

c. GYRO switch - SLAVE.

d. SYM GEN REV switch - NORMAL.

e. Display controller - As required.

15. Mission panel switches and circuit breakers - As required.

16. Subpanels - Check and set.

a. ENG FIRE TEST switches (2) - OFF.

b. CABIN PRESS DUMP switch - OFF.

c. Pressurization controls - As required.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE STARTING ENGINES (CONT)

d. LANDING, TAXI, and RECOG light switches - OFF.

e. LDG GEAR CONTR switch - Recheck DN.

f. CABIN LIGHTS switch - As required.

g. PILOTS STATIC AIR SOURCE - NORMAL.

CAUTION

Do not use alternate static source during takeoff and landing except in an emergency. Pilot's instruments will show a variation in airspeed and altitude.

17. AC and DC GPU - As required.

18. BATTERY switch - ON.

* 19. DC power - Check (22 VDC minimum for battery, 28 VDC maximum for GPU starts).

* 20. Annunciator panels - Test as follows: D1-4

a. MASTER CAUTION, MASTER WARNING, # 1 FUEL PRESS, # 2 FUEL PRESS, L BL AIR FAIL, R BL AIR FAIL, INST AC, # 1 OIL PRESS, # 2 OIL PRESS, # 1 DC GEN, # 1 INVERTER, # 1 NO FUEL XFR, # 2 NO FUEL XFR, # 2 INVERTER, # 2 DC GEN,# 1 VANE EXT, # 2 VANE EXT, GEAR DOWN, ANT STOWED - Check illuminated.

PROCEDURE	TROUBLESHOOTING REFERENCE

b. ANNUNCIATOR TEST switch - Hold to TEST position. Check that all annunciator panels, FIRE PULL handle annunciators, ANT AZIMUTH indicator, MASTER CAUTION, and MASTER WARNING annunciators are illuminated.

c. MASTER CAUTION and MASTER WARNING annunciators - Press and release. Both annunciators should extinguish.

FIRST ENGINE START (BATTERY START)

NOTE

The engines must not be started until after the INS is placed into the NAV mode or OFF, as required.

Starting procedures are identical for both engines. Assign a crewmember to monitor the fire guard throughout the engine start procedures.

1. INS - As required.

2. Exterior lights switches - As required.

3. Fire guard - Posted.

4. Propeller area - Clear. A1-7

5. # 2 ENG START switch - START-IGNITION. # 2 IGN ON annunciator should illuminate and # 2 FUEL PRESS annunciator should extinguish.

NOTE

False fuel flow indications may be observed with the starter-generator engaged and the CONDITION lever in FUEL CUTOFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

FIRST ENGINE START (BATTERY START) (CONT)

CAUTION

If ignition does not occur within 10 seconds after moving CONDITION lever to LOW IDLE, initiate Abort Start procedure. If for any reason a starting attempt is discontinued, the entire starting sequence must be repeated after allowing the engine to come to a complete stop (1 minute minimum).

6. CONDITION lever (after N_1 RPM passes 13% minimum) - LOW IDLE. E1,J1

CAUTION

Monitor TGT to avoid a hot start. If there is a rapid rise in TGT, be prepared to abort the start before limits are exceeded. During starting, the maximum allowable TGT is 1000°C for 5 seconds. If this limit is exceeded, initiate Abort Start procedure and discontinue start. Enter the peak temperature and duration on DA Form 2408-13-1.

7. TGT and N! (TGT 1000°C Maximum).

8. Oil pressure - Check (60 PSI minimum). E7-9

9. # 2 ENG START switch - OFF after TGT peaks.

10. CONDITION lever - HIGH IDLE. Monitor TGT as CONDITION lever is advanced. E2

11. # 2 GENERATOR switch - RESET, then ON. C1

PROCEDURE	TROUBLESHOOTING REFERENCE

SECOND ENGINE START (BATTERY START)

1.	# 2 generator load - Verify less than 50%.	
2.	Propeller area - Clear.	
3.	# 1 ENG START switch - START-IGNITION. # 1 IGN ON annunciator should illuminate and # 1 FUEL PRESS annunciator should extinguish.	A1-7
4.	CONDITION lever (after N_1 RPM passes13% minimum - LOW IDLE.	E1, J1
5.	TGT and N_1 - Monitor (TGT 1000°C maximum).	
6.	Oil pressure - Check (60 PSI minimum).	E7-9
7.	# 1 ENG START switch - OFF after TGT peaks.	E2
8.	CONDITION levers - HIGH IDLE. Monitor TGT as CONDITION lever is advanced.	
9.	POWER levers - GROUND FINE.	
10.	PROP levers - Retard to FEATHER detent.	
11.	BATTERY CHARGE annunciator - Check on. BATTERY CHARGE annunciator should extinguish within 5 minutes following a normal engine start on battery.	
12.	# 1 and # 2 INVERTER switches - ON, check INVERTER annunciators off.	
13.	# 1 GENERATOR switch - RESET, then ON.	C1

PROCEDURE	TROUBLESHOOTING REFERENCE

SECOND ENGINE START (BATTERY START) (CONT)

NOTE

When voltage drops below approximately 20 volts, the beacon light may become inoperative. To reset beacon light, turn off for approximately 5 seconds, then DAY or NIGHT.

14. BEACON lights switch - Reset, then on.

ABORT START PROCEDURE

1. CONDITION lever - FUEL CUTOFF.
2. ENG START switch - STARTER ONLY.
3. TGT - Monitor for drop in temperature.
4. ENG START switch - OFF.

ENGINE CLEARING PROCEDURE

1. CONDITION lever - FUEL CUTOFF.
2. ENG START switch - OFF (1 minute minimum).
3. ENG START switch - STARTER ONLY.
4. ENG START switch - OFF.

FIRST ENGINE START (GPU START)

When making a ground power unit (GPU) start, start the left engine first due to the GPU receptacle being adjacent to the right engine. Normally, only one engine is started utilizing the GPU, reverting to the battery start procedure for the second engine start. Assign a crew member to monitor the fire guard throughout the engine start procedures.

1. INS - As required.

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

Do not start the engines until after the INS is placed into the NAV mode or OFF as required.

2. Exterior light switches - As required.

3. Fire guard - Posted.

4. Propeller area - Clear. A1-7

5. # 1 ENG START switch - START- IGNITION. # 1 IGN ON annunciator should illuminate and # 1 FUEL PRESS annunciator should extinguish.

NOTE

False fuel flow indication may be observed with the starter-generator engaged and the CONDITION lever in FUEL CUTOFF.

CAUTION

If ignition does not occur within 10 seconds after moving CONDITION lever to LOW IDLE, initiate Abort Start procedure. If for any reason a starting attempt is discontinued, the entire starting sequence must be repeated after allowing the engine to come to a complete stop (1 minute minimum).

6. CONDITION lever (after N_1, RPM passes 13% minimum) - LOW IDLE. E1, J1

PROCEDURE	TROUBLESHOOTING REFERENCE

FIRST ENGINE START (GPU START) (CONT)

CAUTION

Monitor TGT to avoid a hot start. If there is a rapid rise in TGT, be prepared to abort the start before limits are exceeded. During engine start, the maximum allowable TGT is 1000°C for 5 seconds. If this limit is exceeded, initiate Abort Start procedure and discontinue start. Enter the peak temperature and duration on DA Form 2408-13-1.

7. TGT and N_1 - Monitor (TGT 1000°C maximum).

8. Oil pressure - Check (60 PSI minimum). E7-9

9. # 1 ENG START switch - OFF after TGT peaks.

10. CONDITION lever - HIGH IDLE. E2
    Monitor TGT as CONDITION lever is advanced.

11. DC GPU disconnect - As required.

12. # 1 GENERATOR switch - RESET C1
    then ON, for second engine battery start.

SECOND ENGINE START (GPU START)

1. Propeller area - Clear.

2. # 2 ENG START switch - START- IGNITION. A1-7
    # 2 IGN ON annunciator should illuminate and # 2 FUEL PRESS annunciator should extinguish.

3. CONDITION lever (after N1 RPM passes 13% minimum) - LOW IDLE.

PROCEDURE	TROUBLESHOOTING REFERENCE

4. TGT and N_1 - Monitor (TGT 1000°C maximum).

5. Oil pressure - Check (60 PSI minimum).

6. # 2 ENG START switch - OFF after TGT peaks.

7. CONDITION lever - HIGH IDLE. Monitor TGT as CONDITION lever is advanced.

CAUTION

Monitor oil temperature closely during ground operation with propellers in FEATHER due to lack of air flow over oil cooler. If necessary move propeller control out of FEATHER to keep oil temperature within limits.

8. PROP levers - FEATHER (if required).

9. AC and DC GPU units - Disconnect (check aircraft external power and mission external power annunciator extinguished).

10. PROP levers - Advance, then retard to FEATHER detent.

11. POWER levers - GROUND FINE.

12. # 1 and # 2 INVERTER switches - ON. Check INVERTER annunciators extinguished.

13. GENERATOR switches - RESET, then ON. C1

PROCEDURE **TROUBLESHOOTING REFERENCE**

SECOND ENGINE START (GPU START) (CONT)

NOTE

To reset beacon light, turn OFF approximately 5 seconds, then ON. When voltage drops below approximately 20 volts, the beacon light may become inoperative.

14. BEACON lights switch - Reset, then on.

BEFORE TAXIING

CAUTION

Propeller speeds below 1000 RPM are not authorized, unless the propeller is feathered.

1. BRAKE deice switch - Check and set as required. To activate the brake deice system, proceed as follows:
   a. LEFT PNEU & ENVIRO BLEED AIR valve switch - Off.
   b. RIGHT PNEU & ENVIRO BLEED AIR valve switch - ON.
   c. BRAKE deice switch - Turn ON and observe that the BRAKE DE-ICE ON light is illuminated.
   d. PNEUMATIC PRESSURE gage - Check for a momentary pressure decrease.
   e. Repeat procedure for opposite bleed air valve.
2. CABIN AIR MODE SELECT switch - Set as desired.
3. CABIN AIR TEMP control rheostat - Set as desired.

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

For maximum cooling on the ground, turn the PNEU & ENVIRO BLEED AIR valve switches to PNEU ONLY position. Verify airflow is present from aft cockpit eyeball outlets to ensure sufficient cooling for mission equipment.

Check may also be accomplished by switching the # 1 GENERATOR OFF and leaving the #2 GENERATOR ON.

* 4. AC/DC power/current limiters/inverters - Check as follows:

a. # 1 GENERATOR switch - ON.

b. # 2 GENERATOR switch - OFF.

c. # 1 and # 2 INVERTER switches - ON. C36,37
Check for the following indications:

(1) # 1 and # 2 INVERTER annunciator lights not illuminated.

* (2) AC frequency - 394 to 406 Hz.

* (3) AC voltage - 104 to 124 VAC.

* (4) DC voltage - 28 to 28.5 VDC.

(5) Battery ammeter - Check for charge indication.

NOTE

This procedure checks both 400 and 500 ampere current limiters that tie the aircraft bus systems together.

d. # 2 GENERATOR switch - ON.

5. AUTO PLT POWER switch - ON.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE TAXIING (CONT)

6. AVIONICS MASTER POWER switch - ON.
7. # 1 and # 2 EFIS POWER switches - ON.
8. Mission control panel - Check and set as required.
9. Avionics - Check and set as required.
10. Flaps - Check.
11. Altimeters - Check and set.

TAXIING

CAUTION

Extend the ice vanes during ground operation to minimize foreign object damage (FOD) to the engine.

Taxi speed can be effectively controlled by the use of power application and the use of the variable pitch propellers in the ground fine range with the PROP levers retarded to the FEATHER detent.

* 1. Brakes - Check. G1-4,6-8

NOTE

If brakes have been overhauled, "burn in" the brakes by applying near maximum braking (short of locking) for one or two landings or high speed taxi runs. After this, check brakes for any tendency to drag.

* 2. Flight instruments - Check for normal operation.

PROCEDURE	TROUBLESHOOTING REFERENCE
* 3. Nosewheel steering - Check for no turning tendency while taxiing straight ahead with the same RPM on both engines, with no braking and no rudder applied to either side. (This check must be performed with minimum cross wind.) Check freedom of movement and ability to turn aircraft using rudder pedals, engines and brakes. Note any indication of nosewheel vibration or shimmy during takeoff or landing.	
* 4. Magnetic compass - Check for freedom of movement.	B4

ENGINE RUNUP

1. Nose wheel - Center.	
* 2. PARKING BRAKE - Set. The parking brake must lock without undue pressure on the brake pedals and release cleanly when PARKING BRAKE handle is reset.	G5

CAUTION

Monitor oil temperature closely during ground operation with PROP levers in FEATHER due to lack of air flow over oil cooler.

* 3. Engine low idle speed - Check 60 to62% N1, with propellers feathered.	E1
* 4. Propeller feathering - Check as follows:	F14,15
a. CONDITION lever - HIGH IDLE.	
b. Left PROP lever - FEATHER. Check that propeller feathers with no hesitation.	

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE RUNUP (CONT)

c. Check for proper pedestal control detent position.

d. Left PROP lever - HIGH RPM.

e. Repeat procedure for right propeller.

* 5. Engine acceleration - Check as follows: E5,14-20

a. Left POWER lever - Set 64% N_1, then rapidly move lever to maximum forward travel. Acceleration time required for N, to reach 93.5 % is 2.5 to 4.0 seconds.

b. Left POWER lever - Immediately retard to IDLE as N_1 passes through 93.5%.

c. Repeat procedure for right engine.

* 6. Engine high idle speed - Check 71 to 73% N_1. E2

* 7. N_1 speed switch (air conditioning) - Check as follows:

a. Right engine CONDITION lever - LOW IDLE.

b. Right engine PROP lever - FEATHER.

c. CABIN AIR MODE SELECT switch - MANUAL COOL.

d. Verify that AIR COND N, LOW annunciator light is illuminated.

e. Right engine CONDITION lever - Advance to increase N_1 to above 62%.

f. Verify that AIR COND N_1 LOW annunciator light is extinguished with N_1 above 62%.

g. CABIN AIR MODE SELECT switch - AUTO.

* 8. Pneumatics/Vacuum/Pressurization - Check as follows:

a. PNEUMATIC PRESSURE gage/GYRO SUCTION gage - Check in green arcs.

b. CABIN ALT controller - Set 500 feet lower than field pressure altitude.

c. Cabin pressurization RATE control - Set to maximum.

d. ENVIRO & PNEU BLEED AIR valve switches (2) - ENVIRO & PNEU off.

e. PNEUMATIC PRESSURE gage/GYRO SUCTION gage - Check. Pressure should drop to zero.

f. BL AIR OFF annunciators (2) - Check illuminated.

g. BL AIR FAIL annunciators (2) - Check illuminated.

h. CABIN PRESS switch - TEST (hold).

i. LEFT PNEU & ENVIRO BLEED AIR valve switch - ON.

j. L BL AIR OFF annunciator - Check extinguished.

k. BL AIR FAIL annunciators (2) - Check extinguished.

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE RUNUP (CONT)

l. PNEUMATIC PRESSURE gage/GYRO SUCTION gage - Check in green arc.

m. CABIN CLIMB indicator - Check for descent indication within 10 - 15 seconds, then release test switch.

n. LEFT PNEU & ENVIRO BLEED AIR valve switch - Off.

o. Repeat steps e through m using the right bleed air valve.

p. CABIN PRESS switch - Set to pressure position (center).

q. CABIN ALT controller - Reset as required.

r. Cabin pressurization RATE control - Reset as required.

s. PNEU & ENVIRO BLEED AIR valve switches (2) - As required.

* 9. Rudder boost - Check as follows:

a. RUDDER BOOST/YAW CONTROL TEST switch - YAW CONTROL TEST. Check that RUDDER BOOST annunciator light (flight director annunciator panel) is illuminated.

b. Yaw damper - Engage. Yaw damper should not engage.

c. RUDDER BOOST/YAW CONTROL TEST switch - RUDDER BOOST. Check that RUDDER BOOST annunciator light is illuminated.

PROCEDURE	TROUBLESHOOTING REFERENCE

d. RUDDER BOOST/YAW CONTROL TEST switch - Off (center). Check that RUDDER BOOST annunciator light is extinguished.

e. RUDDER BOOST/YAW CONTROL TEST switch - RUDDER BOOST.

f. Yaw damper pushbutton switch - Depress to engage yaw damper. Check that YD ENG annunciator is illuminated.

g. Left POWER lever - Advance. At a torque differential of approximately 60%, observe that the YD ENG annunciator light extinguishes, and that the left rudder pedal begins to move forward. Check that increasing power results in increasing rudder pedal deflection.

h. Left POWER lever - Slowly retard.

NOTE

YD ENG annunciator light may flicker at a torque differential of approximately 50%.

i. Repeat steps f through h for the right engine.

* 10. Autofeather/auto ignition - Check as follows: F4-15

a. AUTO IGNITION switches - ARM.

b. POWER levers - Approximately 25% torque.

c. AUTOFEATHER switch - Hold to TEST (both AUTOFEATHER annunciators illuminated).

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE RUNUP (CONT)

d. POWER levers - Retard individually.

(1) At 13% to 19% torque - Opposite AUTOFEATHER annunciator extinguished, IGN ON annunciator illuminated.

(2) At 7% to 13% torque - Both AUTOFEATHER annunciators extinguished (propeller starts to feather).

NOTE

The POWER lever may have to be lifted and pulled towards the ground fine gate in order to attain the 7% to 13% torque.

AUTOFEATHER annunciators will illuminate and extinguish with each fluctuation of torque as the propeller feathers.

(3) Return POWER lever to approximately 25% torque.

e. Repeat steps c and d for other engine.

f. AUTOFEATHER switch - ARM.

g. AUTO IGNITION switches - Off.

* 11. Propeller overspeed governors - Check as follows: F1-3

a. PROP levers - HIGH RPM.

b. PROP GOVERNOR test switch - Hold in TEST position.

c. Left engine POWER lever - Advance until overspeed governor governs propeller (1540 to 1580

PROCEDURE	TROUBLESHOOTING REFERENCE
RPM). Do not exceed temperature and torque limits.	
d. PROP GOVERNOR test switch - Release. Verify that propeller RPM increases.	
e. Left engine POWER lever - IDLE.	
f. Repeat steps b through e for right engine.	
* 12. Primary governors - Check as follows:	F1-3
a. POWER levers - Set 1500 RPM.	
b. PROP levers - Move aft to detent.	
c. Propeller RPM - Check 1150 +50.	
d. PROP levers - HIGH RPM.	
* 13. Propeller low pitch stop - Check one engine at a time as follows:	E3
a. Aircraft - Position crosswind.	
b. Read the corrected propeller torque in % at 1500 RPM from figure 1.	
c. PROP lever - HIGH RPM (full forward).	
d. POWER lever - Set 1500 RPM.	
e. Torquemeter - Read and record torque.	
f. POWER lever - IDLE.	
g. Torque reading taken in step e must equal the corrected torque in step b, within +2%.	

PROCEDURE **TROUBLESHOOTING REFERENCE**

ENGINE RUNUP (CONT)

h. Repeat steps c through g for other engine. Observe that the difference in torque readings between left and right engines is not greater than 1%.

* 14. Engine anti-ice - Check as follows:

a. ICE VANE POWER SELECT switches (2) - MAIN.

b. ICE VANE CONTROL switches (2) - Off. Verify # 1 and # 2 VANE EXT annunciators extinguish.

c. ICE VANE POWER SELECT switch - STBY.

d. ICE VANE CONTROL switches - ON, verify # 1 and # 2 VANE EXT annunciators illuminated.

e. ICE VANE POWER SELECT switch - MAIN.

WARNING

Do not operate the weather radar set while personnel or combustible materials are within 18 feet of the antenna reflector. When the weather radar set is operating, high-power radio frequency energy is emitted from the antenna reflector, which can have harmful effects on the human body and can ignite combustible materials. Do not operate radar in congested areas.

PROCEDURE	TROUBLESHOOTING REFERENCE

CAUTION

Do not operate the weather radar system in a confined space where the nearest metal wall is 50 feet from the antenna reflector. Scanning such surfaces within 50 feet of the antenna reflector may damage receiver crystals.

NOTE

Test the weather radar system before each flight on which the system is to be used.

* 15. Weather radar/LSS - Test and set as required.

BEFORE TAKEOFF

1. AUTOFEATHER switch - ARM.

2. PNEU & ENVIRO BLEED AIR valves (2) - As required.

CAUTION

Do not use pitot heat for more than 15 minutes while the aircraft is on the ground. Overheating may damage the heating elements.

3. ICE & RAIN switches - As required. As a minimum, PITOT, STALL WARN, and FUEL VENT switches shall be ON.

4. Fuel panel - Check fuel quantity and switch positions.

5. Flight and engine instruments - Check for normal indications and EFIS display controllers are set

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE TAKEOFF (CONT)

to desired setting.

6. CABIN CONTROLLER - Set.
7. Annunciator panels - Check (note indications).
8. Flaps - As required.
9. Trim - Set.
10. ASE/ACS - Set.
11. Avionics - Set.
12. Flight controls - Check.
13. Departure briefing - Complete.

LINE UP

1. Engine anti-ice - As required.
2. Engine AUTO IGNITION switches - ARM.
3. PROP levers - HIGH RPM.
4. Altitude alerter - Check. Set as required.
5. Transponder - As required.
6. Weather radar/LSS - Set as required.
7. Lights - As required.

NOTE

Use landing lights for takeoff to assist in avoiding bird strikes and to make the aircraft more visible while operating in congested areas.

DURING TAKEOFF

*	1.	Propeller tachometers - Check. During takeoff verify that propeller tachometers indicate	E28

PROCEDURE	TROUBLESHOOTING REFERENCE

1700 RPM. With propellers synchronized, minimum indicated RPM is 1700 RPM. The maximum difference between the indicators is 20 RPM.

2. Engine instruments - Check the following instrument indications:

* a.	Torque	E24
* b.	TGT	B9,E26,
* c.	N1	E27
* d.	Oil pressure	E7-9
* e.	Oil temperature	E10

AFTER TAKEOFF

WARNING

Immediately after takeoff, the pilot flying the aircraft should avoid adjusting controls located on the aft portion of the extended pedestal to preclude inducing spatial disorientation.

1. Gear- UP.

NOTE

Listen for unusual noises during landing gear retraction.

* 2. Tail boom antenna - Check that ANT OPERATE annunciator light illuminates after landing gear has retracted.

3. Flaps - UP.

4. Landing lights - OFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

AFTER TAKEOFF (CONT)

CAUTION

Turn windshield anti-ice on to normal when passing 10,000 feet AGL or prior to entering the freezing level (whichever comes first). Leave on until no longer required during descent for landing. Select high temperature, as required, after a minimum warm-up period of 15 minutes.

5. Windshield anti-ice - As required.

CLIMB

1. Climb power - Set.
2. Propeller synchronization - As required.
3. Yaw damper - ENGAGE (required above 17,000 ft).
4. Brake deice - As required.
5. ICE VANE CONTROL switches - As required.
6. STANDBY PUMP switches - As required.
7. Cabin pressurization - Check. Adjust rate control knob so that cabin rate-of-climb equals one third of aircraft rate-of-climb.

* 8. Wings and center section - Check for security and no fuel fuel/oil leaks. E29

9. Flare/chaff dispenser safety pin - Remove as required.
10. ASE - As required.

* 11. Engine and flight instruments - Moni- E6

PROCEDURE	TROUBLESHOOTING REFERENCE
tor. All instruments must give proper indication with minimum fluctuation.	
*12. Engine control levers - Check for alignment.	E29
*13. Vertical speed indicators - Check normal operation against altimeter as follows:	B2
a. Aircraft rate of climb - Fly an indicated 1000 feet per minute.	
b. Read altimeter at beginning of timing, and time for one minute.	
c. Read altimeter at end of one minute. Second reading must be 1000 ±200 feet more than first reading.	
*14. Surface deice system - Check as follows:	C42
a. SURFACE deice switch - AUTO. Verify that surface boots inflate and automatically deflate for one cycle, and that wing boots stay inflated for 6 seconds, then tail boots stay inflated for 4 seconds.	
b. SURFACE deice switch - Hold to MANUAL position. Verify that boots stay inflated until switch is released.	
c. SURFACE deice switch - Release. Check boots visually to see that they are sucked down flat after use.	
*15. Antenna deice system - Check as follows:	C42

PROCEDURE	TROUBLESHOOTING REFERENCE
CLIMB (CONT)	
a. ANTENNA deice switch - AUTO. Check that wing dipole antenna boots inflate and automatically deflate for one cycle.	
b. ANTENNA deice switch - Hold to MANUAL position. Check that wing dipole antenna boots inflate and stay inflated until switch is released.	
c. ANTENNA deice switch - Release. Check boots visually to see that they are sucked down flat after use.	
*16. Propeller deice system - Check as follows:	C54
a. PROP deice switch - Set to AUTO position.	
b. PROP deice ammeter - Monitor for 26 to 30 amperes and for a slight needle deflection every 90 seconds.	
c. MANUAL deice - Hold switch to ON position. Note a 28 ampere increase in each loadmeter indication.	
*17. Windshield anti-ice system - Check operation as follows:	
a. Pilot's WINDSHIELD anti-ice switch - OFF.	
b. Pilot's WINDSHIELD anti-ice switch - NORMAL, check for load-meter rise.	

c. Pilot's WINDSHIELD anti-ice switch - HI, check for an increased loadmeter indication, then OFF.

d. Copilot's WINDSHIELD anti-ice switch - Check by repeating steps a through c.

e. Windshield anti-ice system - Set as required.

*18. Radome anti-icing system - Check as follows:

a. RADOME anti-ice switch - ON.

b. Loadmeters - Monitor for increase.

c. PNEUMATIC PRESSURE GAGE- Check for decrease.

d. RADOME HEAT annunciator light - Check illuminated within 5 minutes.

e. RADOME HOT annunciator light- Check extinguished.

*19. Waveguide pressurization system -Verify that the WAVE GUIDE annunciator light is illuminated when N, is above 80%.

*20. Cabin and cockpit ventilation system -Check the following items for flow of air, binding controls, and the capability of being shut off by appropriate control:

a. Eye-ball cold air vents.

b. Pilot's and copilot's air vents.

c. Windshield defroster ducts.

d. Main cabin air ducts.

PROCEDURE	TROUBLESHOOTING REFERENCE
CLIMB (CONT)	
*21. Air conditioning and heating system - Check as follows:	C48-53
a. CABIN AIR MODE SELECT switch- - MAN COOL or MAN HEAT.	
b. CABIN AIR MANUAL TEMP control switch - Hold to INCREASE position for one minute. Observe an increase in cabin temperature.	
c. CABIN AIR MANUAL TEMP control switch - Hold to DECREASE position for one minute. Observe a decrease in cabin tem-perature.	
d. CABIN AIR MODE SELECT switch - AUTO.	
e. CABIN AIR TEMP CONTROL rheostat - Rotate to full INCR posi-tion. Observe an increase in cabin temperature.	
f. CABIN AIR TEMP control rheostat - Rotate fully counterclock-wise. Observe an decrease in cabin temperature.	
NOTE Air conditioning will come on if cabin temperature is above 60 to 650F. Ensure that the temperature control rheostat is set to the mid position (approximately 75°F cabin temperature).	
*22. Air conditioning cold operation - Check as follows:	

PROCEDURE	TROUBLESHOOTING REFERENCE

a. Verify that the AC COLD OPN annunciator light is illuminated only when the FAT is below 45° F.

b. CABIN AIR MODE SELECT switch - AC COLD OPN. Check that air conditioner turns on in 8 to 12 seconds and the A/C COLD OPN annunciator extinguishes.

c. Verify that air conditioner operation is the same as the AUTO mode except that the air conditioner operates continuously above 61% N_1.

23. Pressurization system - Check as required (Section IV).

*24. Carbon monoxide - Check the cockpit and cabin for the presence of carbon monoxide. Maximum carbon monoxide allowable is 0.005%.

CRUISE

1. Power- Set.
2. ICE & RAIN switches - As required.
3. AUTOFEATHER - As required.
4. Volt-loadmeters - Check.
5. Auxiliary fuel gages - Monitor. Ensure that fuel is being transferred from auxiliary tanks.
6. Altimeters - Check.

* 7. Engine instrument indications - Check all engine instruments for normal indications. E21-28

8. RECOG lights - As required.

PROCEDURE	TROUBLESHOOTING REFERENCE

CRUISE (CONT)

* 9.	Wings and nacelles - Check for fuel and oil leaks.	E29
*10.	Cabin noise level - Check for undue air noise in the cabin from around the perimeter of doors or windows. Check for undue noise in the cabin due to vibrating and rattling articles or oil canning of skins.	
*11.	Pilot's alternate static air source -Check as follows:	
	a. Maintain level flight and note air-speed and altitude.	
	b. Pilot's alternate static air source switch - ALTERNATE. Verify that airspeed indicator, altimeter, and vertical speed indicator readings increase.	
	c. Pilot's alternate static air source switch - NORMAL. Airspeed indicator, altimeter, and vertical speed indicator indications should return o their original readings.	
*12.	Propeller synchrophaser - Check capturing ability of the synchrophaser by establishing a small out of synchronization condition, then turning the synchrophaser on. Verify that synchronization is established and held within a few seconds.	
13.	Maximum TGT/N_1 availability - Perform as required (Section IV).	
14.	Speed performance at maximum cruise power - Perform as required (Section IV).	

PROCEDURE	TROUBLESHOOTING REFERENCE

15. Engine performance at maximum continuous power - Perform as required (Section IV).

16. Engine performance at maximum cruise power - Perform as required (Section IV).

*17. Engine ice vanes - Check operation as follows:

a. #1 and #2 ICE VANE POWER SELECT switches (2) - MAIN.

b. #1 and #2 ICE VANE CONTROL switches - ON. Check #1 and #2 VANE EXT annunciators illuminated.

c. Torquemeters - Monitor for approximately a 10% drop in torque with ice vanes extended.

d. #1 and #2 ICE VANE CONTROL switches - Retract (up).

e. Torquemeters - Monitor for an increase in torque.

f. ICE VANE CONTR MAIN circuit breakers - Pull. Check that #1 and #2 VANE FAIL annunciator lights illuminate.

g. #1 and #2 ICE VANE POWER SELECT switches (2) - STBY. Check that #1 and #2 VANE FAIL annunciator lights extinguish.

h. #1 and #2 ICE VANE CONTROL switches - ON. Check that #1 and #2 VANE EXT annunciators illuminate.

i. #1 and #2 ICE VANE CONTROL switches - Retract (up).

PROCEDURE	TROUBLESHOOTING REFERENCE
CRUISE (CONT)	
j. ICE VANE CONTR MAIN circuit breakers - Reset.	
k. ICE VANE CONTR AUXILIARY circuit breakers - Pull. Check that #1 and #2 VANE FAIL annunciator lights illuminate.	
l. #1 and #2 ICE VANE POWER SELECT switches (2) - MAIN. Check that #1 and #2 VANE FAIL annunciators extinguish.	
m. ICE VANE CONTR AUXILIARY circuit breakers - Reset.	
18. Trim and rigging - Check as required (Section IV).	
*19. Turn and bank indicators - Check as follows:	B5
a. Bank - Establish a coordinated standard rate turn.	
b. Timing - Maintain turn for 1 minute. Heading change shall be 180 ±25".	
c. In straight and level flight, the turn needle will be centered to within ±1/16 inch.	
d. Repeat procedure for opposite turn direction. 20. Avionics - Check in flight as required (Section IV).	
LOW SPEED SYSTEMS CHECK	
* 1. Flap operation - Check as follows:	
a. Airspeed - Reduce to 197 KIAS or below.	

PROCEDURE	TROUBLESHOOTING REFERENCE

(b) **FLAPS - APPROACH.** Check flaps for freedom and smoothness of operation and for excessive aircraft roll.

(c) Airspeed - Reduce to 151 KIAS.

(d) **FLAPS - 100%.** Check flaps for freedom and smoothness of operation and for excessive aircraft roll.

*(e) Flap extension and retraction time - Check as follows:

(1) Airspeed - 151 KIAS.

(2) **FLAPS - UP**, check and record retraction time. Full down to full up maximum time- 9 seconds.

(3) Airspeed – 151 KIAS.

(4) **FLAPS - DOWN,** check and record extension time. Full up to full down maximum time -13 seconds.

PREFACE TO STALL WARNING SYSTEM CHECK

Prior to conducting a MTF where the stall warning system will be checked:

The Maintenance Test Pilot (MP) and a contractor maintenance person will physically check, with a measuring tape or other approved device, the proper measurements and installation of the stall strips per the appropriate maintenance manual.

Prior to conducting a power off maneuver, the MP will consult the POWER OFF STALL SPEED TABLE (fig. 1 page 2-66.1) to determine the stall speed and stall warning horn speed range for the aircraft at its weight and configuration during the flight.

During the crew briefing prior to commencing the flight, the crew must determine and announce that they will cease aileron inputs at activation of the stall warning horn. A wings level attitude shall be maintained by careful and prudent rudder input.

WARNING

The RC-12 may not produce a clean aerodynamic "break" (i.e. In the C-12 the nose does not pitch down during a stall). The indication of the stall when the aircraft pitch attitude is held constant may be a moderate buffet, a loss in control effectiveness, full aft yoke, or any sink rate as indicated on the altimeter or VSI. Generally, 800 feet of altitude will be lost during a normal stall recovery.

Delayed recovery from a stall can result in a "deep stall" which is characterized by a level pitch attitude, flight path angle of approximately 45 degrees down, and a sink rate of up to 8500 FPM. Recovery from a "deep stall" requires a 10-15 degree nose-down pitch change to break the stall. Allow the airspeed to increase to at least 25 KIAS above the stall speed before recovery.

NOTE

In the event of an inadvertent stall, recovery can be effected by relaxing aft control force, lowering the nose below the visible horizon and adding power to reduce altitude loss. Rapid recovery is hampered by a pronounced secondary stall tendency (recurrence of buffet). Secondary stall can be avoided by increasing the airspeed 25 KIAS above the stall speed.

Stall warning horn shall sound at no more than 12, and no less than 5 knots above the stall speed IAW fig. 1 page 2-66.1.

Do not perform the low speed systems checks in turbulence conditions greater than occasional light turbulence.

*2.	Stall warning system (gear and flaps up, power off) – Check as follows:	**C34-35**

WARNING

Begin the maneuver at 160 KIAS at an altitude that will allow recovery to be safely completed no lower than 7500 AGL.

PROCEDURE	TROUBLESHOOTING REFERENCE

a. **GEAR** – **UP**.

b. **FLAPS** – **UP**.

c. **PROP** levers – **HIGH RPM.**

d. **CONDITION** levers – **HIGH IDLE.**

e. **POWER** levers – **IDLE**.

f. Trim aircraft IAW Fig. 1 page 2-66.1 (Make no further pitch trim adjustments).

WARNING

If the aircraft reaches an airspeed 5 KTS above the stall speed IAW fig. 1 page 2-66.1 with no stall horn activation, terminate the LOW SPEED SYSTEMS CHECK and have maintenance personnel adjust/repair the stall warning horn system.

g. Airspeed – Reduce at a rate NO GREATER THAN one knot/second until the stall horn ACTIVATES, but NO LOWER THAN 5 knots above the published stall speed specified in fig. 1 page 2-66.1.

* h. Airspeed – Record at onset of the stall warning horn and terminate the maneuver.

* 3. Stall warning system, (gear and flaps down, power off) – Check as follows:

WARNING

Begin the maneuver at 160 KIAS at an altitude that will allow recovery to be safely completed no lower than 7500 AGL.

NOTE

Configure the aircraft by performing the BEFORE LANDING CHECK. Allow the aircraft to slow to approximately 120 KIAS and perform the following.

a. **GEAR**– **DN**.

b. **FLAPS** – **DOWN**.

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

c. **PROP** levers – **HIGH RPM.**

d. **CONDITION** levers – **HIGH IDLE.**

e. **POWER** levers– **IDLE**.

f. Trim aircraft IAW Fig. 1 page 2-66.1 (Make no further pitch trim adjustments).

WARNING

If the aircraft reaches an airspeed 5 KTS above the stall speed IAW fig. 1 page 2-66.1 with no stall horn activation, terminate the LOW SPEED SYSTEMS CHECK and have maintenance personnel adjust/repair the stall warning horn system.

g. Airspeed – Reduce at a rate NO GREATER THAN one knot/second until the stall horn ACTIVATES, but NO LOWER THAN 5 knots above the published stall speed specified in fig. 1 page 2-66.1.

* h. Airspeed – Record at onset of the stall warning horn and terminate the maneuver.

4. Step deleted.

5. Step deleted.

6. Step deleted.

7. Step deleted.

8. **FLAPS – UP.** **C31,32**

9. **GEAR – UP.**

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

The MP is responsible for ensuring the aircraft is within required weight and balance limits IAW the appropriate maintenance manual.

RC-12N				
13,500 TRIM SPEED	Gear & Flaps UP Gear & Flaps DOWN		Power Idle Power Idle	147 KIAS 123 KIAS
15,000 TRIM SPEED	Gear & Flaps UP Gear & Flaps DOWN		Power Idle Power Idle	155 KIAS 127 KIAS
WEIGHT	**STALL SPEEDS**		**WARNING HORN RANGE**	
	Vs	**Vso**	**Vs**	**Vso**
16,000	102	76	107 – 114	81 – 88
15,500	100	75	105 – 112	80 – 87
15,000	99	74	104 – 111	79 – 86
14,500	98	73	103 – 110	78 – 85
14,000	96	72	101 – 108	77 – 84
13,500	95	71	100 – 107	76 – 83
13,000	93	70	98 – 105	75 – 82
12,500	91	68	96 – 103	73 – 80
12,000	89	67	94 – 101	72 – 79

Figure 1. Power Off Stall Speeds Table.

PROCEDURE	TROUBLESHOOTING REFERENCE
*10. Autoignition - Check as follows:	
a. AUTO IGNITION switches -ARM.	
b. Slowly retard each POWER lever.	
c. Respective IGN ON annunciator light illuminates at 13 to 19 % torque.	
d. Power - Establish cruise power with autoignition armed.	
e. CONDITION lever (engine to be tested) - Rapidly retard to IDLE CUTOFF for 3 seconds, then return to LOW IDLE. Observe that engine relight occurs within 3 to 5 seconds. Monitor engine acceleration and TGT rise. If relight does not occur within limits, or acceleration or TGT do not appear normal, abort the start. Restart engine using Normal Procedures.	
f. Repeat substep e for opposite engine if required.	
*11. Propeller feathering - Check each engine as follows:	F14,15
a. Airspeed - 120 KIAS.	
b. POWER lever (engine to be feathered) - IDLE.	
c. PROP lever (engine to be feathered) - HIGH RPM.	
d. CONDITION lever (engine to be feathered) - IDLE CUTOFF. Allow N, RPM to decay below 20%.	
e. PROP lever (engine to be feathered) - FEATHER. Time to feather must not exceed 10 seconds from	

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

windmilling at 1700 RPM to no rotation in the feathered position.

f. Engine cleanup.

(1) CONDITION lever - FUEL CUTOFF.

(2) AUTO IGNITION switch -Off.

(3) AUTOFEATHER switch -OFF.

(4) GENERATOR switch - OFF.

(5) PROP SYN switch - OFF.

g. Engine restart.

WARNING

Airstarts using the starter assist procedures will momentarily cause the loss of all electronic flight instrument system (EFIS) data. The engine restart during flight (no starter assist procedure), or turning EFIS power off prior to a starter assisted restart, should normally be performed.

CAUTION

Do not attempt engine airstarts above 25,000 feet. During engine acceleration to idle speed, it may become necessary to move the CONDITION lever into FUEL CUTOFF in order to avoid an over temperature condition.

(1) CABIN AIR MODE SELECT switch - OFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

(2) FWD VENT BLOWER switch- AUTO.

(3) AUTO PLT POWER switch -Off.

(4) EFIS POWER switches (2) -OFF (if conditions permit).

NOTE

If EFIS power is turned off, aircraft attitude should be maintained by using outside visual references or the air driven standby attitude indicator and turn-and-slip indicator.

(5) Radar - SBY or OFF.
(6) POWER lever - IDLE.
(7) PROP lever - Low RPM.
(8) CONDITION lever - FUEL CUTOFF.
(9) FIRE PULL handle - Push in (to extinguish annunciator).

NOTE

If conditions permit, reduce power on the operative engine to obtain a TGT of 700°C or less to reduce the possibility of exceeding TGT limit. Reduce electrical load to minimum consistent with flight conditions.

False fuel flow indications may be observed with the starter engaged and the CONDITION lever in FUEL CUTOFF.

(10) ENG START switch -START-IGNITION. Check IGN ON annunciator illuminated.

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

(11) CONDITION lever - LOW IDLE.

(12) ENG START switch - OFF after TGT peaks.

(13) CONDITION lever - HIGH IDLE.

(14) PROP lever - As required.

(15) POWER lever - As required.

(16) GENERATOR switch - RESET, then ON.

(17) Engine AUTO IGNITION -As required.
(18) PROP SYNC switch - As required.
(19) Electrical equipment - As required.

h. Repeat step g for opposite engine if required.

*12. Propeller autofeathering system and propeller unfeathering - Check as follows: F4,15

a. AUTOFEATHER switch - ARM.

b. Airspeed - 120 KIAS.

c. PROP levers - Set 1700 RPM.

d. POWER levers - Set as required to arm auto feather system.

e. CONDITION lever (engine to be feathered) - IDLE CUTOFF.

*f. Record the time from fuel cutoff until propeller is feathered. (Propeller is considered to be feathered

PROCEDURE	TROUBLESHOOTING REFERENCE

when the blades are individually visible to the human eye, but the propeller is still rotating.) Time to feather shall not exceed 10 seconds.

NOTE

For proper autofeather operation, propeller must stop completely.

g. Engine cleanup.

(1) CONDITION lever - FUEL CUTOFF.

(2) AUTO IGNITION switch -OFF.

(3) AUTOFEATHER switch -OFF.

(4) GENERATOR switch - OFF.

(5) PROP SYN switch - OFF.

h. Engine restart.

WARNING

Airstarts using the starter assist procedures will momentarily cause the loss of all electronic flight instrument system (EFIS) data. The engine restart during flight (no starter assist procedure), or turning EFIS power off prior to a starter assisted restart, should normally be performed.

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

CAUTION

Do not attempt engine airstarts above 25,000 feet. During engine acceleration to idle speed, it may become necessary to move the CONDITION lever into FUEL CUTOFF in order to avoid an over-temperature condition.

(1) CABIN AIR MODE SELECT switch - OFF.

(2) FWD VENT BLOWER switch- AUTO.

(3) AUTO PLT POWER switch -Off.

(4) EFIS POWER switches (2) -OFF (if conditions permit).

NOTE

If EFIS power is turned off, aircraft attitude should be maintained by using outside visual references or the air driven standby attitude indicator and turn-and-slip indicator.

(5) Radar - SBY or OFF.

(6) POWER lever - IDLE.

(7) PROP lever - Low RPM.

(8) CONDITION lever - FUEL CUTOFF.

(9) FIRE PULL handle - Push in (to extinguish annunciator).

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

If conditions permit, reduce power on the operative engine to obtain a TGT of 700°C or less to reduce the possibility of exceeding TGT limit. Reduce electrical load to minimum consistent with flight conditions.

False fuel flow indications may be observed with the starter engaged and the CONDITION lever in FUEL CUTOFF.

(10) ENG START switch START-IGNITION. Check IGN ON annunciator illuminated.

(11) CONDITION lever - LOW IDLE.

(12) ENG START switch - OFF after TGT peaks.

(13) CONDITION lever - HIGH IDLE.

(14) PROP lever - As required.

(15) POWER lever - As required.

(16) GENERATOR switch - RESET, then ON.

(17) Engine AUTO IGNITION -As required.

(18) PROP SYNC switch - As required.

(19) Electrical equipment - As required.

*(20) Propeller unfeathering-Check as follows with propeller in the feathered position with the gas generator running in HIGH IDLE:

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

(a) POWER lever - IDLE. PROP lever - Move out of FEATHER detent to full forward. Propeller RPM must reach 1,000 RPM in 20 seconds or less.

i. Repeat step h for other engine if required.

NOTE

The landing gear warning horn is automatically silenced by an altitude sensing switch, provided to silence the landing gear warning horn when above 12,500 feet.

*13. Landing gear warning horn - Check as follows: C24-26

a. POWER levers - Retard slowly, individually, until landing gear warning horn first sounds.

*b. Turbine tachometers - Read N_1 tachometers on first hearing landing gear warning horn. Verify that the landing gear warning horn sounds when POWER levers are retarded below 84 to 86% N, and airspeed is below 140 KIAS.

c. Flaps - Extend beyond APPROACH position. Verify that the landing gear warning horn sounds regardless of POWER lever position (with airspeed less 140 KIAS).

d. POWER levers - Advance past 84 to 86% N_1. Check that landing gear warning horn is armed again.

PROCEDURE	TROUBLESHOOTING REFERENCE
With the airspeed greater than 153 KIAS and the flaps retracted, verify that the landing gear warning horn is silent regardless of power setting.	
*14. Landing gear normal operation - Check as follows:	C13-30
a. Airspeed - 179 KIAS.	
b. LDG GEAR CONTR switch - DN.	
*c. Landing gear extension time -Record (7 seconds maximum).	
d. Landing gear handle lights (red) -Check illuminated while gear is in transit.	
e. GEAR DOWN indicator lights (3, green) - Check illuminated.	
f. Airspeed - 160 KIAS.	
g. LDG GEAR CONTR switch - UP.	
*h. Landing gear retraction time -Record (8 seconds maximum).	
i. Landing gear handle lights (red) -Check illuminated while gear is in transit.	
j. GEAR DOWN indicator lights (3, green) - Check all extinguished.	
*15. Emergency landing gear extension system - Check operation and condition as follows:	
a. Airspeed - 179 KIAS.	
b. LANDING GEAR CONTROL circuit breaker - Out (pulled).	
c. LDG GEAR CONTR switch - DN.	

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

d. LANDING GEAR ALTERNATE EXTENSION pump handle - Unstow.

e. LANDING GEAR ALTERNATE EXTENSION pump handle -Pump.

f. GEAR DOWN indicator lights (3)- Monitor. Stop pumping lever when GEAR DOWN indicator lights are illuminated or resistance is felt.

NOTE

Eighty or more strokes of the handle could be required to fully extend the landing gear.

g. LANDING GEAR ALTERNATE EXTENSION pump handle - Stow.

h. LANDING GEAR CONTROL circuit breaker - In.

i. LDG GEAR CONTR switch - UP.

DESCENT AND LOW LEVEL CRUISE

* 1. Maximum rate (Vmo) descent. If the test pilot is satisfied that the entire aircraft is functioning properly, perform the maximum rate descent check as follows:

a. Establish cruise altitude in accordance with figure 3.

b. POWER levers - IDLE.

c. PROP levers - Set 1700 RPM.

d. Gear - UP.

e. Flaps - UP.

PROCEDURE	TROUBLESHOOTING REFERENCE

f. Airspeed - In accordance with figure 3.

WARNING

Immediately reduce airspeed if any flutter, oscillation or vibration is encountered.

*g. Flight controls - Check for any indication of flutter, oscillation, vibration, or malfunction.

*h. Windows and doors - Check for wind noise indicating air leaks.

i. Level off aircraft at 10,000 feet.

* 2. Elevator trim - Nose down trim stops will be set as follows:

a. POWER levers - Set maximum continuous power. Do not exceed N, or TGT limits.

b. PROP levers - Set 1700 RPM.

c. Airspeed - 240 KIAS.

d. Trim aircraft.

e. Verify that excess nose down trim is at least 0.9, but does not exceed 1.4 trim wheel indicator units.

DESCENT-ARRIVAL

Perform the following checks prior to the final descent for landing:

PROCEDURE **TROUBLESHOOTING REFERENCE**

DESCENT-ARRIVAL (CONT)

WARNING

M_{mo} may be easily exceeded when descending from high altitude. The pilot should frequently cross check the airspeed and Mach limit indicators to avoid exceeding Mmo. Exceeding Mmo could result in structural failure and loss of airframe integrity.

1. CABIN CONTROLLER - Set.

2. ICE & RAIN switches - As required.

3. WINDSHIELD anti-ice - As required.

CAUTION

Set windshield anti-ice to NORMAL or HIGH as required well before descent into icing conditions or into warm moist air to aid in defogging. Turn off windshield anti-ice when descent is completed to lower altitudes and when heating is no longer required. This will preclude possible wind screen distortions.

4. RECOG lights - On.

5. Altimeters - Set to current altimeter setting (QNH) when passing through transitional altitude.

6. ASE - As required.

7. Flare/chaff dispenser safety pin - Insert.

8. CONDITION lever - HIGH IDLE.

PROCEDURE	TROUBLESHOOTING REFERENCE

9. Avionics and EFIS display controller -Set and check. Ensure EFIS displays match procedure to be flown.

10. Arrival briefing - Complete.

BEFORE LANDING

1. PROP SYN switch - OFF.

2. AUTOFEATHER switch - ARM.

3. Ice vane control switches - As required.

4. PROP levers - As required.

5. Flaps (below 197 KIAS) - APPROACH.

6. Gear (below 179 KIAS) - DN.

7. Landing lights - As required.

8. BRAKE deice - As required.

LANDING

CAUTION

The maximum demonstrated crosswind component is 20 knots at 90° . Landing the aircraft in a crab will impose side loads on the landing gear. Record landing the aircraft in a crab on DA Form 2408-13-1.

When landing is assured:

1. Autopilot and yaw damper - Disengage.

2. GEAR DOWN annunciators - Check.

3. Flaps - Down. After touchdown:

PROCEDURE	TROUBLESHOOTING REFERENCE

LANDING (CONT)

4. POWER levers - Lift and retard to GROUND FINE.

* 5. Brake operation - Check during landing roll for any tendency to bleed down, drag after release, or indicate assymmetrical braking power.

* 6. Propeller reversing - Check as follows: E4

a. During landing utilize maximum reverse power.

b. Check for smoothness of operation and equal thrust from engines.

*c. Turbine tachometers - Maximum reverse N_1 is 86 to 88%. Observe that maximum difference between engines is 2% N_1.

* 7. Oil temperature - Monitor. Ground idle limits are 10 to 105°C.

* 8. Oil pressure - Monitor. Ground idle limits are 60 PSI minimum.

GO-AROUND

1. Power - Maximum allowable.
2. Flaps - As required.
3. Gear- UP.
4. Flaps - UP.
5. Landing lights - OFF.
6. Climb power - Set.
7. BRAKE deice - Off.

PROCEDURE	TROUBLESHOOTING REFERENCE

AFTER LANDING

Complete the following procedures after the aircraft has cleared the runway:

1. CONDITION levers - HIGH IDLE.
2. PROP levers - Retard to FEATHER detent.
3. ICE VANE CONTROL switches - ON.
4. Engine AUTO IGNITION switches -Off.
5. ICE & RAIN switches - Off.
6. Flaps - UP.
7. Radar/transponder - As required.

* 8. Lightning sensor system (LSS) - Test as follows:

   a. Lightning sensor system mode selector switch (weather radar/LSS control panel) - CLR/TST. Display should show a simulated lightning strike at a bearing of 045 degrees at 25 nautical miles.

NOTE

The lightning sensor system antenna is used in this test, and as a result, any real lightning activity that occurs while the test is in operation may also be displayed.

9. Lights - As required.
10. Mission control panel - Set as follows:

    a. ELINT power switch (mission status panel, in rack behind pilot) -OFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

AFTER LANDING (CONT)

b. ELINT battery switch (mission status panel, in rack behind pilot) -OFF.
c. DATA LINK HV switch - OFF.
d. TDOA SYSTEM switch - OFF.
e. RADIO ALT switch - OFF.
f. MISSION CONTROL ORIDE switch - OFF.

ENGINE SHUTDOWN

NOTE

To prevent sustained loads on rudder shock links, park the aircraft with the nose gear centered.

1. PARKING BRAKE - Set.

2. LANDING and TAXI light switches -OFF.

3. INS - OFF.

4. Mission equipment - Set and check as follows:
   a. KG-45 (mission status panel, in rack behind pilot) - ZEROIZE.
   b. BUS CROSS TIE switch - OFF.

5. CABIN AIR MODE SELECT switch -OFF.

6. FWD and AFT VENT BLOWER switches - AUTO.

7. AUTOFEATHER switch - OFF.

8. INVERTER switches (4) - Off.

9. AUTO PLT POWER switch - Off.

PROCEDURE	TROUBLESHOOTING REFERENCE

10. #1 and #2 EFIS power switches - Off.

11. BRAKE deice - Off.

*12. Battery condition - Check.

13. TGT - Check stabilized for 1 minute prior to shutdown.

14. POWER levers - Flight IDLE.

15. PROP levers - FEATHER.

CAUTION

Monitor TGT during shutdown. If sustained combustion is observed, proceed immediately to Abort Start procedure.

16. CONDITION levers - FUEL CUT-OFF.

17. Oxygen system - OFF.

WARNING

Do not turn exterior lights off until propeller rotation has stopped.

18. EXTERIOR LTS switches - Off.

19. IR FLOOD light switches - Off.

20. COCKPIT LIGHTS MASTER switch- Off.

21. AVIONICS MASTER POWER switch- Off.

22. MASTER SWITCH - OFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE SHUTDOWN (CONT)

23. Keylock switch - OFF.

BEFORE LEAVING AIRCRAFT

NOTE

Release brakes after chocks are in place (ramp conditions permitting).

1. Wheels - Chocked.

2. PARKING BRAKE - As required.
3. Flight controls - Locked.

4. STANDBY PUMP switches - Off.

5. COMSEC - Zeroize as required.
6. Windows - As required.

7. Emergency exit lock - As required.
8. Aft cabin lights - OFF.
9. Door light - OFF.

*10. Walk-around inspection - Complete. E11-13
Conduct a thorough walk-around inspection, checking for damage, fluid leaks, and fluid levels. Check that covers, tiedowns, restraints, and chocks are installed as required.

NOTE

A cold oil check is unreliable. Check oil within 10 minutes after stopping engine.

*11. Aircraft forms - Complete. In addition to established requirement for reporting any system defects, unusual and excessive operation such as hard landings, etc., the flight crew will also make entries on DA Form 2408-13-1

PROCEDURE	TROUBLESHOOTING REFERENCE
to indicate when limits in the operator's manual have been exceeded.	
12. Aircraft - Check secured. Lock cabin door as required.	

SECTION III. TROUBLESHOOTING

General. This section contains troubleshooting information that has been referenced in Section II. This section lists possible conditions, abnormal conditions and indications and probable causes. The information is to be used only as a quick reference and may not be all-encompassing.

TROUBLESHOOTING GUIDE A - STARTING

CONDITION
PROBABLE CAUSE

A1. Both starter-generators inoperative.

a. Low battery.

b. Loose connection or open circuit between battery relay and power cabinet.

A2. One starter-generator inoperative.

a. Starter relay inoperative.
b. Poor ground at starter-generator.
c. Open circuit.
d. Defective starter-generator.
e. Defective switch.
f. Defective wiring.
g. Defective generator control unit.
h. Current transformer miswired.

A3. Engine slow to start or does not start.

a. Low battery.
b. High resistance starter circuit.
c. Defective starter-generator.
d. Turbine dragging.
e. Defective generator control unit.
f. Current transformer miswired.

A4. Engine fails to light up.

a. Improper engine starting procedure.
b. Ignition system.

(1) No power to ignition exciter.
(2) Defective wiring or components.

c. Fuel system.

(1) Debris or ice in fuel system.
(2) Air lock in fuel control unit.

d. Engine driven primary high pressure pump failure.

A5. Engine fails or is slow to accelerate to idle. N_1 speed.

a. Improper engine starting procedure.
b. Leaks or restrictions on fuel control unit pneumatic system.
c. Leaks in pneumatic line of propeller governor.
d. Fuel control unit contaminated with water or ice, or corroded.

A6. Hot start or delayed light up.

a. Improper engine starting procedure.
b. Insufficient power from battery or ground power unit.
c. Poor connections on power input lines or starter-generator.
d. Low power to ignition exciter.
e. Defective ignition cable.
f. Defective igniters.
g. Defective ignition exciter.
h. Bleed air leaking or system in aircraft using bleed air is on.
i. Engine control linkage improperly rigged.
j. Fuel nozzle restrictions.

A7. Engine fails to or is slow to accelerate propeller to idle. speed.

a. Propeller oil transfer sleeve binding.

TROUBLESHOOTING GUIDE B - INSTRUMENTS

CONDITION
PROBABLE CAUSE

B1. Airspeed indicator reading remains fixed.

a. Pitot pressure line clogged with ice or debris.
b. Defective indicator.

B2. Vertical speed indicator inaccurate or inoperative.

a. Static line clogged.
b. Leak in line or instrument case or loose fittings.
c. Defective vertical velocity indicator.

B3. Airspeed indicator reads incorrectly or fluctuates excessively.

a. Pitot tube or pressure line partially restricted or leaking.
b. Static port or line clogged or static line leaking.
c. Faulty airspeed indicator.

B4. Magnetic compass inaccurate, sluggish, or erratic.

a. Insufficient liquid.
b. External magnetic interference.
c. Defective compass.
d. Windshield heat on.
e. Air conditioner on.
f. Sun visors not stowed outboard.
g. EFIS power switches on.

B5. Turn-and-slip indicator inoperative or erratic.

a. No pneumatic pressure.
b. Defective turn-and-slip instrument.

B6. Fuel quantity indicator fluctuates or reads low.

a. Defective pins in connector on harness that mates with gage.
b. Compensator immersed in water.
c. Circuit out of calibration.
d. Tank unit(s) out of circuit.
e. Defective pins in connector on fuel probes and wing harness used to connect fuel probes.

B7. Fuel quantity gage pegs down scale against stop.

a. Defective probe.
b. Defective pins on connectors on both gage and probes.
c. Nacelle probe body is making contact with metal braided hose inside of nacelle tank.
d. Defective indicator.
e. No power to fuel quantity indicator system.

B8. Fuel quantity indicator needle pegs up scale against stop.

a. Defective indicator.

B9. Turbine gas temperature indicator inoperative or indicates inaccurately.

a. Defective or out of adjustment balance resistor.
b. Defective turbine gas temperature harness.
c. Defective turbine gas temperature indicator.

TROUBLESHOOTING GUIDE C - ELECTRICAL

CONDITION
PROBABLE CAUSE

C1. Zero or low voltage indicated.

a. Circuit breaker tripped.
b. Loose connection.

c. Open or shorted field circuit in generator or defective armature.

d. Brushes not contacting commutator.

e. Brushes worn out.

f. Dirty commutator.

g. Defective generator control unit.

h. Starter-generator switch on.

C2. No generator output.

a. Improper connections.

b. Circuit breaker tripped.

c. Open or short circuit.

d. Loss of residual magnetism.

e. Generator control switch not ON or RESET.

f. Defective generator control switch.

g. Starter-generator switch on.

h. Generator control unit over-voltage circuit defective.

i. Paralleling circuit open.

j. Defective generator control unit.

k. High resistance field circuit.

l. Shorted field.

m. Generator feeder fault.

C3. Low generator output.

a. Generators not paralleled.

b. Defective generator control unit.

C4. Low voltage.

Malfunctioning generator control unit.

C5. Volt-loadmeter reads off scale in wrong direction.

Generator field magnetized in wrong direction.

C6. Volt-loadmeter does not indicate.

a. Tripped circuit breaker.

b. Open volt-loadmeter lead.

c. Defective volt-loadmeter.

C7. No power indicated with BATTERY MASTER SWITCH ON.

a. Battery discharged or defective.

b. Open circuit between battery and MASTER SWITCH.

c. MASTER switch defective.

d. Defective relay.

e. Keylock switch OFF.

C8. Power on with MASTER SWITCH in OFF position.

a. Master switch defective.

b. Relay contacts stuck.

C9. Apparent loss of battery capacity.

a. Cells unbalanced.

b. Electrolyte level too low.

c. Charging rate too low in aircraft.

d. Too little usage or shallow discharges.

C10. Complete failure of battery to operate.

a. Loose or broken lead.

b. Loose or disengaged terminals in battery.

c. Battery not charged.

d. Cell open internally.

e. Battery feeder fault.

C11. Below normal battery output.

a. BATTERY switch left ON.

b. Generator control unit set too low.

c. Internal connection links loose.

d. External connector burned or pitted.

e. Defective or reversed cells.

f. Cell case current leakage.

C12. External power fails to energize aircraft.

a. Defective or incorrectly polarized external power source.

b. Defective external power receptacle.

c. Defective external power relay.

d. Loose or wrong connection in external power circuit.

e. Defective external power overvoltage monitor.

f. APU voltage too high.

g. APU defective.

h. Defective switch.

i. Circuit breaker tripped.

j. External power feeder fault.

k. Battery feeder fault.

C13. Landing gear will not retract or extend.

a. LANDING GEAR CONTROL circuit breaker (overhead circuit breaker panel) tripped.

b. LANDING GEAR POWER circuit breaker (under floor in cabin) tripped.

c. Landing gear power safety control circuit breaker (under floor in cabin) tripped. floor in cabin) tripped.

e. Landing gear safety power circuit breaker (under floor in cabin) tripped.

f. Faulty power pack motor.

g. Faulty power relay.

h. Faulty remote-controlled circuit breaker (RCCB), (under floor in cabin).

i. Defective landing gear control switch.

j. Defective wiring.

C14. Landing gear fails to retract.

a. Safety switch not closing.

b. Pressure switch not closing.

c. Gear selector valve stuck.

d. Circuit is open between the selector valve and the power relay.

e. Time delay circuit opening prematurely.

f. Hand pump handle improperly stowed.

g. Service valve in up position.

h. Defective landing gear control switch.

i. Defective wiring.

C15. Landing gear fails to extend.

a. Service valve switches faulty.

b. Landing gear selector valve stuck in up position.

c. Control switch not providing power to the extend side of selector valve.

d. Defective limit switch.

e. Defective landing gear control switch.

C16. Landing gear pump motor continues to run after the gear is retracted, causing the circuit breaker to trip.

a. Pressure switch not opening on high pressure.

b. Low accumulator charge.

c. Excessive fluid leakage past the piston seals in the actuators.

d. Defective valve in the power pack.

C17 Landing gear pump motor continues to run after the gear are extended, causing the circuit breaker to trip.

a. Downlock switches are not opening.

b. Power relay points stuck.

c. Defective limit switch.

C18 Landing gear pump motor continues to run when the gear is extended or retracted, causing the circuit breaker to trip.

a. Weak power pack motor.

b. Low voltage to the motor.

c. Low fluid level.

d. Blockage in the hydraulic system.

C19. Landing gear pump motor operating longer than 14 seconds in both the extension and retraction modes. The 2-ampere circuit breaker does not trip. Low voltage.

C20. Landing gear pump motor operating longer than 14 seconds in the retract mode, but the 2-ampere circuit breaker does not trip.

Faulty time delay PCB and pressure switch.

C21. Landing gear pump motor operating longer than 14 seconds in the extended mode, but the 2 ampere circuit breaker does not trip.

Downlock switches failing to open and/or the time delay PCB is faulty.

C22. Landing gear HYD FLUID LOW light not functioning.

a. Defective lamp.
b. Defective fluid indicator circuit.

C23. Landing gear circuit breaker trips.

Shorted circuit.

C24. Landing gear warning horn inoperative when LDG GEAR CONTR switch is in the up position and weight of aircraft is on struts, but operates when a POWER lever is closed and the gear is retracted.

a. Poor ground at landing gear control switch.
b. Defective wiring between LDG GEAR CONTR switch and landing gear safety switch.
c. Defective stall/landing gear warning module.
d. Defective speaker.

C25. Landing gear warning horn inoperative when POWER lever is closed and landing gear is up.

a. Defective or out of adjustment POWER lever switch.
b. Defective wiring between POWER lever switches and pedestal terminal board, and between LDG GEAR CONTR switch and stall/landing gear warning horn module.
c. Defective "Q" switch.

C26. Landing gear warning horn fails to shut off when landing gear is extended.

Defective or out of adjustment down-lock switches.

C27. Landing GEAR DOWN position indicator lights are illuminated with landing gear retracted.

a. Defective or out of adjustment down lock switch.
b. Wrong connection in light test circuit.
c. Ground between light and down lock switch.

C28. Landing GEAR DOWN position indicator light inoperative.

Defective or out of adjustment down lock switch.

C29. Landing gear handle light is illuminated with gear up and locked.

Defective or out of adjustment up-lock switch.

C30. Landing gear handle light inoperative.

a. Defective or out of adjustment up-lock or downlock switch.

b. Defective landing gear control switch.

c. Defective bulbs in handle.

C31. Flaps fail to extend or retract.

a. Tripped circuit breaker.

b. Defective flap motor.

c. Defective flap control switch.

d. Defective mechanical component in actuator system.

e. Defective wiring.

f. Defective split flap switch.

g. Split flap condition.

C32. Flap position indicator inoperative.

a. Tripped circuit breaker.

b. Defective position indicator.

c. Defective position transmitter.

d. Defective wiring.

C33. Pilot tube heater fails to operate.

a. Tripped circuit breaker.

b. Defective heater.

c. Defective wiring.

d. Defective switch.

C34. Stall warning system inoperative.

a. Defective stall warning transducer.

b. Defective stall warning computer.

c. Defective wiring.

d. Defective stall/landing gear warning module.

e. Defective speaker.

C35. Stall warning horn sounds continuously.

a. Defective stall warning transducer.

b. Defective stall warning test system.

c. Defective wiring.

d. Defective stall warning computer.

C36. Both inverters inoperative.

Defective wiring in inverter system.

C37. One inverter inoperative.

a. Tripped inverter circuit breaker (on DC power distribution panel beneath floor).

b. Loose or corroded ground connection.

c. Defective wiring to inverter.

d. Defective inverter switch.

C38. BATTERY CHARGE annunciator light inoperative.

a. Defective light bulb.

b. Connections on battery shunt loose or corroded.

c. Defective battery charge monitor module.

C39. One portion of interior lighting or lighting control system inoperative.

a. Defective light circuit board.

b. Defective light bulbs.

c. Defective components in overhead control panel.

d. Defective power supply.

C40. Fuel crossfeed valve inoperative or FUEL PRESS annunciator light remains illuminated.

a. Defective standby fuel pump.

b. Defective crossfeed valve.

C41. Standby fuel pump inoperative.

a. Defective standby pump.

b. Defective switch in fuel management panel.

C42. Pneumatic surface or antenna deice system inoperative.

a. Defective surface deice time delay module.

b. Defective deice distributor valve.

c. Defective plumbing.

d. Defective boot.

C43. Right and left FIRE PULL warning lights do not illuminate in test position of fire protection test switch.

a. Tripped fire detector circuit breaker.

b. Defective fire protection test switch.

c. Defective wiring.

C44. Engine fire detection system wholly or partially inoperative.

a. Defective sensing tube.

b. Defective fire detector.

c. Defective ENG FIRE TEST switch.

C45. FIRE DETR circuit breaker trips.

Short circuit in wiring or components.

C46. Left FIRE PULL warning light illuminates in test position but right FIRE PULL warning light does not.

a. Defective right fire detector.

b. Defective wiring between fire warning power circuit breaker and right fire detector.

C47. Right FIRE PULL warning light illuminates in test position but left FIRE PULL warning light does not.

a. Defective left fire detector.

b. Defective wiring between fire warning power circuit breaker and left fire detector.

C48. Ventilation blower will not run.

a. Tripped vent blower circuit breaker.

b. Defective motor brushes.

c. Defective wiring.

d. Defective motor.

e. Defective switch.

C49. Ventilation blower draws excessive current.

a. Misaligned or preloaded bearings.

b. Defective bearings.

C50. Ventilation blower runs at reduced speed.

Brushes not seated properly.

C51. Ventilation blower draws excessive current and runs at high speed.

Shorted turns in field windings.

C52. Ventilation blower draws excessive current and speed surges.

Shorted turns in armature.

C53. Ventilation blower has excessive vibration.

a. Armature out of balance.

b. Fan damaged.

c. Fan out of balance.

d. Defective bearings.

C54. Propeller deice inoperative.

a. Circuit breaker tripped.

b. Propeller deice switch defective.

c. Ammeter defective.

d. Defective propeller deice timer.

C55. Stall warning deice inoperative.

a. STALL WARN circuit breaker tripped.

b. STALL WARN circuit breaker defective.

c. STALL WARN deice switch defective.

d. Defective stall warning deice heating element.

C56. Left or right fuel vent deice inoperative.

a. FUEL VENT HEAT circuit breaker tripped.

b. FUEL VENT HEAT circuit breaker defective.

c. FUEL VENT deice switch defective.

d. Defective fuel vent deice heating element.

TROUBLESHOOTING GUIDE D CAUTION PANEL

CONDITION

PROBABLE CAUSE

D1. Place card light (annunciator panel) will not illuminate when press-to-test button is pressed.

a. Defective placard light.

b. Defective lamps.

c. Defective fault detection module.

D2. MASTER WARNING or MASTER CAUTION annunciator light will not illuminate for any red or yellow faults.

a. Defective fault warning light.

b. Defective fault detection module.

c. Defective annunciator control module.

D3. Depressing the press-to-test switch has no effect on fault warning system operation.

a. Defective switch.

b. Defective circuit breaker.

c. Defective wiring.

D4. Dim control does not function properly.

a. Defective rheostat switch.

b. Defective annunciator control module.

TROUBLESHOOTING GUIDE E - POWER PLANT

CONDITION

PROBABLE CAUSE

E1. LOW IDLE speed is either high or low.

LOW IDLE speed improperly adjusted.

E2. HIGH IDLE speed is either high or low.

HIGH IDLE speed improperly adjusted.

E3. Low or high torque is observed during torque check.

Barrel adjustable stop is improperly adjusted.

E4. Reverse torque, N1, and propeller RPM is too high or low.

Reverse adjusting screw is improperly adjusted.

E5. Newly rigged engine accelerates faster or slower than opposite engine.

Engine rigging, components, or engine is mismatched.

E6. POWER levers are not aligned.

Fuel control rod improperly adjusted.

E7. High engine oil pressure.

a. Defective oil pressure indicating system.

b. Defective pressure relief valve.

E8. Low engine oil pressure.

a. Insufficient oil.

b. Defective oil pressure indicating system.

c. Dirty oil filter

d. Leak in oil lines or oil cooler.

e. Defective pressure relief valve.

E9. Fluctuating engine oil pressure.

a. Insufficient or excess oil.

b. Defective oil pressure indicating system

c. Dirty oil filter.

d. Defective pressure relief valve.

E10. High oil temperature.

a. Insufficient oil supply.

b. Defective oil temperature indicating system.

c. Excessive idling in feather.

d. Restriction in oil cooler.

e. Cooling air flow blocked.

E11. Oil leak from compressor inlet.

a. Defective preformed packing and plastic ring on oil filter housing.

b. Defective preformed packings on accessory gearbox.

E12. Excessive oil discharge from overboard breather.

a. Excess oil in tank.

b. Defective preformed packing and plastic ring on oil filter.

c. Excessive back pressure in scavenge system due to restrictions in oil scavenge tubes, pump screen or oil-to-fuel heater tubes.

E13. Excessive engine oil consumption.

a. Excess oil in tank.

b. Leak or restriction in pressure scavenge oil tubes.

c. Defective preformed packing and plastic ring on oil filter housing.

d. Leakage in oil to fuel heat exchanger.

e. Defective centrifugal breather carbon seal.

f. Defective air seals.

E14. Failure of engine to decelerate.

a. Fuel control unit defective.

b. Disconnected or improperly adjusted linkage.

E15. Gas generator overspeed.

a. Defective turbine tachometer system.

b. Sheared or worn fuel control unit splined coupling or drive spline.

c. Defective fuel control unit.

E16. Gas generator uncontrolled acceleration.

a. Sheared or worn fuel control unit splined coupling or drive spline.

b. Defective fuel control unit.

E17. Surge during acceleration.

a. Defective compressor bleed valve.

b. Defective fuel control unit.

c. Compressor damaged.

E18. Slow to accelerate.

a. Possible leak or restriction in P_y air bleed tube or P3 air delivery tube.

b. P3 air filter needs replacing.

c. Improper acceleration adjustment on fuel control unit.

d. Propeller governor out of adjustment.

e. Defective fuel control unit.

f. Defective propeller governor.

E19. Flame out.

a. Fuel supply contaminated with ice, water, or debris.

b. Engine driven high pressure fuel pump defective.

c. Fuel control unit contaminated or corroded.

d. Manifold adapter or fuel nozzles restricted.

E20. Low power output.

a. Defective indicating system.

b. Operating procedures incorrect.

c. Control linkages incorrectly adjusted or disconnected.

d. Propeller governor defective.

e. Leaks or restrictions in fuel control unit pneumatic system.

f. Fuel nozzles restricted.

E21. High fuel flow at altitude.

a. Defective indicating system.

b. Defective compressor bleed valve.

E22. Maximum operating TGT has been exceeded.

a. Faulty instrumentation, thermocouples, or wiring.

b. Excessive accessory power being pulled due to failure or overload.

c. Torquemeter system reading low.

E23. TGT limited (turbine temperature is at maximum limit before target torque is reached).

a. Defective instruments, thermocouple, or wiring.

b. Improper operating procedure.

c. Dirty compressor.

d. Excessive accessory power being pulled due to failure or overload.

e. Defective compressor bleed valve.

f. Damaged compressor.

g. Air leaks in engine flanges or fittings.

h. Hot section distress.

i. Torquemeter system reading low.

E24. Fluctuating torque indication.

a. Faulty instrumentation system.

b. Defective power turbine governor.

c. Engine driven high pressure pump shaft seal leakage.

d. Defective or out of adjustment propeller overspeed governor.

e. Defective propeller primary governor.

f. Sticking beta mechanism.

E25. Fluctuating fuel flow.

a. Faulty instrumentation system.

b. Defective power turbine governor.

c. Engine driven high-pressure fuel pump shaft seal leaking.

d. Defective propeller overspeed governor.

e. Sticking beta mechanism.

E26. Fluctuating TGT.

a. Faulty instrumentation system.

b. Defective power turbine governor.

c. Defective engine driven high pressure fuel pump shaft seal

d. Defective or out of adjustment propeller overspeed governor.

e. Defective propeller primary governor.

f. Sticking beta mechanism.

E27. Fluctuating gas generator speed.

a. Faulty instrumentation system.

b. Defective power turbine governor.

c. Defective engine driven primary high pressure fuel pump shaft seal

d. Defective or out of adjustment propeller overspeed governor.

e. Defective propeller primary governor.

f. Sticking beta mechanism.

E28. Fluctuating torque and propeller RPM.

a. Defective or out of adjustment propeller overspeed governor.

b. Defective propeller primary governor.

c. Sticking beta mechanism.

E29. Fuel leaking overboard.

a. Fuel cap not seated and anti-siphon valve defective.

b. Filler cap or preformed packing defective and anti-siphon valve defective.

c. Fuel transfer module defective.

d. Fuel level transmitter defective.

TROUBLESHOOTING GUIDE F PROPELLERS

CONDITION

PROBABLE CAUSE

F1. Propeller governor system partially or completely inoperative.

Defective propeller governor test switch.

F2. Propeller governor test system inoperative.

a. Tripped propeller governor test circuit breaker.

b. Defective wiring.

c. Defective switch.

d. Defective propeller governor reset solenoid.

F3. Propeller governor test system inoperative on one engine.

a. Defective PROP GOVERNOR test switch.

b. Defective propeller governor reset solenoid.

F4. Propeller autofeather system inoperative (propeller AUTOFEATHER switch in ARM or TEST position).

a. Tripped circuit breaker.

b. Defective arming light out relay or feathering relay.

c. Defective arc suppression diode on relays or feather dump valve.

d. Defective ground blocking diode.

F5. AUTOFEATHER circuit breaker trips (AUTO-FEATHER switch in ARM or TEST position).

a. Defective ARM-TEST switch.

b. Defective wiring.

F6. One AUTOFEATHER arm light illuminates when power setting is less than 90 percent N, (AUTOFEATHER switch in ARM position).

Defective or out of adjustment power lever switch.

F7. Neither AUTOFEATHER arm light illuminates when POWER levers are advanced (AUTOFEATHER switch in ARM position).

Defective AUTOFEATHER switch (overhead control panel).

F8. One arm light does not illuminate when POWER levers are advanced (AUTOFEATHER switch in ARM position).

a. Defective or out of adjustment power lever switch.

b. Defective No. 1 (4.7 PSI) torque pressure switch.

F9. Both arm lights remain illuminated when one POWER lever is retarded (AUTOFEATHER switch in ARM position).

Defective or out of adjustment power lever switch.

F10. Propeller does not start to feather after engine torque falls below 7% (AUTOFEATHER switch in ARM position).

a. Defective No. 2 (3.1 PSI) torque pressure switch on retarded engine.

b. Defective autofeather dump valve.

F11. One arm light does not illuminate when POWER levers are advanced to 90 percent N1, (AU- TOFEATHER ARM TEST switch in TEST position).

Defective No. 1 (4.7 PSI) torque pressure switch.

F12. Both arm lights extinguish when one POWER lever is retarded (engine torque 7 to 12% on retarded engine, AUTOFEATHER ARM-TEST switch in TEST position).

Defective No. 2 (3.1 PSI) torque pressure switch on retarded engine.

F13. One arm light remains illuminated after torque of one engine falls below 7% on retarded engine,

AUTOFEATHER ARM-TEST switch in TEST position).

a. Defective No. 2 (3.1 PSI) torque pressure switch on retarded engine.

b. Defective autofeather dump valve.

F14. Propeller slow to feather.

a. Preformed packing leak at transfer tube or transfer housing.

b. Defective propeller governor.

F15. Propeller slow to unfeather.

Defective propeller governor.

TROUBLESHOOTING GUIDE G HYDRAULIC

CONDITION

PROBABLE CAUSE

G1. Solid pedal, no brakes.

Brake linings worn beyond allowable limits.

G2. Spongy brakes.

a. Air in brake hydraulic system.

b. Low hydraulic fluid.

G3. Unable to hold brake pressure.

a. Leak in brake hydraulic system.

b. Brake cylinder seal leaking.

c. Master cylinder seal leaking.

G4. Brake pedals bottom, no brakes.

a. Broken or leaking hydraulic lines.

b. Brake cylinder seal failure.

c. Master cylinder seal leaking.

G5. Parking brake will not hold.

a. Air in brake hydraulic system.

b. Defective parking brake valve.

c. PARKING BRAKE control out of adjustment.

G6. Brakes grab.

a. Stones or foreign matter locking brake disc.

b. Warped or bent disc.

G7. Brakes drag.

Packing nut or threaded bushing too loose.

G8. Brakes weak.

Packing nut or threaded bushing, as applicable, too tight.

TROUBLESHOOTING GUIDE H FLIGHT

CONTROLS CONDITION
PROBABLE CAUSE

For complete troubleshooting of autopilot system, refer to Honeywell maintenance manual P/N A15-1146-059.

TROUBLESHOOTING GUIDE I NOT APPLICABLE

CONDITION
PROBABLE CAUSE

TROUBLESHOOTING GUIDE 1 VIBRATIONS

CONDITION

PROBABLE CAUSE

J1. Engine vibration.

a. Propeller damaged or blade angle slipped.

b. Loose engine mounting bracket bolts.

c. Compressor damaged.

d. Turbine damaged.

TROUBLESHOOTING GUIDE K - COMMUNICATION/NAVIGATION EQUIPMENT

CONDITION
PROBABLE CAUSE

K1. Interphone system: No audio signals heard in headset.

a. No power to audio system.

b. Defective microphone.

c. Defective control wheel microphone switch.

d. Defective foot microphone switch.

e. Defective headset-microphone cord or jack.

f. Defective microphone jack.

g. Defective audio control panel.

h. Headset-oxygen mask switch set in wrong position.

K2. Interphone system: Audio signals can be heard at other headset stations when transmitter selector switches at audio control panels are at different positions and receiver monitor switches are pulled out.

a. Defective audio control panel.

b. Defective wiring.

K3. UHF VOL control has no effect on receiver noise or incoming signal.

a. Defective UHF control panel.

K4. UHF channeling tone not heard.

Defective UHF command set.

K5. UHF squelch switch has no effect on receiver noise.

a. Defective UHF command set.

b. Defective static wicks.

K6. UHF guard receiver noise not audible.

Defective UHF command set.

K7. Cannot establish UHF two-way communications.

a. Defective audio distribution channels.

b. Defective antenna or antenna cabling.

c. Defective UHF command set.

K8. Cannot establish VHF two-way communications.

a. Defective audio distribution channels.

b. Defective antenna or cabling.

c. Defective VHF command set.

K9. VHF volume control does not affect received audio level.

a. Defective VHF control panel.

b. Defective antenna or antenna cabling.

K10. HF transmitted or received signal or sidetone not clear.

a. Defective HF receiver-transmitter.

b. Defective antenna cabling.

c. Defective HF control panel.

d. Defective audio control panel.

K11. No VOR audio tone heard in headset.

a. Defective VOR receiver.

b. Defective VOR control panel.

c. Defective audio control panel.

K12. VOR receiver inoperative.

a. No power to equipment.

b. Defective VOR control panel.

c. Defective VOR receiver.

K13. Marker beacon signals not heard in headset.

a. Defective audio control panel.

b. Defective marker beacon volume control or sensitivity switch on pedestal extension.

c. Defective VOR receiver.

K14. ADF radio set inoperative.

No power to ADF radio set.

K15. No ADF audio heard in headsets.

a. No power to equipment.

b. Defective ADF receiver.

c. Defective ADF control panel.

d. Defective ADF antenna.

K16. Quality of ADF reception is poor.

a. Defective ADF control panel.

b. Defective audio control panel.

c. Defective ADF receiver.

d. Defective antenna.

K17. Radar inoperative.

a. System circuit breaker tripped.

b. Defective radar receiver-transmitter.

c. Defective wiring.

K18. Radar antenna does not scan.

a. No power to radar antenna.

b. Defective radar antenna.

K19. No radar display on EHSI.

a. Defective radar receiver-transmitter.

b. Defective wiring.

K20. No radar targets on EHSI or targets do not move with TILT control.

a. Defective radar receiver-transmitter.

b. Radar TILT control inoperative.

K21. Transponder cannot be interrogated or provides unsatisfactory response.

a. Mode C not set or defective.

b. Air data computer defective.

c. Defective transponder.

d. Defective antenna.

e. Defective coax.

f. Defective wiring.

SECTION IV. SPECIAL PROCEDURES

General. This section contains the special procedures that were referenced in Section II.

* A. PRESSURIZATION

1. Before takeoff:
   a. CABIN CONTROLLER - Set for a 5000 foot cabin altitude.
   b. CABIN CONTROLLER RATE knob - Set to the 1 to 3 o'clock position.
   c. ENVIRO & PNEU BLEED AIR valve switches (2) - ON.
   d. CABIN PRESS DUMP switch - OFF.
2. After takeoff - Initiate a climb to 10,000 to 12,000 feet pressure altitude.
3. Cabin rate-of-climb indicator - Monitor for a smooth transition from an unpressurized to a pressurized cabin.
4. CABIN CONTROLLER RATE knob - Set to minimum. Monitor the cabin rate of climb for a rate of less than 200 feet per minute.
5. CABIN CONTROLLER RATE knob - Set 1 to 3 o'clock position. Monitor the cabin rate of climb for a rate of 350 to 650 feet per minute.
6. CABIN CONTROLLER RATE knob - Set to maximum. Monitor the cabin rate of climb for a rate of 1500 to 2500 feet per minute.
7. Cabin altimeter - Check that the cabin altimeter needle stabilizes at 4600 to 5400 feet while the cabin differential pressure needle continues to increase.
8. CABIN CONTROLLER - Set to 10,000 feet.
9. CABIN PRESS DUMP switch - DUMP, when cabin altitude approaches aircraft altitude.

10. Continue climbing and ensure that the ALT WARN annunciator light illuminates between 12,000 and 12,500 feet

11. CABIN PRESS DUMP switch - OFF.

12. CABIN CONTROLLER - Set to 0 feet.

13. Continue climbing to between 15,000 and 16,000 feet. As the altitude cabin descends to 0 feet, ensure that the ALT WARN annunciator extinguishes prior to 9,000 feet cabin altitude.

14. CABIN CONTROLLER RATE knob - Set to minimum. Monitor the cabin rate of climb for a rate of less than 200 feet per minute.

15. CABIN CONTROLLER RATE knob - Set 1 to 3 o'clock position. Monitor the cabin rate of climb for a rate of 350 to 650 feet per minute.

16. CABIN CONTROLLER RATE knob - Set to maximum. Monitor the cabin rate of climb for a rate of 1500 to 2500 feet per minute.

17. Cabin altimeter - Check that the cabin altimeter needle stabilizes and remains at -250 to +250 feet until the maximum differential pressure of 6.5 +.I PSI is reached. At this point (approximately 15,300 feet pressure altitude), verify that cabin altitude increases and differential pressure remains constant.

18. With the cabin at maximum differential pressure, place both ENVIRO & PNEU BLEED AIR switches to PNEU ONLY. As the cabin differential pressure decreases from 6.1 to 5.7 PSI, the cabin rate of climb shall not exceed 2200 feet per minute.

19. ENVIRO & PNEU BLEED AIR switches - ON and re-establish maximum differential pressure.

20. Left ENVIRO & PNEU BLEED AIR switch - PNEU ONLY.

21. Slowly retard the right POWER lever to flight idle and determine the minimum N. required to maintain cabin pressure. Verify that cabin pressurization is maintained down to flight idle NI.

22. Left ENVIRO & PNEU BLEED AIR switch - ON.

23. Right ENVIRO & PNEU BLEED AIR switch - PNEU ONLY.
24. Slowly retard the left POWER lever to flight idle and determine the minimum N. required to maintain cabin pressure. Verify that cabin pressurization is maintained down to flight idle N1.
25. Right ENVIRO & PNEU BLEED AIR switch - ON.
26. Cabin pressurization controller - Set to 500 feet above field elevation.

*** B. TRIM AND RIGGING**

Check as follows:

In smooth air, at cruise power, the aircraft will fly hands off, straight and level with the ailerons symmetrically aligned at the trailing edge and the aileron adjustable tab set to zero.

*** C. MAXIMUM TGT/N1 AVAILABILITY**

Ensure that sufficient POWER lever travel is available at 16,000 feet to produce a TGT of 840°C or an N. of 104%. Check the maximum POWER lever position as follows:

NOTE

The only requirement of the maximum POWER lever position check is to verify that it is possible to obtain maximum allowable gas generator RPM (No) with the POWER levers in the full forward position. If during the test the TGT temperature limit or N_1 limit is obtained prior to reaching maximum N_1, the check is completed.

1. Altitude - 16,000 feet pressure altitude.
2. PROP levers - Set 1700 RPM.
3. Ice vanes - Retracted.
4. ENVIRO & PNEU BLEED AIR valve switches (2) - ON.
5. Airspeed - As required.

6. POWER levers Full forward (do not exceed TGT and/or No. Maximum N. is 104%. Maximum TGT is 840° C.

*** D. SPEED PERFORMANCE AT MAXIMUM CRUISE POWER**

NOTE

A new or rebuilt engine operated at the torque value presented in the Maximum Cruise Speed and Power chart (figure 4) will show a TGT margin below the maximum cruise limit for the torque value presented in the table. With ice vanes retracted, cruise torque settings shown on the Maxi- mum Cruise Speed and Power chart (figure 4) shall be obtained without exceeding TGT limits.

Speed-power runs shall be made in smooth air to determine consistency with performance figures. Determine torque settings, fuel flow, and airspeed to be achieved by referencing Maximum Cruise Speed and Power Chart (figure 4).

1. Record the following:
   *a. Engine serial number.
   *b. Engine hours since new.
   *c. Engine hours since overhaul.
2. Altitude 25,000 feet pressure altitude.
3. Propeller RPM 1700 RPM.
4. Ice vanes Retracted.
5. FAT Determine and record.
6. Power setting Read torque for the recorded FAT from figure 4.
7. Set torque on left and right engines to the torque from figure 4.
8. Verify that pilot's and copilot's airspeed indicators agree within 4 KIAS, and that neither indicator reads more than 3 KIAS less than the chart value.
9. Allow conditions to stabilize for one minute, then record the following for each engine being tested.

*a. Pressure altitude.

*b. Propeller RPM.

*c. FAT.

*d. Torque.

*e. Fuel flow.

*f. KIAS.

*g. TGT.

*h. N1.

10. Indicated fuel flow must be within +21 and -25 lb/hr of chart value for Jet-A fuel.

11. If observed TGT exceeds chart value, conduct the Engine Performance at Maximum Cruise Power check.

12. Repeat steps 2 through 11 for opposite engine if required.

*** E. ENGINE PERFORMANCE AT MAXIMUM CONTINUOUS POWER**

1. Record the following:

*a. Engine serial number.

*b. Engine hours since new.

*c. Engine hours since overhaul.

2. Altitude - Establish level flight at 16,000 feet pressure altitude.

3. PROP levers - Set 1700 RPM.

4. Adjust the opposite engine to maintain 160 KIAS.

5. Ice vanes - Retracted.

*6. FAT - Determine and record.

7. Power setting - Read torque for the recorded FAT from figure 5.

8. Set torque on engine being tested to the torque from figure 5.

9 Adjust opposite engine to maintain 160 KIAS.

10 Allow conditions to stabilize for one minute, then record the following for each engine or being tested.

*a. Pressure altitude.

*b. Propeller RPM.

*c. FAT.

*d. Torque.

*e. Fuel flow.

*f. KIAS.

*g. TGT.

*h. N_1.

11. If observed TGT exceeds chart value, conduct the Maximum Cruise Power check.

12. Repeat steps 3 through 11 for the other engine if required.

*** F. ENGINE PERFORMANCE AT MAXIMUM CRUISE POWER**

NOTE

The Engine Performance at Maximum Cruise Power Check needs to be performed only if the TGT observed during the Speed Performance at Maximum Cruise Power check exceeds chart value.

1. Record the following:

*a. Engine serial number.

*b. Engine hours since new.

*c. Engine hours since overhaul.

2. Altitude - Establish level flight at 25,000 feet pressure altitude.

3. PROP levers - Set 1500 RPM.

4. Adjust the opposite engine to maintain 160 KIAS.

* 5. FAT - Determine and record.

6. Power setting - Read torque for the recorded FAT from figure 6.
7. Set torque on engine being tested to the torque from figure 6.
8. Adjust opposite engine to maintain 160 KIAS.
9. Allow conditions to stabilize for one minute, then record the following for engine being tested.
   *a. Pressure altitude.
   *b. Propeller RPM.
   *c. FAT.
   *d. Torque.
   *e. Fuel flow.
   *f. KIAS.
   *g. TGT.
   *h. N_1.
10. Observed TGT should not exceed chart value.
11. Repeat steps 3 through 10 for the other engine if required.

G. AVIONICS FLIGHT CHECKS

PROCEDURE	TROUBLESHOOTING REFERENCE
* 1. Autopilot - Check as follows:	
Observe that all channels operate positively and smoothly with no oscillation of any flight control.	
a. Trim aircraft for straight and level flight.	
b. AUTO PLT POWER switch - ON.	
c. TURN control - Place in center (detent) position.	
d. AP ENGAGE switch - Press to engage.	

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

e. Check autopilot heading preselection as follows:

(1) Autopilot HEADING selector knob (on pedestal extension) - Set test heading.

(2) HDG switch-indicator (flight director mode selector) - Press on.

(3) Aircraft should automatically turn and roll out on preselected heading.

f. Check altitude control and selection as follows:

(1) Pitch thumbwheel (autopilot controller) - Move UP and DN while observing that aircraft and pitch trim indicator respond properly.

g. Check autopilot VOR/ILS operation as follows:

(1) VOR receiver Set.

(2) V/L pushbutton selector switch (display controller) - Depress to select VOR.

(3) NAV switch-indicator (flight director mode selector) - Depress on.

(4) When the aircraft is within 10 degrees of the selected radial, observe that the aircraft begins a gradual interception of the radial or glideslope signal.

h. Check autopilot altitude hold function as follows:

PROCEDURE	TROUBLESHOOTING REFERENCE

(1) Fly aircraft to test altitude.

(2) ALT switch-indicator (flight director mode selector) - Press on.

(3) Verify that the aircraft maintains the altitude being flown at the time the ALT hold switch was pressed.

i. Check autopilot indicated airspeed hold function as follows:

(1) Fly aircraft to test airspeed.

(2) IAS switch-indicator (flight director mode selector) - Press on.

(3) Aircraft should maintain airspeed that was being flown at the time IAS hold switch was pressed.

j. Check roll command function of autopilot as follows:

(1) TURN control knob (autopilot controller) - Turn to L and R and verify that autopilot turns aircraft left or right respectively.

* 2. Slaved compass systems - Check that systems agree with known magnetic headings within ±2° and within 3° of each other.

* 3. Inertial Navigation System Flight Test - Perform as follows:

Demonstrate satisfactory performance by flying over three known checkpoints, and comparing the inertial present position readouts with the coordinates of the checkpoints. Establish a

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

low altitude, compatible with aircraft safety and applicable laws and codes of flight, which will allow accurate sighting of ground landmarks. Fly the aircraft at an altitude of 1000 feet over waypoints and 10,000 feet or more when between waypoints whenever possible. Use TACAN updating for the first half of the flight and GPS updating for the second half. Check the displays in flight by performing the following procedures.

a. Inertial navigation system - Set up, align, and operate in accordance with TM 1-1510-223-10.

b. B mode selection switch - Depress to select FPLN mode.

c. R5 line selection switch - Depress to select NAV SETUP page.

d. R3 line selection switch - Depress to select TACAN LIST page.

e. Station list numbers to be used in AUTO MIXING mode - Enter into scratchpad using keyboard unit (KU).

f. R4 line selection switch - Depress to select scratchpadded stations for AUTO MIXING mode.

g. R5 line selection switch - Depress to select NAV SETUP page.

h. R5 line selection switch - Depress to select INS SETUP page.

i. R3 line selection switch - Depress to change AUTO MIXING mode to TACAN.

'PROCEDURE	TROUBLESHOOTING REFERENCE
j. INS UPDATE annunciator light (mission control panel) - monitor. Illumination indicates satisfactory TACAN updating of the INS.	
k. R5 line selection switch - Depress to select INS SETUP page.	
l. R3 line selection switch - Depress to change AUTO MIXING mode to GPS.	
m. INS UPDATE annunciator light (mission control panel) - monitor. Illumination indicates satisfactory GPS updating of the INS.	
n. INS/TACAN pushbutton selector switch (display controller) - Depress to select INS.	
o. NAV mode switch-indicator (flight director mode selector) - Depress to select NAV mode.	
p. Autopilot ENGAGE switch indicator - Depress to engage autopilot. Observe EFIS displays LNAV information and autopilot follows LNAV heading signals.	
q. After landing, taxi aircraft to a location whose geographical coordinates are known, and compare INS position indication to actual coordinates. Verify that INS position indication is within 1250 feet of known location.	
* 4. Audio control panel and interphone system Check each unit as follows:	K1-2
a. Interphone functional check:	
(1) RADIO MON switches OFF.	

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

(2) ICS switch - NORM.

(3) Transmitter selector switches on pilot's and copilot's audio control panel - ICS. This will allow the pilot to talk to the copilot by pressing a micro- phone switch and speaking into microphone or visa-versa from copilot's position.

(4) Microphone switches - Actuate one at a time and speak into appropriate microphone. Side tone should be heard and speech should be heard in other headset.

(5) ICS switch - HOT MIC. Verify that crew is able to converse on intercom without depressing microphone switches.

(6) VOL control - Check for function.

b. Receiver and transmitter facilities

-Check as follows:

(1) RADIO MON volume controls -Turn all fully counter- clockwise.

(2) RADIO MON switches (audio control panel)- Push on one at a time and turn clockwise to increase volume and increase volume on appropriate receiver, listening for either radio reception or background noise.

PROCEDURE	TROUBLESHOOTING REFERENCE
(a) Cycle PROP deice switch from OFF to AUTO and return to OFF.	
(b) Cycle electric standby fuel pumps.	
(3) Pull each RADIO MON switch (on audio control panel) out to the off position and each receiver volume control fully counterclockwise.	
(4) Transmitter selector switches (pilot's and copilot's audio control panels) - INTPH.	
(5) Audio control panel VOL control (pilot's) - Turn fully clockwise. Listen for excessive noise.	
(6) Repeat for other audio control panel.	
c. Receiver/transmitter selectors - Check as follows:	
(1) Transmit and receive on each radio using all microphone switches one at a time.	
(2) Repeat entire procedure for each audio control panel.	
* 5. UHF radio set - Check as follows:	K3-7
a. Altitude - 1200 feet above ground level (AGL).	
b. Transmitter selector switch - #3 or #5.	
c. Function selector switch (UHF command set) - BOTH.	

PROCEDURE	TROUBLESHOOTING REFERENCE
G. AVIONICS FLIGHT CHECKS (CONT)	
d. Frequency selector switches Select required test frequencies.	
e. Mode selector - As required.	
f. Volume control - As required.	
g. Squelch switch - As required.	
h. Fly aircraft to a point 35 nautical miles away from test station.	
i. Communicate with test station when 20 miles away and again at 35 miles.	
j. At 35 nautical miles maintain communication with test station each 10° while flying a 360° flat turn (not to exceed 5° bank). Verify that communication is uniformly loud and clear through these tests.	
k. Repeat procedure for frequencies in low, middle, and high ranges.	
* 6. VHF radio set Check as follows	K8-9
a. Altitude - 1000 feet AGL.	
b. Transmitter selector switch (audio control panel) - #1 or #2.	
c. Off-volume control - Turn clock- wise, set volume as required.	
d. Frequency selector - Set desired frequency.	
e. Fly aircraft to a point 40 nautical miles away from test station.	
f. At 40 nautical miles, maintain communication with test station each 10° while flying a 360° flat turn (not to exceed 5° bank). Verify that	

PROCEDURE	TROUBLESHOOTING REFERENCE
communication is uniformly loud and clear through these tests.	
g. Repeat procedure for frequencies in low, middle, and high ranges.	
* 7. HF radio set Check as follows.	K10
a. Transmitter selector switch (audio control panel) #4.	
b. Mode selector (HF control panel) - Set desired operating mode.	
c. Microphone switch Press momentarily and wait for antenna coupler to tune. A 1000 Hz tone will be heard in the headphones until tuning is complete. Verify that tuning time does not exceed 30 seconds.	
d. Establish communications with a ground station at least 150 miles distant on at least three frequencies (one each from the lower, middle, and upper frequency ranges). Establish two-way communications on AM and, when possible, on USB. Obtain signal quality reports from the other station and note received signal quality.	
NOTE The intelligibility of SSB voice operations becomes degraded when the receiver and transmitter differ in frequency by a small amount (approximately 50 Hz). The voice pitch will sound either too high or too low. The cause may be either the receiver or transmitter.	
e. Frequency accuracy Check as follows:	

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

(1) Station WWV - Select the frequency that provides the best signal. The station broadcasts on 2.5000, 5.0000, 10.000, 15.0000, and 20.0000 MHz. The higher the frequency selected, the more accurate the frequency check will be.

NOTE

Do not key transmitter when set to WWV.

(2) Mode selector - USB.

(3) Listen to the time tick, tone, or voice announcements. The tone is preferable.

* 8. ADF radio set Check as follows: K13-16

a. Power and mode switch - ADF.

b. Tuning knobs - Set test frequency. Tune the ADF receiver to at least three frequencies as nearly equally spaced as possible throughout the frequency range of 200 to 1750 KHz.

c. Single or double bearing pointer source selector switch (display controller) - ADF. Both single and double needle pointers on both the pilot's and copilot's EHSI should be functionally checked.

d. Verify accuracy of ADF indications on pilot's and copilot's EFIS displays over a known ground reference point approximately every 90° throughout 360°.

* 9. Navigation receivers (VOR/localizer/ K11-12,

glideslope/marker beacon) - Check as follows:

a. VOR receivers - Check each VOR receiver as follows:

(1) NAV A control (audio control panel) - Depress on and rotate clockwise to set volume.

(2) Power and mode switch (VHF navigation receiver control unit) - ON.

(3) Volume control (VHF navigation receiver control unit) - As required.

(4) Tuning knobs - Set test frequency.

(5) VOR/localizer pushbutton selector switch (display controller) - Depress to select VOR1 or VOR2 navigation source annunciator on respective HSI.

(6) Check the operational status and accuracy of the VOR receivers by one of the following methods:

(a) A VOT (VOR test facility). Maximum permissible bearing error is ±4°.

(b) A radiated test signal from an appropriately rated repair station. Maximum permissible bearing error is ±4°.

(c) A certified airborne check point. Maximum permissible bearing error is ±6°.

PROCEDURE **TROUBLESHOOTING REFERENCE**

G. AVIONICS FLIGHT CHECKS (CONT)

(d) Certified check points on an airport surface. Maximum permissible error is +4°.

(e) Comparison of indications of dual aircraft VOR systems. The maximum permissible variation between the two indicated bearings is 4°.

b. Localizer/glideslope/marker beacon - Check as follows:

(1) Marker beacon volume control (pedestal extension) - Rotate full clockwise.

(2) NAV A control (pilot's audio control panel) - Push on and turn clockwise to adjust volume. Verify that clear audio signals are available.

(3) Tuning knobs (VOR control panel) - Select localizer frequency.

(4) VOR/localizer pushbutton selector switch (display controller) - Depress to select ILS 1 or ILS2 navigation source annunciator on respective HSI.

(5) Glideslope indicator (EADI and EHSI) - Read glideslope indications.

(6) Fly an ILS approach monitoring localizer and glideslope indications and marker beacon indicator lights and audio tone for proper function.

(7) Each localizer and glideslope receiver shall provide positive indications with no glideslope or localizer display oscillations occurring from the outer marker to the approach end of the runway.

(8) Verify that marker beacon can be received for a distance of not less than one mile, when in horizontal flight over the ground station cone of silence marker at 10,000 feet above ground level.

(9) Check marker beacon sensitivity switch function as follows:

(a) Marker beacon sensitivity switch (pedestal extension) - HI.

(b) Fly toward marker beacon station. When marker beacon indicator light illuminates and audio tone sounds, set sensitivity switch to LO. Observe that marker beacon indicator light and audio tone cease.

(c) Continue to fly toward station. Verify that marker beacon indicator light again illuminates and audio tone sounds.

*10. TACAN - Check as follows:

G. AVIONICS FLIGHT CHECKS (CONT)

a. NAV B control (audio control panel) - Depress on and rotate clockwise to set volume.

b. Frequency selectors (TACAN control panel) - Set test frequency.

c. Volume control (TACAN control panel) - As required.

(1) INS/TACAN pushbutton selector switch (display controller) - Depress to select TCN navigation source annunciator on respective EADI.

d. Fly directly toward a TACAN station of known direction and near enough to provide a reliable signal.

e. Set direction to station on course indicator (EHSI) using remote course knob (pedestal extension). Verify that course deviation bar is nearly centered and the to/from indicator reads to.

f. Set reciprocal of direction to station on course indicator (EHSI) using remote course knob (pedestal extension). Observe that course deviation bar is nearly centered and the to/from indicator reads from.

g. Set direction to station again on course indicator (EHSI) using remote course knob (pedestal extension). Observe that course deviation bar is nearly centered and the to/from indicator reads to.

PROCEDURE	TROUBLESHOOTING REFERENCE
h. Fly a 90° right turn such that the flight path is at a 90° angle to the direction to the station. Observe that the course deviation indicator needle deflects noticeably to the left after one or two miles of flight (assuming the station is 25 to 50 miles from the aircraft).	
i. TACAN range test: Achieve adequate usable reception at 45 miles at 1,250 feet above station antenna altitude.	
j. TACAN ground-track accuracy test: Fly aircraft over a predetermined ground check point. The maximum error is ±3%.	
*k. TACAN distance measuring equipment - Check against known distances (on the ground if possible) using known checkpoints. Verify that TACAN distance accuracy is within 2% of known distances.	
*11. Transponder set - Check as follows:	K22
a. MASTER control - STBY (allow 2 minute warm up). b. MASTER control - NORM. c. Mode switches - Set test mode. d. Code selectors - Set test code. e. Fly aircraft within line of sight of interrogating stations. f. Contact the facility by radio and request that the aircraft be interrogated and that the reply be checked for satisfactory response.	

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

*12. Encoding altimeter - Check as follows:

a. Mode C switch (transponder control panel) - ON.
b. Contact ground radar facility and request their altitude readout. Observe that ground facility altitude readout agrees with aircraft altitude within ±200 feet.

*13. Radar set - Check while airborne as follows: K17-21

a. RADAR system mode selector switch - OFF.
b. Radar receiver GAIN control - Preset (pushed in) position.
c. Antenna TILT angle control - +15 degrees.
d. Weather (WX) pushbutton selector switch (display controller) - Depress to select weather display mode on the EHSI.
e. Radar mode selector switch - SBY or TEST.

NOTE

When power is first applied, the radar will be in the wait mode for 45 seconds to allow the magnetron to warm up.

f. RADAR mode selector switch - WX or GMAP.
g. Range switches - As required. Satisfactory operation of the weather radar shall be verified using 5, 25,

50, 100, 200, and 300 nautical mile sweep ranges.

h. TILT control - Move up or down to observe targets above or below aircraft. Verify that echo displays change in shape and location only and that weather targets do not change shape or location. Ground targets will not change shape or location. Ground targets are selected as a function of tilt.

i. Antenna stabilization check:

(1) Fly to an altitude above 10,000 feet AGL.
(2) RADAR system mode selector switch - WX.
(3) SECT scan angle pushbutton selector switch - 120 or 60.
(4) STAB pushbutton selector switch - Push OFF to remove stabilization.
(5) While flying level (0° pitch, 0° roll), adjust TILT control to obtain a video pattern through-out the upper range marks. Note TILT control setting. If the inner ring of video is not parallel to the range mark, the error is caused by mechanical displacement of the antenna about the roll axis of the aircraft. Use TILT control to determine exact error. Correct on ground, if necessary, before further in-flight calibration.

(6) Attitude stabilization pushbutton selector switch - Push on to restore stabilization.

G. AVIONICS FLIGHT CHECKS (CONT)

(7) Verify that pattern does not change. If the pattern shifts either left or right, ground check leveling of the gyro and accuracy of the horizon indicator. Use TILT control to find exact error.

(8) Roll the aircraft 20° right. For perfect stabilization, the terrain band will be displayed throughout the third range marks.

(9) If the terrain band shifts to the right around the second range marks, increase tilt angle using TILT control until pattern is displayed throughout the third range marks. Note new position of TILT control. Tilt will not be more than two degrees above that noted in step (5).

(10) If the terrain band shifts (in step 8) to the left around the second range marks, decrease tilt angle using TILT control until pattern is displayed throughout the third range marks. Note new position of TILT control. Verify that tilt is no more than two degrees below that noted in step (5).

(11) If the differences between steps (10) and (5) or steps (9) and (5) are greater than two degrees, recalibrate roll stabilization circuitry to the gyro

using the following procedure:

(a) Altitude - 10,000 feet AGL.

(b) Range switches - Set range to 100 NM.

(c) TILT control - Adjust until a fairly solid band of ground clutter is visible.

(d) Radar receiver GAIN control - Pull to select variable gain. Observe that VAR is observed on radar display.

(e) RCT pushbutton switch - Depress four times within four seconds. Observe that VAR is not displayed. This puts the unit in roll compensation mode.

(f) RCT pushbutton switch - Depress once more. Verify that VAR is not displayed. If it is, repeat this step.

(g) Manual GAIN control - Adjust until ground clutter display is symmetrical.

NOTE

Do not touch manual GAIN control once display is adjusted properly

(h) RCT pushbutton switch - Depress four times within four seconds to exit the

PROCEDURE	TROUBLESHOOTING REFERENCE

G. AVIONICS FLIGHT CHECKS (CONT)

roll compensation mode. When VAR is displayed again, the roll compensation mode has been exited. Set variable or preset GAIN as desired.

(12) Ground mapping operating procedure: MODE switch - GMAP.

(13) Standby procedure: function switch - STBY.

(14) Shutdown procedure: Function switch - OFF.

*14. Lightning Sensor System (LSS) - Check as follows:

a. Range switches (radar control panel) - Select range of 50 miles or greater.

b. Lightning sensor system (LSS) mode selector switch (radar control panel) - CLR/TST. Verify that all lightning rate symbols are erased from display.

NOTE

After 3 or 4 seconds, simulated lightning test pulses are sent to the display.

c. Verify that a rate symbol is displayed at 25 nautical miles, at 45 degrees to right of center. This symbol will take approximately 5 to 7 seconds to build up.

PROCEDURE	TROUBLESHOOTING REFERENCE

NOTE

This time will be extended to approximately 15 seconds if TST is selected immediately from OFF, due to lightning processor initialization.

The symbol's range may vary by as much 5 nautical miles if strong local interference is present.

d. Verify that a magenta lightning alert symbol is displayed at maximum selected range, at 45 degrees right of center. This must remain on display for 3 to 7 seconds.

e. To restart the test, switch to LX mode and back to CLR/TST mode.

SECTION V. CHARTS AND FORMS

General. This section contains the necessary charts and forms required to ascertain that the aircraft is performing to established standards and to record readings, pressures, RPM, etc., obtained during maintenance test flight.

Performance tables for aircraft with Infra Red exhaust stack configuration are identified with the designation IR in the figure title. Performance tables for aircraft with Constant Area exhaust stack configuration are identified with the designation CA in the figure title.

LIST OF CHARTS

FIGURE NUMBER . . . . . TITLE . . PAGE NUMBER

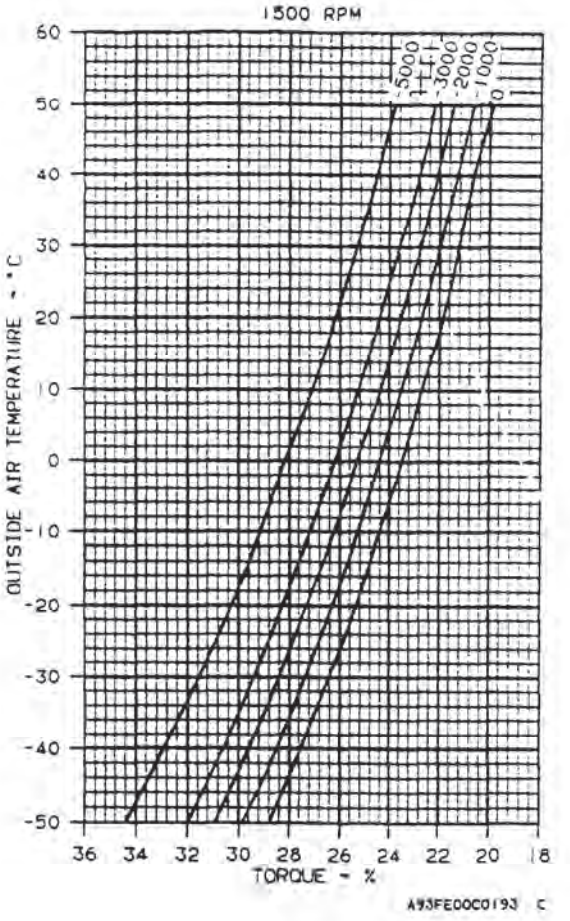


Figure I. Propeller Low Pitch Stop (Sheet 1 of 4)

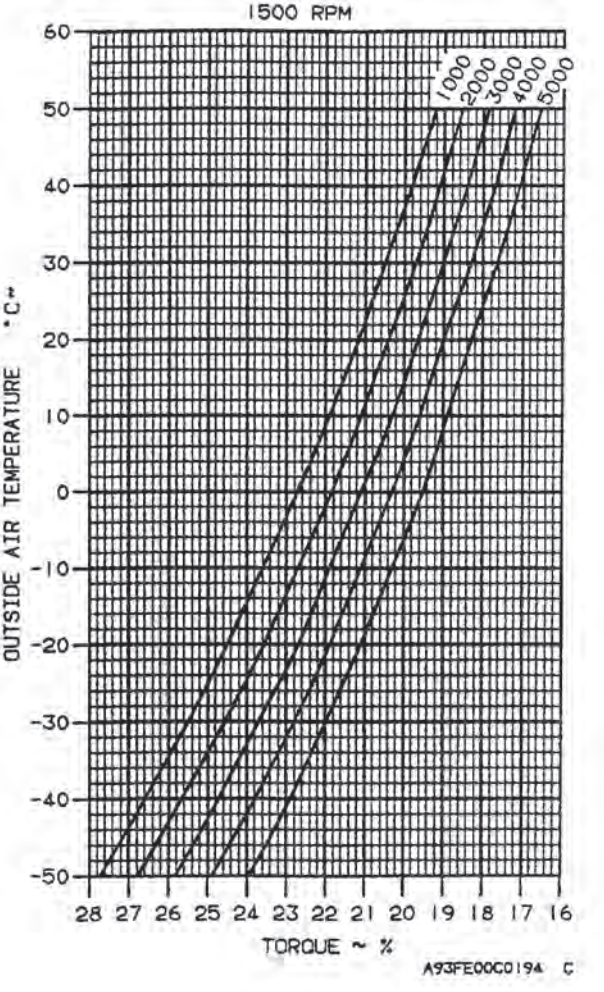


Figure 1. Propeller Low Pitch Stop (Sheet 2 of 4)

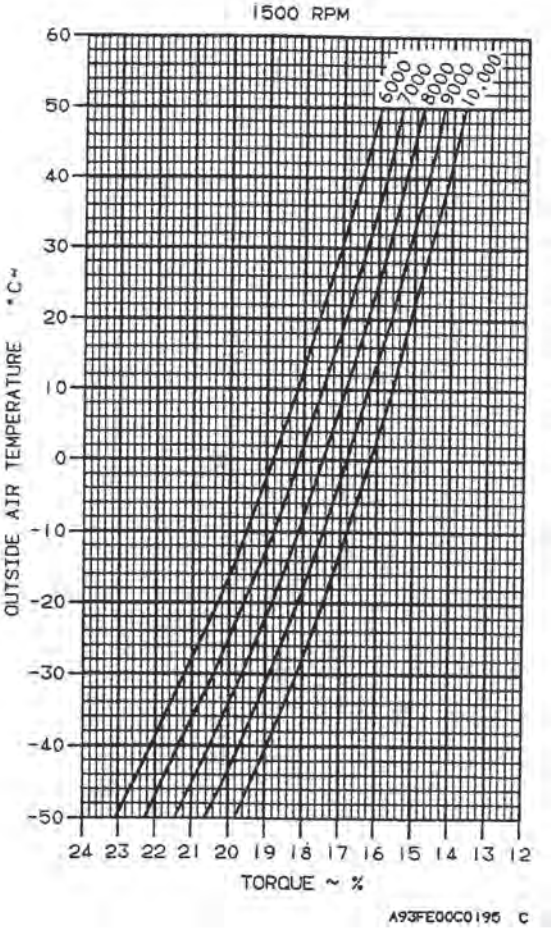


Figure 1. Propeller Low Pitch Stop (Sheet 3 of 4)

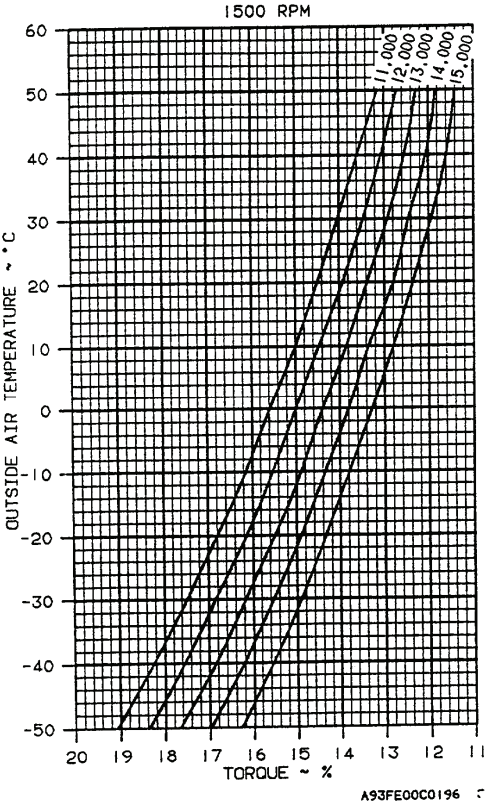


Figure 1. Propeller Low Pitch Stop (Sheet 4 of 4)

THIS FIGURE HAS BEEN DELETED

Figure 2. Stall Speeds (Sheet 1 of 2)

THIS FIGURE HAS BEEN DELETED

Figure 2. Stall Speeds (Sheet 2 of 2)

PRESSURE ALTITUDE	KIAS
18,000	221
16,000	231
14,000	240
12,000 and Below	248

BT04224

Figure 3. Airspeeds for Vmo Dive.

PT-6A-67 MODEL RC-12N				
MAXIMUM CRUISE SPEED AND POWER 13,500 LB - 25,000 FT - 1700 RPM				
FAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	67	419	172	779
-38	66	414	171	781
-36	65	409	169	783
-34	64	404	168	785
-32	63	399	166	787
-30	62	394	165	789
-28	61	388	163	791
-26	60	382	161	793
-24	59	376	159	795
-22	57	370	157	797
-20	56	363	156	799
-18	55	357	154	801
-16	54	351	152	803
-14	52	341	148	805
-12	50	334	146	807
-10	49	328	144	809
-8	48	321	141	811
-6	46	315	139	813
-4	45	309	136	815
-2	44	302	134	817
0	42	296	131	819
2	40	286	126	821
4	39	279	122	823
6	37	272	118	825
8	--	--	--	--
10	--	--	--	--
12	--	--	--	--
14	--	--	--	--
16	--	--	--	--
18	--	--	--	--
NO TESTING ALLOWED ABOVE 830°C TGT				

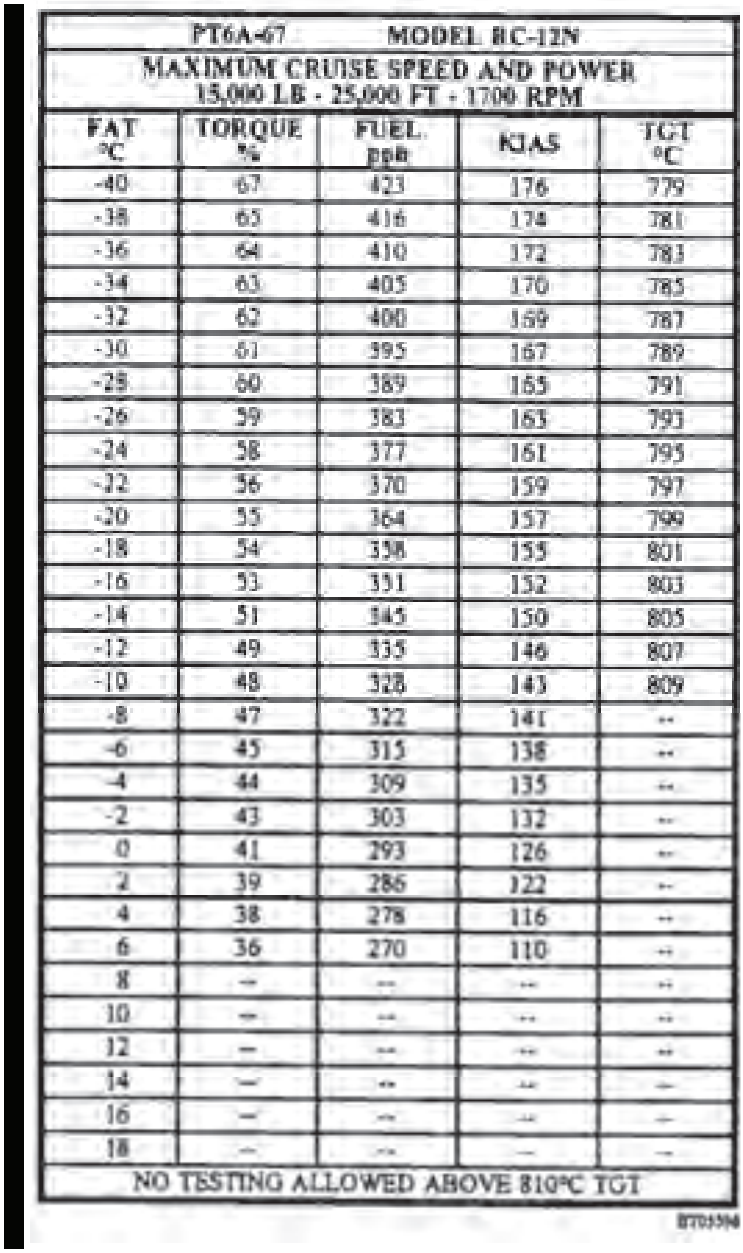
Figure 4. Maximum Cruise Speed and Power (Sheet 1 of 2)

PT-6A-67 MODEL RC-12N MAXIMUM CRUISE SPEED AND POWER 15,000 LB - 25,000 FT - 1700 RPM				
FAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	67	419	170	780
-38	66	414	168	782
-36	65	409	166	784
-34	64	404	165	786
-32	63	399	163	788
-30	62	394	162	790
-28	61	388	160	792
-26	60	382	158	794
-24	58	376	156	796
-22	57	369	154	798
-20	56	363	152	800
-18	54	354	148	802
-16	53	347	146	804
-14	51	341	144	806
-12	50	334	141	808
-10	49	327	138	810
-8	47	321	136	812
-6	46	315	133	814
-4	45	308	130	816
-2	43	299	125	819
0	41	292	121	822
2	40	285	117	824
4	38	277	111	826
6	--	--	--	--
8	--	--	--	--
10	--	--	--	--
12	--	--	--	--
14	--	--	--	--
16	--	--	--	--
18	--	--	--	--
NO TESTING ALLOWED ABOVE 830°C TGT				

Figure 4. Maximum Cruise Speed and Power IR
(Sheet 2 of 2)

PT6A-67 MODEL RC-12N				
MAXIMUM CRUISE SPEED AND POWER 13,500 LB - 25,000 FT - 1700 RPM				
FAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	67	423	179	779
-38	66	419	177	781
-36	65	414	176	783
-34	64	408	174	785
-32	63	403	172	787
-30	61	396	170	789
-28	60	390	168	791
-26	59	384	166	793
-24	58	377	165	795
-22	57	371	163	797
-20	55	365	161	799
-18	54	358	159	801
-16	53	352	156	803
-14	52	345	154	805
-12	50	339	152	807
-10	49	332	150	809
-8	47	323	146	--
-6	46	316	143	--
-4	44	310	141	--
-2	43	303	138	--
0	42	297	135	--
2	40	290	132	--
4	39	283	129	--
6	37	273	123	--
8	--	--	--	--
10	--	--	--	--
12	--	--	--	--
14	--	--	--	--
16	--	--	--	--
18	--	--	--	--
NO TESTING ALLOWED ABOVE 810°C TGT				

Figure 4.1. Maximum Cruise Speed and Power C1
(Sheet 1 of 2)



PT6A-67 MODEL 8C-12N

MAXIMUM CRUISE SPEED AND POWER
15,000 LB - 25,000 FT - 1700 RPM

FAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	67	423	176	779
-38	65	416	174	781
-36	64	410	172	783
-34	63	405	170	785
-32	62	400	169	787
-30	61	395	167	789
-28	60	389	165	791
-26	59	383	163	793
-24	58	377	161	795
-22	56	370	159	797
-20	55	364	157	799
-18	54	358	155	801
-16	53	351	152	803
-14	51	345	150	805
-12	49	335	146	807
-10	48	328	143	809
-8	47	322	141	--
-6	45	315	138	--
-4	44	309	135	--
-2	43	303	132	--
0	41	293	126	--
2	39	286	122	--
4	38	278	116	--
6	36	270	110	--
8	--	--	--	--
10	--	--	--	--
12	--	--	--	--
14	--	--	--	--
16	--	--	--	--
18	--	--	--	--

NO TESTING ALLOWED ABOVE 810°C TGT

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Figure 4.1. Maximum Cruise Speed and Power C 1
(Sheet 2 of 2)

PT6-67 MODEL RC-12N		
MAXIMUM CONTINUOUS POWER 16,000 FT - 1700 RPM - 160 KIAS		
FAT °C	TORQUE %	TGT °C
-40	94.6	782
-38	93.8	784
-36	93.0	786
-34	92.1	788
-32	91.2	790
-30	90.3	792
-28	89.3	794
-26	88.3	796
-24	87.3	798
-22	86.3	800
-20	85.3	802
-18	84.3	804
-16	83.3	806
-14	82.3	808
-12	81.3	810
-10	80.3	812
-8	79.3	814
-6	78.3	816
-4	77.3	818
-2	76.4	820
0	75.5	822
2	74.6	824
4	73.6	826
6	72.5	828
8	71.3	830
10	69.9	830*
12	68.5	830*
14	67.2	830*
16	65.8	830*
18	--	--
* NO TESTING ALLOWED ABOVE 830°C TGT		

Figure 5. Maximum Continuous Power IR

PT6A-67 MODEL RC-12N		
MAXIMUM CONTINUOUS POWER 16,000 FT - 1700 RPM - 160 KIAS		
FAT °C	TORQUE %	TGT °C
-40	90	783
-38	89	785
-36	89	787
-34	88	789
-32	87	791
-30	86	793
-28	85	795
-26	84	797
-24	83	799
-22	82	801
-20	81	803
-18	80	805
-16	79	807
-14	78	809
-12	77	811
-10	76	813
-8	75	815
-6	74	817
-4	73	819
-2	72	821
0	71	823
2	70	825
4	69	827
6	68	828
8	67	830
10	66	--
12	65	--
14	64	--
16	63	--
18	62	--
* NO TESTING ALLOWED ABOVE 830°C TGT		

Figure 5.1. Maximum Continuous Power C 1

PT6A-67 MODEL RC-12N		
MAXIMUM CRUISE POWER 25,000 FT - 1500 RPM - 160 KIAS		
TORQUE %	TGT °C	FAT °C
76.5	780	-40
75.6	782	-38
74.8	784	-36
73.9	786	-34
72.9	788	-32
71.9	790	-30
70.8	792	-28
69.6	794	-26
68.4	796	-24
67.2	798	-22
66.0	800	-20
64.7	802	-18
63.5	804	-16
62.3	806	-14
61.0	808	-12
59.8	810	-10
58.6	812	-8
57.3	814	-6
56.1	816	-4
54.8	818	-2
53.4	820	0
52.0	822	2
50.6	824	4
49.1	826	6
47.6	828	8
46.0	830	10
44.5	830	12
42.8	830	14
41.2	830	16
—	—	18
NO TESTING ALLOWED ABOVE 830°C TGT		

BT04223

Figure 6. Maximum Cruise Power rm

PT6A-67 MODEL RC-12N MAXIMUM CRUISE POWER 25,000 FT - 1500 RPM - 160 KIAS		
TORQUE %	TGT °C	FAT °C
73	780	-40
73	781	-38
72	783	-36
71	785	-34
70	787	-32
69	789	-30
68	791	-28
67	793	-26
65	795	-24
64	797	-22
63	799	-20
62	801	-18
60	803	-16
59	805	-14
58	807	-12
57	809	-10
56	--	-8
54	--	-6
53	--	-4
52	--	-2
50	--	0
49	--	2
48	--	4
46	--	6
45	--	8
43	--	10
41	--	12
40	--	14
38	--	16
36	--	18
NO TESTING ALLOWED ABOVE 810°C TGT		

Figure 6.1. Maximum Cruise Power C1

PIN: 075358-001

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RC-12N MAINTENANCE TEST FLIGHT CHECK SHEET		
PURPOSE OF MTF	FAT	DATE
PILOT	UNIT	
SYMBOLS: √ = SATISFACTORY, X = DEFICIENCY		

PRIOR TO MTF	5. Copilot's flight instruments
1. Forms and records	6. DC power, _____ VDC
2. Weight and balance	7. Annunciator panels
3. Flight readiness inspection	BEFORE TAXIING
4. Oxygen	1. AC/DC power
5. Standby pumps and firewall valves	a. AC frequency _____ Hz
6. Fuel quantity indicators	b. AC voltage _____
7. Pitot tubes (2), stall warning vane, heated fuel vents (2), TAS temperature probe	c. DC voltage _____
	DURING TAXIING
8. Lights	1. Brakes
9. Hydraulic fluid level sensor	2. Flight instruments
10. Engine fire protection	3. Nosewheel steering
11. Stall and gear warning	4. Magnetic compass
12. Flaps	ENGINE RUNUP
13. Seat belts	1. Parking brake
14. Toilet	2. Low idle speed
15. Emergency equipment	3. Propeller feathering
16. Parachutes	4. Engine acceleration to high idle
17. Placards and markings	5. High idle speed
18. Trim tabs	6. N_1 speed switch
19. Flight controls	7. Pneumatics/vacuum/pressurization
20. ASE/ACS	8. Rudder boost
21. EFIS	9. Autofeather/auto ignition
22. Flight director/autopilot	10. Overspeed governors
INTERIOR CHECK	11. Primary governors
1. Cabin/cargo doors	12. Low pitch stop
2. Emergency exit	13. Ice vanes
3. Mission cooling ducts	14. Weather radar
4. Flare/chaff	DURING TAKEOFF
BEFORE STARTING ENGINES	1. Propeller tachometers L _____ RPM, R _____ RPM
1. Magnetic compass	2. Torque L _____%, R _____%
2. Free air temperature gage	3. TGT, L _____ °C, R _____ °C
3. Pilot's flight instruments	4. N_1 L _____ %, R _____ %
4. Engine instruments	

Figure 7. Maintenance Test Flight Checksheet (Sheet 1 of 3)

5. Oil pressure, L _____ PSI, R _____ PSI	4. Stall speed, stall warning, and stall characteristics (gear down, flaps approach, power off), KIAS at warning _____, KIAS at stall _____, roll °L or R
6. Oil temperature, L _____°C, R _____ °C	5. Stall speed, stall warning, and stall characteristics (gear down, flaps approach, power on), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R
AFTER TAKEOFF	6. Stall speed, stall warning, and stall characteristics (gear down, flaps down, power off), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R
1. Tail boom antenna	7. Stall speed, stall warning, and stall characteristics (gear down, flaps down, power on), KIAS at warning _____, KIAS at stall_____, roll _____ °L or R
CLIMB	8. Autoignition
1. Wings and center section	9. Propeller feathering
2. Engine and flight instruments	10. Propeller autofeathering time from fuel cutoff to rotation stop L _____ seconds, R _____ seconds
3. Engine control levers	11. Propeller unfeathering time from propeller lever full forward to 1000 RPM L _____ seconds, R _____ seconds
4. Vertical speed indicators	12. Landing gear warning horn, N_1 on first bearing horn _____ %
5. Surface deice	13. Landing gear normal operation
6. Antenna deice	a. Landing gear extension time _____ seconds
7. Propeller deice	b. Landing gear retraction time _____ seconds
8. Windshield anti-ice	14. Emergency landing gear extension
9. Radome anti-ice	**DESCENT AND LOW LEVEL CRUISE**
10. Waveguide pressurization	1. Maximum rate (V_{mo}) descent
11. Cabin and cockpit ventilation	a. Flight controls
12. Air conditioning and heating	b. Windows and doors
13. Air conditioning cold operation	2. Excess nose down trim
14. Carbon monoxide	**LANDING**
CRUISE	1. Brake operation
1. Engine instrument indications	2. Propeller reversing, L _____ % N_1, R _____ % N_1
2. Wings and nacelles	3. Oil temperature, L _____ °C, R _____ °C
3. Cabin noise level	4. Oil pressure, L _____ PSI, R _____ PSI
4. Pilot's alternate static air source	
5. Propeller synchrophaser	
6. Ice vanes	
7. Turn and bank indicators	
LOW SPEED SYSTEMS	
1. Flap operation	
a. Flap retraction time _____ seconds	
b. Flap extension time _____ seconds	
2. Stall speed, stall warning, and stall characteristics (clean, power off), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R	
3. Stall speed, stall warning, and stall characteristics (clean, power on), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R	

Figure 7. Maintenance Test Flight Checksheet (Sheet 2 of 3)

AFTER LANDING	
1. LSS	
ENGINE SHUTDOWN	
1. Battery condition	
BEFORE LEAVING AIRCRAFT	
1. Walkaround inspection	
2. Aircraft forms	
SPECIAL PROCEDURES	
1. Pressurization	
2. Trim and rigging	
3. Maximum TGT/N_1 availability	
4. Speed performance at maximum cruise power	
a. Engine serial number, L _____, R _____	
b. Engine hours since new, L _____, R _____	
c. Engine hours since overhaul, L _____, R _____	
d. Pressure altitude, _____ feet	
e. Propeller RPM, L _____, R _____	
f. FAT _____ °C	
g. Torque, L _____ %, R _____ %	
h. Fuel flow, L _____ PPH, R _____ PPH	
i. KIAS _____	
j. TGT, L _____ °C, R _____ °C	
k. N_1, L _____ %, R _____ %	
5. Engine performance at maximum continuous power	
a. Engine serial number, L _____, R _____	
b. Engine hours since new, L _____, R _____	
c. Engine hours since overhaul, L _____, R _____	
d. Pressure altitude, _____ feet	
e. Propeller RPM, L _____ R _____	
f. FAT _____ °C	
g. Torque, L _____ %, R _____ %	
h. Fuel flow, L _____ PPH, R _____ PPH	
i. KIAS _____	
	j. TGT, L _____ °C, R _____ °C
	k. N_1, L _____ %, R _____ %
	6. Engine performance at maximum cruise power
	a. Engine serial number, L _____, R _____
	b. Engine hours since new, L _____, R _____
	c. Engine hours since overhaul, L _____, R _____
	d. Pressure altitude, _____ feet
	e. Propeller RPM, L _____, R _____
	f. FAT _____ °C
	g. Torque, L _____ %, R _____ %
	h. Fuel flow, L _____ PPH, R _____ PPH
	i. KIAS _____
	j. TGT, L _____ °C, R _____ °C
	k. N_1, L _____ %, R _____ %
	7. Autopilot
	8. Slaved compass
	9. Inertial navigation
	10. Audio control panel and interphone
	11. UHF
	12. VHF
	13. HF
	14. ADF
	15. VOR/Localizer/glideslope/marker beacon
	17. TACAN
	18. TACAN distance measuring equipment
	19. Transponder
	20. Encoding altimeter
	21. Radar
	22. LSS
	REMARKS

BT04777

Figure 7. Maintenance Test Flight Checksheet (Sheet 3 of 3)

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By Order of the Secretary of the Army:

Official:

MILON H. HAMILTON
Administrative Assistant to the Secretary of the Army

GORDON R. SULLIVAN
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Chief of Staff

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