TECHNICAL MANUAL

MAINTENANCE TEST FLIGHT MANUAL

ARMY MODELS
RC-12P
NSN 1510-01-370-0805
AND
RC-12Q
NSN 1510-01-417-0137
AIRCRAFT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

HEADQUARTERS
DEPARTMENT OF THE ARMY
16 MAY 1997

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 1-1510-224-10 (operator's manual) and must be completed prior to each maintenance test flight. Emergency procedures are found in the applicable operator's manual (-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 1-1510-224-MTF
C2

CHANGE
NO. 2

HEADQUARTERS
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WASHINGTON, D.C., 1 October 2009

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ARMY MODEL
RC-12P
AIRCRAFT

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TM 1-1510-224-MTF, 16 May 1997 is changed as follows:

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2-67 through 2-72	2-67 through 2-72
None	2-72.1/(2-72.2 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.

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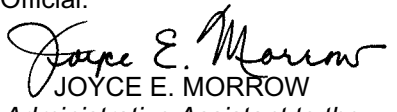

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MAINTENANCE TEST FLIGHT MANUAL

ARMY MODELS
RC-12P
NSN 1510-01-370-0805
AND
RC-12Q
NSN 1510-01-147-0137

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TECHNICAL MANUAL
No. 1-1510-224-MTF

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DEPARTMENT OF THE ARMY
WASHINGTON, DC, 16 MAY 1997

MAINTENANCE TEST FLIGHT MANUAL

ARMY MODELS
RC-12P
NSN 1510-01-147-0137
AND
RC-12Q
NSN 1510-01-147-0137

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. 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: AM-SAM-MMC-LS-LP, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you.

You may also send in your comments electronically to our e-mail address: ls-lp@redstone.army.mil or by fax 256-842-6546/DSN 788-6546.

Chapter ..... Page

CHAPTER 1. INTRODUCTION

NOTE

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 1-1510-224-10 (operator's manual) and must be completed prior to each maintenance test flight. Emergency procedures are found in the applicable operator's manual (-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 be qualified maintenance test flight pilots as required in AR 95-1.

1-1. PURPOSE. The purpose of this manual is to provide complete instructions for performing a maintenance test flight of RC-12P and RC-12Q aircraft. For the specific conditions which require a general or limited maintenance test flight, refer to TM 1-1500-328-23, the applicable maintenance manual, and the aircraft support contract.

1-2. DEFINITIONS.

a. Maintenance Test Flight. A flight for which the primary mission is to determine airworthiness, i.e., that the airframe, powerplant, accessories, and items of equipment are functioning in accordance with predetermined requirements in the intended operational 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:

WARNING

An operating or maintenance procedure, practice, condition, or statement which, if not strictly observed, could result in injury or death of the person who performs the action which follows the warning.

CAUTION

An operating or maintenance procedure, practice, condition, or statement which, if not strictly observed, could result in damage to or destruction of equipment or loss of mission effectiveness or long term health hazard to personnel who perform the action which follows.

NOTE

An essential operating or maintenance procedure, condition, or statement which must be highlighted.

1-3. GENERAL INFORMATION.

a. This manual covers only maintenance test flight or RC-12P and RC-12Q aircraft and in no way supersedes any information contained in TM 1-1510-224-10 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. Effectivity code P is used to designate text or material that is peculiar to the RC-12P aircraft. Effectivity code Q is used to designate text or material that is peculiar to the

RC-12Q aircraft. Material that is common to both models will have no effectivity code.

c. Crew requirements are as specified in TM 1-1500-328-23 and TM 1-1510-224-10.

d. The duration of a general or limited test flight shall be in accordance with the requirements of TM 1-1500-328-23.

1-4. 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 assure 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 assure 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 (✓) 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. A check sheet similar to the one contained in Chapter 5 shall 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. 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 2401-13-1 immediately after termination of the flight. The sheet shall 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 considered to be same as outside air temperature (OAT).

CHAPTER 2. MAINTENANCE TEST FLIGHT CHECKLIST

2-1. GENERAL. This chapter contains the maintenance test flight requirements peculiar to Army Model RC-12P aircraft. Conditions requiring accomplishment of test flights shall be in accordance with TM 1-1500-328-23. The requirements contained herein are established to assure 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 Chapter 3 or the troubleshooting chapter of the applicable maintenance manual or both. 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 1-1510-224-10 - Performed.	

PROCEDURE **TROUBLESHOOTING REFERENCE**

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

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

7. Elevator trim - set to 0 (neutral).

CAUTION

Do not cycle LDG GEAR CONTR handle on the ground.

8. Gear - DN.

9. Keylock switch - ON.

10. Weather radar - OFF.

*11. Fuel control panel - Check the standby pumps and firewall valves as follows to ensure that they are powered through the hot battery 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 (listen for pump operation). C41
    (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 #1 and #2 FUEL PRESS annunciator lights are extinguished. C40
(o) CROSSFEED valve switch - OFF.

*12. 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.

*13. 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

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(h) TAS temperature probe - Check by feel for heat and condition.
(i) Right wing heated fuel vent - Check by feel for heat and condition.
(j) STAFF 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.

14. ICE VANE CONTROL switches - ON.

*15. 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.

*16. HYD FLUID SENSOR TEST switch - Check as follows: C22

(a) HYD FLUID SENSOR TEST switch - Depress and hold. Check HYD FLUID LOW annunciator light illuminates.
(b) HYD FLUID SENSOR TEST switch - Release. Check that annunciator light extinguishes.

*17. Engine fire protection system - Check as follows: C43-47
(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 cancelled between tests, it may not re-illuminate.

*18. 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

PROCEDURE	TROUBLESHOOTING REFERENCE

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

	*19.	Flaps - Check in full down and full up positions.	C31, C32
	20.	BATTERY switch - As required.	
	*21.	Seat belts - Check for security and proper connections.	
	*22.	Toilet - Check condition.	
	*23.	Emergency equipment - Check that all required emergency equipment is available and that fire extinguishers and first-aid kits have current inspection dates.	
O	*24.	Parachutes - Check secure and for current inspection and repack dates.	
	*25.	Check all interior and exterior placards and markings.	
	*26.	Trim tab travel and direction - Check. Operate trim tabs through the full range of travel, noting any excessive looseness, friction, or binding. Check tab direction and neutral position at the control and the surface.	
	*27	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.	
	28.	GPU - Connect as required.	C12
	29.	Overhead control panel switches - Set as required:	
		(a) Aircraft #1 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 switch (display controller) - Press as required.
(f) Autopilot EFIS 1/2 switch - 1.

30. Mission control panel switches - Check and set as required.
(a) Mission control panel circuit breakers - Check in.
(b) ANT ORIDE switch - AUTO ROTATE.
(c) MISSION CONTROL switch - As required.
(d) RADIO ALT switch - ON.
(e) ELINT/COMINT switches (2) - As required.
(f) WOW OVERRIDE - OFF.
(g) BUS CROSS TIE switch - As required.
(h) #2 3-phase INV switch - RESET/ ON.
(i) #1 3-phase INV switch - RESET/ ON.
(j) EXT PWR switches - As required.
(k) AC phase meter switch - As required.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(l) ASE SILENT switch - OFF.

31. INS - Align as required.
    (a) Mode switch B (MFD) - Depress to select FPLN page.
    (b) NAV SET UP (R5) - Depress.
    (c) INS SETUP (R5) - Depress.
    (d) INS mode selector - STBY. Text at L1 will be blank until INS mode selector is placed in STBY or ALIGN. The 1. LAST ALIGN and 2. LAST KNOWN text will appear.
    (e) Present position - Enter by one of these methods:
        (1) To accept LAST ALIGN coordinates, SKPD 2, then depress L1
        (2) To accept LAST KNOWN coordinates, SKPD 2, then depress L1.
        (3) SKPD in alignment coordinates, then depress L1.
        (4) If using the Data Transfer System, load the present position by depressing SETUP DATA L5 in the desired data set on DATA TRANSFER page.

NOTE

When L1 is depressed INS LOADING will appear at the top of the MFD and L1 text changes to ALIGN=X.DD.MM.SS Y.DD.MM.SS and ALIGN STATE 9. It takes 6 to 8 minutes for the program to load. Complete autopilot/flight director checks while waiting.

(f) When the INS LOADING message is extinguished - Place the INS mode selector switch to ALIGN.

32. Pilot's and copilot's EFIS TEST switches - Depress. Verify the following indications:
    (a) EADI
        (1) Radio altimeter - Slews to 100 ±10 feet.
        (2) DH display - Replaced with dashes.
        (3) Marker beacon annunciators - Appear.
        (4) HDG and ATT annunciators - Appear.
        (5) ATT FAIL annunciator - Appears.
        (6) Pitch and roll command cue - Out of view.
        (7) Caution and warning flags - All will be in view.
        (8) TEST should appear in left center of display to indicate that flight director mode selector lamp test is good. FD FAIL will appear momentarily

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

and be replaced by TEST.

(b) EHSI - DTRK, NM, GSPD, and HDG displays - Replaced with dashes.

(c) AP disconnect horn sounds after 5 to 7 seconds.

NOTE

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

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

EFIS test is inhibited during glideslope capture.

33. Automatic flight control system - Check as follows:

(a) Altitude alerter - Check as follows:

NOTE

Pause for a few seconds between each step to allow time for proper indications.

(1) Altitude preselector - Set to more than 1000 feet above altitude set on pilot's altimeter. Pilot's altimeter altitude alert annunciator light should be extinguished.

(2) Pilot's altimeter barometric set knob - Slowly increase

pilot's altimeter setting.

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

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

(5) Altitude preselector - Reset to field elevation.

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

(7) Altitude alerter annunciator and horn - Verify that the altitude alerter annunciator on pilot's altimeter illuminates and altitude alerter horn sounds when altimeter reading is approximately 250 feet from value set on altitude alert controller.

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

(b) Flight director - 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:

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

a Flight director mode selector - Annunciators illuminate.
b Autopilot controller - Annunciator illuminate.
c Altitude select controller - All 8's illuminate.
d Pilot's altimeter altitude alerter annunciator - Illuminates.
e EADI - FD FAIL (amber) will be annunciated.

(2) After SBY pushbutton switch-indicator has been held depressed for 5 to 8 seconds verify that:
a AP TRIM annunciator - Illuminates.
b Autopilot disconnect horn - Sounds.

(3) SBY pushbutton switch-indicator - Release.

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

(c) Autopilot - Check as follows:

(1) Autopilot trim annunciators - Check extinguished.

(2) TURN knob - Center.

(3) ELEV TRIM switch - Check on.

NOTE

The control wheel must be held at mid-travel due to ballast in the elevator. The autopilot will disconnect during pitch wheel check due to the heavy nose down force if the control wheel is not off the forward stop.

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

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

(d) Autopilot overpower check - Check as follows:

(1) Rudder pedals - Overpower slowly.

(2) Control wheel - Overpower slowly in both directions.

WARNING

If the autopilot or yaw damper disengages during the overpower test, the system is considered nonoperative and should not be used. The elevator trim system must not be forced beyond the limits which are indicated on the elevator trim indicator.

(e) Elevator trim follow-up - Check as follows:

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(1) Control wheel - Move aft of mid-travel. Trim wheel should run nose down after approximately 3 seconds. TRIM DN annunciator (autopilot controller) should illuminate after approximately 6 to 8 seconds, and AP TRIM annunciator (instrument panel) should illuminate after approximately 15 seconds.

(2) Control wheel - Move forward of mid-travel. Trim wheel should run nose up after approximately 3 seconds. TRIM UP annunciator (autopilot controller) check illuminated after approximately 6 to 8 seconds. AP TRIM annunciators (instrument panel) check illuminated after approximately 15 seconds.

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

(g) Control wheel - Hold to mid-travel.

(h) AP ENGAGE switch - Re-engage.

(i) Turn Knob - Check that elevator control trim wheel follows in each applied direction, then center.

(j) Pitch wheel - Check that trim responds to pitch wheel movements. (UP TRIM and DN TRIM annunciators may illuminate.)

(k) Heading marker - Center and engage HDG Check that control wheel follows a turn in each direction.

(l) GO AROUND button (left power lever) - Depress. Check that AP disengages and FD commands a wings level, 7 degrees nose up attitude. Check GA annunciators on EADI illuminates. Yaw damper should automatically engage and YD ENGAGE switch-annunciator should be illuminated on the autopilot controller and the remote annunciators above the EADI's should be illuminated.

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

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

WARNING

If the SBY annunciator on the flight director mode selector does not illuminate within 10 seconds after the avionics master switch is turns on, the autopilot has failed self-test and is considered inoperative and should not be used

CAUTION

Do not force the elevator trim system beyond the limits which are indicated on the ELEVATOR trim tab indicator

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

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

(p) 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. The electric elevator trim control switch must then be turned OFF and flight conducted by operating the elevator trim wheel manually. Do not use autopilot.

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

(4) Pilot trim switches - Check that pilot switches override copilot switches while trimming in opposite directions, and trim moves in direction commanded by pilot.

(5) Pilot or copilot trim disconnects while activating pilot or copilot trim disconnect switches

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

34. ASE/ACS - Perform BIT checks as required.

(a) UTIL on MFD - Depress.
(b) System BIT (R1) - Depress.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

NOTE

Before conducting the INS BIT ensure mode selector is in ALIGN and align state is 8 or lower but before mode selector is placed in NAV.

(c) INS BIT - Perform as follows:

(1) INS - Select on EHSI by depressing INS/TCN on display controller.

(2) INS - Select on single needle bearing source selector switch on display controller.

(3) UTIL ON MFD - Depress.

(4) INS BIT (R1) - Depress.

(5) INS BIT (R2) - Depress.

(6) NAV on flight director mode selector - Select.

a MFD - INS BATT, INS FAIL, and WAYPOINT ALERT CWA annunciators (3) illuminated.

b EHSI - INS needle 30 degrees right of libber line and course deviation bar displaced right followed by INS needle centering and course deviation bar displaced left. Check WPT alert annunciator illuminated.

c Aircraft caution/advisory annunciator panel - Amber INS annunciator light illuminated.

d INS mode controller Green READY light and red BATT light illuminated

e Mission annunciator panel - Green INS UPDATE annunciator light and amber NO INS UPDATE annunciator light illuminated.

(8) After 15 seconds the text COMPLETE or any active ACTION or MALFUNCTION codes will be displayed. If an action and malfunction code is displayed they may have been cleared by the BIT test. The only way to ensure that they are cleared is to conduct another BIT and the text complete appears.

(d) ASE RTU, 2-FM, 3-UHF, 5-UHF, DTS MFD KU, GPS, AND ASE BIT check - Conduct as required by depressing the appropriate line button.

35. ASE/ACE - Program as required.

(a) Waypoint list - Build as follows:

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

(2) WPT LIST (R4) - Depress WPT numbers 10-59 are shown. The WPT select window surrounds a WPT line.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

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

(4) Add/SEL (R1) - Depress to load WPT into system.

(5) Or load waypoint list using the data transfer system by depressing NAV DATA (L2) when the desired data set is boxed on the DATA TRANSFER page.

(b) Flight plan - Build as follows:

(1) WPT numbers - Enter into scratchpad in order of desired use (up to nine) or box desired WPT's and PREV (R2) or NEXT (R3) and depress LOAD SCRATCH PAD (L5).

(2) ROUTES (R5) - Depress.

(3) Route - Select 1st, 2nd, or 3rd to enter WPT numbers by depressing the appropriate line button to store the WPTs.

(4) Routes to use as the active FPLN - Select and depress the adjacent line button to box it.

(5) NEW FPLN (L1) - Depress to active the FPLN.

(c) TACAN list - Build as follows:

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

(2) R5 line selection switch - Depress to select TACAN LIST page.

(3) TACAN station information (list number, ID, channel number, latitude/longitude, and station elevation) - Enter into scratchpad.

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

(5) Or load TACAN list using the DATA TRANSFER SYSTEM by depressing NAV DATA (L1) on the DATA TRANSFER page.

(6) TACAN stations to be used for updating - Select and enter into scratchpad.

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

(d) 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 scratchpad.

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

(5) Leg length in NM - Enter into scratchpad.

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(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 scratchpad.

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

(e) Waypoint move mode - Program as follows:

(1) True bearing - Enter into scratchpad.

(2) R1 line selection switch - Depress to enter BEARING.

(3) Range in NM - Enter into scratchpad.

(4) R2 line selection switch - Depress to enter RANGE.

*36. VHF transceivers (#1 and #2) - Press TEST and observe the following:

(a) Normal - Dashes displayed in the active display and 00 in the preset display.

(b) Fault - Flag in the active display and a two digit fault code in the preset display.

*37. VHF navigation receivers (#1 and #2) - Test as follows:

(a) VOR self test/marker beacon test:

(1) Tuning knobs (NAV control unit) - Select a VOR frequency.

(2) VOR/localizer pushbutton selector switch (display controller) - Select VOR 1 or VOR 2.

(3) Single needle bearing pointer source selector switch (display controller) - VOR 1.

(4) Double needle bearing pointer source selector switch (display controller) - VOR 2.

(5) Course knob (EHSI) - Rotate until pointer indicates 0 degrees.

(6) TEST switch (NAV control unit) - Depress.

(7) NAV flag on the EHSI - Will come into view. After two seconds, the flag will go out of view, the EHSI course deviation bar will center, and a TO indication will appear. The bearing pointers will indicate a 0 degree magnetic bearing. The VIR-32 will return to normal after 15 seconds.

(8) Check the three marker indications on the EHSI and listen for a 30 Hz tone on the audio channel of the NAV system.

(b) ILS self test (NAV 1 and NAV 2):

PRIOR TO MAINTENANCE TEST FLIGHT (CONT)

(1) Tuning knobs (NAV control unit) - Select a localizer frequency.

(2) TEST switch (NAV control unit) - Depress.

(3) The NAV and GS flags on EHSI - Will come into view. After 3 seconds, the flags will go out of view, the EHSI course deviation bar will deflect right 2/3 full scale, and the glide slope pointer will deflect down 2/3 full scale.

(4) VIR-32 - Will return to normal after 15 seconds.

*38. ADF receiver - test as follows:

(a) Power and mode switch - On.

(b) Tuning knobs - Tune a nearby NDB, compass locater, or broadcast station.

(c) EFIS display controller - Select ADF on the single needle pointer bearing source selector switch.

(d) TEST switch - Depress. Bearing pointer will rotate 90 degrees from the previous indication. Release TEST switch and verify the bearing pointer returns to the previous indication.

*39. TACAN/DME indicator system:

(a) TACAN/DME - Will conduct a self test for 3 seconds after power-up. After 3 seconds, check

for SELF TEST PASS or SELF TEST FAIL (with a fail message number).

*40. Transponder (APX-100) Test as follows:

(a) MASTER Switch - STBY.

(b) Warmup - Allow two minutes.

(c) Mode 1 and mode 3/A codes - Set.

(d) Lamp indicators - Press to test.

(e) Antenna switch - Select TOP.

(f) Mode selector - NORM.

(g) Modes 1, 2, 3/A, and C - Hold to TEST and observe go light.

(h) Antenna switch - Select BOT and repeat step (g).

(i) Antenna switch - Select DIV and repeat step (g).

(j) Mode 4 - Hold to test and observe GO light (if code has been set in the external computer).

41. 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).

INTERIOR CHECK (CONT)

(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.

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.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE STARTING ENGINES (CONT)

(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.

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 - FEATHER.

(c) CONDITION levers - FUEL CUTOFF.

(d) Flaps - As required.

10. Pedestal extension switches - Set.

BEFORE STARTING ENGINES (CONT)

(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.

(a) ELINT/COMINT switches (2) - OFF.

(b) ANT ORIDE switch - AUTO ROTATE.

(c) MISSION CONTROL switch - OFF.

(d) RADIO ALT switch - OFF.

(e) WOW OVERRIDE switch - OFF.

16. Subpanels - Check and set.

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

(b) CABIN PRESS DUMP switch - OFF.

(c) Pressurization controls - As required.

(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.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE STARTING ENGINES (CONT)

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

(b) 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.

1. INS - OFF.
2. Exterior lights switches - As required.

3. Propeller area - Clear.

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

NOTE

False fuel flow indications 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 (15 minute minimum).

5. 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.

6. TGT and N_1 (TGT 1000°C maximum).

PROCEDURE	TROUBLESHOOTING REFERENCE

FIRST ENGINE START (BATTERY START) (CONT)

7.	Oil pressure - Check (60 PSI minimum).	E7-9
8.	ENG START switch - OFF after TGT peaks.	
9.	CONDITION lever - HIGH IDLE. Monitor TGT as CONDITION lever is advanced.	E2
10.	GENERATOR switch - RESET, then ON.	C1

SECOND ENGINE START (BATTERY START)

1.	Generator load - Verify less than 50%.	
2.	Propeller area - Clear.	
3.	ENG START switch - START - IGNITION. IGN ON annunciator should illuminate and FUEL PRESS annunciator should extinguish.	A1-7
4.	CONDITION lever (after N_1 RPM passes 13% 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.	ENG START switch - OFF after TGT peaks.	E2
8.	CONDITION levers - HIGH IDLE. Monitor TGT as CONDITION lever is advanced.	
9.	PROP levers - HIGH RPM.	
10.	INVERTER switches - ON, check INVERTER annunciators off.	
11.	Current limiters - Check as follows:	

PROCEDURE	TROUBLESHOOTING REFERENCE

(a) BATTERY CHARGE annunciator - Check on. BATTERY CHARGE annunciator should extinguish within 5 minutes following a normal engine start on battery.

(b) #1 and #2 INV annunciators - Check extinguished. This procedure checks both 400 and 500 ampere current limiters that tie the aircraft bus systems together.

12. GENERATOR switch - RESET, then ON. C1

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.

13. 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 (15 minutes minimum).

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE CLEARING PROCEDURE (CONT)

3. ENG START switch - STARTER ONLY.
4. ENG START switch - OFF.

FIRST ENGINE START (GPU START)

1. INS - As required.

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. Propeller area - Clear.
4. ENG START switch - START - IGNITION. IGN ON annunciator should illuminate and FUEL PRESS annunciator should extinguish. A1-7

NOTE

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

PROCEDURE	TROUBLESHOOTING REFERENCE

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 (15 minute minimum).

5. 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 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.

6. TGT and N_1 - Monitor (TGT 1000°C maximum).
7. Oil pressure - Check (60 PSI minimum). E7-9
8. ENG START switch - OFF after TGT peaks.
9. CONDITION lever - HIGH IDLE. Monitor TGT as CONDITION lever is advanced. E2.
10. DC GPU disconnect - As required.
11. GENERATOR switch - RESET then ON, for second engine battery start. C1

PROCEDURE	TROUBLESHOOTING REFERENCE

SECOND ENGINE START (GPU START)

1. Propeller area - Clear.
2. ENG START switch - START - IGNITION. IGN ON annunciator should illuminate and FUEL PRESS annunciator should extinguish. A1-7
3. CONDITION lever (after N_1 RPM passes 13% minimum) - LOW IDLE.
4. TGT and N_1 -Monitor (TGT 1000°C maximum).
5. Oil pressure - Check (60 PSI minimum).
6. ENG START switch - OFF after TGT peaks.
7. CONDITION lever - HIGH IDLE. Monitor TGT as CONDITION lever is advanced.

CAUTION

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

8. AC and DC GPU units - Disconnect (checks aircraft external power and mission external power annunciator extinguished.
9. PROP levers - HIGH RPM.

PROCEDURE	TROUBLESHOOTING REFERENCE

10. #1 and #2 INVERTER switches - ON Check INVERTER annunciators extinguished.
11. GENERATOR switches - RESET, then ON. C1
12. Current Limiters - Check as indicated:
    (a) BATTERY CHARGE annunciator - Check on. BATTERY CHARGE annunciator should extinguish within 5 minutes following a normal engine start on battery.
    (b) #1 and #2 INV annunciators - Check extinguished. This procedure checks both 400 and 500 ampere current limiters that tie aircraft bus systems together.
13. GENERATOR switch - RESET, then ON.

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.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE TAXING

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 DEICE 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.

NOTE

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

*4. AC/DC power - Check for:

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

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

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

5. AUTO PLT POWER switch - ON.

6. AVIONICS MASTER POWER switch - ON.

7. #1 and #2 EFIS POWER switches - ON.

8. Mission control panel - Set as follows:

(a) ANT ORIDE switch - AUTO ROTATE.

(b) MISSION CONTROL switch - OFF.

(c) RADIO ALT switch - ON.

9. Avionics - Check and set as required.

10. Weather radar/LSS - SBY.

11. Flaps - Check.

12. Altimeters - Check and set.

PROCEDURE	TROUBLESHOOTING REFERENCE

TAXING

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.

*3. Nosewheel steering - Check for no turning tendency while taxing 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.

PROCEDURE	TROUBLESHOOTING REFERENCE
*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

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE RUNUP (CONT)

CAUTION

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

*3. Engine low idle speed - Check 62% N_1, 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.

(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_1 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_1 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. Pneumatic/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.

ENGINE RUNUP (CONT)

(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.
(l) PNEUMATIC PRESSURE gage/ GYRO SUCTION gage - Check in green arc.
(m) CABIN CLIMB indicator - Check for descent indication within 10 to 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.

(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 50%, observe that the YD ENG annunciator light

ENGINE RUNUP (CONT)

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 as rudder boost system disengages.

(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).

(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).

PROCEDURE	TROUBLESHOOTING REFERENCE

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 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

PROCEDURE	TROUBLESHOOTING REFERENCE

ENGINE RUNUP (CONT)

(a) POWER levers - Set 1500 RPM.
(b) PROP levers - Move aft to detent.
(c) Propeller RPM - Check 1150 ±50.

*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%.
(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 VAN 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 switches (2) - MAIN.
(f) ENG INLET LIP HEAT switches - ON. Check #1 and #2 LIP HEAT caution/advisory annunciator lights illuminated.

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 which can have harmful effects on the human body and can ignite combustible materials, is emitted from the antenna reflector. Do not operate radar in congested areas.

PROCEDURE **TROUBLESHOOTING REFERENCE**

ENGINE RUNUP (CONT)

CAUTION

Do not operate the weather radar system where the nearest metal wall is within 50 feet of 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.
   (a) RADAR mode selector switch - SBY.
   (b) LSS mode selector switch - SBY.
   (c) WX pushbutton selector switch (display controller) - Depress. Observe that EHSI displays partial compass heading arc.
   (d) RADAR mode selector switch - TST. Observe that WX mode annunciator on EHSI remain STBY.
   (e) Range switches (radar control panel) - Depress both switches simultaneously. Observe that WX mode annunciator on EHSI changes from STBY to TEST, and that magenta, red, yellow, and green are displayed. A green noise band will appear at the upper arc range marking.

(f) RADAR mode selector switch - SBY, then as required.
(g) Range switches (radar control panel) - Select 50 NM or greater.
(h) LSS mode selector switch - CLR TST.
(i) EHSI - Verify that a white lightning rate symbol appears at approximately 25 NM at 45 degrees right of center and a magenta lightning alert symbol is displayed at maximum selected range of 45 degrees right of center.

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.

(j) LSS mode selector switch - SBY or as required.

NOTE

While the aircraft's weight is on the wheels, the weather radar system is forced into the standby mode. This is a safety feature that prevents the radar from transmitting on the ground, to eliminate the microwave radiation hazard.

BEFORE TAKEOFF

1. AUTOFEATHER switch - ARM.
2. PNEU & ENVIRO BLEED AIR valves (2) - As required.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE TAKEOFF (CONT)

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 to desired setting.
6. CABIN CONTROLLER - Set.
7. Annunciator panels - Check (not 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.

PROCEDURE	TROUBLESHOOTING REFERENCE

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 1700 RPM. With propellers synchronized, minimum indicated RPM is 1700 RPM. The maximum difference between the indicators is 20 RPM.	E28
2.	Engine instruments - Check the following instrument indications:	
	*(a) Torque	E24
	*(b) TGT	B9, E26
	*(c) N_1	E27
	*(d) Oil pressure	E7-9
	*(e) Oil temperature	E10
3.	Flight instruments - Check.	B1, 3

PROCEDURE	TROUBLESHOOTING REFERENCE

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.

CAUTION

Turn windshield anti-ice on to normal when passing 10,000 feet AGL or prior to entering the freezing level (whichever occurs 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.

PROCEDURE		TROUBLESHOOTING REFERENCE
2.	Propeller synchronization - As required.	
3.	Yaw damper - ENGAGE (required above 17,000 feet).	
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 point - Remove as required.	
10.	ASE - As required.	
*11.	Engine and flight instruments - Monitor. All instruments must give proper indication with minimum fluctuation.	E6
*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 of one minute.	
	(c) Read altimeter at end of one minute. Second reading must be 1000 $\pm$200 feet more than first reading.	

PROCEDURE	TROUBLESHOOTING REFERENCE

CLIMB (CONT)

*14.	Surface deice system - Check as follows: (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.	C42
*15.	Antenna deice system - Check as follows: (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.	C42
*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.

17. MANUAL deice - Hold switch to ON position. Note a 28 ampere increase in each loadmeter indication.

*18. 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 loadmeter 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.

*19. 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.

PROCEDURE	TROUBLESHOOTING REFERENCE

CLIMB (CONT)

(d) RADOME HEAT annunciator light - Check illuminated within 5 minutes.
(e) RADOME HOT annunciator light - Check extinguished.

*20. Waveguide pressurization system - Verify that the WAVE GUIDE annunciator light is illuminated when N_1 is above 80%.

*21. 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.

*22. 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 temperature.

(d) CABIN AIR MODE SELECT switch - AUTO.
(e) CABIN AIR TEMP CONTROL rheostat - Rotate to full INCR position. Observe an increase in cabin temperature.
(f) CABIN AIR TEMP control rheostat - Rotate fully counterclockwise. Observe a decrease in cabin temperature.

NOTE

Air conditioning will come on if cabin temperature is above 60 to 65° F.

Ensure that the temperature control rheostat is set to the mid position (approximately 75° F cabin temperature).

*23. Air conditioning cold operation - Check as follows:
(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.

PROCEDURE	TROUBLESHOOTING REFERENCE

CLIMB (CONT)

24. Pressurization system - Check as required (Chapter 4).

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.

* 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 and 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 airspeed 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 to their original readings.

*12. Propeller synchrophaser - Check capturing ability of the synchrophaser by establishing a small out of synchronization condition, then turning the synchronization is established and held within a few seconds.

13. Maximum TGT/N_1 availability - Perform as required (Chapter 4).

14. Speed performance at maximum cruise power - Perform as required (Chapter 4).

15. Engine performance at maximum continuous power - Perform as required (Chapter 4).

16. Engine performance at maximum cruise power - Perform as required (Chapter 4).

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

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

CRUISE (CONT)

(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).
(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 (Chapter 4).

*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 (Chapter 4).

LOW SPEED SYSTEMS CHECK

*1. Flap operation - Check as follows:

(a) Airspeed - Reduce to 197 KIAS or below.

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

(c) Airspeed - Reduce to 151 KIAS.

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

(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 2-71.1) 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.

PROCEDURE	TROUBLESHOOTING REFERENCE

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 2-71.1.

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**

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

WARNING

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

(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 2-71.1 (Make no further pitch trim adjustments).

WARNING

If the aircraft reaches an airspeed 5 KTS above the stall speed IAW fig. 1 page 2-52.2 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 2-71.1.

* (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.

PROCEDURE	TROUBLESHOOTING REFERENCE

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**.

(c) **PROP** levers – **HIGH RPM.**

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

(e) **POWER** levers– **IDLE**.

(f) Trim aircraft IAW Fig. 1 page 2-71.1 (Make no further pitch trim adjustments).

WARNING

If the aircraft reaches an airspeed 5 KTS above the stall speed IAW fig. 1 page 2-71.1 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 2-71.1.

* (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**

LOW SPEED SYSTEMS CHECK (CONT)

NOTE

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

RC-12P				
13,500 TRIM SPEED	Gear and Flaps Up Gear and Flaps Down		Power Idle Power Idle	150 KIAS 118 KIAS
15,000 TRIM SPEED	Gear and Flaps Up Gear and Flaps Down		Power Idle Power Idle	160 KIAS 127 KIAS
WEIGHT	STALL SPEEDS		WARNING HORN RANGE	
	VS	VSO	VS	VSO
16,500	107	83	112 - 119	88 - 95
16,000	105	82	110 - 117	87 - 94
15,500	104	81	109 - 116	86 - 93
15,000	102	80	107 - 114	85 - 92
14,500	101	79	106 - 113	84 - 91
14,000	99	77	104 - 111	82 - 89
13,500	98	76	103 - 110	81 - 88
13,000	96	75	101 - 108	80 - 87
12,500	95	74	100 - 107	79 - 86

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 individually.

(c) Respective IGN ON annunciator light - Illuminates at 13 to 19% torque.

(d) Power - Establishes 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 **F14,15** as follows:

(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 N1 RPM to decay below 20%.

(e) PROP lever (engine to be feathered) - FEATHER. Time to feather must not exceed 10 seconds from 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

Aristocrats 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.

LOW SPEED SYSTEMS CHECK (CONT)

CAUTION

Do not attempt engine restarts 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 overtemperature 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).

NOTE

If conditions permit, reduce power on the operative engine to obtain at 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) POWER lever - As required.
(15) GENERATOR switch - RESET, then ON.
(16) Engine AUTO IGNITION - As required.
(17) PROP SYNC switch - As required.
(18) Electrical equipment - As required.

(h) Repeat step g for opposite engine if required.

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

LOW SPEED SYSTEMS CHECK (CONT)

(a) AUTOFEATHER switch - ARM.
(b) Airspeed - 120 KIAS.
(c) PROP levers - Set 1700 RPM.
(d) POWER levers - Set as required to arm autofeather 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 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.

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 overtemperature condition.

(1) CABIN AIR MODE SELECT switch - OFF.
(2) FWD VENT BLOWER switch - AUTO.
(3) AUTO FLT 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

LOW SPEED SYSTEMS CHECK (CONT)

(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 700o 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) POWER lever - As required.
(15) GENERATOR switch - RESET, then ON.
(16) Engine AUTO IGNITION - As required.
(17) PROP SYNC switch - As required.

(18) Electrical equipment - As required.

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

a POWER lever - IDLE. PROP lever - Move out of FEATHER detent to full forward. Propeller RPM must reach 1000 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_1 and airspeed is below 140 KIAS.

PROCEDURE	TROUBLESHOOTING REFERENCE

LOW SPEED SYSTEMS CHECK (CONT)

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

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

(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) Cruise altitude - Establish in accordance with figure 3.
   (b) POWER levers - IDLE.
   (c) PROP levers - Set 1700 RPM.
   (d) Gear - UP.
   (e) Flaps - UP.
   (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) Aircraft - Level off 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_1 or TGT limits.

(b) PROP levers - Set 1700 RPM.
(c) Airspeed - 240 KIAS.
(d) Trim aircraft. 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:

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 M_{mo}. Exceeding M_{mo} could result in structural failure and loss of airframe integrity.

1. CABIN CONTROLLER - Set.

2. ICE & RAIN switches - As required.

DESCENT-ARRIVAL (CONT)

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.

3. WINDSHIELD anti-ice - As required.
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. Avionics and EFIS display controller - Set and check. Ensure EFIS displays match procedure to be flown.
9. 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.

PROCEDURE	TROUBLESHOOTING REFERENCE

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. PROP levers - HIGH RPM.

After touchdown:

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 asymmetrical braking power.
* 6. Proper reversing - Check as follows: E4
   (a) During landing utilize maximum reverse power.
   (b) Check for smoothness of operation and equal thrust from engines.

PROCEDURE **TROUBLESHOOTING REFERENCE**

LANDING (CONT)

*(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.

AFTER LANDING

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

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

7. Lights - As required.
8. Mission control panel - Set as follows:
   (a) RADIO ALT switch - OFF.
   (b) 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.
10. #1 and #2 EFIS power switches - Off.
11. BRAKE deice - Off.

*12. Battery condition - Check.

ENGINE SHUTDOWN (CONT)

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 CUTOFF.
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.
23. Keylock switch - OFF.

PROCEDURE	TROUBLESHOOTING REFERENCE

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. 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. E11-13

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 to indicate when limits in the operator's manual have been exceeded.

PROCEDURE	TROUBLESHOOTING REFERENCE

BEFORE LEAVING AIRCRAFT (CONT)

12. Aircraft - Check secured. Lock cabin door as required.

CHAPTER 3. TROUBLESHOOTING

3-1. GENERAL. This chapter contains troubleshooting information that has been referenced in Chapter 2. This chapter lists possible conditions, abnormal conditions and indications and probable causes. The information is to be used only as a quick reference any 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.
   (3) 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 indictor 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 indicator.

B3. Airspeed indicator reads incorrectly or fluctuate excessively.

a. Pitot tube or pressure line partially restricted or leaking.
b. Static port or line clogged or static line leaking.
c. Defective 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 electrical power.
b. Defective turn-and-slip indicator.

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.
f. Defective indicator.

B7. Fuel quantity indicator 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 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.
i. Defective indicator.

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.
n. Defective indicator.

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.
d. Landing gear power sense circuit breaker (under 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 landing gear pump motor 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 landing gear pump motor 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.
d. Defective speaker.

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 down lock switch.

C30. Landing gear handle light inoperative.

a. Defective or out of adjustment up-lock or down-lock 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. Pitot 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 fir 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. Staff warning deice heating element defective.

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. Fuel vent deice heating element defective.

TROUBLESHOOTING GUIDE D - CAUTION PANEL

CONDITION
PROBABLE CAUSE

D1. Placard 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, N_1, 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 oil supply.
b. Defective oil pressure indicator.
c. Dirty oil filter.
d. Defective pressure relief valve.

E10. High oil temperature.

a. Insufficient oil supply.
b. Defective oil temperature indicator.
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. Disconnect 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. Leak or restriction in P_y air bleed tube or P3 air delivery tube.

b. P3 air filter contaminated.
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 indicator.
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 indicator.
b. Defective compressor bleed valve.

E22. Maximum operating TGT has been exceeded.
a. Faulty instrumentation, thermo-couples, 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 performed 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 (AUTOFEATHER 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_1 (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 autofeather arm light does not illuminate when POWER levers are advanced to 90 percent N_1, (AUTOFEATHER ARM - TEST switch in TEST position).

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

F12. Both autofeather 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 autofeather 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 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 J - 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.

Defective UHF channeling tone not heard.

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 UFH 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 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.

TROUBLESHOOTING GUIDE L - STABILITY AND CONTROL SYSTEMS - NOT APPLICABLE

CONDITION
PROBABLE CAUSE

CHAPTER 4. SPECIAL PROCEDURES

4-1. GENERAL. This chapter contains the special procedure that were referenced in Chapter 2.

***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 less than 200 feet per minute.

6. CABIN CONTROLLER RATE knob - Set to a maximum. Monitor the cabinet of climb for a rate of 350 to 650 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 annunicator light illuminates between 12, 000 and 12, 500 feet.
11. CABIN PRESS DUMB 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 9000 feet cabin altitude.
14. CABIN CONTROLLER RTE 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 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 ±.1 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 determine the minimum N_1 required to maintain cabin pressure. Verify that cabin pressurization is maintained down to flight idle N_1.
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_1 required to maintain cabin pressure. Verify that cabin pressurization is maintained down to flight idle N_1.
25. Right ENVIRO & PNEU BLEED AIR switch - ON.
26. Cabin pressurization controller - Set to 500 feet above field elevation.

***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.

***MAXIMUM TGT/N_1 AVAILABILITY**

Ensure that sufficient POWER lever travel is available at 16,000 feet to produce a TGT of 840°C or an N_1 of 104%. Check that maximum TGT or N1 is available at the maximum POWER lever position as follows:

NOTE

The only requirement of the maximum TGT/N_1 id to verify that it is possible to obtain maximum allowable gas generator RPM (N_1) or reach the TGT limit with the POWER levers in the full forward position. If during the test the TGT limit or N_1 limits is obtained 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 N_1 Maximum N_1 is 104%. Maximum TGT is 840°C.

***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 Maximum 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) N_1.

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.

***ENGINE PERFORMANCE AT MAXIMUM CONTINUOS 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.

***ENGINE PERFORMANCE AT MAXIMUM CONTINUOS 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 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.
10. Observed TGT should not exceed chart value.
11. Repeat steps 3 through 10 for the other engine if required.

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.

AVIONICS FLIGHT CHECKS (CONT)

(c) TURN control - Place in center (detent) position.
(d) AP ENGAGE switch - Press to engage.
(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 thumblewheel (autopilot controller) - Move UP and DN while observing that aircraft and pitch trim indicator respond properly.
    (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:
  (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 air-speed hold function as follow:
  (1) Fly aircraft to test airspeed.
  (2) IAS switch-indicator (flight director mode selector) - Press on.
  (3) Aircraft should maintain air-speed 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 $\pm 2^\circ$ and within 3° of each other.

AVIONICS FLIGHT CHECKS (CONT)

*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 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 1-1510-224-10.

(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.

(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

PROCEDURE	TROUBLESHOOTING REFERENCE

AVIONICS FLIGHT CHECKS (CONT)

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.

(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 microphone switch and speaking into microphone or vice versa from copilot's position.

(4) Microphone switches - Actuate one at a time and speak into appropriate microphone. Side tone 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 to the on position one at a time and turn clockwise to increase volume and increase volume on appropriate receiver, listening for either radio reception or background noise.
    a Cycle PROP deice switch from OFF to AUTO and return to OFF.
    b Cycle electric standby fuel pumps.
(3) RADIO MON switches (audio control panel) - Pull out to the off position and turn 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.

PROCEDURE	TROUBLESHOOTING REFERENCE

AVIONICS FLIGHT CHECKS (CONT)

(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.
(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 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 hear 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:

(1) Station WWV - Select the frequency that provides the best signal. The station broadcasts on 2.5000, and 5.0000, 10.0000, 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/ glideslope/marker beacon) - Check as follows: K11-12,

(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

AVIONICS FLIGHT CHECKS (CONT)

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°.

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 ILS1 or ILS2 navigation source annunciator on respective HS1.

(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:

AVIONICS FLIGHT CHECKS (CONT)

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 illuminates and audio tone sounds.

*10. TACAN - Check as follows:
(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.

(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%.

AVIONICS FLIGHT CHECKS (CONT)

*(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: K21
(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.

*12. Encoding altimeter - Check as follows:
(a) Mode C switch (transponder control panel) - ON.
(b) Contact ground radar facility and request facility 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 sweep ranges at 5, 25, 50, 100, 200, and 300 nautical miles.
(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.

AVIONICS FLIGHT CHECKS (CONT)

(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 throughout 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.
(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. Verify that tilt is no 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 solid band of ground clutter is visible.

d Radar receiver GAIN control - Pull to select variable gain. Observe VAR on radar display.

AVIONICS FLIGHT CHECKS (CONT)

e RCT pushbutton switch - Depress four time 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 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) Lighting 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 display at 25 nautical miles, at 45 degrees to right of center. This symbol will take approximately 5 to 7 seconds to build up.

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 very bay as much 5 nautical miles if strong local interference is present.

(d) Verify that 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.

CHAPTER 5. CHARTS AND FORMS

5-1. GENERAL. This chapter 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.

LIST OF CHARTS

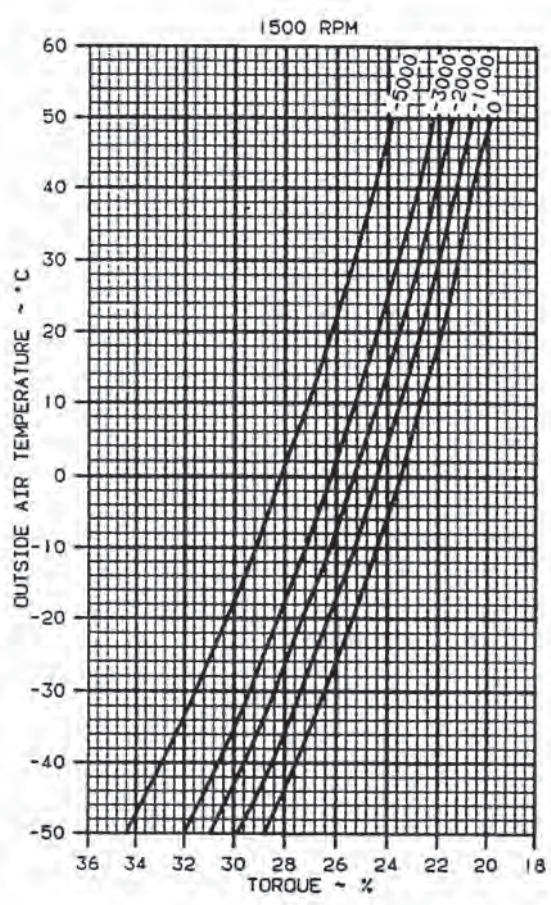


Figure 1. Propeller Low Pitch Stop (Sheet 1 of 4)

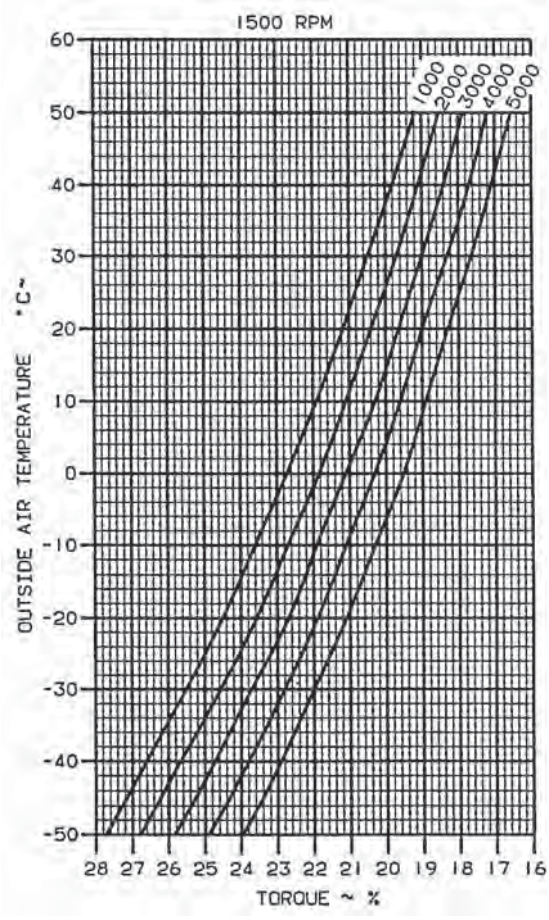
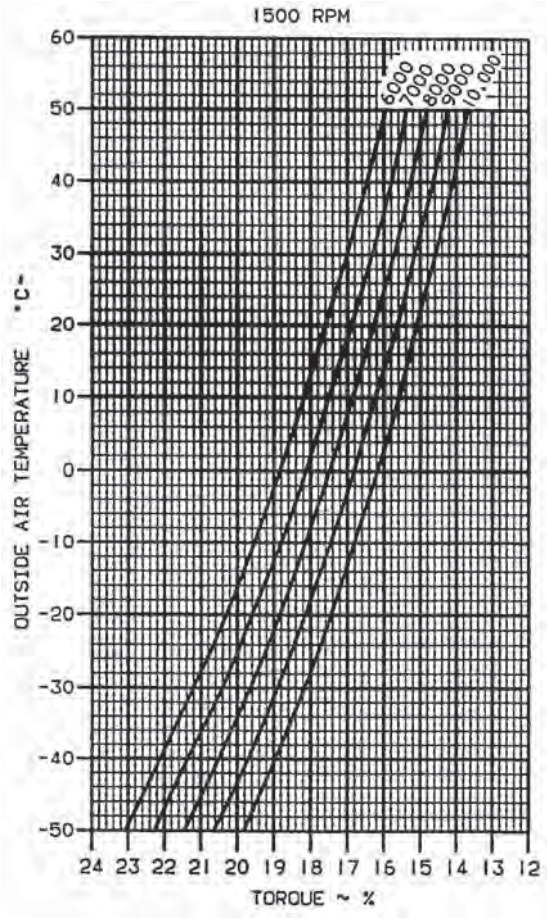


Figure 1. Propeller Low Pitch Stop (Sheet 2 of 4)



A93FE00C0195 C

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

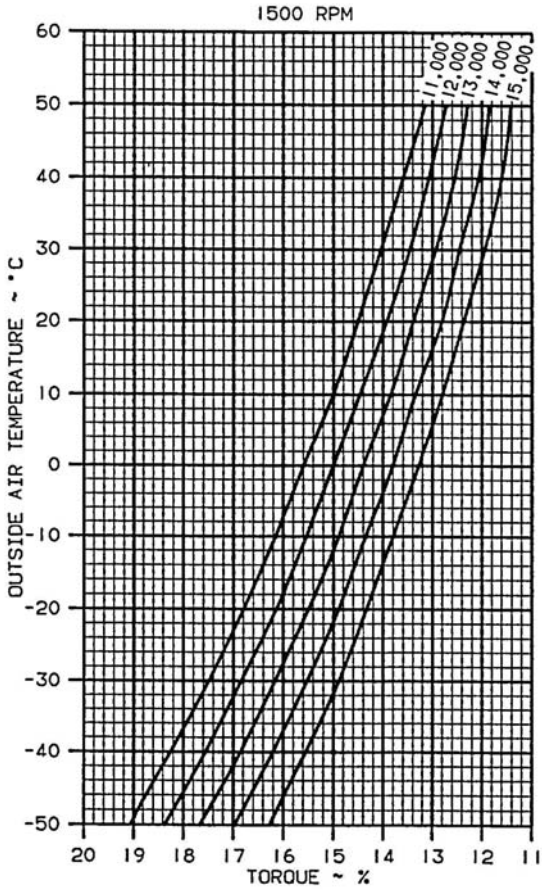


Figure 1. Propeller Low Pitch Stop (Sheet 4 of 4)

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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

BTO04224

Figure 3. Airspeeds for VMO Dive.

PT6A-67 MODEL RC-12P				
MAXIMUM CRUISE SPEED AND POWER 13,500 LB - 25,000 FT - 1700 RPM				
IFAT °C	**TORQUE %**	**FUEL pph**	**KIAS**	**TGT °C**
-40	69	429	193	777
-38	67	424	191	779
-36	66	416	188	188
-34	65	411	187	784
-32	64	406	185	786
-30	63	401	183	788
-28	62	395	182	790
-26	61	389	180	792
-24	59	383	178	794
-22	58	376	176	796
-20	57	370	173	798
-18	56	363	171	800
-16	54	357	169	802
-14	53	351	167	804
-12	51	341	163	807
-10	50	334	161	809
-8	48	328	158	*
-6	47	321	155	*
-4	46	314	153	*
-2	44	308	150	*
0	43	301	147	*
2	41	291	142	*
4	39	284	138	*
6	38	277	135	*
8	36	270	130	*
10	34	259	123	*
12	32	252	117	*
14	30	244	107	*
16	--	--	--	--
NO TESTING ALLOWED ABOVE 810°C TGT				

BT05319

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

PT6A-67 MODEL RC-12P				
MAXIMUM CRUISE SPEED AND POWER 15,000 LB - 25,000 FT - 1700 RPM				
IFAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	68	426	189	778
-38	67	421	187	780
-36	66	416	186	782
-34	65	410	184	784
-32	64	405	182	786
-30	63	400	180	788
-28	62	395	178	790
-26	60	388	176	792
-24	59	382	174	794
-22	58	376	172	796
-20	57	369	170	798
-18	55	363	167	800
-16	53	353	164	802
-14	52	347	161	804
-12	51	340	159	806
-10	49	334	156	808
-8	48	327	153	810
-6	47	320	150	*
-4	45	314	147	*
-2	43	304	142	*
0	42	297	138	*
2	40	290	134	*
4	39	283	129	*
6	--	--	--	--
8	--	--	--	--
10	--	--	--	--
12	--	--	--	--
14	--	--	--	--
16	--	--	--	--
18	--	--	--	--
NO TESTING ALLOWED ABOVE 810°C TGT				

BT05318

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

PT6A-67 MODEL RC-12Q				
MAXIMUM CRUISE SPEED AND POWER 13,500 LB - 25,000 FT - 1700 RPM				
ENGINE ANTI-ICE OFF				
IFAT °C	TORQUE %	FUEL pph	KIAS	TGT °C
-40	68	417	190	778
-38	67	411	188	780
-36	66	406	186	782
-34	65	401	185	784
-32	64	395	183	786
-30	63	389	181	788
-28	62	384	180	790
-26	60	376	177	792
-24	59	370	175	794
-22	58	364	173	796
-20	57	357	171	799
-18	55	350	169	801
-16	54	343	167	803
-14	52	336	164	805
-12	51	329	161	807
-10	50	323	159	809
-8	48	315	156	*
-6	47	309	154	*
-4	46	302	151	*
-2	44	295	148	*
0	42	288	144	*
2	41	281	140	*
4	39	274	137	*
6	38	267	133	*
8	36	259	128	*
10	--	--	--	*
12	--	--	--	*
14	--	--	--	*
16	--	--	--	--
NO TESTING ALLOWED ABOVE 810°C TGT				

BT06141

Figure 5. Maximum Cruise Speed and Power Q

PT6A-67 MODEL RC-12P		
MAXIMUM CONTINUOUS POWER 16,000 LB - 1700 RPM - 160 KIAS		
IFAT °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	69.9	*
12	68.5	*
14	67.2	*
16	65.8	*
18	--	--
* NO TESTING ALLOWED ABOVE 810°C TGT		

BT05316

Figure 6. Maximum Continuous Power P

PT6A-67 MODEL RC-12Q		
MAXIMUM CONTINUOUS POWER 16,000 LB - 1700 RPM - 160 KIAS		
IFAT °C	**TORQUE %**	**TGT °C**
-40	90	783
-38	89	785
-36	88	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	829
8	67	*
10	66	*
12	65	*
14	64	*
16	63	*
* NO TESTING ALLOWED ABOVE 810°C TGT		

BT06305

Figure 7. Maximum Continuous Power Q

PT6A-67 MODEL RC-12P		
MAXIMUM CRUISE POWER 25,000 LB - 1500 RPM - 160 KIAS		
IFAT °C	TORQUE %	TGT °C
-40	73	780
-38	73	781
-36	72	783
-34	71	785
-32	70	787
-30	69	789
-28	68	791
-26	67	793
-24	65	795
-22	64	797
-20	63	799
-18	62	801
-16	60	803
-14	59	805
-12	58	807
-10	57	809
-8	58.6	*
-6	57.3	*
-4	56.1	*
-2	54.8	*
0	53.4	*
2	52.0	*
4	50.6	*
6	49.1	*
8	47.6	*
10	46.0	*
12	44.5	*
14	42.8	*
16	41.2	*
18	--	*
* NO TESTING ALLOWED ABOVE 810°C TGT		

BT05317

Figure 8. Maximum Cruise Power P

PT6A-67 MODEL RC-12P		
MAXIMUM CRUISE POWER 25,000 LB - 1500 RPM - 160 KIAS		
IFAT °C	TORQUE %	TGT °C
-40	75	780
-38	74	782
-36	73	784
-34	72	786
-32	71	787
-30	70	789
-28	69	791
-26	68	793
-24	66	795
-22	65	797
-20	64	799
-18	63	801
-16	62	803
-14	60	805
-12	59	807
-10	58	809
-8	56	*
-6	55	*
-4	54	*
-2	53	*
0	51	*
2	50	*
4	48	*
6	47	*
8	45	*
10	44	*
12	42	*
14	40	*
16	39	*
* NO TESTING ALLOWED ABOVE 810°C TGT		

BT05865

Figure 9. Maximum Cruise Power

RC-12P AND RC-12Q MAINTENANCE TEST FLIGHT CHECK SHEET		
PURPOSE OF MTF	**FAT**	**DATE**
PILOT	**UNIT**	
SYMBOLS: √ = SATISFACTORY, X = DEFICIENCY		

	PRIOR TO MTF		3. Pilot's flight instruments
	1. Forms and records		4. Engine instruments
	2. Weight and balance		5. Copilot's flight instruments
	3. Flight readiness inspection		6. DC power, _____ VDC
	4. Oxygen		7. Annunciator panels
	5. Standby pumps and firewall valves		**BEFORE TAXIING**
	6. Fuel quantity indicators		1. AC/DC power
	7. Pitot tubes, stall warning vane, heated fuel vents (2), TAS temperature probe		2. a. AC frequency _____ Hz
			b. AC voltage _____
	8. Lights		c. DC voltage _____
	9. Hydraulic fluid level sensor		**DURING TAXIING**
	10. Engine fire protection		1. Brakes
	11. Stall and gear warning		2. Flight instruments
	12. Flaps		3. Nosewheel steering
	13. Seat belts		4. Magnetic compass
	14. Toilet		**ENGINE RUNUP**
	15. Emergency equipment		1. Parking brake
	16. Parachutes		2. Low idle speed
	17. Placards and markings		3. Propeller feathering
	18. Trim tabs		4. Engine acceleration to high idle
	19. Flight controls		5. High idle speed
	20. VHF transceivers		6. N_1 speed switch
	21. VHF NAV receivers		7. Pneumatics/vacuum/pressurization
	22. ADF		8. Rudder boost
	23. TACAN/DME		9. Autofeather/auto ignition
	24. Transponder		10. Overspeed governors
	25. **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/LSS
	4. Flare/chaff		**DURING TAKEOFF**
	BEFORE STARTING ENGINES		1. Propeller tachometers
	1. Magnetic compass		L _____ RPM, R _____ RPM
	2. Free air temperature gage		2. Torque L _____%, R _____%

Figure 10. Maintenance Test Flight Checksheet (Sheet 1 of 3)

	3. TGT, L _____°C, R _____°C		4. Stall speed, stall warning, and stall characteristics (gear down, flaps approach, power off), KIAS at warning _____, KIAS at stall _____, roll °L or R
	4. N_1 L _____ %, R _____ %		
	5. Oil pressure, L _____ PSI, R _____ PSI		
	6. Oil temperature, L _____°C, R _____°C		
	AFTER TAKEOFF		5. Stall speed, stall warning, and stall characteristics (gear down, flaps approach, power on), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R
	1. Tail boom antenna		
	CLIMB		
	1. Wings and center section		
	2. Engine and flight instruments		6. Stall speed, stall warning, and stall characteristics (gear down, flaps down, power off), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R
	3. Engine control levers		
	4. Vertical speed indicators		
	5. Surface deice		
	6. Antenna deice		7. Stall speed, stall warning, and stall characteristics (gear down, flaps down, power on), KIAS at warning _____, KIAS at stall _____, roll _____ °L or R
	7. Propeller deice		
	8. Windshield anti-ice		
	9. Radome anti-ice		
	10. Waveguide pressurization		8. Autoignition
	11. Cabin and cockpit ventilation		9. Propeller feathering
	12. Air conditioning and heating		10. Propeller autofeathering time from fuel cutoff to rotation stop L _____ seconds, R _____ seconds
	13. Air conditioning cold operation		
	CRUISE		
	1. Engine instrument indications		11. Propeller unfeathering time from propeller lever full forward to 1000 RPM L _____ seconds, R _____ seconds
	2. Wings and nacelles		
	3. Cabin noise level		
	4. Pilot's alternate static air source		12. Landing gear warning horn, N_1 on first hearing horn L _____ % R _____ %
	5. Propeller synchrophaser		
	6. Ice vanes		13. Landing gear normal operation
	7. Turn and bank indicators		a. Landing gear extension time _____ seconds
	LOW SPEED SYSTEMS		b. Landing gear retraction time _____ seconds
	1. Flap operation a. Flap retraction time _____ seconds b. Flap extension time _____ seconds		14. Emergency landing gear extension
			DESCENT AND LOW LEVEL CRUISE
			1. Maximum rate (V_{mo}) descent
			a. Flight controls
	2. Stall speed, stall warning, and stall characteristics (clean, power off), KIAS at warning _____, KIAS at stall _____, roll _____°L or R		b. Windows and doors
			2. Excess nose down trim
			LANDING
			1. Brake operation
	3. Stall speed, stall warning, and stall characteristics (clean, power on), KIAS at warning _____, KIAS at stall _____, roll _____°L or R		2. Propeller reversing. L _____ % N_1, R _____ % N_1
			3. Oil temperature, L _____°C, R _____°C
			4. Oil pressure, L _____ PSI, R _____ PSI

Figure 10. Maintenance Test Flight Checksheet (Sheet 2 of 3)

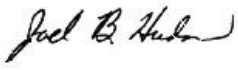
	ENGINE SHUTDOWN		i. KIAS _____
	1. Battery condition		j. TGT, L _____°C, R _____°C
	BEFORE LEAVING AIRCRAFT		k. N_1, L _____ %, R _____ %
	1. Walkaround inspection		6. Engine performance at maximum cruise power
	2. Aircraft forms		a. Engine serial number, L _____, R _____
	SPECIAL PROCEDURES		
	1. Pressurization		b. Engine hours since new, L _____, R _____
	2. Trim and rigging		
	3. Maximum TGT/N_1 availability		c. Engine hours since overhaul, L _____, R _____
	4. Speed performance at maximum cruise power		
	a. Engine serial number L _____, R _____		d. Pressure altitude, _____ feet
			e. Propeller RPM, L _____, R _____
	b. Engine hours since new, L _____, R _____		f. FAT _____ °C
			g. Torque, L _____%, R _____%
	c. Engine hours since overhaul, L _____, R _____		h. Fuel flow, L _____ PPH, R _____ PPH
	d. Pressure altitude, _____ feet		i. KIAS _____
	e. Propeller RPM, L _____, R _____		j. TGT, L _____°C, R _____°C
	f. FAT _____ °C		k. N_1, L _____ %, R _____ %
	g. Torque, L _____%, R _____%		7. Autopilot
	h. Fuel flow, L _____ PPH, R _____ PPH		8. Slaved compass
	i. KIAS _____		9. INS
	j. TGT, L _____°C, R _____°C		10. Audio control panel and interphone
	k. N_1 L _____ %, R _____ %		11. UHF
	5. Engine performance at maximum continuos power		12. VHF
	a. Engine serial number, L _____, R _____		13. HF
			14. ADF
	b. Engine hours since new, L _____, R _____		15. VOR/localizer/glideslope/marker beacon
			16. TACAN
	c. Engine hours since overhaul, L _____, R _____		17. TACAN distance measuring equipment
			18. Transponder
	d. Pressure altitude, _____ feet		19. Encoding altimeter
	e. Propeller RPM, L _____ R _____		
	f. FAT _____ °C		20. Radar
	g. Torque, L _____ %, R _____ %		
	h. Fuel flow, L _____ PPH, R _____ PPH		21. LSS

Figure 10. Maintenance Test Flight Checksheet (Sheet 3 of 3)

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:



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