

TECHNICAL MANUAL

MAINTENANCE OPERATIONAL CHECKS AND CHECK FLIGHTS

(ATOS)

THIS MANUAL SUPERSEDES T.O. 1-1-300, DATED 14 NOVEMBER 2007.

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Published under authority of the Secretary of the Air Force

15 MARCH 2012

1. PURPOSE.

1.1. This technical manual establishes policy and requirements to perform Maintenance Operational Checks and Check Flights on USAF aircraft. It establishes requirements to ensure the aircraft is airworthy via Functional Check Flights (FCF) or capable of mission accomplishment via Operational Check Flights (OCF). It establishes requirements to be used by USAF in accepting new production aircraft and guidelines for conducting Acceptance Check Flights (ACF). It also establishes requirements to be used for noncritical systems checks via Equipment Check Flights (ECF).

1.2. Submit proposed changes to this technical manual through the major command to HQ AFMC/A3V, 508 W Choctawhatchee Ave, Suite 4, Eglin AFB, FL 32542-5713.

2. SCOPE.

This technical manual applies to all commands, field operating agencies, and direct reporting units of the USAF, Air Force Reserve Command, Air National Guard, and Air Force contractors involved in the manufacture of new production aircraft, having bailed aircraft or processing aircraft on contract for maintenance, modification or removal from storage.

3. MAINTENANCE OPERATIONAL CHECKS.

3.1. Maintenance operational checks are checks accomplished on the ground to ensure aircraft systems or components, which have been disturbed during inspection or maintenance operations, have been repaired, reassembled or adjusted satisfactorily.

3.2. These checks will be accomplished to simulate, insofar as possible, the conditions under which the system or component will be operated. The affected equipment will

be operated through a sufficient number of cycles to ensure aircraft is safe for operational use.

3.3. Maintenance operational checks involving ground or hover taxi of helicopter or high-speed taxi of fixed wing aircraft will be accomplished and certified by pilots qualified as specified in paragraph 5.1. Pilots performing high-speed taxi checks will compute takeoff data to indicate the highest speed expected and the stopping distance.

3.4. Maintenance operational checks will be recorded on AFTO Form 781A and/or AFTO Form 349 and/or CAMS in accordance with TO 00-20-1 and TO 00-20-2 series technical manuals.

3.5. Acceptance inspections on newly produced weapon systems, major system modifications or upgrades will be accomplished on receipt at either test or operational locations for the purpose of ensuring proper configuration control and to provide feedback to the developing command and contractors concerning manufacturing quality assurance.

4. CHECK FLIGHTS.

4.1. Check flights are performed to determine whether an aircraft and its various components are functioning according to predetermined specifications while subjected to the flight environment. Such flights are conducted when it is not feasible to determine safe or required operation (aerodynamic reaction, air loading, signal propagation, etc.) by means of ground or shop tests. Equipment operating procedures, limit pressure readings, and conditions to be noted and recorded during ACF/FCF are normally specified in the -6CF Acceptance/Functional Check Flight Procedures Manual. Check flights are normally conducted following maintenance work and prior to release of the aircraft for operational use. For the purpose of this instruction, to ensure aircraft is airworthy, primary aircraft systems are

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those affecting engines; flight controls; landing gear; and those systems affecting the basic Instrument Flight Rules (IFR) capability of the aircraft (i.e., pitot static; compasses; attitude references, air data computers, etc.).

4.1.1. Acceptance Check Flight (ACF). Includes check flights for performance and operation of systems/equipment to verify contractual conformance and/or to ensure aircraft is airworthy in accordance with paragraph 4.1. This is applicable to all aircraft on new aircraft production, modification or Programmed Depot Maintenance (PDM) contracts. ACF missions are flown to check the operations of selected systems or equipment that requires flight verification. Full ACF profiles are flown when required.

4.1.2. Equipment Check Flight (ECF). Airborne functional check to establish if a basic aircraft noncritical system, subsystem or equipment when subjected to design environment, is operating properly. Generally, areas checked on the ECF are equipment or systems whose failure would not adversely affect flight safety.

4.1.3. Functional Check Flight (FCF). Check flight conducted for other than contractual conformance and/or to ensure aircraft is airworthy in accordance with paragraph 4.1. FCF missions are flown to check the operations of selected systems or equipment that requires flight verification. Full FCF profiles are flown when required.

4.1.4. Operational Check Flight (OCF). Check flight conducted after maintenance to ensure aircraft mission specific equipment is operational and the aircraft is mission ready, (i.e., AC-130U 105 mm gun check firing).

4.2. Conditions requiring an ACF/FCF are specified in the -6 inspection manual for each type of aircraft. Time Compliance Technical Orders (TCTO) may also require an FCF for work accomplished in accordance with the TCTO. In the event the aircraft manufacturer does not provide guidance as to what maintenance actions require a functional check flight, the MAJCOM/LG will develop an ACF/FCF/maintenance action guidance matrix for use by the field.

4.3. Under circumstances other than those specified in the aircraft -6 inspection manual, the need for an aircraft Check Flight following maintenance or repair work is an engineering decision to be exercised by the commander. Such decisions will be based upon the scope of work accomplished and consideration of the affected components relative to safety of operation.

4.4. Any flight performed to accept or check accomplishment of depot maintenance or modification will be identified as an ACF/FCF. Any modification or TCTO that affects a primary aircraft system as defined in paragraph 4.1 will be identified as an ACF/FCF.

4.5. Any flight performed to accept or check new aircraft production will be identified as an ACF. Normally all -6

and -6CF requirements will be completed, however, procedures developed by the contractor and approved by the government may be used.

4.6. Check flights will:

- a. Be conducted at power settings within the limits specified in flight operating flight manual/publications.
- b. Be conducted within the designated check flight airspace of the base from which the flight was launched except when the flight must be conducted under specific environmental conditions not compatible with local conditions and/or restrictions. This does not preclude departing from an auxiliary field or base within the home station.
- c. Be conducted from runways with an operable barrier system for those aircraft equipped with arresting gear (tail hook). See published MAJCOM guidance (AFI 11-2MDS, Vol 3) for detailed requirements and/or exceptions to this requirement.

4.7. Combat and combat support aircraft assigned to units engaged in armed conflict, which have had temporary repairs made at an auxiliary or recovery base, may have an FCF accomplished enroute to home station or a designated repair facility. If practical, the FCF portion of the flight will be accomplished in the immediate area of the departure base to determine the aircraft is airworthy for the flight. The decision to approve combined FCF and ferry flight is the responsibility of the wing commander of the unit to which the aircraft is assigned, in coordination with the wing or equivalent commander of the unit where the repair is accomplished. Prior to approval, the following should be considered: pilot proficiency, route of flight, weather conditions, extent of repair, and conditions under which the repairs were accomplished. Authority to approve combined FCF and ferry flights will not be delegated. The wing or equivalent commander shall have the option to conduct combat aircraft functional check flights with loaded and charged internal gun systems in a hostile environment. (Helicopter only) Combined FCF and ferry flights may be conducted from isolated combat locations such as a Forward Operating Base (FOB) with a normal weapons and self-protection combat loadout.

4.8. If the mission is an ACF/FCF flown to ensure aircraft is airworthy. Mission or training events may be flown at the end of the sortie, provided the primary aircraft systems as defined in paragraph 4.1 are first checked and verified as functional.

4.9. The wing or equivalent commander may authorize a combination ACF/FCF with a mission or training flight if the ACF/FCF is being flown to check the operation of auxiliary systems or components.

4.10. Commanders or their maintenance officers may expand the scope of check flight requirements. During the

crew briefing, the check flight items/scope will be mutually understood.

4.11. Major commands may waive ACF/FCF only under extenuating circumstances, such as when weather delays would seriously degrade combat potential or preclude meeting operational mission requirements.

4.12. Duplication of ACF by the USAF and contractors will be held to a minimum. The USAF should use flight test sampling when a contact's production quality levels permit.

5. AIRCREW REQUIREMENTS.

5.1. Check flights will be accomplished by aircrew possessing the best qualifications as determined by command directives and flying unit commanders. Check flights accomplished on USAF aircraft by contractor personnel in the performance of contractor maintenance requirements will be performed by flight crews qualified in accordance with the provisions of DCMA Instruction 8210.1, Contractors Flight and Ground Operations or earlier version as defined by contract.

5.2. Check flights will be conducted by the minimum aircrew defined by the technical manual and MAJCOM directives plus any personnel designated by the OG/CC or equivalent as required for the mission in accordance with AFI 11-401, Aviation Management, and applicable MAJCOM supplements. Check flights will be accomplished without cargo or nonessential passengers/crew members (as determined by the OG/CC or equivalent).

5.3. Major commands will determine Check Flight crew complement and certification. These crew members will be designated in writing.

6. WEATHER REQUIREMENTS.

6.1. Check flights will normally be conducted in daylight, Visual Meteorological Conditions (VMC). Aircraft with four or more engines may conduct check flights during hours of darkness if VMC exists at the departure airfield.

6.2. The operations group (or equivalent) commander to which the aircraft is assigned (for transient aircraft, the wing or equivalent commander at the transient base) may waive paragraph 6.1 and authorize ACF/FCF under the following conditions, when required:

- a. Takeoff in VMC to begin the check flight. If the aircraft is operating properly in VMC, pilots may proceed into Instrument Meteorological Conditions (IMC) to penetrate cloud cover and complete the check flight in VMC conditions above the clouds.
- b. Weather conditions versus the necessity to conduct a check flight must be considered.

6.3. When a flight is required only to check the operation of auxiliary systems or components, the flight may be

initiated during daylight hours under IMC or during hours of darkness under VMC provided:

- a. The aircraft is known to be operational for night or IMC flight as appropriate.
- b. Failure or malfunction of the component or system to be checked would not affect operation of the aircraft at night or under IMC, as appropriate.
- c. The check flight portion of the flight can be accomplished under VMC or VMC conditions above the clouds.

7. FLIGHT DURATION.

7.1. ACF/FCF duration for engine changes are specified in the -6 inspection manual. These are minimum times based on the time required to accomplish the functional checks prescribed in the applicable ACF/FCF checklist.

7.2. Duration of a flight to complete a specified inspection is the time necessary to accomplish the checklist, determine the affected equipment is operating properly, and ensure aircraft is airworthy and capable of mission accomplishment.

7.3. Duration of flights for other conditions will be determined by the responsible maintenance officer or pilot but must be sufficient duration to accomplish the checks specified in the check list at specified altitudes.

7.4. The ACF/FCF should not take off unless sufficient time is available to complete the required elements as defined in the -6CF and in accordance with paragraph 6.1.

8. FLIGHT DOCUMENTATION.

8.1. ACF/FCF and release of aircraft for operational use are recorded in the AFTO Form 781 series and/or on AFTO Form 349 and/or CAMS in accordance with TO 00-20-1 and TO 00-20-2 series technical manuals.

8.2. The check pilot is responsible to ensure all discrepancies noted by the flight crew before, during, and after flight are recorded on AFTO Form 781A or on the contractor form approved by the government in accordance with TO 00-20-1.

8.3. The ACF/FCF that have validated airworthiness but must continue to subsequent sortie(s) for additional in-flight verification of noncritical systems will still be documented as an ACF/FCF. The ACF/FCF is not complete until all required items have been verified. Subsequent sortie(s) status will not be changed to ECF status.

9. FLIGHT CHECKLISTS.

9.1. USAF ACF/FCF checklists are issued for each type, model or series aircraft for which a -6 inspection manual exists. These checklists specify minimum requirements for accomplishment of ACF/FCF. Use of the entire checklist is

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required only when a complete check flight is accomplished. Locally developed checklists may be used for aircraft that do not have a published checklist. Units may develop local checklist guides to accommodate local air-space configuration, weather, etc., to facilitate the smooth flow of the mission. Once the mission is complete, transcribe the results into the -6CF published checklists (if available) for inclusion in the aircraft documentation folders. Locally developed ACF/FCF results worksheets must capture the pertinent information from the ACF/FCF checklist and contain all signature and ACF/FCF sign-off information. Contact the applicable TO manager for approval to use ACF/FCF worksheets.

9.2. ACF checklists are developed by the contractor and approved by the government. These checklists specify minimum requirements for accomplishment of ACF.

9.3. ACF/FCF checklists are divided into sections pertaining to particular stations and flight crew members. Flight crew members will use the specified symbols to complete the checklist or section of the checklist applicable to their station and/or equipment. When check flights are accomplished to check specific equipment or systems, only applicable portions of the checklist will be used. The AFTO

Form 781A may also be used to record and verify accomplishment of specific checklist requirements of partial check flights. Upon completion of the check flight, the pilot in command will sign the checklist to indicate they have completed the inspection requirements. Government approved procedures apply for ACF.

9.4. Completed ACF/FCF checklists or approved ACF/FCF results worksheets are filed with the aircraft maintenance records for a period of 3 months or until replaced by a new ACF/FCF checklist/worksheet, whichever is later. Copies of worksheets used in place of an AFTO Form 781A to report ACF/FCF discrepancies are filed and disposed of in accordance with TO 00-20-1. Checklists containing classified information entries may be treated as classified waste immediately following debriefing under the provisions of AFI 31-401, Information Security Program Management. The responsible crew members will sign a certificate stating all required equipment checks were made and were satisfactory, and the certificate will be filed instead of the classified checklists. Government approved procedures apply for ACF.

THE END