

**BY ORDER OF THE
SECRETARY OF THE AIR FORCE**

**DEPARTMENT OF THE AIR FORCE
INSTRUCTION 63-140**



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**442D FIGHTER WING
Supplement**

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Acquisition

**AIRCRAFT STRUCTURAL INTEGRITY
PROGRAM AND AIR AND SPACE
EQUIPMENT STRUCTURAL
MANAGEMENT**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This publication implements the integrity program requirements related to structural integrity in Air Force Policy Directive (AFPD) 63-1/20-1, *Integrated Life Cycle Management*, and is consistent with DoD Directive 5000.01, *The Defense Acquisition System*, and DoD Instruction 5000.02T, *Operation of the Defense Acquisition System*. It also provides structural management direction associated with AFPD 21-1, *Maintenance of Military Materiel*, and designates offices and procedures that provide Air Force technical and engineering support for air and space assets utilizing technologies in the structural disciplines. This Department of the Air Force Instruction (AFI) specifically addresses the structural disciplines of advanced composites, corrosion prevention and control, low observables supportability, metals technology, and nondestructive inspection (commonly abbreviated as “NDI”) for non-facilities assets. This publication applies to

all military and civilian employees of the Regular Air Force, Air Force Reserve, and Air National Guard, and to other individuals or organizations as required by binding agreement or obligation with the Department of the Air Force. Any contractor requirements contained within this instruction must be contained within the contract, grant, or agreement to be enforceable. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with AFI 33-322, *Communication and Information Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*. Route AF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but to ensure standardization, any organization supplementing this instruction must send the implementing publication to the Engineering & Force Management Division, office of the Deputy Assistant Secretary for Science, Technology and Engineering (SAF/AQRE) for review and coordination before publishing. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0,” “T-1,” “T-2,” “T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor’s commander for non-tiered compliance items. Tiering is further addressed in [paragraph 1.4](#).

(442FW) This supplement establishes procedures and organizational direction for the 442 Fighter Wing (442FW). This instruction applies to all personnel assigned to the 442d Maintenance group (MXG). MXG Supervisors will ensure compliance with this instruction. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with AFI 33-322, *Communication and Information Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*. Route AF Forms 847 from the field through the appropriate functional chain of command.

SUMMARY OF CHANGES

This document has been substantially revised. Major changes include the integration and streamlining of content from AFI 20-114. The integration removes Air Force Materiel Command (AFMC) detailed procedures previously in AFI 20-114. Removed procedures may be addressed in a supplement or another lower-level Air Force publication.

1. Overview.

1. (442FW) Overview. This 442d Fighter Wing Instruction addresses the approval and application of aircraft artwork/optional markings applied to all 442d Fighter Wing aircraft as directed in DAFI 63-140 AFRC Sup [paragraph 4.1.3](#).

1.1. Publication Organization.

1.1.1. This instruction integrates directive guidance for the Air Force Aircraft Structural Integrity Program (commonly abbreviated as “ASIP”) with directive guidance for the complementary air and space equipment structural management disciplines.

1.1.2. **Paragraph 2** and its subparagraphs contain combined roles and responsibilities. Where appropriate, this instruction clearly delineates separate Aircraft Structural Integrity Program and structural management roles and responsibilities.

1.1.3. **Paragraph 3** and its subparagraphs contain specific directive guidance and procedures for the Aircraft Structural Integrity Program.

1.2. **Air Force Aircraft Structural Integrity Program.**

1.2.1. The Aircraft Structural Integrity Program requires aircraft program offices and Major Commands (MAJCOM) to collaborate on a series of time-phased tasks during the development, acquisition, production, modification, and sustainment of Air Force aircraft. These collaborative tasks support aircraft mission readiness and airworthiness assurance.

1.2.2. The goal of the Aircraft Structural Integrity Program is to ensure the structural safety, performance, durability, and supportability of Air Force aircraft throughout their service lives, with the least possible economic burden.

1.2.2.1. The objectives of the Air Force Aircraft Structural Integrity Program are to:

1.2.2.2. Define the structural integrity requirements necessary to support airworthiness assurance.

1.2.2.3. Establish, evaluate, substantiate, and certify the structural integrity of aircraft structures.

1.2.2.4. Acquire, evaluate, and apply aircraft usage and maintenance data to ensure the continued structural integrity of operational aircraft.

1.2.2.5. Provide quantitative information for decisions on force structure planning, inspection, modification priorities, and risk management. The Aircraft Structural Integrity Program also provides information on expected life cycle costs and related operational and support issues.

1.2.2.6. Provide a basis for improving structural criteria and methods of design, manufacturing, evaluation, and substantiation for future aircraft systems and modifications.

1.3. **Air and Space Equipment Structural Management.**

1.3.1. This publication addresses the structural management disciplines of advanced composites, corrosion prevention and control, low observables supportability, metals technology, and nondestructive inspection (commonly abbreviated as “NDI”). Structural management disciplines complement the Aircraft Structural Integrity Program. They also optimize safety, serviceability and readiness throughout the life cycle of air and space equipment.

1.3.2. Structural management, as addressed in this publication, refers to the technical and engineering support activities associated with requirements development, design, maintenance, and integrity monitoring-assessment of air and space physical structural

equipment and assets. AFMC maintains offices with structural management technical experts. These experts advise MAJCOMs, program managers, and the AFMC enterprise on the structural management disciplines. They provide engineering and technical support on the maintenance, training, supportability, and development of metal, plastics, bonded honeycomb and advanced composite repair capabilities. They also support Air Force-wide implementation of facility, tooling, processing and equipment guidelines. The AFMC structural management technical experts may also advise or review facilities and infrastructure projects. However, this publication only addresses the structural management requirements and responsibilities for non-facilities Air Force air and space equipment. **Note:** Specific directive guidance for the structural maintenance career fields, maintenance technicians, and maintenance specialties is included in AFI 21-101, *Aircraft and Equipment Maintenance Management*. AFI 63-140 and the structural maintenance guidance in AFI 21-101 are complementary.

1.3.2.1. Advanced composites are composed of various filament reinforcements of high strength, stiffness, electrical, chemical or other specialized properties embedded in matrix materials with tailored physical properties. AFMC advanced composites technical experts provide engineering and technical support on the repair, maintenance, training, development, testing, and selection of advanced composites. They also support Air Force-wide implementation of facility, tooling, processing and equipment guidelines for advanced composites supportability processes in accordance with Technical Order (TO) 1-1-690, *General Advanced Composite Repair Processes Manual*.

1.3.2.2. Corrosion prevention and control is the materials, processes, and activities utilized to combat the deterioration of a material or its properties due to the reaction of that material with its chemical environment. AFMC corrosion prevention and control technical experts provide engineering and technical support to the Air Force Corrosion Control and Prevention Executive (a position required in each Military Service by Title 10 United States Code Section 2228, *Office of Corrosion Policy and Oversight*), in addition to program managers and MAJCOMs, for corrosion prevention, mitigation, and control on air and space systems Air Force-wide.

1.3.2.3. Low observables are the technologies implemented to control the radar, infrared, visual, and acoustic signatures in aircraft to reduce their vulnerability. AFMC low observables technical experts provide engineering and technical support to ensure the integrity, reliability and maintainability of low observable materials, repair processes, nondestructive inspections, signature diagnostic measurements, and signature health assessments for air and space systems Air Force-wide.

1.3.2.4. Metals technology encompasses the technologies used in the manufacture, fabrication, heat treatment, welding, inspection, and testing of metal parts for aircraft and aerospace equipment. AFMC metals technology technical experts provide engineering and technical support for additive manufacturing (i.e., 3-dimensional printing) and support its implementation Air Force-wide. They establish Air Force-wide guidance for welding certification, and advise the AFMC enterprise and MAJCOMs on aerospace welding repairs and processes, as requested.

1.3.2.5. Nondestructive inspection is an inspection process or technique designed to reveal the damage at or beneath the external surface of a part or material without adversely affecting the material or part being inspected. Nondestructive inspection methods require specific long term training, experience and qualifications. AFMC Nondestructive Inspection experts provide engineering and technical support to program managers and MAJCOMs on nondestructive inspection standards, methods, processes, equipment, and personnel certification.

1.4. Waivers and Tailoring for Acquisition Programs.

1.4.1. Waivers. Waivers for compliance requirements that this instruction places on the acquisition execution chain are not elevated through the MAJCOM-wing-unit organizational chain of authority. The acquisition execution chain is defined in AFI 63-101/20-101, *Integrated Life Cycle Management*. It includes the Service Acquisition Executive, Program Executive Officer, Decision Authority, the program manager, or other program office members. Therefore, tiering in accordance with the standard organizational terminology of AFI 33-360 cannot be applied. Instead, the waiver authority for each compliance requirement applied to the acquisition execution chain by this instruction is specified in the text.

1.4.2. Tailoring. Acquisition program managers, with Decision Authority approval, retain the ability to tailor and streamline strategies, oversight, reviews, phases, decision levels, documentation, regulatory requirements and information consistent with the tailoring guidance in AFI 63-101/20-101 and DoDI 5000.02T. Tailoring is especially appropriate for programs that are rapidly fielding capabilities, for example, Middle Tier Acquisition pathway programs or the acquisition of commercial off-the-shelf systems.

2. Roles and Responsibilities.

2. (442FW) Roles and Responsibilities. All aircraft artwork/optional markings installed on the aircraft will be requested and reviewed by the Maintenance Group chain of command, Public Affairs Office, and Wing Historian Office before final approval by 442d Fighter Wing Commander, per DAFI 63-140 Air Force Reserve Command (AFRC) Supplement, *Aircraft Structural Integrity Program and Air and Space Equipment Structural Management*, paragraphs 4.1.3.5.1, using a locally produced routing worksheet (see [Attachment 2](#)).

2.1. Assistant Secretary of the Air Force for Acquisition, Technology & Logistics (SAF/AQ):

2.1.1. Oversees Air Force Aircraft Structural Integrity Program policy.

2.1.2. Supports aircraft program office Aircraft Structural Integrity Program implementation as a part of the integrated life cycle management of systems.

2.1.3. Works with the Deputy Chief of Staff, Logistics, Engineering and Force Protection (AF/A4) and the Commander, AFMC (AFMC/CC) to designate the Air Force Aircraft Structural Integrity Program Technical Advisor.

2.1.4. Works with AF/A4 and AFMC/CC to develop and implement technician and artisan certification and recertification standards applicable to structural maintenance.

2.2. Deputy Chief of Staff, Logistics, Engineering and Force Protection (AF/A4):

- 2.2.1. Integrates Aircraft Structural Integrity Program into field-level maintenance policy.
- 2.2.2. Supports Aircraft Structural Integrity Program-related planning, programming, and budgeting activities for each aircraft program.
- 2.2.3. Promotes initiatives, develops policy and issues implementation guidance that enhances effectiveness of structural materials and fabrication maintenance. AF/A4 also resolves training issues in accordance with AFI 36-2651, *Air Force Training Program*, for the structural disciplines that directly involve Air Force Specialty Code 2A7XX and the equivalent civilian workforce.

2.3. Commanders, Major Commands (MAJCOM) and Director, Air National Guard:

- 2.3.1. Establish an Aircraft Structural Integrity Program office of primary responsibility for managing the Aircraft Structural Integrity Program command-wide.
- 2.3.2. Develop, publish, and update documentation specifying MAJCOM or lead operating command Aircraft Structural Integrity Program responsibilities in accordance with this instruction.
- 2.3.3. Assist program managers in the development, maintenance, and implementation of Aircraft Structural Integrity Program master plans as requested.
- 2.3.4. Install, operate, and maintain Aircraft Structural Integrity Program hardware. This includes systems that support loads and environment spectra surveys and individual aircraft tracking data collection, transfer, and analysis. These systems are maintained in a manner sufficient to support the valid data capture rates required by the aircraft-specific Aircraft Structural Integrity Program Master Plans.
- 2.3.5. Ensure that unit personnel collect and report data in accordance with the valid data capture rates defined by the Aircraft Structural Integrity Program Master Plans.
- 2.3.6. Assist program office Aircraft Structural Integrity Program managers in the development and implementation of corrective actions as needed to achieve required valid data capture rates.
- 2.3.7. Evaluate annual Aircraft Structural Integrity Program summaries as they apply to force structure, aircraft operational use and budgeting.
- 2.3.8. Ensure that unit personnel conduct structural inspections required by an aircraft's Aircraft Structural Integrity Program in accordance with the appropriate schedules, processes, procedures, and TOs.
- 2.3.9. Support command-wide integrated life cycle execution of structural disciplines by:
 - 2.3.9.1. Assigning MAJCOM functional manager(s) to each structural discipline as determined by and applicable to the specific MAJCOM.
 - 2.3.9.2. Ensuring personnel performing nondestructive inspections (including contracted personnel) are certified in accordance with AFI 21-101 and National Aerospace Standard 410, *Certification & Qualification of Nondestructive Test Personnel*, as applicable. **Note:** The AFMC nondestructive inspection focal point may periodically audit and validate the certification of contracted nondestructive inspection personnel.

2.3.9.3. Providing subject matter expert support for TO change validation and verification processes.

2.3.9.4. Supporting field testing of materials, processes, facilities, and equipment.

2.3.9.5. Supporting proficiency testing and probability of detection studies in operational and depot environments.

2.3.9.6. Participating, as applicable to the MAJCOM structural disciplines, in periodic MAJCOM-specific surveys, and base assessments.

2.4. **Commander, AFMC (AFMC/CC):**

2.4.1. Includes Aircraft Structural Integrity Program master plan development, maintenance, and implementation requirements in MAJCOM self-assessment communicator checklists.

2.4.2. Sustains and enhances a data management capability to support Aircraft Structural Integrity Program (e.g., the Aircraft Structural Integrity Management Information System).

2.4.3. Provides structural management integrated life cycle engineering and technical support to Headquarters Air Force, MAJCOMs, program managers, and to Air Force advisory boards for design, test, redesign, analysis and sustainment of assets associated with structural disciplines. This engineering and technical support includes:

2.4.3.1. Evaluating materials, processes, facilities and equipment requirements for structural impacts. This includes viability assessment of emerging material, nondestructive inspection, and repair technologies in structural disciplines and assistance with transition to new and existing systems.

2.4.3.2. Supporting Air Force career field managers, MAJCOM functional managers, Air Education and Training Command training managers, utilization and training workshops, and career development course writers for education and training of Air Force Specialty Code 2A7XX personnel.

2.4.3.3. Conducting Air Force structural management assessments and corrosion surveys at least every five years or at the request of a MAJCOM. These assessments and surveys identify deficiencies in the Air Force implementation of structural management disciplines and assist in the prioritization of AFMC structural management projects. Execute these assessments and surveys in accordance with AFI 90-201, *The Air Force Inspection System*.

2.4.3.4. Coordinating with environment, safety, and occupational health offices of primary responsibility to assist users in meeting applicable environment, safety, and occupational health requirements. This includes providing inputs associated with structural disciplines to Air Force occupational safety and health publications.

2.4.3.5. Establishing AFMC offices and focal points that provide technical experts for the structural disciplines listed in [paragraph 1.3.2](#) and designating managers for the structural management-related TOs identified in [Attachment 2](#) to ensure their currency, applicability, and completeness.

2.4.3.6. Providing program managers and MAJCOMs verifiable engineering inspection reliability data based on probability of detection and proficiency studies.

These studies are conducted in accordance with Military Handbook 1823 (MIL-HDBK-1823), *Nondestructive Evaluation System Reliability Assessment* and Military Standard 1530 (MIL-STD-1530), *DoD Standard Practice for Aircraft Structural Integrity Program*, every five years or sooner when requested by MAJCOMs or program managers.

2.4.3.7. Establishing and maintaining the Air Force-wide process for the certification of all Air Force civil service nondestructive inspection personnel who require certification in accordance with AFI 21-101 or this instruction.

2.5. Air Force Aircraft Structural Integrity Program Technical Advisor:

2.5.1. Reviews all Aircraft Structural Integrity Program master plans including updates and makes approval recommendations to the Program Executive Officer. **(T-2)**.

2.5.2. Reviews execution of the Aircraft Structural Integrity Program for each mission design series. **(T-2)**. Identifies trends, gaps, and opportunities for improvement in the Aircraft Structural Integrity Program execution, and will report these findings to Program Executive Officers and lead and operating MAJCOMs. **(T-2)**.

2.6. Program Executive Officers (or delegated Decision Authority, when delegated in accordance with AFI 63-101/20-101):

2.6.1. Ensure that program managers establish Aircraft Structural Integrity Programs and develop Aircraft Structural Integrity Program Master Plans for each mission design series operated by the Air Force in their portfolio.

2.6.2. Ensure aircraft program managers are executing the Aircraft Structural Integrity Program requirements in a timely manner as an integral part of life cycle management.

2.6.3. Utilize Aircraft Structural Integrity Program information in modification management and implementation.

2.6.4. Approve all Aircraft Structural Integrity Program master plans including updates.

2.7. Program Managers:

2.7.1. Plan, program, and budget funds required to develop, maintain, and execute the Aircraft Structural Integrity Program.

2.7.2. Ensure that program life cycle cost estimates developed in accordance with AFI 65-508, *Cost Analysis Guidance and Procedures*, include estimated costs of supporting the Aircraft Structural Integrity Program.

2.7.3. Oversee the development, modification and execution of the Aircraft Structural Integrity Program and ensure that the Aircraft Structural Integrity Program Master Plan is approved, updated and executed.

2.7.4. Unless waived in writing by the Program Executive Officer, will appoint an Aircraft Structural Integrity Program manager.

2.7.5. Ensure the usage collection and evaluation systems for loads and environment spectra survey and individual aircraft tracking achieve the valid data capture rates defined in the approved Aircraft Structural Integrity Program Master Plan. Monitor all Aircraft Structural Integrity Program flight data retrieval results to identify incomplete or missing

data. Notify MAJCOM Aircraft Structural Integrity Program offices of primary responsibility of flight data retrieval discrepancies.

2.7.6. Ensure processes are in place for collecting, processing, storing, analyzing and reporting structural maintenance data essential to evaluating aircraft structural integrity.

2.7.7. Unless waived in writing by the Program Executive Officer, will annually provide summaries to lead commands of past aircraft operational usage and the effect on the structural integrity.

2.7.8. Establish and document the life cycle inspection and modification actions and schedules required to maintain the structural integrity of each aircraft system.

2.7.9. Ensure Aircraft Structural Integrity Program aircraft usage data requirements are integrated with mandatory crash survivable data recorder requirements whenever possible.

2.7.10. Coordinate new or modified nondestructive inspection procedures with the center nondestructive inspection manager or designated individual, who is Level 3 certified in accordance with National Aerospace Standard 410. **Note:** Level 3 certification ensures that the individual is capable of developing, qualifying and approving nondestructive test and inspection procedures, methods, and techniques.

2.7.11. Ensure contract support requirements for nondestructive inspection personnel contain provisions to have certified personnel in accordance with National Aerospace Standard 410.

3. Aircraft Structural Integrity Program Requirements and Procedures.

3. (442FW) Aircraft Structural Integrity Program Requirements and Procedures. Aircraft artwork/optional markings will not interfere with the mandatory aircraft marking/stencils outlined in Technical Order (TO) 1A-10C-23, *Corrosion Control*.

3.1. Unless waived in writing by the Decision Authority, the program manager shall establish an Aircraft Structural Integrity Program for each mission design series the Air Force acquires, uses, or leases.

3.2. For each aircraft mission design series developed or modified by the Air Force, the program manager shall implement an Aircraft Structural Integrity Program that complies with MIL-STD-1530, unless waived in writing by the Decision Authority. For these mission design series, unless waived in writing by the Decision Authority, the program manager shall:

3.2.1. Draft an initial Aircraft Structural Integrity Program Master Plan for the program as early as possible in the Technology Maturation and Risk Reduction phase. The initial Aircraft Structural Integrity Program Master Plan shall identify the tasks required to achieve structural integrity and to determine structural safety, performance, durability, supportability, and life cycle costs for the aircraft structure.

3.2.2. Obtain Program Executive Officer (or delegated Decision Authority) approval for the Aircraft Structural Integrity Program Master Plan before the system requirements review.

3.2.3. Update the Aircraft Structural Integrity Program Master Plan during the Engineering and Manufacturing Development, Production and Deployment, and

Operations and Sustainment phases of the program to document changes in the Aircraft Structural Integrity Program.

3.2.4. For aircraft in sustainment, execute the Aircraft Structural Integrity Program as an integral part of the total system engineering and management effort in the sustainment of the aircraft.

3.2.5. For aircraft that are to be modified, fly new missions, or whose operation will extend past the aircraft's certified design service life, develop a revised Aircraft Structural Integrity Program Master Plan. Obtain Program Executive Officer approval of the revised plan before modifications are executed, regular flights begin under the new mission, or commencing operations beyond the previously certified service life.

3.3. For each aircraft mission design series operated by the Air Force but not developed or modified by the Air Force, the program manager shall, unless waived in writing by the Program Executive Officer, use Military Standard 1530 as the basis for implementing Aircraft Structural Integrity Program tasks and elements in the program. Program managers select and implement tasks and elements necessary to ensure the aircraft's structural safety, performance, durability, supportability, and affordability for the operational life of structural components, while remaining consistent with the program's acquisition strategy and engineering authority over the aircraft. For these mission design series, the program manager, unless waived in writing by the Program Executive Officer, shall:

3.3.1. Document the tailored program in an Aircraft Structural Integrity Program Master Plan.

3.3.2. Finalize the Aircraft Structural Integrity Program Master Plan and obtain Program Executive Officer (or delegated Decision Authority) approval before the Air Force operates the aircraft.

4. (Added-442FW) Aircraft artwork/optional marking approval worksheets and current approved artwork/optional marking photos will be documented and kept in a continuity binder that will be located in the 442d Maintenance Squadron Aircraft Structural Maintenance Section.

5. (Added-442FW) Description of 442d Aircraft Artwork/Optional Markings:

5.1. **(Added-442FW)** Nose: Warthog Teeth and Eyes/Nose Art; description and layout will be located in continuity book. Warthog Nose Art will promote unit morale by giving unit uniqueness and worldwide recognition. Artwork will assist in Air Force recruitment efforts.

5.2. **(Added-442FW)** Main Wheel Hubcap: Unique to aircraft; Hubcap Art will be approved by 442d Wing Commander and description/pictures will be located in continuity book.

5.3. **(Added-442FW)** Ladder Door: Unique to aircraft; Art will be approved by 442d Fighter Wing Commander and description will be located in continuity book maintained by 442d MXS/MXMFS Aircraft Structural Maintenance Section. Artwork establishes cohesiveness between the pilot and dedicated crew chief while establishing ownership and pride.

5.4. **(Added-442FW)** Wing Commander's (WG/CC) Aircraft Markings:

5.4.1. **(Added-442FW)** 442d FW/CC, 303 GP/CC, & 303 FS/CC aircraft shall have the following unique markings.

- 5.4.1.1. **(Added-442FW)** The crew name block will be black lettering with white shadowing.
- 5.4.1.2. **(Added-442FW)** The 303rd FS and 442d FW fuselage patches will be applied with full color.
- 5.4.1.3. **(Added-442FW)** The left and right vertical stabilizer markings (ie “KC” and tail numbers) will be black lettering with white shadowing.
- 5.4.2. **(Added-442FW)** The 358th FS/CC aircraft shall have the following unique markings:
 - 5.4.2.1. **(Added-442FW)** The crew name block will be black lettering with white shadowing.
 - 5.4.2.2. **(Added-442FW)** The 358th FS and 442d FW fuselage patches will be applied with full color.
 - 5.4.2.3. **(Added-442FW)** The left and right vertical stabilizer markings (ie “KC” and tail numbers) will be black lettering with white shadowing.
 - 5.4.2.4. **(Added-442FW)** A black stripe with red border will be applied to the upper portion of the vertical stabilizer, just below the cap, with a grey lobo within the black stripe.

6. (Added-442FW) Application of Optional Markings:

- 6.1. **(Added-442FW)** All artwork/optional markings will be installed using guidance outlined in TO’s 1A-10C-23, 1-1-8, and DAFI 63-140 AFRC Supplement.
- 6.2. **(Added-442FW)** OPR for this publication is MXS/MXMFS, DSN 975-3983

William B. Roper, Jr.
Assistant Secretary of the Air Force
(Acquisition, Technology & Logistics)

(442FW)

STEPHEN J. NESTER, Col, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

- (Added-442FW) AFI 33-322, *Records management and Information Governance Program*, 27 July 2021
- AFPD 63-1/20-1, *Integrated Life Cycle Management*, 7 August 2018
- DoD Directive 5000.01, *The Defense Acquisition System*, 12 May 2003
- DoD Instruction 5000.02T, *Operation of the Defense Acquisition System*, 7 January 2015
- AFPD 21-1, *Maintenance of Military Materiel*, 1 August 2018
- AFI 33-322, *Communication and Information Records Management and Information Governance Program*, 23 March 2020
- AFI 33-360, *Publications and Forms Management*, 1 December 2015
- AFI 21-101, *Aircraft and Equipment Maintenance Management*, 16 January 2020
- TO 1-1-690, *General Advanced Composite Repair Processes Manual*
- DoDI 5000.80, *Operation of the Middle Tier of Acquisition*, 30 December 2019
- TO 1-1-690, *General Advanced Composite Repair Processes Manual*, 8 November 2016
- 10 USC § 2228, *Office of Corrosion Policy and Oversight*, 28 January 2008
- AFI 63-101/20-101, *Integrated Life Cycle Management*, 9 May 2017
- AFI 36-2651, *Air Force Training Program*, 3 January 2019
- National Aerospace Standard 410, *Certification & Qualification of Nondestructive Test Personnel*, 19 December 2014
- AFI 90-201, *The Air Force Inspection System*, 20 November 2018
- MIL-HDBK-1823, *Nondestructive Evaluation System Reliability Assessment*, 7 April 2009
- MIL-STD-1530, *DoD Standard Practice for Aircraft Structural Integrity Program*, 13 October 2016
- AFI 65-508, *Cost Analysis Guidance and Procedures*, 13 July 2018
- TO 00-25-224, *Welding High Pressure and Cryogenic Systems*, 25 September 1973
- TO 00-25-252, *Aeronautical Equipment Welding*, 27 September 2017
- (Added-442FW) TO 1-1-8, *Application and Removal of Organic Coatings, Aerospace and Non-Aerospace Equipment*, 8 June 2022
- TO 1-1-8, *Application and Removal of Organic Coatings, Air and Space and Non-Air and Space Equipment*, 25 October 2019
- TO 1-1A-1, *General Manual for Structural Repair*, 15 January 2016
- TO 1-1A-9, *Aerospace Metals - General Data and Usage Factors*, 24 January 2020

TO 1-1-686, *Desert Storage Preservation and Process Manual for Aircraft, Aircraft Engines, and Aircraft Auxiliary Power Unit Engines*, 9 April 2019

TO 1-1-691, *Aircraft Weapon Systems Cleaning and Corrosion Control*, 8 November 2019

TO 1-1-694, *Application and Removal of Low Observable Coatings on Aerospace Equipment*, 6 May 2019

TO 1-1-700, *Corrosion Prevention and Control for Ground Communications Equipment*, 9 June 2018

(Added-442FW) TO 1A-10C-23, *Corrosion Control*, 10 Jan 2022

TO 32-1-101, *Use and Care of Hand Tools and Measuring Tools*, 14 September 2019

TO 33B-1-1, *Non-Destructive Inspection Methods, Basic Theory*, 1 August 2019

TO 33B-1-2, *Nondestructive Inspection General Procedures and Process Controls*, 15 August 2019

TO 34-1-3, *Technical Manual Inspection and Maintenance of Machinery and Shop Equipment*, 23 August 2019

TO 34W4-1-5, *Operator Manual Welding Theory and Application*, 18 April 2015

TO 34-1-10, *Fundamentals of Ordnance Corps Machine Tools*, 22 April 2016

TO 35-1-3, *Corrosion Prevention, Painting and Marking of USAF Support Equipment*, 2 December 2019

AFI 62-601, *USAF Airworthiness*, 11 June 2010

(Added-442FW) DAFI 63-140 AFRC Sup, *Aircraft Structural Integrity Program and Air and Space Equipment Structural Management*, 3 February 2021

Prescribed Forms

(Added-442FW) 442nd Form 1114

Adopted Forms

Air Force Form 847, *Recommendation for Change of Publication*

(Added-442FW) DAF 847, *Recommendation for Change of Publication*, 14 Apr 2022

Abbreviations and Acronyms

(Added-442FW) AF—Air Force

AFI—Air Force Instruction

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

(Added-442FW) AFRC—Air Force Reserve Command

(Added-442FW) DAFI—Department of the Air Force Instruction

MAJCOM—Major Command

MIL-HDBK—Military Handbook

MIL-STD—Military Standard

(Added-442FW) **MXG**—Maintenance Group

(Added-442FW) **MXS**—Maintenance Squadron

(Added-442FW) **OPR**—Office of Primary Responsibility

(Added-442FW) **RDS**—Records Disposition Schedule

SAF—Secretariat Offices within the Headquarters Air Force

TO—Technical Order

USC—United States Code

Terms

Airworthiness—The property of an air system configuration to safely attain, sustain, and complete flight in accordance with approved usage limits. (AFI 62-601, *USAF Airworthiness*).

Middle Tier of Acquisition pathway—The Middle Tier of Acquisition pathway is for capabilities that have a level of maturity to allow them to be rapidly prototyped within an acquisition program or fielded within 5 years of Middle Tier of Acquisition program start. The Middle Tier of Acquisition pathway may be used to accelerate capability maturation before transitioning to another acquisition pathway or may be used to minimally develop a capability before rapid fielding. See DoDI 5000.80, *Operation of the Middle Tier of Acquisition*.

Structural Disciplines—For the purpose of this instruction, the term “structural disciplines” refers to advanced composites, corrosion prevention and control, low observables supportability, metals technology, and nondestructive inspection.

Tailoring—The manner in which certain core issues (program definition, program structure, program design, program assessments, and periodic reporting) are addressed in a particular program. The Milestone Decision Authority (MDA) seeks to minimize the time it takes to satisfy an identified need consistent with common sense, sound business management practice, applicable laws and regulations, and the time sensitive nature of the requirement itself. Tailoring may be applied to various aspects of the acquisition process, including program documentation, acquisition phases, the time and scope of decision reviews, Supportability Analysis, and decisions levels consistent with all applicable statutory requirements.

Attachment 2

AIR FORCE STRUCTURAL MANAGEMENT TECHNICAL ORDERS (TO)

Table A2.1. Air Force Structural Management Technical Orders (TO).

TO 00-25-224 <i>Welding High Pressure and Cryogenic Systems</i>
TO 00-25-252 <i>Aeronautical Equipment Welding</i>
TO 1-1-8 <i>Application and Removal of Organic Coatings, Air and Space and Non-Air and Space Equipment</i>
TO 1-1A-1 <i>General Manual for Structural Repair</i>
TO 1-1A-9 <i>Aerospace Metals General Data and Usage Factors</i>
TO 1-1-686 <i>Desert Storage Preservation and Process Manual for Aircraft, Aircraft Engines, and Aircraft Auxiliary Power Unit Engines</i>
TO 1-1-690 <i>General Advanced Composite Repair Processes Manual</i>
TO 1-1-691 <i>Aircraft Weapon Systems Cleaning and Corrosion Control</i>
TO 1-1-694 <i>Application and Removal of Low Observable Coatings on Aerospace Equipment</i>
TO 1-1-700 <i>Corrosion Prevention and Control for Ground Communications Equipment</i>
TO 32-1-101 <i>Use and Care of Hand Tools and Measuring Tools</i>
TO 33B-1-1 <i>Non-Destructive Inspection Methods, Basic Theory</i>
TO 33B-1-2 <i>Nondestructive Inspection General Procedures and Process Controls</i>
TO 34-1-3 <i>Technical Manual Inspection and Maintenance of Machinery and Shop Equipment</i>
TO 34W4-1-5 <i>Operator Manual Welding Theory and Application</i>
TO 34-1-10 <i>Fundamentals of Ordnance Corps Machine Tools</i>
TO 35-1-3 <i>Corrosion Prevention, Painting and Marking of USAF Support Equipment</i>

Note: Referenced In [Paragraph 2.4.3.5](#).

Attachment 2 (442FW)

4422ND FIGHTER WING LADDER DOOR/HUB CAP APPROVAL WORKSHEET

Figure A2.1. (442FW) 4422ND Fighter Wing Ladder Door/Hub Cap Approval Worksheet.

442nd Fighter Wing Ladder Door/Hub Cap Approval Worksheet			
NOTE: Art work must meet all standards outlined in DAFI 63-140 AFRC Sup paragraph 4.7.2.			
SECTION I			
Name: <input style="width: 150px;" type="text"/>	Rank: <input style="width: 80px;" type="text"/>	Flight: <input style="width: 120px;" type="text"/>	Phone: <input style="width: 100px;" type="text"/>
SECTION II			
Attach Ladder Door/Hub Cap Design, Size and Specifications			
SECTION III			
1. Reviewed by Requesters Flight Chief (Minimum art requirements are as follows: "Be representative of unit or civilian community. Be distinctive, symbolic and designed in good taste. Enhances unit pride. Complies with equal opportunity policies. Must not interfere with any mandatory markings. The Wing is responsible for all copyright/trademark compliance requirements.")			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="radio"/> Approved <input type="radio"/> Disapproved	
2. Fabricating Section will review and assess the capability to produce in house. (IF REQUIRED)			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Feasible <input type="checkbox"/> Not Feasible	
3. Approval by 442 AMXS/CC or Superintendent			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
4. Approval by 422 MXS/CC or Superintendent			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
5. Approval by 442 MXG/CC			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
6. Approval by 442 FW/CC			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
7. Approval by 442 FW/HO			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
8. Approval by 442 FW/PA			Date <input style="width: 100px; height: 30px;" type="text"/>
Print Name: <input style="width: 150px;" type="text"/>	Sign: <input style="width: 150px; border-bottom: 1px solid black;" type="text"/>	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
This locally generated form must be returned to 442 MXS/MXMFS (Structural Maintenance) for future reference DSN: 975-2957.			