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AFSC 2E1X4

VISUAL IMAGERY AND INTRUSION DETECTION SYSTEMS



CAREER FIELD EDUCATION AND TRAINING PLAN

**VISUAL IMAGERY AND INTRUSION DETECTION SYSTEMS
AFSC 2E1X4
CAREER FIELD EDUCATION AND TRAINING PLAN**

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Certified by: HQ USAF/ILC Col Ronnie Hawkins

OPR: HQ USAF/ILCXD, CMSgt Watlington

Editors: HQ AFCA/GCOF, MSgt Williams; 338 TRS/TRR, Mr. Hancock;

81 TRSS Qualification Training Flight, TSgt Sanders

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PART I

Preface

1. Resource constraints in the Air Force are impacting the availability of our most valuable resource--people. This condition, which will continue to exist in the future, makes it essential for the work force to be effectively and efficiently trained to perform duties within each skill level of an Air Force Specialty (AFS). To meet the challenges of tomorrow the Air Force must place a greater emphasis on career field training. This Career Field Education and Training Plan (CFETP) is a management tool that enables the Air Force and each MAJCOM to place the needed emphasis on total career field training. It provides the framework and guidance necessary to plan and develop a career field training program. The plan, which is a "training road map" for the career field, identifies mandatory and optional training requirements. It includes initial skills, upgrade, and continuation training that individuals should receive during their career in this specialty.
2. The CFETP, which documents the career field training program, consists of two parts. Management uses both parts to plan, manage, and control training within the career field.
 - 2.1. Part I, Section A, provides the information necessary for overall management of training in the career field. It contains administrative details and explains the purpose and use of the CFETP. Section B provides a description of the specialty, suggests career field progression, provides career field information, documents training decisions, defines each skill level, and identifies MAJCOM continuation training options. Section C specifies qualification requirements for upgrade/progression in each subsequent skill level in the career field. It also identifies sources of training other than those provided by the Air Education and Training Command (AETC). Section D identifies known resource constraints.
 - 2.2. Part II of the CFETP contains the Specialty Training Standard (STS) and identifies the various training sources and courses available to members of the specialty. The STS is comprised of the Specialty Training Standard (STS) and the Career Training Guide (CTG). The STS includes the tasks and knowledge requirements for award of the three skill level. The CTG includes task and knowledge requirements for upgrade/progression to subsequent skill levels in the career field and identifies career development course (CDC) subject content. Supervisors and trainers at the unit level use Part I, Section C, and Part II of the CFETP to identify, plan, and conduct unit level training commensurate with the overall goals of this plan.
3. Use of the guidance provided in this CFETP ensures individuals in this career field receive effective and efficient training at the appropriate points in their careers. This plan enables the Air Force to train today's work force for tomorrow's jobs.

Abbreviations/Terms Explained

This section provides a common understanding of the terms that apply to the Visual Imagery and Intrusion Detection Systems Career Field and Education Training Plan.

Advanced Training. A formal course of training that leads to a technical or supervisory level of an AFS. Training is for selected airmen at the advanced level of an AFS.

Air Education Training Command (AETC). Responsible for the recruiting, training and education of Air Force personnel. AETC also provides pre-commissioning, professional military, and continuing education.

Air Force Career Field Manager (AFCFM). Representative appointed by the respective HQ USAF Deputy Chief of Staff or Under Secretariat to ensure that assigned AF specialties are trained and utilized to support AF mission requirements.

Air Force Institute for Advanced Distributed Learning (AFIADL). The result of a merger between the Air Force Distance Learning Office and the Extension Course Institute (ECI).

Air Force Job Qualification Standard (AFJQS). A comprehensive task list that describes a particular job type or duty position. Supervisors use the AFJQS to document task qualification. The tasks on AFJQSs are common to all persons serving in the described duty position.

Air Force Qualification Training Package (AFQTP). An instructional package designed for use at the unit to qualify or aid qualification in a duty position, program, or on a piece of equipment. It may be printed, computer-based, or other audiovisual media.

Air Force Specialty (AFS). A group of positions (with the same title and code) that require common qualifications.

Career Field Education and Training Plan (CFETP). A CFETP is a comprehensive core training document that identifies: life-cycle education and training requirements; training support resources, and minimum core task requirements for a specialty. The CFETP aims to give personnel a clear path and instill a sense of industry in career field training. CFETPs are officially posted at <http://www.e-publishing.af.mil/>.

Career Training Guide (CTG). A document that uses Task Modules (TM) in lieu of tasks to define performance and training requirements for a career field.

Certifying Official. A person assigned by the commander to determine an individual's ability to perform a task to the required standard.

Communications-Electronics (C-E): The specialized field concerned with the use of electronic devices and systems for the acquisition or acceptance, processing, storage, display, analysis, protection, disposition, and transfer of information.

Computer Based Training (CBT). A forum for training in which the student learns via a computer terminal. It is an especially effective training tool that allows the students to practice applications while they learn.

Continuation Training. Additional advanced training that exceeds the minimum upgrade training requirements and emphasizes present or future duty assignments.

Core Task. A task the AFCFM identifies as a minimum qualification requirement for everyone within an AFSC, regardless of duty position. Core tasks may be specified for a particular skill level or in general across the AFSC. Guidance for using core tasks can be found in the applicable CFETP narrative.

Course Training Standard (CTS). A standard developed for all courses not governed by an STS, including specialized training packages and computer-based training courses.

Critical Tasks. Critical Tasks are tasks that require specific training and certification above and beyond other tasks. Tasks may be defined as critical either through AFI, Technical Orders, higher headquarters, or at any level in the unit.

Enlisted Specialty Training (EST). A mix of formal training (technical school) and informal training (on-the-job) to qualify and upgrade airmen in each skill level of a specialty.

Exportable Training. Additional training via computer assisted, paper text, interactive video, or other necessary means to supplement training.

Go/No Go. In OJT, it is the stage at which an individual has gained enough skill, knowledge, and experience to perform a task without supervision.

Initial Skills Training. A formal school course that results in an AFSC 3-skill level award for enlisted or mandatory training for upgrade to qualified officers.

Instructional System Development (ISD). A deliberate and orderly (but flexible) process for planning, developing, implementing, and managing instructional systems. It ensures personnel are taught in a cost efficient way the knowledge, skills, and attitudes essential for successful job performance.

Major Command (MAJCOM). A MAJCOM represents a major Air Force subdivision having a specific portion of the Air Force mission. Each MAJCOM is directly subordinate to HQ USAF. MAJCOMs are interrelated and complementary, providing offensive, defensive, and support elements.

Occupational Survey Report (OSR). A detailed report showing the results of an occupational survey of tasks performed within a particular AFSC.

On-the-Job Training (OJT). Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade (skill level award) and job qualification (duty position certification) training.

Qualification Training. Hands-on, task performance based training designed to qualify airmen in a specific duty position. This training occurs both during and after the upgrade training to maintain up-to-date qualifications.

Resource Constraints. Resource deficiencies (such as money, facilities, time, manpower, and equipment) that preclude desired training from being delivered.

Skill Training. A formal course that results in the award of a skill level.

Specialty Training Package and COMSEC Qualification Training Package. A composite of lesson plans, test material, instructions, policy, doctrine, and procedures necessary to conduct training. These packages are prepared by AETC, approved by National Security Agency (NSA), and administered by qualified communications security (COMSEC) maintenance personnel.

Specialty Training Standard (STS). An Air Force publication that describes an Air Force specialty in terms of tasks and knowledge that an airman in that specialty may be expected to perform or to know on the job. Also identifies the training provided to achieve a 3-, 5-, or 7-skill level within an enlisted AFS. It further serves as a contract between AETC and the functional user to show which of the overall training requirements for an Air Force Specialty Code (AFSC) are taught in formal schools and correspondence courses.

Standard. An exact value, a physical entity, or an abstract concept established and defined by authority, custom, or common consent to serve as a reference, model, or rule in measuring quantities or qualities, establishing practices or procedures, or evaluating results. It is a fixed quantity or quality.

Task Module (TM). A group of tasks performed together within an AFSC that require common knowledge, skills, and abilities. TMs are identified by an identification code and a statement.

Total Force. All collective components (active, reserve, guard, and civilian elements) of the United States Air Force.

Training Capability. The capability of a training setting to provide training on specified requirements, based on the availability of resources.

Training Planning Team (TPT). Comprised of the same personnel as a U&TW, TPTs are more intimately involved in training development and the range of issues examined is greater than in the U&TW forum.

Training Requirements Analysis (TRA). A detailed analysis of tasks for a particular AFSC to be included in the training decision process.

Training Setting. The type of forum in which training is provided (formal resident school, on-the-job, field training, mobile training team, self-study, etc.).

Upgrade Training. Mandatory training that leads to award of a higher level of proficiency.

Utilization and Training Pattern. A depiction of the training provided to and the jobs performed by personnel throughout their tenure within a career field or AFS. There are two types of patterns: 1) Current pattern, which is based on the training provided to incumbents and the jobs to which they have been and are assigned; and 2) Alternate pattern, which considers proposed changes in manpower, personnel, and training policies.

Utilization and Training Workshop (U&TW). A forum of the AFCFM, MAJCOM functional managers, subject matter experts (SME), and AETC training personnel that determines career ladder training requirements.

Wartime Tasks. Those tasks that must be taught when courses are accelerated in a wartime environment. These task are identified by an asterisk (*) in CFETP Part II, Section A, STS. In response to a wartime scenario, these tasks will be taught in the 3- level course in a streamlined training environment. These tasks are only for those career fields that still need them applied to their schoolhouse tasks.

Section A - General Information

1. Purpose of the CFETP. This CFETP provides the information necessary for career field managers, training management, supervisors, and trainers to plan, develop, manage, and conduct an effective and efficient career field training program. The plan outlines the training that individuals should receive in order to develop and progress throughout their careers. For purposes of this plan, training is divided into three areas: initial skills, upgrade, and continuation training. Initial skills training is the AFS specific training an individual receives upon entry in the Air Force, normally conducted by AETC at one of the technical training centers. Upgrade training identifies the mandatory courses, task qualification requirements, and Career Development Course (CDC) completion required for award of the 5-, 7-, or 9-skill level. Continuation training is additional training provided to 3-, 5-, 7-, and 9-level personnel to increase their skills and knowledge beyond the minimum required for upgrade. The CFETP has several purposes, some of which are:

- 1.1. Serves as a management tool to plan, develop, manage, and conduct a career field training program. Also, ensures that established training is provided at the appropriate point in an individual's career.
- 1.2. Identifies task and knowledge training requirements for each skill level in the specialty and recommends training throughout each phase of an individual's career.
- 1.3. Lists training courses available in the specialty, identifies sources of the training, and provides the training medium.
- 1.4. Identifies major resource constraints that impact implementation of the desired career field training program.

2. Use of the CFETP. The CFETP is maintained by the Air Force Career Field Manager (AFCFM). MAJCOM Functional Managers and AETC review the plan annually to ensure currency and accuracy and forward recommended changes to the AFCFM. Using the list of courses in Part II, they determine whether duplicate training exists and take steps to eliminate/prevent duplicate efforts. Career field training managers at all levels use the plan to ensure a comprehensive and cohesive training program is available for each individual in the career ladder.

- 2.1. AETC training personnel develop/revise formal resident and exportable training based upon requirements established by the users and documented in the STS. They also develop procurement and acquisition strategies for obtaining resources needed to provide the identified training.
- 2.2. MAJCOM Functional Managers ensure their training programs complement the CFETP mandatory initial skill and upgrade requirements. They also identify the needed AFJQSSs/AFQTPs to document unique upgrade and continuation training requirements. Requirements are satisfied through OJT, resident training, or exportable courseware/courses. MAJCOM developed training to support this AFSC must be identified for inclusion into this plan. Forward recommendations concerning this CFETP to your MAJCOM Functional Manager.
- 2.3. 81 TRSS Qualification Training Flight (Q-Flight) personnel develop AFJQSSs/AFQTPs based on requests submitted by the MAJCOMs and according to the priorities assigned by the Communications-Electronics (C-E) Maintenance Training Advisory Group (MATAG) Working Group.
- 2.4. Unit level training managers and supervisors manage and control progression through the career field by ensuring individuals complete the mandatory training requirements for upgrade specified in this plan and supplemented by their MAJCOM. The list of courses in Part II is used as a reference for planning continuation or career enhancement training.

3. Coordination and Approval of the CFETP. The AFCFM is the approval authority. MAJCOM representatives and AETC training personnel coordinate on the career field training requirements. The AFCA executive agent reviews CFETPs for accuracy prior to submission for approval by the AFCFM.

Section B - Career Field Progression and Information

4. Specialty Description. This information supplements that presented in AFMAN 36-2108.

4.1. Visual Imagery and Intrusion Detection Systems Apprentice/Journeyman.

4.1.1. Specialty Summary. Prepares for use, performs operational checks, inspects, troubleshoots, repairs, overhauls, calibrates, modifies, installs, and tests Visual Imagery and Intrusion Detection equipment.

4.1.2. Duties and Responsibilities:

4.1.2.1. Performs maintenance on Visual Imagery and Intrusion Detection equipment. Inspects and tests components to correct system malfunctions. Ensures equipment performance standards are within technical order or commercial manual specifications. Inspects wiring and electrical connectors, printed circuit boards, and electronic chassis. Evaluates systems using test equipment and test devices. Installs, services, and adjusts equipment and systems. Identifies corrosion problems and accomplishes corrective measures. Lubricates and cleans equipment and components.

4.1.2.2. Prepares for use, performs operational checks, repairs, overhauls, calibrates, modifies, and tests Visual Imagery and Intrusion Detection equipment. Troubleshoots malfunctioning equipment using system-checking or problem-solving procedures and mechanical layout drawings, block diagrams, schematics, and diagrams with specialized test equipment. Determines defective components, and repairs or replaces those components. Removes assemblies and performs repairs on Visual Imagery and Intrusion Detection equipment. Performs tests and adjustments on quality control instruments and other diagnostic equipment.

4.1.2.3. Maintains inspection and maintenance records and completes maintenance forms. Posts entries on maintenance and inspection records.

4.1.2.4. Prepares deployable facilities and equipment for transportation and employment. Maintains deployable facilities and support equipment using test and shop equipment.

4.2. Visual Imagery and Intrusion Detection Systems Craftsman.

4.2.1. Specialty Summary. Includes all information in paragraph 4.1.1. Prepares for use, performs operational checks, inspects, troubleshoots, repairs, overhauls, calibrates, modifies, installs, and tests Visual Imagery and Intrusion Detection equipment.

4.2.2. Duties and Responsibilities.

4.2.2.1. Includes all duties and responsibilities of paragraph 4.1.2.

4.2.2.2. Supervises Visual Imagery and Intrusion Detection systems maintenance activities. Establishes requirements for tools, equipment, and technical documents. Establishes work standards, methods, and controls for functions such as periodic inspections, operational testing, and component repair. Reviews, evaluates, and resolves documented deficiencies. Ensures maintenance data collection forms and inspections and maintenance records are completed correctly and accurately. Evaluates justification and practicality of recommended improvements to equipment performance and maintenance procedures. Develops safety standards and practices for Visual Imagery and Intrusion Detection Systems maintenance activities. Coordinates with the appropriate agencies to ensure systems support requirements.

4.2.2.3. Resolves problems encountered during siting, installation, repair, overhaul, and modification of Visual Imagery and Intrusion Detection systems. Uses layout drawings, schematics, and pictorial diagrams to solve maintenance problems, and analyze construction, employment, and operating characteristics of equipment to determine source of malfunction. Performs intricate alignment and calibration procedures. Determines repair procedures necessary to correct defective equipment. Interprets and implements maintenance and installation policy and procedures. Identifies problem areas, and recommends corrective action. Develops methods to improve maintenance efficiency.

4.2.2.4. Inspects and evaluates components and equipment for Visual Imagery and Intrusion Detection systems. Inspects assembly, installation, and electro-optical adjustment of mechanical, electrical, optical, and electronic equipment used in Visual Imagery and Intrusion Detection systems. Analyzes maintenance data collection reports for unfavorable trends or conditions. Reviews inspection findings and determines adequacy of corrective action. Completes and reviews maintenance forms and records. Performs quality control functions and recommends corrective action. Complies with hazard communications program.

4.2.2.5. Performs tasks related to transporting and installing deployable facilities and equipment. Manages maintenance and corrosion control programs.

4.3. **Communications Systems Superintendent.**

4.3.1. Specialty Summary. Manages and directs communications systems maintenance facilities and resources. Included are functions of installing, maintaining, repairing, overhauling, deploying, and modifying. Systems and equipment include ground radar and radio, meteorological and navigation, combat camera, imagery, video, television, satellite, intrusion detection, space systems, telemetry, and microwave.

4.3.2. Duties and Responsibilities. This specialty “caps” at the Senior Master Sergeant level with those personnel that came up through the 2E0XX and 2E1XX career fields. Therefore, the duties and responsibilities defined below encompass the complete spectrum of this specialty.

4.3.2.1. Plans and organizes maintenance activities. Prepares and analyzes reports encompassing siting, deploying, maintaining, installing, repairing, and removing communications systems, combat camera equipment, imagery systems, and related equipment. Included are ground radio equipment; navigation and meteorological systems; satellite and microwave communications systems; video, television studio, and intrusion detection systems; combat camera space systems, telemetry and instrumentation missions, and imagery systems. Coordinates activities and resolves common problems.

4.3.2.2. Directs maintenance activities. Checks systems and equipment for proper siting, installation, and serviceability. Directs personnel employed in siting, deploying, inspecting, adjusting, removing, replacing, and repairing communication systems and related equipment. Directs overhaul and repair of ground radar and communication systems, combat camera equipment, telemetry systems, imagery systems, and related equipment. Ensures work standards are maintained. Determines extent and economy of repair, including disposition of malfunctioning equipment.

4.3.2.3. Inspects and evaluates maintenance actions. Interprets findings and recommends or initiates corrective action. Serves on or directs inspection teams to evaluate maintenance activities. Discusses inspection findings. Maintains liaison with users to ensure adequate services are being provided.

4.3.2.4. Supervises maintenance functions. Resolves problems with installing, maintaining, repairing, and overhauling systems and equipment. Establishes local maintenance procedures and policies. Performs research and development of new systems and equipment.

4.4. **Communications-Electronics Chief Enlisted Manager.** This specialty “caps” at the Chief Master Sergeant Level with those specialties that came up through the 2E0XX, 2E1XX, 2E2XX, and 2E6XX career ladders. Personnel attaining the rank of Chief are assigned broad ranging duties in directing and managing diverse functions such as activities that install, remove, relocate, repair, and maintain radar systems (air traffic control and aircraft control and warning), telephone systems, satellite, wideband and telemetry systems, ground radio systems, meteorological and navigation systems, visual, imagery and intrusion detection systems, computer, network, switching and cryptographic, and antenna and cable systems. Other challenges that these Chiefs face are assignments to the White House Communications Agency, Air Force Element at CENTCOM, the Air Force Communications Agency, Defense Information Systems Agency, NATO, etc.

4.5. The following are some of the more common missions you may encounter as a 2E1X4.

BASE INTRUSION SECURITY SYSTEMS

ANNUNCIATOR

Vindicator



SENSORS

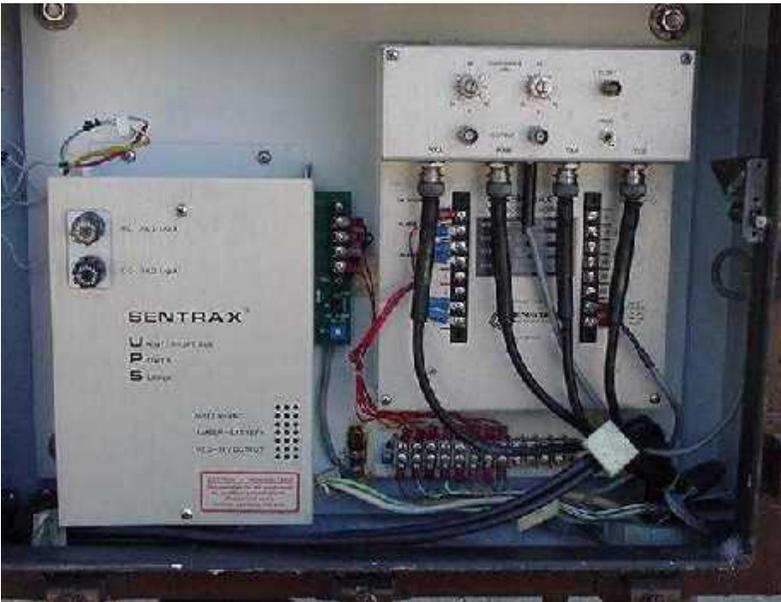
AN/GSS-39 Interior Intrusion Detection System



AN/GSS-42 Exterior Intrusion Detection System



AN/GSS-40 Short Ported Coaxial Cable Sensor



AN/GSS-37 Restricted Area Anti-Intrusion Alarm Set



TELEVISION

AVID Airplay Automation System



BVP7 Video Camera



Video Production Switcher



Broadcast Audio Console



IMAGERY

Electronic Imaging Center



Still Picture Cameras



Wide Film Processor



Light Table



Deployable Equipment



5. Skill/Career Progression. Adequate training and timely progression from the apprentice to superintendent skill levels play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training do their part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP and the [2E1X4 Education and Training Path](#) table will ensure individuals receive viable training at appropriate points in their careers.

| |
|--|
| Apprentice (3-Level) Training |
| Upon completion of initial skills training a trainee will work with a trainer to enhance their knowledge and skills. |
| Utilize CDCs, AFJQs/AFQTPs, and other exportable courses to progress in the field. |
| Once task certified, a trainee may perform the task unsupervised. |
| Journeyman (5-Level) Training |
| Enter into continuation training to broaden experience base. |
| Five-levels may be assigned job positions such as team leader and shift supervisor. |
| Attend the Airman Leadership School (ALS) after serving 48 months in the Air Force or selection to rank of SSgt (active duty only). In-residence or correspondence course is required for Air National Guard/Air Force Reserve Command (ANG/AFRC) personnel. |
| Use CDCs and other references identified by the AFCFM to prepare for Weighted Airman Performance Systems (WAPS) testing. |
| Should continue pursuing a Community College of the Air Force (CCAF) degree. |
| Craftsman (7-Level) Training |
| A seven-level can expect to fill various supervisory and management positions such as shift leader, team chief, supervisor, or task certifier. |
| Seven-levels should take courses or obtain added knowledge on management of resources and personnel and attend the 7-level resident course. |
| Encouraged continuing academic education through CCAF and higher degree programs. |
| Attend the Noncommissioned Officer Academy (NCOA). In-residence or correspondence course is required for ANG/AFRC personnel. |
| Superintendent (9-Level) Training |
| A nine-level can be expected to fill positions such as flight chief, superintendents, and various staff positions. |
| Should pursue increased knowledge for budget, manpower, resources, and personnel management. |
| Recommend they pursue additional education and completion of courses outside of their AFS. |
| Chief Enlisted Manager (CEM) Training |
| Must be selected for CMSgt and possess qualifications in a feeder specialty (2E190, 2E291, and 2E690). |
| CEMs work in a variety of similar jobs and functional areas where general managerial and supervisory abilities can be most effectively used and challenged. |
| Resident graduation of the USAF Senior NCO Academy (SNCOA) is a prerequisite for CMSgt sew-on (active duty only). In-residence or correspondence course required for ANG/AFRC personnel. |

6. Training Decisions. This CFETP was developed to encapsulate an entire spectrum of training requirements for the Visual Imagery and Intrusion Detection Systems career field, using a building block approach (simple to complex). Included in this spectrum was the strategy of when, where, and how to meet the training requirements. The strategy must be apparent and affordable to reduce duplication of training and eliminate a disjointed approach to training. The following decisions were made by members of the 13-17 January 2003 Utilization and Training Workshop.

6.1. Initial Skills. Minor administrative changes were made to Part I of the CFETP. The Specialty Training Standard (STS) for the Keesler portion of the course was redesigned to be less equipment-specific and more functionally oriented. Tasks in the STS 2E134 attachment 2 that must be taught when courses are accelerated in a wartime environment were identified with an asterisk (*).

6.2. Five-Level Upgrade Requirements. Proficiency codes were used to replace the “K” in the CDC column to indicate the level of knowledge training provided in the CDCs. Other minor changes were made to the CTG to include the addition of the optical power meter. The development of CDCs is restricted to a single set consisting of six volumes. Development of this single set of CDCs will include three volumes which will be used by all 2EXXX career fields. The following table outlines 5-level CDC contents.

| | |
|----------|---|
| VOLUME 1 | Electronic Principles (Computer Based Training) |
| VOLUME 2 | Test Equipment |
| VOLUME 3 | Communication Principles |
| VOLUME 4 | AFSC Specific Information |
| VOLUME 5 | AFSC Specific Information |
| VOLUME 6 | AFSC Specific Information |

6.3. Seven-Level Upgrade Requirements. Minor changes were made to the area of Deployment Concepts to include updating training references and adding a task to the UTC development and reporting and area. Two QTPs were also added as tasks to the CTG.

6.4. Proficiency Training. This training is job qualification for an assigned duty position. Additional qualification training becomes necessary when personnel transfer to another duty position, the unit mission changes, a new personnel program comes on board, or any time changes in techniques or procedures occur.

6.5. Continuation Training: The purpose of the continuation training program is to provide additional advanced training, exceeding the minimum upgrade training requirements, with the emphasis on present and future duty positions. MAJCOMs may develop a continuation training program to ensure individuals in the career field receive the necessary training at the appropriate points in their careers. The training program will identify both mandatory and optional training requirements.

7. Community College of the Air Force (CCAF) Academic Programs. Enrollment in CCAF occurs upon completion of basic military training. CCAF provides the opportunity for all enlisted members to obtain an Associate in Applied Science degree. The degree must be completed before the student separates from the Air Force, retires, or is commissioned as an officer. In addition to its associates degree program, CCAF offers the following:

7.1. Occupational Instructor Certification. The College offers the Occupational Instructor Certification to instructors teaching full time in a CCAF affiliated school. To qualify, instructors must complete an instructor course, a teaching practicum, have two years teaching experience, hold an associate or higher degree, and be recommended by their commander/commandant.

7.2. Trade Skill Certification. When a CCAF student separates or retires, a trade skill certification is awarded for the primary occupational specialty. The College uses a competency based assessment process for trade skill certification at one of four proficiency levels-Apprentice, Journeyman, Craftsman/Supervisor, or Master Craftsman/Manager. The trade skill certification is annotated on DD Form 214, Certificate Of Release Or Discharge From Active Duty.

7.3. The Electronic Systems Technology (4VHP) program applies to 2EXXX career fields.

7.3.1. Degree Requirements: Individuals must hold the 5-skill level at the time of program completion.

| | Semester hours |
|--|----------------|
| Technical Education | 24 |
| Leadership, Management, and Military Studies | 6 |
| Physical Education | 4 |
| General Education | 15 |
| Program Electives | 15 |
| Total | 64 |

7.3.2. Technical Education (24 semester hours): A minimum of 12 semester hours of Technical Core subjects and courses must be applied and the remaining semester hours will be applied from Technical Core/Technical Elective subjects and courses.

7.3.3. Leadership, Management, and Military Studies (6 semester hours): Professional military education and/or civilian management courses. See CCAF General Catalog for application of civilian management courses.

7.3.4. Physical Education (4 semester hours): Satisfied upon completion of basic military training.

7.3.5. General Education (15 semester hours): Courses must meet the criteria for application of courses to the General Education requirement and be in agreement with the definitions of applicable General Education subjects/courses as outlined in the CCAF General Catalog.

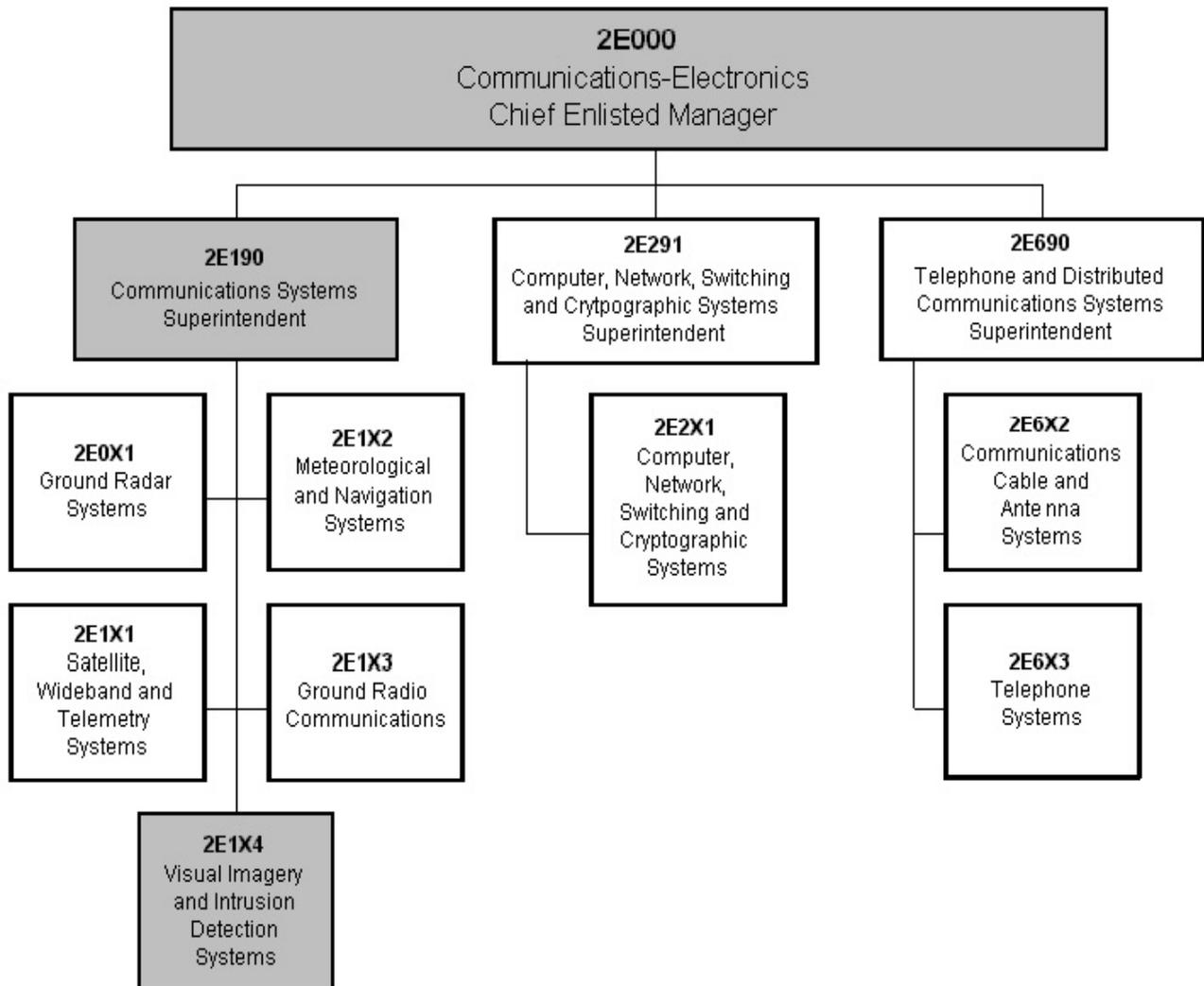
7.3.6. Program Elective (15 semester hours): Satisfied with applicable Technical Education; Leadership, Management, and Military Studies; or General Education courses, including natural science courses meeting General Education requirement application criteria. Six semester hours of CCAF degree applicable technical credit otherwise not applicable to this program may be applied.

7.4. See the current CCAF General Catalog for details regarding the Associates of Applied Science in Electronic Systems Technology. The catalog is available at your education officer or from <http://www.au.af.mil/au/ccaf/>.

7.5. Additional off-duty education is a personal choice that is encouraged for all. Individuals desiring to become an AETC instructor should be actively pursuing an associate degree. A degreed faculty is necessary to maintain CCAF's accreditation through the Southern Association of Colleges and Schools.

8. Career Field Path. The following summarizes career progression and personnel allocations across the career ladder. 2E1XX and 2E0X1 personnel maintain their individual AFSC identifiers through the rank of MSgt. Upon promotion to SMSgt, AFSC 2E1X1, 2E1X2, 2E1X3, 2E1X4, and 2E0X1 merge to become a 2E190. At Chief, the 2E190 merges with other 2EXXX 9-level specialties to become a 2E000. Specific demographic information is available on the Web at http://www.afpc.randolph.af.mil/demographics/nu_demos/Regular_Enlisted_CAFSC_Rank_Gender.htm

2EXXX Career Field Progression



**2E1X4 VISUAL IMAGERY AND INTRUSION DETECTION SYSTEMS
EDUCATION AND TRAINING PATH**

| EDUCATION AND TRAINING REQUIREMENTS | AVERAGE SEW ON TIME AND COMMENTS |
|--|---|
| BASIC MILITARY TRAINING SCHOOL | |
| APPRENTICE TECHNICAL SCHOOL (3-SKILL LEVEL) | Airman..... 6 months |
| UPGRADE TO JOURNEYMAN (5-SKILL LEVEL) Minimum 15 months OJT training (9 months for retrainees). Completion of all 2E154 CTG core tasks and 5-Level CDCs. Mandatory Specific AFJQs/AFQTPs for equipment at assigned location.Mandatory Maintenance Management and Generic AFJQs/AFQTPs for various unit level duties.....Mandatory AETC Supplemental training courses as determined by MAJCOMOptional AFETS/CFS/SMT training as determined by MAJCOM Optional | A1C 10 months SrA 3 years Earliest 28 months HYT 12 years |
| AIRMAN LEADERSHIP SCHOOL (ALS) Attendance is limited to SSgt selectees or those attaining 48 months Total Active Federal Military Service (TAFMS) and who have not been selected for promotion to SSgt. Completion is mandatory before assuming the rank of SSgt. ANG/AFRC may complete by correspondence course.....Mandatory | TRAINER: Qualified to perform the task to be trained; must attend formal OJT Trainer Training; and appointed by the Commander. Refer to AFI 36-2201 volume 3, chapter 6 . |
| UPGRADE TO CRAFTSMAN (7-SKILL LEVEL) Minimum rank of SSgt. 12 months OJT training (6 months for retrainees). Completion of all 2E174 CTG core tasks and AFQTP 2EXXX-201L, Communications-Electronics Work Center Manager's Handbook. Attendance at formal 7-level school. Must be 7-level to sew on TSgt.....Mandatory Maintenance Management and Generic AFJQs/AFQTPs for various unit level duties.....Mandatory AETC Supplemental training courses as determined by MAJCOM..... Optional AFCA Systems Seminar at Scott AFB. Consult your MAJCOM for course quotas..... Optional AFETS/CFS/SMT training as determined by MAJCOM Optional | SSgt 7.5 years Earliest 3 years HYT 20 years TSgt..... 12.5 years Earliest 5 years HYT 24 years CERTIFIER: Must be at least a SSgt (E-5) with a 5-skill level or civilian equivalent; attend the Air Force Training Course; be capable of evaluating the task being certified; evaluate training and certify qualifications. Refer to AFI 36-2201 volume 3, chapter 6 . |

**2E1X4 VISUAL IMAGERY AND INTRUSION DETECTION SYSTEMS
EDUCATION AND TRAINING PATH**

| EDUCATION AND TRAINING REQUIREMENTS | AVERAGE SEW ON TIME AND COMMENTS |
|---|--|
| <p>NONCOMMISSIONED OFFICER ACADEMY (NCOA). Attendance is limited to TSgt and TSgt selectees. Completion is mandatory before assuming the rank of MSgt. ANG/AFRC may attend in-residence as SSgt or TSgt or complete correspondence course.</p> <p>NCOA Correspondence Course..... Optional</p> | <p>MSgt..... 16 years Earliest 8 years HYT 26 years</p> |
| <p>USAF SENIOR NONCOMMISSIONED OFFICER ACADEMY (SNCOA) Attendance is limited to SMSgt, SMSgt selectees, and selected MSgts. Completion is mandatory before assuming the rank of CMSgt. Mandatory</p> <p>SNCOA Correspondence Course Optional</p> <p>ANG/AFRC may complete by correspondence course. ANG/AFRC MSgts may attend in-residence..... Mandatory</p> | <p>SMSgt 19.2 years Earliest 11 years HYT 28 years</p> |
| <p>UPGRADE TO SUPERINTENDENT (9-SKILL LEVEL)</p> <p>Minimum rank of SMSgt.</p> <p>Complete AFQTP 2EXXX-201LB, Communications-Electronics Manager's Handbook..... Mandatory</p> <p>Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties. Mandatory</p> | <p>CMSgt 21.5 years Earliest 14 years HYT 30 years</p> |

NOTE 1: Published sew on times are Air Force averages. Refer to the Air Force Personnel Center's homepage to determine career field specific information: <http://www.afpc.randolph.af.mil/eprom>.

NOTE 2: See Part II, Section D for a list of AFJQSs/AFQTPs, AETC supplemental, and AFETS/CFS/SMT training.

NOTE 3: All core/duty position tasks must be completed prior to upgrade.

Section C - Skill Level Training Requirements

9. Purpose. The various skill levels in the career field are defined in terms of tasks and knowledge requirements for each skill level in the Visual Imagery and Intrusion Detection Systems career field of the Communications-Electronics Systems career ladder. They are stated in broad, general terms and establish the standards of performance. An all encompassing core task list has not been developed for this specialty because of the diversity of the missions supported and the equipment installed to meet mission requirements. Core tasks, knowledge items, and skill requirements for this specialty are identified in the STS, CDCs, AFJQSs/AFQTPs, etc. Completion of the mandatory 3-level skill awarding course, CDCs, 7-level course, and applicable AFJQSs/AFQTPs define the Air Force core tasks for this specialty.

10. Specialty Qualification Requirements.

10.1. Apprentice (3-Level) Training.

| | |
|----------------|--|
| KNOWLEDGE | Electronic, transmission, infrared and thermal imagery theories Solid state components, digital techniques, microprocessors, optical and mechanical principles Imagery equipment Installation and testing practices Test equipment Wiring and logic diagrams and circuit schematics Maintenance and supply procedures |
| EDUCATION | Completion of high school with courses in algebra, geometry, trigonometry, and physics is desirable. |
| TRAINING | Electronic Principles, course E3AQR2E134 481 (PDS Code P01) (See Attachment 1 of the STS for course training standard) Visual Imagery and Intrusion Detection Systems Apprentice, course E3AQR2E134 005 (PDS Code VID) (See Attachment 2 of the STS for specialty training standard) Visual Imagery and Intrusion Detection Systems Maintenance, course E5ABD2E134 005 (PDS Code BOD) (See Attachment 2 of the STS for specialty training standard) |
| EXPERIENCE | None required. |
| OTHER | Normal color vision is required for entry into this AFSC as defined by AFI 48-123, <i>Medical Examination and Standards</i> . Eligibility for a Secret security clearance according to AFI 31-501, <i>Personnel Security Program Management</i> , is mandatory for award and retention of this AFSC. |
| IMPLEMENTATION | Entry into training is accomplished by reserving a position in the career field upon entry into the Air Force. |

10.2. Journeyman (5-Level) Training.

| | |
|----------------|---|
| KNOWLEDGE | No additional knowledge requirements. |
| TRAINING | No AETC training requirement. |
| EXPERIENCE | <p>Qualification and possession of AFSC 2E134</p> <p>Experience installing, testing, aligning, adjusting or repairing television, imagery, and intrusion detection equipment and systems</p> <p>Completion of the 2E154 Career Development Course</p> <p>Completion of all 2E154 CTG core tasks (See Attachment 3 of the STS for career training guide)</p> <p>Completion of applicable equipment AFJQSS/AFQTPs</p> <p>Completion of all local tasks assigned for the duty position</p> |
| OTHER | Eligibility for a Secret security clearance according to AFI 31-501, <i>Personnel Security Program Management</i> , is mandatory for award and retention of this AFSC. |
| IMPLEMENTATION | Entry into formal upgrade is initiated upon assignment to the individual's first duty station. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified. Use CDCs and AFJQSS/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training. |

10.3. Craftsman (7-Level) Training.

| | |
|----------------|---|
| KNOWLEDGE | No additional knowledge requirements. |
| TRAINING | <p>Communications-Electronics Career Advancement Course (In-residence), E3ACR2EX7X 002 (PDS 7SI) [Active Duty only]</p> <p>Communications-Electronics Career Advancement Course (Distance learning), E6ADL2EX7X 000 (PDS Code 4VI) [Guard/Reserve only]</p> <p>Communications-Electronics Career Advancement Course (Self-paced), E6AZS2EX7X 006 (PDS X2J) [Prerequisite for Guard/Reserve members prior to attending the above distance learning course]</p> |
| EXPERIENCE | <p>Qualification and possession of AFSC 2E154</p> <p>Experience performing or supervising functions such as siting, installing, repairing, overhauling or modifying television, imagery, and intrusion detection equipment and systems</p> <p>Completion of all 2E174 CTG core tasks (See Attachment 4 of the STS for career training guide)</p> <p>Completion of AFQTP 2EXXXX-201L, Communications-Electronics Work Center Manager's Handbook</p> <p>Completion of applicable equipment/unit management function AFJQSs/AFQTPs</p> |
| OTHER | Eligibility for a Secret security clearance according to AFI 31-501, <i>Personnel Security Program Management</i> , is mandatory for award and retention of this AFSC. |
| IMPLEMENTATION | Entry into formal upgrade training is initiated when individuals obtain the necessary rank and skill level. Qualification training is initiated anytime an individual is assigned duties for which they are not qualified. Use CDCs and AFJQSs/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training. |

10.4. Superintendent (9-Level) Training.

| | |
|----------------|---|
| KNOWLEDGE | Electronic principles theory and its application to ground radio, meteorological and navigation, combat camera, imagery, video, television, telemetry systems, space systems, intrusion detection, and satellite and microwave communications facilities, systems, equipment, and their interoperability Communications and computer elements of a typical air base Interpretation of wiring and logic diagrams, blueprints, and technical orders |
| TRAINING | No AETC training requirement. |
| EXPERIENCE | Qualification and possession of AFSC 2E071, 2E171, 2E172, 2E173, or 2E174 Experience is mandatory managing or directing functions such as installing, maintaining, repairing, or modifying the various systems and related equipment of the feeder specialties. AFQTP 2EXXXX-201LB, Communications-Electronics Manager's Handbook |
| OTHER | Eligibility for a Secret security clearance according to AFI 31-501, <i>Personnel Security Program Management</i> , is mandatory for award and retention of this AFSC. |
| IMPLEMENTATION | Entry into OJT is initiated when individuals are selected for the rank of SMSgt. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified. |

10.5. Training Sources.

10.5.1. Electronic Principles training - 332 TRS, Keesler AFB, MS at <https://wwwmil.keesler.af.mil/>.

10.5.2. AFSC specific training: 338 TRS, Keesler AFB, MS at <https://wwwmil.keesler.af.mil/>; Defense Information School, Ft Meade, MD at <http://www.dinfos.osd.mil/>.

10.5.3. 2EX7X Communications-Electronics Career Advancement course (7-Level School) – 338 TRS, Keesler AFB, MS at <https://wwwmil.keesler.af.mil/>.

10.5.4. CDC 2E154 is available for upgrade purposes through the unit training manager. For individual qualification and cross-utilization training, CDCs are ordered through the unit training office.

10.5.5. AFJQSs/AFQTPs are Air Force publications and are mandatory for use in qualification training. They are developed by the 81 TRSS (Q-Flight), Keesler AFB, MS and may be downloaded from <https://wwwmil.keesler.af.mil/81trss/qflight/index.htm>. Procedures for requesting development of AFJQSs/AFQTPs are contained in AFI 36-2233, *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*. AFJQSs/AFQTPs are listed in Part II, Section D, of this CFETP.

10.5.6. Air Force Engineering and Technical Service (AFETS) (course listing found at https://www.afca.scott.af.mil/c-e_maint/afets.htm), Contract Field Service (CFS), and Special Maintenance Team (SMT) training may be requested to provide on-site training. The AFETS program is outlined in AFI 21-110, *Engineering and Technical Services Management and Control*. Direct requests for AFETS, CFS, or SMT training to your MAJCOM.

Section D - Resource Constraints

11. Purpose. This section identifies known resource constraints that preclude optimal/desired training from being developed or conducted, including information such as part numbers, national stock numbers, number of units required, cost, manpower, etc. Included are narrative explanations of each resource constraint and an impact statement describing what effect each constraint has on training. Finally, this section includes actions required, OPR, and target completion date. Resource constraints will be, at a minimum, reviewed and updated annually.

12. Apprentice (3-Level) Training.

12.1. Constraints: None.

12.1.1. Impact. N/A

12.1.2. Resources Required. N/A

12.1.3. Action Required. N/A

12.2. OPR/Target Completion Date. N/A

13. Journeyman (5-Level) Training.

13.1. Constraints: None.

13.1.1. Impact. N/A

13.1.2. Resources Required. N/A

13.1.3. Action Required. N/A

13.2. OPR/Target Completion Date. N/A

14. Craftsman (7-Level) Training.

14.1. Constraints: None.

14.1.1. Impact. N/A

14.1.2. Resources Required. N/A

14.1.3. Action Required. N/A

14.2. OPR/Target Completion Date. N/A

Section E - Transition Training Guide

15. There are currently no transition training requirements. This area is reserved.

PART II

Section A - Specialty Training Standard

1. Implementation. The implementation of training in support of this STS is with the class beginning 20031003 and graduating 20031113.

2. Purpose. As prescribed in AFI 36-2201, volume 5, this STS:

2.1. The Course Training Standard (CTS) at Attachment 1 and Specialty Training Standard at Attachment 2:

2.1.1. Establishes the training requirements for airmen to perform 3-skill level duties in the Visual Imagery and Intrusion Detection Systems career ladder of the Airman Communications-Electronics Systems career field. The training tasks are based on an analysis of duties in AFMAN 36-2108 for AFSC 2E134.

2.1.2. Provides the basis for the development of more detailed training materials, training objectives, and training evaluation instruments for the course.

2.1.3. Shows formal training requirements. Attachment 1 lists the Electronic Principles requirements for this specialty and contains the proficiency code key pertaining to this attachment. Students receive this training through AETC course E3AQR2E134 481.

2.1.4. Attachment 2 contains a list of behavioral statements that describe knowledge and job performance requirements the graduate demonstrates on the job as a result of training received in courses E3AQR2E134 005 and E5ABD2E134 005 as described in the Air Force Education and Training Course Announcements (ETCA) database (formerly AFCAT 36-2223, USAF Formal Schools Catalog). Part I, Section D, and the Preface to Attachment 2 explains constraints and/or guidelines to training. When notes or explanations describe constraints in the skill awarding course, they indicate that training on those items is restricted due to the limitation described.

2.2. The Five-Level Career Training Guide (CTG) at Attachment 3:

2.2.1. Provides a complete list of continuation training requirements for the award of AFSC 2E154. Attachment 3 contains the behavioral code key used to indicate the type of training provided by CDCs.

2.2.2. Identifies the mandatory task and knowledge training that is required for the 5-skill level in the Visual Imagery and Intrusion Detection Systems career field of the Airman Communications-Electronic Systems career ladder. These are based on an analysis of duties and responsibilities as outlined in AFMAN 36-2108.

2.3. The Seven-Level Career Training Guide (CTG) at Attachment 4:

2.3.1. Provides a complete list of continuation training requirements for the award of AFSC 2E174. Attachment 4 contains the behavioral code key used to indicate the type of training that will be provided.

2.3.2. Identifies the mandatory task and knowledge training that is required for the 7-skill level in the Visual Imagery and Intrusion Detection Systems ladder of the Airman Communications-Electronics Systems career field. These are based on an analysis of duties and responsibilities as outlined in AFMAN 36-2108.

2.4. The CTGs at Attachments 3 and 4:

2.4.1. Provide OJT certification columns to record completion of task and knowledge training requirements. Use automated training management systems to document technician qualifications, if available. Task certification must show a start and stop date.

2.4.2. Become a job qualification standard for OJT when placed in AF Form 623, On-the-Job Training Record, and used according to AFI 36-2201, volume 3. OJT tasks in column 1 are trained to the go/no go level. Go means the individual can perform the task without assistance and meet local requirements for accuracy, timeliness, and correct use of procedures.

2.4.2.1. Training Documentation. Identify duty position requirements to include core tasks by circling the subparagraph number next to the task statement (with the exception of automated records). As a minimum for initial certification, complete the following columns in Part II of the CFETP:

2.4.2.1.1. Training start date (day, month, year), training complete date (day, month, year), trainee Initials, trainer Initials, certifier initials when required by AFCFM (for tasks requiring third-party certification).

2.4.2.2. Knowledge training documentation. Knowledge training is required if no CDC is available for the AFS or training must be documented for a CDC waiver. Document knowledge training by circling the corresponding letter in the applicable skill level CDC column (with the exception of electronic records). Use the following procedures to document the CFETP:

2.4.2.2.1. Training start date (day, month, year), training complete date (day, month, year), trainee Initials, trainer Initials.

2.4.3. Transcribing documentation. Transcribing from old document to new CFETP is an administrative function, not a re-evaluation of training. Upon publication of a new CFETP, use the following procedures to transcribe:

2.4.3.1. Use the new CFETP to identify and certify current training requirements and to retain previous qualifications from the previous version.

2.4.3.2. Tasks previously certified and required in the current duty position circle the task (with the exception of electronic records) and enter the current date with the trainee and supervisor initials.

2.4.3.3. Tasks previously certified but not required in the current duty position (do not circle), transcribe only the previous certification date (no initials).

2.4.3.4. Annotate the AF Form 623a, (for example, "I certify the information contained in the CFETP dated XX was transcribed to the CFETP dated XX, and the trainee was given the superceded CFETP." Signed, dated, supervisor and trainee).

2.4.4. Maintenance of CFETPs for personnel in retraining status. Maintain CFETP from previous AFSC until commensurate skill level is achieved, then give the obsolete field CFETP to the individual.

2.4.5. Decertification and Recertification. When a supervisor determines an airman is unqualified on a task previously certified for their duty position, the supervisor erases the previous certification, or deletes certification when using automated system. Appropriate remarks pertaining to the reason for decertification are entered on the AF Form 623a.

2.4.6. Begin recertification (if required) following procedures in paragraph 2.4.2.1.

2.4.7. Indicates career knowledge provided in the 5-skill level CDCs. See Air Force Institute for Advanced Distributed Learning (AFIADL) catalog maintained by the unit OJT manager for current CDC listings or go to <http://www.maxwell.af.mil/au/afiadl>.

2.4.8. Are guides for development of promotion tests used in the Weighted Airman Promotion System (WAPS). Specialty Knowledge Tests (SKT) are developed at the USAF Occupational Measurement Squadron by senior NCOs with extensive practical experience in their career fields. The tests sample knowledge of CTG subject matter areas judged by test development team members to be most appropriate for promotion to higher grades. Questions are based upon study references listed in the WAPS catalog. Individual responsibilities are listed in chapter 1 of AFI 36-2605, *Air Force Military Personnel Testing System*. WAPS is not applicable to the Air National Guard or Air Reserve forces.

3. Recommendations. Comments and recommendations are invited concerning the quality of AETC training. A Training Feedback Hotline has been installed for the supervisors' convenience. For a quick response to concerns, call our Training Feedback Hotline at DSN 597-4566, fax us at DSN 597-3790, or e-mail us at, 81trg-tget@keesler.af.mil. Reference this STS and identify the specific area of concern (paragraph, training standard element, etc).

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

MICHAEL E. ZETTLER, Lieutenant General, USAF
Deputy Chief of Staff /Installations & Logistics

Attachments:

1. Electronic Principles Course Training Standard
2. Specialty Training Standard, 2E134
3. Five-Level Career Training Guide, 2E154
4. Seven-Level Career Training Guide, 2E174

PREFACE

NOTE 1: Dashed items in this CTS are not part of the original CTS created at the August 1999 Electronic Principles U&TW however, they are the specific objectives taught in the Electronic Principles course designed to meet the CTS requirements.

NOTE 2: Unless otherwise stated, students may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent the student from continuing in a manner that will lead to an unsatisfactory conclusion, safety violation, or damage to equipment.

NOTE 3: All 3-level tasks will be trained if a wartime surge is ordered.

| PROFICIENCY CODE KEY | | |
|--|--------------------|--|
| | SCALE VALUE | DEFINITION: The individual |
| Task Performance Levels | 1 | Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED) |
| | 2 | Can do most parts of the task. Needs help only on hardest parts. (PARTIALLY PROFICIENT) |
| | 3 | Can do all parts of the task. Needs only a spot check of completed work. (COMPETENT) |
| | 4 | Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT) |
| *Task Knowledge Levels | a | Can name parts, tools, and simple facts about the task. (NOMENCLATURE) |
| | b | Can determine step-by-step procedures for doing the task. (PROCEDURES) |
| | c | Can identify why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES) |
| | d | Can predict, isolate, and resolve problems about the task. (COMPLETE THEORY) |
| **Subject Knowledge Levels | A | Can identify basic facts and terms about the subject. (FACTS) |
| | B | Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES) |
| | C | Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS) |
| | D | Can evaluate conditions and make proper decisions about the subject. (EVALUATION) |
| EXPLANATIONS | | |
| <p>* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Examples: b and 1b)</p> <p>** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task or for a subject common to several tasks.</p> <p>X This mark is used alone instead of a scale value to show that no proficiency training is provided in the course.</p> <p>- This mark is used alone in course columns to show that training is required, but not given, due to limitations in resources.</p> | | |

PROFICIENCY
CODE

1. ELECTRONIC SUPPORT SUBJECTS.

- 1.1. Safety. B
– Identify safety precautions pertaining to electronics.
- 1.2. First Aid. B
– Identify first aid procedures for electrical injuries.
- 1.3. Electrostatic Discharge (ESD) Control. B
– Identify electrostatic discharge (ESD) sensitive device control methods.
- 1.4. Electromagnetic Effects (EMP/EMI). B
– Identify the techniques used to protect electronic equipment from the effects of electromagnetics (EMP/EMI).
- 1.5. Metric Notation.
- 1.5.1. Powers of Ten. B
– Convert decimal numbers to scientific notation and vice versa.
– Perform math operations of numbers expressed as scientific notation.
- 1.5.2. Electrical Prefixes. B
– Convert decimal numbers to electrical prefixes and vice versa.
– Convert electrical prefix values to other equivalent electrical prefix values.

2. USE TEST EQUIPMENT.

- 2.1. Analog Multimeter. 2b
– Identify the operating principles of the analog multimeter.
– Identify procedures for analog multimeter usage.
– Measure selected electrical values using analog and digital multimeters.
- 2.2. Digital Multimeter. 2b
– Identify the operating principles of the digital multimeter.
– Identify procedures for digital multimeter usage.
– Measure selected electrical values using analog and digital multimeters.
- 2.3. Oscilloscope. 2b
– Identify oscilloscope operating principles.
– Identify the procedures for oscilloscope usage.
– Measure selected electrical values using an oscilloscope and signal generator.
- 2.4. Signal Generator. 2b
– Identify the procedures for signal generator usage.
– Measure selected electrical values using an oscilloscope and signal generator.

3. BASIC CIRCUITS.

- 3.1. Direct Current (DC).
- 3.1.1. Terms. B
– Identify terms associated with direct current (DC) principles

| | PROFICIENCY CODE |
|--|---------------------|
| 3.1.2. Theory. <ul style="list-style-type: none">– Identify circuit schematic symbols.– Identify basic circuit operating principles.– Determine the results of parameter changes on DC resistive circuits.– Identify resistor voltage divider operating principles. | B |
| 3.1.3. Calculations. <ul style="list-style-type: none">– Calculate values for a series resistive DC circuit diagram.– Calculate values for a parallel resistive DC circuit diagram.– Calculate values for a series-parallel resistive DC circuit diagram. | B |
| 3.2. Alternating Current (AC). | |
| 3.2.1. Terms. <ul style="list-style-type: none">– Identify terms associated with AC principles. | B |
| 3.2.2. Calculations. <ul style="list-style-type: none">– Calculate AC voltage values.– Calculate AC frequency/time values. | B |
| 4. BASIC CIRCUIT COMPONENTS. | |
| 4.1. Resistors. | |
| 4.1.1. Theory. <ul style="list-style-type: none">– Identify resistor characteristics. | B |
| 4.1.2. Color Code. <ul style="list-style-type: none">– Using resistor color code, determine the ohm/tolerance value of resistors. | B |
| 4.1.3. Troubleshoot. <ul style="list-style-type: none">– Troubleshoot a series-parallel resistive circuit to a faulty resistor. | 2b |
| 4.2. Inductors. | |
| 4.2.1. Theory. <ul style="list-style-type: none">– Identify characteristics of inductors.– Identify inductor DC operating principles.– Identify inductor AC operating principles. | B |
| 4.2.2. Troubleshoot. <ul style="list-style-type: none">– Troubleshoot a faulty inductor in a circuit. | 2b |
| 4.3. Capacitors. | |
| 4.3.1. Theory. <ul style="list-style-type: none">– Identify characteristics of capacitors.– Identify capacitor DC operating principles.– Identify capacitor AC operating principles. | B |
| 4.3.2. Troubleshoot. <ul style="list-style-type: none">– Troubleshoot a faulty capacitor in circuit. | 2b |

PROFICIENCY
CODE

| | |
|---|----|
| 4.4. Resistive-Capacitive-Inductive (RCL) Circuit Theory. | |
| 4.4.1. Basic. | B |
| – Identify RCL circuit operating principles. | |
| 4.4.2. Resonant. | B |
| – Identify resonant RCL circuit operating principles. | |
| 4.4.3. Frequency Sensitive Filter. | B |
| – Identify frequency sensitive filter operating principles. | |
| 5. ELECTROMAGNETIC DEVICES. | |
| 5.1. Transformers. | |
| 5.1.1. Theory. | B |
| – Identify characteristics of transformers. | |
| – Identify transformer operating principles. | |
| 5.1.2. Troubleshoot. | 2b |
| – Troubleshoot a faulty transformer. | |
| 5.2. Relays and Solenoids. | |
| 5.2.1. Theory. | B |
| – Identify relay and solenoid operating principles. | |
| 5.2.2. Troubleshoot Relays. | 2b |
| – Troubleshoot a faulty relay in a circuit. | |
| 5.3. Motor Theory. | |
| 5.3.1. Direct Current. | B |
| – Identify DC motor operating principles. | |
| 5.3.2. Alternating Current. | B |
| – Identify AC motor operating principles. | |
| 5.4. Generator Theory. | |
| 5.4.1. Direct Current. | B |
| – Identify DC generator operating principles. | |
| 5.4.2. Alternating Current. | B |
| – Identify AC generator operating principles. | |
| 5.5. Synchro/Servo. | |
| 5.5.1. Theory. | B |
| – Identify servo/synchro operating principles. | |

| | PROFICIENCY CODE |
|---|---------------------|
| 5.5.2. Fault Isolate. <ul style="list-style-type: none">– Identify servo/synchro fault isolation procedures. | 2b |
| 5.6. Transducer Theory. <ul style="list-style-type: none">– Identify transducer operating principles. | B |
| 6. SOLID STATE DEVICES. | |
| 6.1. Diodes. | |
| 6.1.1. Theory. <ul style="list-style-type: none">– Identify solid state diode operating principles. | B |
| 6.1.2. Troubleshoot. <ul style="list-style-type: none">– Identify diode fault isolation techniques.– Troubleshoot a diode circuit. | 2b |
| 6.2. Bipolar Junction Transistors. | |
| 6.2.1. Theory. <ul style="list-style-type: none">– Identify bipolar transistor operating principles. | B |
| 6.2.2. Troubleshoot. <ul style="list-style-type: none">– Troubleshoot a bipolar junction transistor circuit. | 2b |
| 6.3. Special Purpose Device Theory. | |
| 6.3.1. Zener Diode. <ul style="list-style-type: none">– Identify zener diode operating principles. | B |
| 6.3.2. Light Emitting Diode (LED). <ul style="list-style-type: none">– Identify LED operating principles. | B |
| 6.3.3. Liquid Crystal Display (LCD). <ul style="list-style-type: none">– Identify LCD operating principles. | B |
| 6.3.4. Integrated Circuits (IC). <ul style="list-style-type: none">– Identify integrated circuit (IC) operating principles. | B |
| 6.3.5. Metal Oxide Semiconductor Field Effect Transistor (MOSFET). <ul style="list-style-type: none">– Identify MOSFET operating principles. | B |
| 6.3.6. Operational Amplifier (OP AMP). <ul style="list-style-type: none">– Identify OP AMP operating principles. | B |
| 7. TRANSISTOR AMPLIFIER CIRCUITS. | |
| 7.1. Theory. <ul style="list-style-type: none">– Identify the transistor amplifier configurations.– Identify common emitter amplifier operating principles.– Identify common collector amplifier operating principles.– Identify common base amplifier operating principles. | B |

| | PROFICIENCY CODE |
|--|---------------------|
| 7.2. Stabilization. <ul style="list-style-type: none">– Identify transistor amplifier temperature stabilization operating principles. | B |
| 7.3. Coupling. <ul style="list-style-type: none">– Identify coupling circuit operating principles. | B |
| 7.4. Troubleshoot. <ul style="list-style-type: none">– Troubleshoot a transistor amplifier circuit to a faulty component. | 2b |
| 8. POWER SUPPLY CIRCUITS. | |
| 8.1. Theory. | |
| 8.1.1. Rectifiers. <ul style="list-style-type: none">– Identify power supply rectifier operating principles. | B |
| 8.1.2. Filters. <ul style="list-style-type: none">– Identify power supply filter operating principles. | B |
| 8.1.3. Voltage Regulators. <ul style="list-style-type: none">– Identify shunt regulator operating principles.– Identify series electronic voltage regulator (EVR) operating principles. | B |
| 8.2. Troubleshoot. <ul style="list-style-type: none">– Identify types of malfunctions in a filtered power supply circuit.– Troubleshoot a filtered power supply circuit to a faulty component.– Troubleshoot a series EVR circuit to a faulty component. | 2b |
| 9. WAVE GENERATING CIRCUITS. | |
| 9.1. Theory. | |
| 9.1.1. Oscillators. <ul style="list-style-type: none">– Identify the characteristics of oscillator circuits.– Identify LC oscillator operating principles.– Identify crystal oscillator operating principles. | B |
| 9.1.2. Multivibrators. <ul style="list-style-type: none">– Identify astable multivibrator operating principles.– Identify monostable multivibrator operating principles.– Identify bistable multivibrator operating principles. | B |
| 9.1.3. Waveshaping Circuits. <ul style="list-style-type: none">– Identify RC integrating/differentiating circuit operating principles.– Identify sawtooth generator operating principles. | B |
| 9.2. Fault Isolate. <ul style="list-style-type: none">– Fault isolate a wave generating circuit. | 2b |

PROFICIENCY
CODE

10. DIGITAL NUMBERING SYSTEMS.

10.1. Conversions.

10.1.1. Binary.

- Identify principles of binary conversions.

B

10.1.2. Octal.

- Identify principles of octal conversions.

B

10.1.3. Hexadecimal.

- Identify principles of hexadecimal conversions.

B

10.1.4. Binary Coded Decimal.

- Identify principles of binary coded decimal (BCD) conversions.

B

10.2. Binary Math Operations.

- Determine the results of math operations.

B

11. DIGITAL LOGIC CIRCUITS.

11.1. Theory.

11.1.1. Gates.

- Identify principles of logic gate operation.

B

11.1.2. Flip-Flops.

- Identify principles of flip-flop operation.

B

11.1.3. Counters.

- Identify operating principles of counters.

B

11.1.4. Registers.

- Identify operating principles of registers.

B

11.1.5. Combinational Logic Circuits.

- Identify operating principles of combinational logic circuits.

B

11.2. Troubleshoot.

- Troubleshoot a combinational logic circuit.

B

11.3. Digital-to-Analog (D/A) and Analog-to-Digital (A/D) Converter Theory.

- Identify operating principles of a digital-to-analog (D/A) converters.
- Identify operating principles of analog-to-digital (A/D) converters.

B

12. BASIC COMPUTER FUNDAMENTALS.

12.1. Computer Theory.

12.1.1. Hardware.

- Identify computer hardware operating principles.

B

PROFICIENCY
CODE

| | |
|---|---|
| 12.1.2. Software. | |
| 12.1.2.1. Operating Systems. – Identify computer operating systems principles. | B |
| 12.1.2.2. Virus Protection. – Identify computer virus protection operating principles. | B |
| 12.1.2.3. Diagnostics. – Identify computer diagnostics operating principles. | B |
| 12.1.2.4. Applications. – Identify computer applications operating principles. | B |
| 12.1.3. Peripherals. – Identify computer peripheral devices operating principles. | B |
| 12.2. Network Theory. | |
| 12.2.1. Components. – Identify basic network hardware component operating principles. | B |
| 12.2.2. Types. – Identify basic network communication system types. | B |
| 12.2.3. Topologies. – Identify basic network physical topologies. | B |
| 12.2.4. Communication Mediums. – Identify network medium operating principles. | B |
| 13. BASIC COMMUNICATIONS THEORY. | |
| 13.1. Antenna. – Identify antenna operating principles. | B |
| 13.2. Transmission Lines. – Identify transmission line theory of operation. | B |
| 13.3. Waveguides. – Identify waveguide operating principles. | B |
| 13.4. Transmitters. | |
| 13.4.1. Amplitude Modulation (AM). – Identify AM transmitter operating principles. | B |
| 13.4.2. Frequency Modulation (FM). – Identify FM transmitter operating principles. | B |

PROFICIENCY
CODE

| | |
|---|----|
| 13.5. Receivers. | |
| 13.5.1. AM Receivers. | B |
| – Identify AM receiver operating principles. | |
| 13.5.2. FM Receivers. | B |
| – Identify FM receiver operating principles. | |
| 14. SOLDER AND DESOLDER. | |
| 14.1. Terminal Connection. | 2b |
| – Solder a wire to a terminal connector. | |
| – Desolder a wire from a terminal connector. | |
| 14.2. Printed Circuit Board (PCB). | 2b |
| – Solder three components to a PCB. | |
| – Desolder three components from a PCB. | |
| 14.3. Multipin Connector. | 2b |
| – Solder a tinned wire into a pin for use in a multipin connector. | |
| – Desolder a wire from a pin used in a multipin connector. | |
| 14.4. Coaxial Connector. | 2b |
| – Solder a coaxial connector center contact to a coaxial cable. | |
| – Desolder a coaxial connector center contact from a coaxial cable. | |
| 15. ASSEMBLE SOLDERLESS CONNECTORS. | |
| 15.1. Crimped Connection. | 2b |
| – Splice two wires together using a crimp connector. | |
| – Crimp a terminal lug to a wire. | |
| 15.2. Coaxial Connector. | 2b |
| – Assemble a solderless coaxial cable connector to a coaxial cable. | |
| 15.3. Multipin Connector. | 2b |
| – Crimp a wire into a pin for use in a multipin connector. | |
| – Assemble a multipin connector. | |

PREFACE

NOTE 1: In the event of data network or computer system failure, courses are authorized to use alternative methods of instruction to fulfill this STS element.

NOTE 2: Unless otherwise stated in the objective, the student may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is defined as anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent a student from continuing in a manner which will lead to an unsatisfactory conclusion, safety violation, or damage to the equipment. Successful students have performed the task to the satisfaction of the course; however, they may not be capable of meeting the field requirements for speed or accuracy.

NOTE 3: All equipment related objectives are performed by following procedures from technical orders, technical manuals, or student instructional material developed by the training facility. Test equipment used throughout the course includes:

| | |
|--------------------------|-----------------------------|
| Oscilloscope | Two-Way Radio |
| Infrared Viewer | Digital Multimeter |
| FPS2-2R Adapter | Personal Computer |
| High Voltage Probe | Infrared Test Transmitter |
| Strip Chart Recorder | Transmitter Alignment Meter |
| Receiver Alignment Meter | |

NOTE 4: The equipment items identified below are used as training vehicles within the skill awarding course since it incorporates most of the basic principles and procedures found in the remainder of the AFSC's equipment inventory.

Intrusion Detection - Keesler AFB, MS

Vindicator
Annunciators
Fiber Optic Systems
Entry Control Systems
Microwave Fence Sensor
Camera Surveillance Systems
Unique Uninterrupted Power Supplies (UPS)
AN/GSS-34 Ported Coaxial Cable Sensor (PCCS)
AN/GSS-42 Interior Intrusion Detection System (IIDS)
AN/GSS-39 Exterior Intrusion Detection System (EIDS)

Visual Imagery - Ft Meade, MD

Video Monitors/Receivers
Video Cameras and Systems
Video Recorders/Reproducers
Radio Master Control Systems
RF Broadcast Transmission Systems
Philips LTC 8601/60 Video Processor

NOTE 5: All objective references are performed as terminal objectives. Knowledge required to perform STS elements is inherent in each objective. This includes, but is not limited to, defining the capabilities, limitations, and theory of operation of the stated item.

NOTE 6: All tasks preceded by an asterisk (*) are trained during wartime.

Part I – Visual Imagery and Intrusion Detection Systems Apprentice

(Instruction is conducted at Keesler AFB, MS)

1. SAFETY.

1.1. Employ safety precautions pertaining to electronics.

1.2. Apply principles of Occupational Risk Management (ORM).

2. TECHNICAL PUBLICATIONS & MAINTENANCE DOCUMENTATION.

*2.1. Identify basic facts concerning the Air Force Technical Order System.

2.2. Use specific equipment publications when completing objectives involving maintenance actions.

3. MAINTENANCE DATA COLLECTION (MDC).

*3.1. Describe the purpose and importance of documenting maintenance data.

3.2. Input maintenance data using an automated maintenance data collection system.

4. INTRUSION DETECTION SYSTEMS (IDS).

*4.1. Describe Intrusion Detection systems.

*4.2. Identify the concepts for securing priority levels assets.

*4.3. Identify basic principles of fiber optic systems.

4.4. Identify emerging technologies of intrusion detection systems.

*5. INTRUSION DETECTION SYSTEMS ASSESSMENT EQUIPMENT.

5.1. Perform configuration changes to a Closed Circuit Television (CCTV) associated with an IDS.

5.2. Troubleshoot a CCTV system to the faulty line replaceable unit (LRU).

*6. INTRUSION DETECTION SYSTEMS SENSOR EQUIPMENT.

6.1. Interior Intrusion Detection Systems Sensor Equipment.

6.1.1. Describe the operation of interior intrusion detection systems sensor equipment.

6.1.2. Perform operational checks on a magnetic switch sensor.

6.1.3. Adjust a magnetic switch sensor.

6.1.4. Troubleshoot a magnetic switch sensor.

6.1.5. Perform operational checks on an interior microwave sensor.

6.1.6. Troubleshoot an interior microwave sensor.

6.1.7. Perform operational checks on an interior infrared sensor

- 6.1.8. Troubleshoot an interior infrared sensor.
- 6.1.9. Perform operational checks on an ultra sonic sensor.
- 6.1.10. Troubleshoot an interior ultra sonic sensor.
- 6.2. Exterior Intrusion Detection Systems Sensor Equipment.
 - 6.2.1. Describe the operation of exterior intrusion detection systems sensor equipment.
 - 6.2.2. Perform operational checks on a fence protection system.
 - 6.2.3. Troubleshoot a fence protection system to the faulty LRU.
 - 6.2.4. Perform operational checks on an infrared perimeter detection system.
 - 6.2.5. Align an infrared perimeter detection system.
 - 6.2.6. Troubleshoot an infrared perimeter detection system to the faulty LRU.
 - 6.2.7. Perform operational checks on a microwave fence sensor.
 - 6.2.8. Align a microwave fence sensor.
 - 6.2.9. Troubleshoot a microwave fence sensor to the faulty LRU.
 - 6.2.10. Describe operation of a buried line sensor.
 - 6.2.11. Perform operational checks on a buried line sensor.
 - 6.2.12. Troubleshoot the buried line sensor to the faulty LRU.
- *7. INTRUSION DETECTION SYSTEMS COMMAND AND CONTROL EQUIPMENT.
 - 7.1. Build and modify a site configuration for a computer-based annunciator.
 - 7.2. Identify basic principles of access control devices.
 - 7.3. Perform operational checks on a computer-based annunciator.
 - 7.4. Troubleshoot a computer-based annunciator to the faulty LRU.

Part II – Basic Visual Imagery and Intrusion Detection Systems Apprentice
(Instruction is conducted at Ft Meade, MD)

1. FUNDAMENTALS OF TELEVISION.

1.1. Principles of Safety (OSHA standards). Identify personal risks (to include DoD radiation hazard standard), environmental and HAZMAT considerations, and electrical and equipment safety.

1.2. General Repair Considerations. Explain corrosion control fundamentals and grounding (AC and signal).

*1.3. Identify basic principles of analog video, digital video, and audio (analog/digital).

*1.4. Identify RF transmission theory (AM/FM/TV), antenna systems, data transmission and reception (digital characteristics), and Studio Transmitter Link (STL) (e.g. Infrared, microwave).

1.5. Identify principles of troubleshooting and use block diagrams, component diagrams, schematics, and logic diagram flow charts when troubleshooting.

1.6. Use the following test equipment for measurements:

1.6.1. Waveform monitor.

1.6.2. Vectorscope.

1.6.3. Oscilloscope.

1.6.4. Video test signal generator.

1.6.5. Digital multimeter.

1.6.6. Analog multimeter.

1.6.7. Frequency counter.

1.7. Discuss new technology initiatives impacting the television industry.

2. MONITORS AND RECEIVERS.

*2.1. Identify monitor/receiver operating principles using block diagrams, circuit diagrams, and circuit components.

2.2. Degauss a cathode ray tube (CRT) (instructor demonstrated) and identify CRT replacement techniques.

2.3. Monitor/Receiver Operation and Circuit Checks:

2.3.1. Perform operational check on monitor/receiver.

2.3.2. Align power supply circuits.

2.3.3. Align deflection circuits.

2.3.4. Align high voltage circuits.

2.4. Troubleshoot the following circuits to the component level:

2.4.1. Video.

2.4.2. Audio.

2.4.3. Chroma.

2.4.4. Deflection.

2.4.5. Low voltage.

2.4.6. High voltage.

2.4.7. Radio frequency/intermediate frequency (tuner).

3. TELEVISION CAMERA

*3.1. Identify principles of optical systems (enabling) and charged coupled devices (CCD).

*3.2. Identify principles of television cameras using block diagrams, circuit descriptions, and circuit components.

*3.3. Remove and replace the television camera lens assembly and perform operational checks.

3.4. Perform the following alignments:

3.4.1. Power supply circuits.

*3.4.2. Back focus and tracking.

*3.4.3. Iris drive and aperture control circuits.

3.5. Troubleshoot and repair the camera to circuit card level.

4. AUDIO

*4.1. Identify audio principles using block diagrams, circuit descriptions, and circuit components.

4.2. Identify the following principles of analog audio:

4.2.1. Frequency response.

*4.2.2. Impedance matching.

4.2.3. Signal to Noise ratio.

*4.2.4. Balanced and unbalanced signals.

4.2.5. Pre-emphasis/de-emphasis.

*4.2.6. Signal grounding.

- 4.2.7. Connector types.
- 4.2.8. Stereo (phasing).
- 4.3. Identify the types and uses of microphones.
- 4.4. Use oscillators and audio generators/analyzers to perform audio-visual measurements.
- 4.5. Identify principles of digital audio and analog vs. digital compression techniques.
- 4.6. Identify analog/digital cassette deck principles of operation, perform operational checks, demagnetize heads, and lubricate tape paths.
- 4.7. Identify compact disk players principles of operation and perform operational checks.
- 4.8. Identify audio recorder system (digital cartridge) principles of operation and perform operational checks.
- 4.9. Identify principles of operation, perform operational checks, align, and troubleshoot distribution systems to the circuit board level.
- 4.10. Audio Consoles:
 - 4.10.1. Identify principles of operation.
 - 4.10.2. Identify principles of audio equalization (telephone line interfacing).
 - 4.10.3. Perform operational checks.
 - 4.10.4. Perform alignment (balance).
 - 4.10.5. Troubleshoot to the circuit board level.
- 5. VIDEO TAPE RECORDERS (VTR).
 - *5.1. Identify VTR concepts using block diagrams, circuit descriptions, and circuit components.
 - 5.2. Identify principles of operation for analog and digital VTR systems.
 - 5.3. Perform VTR operational and diagnostic checks.
 - *5.4. Perform VTR routine cleaning and lubrication.
 - 5.5. Perform alignments on mechanical systems, video, audio, and RF circuits.
 - 5.6. Troubleshoot mechanical, servo, and system control systems; video, audio, and RF circuits to the board level.
 - 5.7. Observe an instructor demonstrated removal and replacement of the VTR video head drum assembly.
- 6. STUDIO SYSTEMS.
 - 6.1. Identify principles of studio systems.

6.2. Identify studio generator principles and perform operational checks of sync/test signal and character generators.

6.3. Identify video switcher principles of operation and perform operational checks.

6.4. Identify distribution amplifier principles of operation and perform operational checks and alignments on video, pulse, and processing amplifiers.

6.5. Identify timing and phasing principles of operation, adjust timing and phasing, and perform subcarrier-horizontal phasing of time base correctors/frame synchronizers.

6.6. Prepare studio camera systems by taking light measurements with a photometer and adjusting the Camera Control Unit (CCU) iris, master pedestal, black balance, white balance, and color balance between cameras.

6.7. Troubleshoot video system to board/unit level.

7. TRANSMISSION AND DISTRIBUTION SYSTEMS.

*7.1. Identify the following radio and television transmitter principles:

7.1.1. Transmission concepts. (e.g., block diagrams)

7.1.2. Antenna systems. (e.g. Dipole, Yagi)

7.1.2.1. Radiation patterns.

7.1.2.2. Antenna polarization. (vertical, horizontal, circular)

7.1.2.3. Basic installation considerations.

7.1.2.4. Grounding.

7.2. Use the sweep generator/spectrum analyzer, time domain reflectometer, field strength meter, and watt meter for audio-visual measurements.

7.3. Transmitter Alignments and Performance Checks:

*7.3.1. Perform transmitter performance checks.

*7.3.2. Perform field strength measurements.

7.3.3. Align power supplies.

7.3.4. Align exciters.

7.3.5. Align power amplifiers.

7.3.6. Align antenna coupling networks.

7.3.7. Align RF modulators.

7.4. Troubleshoot transmitter to the module level.

*7.5. INTRODUCTION TO CABLE HEAD-END SYSTEMS. Identify the basic fundamentals of:

7.5.1. Cable distribution concepts. (e.g., block diagrams)

7.5.2. Rack assemblies. (Routing and forming wiring harnesses)

7.5.3. Receivers/Descramblers.

7.5.4. Modulators. (TV/Radio)

7.5.5. Bandpass filters.

7.5.6. Pilot generators.

7.5.7. Combiners/Mixers.

7.5.8. Video cable. (RG type)

7.5.9. Cable connectors. (F Type)

*7.6. Identify basic fundamentals and characteristics of microwave transmission and perform troubleshooting to unit level. (e.g., dish, feedhorn, LNB, etc.)

*7.7. Identify basic fundamentals and characteristics of satellite transmission, perform troubleshooting to unit level (e.g., dish, feedhorn, LNB, etc.), and identify principles of compression transmission.

*8. CONTINGENCY TRAINING EXERCISE.

8.1. Perform a mock deployment using simulated operation orders.

8.2. Perform microwave dish alignments in a simulated deployed environment.

8.3. Perform satellite acquisition and alignments in a simulated deployed environment.

8.4. Perform transmitter setup and operational check of a mobile transmitter in a simulated deployed environment.

9. COMPUTER EMBEDDED SYSTEMS.

9.1. Introduction to Computer-Embedded Systems.

9.1.1. Identify basic principles/concepts.

9.1.2. Identify operating systems employment.

9.1.3. Identify software functions.

9.1.4. Identify motherboard functions.

9.1.5. Identify video card functions.

9.1.6. Identify audio card functions.

9.1.7. Identify drives/storage devices.

9.1.8. Identify input/output (I/O) devices.

9.2. Identify principles of LAN/WAN

9.2.1. Monitor data streams using a protocol analyzer.

9.3. Perform operational checks on computer-embedded systems.

9.4. Troubleshoot computer-embedded systems to the board level.

*9.5. Identify principles and operate a non-linear editing system.

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

| Code | Definition |
|----------------|---|
| A | Subject Knowledge Level - Can identify basic facts and terms about the subject. (FACTS) |
| B | Subject Knowledge Level - Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES) |
| C | Subject Knowledge Level - Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS) |
| D | Subject Knowledge Level - Can evaluate conditions and make proper decisions about the subject. (EVALUATION) |
| - | When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs. |
| X | When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CDCs, CBTs, or a combination of OJT, CDCs, and/or CBTs. |
| X [*] | When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT. |

CDC column. The use of proficiency coding indicates the level of knowledge training provided by the CDCs, The CDC column will now identify the subject knowledge level covered in the CDC. The “K” will no longer be used to identify the knowledge covered in the CDC. Information pertaining to the meaning of the code can be located in the CTG coding system table.

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used when the trainer is other than the trainee's immediate supervisor.

| | | |
|--|-----------------------------|------|
| <i>THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY</i> | | |
| Personal Data - Privacy Act of 1974 | | |
| PRINTED NAME OF TRAINEE (<i>Last, First, Middle Initial</i>) | INITIALS (<i>Written</i>) | SSAN |
| PRINTED NAME OF CERTIFYING OFFICIAL AND WRITTEN INITIALS | | |
| N/I | N/I | |

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending STS revision. Locate current publications at.

AFSSIs at <https://www.afca.scott.af.mil/ip/>

Air Force publications at <http://www.e-publishing.af.mil/>.

AFIND 5, DISA Circulars and Instructions at <https://disa-ca.dtic.mil/pubs/>

Technical Orders (TO) at https://wpafbres34.wpafb.af.mil/aftox/AFTOX_DOCUMENTS/index.cfm

Online ReferenceWare and CBTs at https://www.smartforce.com/learning_community/Custom/USAF/login.asp

NOTE 2: AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training is mandatory for use in conjunction with this CTG. It sets the Air Force standard for qualification and certification for the following subject areas:

- Supply
- Training
- Supervision
- Physical Security
- Electronic Warfare
- Work Center Administration
- Operational Risk Management
- Career Progression Information
- Information Security (INFOSEC)
- Communications Security (COMSEC)
- Electronic Emission Security (TEMPEST)
- C-E Equipment Maintenance Management
- Operator Care of Assigned Government Vehicles
- Technical Orders (TO) and Technical Publications
- Protect MAJCOM/FOA Critical Mission Information
- C-E Equipment Maintenance System Inspecting, Reporting, and Forms

NOTE 3: Equipment/system knowledge and/or performance tasks are defined in the AFJQS. AFJQS items set the standard for qualification and certification and are mandatory for use in conjunction with this CTG. AFQTPs listed in the CTG are generally handbooks which do not have task listings, therefore tracking through the Core Automated Maintenance System (CAMS) is not possible. Annotate completion of these products on AF Form 623A.

NOTE 4: When an AFJQS is loaded into CAMS, letters in the AFJQS identifier are converted to the number representing each letter's alphabetical position (e.g., 200B would be loaded as 200.2). To save space, individual AFJQS tasks are not normally listed within the CTG. However, if a CTG task is closely related to an AFJQS task or area, the AFJQS task/heading is listed (e.g., 200.2.12) and the related CTG task is listed under it (e.g., 200.2.12.75). To prevent potential task numbering conflicts between AFJQS tasks and subordinate CTG tasks, subordinate CTG tasks start with the number 75. This creates gaps in the final task numbering sequence, but integrates related CTG and AFJQS tasks so they will be listed on your training documents in the same area and in order.

NOTE 5: When loading AFJQS tasks into the CAMS database, tasks are loaded as STS not 797 items.

| TASKS, KNOWLEDGE AND TECHNICAL REFERENCES | 5-LEVEL | | OJT CERTIFICATION | | | | |
|--|-------------|-----|-------------------|-----------|------------------|------------------|--------------------|
| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 1. ELECTRONIC PRINCIPLES (EP). TR: EP CBT and TO 31-1-141 Series | | | | | | | |
| 1.1. Identify principles and capabilities of electronic devices and circuits. | - | B | | | | | |
| 2. TEST EQUIPMENT. TR: TO 33K-1-100, Applicable test equipment technical orders | | | | | | | |
| 2.1. Identify principles, capabilities, and limitations of the following test equipment items: | | | | | | | |
| 2.1.1. Analog oscilloscope. | - | B | | | | | |
| 2.1.2. Digital oscilloscope. | - | B | | | | | |
| 2.1.3. Spectrum analyzer. | - | B | | | | | |
| 2.1.4. Analog multimeter. | - | B | | | | | |
| 2.1.5. Digital multimeter. | - | B | | | | | |
| 2.1.6. RF Power meter. | - | B | | | | | |
| 2.1.7. Optical time domain reflectometer. | - | B | | | | | |
| 2.1.8. Time domain reflectometer. | - | B | | | | | |
| 2.1.9. Bit error rate test set. | - | B | | | | | |
| 2.1.10. RF signal generator. | - | B | | | | | |
| 2.1.11. Frequency counter. | - | B | | | | | |
| 2.1.12. Optical Power Meter | - | B | | | | | |
| 2.2. Perform equipment maintenance using the following test equipment/devices: | | | | | | | |
| 2.2.1. AM modulation monitor. | X* | - | | | | | |
| 2.2.2. Analog multimeter. | X* | - | | | | | |
| 2.2.3. Audio oscillator/analyzer. | X* | - | | | | | |
| 2.2.4. Auto sweep generator. | - | - | | | | | |
| 2.2.5. Capacitance/inductance tester. | - | - | | | | | |
| 2.2.6. Collimator. | X* | - | | | | | |
| 2.2.7. Color monitor set-up analyzer. | - | - | | | | | |
| 2.2.8. CRT checker. | - | - | | | | | |
| 2.2.9. Decibel meter. | - | - | | | | | |
| 2.2.10. Digital logic clip. | - | - | | | | | |
| 2.2.11. Digital logic probe. | - | - | | | | | |
| 2.2.12. Digital multimeter. | X* | - | | | | | |

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| 2.2.13. Distortion analyzer. | - | - | | | | | |
| 2.2.14. Dummy load. | - | - | | | | | |
| 2.2.15. Field strength meter. | X* | - | | | | | |
| 2.2.16. FM modulation monitor. | X* | - | | | | | |
| 2.2.17. FM stereo modulation monitor. | X* | - | | | | | |
| 2.2.18. Frequency counter. | X* | - | | | | | |
| 2.2.19. Function generator. | X* | - | | | | | |
| 2.2.20. High voltage probe. | - | - | | | | | |
| 2.2.21. Impedance matching device. | - | - | | | | | |
| 2.2.22. Infrared generator. | - | - | | | | | |
| 2.2.23. Infrared tester. | - | - | | | | | |
| 2.2.24. Insulation test set. | - | - | | | | | |
| 2.2.25. Multi-camera tester. | - | - | | | | | |
| 2.2.26. Oscilloscope. | X* | - | | | | | |
| 2.2.27. Optical time domain reflectometer. | X* | - | | | | | |
| 2.2.28. Photometer. | X* | - | | | | | |
| 2.2.29. Protocol analyzer. | X* | - | | | | | |
| 2.2.30. RF power meter. | X* | - | | | | | |
| 2.2.31. RF signal generator | X* | - | | | | | |
| 2.2.32. Spectrum analyzer. | X* | - | | | | | |
| 2.2.33. Strip chart recorder. | X* | - | | | | | |
| 2.2.34. Television analyzer. | X* | - | | | | | |
| 2.2.35. Test set, alarm system. | - | - | | | | | |
| 2.2.36. Test set, electrical power. | - | - | | | | | |
| 2.2.37. Test set, electronic system. | - | - | | | | | |
| 2.2.38. Test set, sensor simulator. | - | - | | | | | |
| 2.2.39. Transistor/FET tester. | - | - | | | | | |
| 2.2.40. Television demodulator. | - | - | | | | | |
| 2.2.41. Television modulation monitor. | X* | - | | | | | |
| 2.2.42. Time domain reflectometer. | X* | - | | | | | |
| 2.2.43. Vectorscope. | X* | - | | | | | |
| 2.2.44. Video test signal generator. | X* | - | | | | | |
| 2.2.45. Watt meter. | X* | - | | | | | |

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| 2.2.46. Waveform monitor. | X* | - | | | | | |
| 2.2.47. Optical Power Meter | X* | - | | | | | |
| 3. STANDARD MAINTENANCE PRACTICES. TR: 31-141-1 volume 1, TO 00-25-234, MIL-STD 2000A, American Public Works Association Policy and ANSI Z53.1 | | | | | | | |
| 3.1. Describe basic troubleshooting procedures. | X* | - | | | | | |
| 3.2. Interpret results of diagnostic programs. | X* | - | | | | | |
| 3.3. Interpret diagrams for fault isolation. | X* | - | | | | | |
| 3.4. Locate elements such as unit, module, row, column, component, pin, connector, or test point using alphanumeric designator. | X* | - | | | | | |
| 3.5. Solder and desolder electronic equipment components. | X* | - | | | | | |
| 3.6. Perform utility plumbing connections. | - | - | | | | | |
| 3.7. Clean optical surfaces. | - | - | | | | | |
| 3.8. Explain the requirements for marking and identifying underground utilities | X* | - | | | | | |
| 4. COMPUTER SECURITY (COMPUSEC). TR: AFI 33-202 and AFQTP 2EXXX-202D | | | | | | | |
| 4.1. Define COMPUSEC. | X | - | | | | | |
| 4.2. Identify vulnerabilities and incidents. | X | - | | | | | |
| 4.3. Describe data protection techniques. | X | - | | | | | |
| 4.4. Describe basic countermeasures. | X | - | | | | | |
| 4.5. Describe reporting procedures. | X | - | | | | | |
| 4.6. Explain malicious logic. | X | - | | | | | |
| 4.7. Describe methods of malicious logic protection. | X | - | | | | | |
| 4.8. Describe TEMPEST suppression techniques. | X* | - | | | | | |
| 4.9. Perform TEMPEST maintenance. | X* | - | | | | | |
| 5. STANDARD INSTALLATION PRACTICES. TR: TOs 31-10-7, 31-10-11, 31-10-13, 31-10-24, 31W-1-102, 31W2-4-330 series, and 31W3-10-20; TIA/EIA-568A & 569; AFI 32-1065; AFJQS 2EXXX-202B | | | | | | | |
| 5.1. State facts related to the following practices: | | | | | | | |
| 5.1.1. Installation. | X | A | | | | | |
| 5.1.2. Configuration. | X | A | | | | | |

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| 5.1.3. Interconnection. | X | A | | | | | |
| 5.1.4. Inspection. | X | A | | | | | |
| 5.2. Explain the importance of cable labeling and installation documentation. | X | B | | | | | |
| 5.3. Describe wire color coding standards. | X* | B | | | | | |
| 5.4. Describe fiber optics installation concepts. | X* | B | | | | | |
| 5.5. Describe the concepts of: | | | | | | | |
| 5.5.1. Grounding. | X | B | | | | | |
| 5.5.2. Bonding. | X | B | | | | | |
| 5.5.3. Shielding. | X | B | | | | | |
| 5.5.4. Lightning protection. | X | B | | | | | |
| 5.6. Remove or install equipment grounds. | X* | - | | | | | |
| 5.7. Check quality of equipment grounds. | X* | - | | | | | |
| 5.8. Identify procedures to terminate multi-conductor cables. | X* | - | | | | | |
| 5.9. Construct the following cable connectors: | | | | | | | |
| 5.9.1. Multi pin. | X* | - | | | | | |
| 5.9.2. Modular. | X* | - | | | | | |
| 5.9.3. Coaxial. | X* | - | | | | | |
| 5.9.4. Fiber. | X* | - | | | | | |
| 5.10. Isolate and repair malfunctions in cable assemblies. | X* | - | | | | | |
| 6. COMMUNICATIONS PRINCIPLES. TR: TO 31-1-141 Series | | | | | | | |
| 6.1. State facts relating to the following: | | | | | | | |
| 6.1.1. Amplitude Modulation (AM). | - | B | | | | | |
| 6.1.2. Frequency Modulation (FM). | - | B | | | | | |
| 6.1.3. Phase Modulation (PM). | - | B | | | | | |
| 6.1.4. Pulse Code Modulation (PCM). | - | B | | | | | |
| 6.1.5. Bandwidth. | - | B | | | | | |
| 6.1.6. Lightwave communications. | - | B | | | | | |
| 6.1.7. Asynchronous/synchronous communication modes. | - | B | | | | | |
| 6.1.8. Error detection and correction. | - | B | | | | | |

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| 6.2. State facts relating to the theory of operation of the following interface standards and protocols: | | | | | | | |
| 6.2.1. EIA/RS-232C. | - | B | | | | | |
| 6.2.2. EIA/RS-449. | - | B | | | | | |
| 6.2.3. EIA/RS-422. | - | B | | | | | |
| 6.2.4. EIA/RS-423. | - | B | | | | | |
| 6.2.5. EIA-530. | - | B | | | | | |
| 6.2.6. EIA-568. | - | B | | | | | |
| 6.2.7. V.35. | - | B | | | | | |
| 6.2.8. MIL STD 188-114A. | - | B | | | | | |
| 6.2.9. TCP/IP. TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E)/ Communications-Electronics Maintenance Technician; Microsoft TCP/IP on Windows NT 4.0: Introduction to TCP/IP and IP Addressing | - | - | | | | | |
| 6.2.10. X.25/1822. | - | - | | | | | |
| 6.2.11. GOSIP. | - | - | | | | | |
| 6.3. State facts relating to the theory of operation of communication protocols/addressing. TR: https://www.smartforce.com/ /Communications-Electronics Maintenance Technician; Introduction to Common Networking Protocols and Internetworking Overview | - | - | | | | | |
| 6.4. State facts relating to the following switching methods: TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E) /Communications-Electronics Maintenance Technician; WAN Technologies | | | | | | | |
| 6.4.1. Circuit. | - | - | | | | | |
| 6.4.2. Message. | - | - | | | | | |
| 6.4.3. Packet. | - | - | | | | | |
| 6.4.4. Asynchronous transfer mode (ATM). TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E) /Communications-Electronics Maintenance Technician; ATM Principles | - | - | | | | | |

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| 6.5. State facts relating to the following multiplexing methods: TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E) /Communications-Electronics Maintenance Technician; Data Communications: Signals and Systems | | | | | | | |
| 6.5.1. Frequency Division Multiplexing (FDM). | - | - | | | | | |
| 6.5.2. Time Division Multiplexing (TDM). | - | - | | | | | |
| 6.5.3. T1 rate and higher. | - | - | | | | | |
| 6.6. State facts relating to the following cryptology methods: TR: Securing Network Information: CBT Introduction to Security in Networked Environments https://www.smartforce.com/learning_community/Customer/USAF/login.asp | | | | | | | |
| 6.6.1. Secret key/symmetrical (traditional cryptographic equipment). | - | - | | | | | |
| 6.6.2. Public key/asymmetrical (FORTEZZA). | - | - | | | | | |
| 7. INFORMATION TRANSPORT CONCEPTS. | | | | | | | |
| 7.1. State facts relating to the theory of operation of the following network configurations: TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E) /Communications-Electronics Maintenance Technician; LAN Fundamentals; and CBT Volume--LAN Technologies: LAN Topologies and Techniques | | | | | | | |
| 7.1.1. Network topologies (Star, Ring, Bus, etc.). | X | - | | | | | |
| 7.1.2. Network types (LAN, WAN, VPN). | X | - | | | | | |
| 7.2. State facts relating to the theory of operation of the following information transport devices: TR: https://www.smartforce.com/ Communications-Electronics Maintenance (2E) /Communications-Electronics Maintenance Technician; Fundamentals of Internetworking; CBT Volume--LAN Technologies: LAN Media and Components | | | | | | | |
| 7.2.1. Routers. | X | - | | | | | |
| 7.2.2. Hubs (concentrators). | X | - | | | | | |
| 7.2.3. Bridges. | X | - | | | | | |
| 7.2.4. Gateways. | X | - | | | | | |
| 7.2.5. Switches. | X | - | | | | | |

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| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 7.2.6. Data terminal equipment (DTE). | X | - | | | | | |
| 7.2.7. Data communications equipment (DCE). | | | | | | | |
| 7.2.7.1. Modems. | X | - | | | | | |
| 7.2.7.2. Data service units/channel service units (DSU/CSU). | X | - | | | | | |
| 7.2.8. Multiplexers. | X | - | | | | | |
| 7.2.9. Network interface card. | X | - | | | | | |
| 7.2.10. Common encryption devices used in AF and DOD communication networks. | X | - | | | | | |
| 7.2.11. Integrated Digital Network Exchange (IDNX). | X | - | | | | | |
| 8. EXPEDITIONARY COMMUNICATIONS CONCEPTS. TR: https://aefcenter.acc.af.mil | | | | | | | |
| 8.1. Identify basic concepts of the Aerospace Expeditionary Force (AEF) deployment process. TR: AFI 10-400, chapter 1 thru 3 | X | B | | | | | |
| 8.2. Explain basic concepts of Unit Type Codes (UTC) and Force Packaging as it relates to the AEF tasking process. TR: AFMAN 10-401, chapter 4 thru 6; http://www.fas.org/man/dod-101/usaf/docs/cwpc/4200-FO.htm , http://www.cadre.maxwell.af.mil/warfaresudies/cwpc/Instructional%20Period%20Presentation.html | X | B | | | | | |
| 8.3. Describe deployment procedures. TR: AFMAN 10-100; MAJCOM and Local Directives | | | | | | | |
| 8.3.1. Pre-deployment. | X | B | | | | | |
| 8.3.2. Employment. | X | B | | | | | |
| 8.3.3. Post deployment. | X | B | | | | | |
| 8.3.4. Recovery. | X | B | | | | | |
| 8.4. Identify deployable communications systems associated with this AFSC. | X | A | | | | | |
| 8.5. Accomplish the following mobility procedures: TR: Applicable MAJCOM directives; TOs 00-20-series | | | | | | | |
| 8.5.1. Pre-deployment inspections. | X* | - | | | | | |
| 8.5.2. Air mobility equipment preparation. | X* | - | | | | | |
| 8.5.3. Road mobility equipment preparation. | X* | - | | | | | |
| 8.5.4. Post-deployment turn around. | X* | - | | | | | |

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| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 9. ELECTRICAL POWER SYSTEMS. | | | | | | | |
| 9.1. Describe the application of the following types of uninterruptible power supplies: | | | | | | | |
| 9.1.1. Batteries. TR: AFJQS 3E0X2-214D, Module 1 | X* | - | | | | | |
| 9.1.2. Switched electrical power systems. TR: AFQTP 3E0X2-213YA, Modules 1 and 2 | X* | - | | | | | |
| 9.2. Describe the application of the following types of generators: | | | | | | | |
| 9.2.1. Fixed. | X* | - | | | | | |
| 9.2.2. Mobile/tactical. | X* | - | | | | | |
| 9.2.3. 60 Hertz. | X* | - | | | | | |
| 9.2.4. 400 Hertz. | X* | - | | | | | |
| 9.3. Describe commercial power requirements. | X* | - | | | | | |
| 9.4. Describe power phasing requirements. | X* | - | | | | | |
| 10. MAINTENANCE FUNDAMENTALS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 10.1. State basic facts, capabilities, and limitations of: | | | | | | | |
| 10.1.1. Video. | - | A | | | | | |
| 10.1.2. RF transmission. | - | A | | | | | |
| 10.1.3. AM/FM Antenna. | - | A | | | | | |
| 10.1.4. Data transmission and reception. | - | A | | | | | |
| 10.1.5. Infrared. | - | A | | | | | |
| 11. VIDEO CAMERAS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 11.1. State basic facts, capabilities, and limitations of: | | | | | | | |
| 11.1.1. Camera system charged coupled devices (CCD). | X* | A | | | | | |
| 11.1.2. Camera system optics. | X* | A | | | | | |
| 11.1.3. Camera system video processing. | X* | A | | | | | |
| 11.1.4. Color balance between cameras. | X* | A | | | | | |
| 11.1.5. Camera types. | - | A | | | | | |
| 11.2. Perform operational check. | X* | - | | | | | |

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| 11.3. Remove and replace the following camera components: | | | | | | | |
| 11.3.1. Lens and servo assemblies. | X* | - | | | | | |
| 11.3.2. Subassemblies. | X* | - | | | | | |
| 11.3.3. Viewfinder. | X* | - | | | | | |
| 11.4. Adjust cable equalizers for cameras. | X* | - | | | | | |
| 11.5. Adjust the following remote controls: | | | | | | | |
| 11.5.1. Black balance. | X* | - | | | | | |
| 11.5.2. Iris. | X* | - | | | | | |
| 11.5.3. Master pedestal. | X* | - | | | | | |
| 11.5.4. White balance. | X* | - | | | | | |
| 11.6. Align the following camera components: | | | | | | | |
| 11.6.1. Aperture correction circuits. | X* | - | | | | | |
| 11.6.2. Back focus and tracking. | X* | - | | | | | |
| 11.6.3. Encoder circuits. | X* | - | | | | | |
| 11.6.4. Sync processing circuits. | - | - | | | | | |
| 11.6.5. Vertical and horizontal drive circuits. | - | - | | | | | |
| 11.6.6. Video preamplifiers. | - | - | | | | | |
| 11.6.7. Contour circuits. | - | - | | | | | |
| 11.6.8. Iris drive circuits. | - | - | | | | | |
| 11.6.9. Masking circuits. | - | - | | | | | |
| 11.6.10. Shading circuits. | - | - | | | | | |
| 11.6.11. Gamma circuits. | - | - | | | | | |
| 11.6.12. Viewfinder. | X* | - | | | | | |
| 11.7. Troubleshoot and repair the following: | | - | | | | | |
| 11.7.1. Camera circuits. | - | - | | | | | |
| 11.7.2. Camera control unit. | - | - | | | | | |
| 11.7.3. Cable equalizer circuits. | - | - | | | | | |
| 11.7.4. Viewfinder. | - | - | | | | | |
| 11.8. Maintain pedestals and camera head mounts. | | - | | | | | |
| 11.8.1. Clean. | X* | - | | | | | |
| 11.8.2. Lubricate. | X* | - | | | | | |
| 11.8.3. Adjust the following: | | | | | | | |

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| 11.8.3.1. Balance. | - | - | | | | | |
| 11.8.3.2. Mechanical stops. | - | - | | | | | |
| 11.8.4. Troubleshoot and repair. | - | - | | | | | |
| 12. TELEVISION MONITORS AND RECEIVERS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 12.1. Identify principles of operation. | X* | B | | | | | |
| 12.2. Perform operational checks on television monitors and receivers. | X* | - | | | | | |
| 12.3. Degauss color cathode ray tubes (CRT). | X* | - | | | | | |
| 12.4. Align the following circuits: | | | | | | | |
| 12.4.1. High voltage circuits. | X* | - | | | | | |
| 12.4.2. Video. | X* | - | | | | | |
| 12.4.3. Chroma. | X* | - | | | | | |
| 12.4.4. Audio. | X* | - | | | | | |
| 12.4.5. Deflection. | X* | - | | | | | |
| 12.4.6. Convergence. | X* | - | | | | | |
| 12.5. Troubleshoot the following circuits: | | | | | | | |
| 12.5.1. Low voltage. | - | - | | | | | |
| 12.5.2. High voltage. | - | - | | | | | |
| 12.5.3. Video. | - | - | | | | | |
| 12.5.4. Chroma. | - | - | | | | | |
| 12.5.5. Audio. | - | - | | | | | |
| 12.5.6. Deflection. | - | - | | | | | |
| 12.6. Cathode Ray Tubes (CRT). | | - | | | | | |
| 12.6.1. Remove and replace. | - | - | | | | | |
| 12.6.2. Dispose of CRTs. | X* | B | | | | | |
| 13. VIDEO PROJECTION SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 13.1. Describe function of controls and indicators of video projection systems. | X* | B | | | | | |
| 13.2. Describe operational theory of video projection systems. | X* | B | | | | | |
| 13.3. Perform operational check on video projection systems. | X* | - | | | | | |

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| 13.4. Perform preventive maintenance inspections on video projection systems. | X* | - | | | | | |
| 13.5. Align video projection systems. | - | - | | | | | |
| 13.6. Isolate malfunctions associated with video projection systems. | - | - | | | | | |
| 14. VIDEO TAPE RECORDING SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 14.1. State basic facts, limitations, and capabilities of: | | | | | | | |
| 14.1.1. Analog video tape recording systems. | X* | A | | | | | |
| 14.1.2. Digital video tape recording systems. | X* | A | | | | | |
| 14.2. Perform operational check/diagnostic check of video tape recording systems. | X* | - | | | | | |
| 14.3. Perform routine cleaning and lubrication of video tape recording systems. | X* | - | | | | | |
| 14.4. Degauss tape path and heads of video tape recorder system. | - | - | | | | | |
| 14.5. Align the following on a video tape recording system: | | | | | | | |
| 14.5.1. Mechanical systems. | X* | - | | | | | |
| 14.5.2. Servo systems. | - | - | | | | | |
| 14.5.3. Video circuits. | - | - | | | | | |
| 14.5.4. Audio circuits. | - | - | | | | | |
| 14.5.5. Editing systems. | - | - | | | | | |
| 14.5.6. RF circuits. | - | - | | | | | |
| 14.5.7. Remote control systems. | - | - | | | | | |
| 14.6. Troubleshoot and repair the following on a video tape recorder system. | | | | | | | |
| 14.6.1. Mechanical systems. | - | - | | | | | |
| 14.6.2. Servo systems. | - | - | | | | | |
| 14.6.3. System control. | - | - | | | | | |
| 14.6.4. Video circuits. | - | - | | | | | |
| 14.6.5. Audio circuits. | - | - | | | | | |
| 14.6.6. Editing systems. | - | - | | | | | |
| 14.6.7. RF circuits. | - | - | | | | | |
| 14.6.8. Remote control systems. | - | - | | | | | |

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| 15. CAMCORDERS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 15.1. Describe function of camcorder controls and indicators. | X* | B | | | | | |
| 15.2. Describe operational theory of camcorders. | X* | - | | | | | |
| 15.3. Perform operational check on camcorders. | X* | - | | | | | |
| 15.4. Clean and service camcorders. | X* | - | | | | | |
| 15.5. Perform preventive maintenance inspections of camcorder subassemblies. | X* | - | | | | | |
| 16. DISTRIBUTION AMPLIFIERS (DA). TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 16.1. Identify principles of operation. | X* | B | | | | | |
| 16.2. Perform operational check of: | | | | | | | |
| 16.2.1. Video DA. | X* | - | | | | | |
| 16.2.2. Pulse DA. | - | - | | | | | |
| 16.2.3. Processing DA (Audio). | X* | - | | | | | |
| 16.3. Align the following amplifiers: | | | | | | | |
| 16.3.1. Video DA. | X* | - | | | | | |
| 16.3.2. Pulse DA. | - | - | | | | | |
| 16.3.3. Processing DA. (Audio) | X* | - | | | | | |
| 16.4. Remove and replace the following amplifiers: | | | | | | | |
| 16.4.1. Video DA. | - | - | | | | | |
| 16.4.2. Pulse DA. | - | - | | | | | |
| 16.4.3. Processing DA. (Audio) | - | - | | | | | |
| 16.5. Troubleshoot and repair the following amplifiers: | | - | | | | | |
| 16.5.1. Video DA. | - | - | | | | | |
| 16.5.2. Pulse DA. | - | - | | | | | |
| 16.5.3. Processing DA. (Audio) | - | - | | | | | |
| 17. TIME BASE CORRECTOR/FRAME SYNCHRONIZER. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 17.1. Identify principles of operation. | - | B | | | | | |
| 17.2. Perform operational checks. | - | - | | | | | |

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| 17.3. Perform adjustments. | - | - | | | | | |
| 18. VIDEO SWITCHER. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 18.1. Identify principles of operation. | X* | B | | | | | |
| 18.2. Perform operational checks. | X* | - | | | | | |
| 18.3. Align. | - | - | | | | | |
| 18.4. Troubleshoot and repair. | - | - | | | | | |
| 19. TIMING AND PHASING. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 19.1. Identify basic facts of timing/phasing. | - | A | | | | | |
| 19.2. Calculate delay line length. | - | B | | | | | |
| 19.3. Adjust timing/phasing. | X* | - | | | | | |
| 20. SYNC GENERATOR. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 20.1. Identify principles of operation. | - | - | | | | | |
| 20.2. Perform operational check. | - | - | | | | | |
| 20.3. Align. | - | - | | | | | |
| 20.4. Troubleshoot and repair. | - | - | | | | | |
| 21. CHARACTER GENERATOR. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 21.1. Identify principles of operation. | - | B | | | | | |
| 21.2. Perform operational checks. | - | - | | | | | |
| 21.3. Align. | - | - | | | | | |
| 21.4. Troubleshoot and repair. | - | - | | | | | |
| 22. STILL STORE SYSTEM. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 22.1. Identify principles of operation. | - | - | | | | | |
| 22.2. Perform operational check. | - | - | | | | | |
| 22.3. Align. | - | - | | | | | |
| 22.4. Troubleshoot and repair. | - | - | | | | | |

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| 23. DIGITAL VIDEO EFFECTS SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 23.1. Identify principles of operation. | - | B | | | | | |
| 23.2. Perform operational check. | - | - | | | | | |
| 23.3. Align. | - | - | | | | | |
| 23.4. Troubleshoot and repair. | - | - | | | | | |
| 24. DIGITAL VIDEO STORAGE SYSTEM. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 24.1. State basic facts, capabilities, and limitations of a digital video storage system. | - | A | | | | | |
| 25. CAMERA INTERCOM OR INTERPHONE SYSTEM. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 25.1. Identify principles of operation. | - | - | | | | | |
| 25.2. Perform operational checks. | - | - | | | | | |
| 25.3. Align. | - | - | | | | | |
| 25.4. Troubleshoot and repair. | - | - | | | | | |
| 26. TELEPROMPTER SYSTEM. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 26.1. Identify principles of operation. | - | - | | | | | |
| 26.2. Perform operational checks. | - | - | | | | | |
| 26.3. Align control/scroll sections. | - | - | | | | | |
| 26.4. Troubleshoot and repair. | - | - | | | | | |
| 27. LIGHTING SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 27.1. Identify principles of operation. | - | B | | | | | |
| 27.2. Perform operational checks. | - | - | | | | | |
| 27.3. Perform adjustments. | - | - | | | | | |
| 27.4. Troubleshoot and repair. | - | - | | | | | |
| 27.5. Remove and replace lighting system components. | - | - | | | | | |

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| 28. RADIO AND TV TRANSMITTERS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 28.1. Identify principles of operation. | X* | B | | | | | |
| 28.2. Perform transmitter performance checks. | X* | - | | | | | |
| 28.3. Perform transmitter change over. | X* | - | | | | | |
| 28.4. Perform field strength measurements. | X* | - | | | | | |
| 28.5. Align the following: | | | | | | | |
| 28.5.1. Power supplies. | - | - | | | | | |
| 28.5.2. Exciters. | - | - | | | | | |
| 28.5.3. RF Modulators. | - | - | | | | | |
| 28.5.4. Power amplifiers. | - | - | | | | | |
| 28.5.5. Antenna coupling networks. | - | - | | | | | |
| 28.6. Troubleshoot and repair transmitter. | - | - | | | | | |
| 29. CABLE HEAD-END SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 29.1. Identify principles of operation. | X* | B | | | | | |
| 29.2. Align. | - | - | | | | | |
| 29.3. Troubleshoot and repair. | - | - | | | | | |
| 30. MICROWAVE SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 30.1. Identify principles of operation. | - | B | | | | | |
| 30.2. Perform operational checks. | - | - | | | | | |
| 30.3. Align transmitter. | - | - | | | | | |
| 30.4. Align receiver. | - | - | | | | | |
| 30.5. Troubleshoot and repair. | - | - | | | | | |
| 31. SATELLITE SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 31.1. Identify principles of operation. | X* | B | | | | | |
| 31.2. Perform operational checks. | - | - | | | | | |
| 31.3. Troubleshoot and repair. | - | - | | | | | |

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| 32. AUDIO SYSTEMS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 32.1. Identify principles of operation. | - | B | | | | | |
| 32.2. Perform system operational checks. | - | - | | | | | |
| 32.3. Microphones. | | | | | | | |
| 32.3.1. Identify principles of operation. | - | - | | | | | |
| 32.3.2. Perform operational checks. | - | - | | | | | |
| 32.3.3. Troubleshoot and repair. | - | - | | | | | |
| 32.4. Audio consoles. | | | | | | | |
| 32.4.1. Identify principles of operation. | - | B | | | | | |
| 32.4.2. Identify principles of impedance matching. | - | B | | | | | |
| 32.4.3. Perform operational checks. | - | - | | | | | |
| 32.4.4. Align mixer preamps/amps. | - | - | | | | | |
| 32.4.5. Troubleshoot and repair. | - | - | | | | | |
| 32.5. Audio distribution systems. | | | | | | | |
| 32.5.1. Identify principles of operation. | - | B | | | | | |
| 32.5.2. Perform operational check. | - | - | | | | | |
| 32.5.3. Align. | - | - | | | | | |
| 32.5.4. Troubleshoot and repair. | - | - | | | | | |
| 32.6. Speaker systems. | | | | | | | |
| 32.6.1. Identify principles of operation. | - | B | | | | | |
| 32.6.2. Perform operational checks. | - | - | | | | | |
| 32.7. State basic facts, and operations of compact disc players. | - | A | | | | | |
| 33. VIDEO TELECONFERENCING SYSTEM. | | | | | | | |
| 33.1. Identify principles of operation. | X* | B | | | | | |
| 33.2. Configure system. | - | - | | | | | |
| 34. PHOTOGRAPHIC FUNDAMENTALS. TR: TO 10A1-1-32; TM 11-401-2 | | | | | | | |
| 34.1. Identify facts relating to the theory of optics. | - | A | | | | | |
| 34.2. Identify facts concerning the characteristics of sensitized materials. | - | A | | | | | |
| 34.3. Identify facts relating to the characteristics of exposure control. | - | A | | | | | |

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| 35. STILL PICTURE CAMERAS. | | | | | | | |
| 35.1. MEDIUM FORMAT CAMERAS. TR: TOs 10B1-6 Series, 10B1-7 Series, and 10B1-12-6-1; Commercial Manuals | | | | | | | |
| 35.1.1. State basic facts of operation. | X* | A | | | | | |
| 35.1.2. Perform operational checks, clean, and adjust. | X* | - | | | | | |
| 35.1.3. Troubleshoot and repair. | X* | - | | | | | |
| 35.2. SMALL FORMAT CAMERAS. TR: TOs 10B1-12, 10B1-3, and 10B1-4 Series; Commercial Manuals | | | | | | | |
| 35.2.1. State basic facts of operation. | X* | A | | | | | |
| 35.2.2. Perform operational checks, clean, and adjust. | X* | - | | | | | |
| 35.2.3. Troubleshoot and repair. | X* | - | | | | | |
| 35.3. COPY CAMERAS. TR: TOs 10B1-8 and 10B1-10 Series; Commercial Manuals | | | | | | | |
| 35.3.1. Identify principles of operation. | - | - | | | | | |
| 35.3.2. Perform operational checks, clean, and adjust. | - | - | | | | | |
| 35.3.3. Troubleshoot and repair. | - | - | | | | | |
| 35.4. STILL DIGITAL CAMERAS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 35.4.1. State basic facts of operation. | - | A | | | | | |
| 35.4.2. Perform operational checks, clean, and adjust. | - | - | | | | | |
| 35.4.3. Troubleshoot and repair. | - | - | | | | | |
| 36. SUPPORT EQUIPMENT. | | | | | | | |
| 36.1. FILM/PRINT DRYERS. TR: TO 10E3-2 Series and 10E3-3 Series; Commercial Manuals | | | | | | | |
| 36.1.1. Identify principles of operation. | - | - | | | | | |
| 36.1.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 36.1.3. Troubleshoot and repair. | - | - | | | | | |
| 36.2. SLIDE MOUNTERS. TR: TO 10E6 Series; Commercial Manuals | | | | | | | |
| 36.2.1. Identify principles of operation. | - | - | | | | | |

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| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 36.2.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 36.2.3. Troubleshoot and repair. | - | - | | | | | |
| 36.3. FILM CLEANERS. TR: Applicable Equipment TOs and Commercial Manuals | | | | | | | |
| 36.3.1. Identify principles of operation. | - | - | | | | | |
| 36.3.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 36.3.3. Troubleshoot and repair. | - | - | | | | | |
| 36.4. TITLERS. TR: TOs 10C9 Series and 10E5-4 Series; Commercial Manuals | | | | | | | |
| 36.4.1. Identify principles of operation. | - | - | | | | | |
| 36.4.2. Perform operational checks, clean, and adjust. | - | - | | | | | |
| 36.4.3. Troubleshoot and repair. | - | - | | | | | |
| 36.5. MIXERS/DISTRIBUTORS. TR: Applicable TOs and Commercial Manuals | | | | | | | |
| 36.5.1. Identify principles of operation. | - | - | | | | | |
| 36.5.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 36.5.3. Troubleshoot and repair. | - | - | | | | | |
| 37. PHOTOGRAPHIC PRINTERS. TR: 10E8-2 Series; Commercial Manuals | | | | | | | |
| 37.1. CONTINUOUS WIDE FILM PRINTERS. TR: TO 10E8-3 Series; Commercial Manuals | | | | | | | |
| 37.1.1. Identify principles of operation. | - | - | | | | | |
| 37.1.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 37.1.3. Troubleshoot and repair. | - | - | | | | | |
| 37.2. COLOR PROJECTION PRINTERS. TR: TO 10E8-4 Series; Commercial Manuals | | | | | | | |
| 37.2.1. Identify principles of operation. | - | - | | | | | |
| 37.2.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 37.2.3. Troubleshoot and repair. | - | - | | | | | |
| 38. PROCESSORS. | | | | | | | |

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| 38.1. NARROW FILM PROCESSORS. TR: TO 10E2 Series and 10E5-2 Series; Commercial Manuals | | | | | | | |
| 38.1.1. State basic facts of operation. | X* | A | | | | | |
| 38.1.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 38.1.3. Troubleshoot and repair. | X* | | | | | | |
| 38.2. WIDE FILM PROCESSORS. TR: TO 10E5 Series | | | | | | | |
| 38.2.1. State basic facts of operation. | X* | A | | | | | |
| 38.2.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 38.2.3. Troubleshoot and repair. | - | - | | | | | |
| 39. QUALITY CONTROL EQUIPMENT. | | | | | | | |
| 39.1. DENSITOMETERS. TR: TO 10E27-3 Series; Commercial Manuals | | | | | | | |
| 39.1.1 State basic facts of operation. | X* | A | | | | | |
| 39.1.2. Perform operational checks, clean, and adjust. | X* | - | | | | | |
| 39.1.3. Troubleshoot and repair. | X* | - | | | | | |
| 39.2. SENSITOMETERS. TR: TO 10E27-2 Series; Commercial Manuals | | | | | | | |
| 39.2.1. Identify principles of operation. | - | - | | | | | |
| 39.2.2. Perform operational checks, clean, and adjust. | - | - | | | | | |
| 39.2.3. Troubleshoot and repair. | - | - | | | | | |
| 40. LIGHT TABLES. TR: TO 10H9 Series | | | | | | | |
| 40.1. Identify principles of operation. | - | - | | | | | |
| 40.2. Perform operational checks, clean, lubricate, and adjust. | - | - | | | | | |
| 40.3. Troubleshoot and repair. | - | - | | | | | |
| 41. ELECTRONIC IMAGING CENTER. TR: Commercial Manuals | | | | | | | |
| 41.1. State basic facts of operation. | - | A | | | | | |
| 41.2. Perform operational checks, clean, service, and adjust. | - | - | | | | | |
| 41.3. Troubleshoot and repair. | - | - | | | | | |

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| 42. MINI-LABS. TR: TO 10E2-43 Series; Commercial Manuals | | | | | | | |
| 42.1. State basic facts of operation. | X* | A | | | | | |
| 42.2. Perform operational checks, clean, service, and adjust. | - | - | | | | | |
| 42.3. Troubleshoot and repair. | - | - | | | | | |
| 43. INTRUSION DETECTION SYSTEMS. (Systems not covered by an AFJQS.) | | | | | | | |
| 43.1. AN/GSS-36, OPEN-SHELTERED AIRCRAFT SENSOR. TR: TO 31S9-26GSS36-1 | | | | | | | |
| 43.1.1. Identify principles of operation. | - | - | | | | | |
| 43.1.2. Perform operational checks, clean, and adjust. | - | - | | | | | |
| 43.1.3. Troubleshoot and repair. | - | - | | | | | |
| 43.2. Identify principles of operation of a fiber optic intrusion detection system. TR: Applicable technical manuals | X* | - | | | | | |
| 200. AIR FORCE JOB QUALIFICATION STANDARDS APPLICABLE TO AFSC 2E154. TR: AFI 21-116, 36-2233, CFETP 2E1X4 (See Notes 3 and 4) | | | | | | | |
| 200.1. AFQTP XXXXX-200A, Command, Control, and Communications Protection | X* | | | | | | |
| 200.2. AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training. (See Note 2) | X | | | | | | |
| 200.2.8. Operational Risk Management. | | | | | | | |
| 200.2.8.16. Operate and transport compressed gas cylinders safely. | X* | | | | | | |
| 200.2.8.16.75. Apply AFOSH standards when working with photographic chemicals. | - | B | | | | | |
| 200.2.13. Technical Orders (TO) and Technical Publications. TR: AFIND2; AFD 21-3; AFI 37-160V1; TOs 0-1-01, 0-2-1, 0-4-2, 0-4-6-2, 00-5-1, and 00-5-2 | | | | | | | |
| 200.2.13.2. Comply with TO instructions when performing maintenance. | | | | | | | |
| 200.2.13.2.75. Maintenance tasks. | - | | | | | | |
| 200.2.13.2.76. Inspection tasks. | - | | | | | | |
| 200.2.13.75. Use standard publications. | - | | | | | | |

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| 200.2.13.76. Explain the purpose of the technical order system. | - | | | | | | |
| 200.2.13.77. Use abbreviated technical orders when performing maintenance and inspections. | X | | | | | | |
| 200.2.15. C-E Equipment Maintenance Management. TR: AFI 21-116; Applicable Command Directives | | | | | | | |
| 200.2.15.75. Identify the purpose of the preventive maintenance program. | - | | | | | | |
| 200.2.15.76. Perform preventive maintenance on C-E equipment. | X | | | | | | |
| 200.2.15.77. Explain the uses of information/data collected through the maintenance data collection system. | X | | | | | | |
| 201.3. AFJQS 2EXXX-201C, Corrosion Prevention and Control. | X | | | | | | |
| 201.7. AFJQS 2EXXX-201G, Maintenance Support. | X* | | | | | | |
| 201.8. AFJQS 2EXXX-201H, Work Center Deficiency/Discrepancy Reporting. | X* | | | | | | |
| 201.9. AFJQSXXXXX-201I, Integrated Digital Network Exchange Promina 4000. | X* | | | | | | |
| 201.10. AFJQS 2EXXX-201J, Maintenance Training Program. | X* | | | | | | |
| 201.12. AFQTP 2EXXX-201L, Communications Electronic (C-E) Work Center Manager's Handbook | X* | | | | | | |
| 201.12.2. AFQTP 2EXXX-201LB, Communications Electronic (C-E) Manager's Handbook | X* | | | | | | |
| 201.16. AFJQS 2EXXX-201P, Work Center Test Equipment Management. | X* | | | | | | |
| 201.23. AFJQS XXXXX-201W, Integrated Digital Network Exchange (IDNX) 90 | X* | | | | | | |
| 201.24. AFJQS 2EXXX-201X, Engineering Installation (EI) Quality Assurance | X* | | | | | | |
| 202.1. AFQTP 2EXXX-202A, Electrostatic Discharge Familiarization Handbook. | X* | | | | | | |
| 202.2. AFJQS 2EXXX-202B, SIPT Electronics and Inside Plant (E&I). | X* | | | | | | |
| 202.2.75. Analyze policies and procedures for programming and planning installation of C-E equipment. | - | | | | | | |

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| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 202.2.76. Install Visual Imagery and Intrusion Detection systems in accordance with installation instructions. | - | | | | | | |
| 202.2.77. Interconnect Visual Imagery and Intrusion Detection systems in accordance with installation instructions. | - | | | | | | |
| 202.2.78. Inspect systems in accordance with installation instruction. | - | | | | | | |
| 202.2.79. Inspect systems during pre-installation and post installation phase. | - | | | | | | |
| 202.2.80. Plan and design system installations. | - | | | | | | |
| 202.2.81. Update facility records. | - | | | | | | |
| 202.4. AFQTP 2EXXX-202D, EI Tempest Installation Handbook. | X* | | | | | | |
| 204.1. AFJQS2E1X4-204A, Vindicator SMART Annunciator System | X* | | | | | | |
| 204.2. AFJQS2E1X4-204B, Radio Automation System | X* | | | | | | |
| 204.4.1. AFJQS 2E1X4-204DA, AN/GSS-29(V)/G Restricted Area Anti-Intrusion Alarm Set. | X* | | | | | | |
| 204.4.1.75. Identify functional description. | - | B | | | | | |
| 204.4.1.76. Identify technical characteristics. | - | B | | | | | |
| 204.4.2. AFJQS 2E1X4-204DB, AN/GXS-2(V) and -3(V) Perimeter Surveillance Systems, CCTV. | X* | | | | | | |
| 204.4.2.75. Identify functional description. | - | B | | | | | |
| 204.4.2.76. Identify technical characteristics. | - | B | | | | | |
| 204.4.2.77. Thermal Imaging. | | | | | | | |
| 204.4.4. AFJQS 2E1X4-204DD, AN/GSS-20 Restricted Area Anti-Intrusion Alarm Set. | X* | | | | | | |
| 204.4.6. AFQTP 204DF, BISS Familiarization. | X* | | | | | | |
| 204.4.6.75. Identify the principles of operation of a computer-based annunciator. TR: Applicable technical manuals | - | B | | | | | |
| 204.4.7. AFJQS 2E1X4-204DG, AN/GSS-37(V) Restricted Area Anti-Intrusion Alarm Set. | X* | | | | | | |
| 204.4.7.75. Identify functional description. | - | B | | | | | |
| 204.4.7.76. Identify technical characteristics. | - | B | | | | | |
| 204.4.8. AFJQS 2E1X4-204DH, AN/GSS-41(V) Standard Annunciator System. | X* | | | | | | |

| TASKS, KNOWLEDGE AND TECHNICAL REFERENCES | 5-LEVEL | | OJT CERTIFICATION | | | | |
|---|-------------|-----|-------------------|-----------|------------------|------------------|--------------------|
| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 204.4.10. AFJQS 2E1X4-204DJ, AN/GSS-34(V) Ported Coaxial Cable Sensor (PCCS) and AN/GSS-40(V) Short Ported Coaxial Sensor (SPCS) Maintenance. | X* | | | | | | |
| 204.4.10.75. Identify functional description. | - | B | | | | | |
| 204.4.10.76. Identify technical characteristics. | - | B | | | | | |
| 204.4.11. AFJQS 2E1X4-204DK, AN/GSS-42(V) Exterior Intrusion Detection System (EIDS). | X* | | | | | | |
| 204.4.11.75. Identify functional description. | - | B | | | | | |
| 204.4.11.76. Identify technical characteristics. | - | B | | | | | |
| 204.4.12. AFJQS 2E1X4-204DL, AN/GSS-39(V) Interior Intrusion Detection System (IIDS). | X* | | | | | | |
| 204.4.12.75. Identify functional description. | - | B | | | | | |
| 204.4.12.76. Identify technical characteristics. | - | B | | | | | |
| 204.6. AFJQS 2E1X4-204F, AN/FSQ-143 Weapon Storage and Security System. | X* | | | | | | |
| 204.8. AFJQS 2E1X4-204H, MIM4 Light Table. | X* | | | | | | |
| 204.12. AFJQS2E1X4-204L, Basic Imagery Systems Maintenance | X* | | | | | | |
| 206.12. AFJQSI2E1X4-206L, Tektronix VM-700 (Interactive CBT) | X* | | | | | | |
| 208.1. AFJQS XXXXX-208A, Ultra High Frequency Demand Assigned Multiple Access Familiarization | X* | | | | | | |
| 210.19. AFJQS2EXXX-210S, 6KNZ7: C-E Base Communications Systems Support | X* | | | | | | |
| 212.3. AFQTP XXXXX-212C, C4 Information Systems Familiarization Handbook | X* | | | | | | |
| 212.14. AFJQS XXXXX-212N, Tactical Antennas | X* | | | | | | |
| 213.20. AFQTP XXXXX-213T, Career Field Managers Handbook | X* | | | | | | |
| 213.20.1. AFJQS XXXXX-213TA, Functional Manager's Handbook | X* | | | | | | |
| 213.21. AFJQS XXXXX-213U, Tactical Generator Operation for Non Power Production Personnel. | X* | | | | | | |
| 213.22. AFJQS XXXXX-213V, Power Plant Operation for Non-Power Production AFSC | X* | | | | | | |
| 213.25.1. AFQTP 3E0X2-213YA, Solid State Uninterruptible Power System Principles | X* | | | | | | |

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

| Code | Definition |
|------|---|
| A | Subject Knowledge Level - Can identify basic facts and terms about the subject. (FACTS) |
| B | Subject Knowledge Level - Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES) |
| C | Subject Knowledge Level - Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS) |
| D | Subject Knowledge Level - Can evaluate conditions and make proper decisions about the subject. (EVALUATION) |
| - | When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs. |
| X | When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CDCs, CBTs, or a combination of OJT, CDCs, and/or CBTs. |
| X* | When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT. |

CDC column. The use of proficiency coding indicates the level of knowledge training provided by the CDCs, The CDC column will now identify the subject knowledge level covered in the CDC. The “K” will no longer be used to identify the knowledge covered in the CDC. Information pertaining to the meaning of the code can be located in the CTG coding system table.

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used when the trainer is other than the trainee's immediate supervisor.

| | | |
|--|-----------------------------|------|
| <i>THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY</i> | | |
| Personal Data - Privacy Act of 1974 | | |
| PRINTED NAME OF TRAINEE (<i>Last, First, Middle Initial</i>) | INITIALS (<i>Written</i>) | SSAN |
| PRINTED NAME OF CERTIFYING OFFICIAL AND WRITTEN INITIALS | | |
| N/I | N/I | |

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending STS revision. Locate current publications at.

AFSSIs at <https://www.afca.scott.af.mil/ip/>

Air Force publications at <http://www.e-publishing.af.mil/>.

AFIND 5, DISA Circulars and Instructions at <https://disa-ca.dtic.mil/pubs/>

Technical Orders (TO) at https://wpafbres34.wpafb.af.mil/aftox/AFTOX_DOCUMENTS/index.cfm

Online ReferenceWare and CBTs at https://www.smartforce.com/learning_community/Custom/USAF/login.asp

| TASKS, KNOWLEDGE AND TECHNICAL REFERENCES | 7-LEVEL | | OJT CERTIFICATION | | | | |
|--|-------------|-----|-------------------|-----------|------------------|------------------|--------------------|
| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 70. DEPLOYMENT CONCEPTS. TR: AFI 10-201, AFI 10-244, AFMAN 10-401, Volume 1 Chapter 6 Volume 2, Annex K | | | | | | | |
| 70.1. Describe the purpose of the following: | | | | | | | |
| 70.1.1. OPLAN communications requirements. | X | - | | | | | |
| 70.1.2. Time Phased Force Deployment Data (TPFDD). | X | - | | | | | |
| 70.1.3. Status Of Resources and Training Systems (SORTS) | X | - | | | | | |
| 70.1.4. AEF Reporting Tool (ART) | X | - | | | | | |
| 70.1.5. UTC development process. | X | - | | | | | |
| 70.1.6. UTC adjustment procedures. | X | - | | | | | |
| 70.2. Deployment Procedures. TR: AFIs 10-403, 21-109, and 33-211; AFMAN 23-110 | | | | | | | |
| 70.2.1. Develop load plan. | X* | - | | | | | |
| 70.2.2. Explain pallet build-up procedures. | X* | - | | | | | |
| 70.2.3. Explain hazardous cargo preparation. | X* | - | | | | | |
| 70.2.4. Prepare documentation. | X* | - | | | | | |
| 70.2.5. Determine site selection requirements. | X* | - | | | | | |
| 70.2.6. Determine site preparation requirements. | X* | - | | | | | |
| 70.2.7. Determine site configuration requirements. | X* | - | | | | | |
| 70.2.8. Determine requirements for constructing deployment site utility grids. | X* | - | | | | | |
| 70.2.9. Describe control of COMSEC material. | X* | - | | | | | |
| 71. SYSTEM PLANNING AND IMPLEMENTATION. TR: AFI 33-104 and AFI 21-404; TO 32-series; AFQTP 2EXXX-202B | | | | | | | |
| 71.1. Identify systems support requirements for new or modified systems. | X | - | | | | | |
| 71.2. Describe how to manage planning and implementation of new systems. | X | - | | | | | |
| 72. State facts relating to the following work center management principles. TR: AFQTP 2EXXX-201L | | | | | | | |
| 72.1. Principles of management. | X | - | | | | | |
| 72.2. Training. | X | - | | | | | |

| TASKS, KNOWLEDGE AND TECHNICAL REFERENCES | 7-LEVEL | | OJT CERTIFICATION | | | | |
|---|-------------|-----|-------------------|-----------|------------------|------------------|--------------------|
| | OJT Upgrade | CDC | Start Date | Stop Date | Trainee Initials | Trainer Initials | Certifier Initials |
| 72.3. Supply. | X | - | | | | | |
| 72.4. Core Automated Maintenance System (CAMS). | X | - | | | | | |
| 72.5. Work center management. | X | - | | | | | |
| 72.6. Safety and security. | X | - | | | | | |
| 72.7. Maintenance standards. | X | - | | | | | |
| 72.8. Performance reports. | X | - | | | | | |
| 72.9. Awards and recognition. | X | - | | | | | |
| 72.10. Mobility/deployment. | X | - | | | | | |
| 72.11. Manpower. | X | - | | | | | |
| 72.12. Financial management. | X | - | | | | | |
| 72.13 Publications management | X | - | | | | | |
| 73. AFQTP 2EXXX-201LB, Communications-Electronic (C-E) Manager's Handbook | X* | - | | | | | |
| 74. AFQTP XXXXX-213TA, Functional Manager's Handbook | X* | - | | | | | |

Section B - Course Objective List

4. This section not used.

Section C - Support Materials

5. The following is a list of available support materials.

5.1. **Computer Based Training Products.** Air Force computer based training products can be found at https://www.smartforce.com/learning_community/Custom/USAF/login.asp.

5.2. Air Force Job Qualification Standards and Air Force Qualification Training Packages

5.2.1. Refer to AFIND8, Numerical Index of Specialty Education/Training Publications, for the list of published AFJQSs/AFQTPs or download these products from <https://wwwmil.keesler.af.mil/81trss/qflight/index.htm>. Refer to AFI 36-2233, *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*, for information on how to request development of AFJQSs/AFQTPs.

5.2.2. AFJQSs/AFQTPs applicable to AFSC 2E1X4:

| <u>Publication No.</u> | <u>Pseudo File Code</u> | <u>Publication Title</u> |
|-------------------------------|--------------------------------|--|
| AFJQS 2E1X4-204A | 2E1X4-204.1 | Vindicator SMART Annunciator System |
| AFJQS 2E1X4-204B | 2E1X4-204.2 | Radio Automation System |
| AFJQS 2E1X4-204DA | 2E1X4-204.4.1 | AN/GSS-29(V)/G Restricted Area, Anti-Intrusion Alarm Set |
| AFJQS 2E1X4-204DB | 2E1X4-204.4.2 | AN/GXS-2/3(V) Perimeter Surveillance Systems, CCTV |
| AFJQS 2E1X4-204DD | 2E1X4-204.4.4 | AN/GSS-20 Restricted Area Anti-Intrusion Alarm Set |
| AFQTP 2E1X4-204DF | 2E1X4-204.4.6 | BISS Familiarization |
| AFJQS 2E1X4-204DG | 2E1X4-204.4.7 | AN/GSS-37(V) Restricted Area Anti-Intrusion Alarm |
| AFJQS 2E1X4-204DH | 2E1X4-204.4.8 | AN/GSS-41 Standard Annunciator System |
| AFJQS 2E1X4-204DJ | 2E1X4-204.4.10 | AN/GSS-34(V) Ported Coaxial Cable Sensor |
| | | AN/GSS-40 Short Ported Coaxial Sensor Maintenance |
| AFJQS 2E1X4-204DK | 2E1X4-204.4.11 | AN/GSS-42(V) Exterior Intrusion Detection System |
| AFJQS 2E1X4-204DL | 2E1X4-204.4.12 | AN/GSS-39(V) Interior Intrusion Detection System |
| AFJQS 2E1X4-204F | 2E1X4-204.6 | AN/FSQ-143(V) Weapons Storage and Security System |
| AFJQS 2E1X4-204H | 2E1X4-204.8 | MIM4 Light Table |
| AFJQS 2E1X4-204L | 2E1X4-204.12 | Basic Imagery Systems Maintenance |
| AFJQSI 2E1X4-206L | 2E1X4-206.12 | Tektronix VM-700 (Interactive CBT) |

5.2.3. Additional AFJQS/AFQTP maintenance management and generic training products applicable to this specialty.

| <u>Publication No.</u> | <u>Pseudo File Code</u> | <u>Publication Title</u> |
|-------------------------------|--------------------------------|--|
| AFQTP XXXXX-200A | XXXXX-200.1 | Command, Control, and Communications Protection |
| AFJQS 2EXXX-200B | 2EXXX-200.2 | 2EXXX C-E Enlisted Specialty Training |
| AFJQS 2EXXX-201C | 2EXXX-201.3 | Corrosion Prevention and Control |
| AFJQS 2EXXX-201G | 2EXXX-201.7 | Maintenance Support |
| AFJQS 2EXXX-201H | 2EXXX-201.8 | Work Center Deficiency/Discrepancy Reporting |
| AFJQSXXXXX-201I | 2EXXX-201.9 | Integrated Digital Network Exchange Promina 4000 |
| AFJQS 2EXXX-201J | 2EXXX-201.10 | Maintenance Training Program |
| AFQTP 2EXXX-201L | 2EXXX-201.12 | Communications Electronic (C-E) Work Center Manager's Handbook |
| AFQTP 2EXXX-201LB | 2EXXX-201.12.2 | Communications Electronic (C-E) Manager's Handbook |
| AFJQS 2EXXX-201P | 2EXXX-201.16 | Work Center Test Equipment Management |
| AFJQS XXXXX-201W | XXXXX-201.23 | Integrated Digital Network Exchange (IDNX) 90 |
| AFJQS 2EXXX-201X | 2EXXX-201.24 | Engineering Installation (EI) Quality Assurance |

| <u>Publication No.</u> | <u>Pseudo File Code</u> | <u>Publication Title</u> |
|------------------------|-------------------------|---|
| AFQTP 2EXXX-202A | 2EXXX-202.1 | Electrostatic Discharge Familiarization Handbook |
| AFJQS 2EXXX-202B | 2EXXX-202.2 | Standard Installation Practices-Electronics/Inside Plant |
| AFQTP 2EXXX-202D | 2EXXX-202.4 | EI Tempest Installation Handbook |
| AFQTP XXXXX-206P | XXXXX-206.16 | AN/TSC-107 Communications Central (Quick Reaction Package) Familiarization Handbook |
| AFJQS XXXXX-208A | XXXXX-208.1 | Ultra High Frequency Demand Assigned Multiple Access Familiarization |
| AFJQS 2EXXX-209C | 2EXXX-209.3 | 6KNZF: C-E Airfield and Weather Systems Support |
| AFJQS 2EXXX-209D | 2EXXX-209.4 | 6KNZE: C-E SATCOM/Wideband Augmentation |
| AFJQS 2EXXX-209L | 2EXXX-209.12 | 6KNZL: C-E METNAV Operations Maintenance |
| AFJQS 2EXXX-209P | 2EXXX-209.16 | 6KNZG: C-E C-2 Radio System Support |
| AFJQS 2EXXX-209Q | 2EXXX-209.17 | 6KNZN: C-E Personal Wireless Communications (PWCS) Support |
| AFJQS 2EXXX-209W | 2EXXX-209.23 | 6KNZK: C-E Tactical Telephone Systems Support |
| AFJQS 2EXXX-210S | 2EXXX-210.19 | 6KNZ7: C-E Base Communications Systems Support |
| AFJQS XXXXX-211N | XXXXX-211.14 | Installation Spectrum Management |
| AFQTP XXXXX-212C | XXXXX-212.3 | C4 Information Systems Familiarization Handbook |
| AFJQS XXXXX-212M | XXXXX-212.13 | MILSTAR Terminal Operations |
| AFJQS XXXXX-212N | XXXXX-212.14 | Tactical Antennas |
| AFJQS XXXXX-212Z | XXXXX-212.26 | Global Broadcast Service Ground Receive Suite |
| AFQTP XXXXX-213T | XXXXX-213.20 | Career Field Managers Handbook |
| AFJQS XXXXX-213TA | XXXXX-213.20.1 | Functional Manager's Handbook |
| AFJQS XXXXX-213U | XXXXX-213.21 | Tactical Generator Operation For Non Power Production Personnel |
| AFJQS XXXXX-213V | XXXXX-213.22 | Power Plant Operation for Non-Power Production AFSC |
| AFJQS XXXXX-225K | XXXXX-225.11 | IONSCAN 400B |
| AFQTP XXXXX-230RA | XXXXX-230.18.1 | TDC ICAP Systems Handbook |
| AFJQS XXXXX-230RB | XXXXX-230.18.2 | Theater Deployable Communication Integrated Communications Access Package Voice Network |
| AFJQS XXXXX-230RC | XXXXX-230.18.3 | Theater Deployable Communication Integrated Communications Access Package Data Network |
| AFJQS XXXXX-230RD | XXXXX-230.18.4 | Theater Deployable Communication Integrated Communications Access Package Transmission |
| AFJQS XXXXX-230RE | XXXXX-230.18.5 | Theater Deployable Communication Integrated Communications Access Package Message Network |
| AFJQS XXXXX-235A | XXXXX-235.1 | AN/TSQ-209 Communication Central |
| AFQTP 3E0X2-213YA | 3E0X2-213.25.1 | Solid State Uninterruptible Power System Principles |
| AFJQS 3E0X2-214D | 3E0X2-214.4 | Stationary Battery Banks |

Section D - Training Course Index

6. The following is a list of the available Air Force in-residence, field, and/or exportable training courses.

6.1. **Air Force In-Residence Courses.** For information on all formal courses, refer to the Air Force Education and Training Course Announcements (ETCA) database, formerly AFCAT 36-2223, USAF Formal Schools Catalog at <https://etca.randolph.af.mil/>.

| <u>Course Number</u> | <u>Course Title</u> | <u>Location</u> |
|----------------------|--|------------------|
| E3AQR2E134 005 | Visual Imagery and Intrusion Detection Systems Apprentice | Keesler AFB, MS |
| E5ABD2E134 005 | Visual Imagery and Intrusion Detection Systems Maintenance | Ft Meade, MD |
| E3AZR2E000 001 | High Reliability Soldering and Connections | Keesler AFB, MS |
| E3AZR2E066 003 | Comm-Electronics Maintenance Support Procedures | Keesler AFB, MS |
| E5AZD2E154 011 | Broadcast TV Systems Maintenance | Ft. Meade, MD |
| J3AZR2E652 007 | Fiber Optic Cable Installation, Splicing, and Maintenance | Sheppard AFB, TX |

6.2. **Air Force Engineering Technical Services (AFETS) Training.** For a listing of AFETS courses, refer to the *Catalog of Communications-Electronics Air Force Engineering and Technical Services Courses*. This catalog is revised annually and is available through your MAJCOM's C-E MATAG Working Group representative or can be downloaded from https://www.afca.scott.af.mil/c-e_maint/afets.htm.

Section E - MAJCOM Unique Requirements

7. Current MAJCOM unique requirements.

| <u>COURSE ID</u> | <u>TITLE</u> | <u>LOCATION</u> |
|--|---|----------------------------|
| E4AST2E066-010 USAFE/CITC 2E001 | C-E Maintenance Support Procedures WS3 | Various Locations USAFE |