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AFSC 2E1X3

GROUND RADIO COMMUNICATIONS



CAREER FIELD EDUCATION AND TRAINING PLAN

**GROUND RADIO COMMUNICATIONS
AFSC 2E1X3
CAREER FIELD EDUCATION AND TRAINING PLAN**

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 OPR: HQ USAF/ILCXF, CMSgt Watlington
 Editors: HQ AFCA/GCLO SMSgt Pusey; 338 TRS/TRR, Mr. Higgins;
 81 TRSS Qualification Training Flight, MSgt Sanders and TSgt Rivera

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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 Ground Radio Communications Career Field and Education Training Plan.

Advanced Training (AT). 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.

Certification. A formal indication of an individual's ability to perform a task to required standards.

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 task may be specified for a particular skill level or in general across the AFSC. Guidance for using core task can be found in the applicable CFETP narrative.

Course Objective List (COL). A publication derived from initial/advanced skills Course Training Standard (CTS), identifying the tasks and knowledge requirements and respective standards provided to achieve a 3- or 7-skill level in this career field. Supervisors use the COL to assist in conducting graduate evaluations in accordance with AFI 36-2201, *Air Force Training Program*.

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.

Enterprise. The entire range of communications/networking within garrison and tactical realms to include voice, video, data, imagery and sensor.

Expeditionary Aerospace Force (EAF). The EAF concept is how the Air Force will organize, train, equip, and sustain itself by creating a mindset and cultural state that embraces the unique characteristics of aerospace power – range, speed, flexibility, precision – to meet the national security challenges of the 21st Century.

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

Field Operating Agency (FOA). FOAs are subdivisions of the Air Force directly subordinate to a Headquarters US Air Force functional manager. An FOA performs field activities beyond the scope of any of the MAJCOMs. The activities are specialized or associated with an Air Force-wide mission.

Field Training. Technical, operator, and other training that either a field training detachment or field training team conducts at operational locations on specific systems and associated direct-support equipment for maintenance and aircrew personnel.

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.

Proficiency Training. Additional training, either in-residence or exportable advanced training courses, or on-the-job training, provided to personnel to increase their skills and knowledge beyond the minimum required for upgrade.

Qualification Training. Hands-on, task performance based training designed to qualify airmen in a specific duty position. This training program occurs both during and after the upgrade training process and is designed to provide skills training required to do the job.

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.

Supplemental Training. Training toward a portion of an AFS without change by AFSC. Formal training on new equipment, methods and technology that are not suited for on-the-job training.

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 Session. Training that trainers conduct based on technical data for a maintenance task that existing courses could not support

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. Training that leads to the award of a higher skill level.

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 tasks 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. Ground Radio Communications Apprentice/Journeyman.

4.1.1. Specialty Summary. Installs, maintains, modifies, repairs, and overhauls fixed and transportable transmitters, receivers, transceivers, and related equipment including amplitude modulation, frequency modulation, single sideband, and independent sideband applicable to point-to-point, ground-to-air, facsimile, low frequency, high frequency, very high frequency, and ultra high frequency systems; radio frequency amplifiers; recorders; keying and signaling devices; generation and display equipment; and base radio systems. Deploys and activates mobile and transportable ground radio communications and related equipment.

4.1.2. Duties and Responsibilities:

4.1.2.1. Installs, maintains, repairs, and modifies ground radio communications and related equipment. Uses drawings, task lists, instructions, and technical orders or commercial manuals to work on ground radio communications and related equipment. Processes civil engineer work clearance requests. Operates and performs maintenance on tools, test equipment, auxiliary equipment, and vehicles.

4.1.2.2. Locates, repairs, and replaces faulty components in ground radio communications and related equipment. Performs troubleshooting to locate faulty components and assemblies. Maintains radio and related equipment cable systems. Repairs and adjusts components and assemblies.

4.1.2.3. Monitors, analyses, and troubleshoots ground radio communications and related equipment. Determines cause(s) of signal deterioration. Troubleshoots, repairs, and replaces cables, components, and equipment. Uses test equipment to identify faults in equipment/systems. Locates and traces leaks in pressurized radio frequency transmission systems. Performs operational checks and completes preventive maintenance inspections.

4.1.2.4. Maintains Communications Systems Installation Records (CSIR), maintenance and inspection records, and technical orders. Posts entries on maintenance records and CSIRs. Recommends methods to improve test equipment, support equipment, vehicles, installation and maintenance procedures, and technical orders.

4.2. Ground Radio Communications Craftsman.

4.2.1. Specialty Summary. Includes all information in paragraph 4.1.1. Plans and schedules installation and maintenance actions of ground radio communications and related 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. Plans and schedules ground radio communications and related equipment installations and maintenance actions. Resolves installation and maintenance problems by interpreting sketches, drawings, directives, diagrams, CSIRs, and technical orders. Determines installation and maintenance actions and repair procedures. Inventories project and work order materials. Initiates and conducts system verification tests to assess the capability and effectiveness of ground radio communications. Coordinates maintenance on tools, auxiliary equipment, test equipment, and vehicles.

4.2.2.3. Performs technical ground radio communications and related equipment installations and maintenance actions. Installs, tests, and removes ground radio communications and related equipment. Identifies, locates, and corrects faults on ground radio communications and related equipment..

4.2.2.4. Inspects and evaluates ground radio communications and related equipment installation and maintenance actions. Evaluates inspection reports and analyzes survey and test results.

4.2.2.5. Performs ground radio communications and related equipment installation and maintenance actions. Installs, removes, repairs, and tests fixed, mobile, and transportable ground radio communications and related equipment.

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 2E1X3.

ENHANCED TERMINAL VOICE SWITCH



ENHANCED TERMINAL VOICE SWITCH CONSOLE



OJ-314, COMMUNICATIONS CONTROL SYSTEM



[AN/GRC-171B\(V\)4, UHF TRANSCEIVER](#)



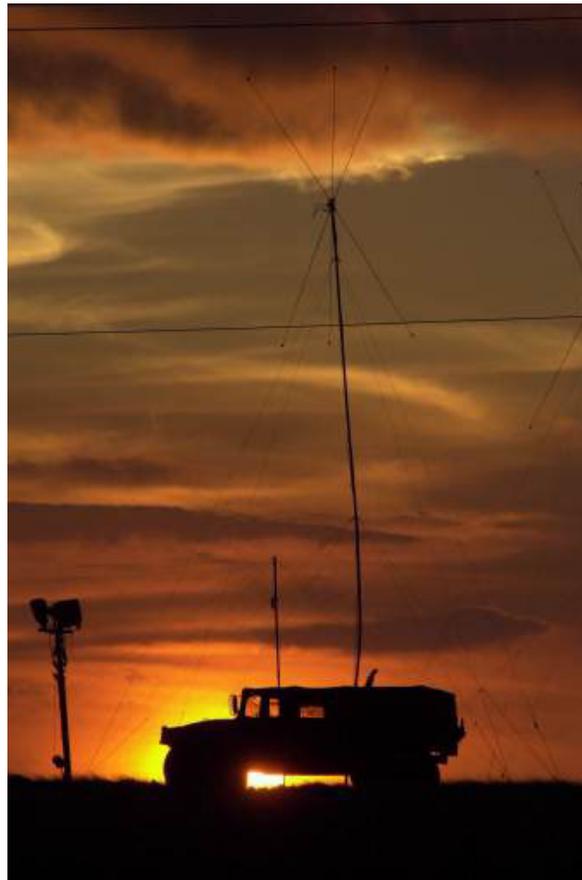
[AN/TYQ-23, MODULAR CONTROL EQUIPMENT](#)



[AN/GRC-206. COMMUNICATIONS CENTRAL](#)



[AN/MRC-144 MOBILE HF/UHF/VHF RADIO](#)



AN/URC-119, HF COMMUNICATIONS SYSTEM



LAND MOBILE RADIOS



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 [2E1X3 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, AFJQSs/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 Ground Radio Communications 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 3-7 March 2003 Utilization and Training Workshop.

6.1. Initial Skills. Major changes were made to the 3-Level course. The course title/header of attachment 2 was changed from Course Training Standard (CTS) to Specialty Training Standard (STS). The following outlines other changes:

6.1.1. Deletion of circuit card alignments/adjustment on the URC-119. Instruction will be to the LRU level and setup, operation and 56 day PMI.

6.1.2. Added PWCS, Mass Notification systems (Giant Voice) training into the basic course.

6.1.3. Designed an AEF deployment block where students will gain knowledge on the AEF concept and get assigned to an AEF bucket and UTC. Students will deploy, setup and operate the URC-119, TRC-176, establish LMR nets and setup a Giant Voice system. These changes are designed to better prepare Airmen for AEF deployments. The block will be designed to allow maximum instructor flexibility to operate in a scenario-based environment. This scenario-based concept will provide students the theory and core concepts of each radio system in previous block of instruction. The AEF concept is introduced and the Airmen are placed into a UTC that corresponds with the equipment taught. During one of the final blocks the students will deploy these UTCs as part of an Air Expeditionary Task Force to establish communications nets. The deployment is all practical hands-on training focusing on initial communications establishment.

The workgroup reprioritized time spent on selected certification tasks in the course for use to train AEF wartime tasks.

6.1.4. The wartime contingency training STS training will consist of deleting the task certification requirements from the school.

6.1.5. Added Maintenance Data Collection (MDC) training.

6.2. Five-Level Upgrade Requirements. Minimal changes were made to the 5 level CTG. The training references were updated and UTC packages related to this AFSC were added. Additionally, subject knowledge level coding replaced the simple knowledge "K" coding in the CDC column. CDC development will continue to be restricted to six volumes, although all 2E six volume CDC courses will be separated into two 3-volume courses. The first course (2EX5X) will contain the three core volumes common to all 2E career fields. The second course will contain the three respective AFSC-specific volumes. Use 2004 AIG 9689 message "04-27 2E CAREER DEVELOPMENT COURSES (CDC) CHANGES FOLLOW UP MESSAGE (IN ADDITION), (REF AIG 9689 MESSAGE 04-18)" as guidance for training managers to order both courses concurrently to decrease enrollment delay time between courses. The following table outlines 5-level CDC contents.

2EX5X	
VOLUME 1	Electronic Principles (Computer Based Training)
VOLUME 2	Test Equipment
VOLUME 3	Communication Principles
2E153	
VOLUME 4	AFSC Specific Information
VOLUME 5	AFSC Specific Information
VOLUME 6	AFSC Specific Information

6.3. Seven-Level Upgrade Requirements. The requirement for 7-level CDCs is obsolete and no longer required. A significant part of the information previously covered in the CDCs is being converted into an AFQTP or made into a 5-level upgrade training requirement. Additional knowledge-based tasks to cover C-E Facility Management were added to the 7-level CTG. The tasks cover grounding, lightning protection, certification (ATC), Antenna PMIs Procedures, Mobile Depot Maintenance, and RF Radiation Surveys. Completion of the seven-level CDC requirement was eliminated in 2000. However, training in core competencies of deployment concepts, system planning and implementation, and management principles were added to provide common core proficiency among all individuals in the 2EXXX arena. This course is now in resident for all ANG and AF Reserve personnel.

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. In order to be awarded a CCAF 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.

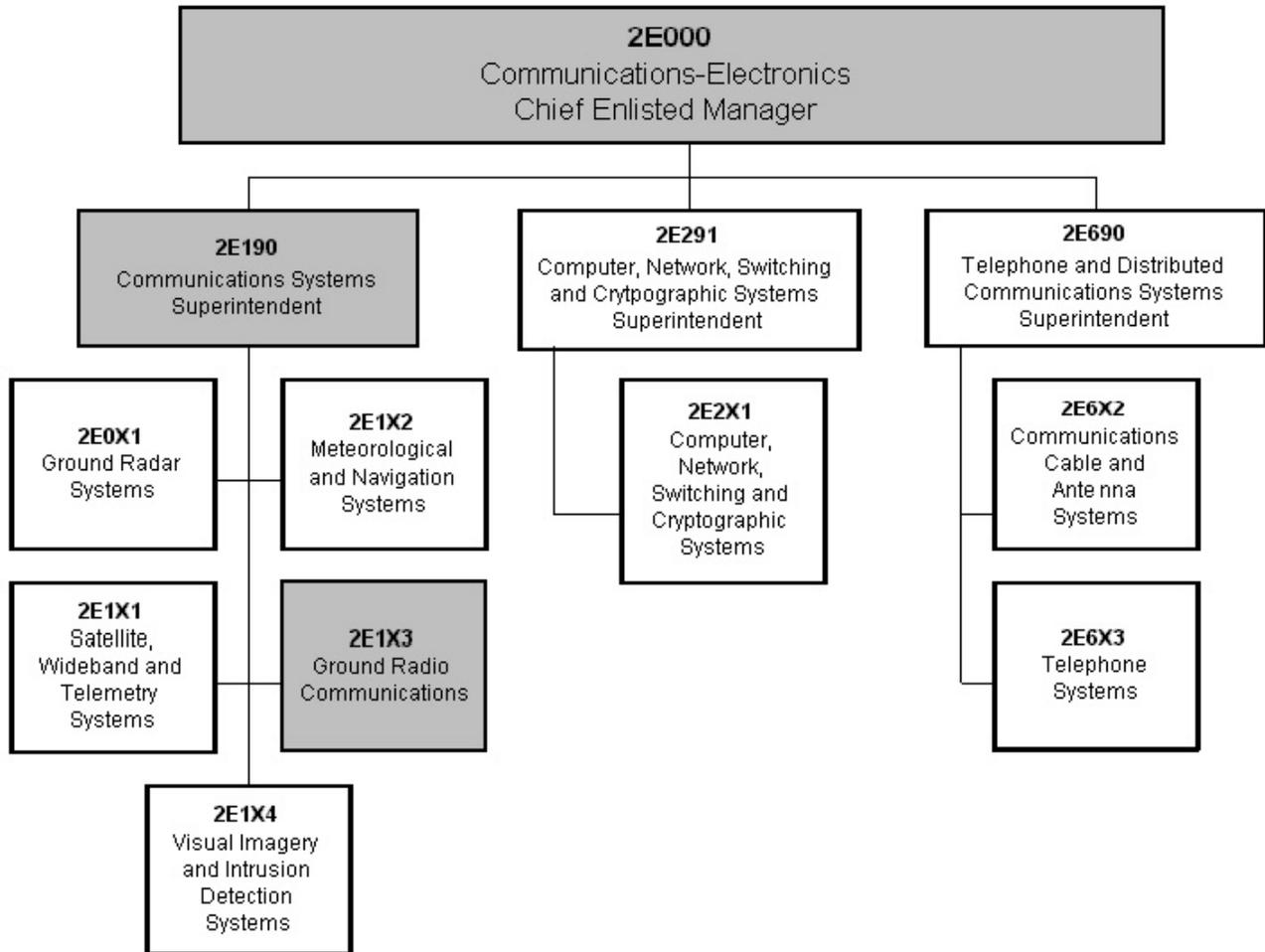
7.3.6. Program Elective (15 semester hours): Satisfied with applicable Technical Education; Leadership, Management, and Military Studies; or General Education courses, including natural science courses meeting General Education requirement application criteria. Six semester hours of CCAF degree applicable 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/>

2EXXX Career Field Progression



**2E1X3 GROUND RADIO COMMUNICATIONS
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 (9 months for retrainees) OJT training. Completion of all 2E153 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 MAJCOM Optional 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 2E173 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 .

2E1X3 GROUND RADIO COMMUNICATIONS 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 Ground Radio Communications 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, AFJQs/AFQTPs, etc. Completion of the mandatory 3-level skill awarding course, CDCs, 7-level course, and applicable AFJQs/AFQTPs define the Air Force core tasks for this specialty.

10. Specialty Qualification Requirements.

10.1. Apprentice (3-Level) Training.

KNOWLEDGE	Electricity and radio theory including transistors, solid-state components, and digital techniques applying to ground radio communications and related equipment maintenance Interpretation of management information data Technical orders, blueprints, wiring diagrams, and schematic diagrams
EDUCATION	Completion of high school with courses in physics and mathematics is desirable.
TRAINING	Electronics Principles, course E3AQR2E133 481 (PDS Code PO1) (See Attachment 1 of the STS for course training standard) Ground Radio Communications Apprentice, course E3ABR2E133 006 (PDS Code GOZ) (See Attachment 2 of the STS for course 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 2E133</p> <p>Experience in functions such as testing, tuning, adjusting, maintaining, or repairing ground radio communications and related equipment; use of test equipment</p> <p>Completion of the 2E153 Career Development Course</p> <p>Completion of all 2E153 CTG core tasks (See Attachment 3 of the STS for career training guide)</p> <p>Completion of applicable equipment AFJQs/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 AFJQs/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 2E153</p> <p>Experience in functions such as siting, installing, repairing, overhauling, or modifying ground radio equipment; use of test equipment</p> <p>Completion of all 2E173 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/>.

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 2E153 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://private.afca.af.mil/c-e_maint/), 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 20040607 and graduating 20041110.

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 (STS) at Attachment 2:

2.1.1. Establishes the training requirements for airmen to perform 3-skill level duties in the Ground Radio Communications 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 2E133.

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 E3AQR2E133 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 course E3ABR2E133 006 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 2E1X3. 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 Ground Radio Communications 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 2E173. 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 Ground Radio Communications 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. Used to document task when in AF Form 623, On the Job Training Record and used according to AFI 36-2201, volume 3.

2.4.3. 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>.

2.4.4. 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 (TFH) has been installed for the supervisors' convenience. For a quick response to concerns, call our TFH at DSN 597-4566, or 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

DONALD J. WETEKAM, Lieutenant General, USAF
Deputy Chief of Staff /Installations & Logistics

Attachments:

1. Electronic Principles Course Training Standard
2. Specialty Training Standard, 2E133
3. Five-Level Career Training Guide, 2E153
4. Seven-Level Career Training Guide, 2E173

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: Items identified with a “★” are certified during the course. Certified items are completed with no instructor assistance. Technical school certification will be documented using the AFJQS. Graduates will hand carry training records to the gaining supervisor. During wartime, these tasks will not be certified.

NOTE 4: For non-certified items, 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.

NOTE 5: 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:

- | | |
|---------------------|---------------------|
| Dummy Load | Wattmeter |
| Audio Oscillator | Oscilloscope |
| Digital Multimeter | RMS Voltmeter |
| Frequency Counter | Distortion Analyzer |
| RF Signal Generator | Spectrum Analyzer |

NOTE 6: 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.

- | | |
|---|--------------------------------------|
| AN/PSC-5 Radio Set | Base Station |
| AN/GRC-242 HF Transceiver | Handheld Radios |
| AN/GRR-24 UHF AM Receiver | CU-2310 Antenna Coupler |
| AN/GRR-23 VHF AM Receiver | Enhanced Terminal Voice Switch |
| AM-6154 Linear Power Amplifier | AN/TRC-176 VHF/UHF Transceiver |
| AM-6155 Linear Power Amplifier | Global Positioning System Receiver |
| AN/GRC-171 UHF AM Transceiver | AM-7223 AM/SSB/CW HF Amplifier |
| AN/GRC-211 VHF AM Transceiver | RT-1446 AM/SSB/CW HF Transceiver |
| AN/GRT-22 UHF Single Channel AM Transmitter | Digital Voice Recorder System (DVRS) |
| AN/GRT-21 VHF Single Channel AM Transmitter | AN/GRC-171B(V)4 AM/FM Transceiver |

NOTE 7: 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 8: All tasks are trained during wartime.

1. GENERAL PRINCIPLES.

- 1.1. Explain the basic facts of the 2E1X3 career field.
- 1.2. Identify security concerns related to the 2E1X3 career field.
- 1.3. Describe safety hazards in the 2E1X3 career field.
- 1.4. Explain the purpose of selected types of equipment used in the 2E1X3 career field.
- 1.5. Use technical manuals when performing maintenance and inspections.
- 1.6. Maintenance Data Collection (MDC)
 - 1.6.1. Describe the purpose and importance of documenting maintenance data.
 - 1.6.2. Input data using an automated MDC system. (Note 1).

2. TEST EQUIPMENT.

- 2.1. Identify the principles, capabilities, and limitations of the test equipment listed in Note 5.
- 2.2. Operate the test equipment listed in Note 5.

3. VHF/UHF AM RECEIVER EQUIPMENT (AN/GRR-23 or AN/GRR-24).

- 3.1. Identify the principles, capabilities, and limitations of the AN/GRR-23 and AN/GRR-24 Receivers.
 - ★3.2. Tune the AN/GRR-23 or AN/GRR-24 Receiver.
 - ★3.3. Align the AN/GRR-23 or AN/GRR-24 Receiver.
 - ★3.4. Perform a 336-day preventive maintenance inspections (PMI) on the AN/GRR-23 or AN/GRR-24 Receiver.
 - 3.5. Troubleshoot the AN/GRR-23 or AN/GRR-24 Receiver to the line replaceable unit (LRU).
 - 3.6. Remove and replace AN/GRR-23 or AN/GRR-24 Receiver modules.
- ## 4. VHF/UHF AM TRANSMITTER EQUIPMENT (AN/GRT-21 or AN/GRT-22).
- 4.1. Identify the principles, capabilities, and limitations of the AN/GRT-21 and AN/GRT-22 Transmitters.
 - ★4.2. Tune the AN/GRT-21 or AN/GRT-22 Transmitter.
 - ★4.3. Align the AN/GRT-21 or AN/GRT-22 Transmitter with the exception of the frequency synthesizer.
 - ★4.4. Perform a 336-day PMI and system check on an AN/GRT-21 or AN/GRT-22 Transmitter.
 - 4.5. Troubleshoot the AN/GRT-21 or AN/GRT-22 Transmitter to the LRU.

5. RF LINEAR POWER AMPLIFIER EQUIPMENT (AM-6154 or AM-6155).

5.1. Identify the principles, capabilities, and limitations of the AM-6154 and AM-6155 Linear Power Amplifiers (LPA).

★5.2. Tune the AM-6154 or AM-6155 LPA.

★5.3. Align the Buffer Amplifier/Multiplier on the AM-6154 or AM-6155 LPA.

5.4. Troubleshoot the AM-6154 or AM-6155 LPA to the LRU.

6. VHF/UHF AM TRANSCEIVER EQUIPMENT (AN/GRC-211 or AN/GRC-171).

6.1. Identify the principles, capabilities, and limitations of the AN/GRC-211 and AN/GRC-171 Transceivers.

★6.2. Perform front panel adjustments to include receive audio, percent of modulation, side tone, and squelch on an AN/GRC-211 or AN/GRC-171 Transceiver.

★6.3. Perform a 336-day PMI on the AN/GRC-211 or AN/GRC-171 Transceiver.

★6.4. Troubleshoot the AN/GRC-211 or AN/GRC-171 Transceiver to the LRU.

7. Command and Control Transceiver Equipment (AN/GRC-171B(V)4 and AN/GRC 242).

7.1. Identify the principles, capabilities, and limitations of a HAVE QUICK II-capable AN/GRC-171B(V)4 UHF Transceiver.

7.2. Perform all transmit and receive adjustments on an AN/GRC-171B(V)4 UHF Transceiver. Note: All performance checks are accomplished using unclassified maintenance keys.

7.3. Perform the 336-day PMI and establish HAVE QUICK communications using an AN/GRC-171B(V)4 UHF Transceiver.

7.4. Operate a Global Positioning System (GPS) Receiver.

7.5. Identify the principles, capabilities and limitations of the AN/GRC-242 HF radio.

7.6. Describe Tactical Digital Information Links (TADIL/Link-11) netted communication techniques for exchanging digital information among airborne, land-based and shipboard tactical data systems.

8. DIGITAL RECORDING EQUIPMENT.

8.1. Identify the principles, capabilities, and limitations of the digital voice recording equipment.

8.2. Perform digital voice recording equipment alignments.

★8.3. Perform a system initialization check and operate the digital voice recording equipment.

8.4. Troubleshoot the digital voice recording equipment to the LRU.

9. AIR TRAFFIC CONTROL (ATC) GROUND-TO-AIR COMMUNICATION SYSTEM.

9.1. Air Traffic Control Communication Principles.

- 9.1.1. Identify the principles, capabilities, and limitations of a fixed ATC Ground-to-Air system.
- 9.1.2. Identify microphone, headset, and speaker operating principles.
- 9.1.3. Identify telephone principles associated with ATC Air-to-ground systems.
- 9.2. Identify the principles, capabilities, and limitations of the Enhanced Terminal Voice Switch (ETVS) system.
 - 9.2.1. Describe Electrostatic Discharge (ESD) precautions.
 - 9.2.2. Describe the purpose and function of the ETVS.
 - 9.2.3. Describe digital audio and TDM as they pertain to the ETVS.
 - 9.2.4. Describe the ETVS system architecture.
 - 9.2.5. Describe ETVS Operator Position Equipment.
 - 9.2.6. Describe the TX and RX audio path of the ETVS.
 - 9.2.7. Describe the ETVS Configuration and Control subsystem (CCS) equipment.
 - 9.2.8. Describe the ETVS central rack equipment.
 - 9.2.9. Describe the ETVS power distribution equipment.
 - 9.2.10. Describe the operating procedures of the ETVS position consoles.
- 9.3. Perform Positions operational checkout.
- ★9.4. Perform Position Confidence Test.
- 9.5. Perform ETVS configuration changes.
- 9.6. Perform prescribed maintenance procedures.
- ★9.7. Perform performance checks on circuit card assemblies.
- 9.8. Align circuit card assemblies.
- 9.9. Troubleshoot the ETVS to the LRU.
- 9.10. Perform troubleshooting on a complete ATC Ground-to-Air system.
- 10. HIGH FREQUENCY (HF) TRANSCEIVER EQUIPMENT (AN/URC-119).
 - 10.1. Explain HF system theory.
 - 10.2. Identify the principles, capabilities, and limitations of the AN/URC-119 HF Transceiver.
 Note: For purpose of STS elements 10.2., 10.3., 10.4., and 10.6., the AN/URC-119 is comprised of the RT-1446, AM-7223, CU-2310, and C-11329. The C-11329 is only used to teach digital interface between the remote control head and the RT-1446.

- 10.3. Operate the AN/URC-119 with the exception of the FSK function.
- 10.4. Accomplish a system performance test (56-day PMI) on the AN/URC-119.
- 10.5. Troubleshoot the AN/URC-119 system to the defective system component.
- 10.6. Troubleshoot the RT-1446 to the LRU.
- 10.7. Troubleshoot the CU-2310 Antenna Coupler.
- 10.8. Describe troubleshooting procedures of the AM-7223.
- 11. TRANSPORTABLE VHF/UHF TRANSCEIVERS (RT-1319B or AN/TRC-176).
- 11.1. Identify the principles, capabilities, and limitations of the RT-1319B and AN/TRC-176 transportable VHF/UHF transceivers.
- ★11.2. Perform an operational check of the RT-1319B or AN/TRC-176 transportable VHF/UHF transceiver.
- ★11.3. Accomplish a performance check (168-day PMI) of the RT-1319B or AN/TRC-176 transportable VHF/UHF transceiver with the exception of the audio amplifier check.
- ★11.4. Align the RT-1319B or AN/TRC-176 transportable VHF/UHF transceiver.
- 11.5. Troubleshoot RT-1319B or AN/TRC-176 transportable VHF/UHF transceiver to the LRU.
- 12. MOBILE COMMUNICATION CENTRAL and DAMA (AN/GRC-206 and AN/PSC-5).
- 12.1. Explain the basic concepts of lightwave communication and fiber optics.
- 12.2. Identify the principles, capabilities, and limitations of the AN/GRC-206 communications central.
- 12.3. Identify the principles, capabilities, and limitations of single channel satellite communications.
- 12.4. Explain UHF Demand Assigned Multiple Access (DAMA) theory.
- 12.5. Identify the principles, capabilities, and limitations of the AN/PSC-5.
- 12.6. Perform an operational check of the AN/PSC-5.
- 12.7. Establish a UHF TACSAT communications link.
- 13. PERSONAL WIRELESS COMMUNICATION SYSTEMS (PWCS)
- 13.1. Identify the principles, capabilities, and limitations of PWCS communications systems.
- 13.2. Utilize Tracking Reporting System (TRS) database.
- 13.3. Identify basic duties of PWCS managers.
- 13.4. Identify basic principles of Base Stations, Antennas, and Repeaters installations.
- 13.5. Program radios for multiple nets.

13.6. Identify basic principles of installation spectrum management.

14. MASS NOTIFICATION SYSTEM (Giant Voice)

14.1. Identify the principles, capabilities, and limitations of mass notification system.

15. EXPEDITIONARY COMMUNICATIONS DEPLOYMENT

Note: In the event of inclement weather or unforeseen circumstances, course is authorized to use alternative methods of instruction to fulfill these STS elements.

15.1. Establish a HF command and control net.

15.2. Establish intra base communications net.

15.3. Establish UHF line of sight communications.

15.4. Establish a mass notification system.

15.5. Set up and orient tactical satellite antenna.

15.6. Identify basic concepts of the AEF and UTC deployment process.

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 CTG revision. Locate current publications at

Air Force publications at <http://www.e-publishing.af.mil/>.
 AFSSIs at https://private.afca.af.mil/afcaia/pubs_view.cfm?pubid=2
 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: 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
- Emission Security (EMSEC)
- Operational Risk Management
- Career Progression Information
- Information Security (INFOSEC)
- Communications Security (COMSEC)
- 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. 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					
2.2. Perform equipment maintenance using the following test equipment/devices:							
2.2.1. Analog multimeter.	X*	-					
2.2.2. Digital multimeter.	X*	-					
2.2.3. Decibel meter.	X*	-					
2.2.4. Watt meter.	X*	-					
2.2.5. Dummy load.	X*	-					
2.2.6. Modulation meter.	X*	-					
2.2.7. Frequency counter.	X*	-					
2.2.8. Audio oscillator.	X*	-					
2.2.9. RF signal generator.	X*	-					
2.2.10. Sweep generator.	X*	-					
2.2.11. Oscilloscope.	X*	-					
2.2.12. Distortion analyzer.	X*	-					
2.2.13. Spectrum analyzer.	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
2.2.14. Communications systems analyzer	X*	-					
2.2.15. Megohmmeter.	X*	-					
2.2.16. Impedance matching device.	X*	-					
2.2.17. Time domain reflectometer.	X*	-					
2.2.18. Protocol analyzer	X*	-					
3. STANDARD MAINTENANCE PRACTICES. TR: TO 31-141-1 volume 1, 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. 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 EMSEC suppression techniques.	X*	-					
4.9. Perform EMSEC 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					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
5.1.2. Configuration.	X	A					
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. Check quality of lightning protection.	X*	-					
5.9. Identify procedures to terminate multi-conductor cables.	X*	-					
5.10. Construct the following cable connectors:							
5.10.1. Multi pin.	X*	-					
5.10.2. Modular.	X*	-					
5.10.3. Coaxial.	X*	-					
5.10.4. Fiber.	X*	-					
5.11. 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					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
6.1.8. Error detection and correction.	-	B					
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: Communications-Electronics Maintenance Technician (2E); CBT Volume--Microsoft TCP/IP on Windows NT 4.0: Introduction to TCP/IP and IP Addressing https://www.smartforce.com/learning_community/Customer/USAF/login.asp	-	-					
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: Communications-Electronics Maintenance Technician (2E); CBT Volume--Introduction to Common Networking Protocols; and CBT Volume--Cisco ICND: Internetworking Overview https://www.smartforce.com/learning_community/Customer/USAF/login.asp	-	-					
6.4. State facts relating to the following switching methods: TR: Communications-Electronics Maintenance Technician (2E); CBT Volume--WAN Technologies https://www.smartforce.com/learning_community/Customer/USAF/login.asp							
6.4.1. Circuit.	-	-					
6.4.2. Message.	-	-					
6.4.3. Packet.	-	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
6.4.4. Asynchronous transfer mode (ATM). TR: Communications-Electronics Maintenance Technician (2E); CBT Volume--ATM Principles https://www.smartforce.com/learning_community/Customer/USAF/login.asp	-	-					
6.5. State facts relating to the following multiplexing methods: TR: Communications-Electronics Maintenance Technician (2E); CBT Volume--Data Communications: Signals and Systems, and CBT Volume--WAN Technologies https://www.smartforce.com/learning_community/Customer/USAF/login.asp							
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 Networked Information I: CBT Volume--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: Communications-Electronics Maintenance Technician (2E); CBT Volume--LAN Fundamentals; and CBT Volume--LAN Topologies and Techniques at https://www.smartforce.com/learning_community/Customer/USAF/login.asp							
7.1.1. Network topologies (Star, Ring, Bus, etc.).	X	B					
7.1.2. Network types (LAN, WAN, VPN).	X	B					
7.2. State facts relating to the theory of operation of the following information transport devices: TR: Communications-Electronics Maintenance Technician (2E); CBT Volume--Fundamentals of Internetworking; and CBT Volume--LAN Media and Components https://www.smartforce.com/learning_community/Customer/USAF/login.asp							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
7.2.1. Routers.	X	B					
7.2.2. Hubs (concentrators).	X	B					
7.2.3. Bridges.	X	B					
7.2.4. Gateways.	X	B					
7.2.5. Switches.	X	-					
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. Network Bandwidth Management equipment.	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, Chap 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, Chap 4 thru 6; http://www.cadre.maxwell.af.mil/warfaresudies/cwpc/Instructional Period Presentation.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							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
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*	-					
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. RADIO CONCEPTS AND MISSIONS							
10.1. Identify basic concepts and principles of the following:							
10.1.1. Transmitters (UHF/VHF).	-	B					
10.1.2. Receivers.							
10.1.2.1. UHF/VHF.	-	B					
10.1.2.2. LF/VLF.	-	A					
10.1.3. Transceivers.							
10.1.3.1. UHF/VHF.	-	A					
10.1.3.2. HF.	-	A					
10.1.4. Ancillary Equipment.							
10.1.4.1. Linear power amplifiers.	-	A					
10.1.4.2. Antenna systems.	-	B					
10.1.4.3. Transmission lines.	-	B					
10.1.4.4. Remote control functions.	-	A					
10.1.4.5. Recorder/reproducers.	-	A					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
10.1.4.6. Couplers.	-	A					
10.1.5. Single channel satellite communications networks.	-	B					
10.1.6. HAVE QUICK.	-	A					
10.1.7. Single Channel Ground and Airborne Radio System (SINCGARS).	-	A					
10.1.8. Tactical Digital Information Link (TADIL).	-	A					
10.1.9. Automatic Link Establishment (ALE).	-	A					
10.1.10. DAMA	-	A					
10.2. Describe equipment associated with the following missions:							
10.2.1. Intelligence.	-	A					
10.2.2. Air Traffic Control And Landing Systems (ATCALs).	-	A					
10.2.3. Missile Communications.	-	A					
10.2.4. C2 platforms.							
10.2.4.1. Tactical Air Control Systems (TACS).	-	A					
10.2.4.2. High Frequency Global Communication Systems (HFGCS).	-	A					
11. AN/GSC-37, COMMUNICATIONS AND CONTROL DISTRIBUTION SYSTEM. TR: TO 31W2-2GSC37 Series							
11.1. Identify principles, capabilities, and limitations.	-	-					
11.2. Perform operational checks.	-	-					
11.3. Configure.	-	-					
11.4. Align.	-	-					
11.5. Troubleshoot and repair.	-	-					
11.6. Remove and replace.	-	-					
12. AN/GSH-59, AUTOMATED TERMINAL INFORMATION SYSTEM (ATIS) CDD-1000 RECORDER-REPRODUCER. TR: TO 31S3-4-132-12							
12.1. Identify principles, capabilities, and limitations.	-	-					
12.2. Perform operational checks.	-	-					
12.3. Configure.	-	-					
12.4. Align.	-	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
12.5. Troubleshoot and repair.	-	-					
12.6. Remove and replace.	-	-					
13. PATCH PANEL. TR: Applicable TOs							
13.1. Identify principles, capabilities, and limitations.	-	-					
13.2. Perform operational checks.	X*	-					
13.3. Configure.	X*	-					
13.4. Align.	X*	-					
13.5. Troubleshoot and repair.	X*	-					
13.6. Remove and replace.	X*	-					
14. MASS NOTIFICATION SYSTEMS (GIANT VOICE). TR: AFI 10-2501, Commercial Manuals							
14.1. Identify principles, capabilities, and limitations of a public address system.	X*	A					
14.2. Perform operational checks.	X*	-					
14.3. Configure.	X*	-					
14.4. Align.	X*	-					
14.5. Troubleshoot and repair.	X*	-					
14.6. Remove and replace.	X*	-					
15. AN/PSN-11, GLOBAL POSITIONING SYSTEM RECEIVER. TR: TO 31R4-2PSN11 Series							
15.1. Identify principles, capabilities, and limitations.	X*	-					
15.2. Perform operational checks.	X*	-					
15.3. Configure.	X*	-					
16. R-2174(P)/URR, HF RECEIVER. TR: TO 31R2-2URR-251 Series							
16.1. Identify principles, capabilities, and limitations.	-	-					
16.2. Perform operational checks.	-	-					
16.3. Configure.	-	-					
16.4. Align.	-	-					
16.5. Troubleshoot and repair.	-	-					
16.6. Remove and replace.	-	-					
17. SDU-4A, TOWER LIGHT GUN. TR: TO (4-U) 35F5-2-4-13							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
17.1. Identify principles, capabilities, and limitations.	X*	-					
17.2. Perform operational checks.	X*	-					
17.3. Align.	X*	-					
17.4. Troubleshoot and repair.	X*	-					
17.5. Remove and replace.	X*	-					
18. CU2274, VHF ANTENNA COUPLER TR: 31R2-2GR-109 Series							
18.1. Identify principles, capabilities, and limitations.	-	-					
18.2. Perform operational checks.	-	-					
18.3. Configure.	-	-					
18.4. Align.	-	-					
18.5. Troubleshoot and repair.	-	-					
18.6. Remove and replace.	-	-					
200. AIR FORCE JOB QUALIFICATION STANDARDS APPLICABLE TO AFSC 2E153. TR: AFI 21-116, 36-2233, CFETP 2E1X3 (See Notes 3 and 4)							
200.2. AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training. (See Note 2)	X						
201.3. AFJQS 2EXXX-201C, Corrosion Prevention and Control.	X						
201.6. AFJQS 2EXXX-201F, Maintenance Control.	X*						
201.7. AFJQS 2EXXX-201G, Maintenance Support.	X*						
201.8. AFJQS 2EXXX-201H, Work Center Deficiency/Discrepancy Reporting.	X*						
201.10. AFJQS 2EXXX-201J, Maintenance Training Program.	X*						
201.16. AFJQS 2EXXX-201P, Work Center Test Equipment Management.	X*						
201.20.1. AFJQS 2E1X3-201TA, Modular Control Equipment (Radios).	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*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
203.13. AFJQS 2EXXX-203M, Missile Launch Facility Penetration.	X*						
203.22. AFJQS 2E1X1-203V, AN/PSC-5 Radio Set.	X*						
205.17. AFJQS 2E1X3-205Q, AN/GRT-21/22 VHF/UHF Transmitter.	X*						
205.18. AFJQS 2E1X3-205R, AN/GRR-23/24, VHF/UHF Receiver.	X*						
205.19.1. AFJQS 2E1X3-205SA, AN/GRC-171(V1, AV1) UHF Transceivers and AN/GRC-211 VHF Transceivers.	X*						
205.19.2. AFJQS 2E1X3-205SB, AN/GRC-171B(V)4, UHF Transceiver.	X*						
205.22. AFJQS 2E1X3-205V, OJ-314 FSC Standard Communications Control System (SCCS).	X*						
205.23. AFJQS 2E1X3-205W, Enhanced Terminal Voice Switch (ETVS).	X*						
205.24. AFJQS 2E1X3-205X, AN/MSN-7, Communication Central.	X*						
206.1. AFJQS 2E1X3-206A, AN/PRC-77 and AN/VRC-46/47 Radio Sets.	X*						
206.3. AFJQS 2E1X3-206C, Digital Voice Recorder System.	X*						
206.6. AFJQS 2E1X3-206F, RT-1319/URC, AN/PRC-113, AN/TRC-176, and AN/VRC-83 Radio Set Maintenance.	X*						
206.14. AFJQS 2E1X3-206N, AN/URC-119(V) HF Communications System.	X*						
206.16. AFQTP XXXXX-206P, AN/TSC-107 Communications Central (Quick Reaction Package) Familiarization Handbook.	X*						
206.18. AFJQS 2E1X3-206R, Scope Command High Frequency (HF) Radio Station.	X*						
206.20.1. AFJQS 2E1X3-206TA, OK-423/G Control Monitor Group.	X*						
206.20.2. AFJQS 2E1X3-206TB, CU-547/GR Antenna Coupler.	X*						
206.21. AFJQS 2E1X3-206U, AN/FRR-97/98 Radio Receiver-Teletypewriter Set.	X*						
206.22. AFJQS 2E1X3-206V, ICBM UHF Communication System.	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
206.25. AFJQS 2EXXX-206Y, AN/GSC-42(V) AFSATCOM Terminal.	X*						
207.5.2. AFJQS 2E1X3-207EB, AN/GRC-206(V)5 Communications Central.	X*						
207.5.3. AFJQS 2E1X3-207EC, AN/PRC-104 Radio Set.	X*						
207.5.4. AFJQS 2E1X3-207ED, Single Channel Ground and Airborne Radio System (SINCGARS).	X*						
207.7. AFJQS 2E1X3-207G, AN/GRC-221 Aircraft Alerting EMP System Maintenance.	X*						
207.24. AFJQS 2E1X3-207X, AN/TRC-187 Time Signal Set.	X*						
208.1. AFJQS XXXXX-208A, UHF Demand Assigned Multiple Access (DAMA).	X*						
209.3. AFJQS 2EXXX-209C, 6KNZF: C-E Airfield and Weather Systems Support	X*						
209.12. AFJQS 2EXXX-209L, 6KNZL: C-E METNAV Operations Maintenance	X*						
209.16. AFJQS 2EXXX-209P, 6KNZG: C-E C-2 Radio System Support	X*						
209.17. AFJQS 2EXXX-209Q, 6KNZN: C-E Personal Wireless Communications (PWCS) Support	X*						
210.1.1. AFQTP 2EXXX-210AA, Scope Shield II User's Handbook.	X*						
210.1.2. AFJQS 2EXXX-210AB, Scope Shield II Maintenance.	X*						
210.4. AFJQS 2E6X2-210D, UHF/VHF Antenna (AT-19007, AS-1097, AS-1181) Installation/Maintenance	X*						
210.23. AFJQS 2E1X3-210W, Personal Wireless Communications Systems	X*						
211.3.25.1. AFQTP 2E2X1-211CYA, Missile Communications Familiarization Handbook.	X*						
211.14. AFJQS XXXXX-211N, Installation Spectrum Management.	X*						
212.14. AFJQS XXXXX-212N, Tactical Antennas.	X*						

PREFACE

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

AFSSIs at https://private.afca.af.mil/afcaia/pubs_view.cfm?pubid=2

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: https://www.smartforce.com/learning_community/Custom/USAF/login.asp

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 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

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

AFSSIs at https://private.afca.af.mil/afcaia/pubs_view.cfm?pubid=2

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: 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, 10-244, AFMAN 10-401, Volume 1 Chapter 6 Volume 2, Annex K https://www.afmia.randolph.af.mil/Wartime%20readiness/Main%20Page.htm : Training, Manpower and Organization Deployment Handbook.							
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, 13-216, 21-109, 33-201, 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*	-					
70.3. State facts related to the following C-E Facility Management areas: TR: AFI 21-116 ATTCH 11, 32-1065, AFCEMI 300-7, TO 00-25-108, 31-10-24							
70.3.1. Grounding	X	-					
70.3.2. Lightning Protection	X	-					
70.3.3. Certification (ATC)	X*	-					
70.3.4. Antenna PMI Procedures	X*	-					
70.3.5. Mobile Depot Maintenance	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
70.3.6. RF Radiation Surveys	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	-					
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 2EXXX-213TA, Functional Manager's Handbook	X*	-					

Section B - Course Objective List

4. This area is reserved.

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/>.

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 2E1X3:

Publication No.	Pseudo File Code	Publication Title
AFJQS 2E1X3-201TA	2E1X3-201.20.1	Modular Control Equipment (Radios)
AFJQS 2E1X1-203V	2E1X1-203.22	AN/PSC-5 Radio Set
AFJQS 2E1X3-205Q	2E1X3-205.17	AN/GRT-21/22 VHF/UHF Transmitter
AFJQS 2E1X3-205R	2E1X3-205.18	AN/GRR-23/24, VHF/UHF Receiver
AFJQS 2E1X3-205SA	2E1X3-205.19.1	AN/GRC-171(V1, AV1) UHF Transceivers and AN/GRC-211 VHF Transceivers
AFJQS 2E1X3-205SB	2E1X3-205.19.2	AN/GRC-171B(V)4, Ultra High Frequency Transceiver
AFJQS 2E1X3-205V	2E1X3-205.22	OJ-314 FSC Standard Communications Control System (SCCS)
AFJQS 2E1X3-205W	2E1X3-205.23	Enhanced Terminal Voice Switch (ETVS)
AFJQS 2E1X3-205WC1		Enhanced Terminal Voice Switch (ETVS) Change 1
AFJQS 2E1X3-205X	2E1X3-205.24	AN/MSN-7, Communication Central
AFJQS 2E1X3-206A	2E1X3-206.1	AN/PRC-77 and AN/VRC-46/47 Radio Sets
AFJQS 2E1X3-206C	2E1X3-206.3	Digital Voice Recorder System
AFJQS 2E1X3-206F	2E1X3-206.6	RT-1319/URC, AN/PRC-113, AN/TRC-176, and AN/VRC-83 Radio Set Maintenance
AFJQS 2E1X3-206N	2E1X3-206.14	AN/URC-119 (V) HF Communications System
AFQTP XXXXX-206P	N/A	AN/TSC-107 Communications Central (Quick Reaction Package) Familiarization Handbook
AFJQS 2E1X3-206R	2E1X3-206.18	Scope Command HF Radio Station
AFJQS 2E1X3-206TA	2E1X3-206.20.1	OK-423/G Control Monitor Group
AFJQS 2E1X3-206TB	2E1X3-206.20.2	CU-547/GR Antenna Coupler
AFJQS 2E1X3-206U	2E1X3-206.21	AN/FRR-97/98 Radio Receiver-TTY Set
AFJQS 2E1X3-206V	2E1X3-206.22	ICBM UHF Communication System
AFJQS 2E1X3-206Y	2E1X3-206.25	AN/GSC-42(V) AFSATCOM Terminal
AFJQS 2E1X3-207EB	2E1X3-207.5.2	AN/GRC-206(V)5 Communications Central
AFJQS 2E1X3-207EC	2E1X3-207.5.3	AN/PRC-104 Radio Set
AFJQS 2E1X3-207ED	2E1X3-207.5.4	Single Channel Ground and Airborne Radio System (SINCGARS)
AFJQS 2E1X3-207G	2E1X3-207.7	AN/GRC-221 Aircraft Alerting Communication EMP System Maint
AFJQS 2E1X3-207X	2E1X3-207.24	AN/TRC-187 Time Signal Set
AFJQS 2E1X3-210W	2E1X3-210.23	Personal Wireless Communications Systems

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>
AFJQS 2EXXX-200B	2EXXX-200.2	2EXXX Communications-Electronics (C-E) Enlisted Specialty Training
AFJQS 2EXXX-201C	2EXXX-201.3	Corrosion Prevention and Control
AFQTP 2EXXX-201EB	N/A	Database Manager's Handbook
AFQTP 2EXXX-201F	2EXXX-201.6	Maintenance Control
AFJQS 2EXXX-201G	2EXXX-201.7	Maintenance Support
AFJQS 2EXXX-201H	2EXXX-201.8	Work Center Deficiency/Discrepancy Reporting
AFJQS 2EXXX-201J	2EXXX-201.10	Maintenance Training Program
AFQTP 2EXXX-201L	N/A	Communications-Electronics (C-E) Work Center Manager's Handbook
AFQTP 2EXXX-201LB	N/A	Communications-Electronic (C-E) Manager's Handbook
AFJQS 2EXXX-201P	2EXXX-201.16	Work Center Test Equipment Management
AFJQS 2EXXX-201X	2EXXX-201.24	Engineering Installation (EI) Quality Assurance
AFQTP 2EXXX-202A	N/A	Electrostatic Discharge Handbook
AFJQS 2EXXX-202B	2EXXX-202.2	Standard Installation Practices Electronics\Inside Plant
AFJQS 2E6X1-202C	2E6X1-202.3.	EI Standard Installation Practices—Construction/Antenna
AFQTP 2EXXX-202D	N/A	EI TEMPEST Installation Handbook
AFQTP 2E1X2-206M	N/A	Introduction to the Ionosphere Handbook
AFJQS 2EXXX-206Z	2EXXX.206.26	Advanced Narrowband/Wideband Communications Systems Concepts
AFQTP XXXXX-208A	N/A	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
AFJQS2EXXX-209ED	2EXXX-209.5.4	Air Force Mission Support System (AFMSS)
AFJQS2EXXX-209J	AFJQS2EXXX-209.10	Dataproducts DPMUX-2048 Multiplexer
AFJQS 2EXXX-209L	2EXXX-209.12	6KNZL: C-E METNAV Operations Maintenance
AFJQS 2EXXX-209P	2EXXX-209.16	6KNZG: C-E C-2 Radio Systems Support
AFJQS 2EXXX-209Q	2EXXX-209.17	6KNZN: C-E Personal Wireless Communications Support
AFJQS 2EXXX-209W	2EXXX-209.23	6KNZK: C-E Tactical Telephone Systems Support
AFQTP 2EXXX-210AA	N/A	Scope Shield II User's Handbook
AFJQS 2EXXX-210AB	2EXXX-210.1.2	Scope Shield II Maintenance
AFJQS 2E6X2-210D	2E6X2-210.4	UHF/VHF Antenna (AT-19007, AS-1097, AS-1181) Installation/Maintenance
AFJQS2EXXX-210J	AFJQS2EXXX-210.10	Hardened Intersite Cable System (HICS) Pressure Monitoring System (PMS)
AFJQS2EXXX-210K	AFJQS2EXXX-210.11	6KNZC: C-E Crypto/Computer System Support
AFQTP 2EXXX-210P	N/A	SUN Series Workstation Handbook
AFJQS 2EXXX-210S	2EXXX-210.19	6KNZ7: C-E Base Communications Systems Support
AFJQS2EXXX-211D	AFJQS2EXXX-211.4	Constant Source
AFJQS XXXXX-211N	XXXXX-211.14	Installation Spectrum Management
AFJQS XXXXX-212N	XXXXX-212.14	Tactical Antennas
AFJQS XXXXX-212Z	XXXXX-212.26	Global Broadcast Service Ground Receive Suite
AFQTP XXXXX-213TA	N/A	Functional Manager's Handbook
AFQTP 3E0X2-213YA	N/A	Solid State Uninterruptible Power System Principles
AFJQS 3E0X2-214D	3E0X2-214.4	Stationary Battery Banks
AFJQS 2EXXX-215B	2EXXX-215.2	AN/FSC-125 Fixed Site Single Channel Anti-jam Manportable (SCAMP) (FSS) Communication Set
AFJQS 3C1X1-215S	3C1X1-215.19	AN/URC-11900(V) HF Communications System

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/>.

Course Number	Course Title	Location
E3ABR2E133 006	Ground Radio Communication Apprentice	Keesler
E3AZR2E153 046	AN/GRC 206 O/I Maintenance	Keesler
E4AST2E153 046	AN/GRC 206 O/I Maintenance	Keesler MTT
E3AZR2E153 072	Enhanced Terminal Voice Switch	Keesler

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://private.afca.af.mil/c-e_maint/.

Section E - MAJCOM Unique Requirements

7. There are currently no MAJCOM unique requirements. This area is reserved.