



NATIONAL HEADQUARTERS CIVIL AIR PATROL

CAP REGULATION 100-1

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Communications – Electronics

COMMUNICATIONS

This regulation prescribes concepts, policies, and standards which govern the Civil Air Patrol (CAP) Communications Program. The National Commander prescribes the minimum communications requirements. Practices, procedures, and standards prescribed in this regulation are mandatory. All suggestions for modification and improvement of the program will be forwarded through the chain of command. **Note: This regulation is revised in its entirety.**

SUMMARY OF CHANGES.

Adds new Chapter 12 on implementation of the Narrowband Transition and makes related changes throughout. Deletes the monitoring program and provides interference reporting procedures. Clarifies use of amateur radio. Makes CAPF 76 optional. Corrects paragraph citations and terminology throughout. Removes requirement for the common access tone on repeaters. Clarifies guidance on assigning communications equipment IAW the Communications Table of Allowances. Provides guidance on communications equipment assigned to region and national staff. Revises the Mission and Purpose statements.

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CHAPTER 1 – GENERAL INFORMATION

1-1. Mission. The mission of the Civil Air Patrol (CAP) Communications Program is to meet the validated communications requirements of internal and external customers. This is accomplished by strong planning to organize and maintain a reliable, integrated, point-to-point, air-to-ground, and ground mobile radio capability in support of the missions of CAP.

a. Emergency Services. Emergency Services is the primary user of the CAP Communications System. Most support provided is tactical in nature.

b. Cadet Programs. The Cadet Program is an important user of the CAP Communications System. Support provided to this mission is both tactical and administrative in nature.

c. Aerospace Education (AE). While not as heavy a user of the CAP Communications System, AE is no less important. Support to this mission is primarily administrative in nature.

1-2. Purpose. The primary purpose of CAP communications is to provide internal communications capabilities; to provide commanders with the means to conduct the missions of CAP both during normal conditions and when commercial infrastructure is unavailable or unsuitable. The CAP communications system provides a continuity of operations capability when commercial infrastructure fails, such as allowing commanders, at each echelon, the ability to communicate with superior and subordinate commanders. In addition, the CAP communications system may also provide third-party support to “customer” agencies where it does not conflict with the primary purpose. All message traffic must be of, or pertaining to, the business of Civil Air Patrol or its customer agencies.

1-3. Utilization. Communications facilities of CAP are used in support of many operations including:

a. Emergencies. Radio communications supports search and rescue, emergency preparedness, and disaster relief missions; augments existing communications services in the event of floods, fire, tornado, and other natural disasters and supports the U.S. Air Force.

b. Flying. Communications provides messages on CAP aircraft movements, aircraft landings, and other information related to the safety of lives and property. This category also includes ground-to-air communications with in-flight aircraft.

c. Administration. In addition to CAP’s operational missions, the communications program will support all legitimate functions of CAP.

d. Training. The Communications program provides familiarization and practice courses in CAP radio communications procedures and demonstrates techniques of air-to-ground, point-to-point and network operations.

e. Support to Federal, State, and Local Agencies. Communications supports federal, state, and local agencies, either on behalf of the Air Force (federal agencies), or in CAP’s corporate status (state and local agencies) when that support does not conflict with internal command and control needs.

1-4. Principles. To be effective in accomplishing its mission, the CAP communications system must follow certain principles. These principles are the guiding criteria for the planning and operation of CAP communications systems, networks, and facilities. These principles are:

a. Scalability. A well engineered communications system with proper operating procedures has the ability to meet the operational needs of small missions or large missions with the same level of performance. As mission size and complexity grows the transition is seamless not requiring users to change their mode of operation.

b. Intra-Operability. A properly engineered communications system supports users anywhere in the system without requiring them to adapt to local variations. The most demanding CAP missions involve users from multiple wings and regions. Such demanding missions require immediate communication support. Local variations reduce intra-operability.

c. Inter-Operability. Interoperability is the ability to cooperate with partner agencies, achieved primarily through advance planning. It is seldom necessary for every user from every agency to be able to communicate directly during a joint mission. Done correctly, CAP works with other agencies to plan where cross connects among the partner agencies' independent systems will be most beneficial to mission success.

d. Survivability. In many instances, CAP goes to work when commercial infrastructure fails or is over-tasked. For this reason, our communications systems must survive when other resources fail. Emergency power, backup antennas, and standby stations are all good examples of planned survivability.

e. Security. The CAP communications system must support the operational and communications security requirements of internal and external customers in order to deny unauthorized persons access to sensitive information being transported through our communications system. This is accomplished both with secure equipment and proper operational procedures.

1-5. Network Structure. Only through planned organization and proper utilization can a communications system function to its maximum potential. In voice networks, that organization is achieved through correct application of directed nets and free nets. Network structure is implemented by Net Control Stations (NCS) and Alternate Net Control Stations (ANCS).

1-6. Maintenance, Testing, and Measurements of Radio Communications Equipment. Since the communications and electronics knowledge of the average CAP radio operator is normally limited to proficiency of radio operations, the recruitment of technically qualified personnel is highly encouraged. All transmitter, servicing, testing, or maintenance adjustments for operation which may affect the proper operation of the station shall be made by, or under the immediate supervision and responsibility of, a qualified technician. Programming of radio equipment does not require a fully qualified technician, as long as the member doing the programming is authorized by the wing DC or higher. See para. 12-10 for special requirements applying to maintenance and other work on CAP repeaters. For equipment other than repeaters, the following standards apply:

a. The minimum standard for qualification will be a General Radiotelephone Operator License or equivalent certification. The National Association of Business/Emergency Radio (NABER) certificate, Association of Public Safety Communications Officers (APCO) certificate, or Society of Broadcast Engineers (SBE) certificate are examples of acceptable certification. Persons in certain military specialties may also be authorized to service CAP communications equipment. These persons shall be authorized by the wing director of communications or higher.

b. All maintenance personnel, authorized under this regulation, are responsible for ensuring that all equipment serviced by them or under their supervision is functioning properly and within the required specifications prior to returning it to service.

c. Communications equipment provided through National Headquarters will not be modified in any manner without prior approval from the National Technology Center (NTC). Approved modifications will be documented and posted on the NTC Communications Program website. Modifications are defined as:

(1) The alteration or removal of components provided as part of the originally issued system or package design.

(2) The interfacing of any external components which are not a standard option or accessory obtained from the Original Equipment Manufacturer (OEM), or designed in cooperation with the OEM, to directly interface to the equipment through existing connections utilizing vendor-provided or common off-the-shelf interface cabling.

(3) The alteration of equipment circuitry in a manner which was not part of the OEM design or included in OEM documentation.

d. The fabrication of RF (coax) jumpers and the extension of power and speaker cables are allowed provided that the OEM connectors are not altered and good engineering practices are observed. Should a requirement exist to separate the components of an integrated system, that requirement will be identified to the NTC and the alteration will be performed at the NTC prior to distribution. This is necessary to ensure that unused components are properly accounted for and reutilized to the maximum extent possible.

1-7. Definition of Terms.

a. **National Telecommunications and Information Administration (NTIA).** The federal agency responsible for the regulation of frequency spectrum use by federal agencies. By agreement between the Air Force and NTIA, CAP radio communications falls under this authority.

b. **Standard Frequency Action Format (SFAF).** This is the standard format for frequency authorization applications within the DoD. In CAP requests for authorization to use frequencies are filed in this format with the NTC by wing, region or higher communications managers.

c. **Types of Stations.** There is a need to align CAP terms with NTIA usage. NTIA and the International Telecommunications Union (ITU) use station class based on how the equipment is being used, not on its operating band, operating function, or service. The following are examples that could be used within CAP:

FA – A ground station that communicates with an aircraft.

FB – A ground station that communicates with mobiles (both handhelds and vehicle mounted).

FC – A ground station that communicates with a ship.

FX – A point-to-point communication.

MA – An aircraft communicating with another aircraft.

ML – A mobile communicating with another mobile.

MS – A ship communicating with another ship.

MO – This is a shorthand expression for combining the previous three station classes in the same SFAF.

TT – A ground station communicating with a satellite (such as ATS-3).

"R" – May be added to any station class if the equipment functions as a repeater.

The preceding terms are primarily used by spectrum managers. The operational community may use such terms as search and rescue (SAR) station, command station, mission station, or a net

control station. These are useful to know and these may be documented in a remark field of the SFAF.

d. Nets. Nets are composed of stations selected based on the purposes of the individual net. Some nets restrict open participation, while other nets are open to all communicators.

e. Directed Nets. Directed nets require strict adherence to procedures. Stations obtain permission from the net control station prior to communicating with other stations in the net. Directed nets generally follow published schedules.

f. Free Nets. Free nets allow relaxed procedures. The NCS authorizes member stations to transmit traffic to other stations in the net without obtaining prior permission. Free net operation does not relieve the NCS of the responsibility for maintaining net discipline.

g. Net Control Station. The NCS is responsible for net discipline. The NCS controls and directs the flow of traffic in the net. NCS are authorized by region/wing.

h. Alternate Net Control Station. ANCS perform the same function and have the same responsibilities as the NCS when the appointed NCS is unable to run the net.

i. Provisional Net Control Station. When the NCS or ANCS must leave the air during a net, he/she appoints a provisional net control station to maintain discipline and conduct the net. The NCS or ANCS will officially relieve the provisional NCS upon his/her return to the net.

j. Ground Station. A ground station normally operates from a stationary, fixed, or permanent location and utilizes antennas that are permanently mounted.

k. Mobile Station. A mobile station normally operates in motion or during halts at unspecified locations. Mobile stations include handhelds, as well as radios in ground vehicles, boats, and aircraft.

l. Search and Rescue (SAR) Station. SAR stations are fixed or mobile stations authorized to operate on specific aeronautical frequencies for search and rescue purposes.

m. Simplex Operation. Simplex is operating on the same transmit and receive frequency.

n. Duplex Operation. Duplex is operating on different transmit and receive frequencies. It is commonly used with repeaters.

o. Repeater. A repeater is an interconnected receiver and transmitter system that automatically retransmits, on the output frequency, what is heard on the input frequency. Repeaters and/or their associated antennas are placed in higher locations to extend the range of fixed and mobile stations.

p. CAP Form 76, Radio Operator Authorization. A CAPF 76, Civil Air Patrol Radio Operator Authorization, may be issued to CAP personnel who meet the requirements listed in para 5-1 of this regulation. CAPF 76 may only be issued by the region or wing DC (or his/her designee).

q. Table of Allowances (TA). This document is the basis for funding, distribution and assignment of Air Force-provided communications equipment and was originally based on input from the wings. The TA lists communications "requirements" that have been validated and approved by CAP-USAF. Because the formulas and allocations of equipment in the TA represent justifications for funding, CAP must assign equipment in keeping with the justifications presented to the Air Force. Procedures to amend the TA are contained in the TA document. See para. 7-7 for more information.

r. CAP-DC Listserv. This listserv is the primary Communications program management coordination channel between National Headquarters, the regions and wings. Directors of Communication are subscribed to this listserv when the NTC is notified that the DC has changed. Other communications staff members may be subscribed based on guidance from the CAP National Staff and CAP Headquarters Staff, as revised from time to time. In all cases, the address receiving e-mails is the address entered in eServices.

s. National Repeater Coordination Group. The National Repeater Coordination Group (NRCG) is the body that reviews and approves requests from the wings to make changes in the national repeater system. The NRCG consists of 16 voting members, two from each region appointed by the region commanders to act on their behalf. When a wing develops a request for a new or modified repeater, it is first submitted for region approval. If approved at the region level, it is referred to the NRCG through an electronic system on the secure NTC website.

t. Region Repeater Committee. The Region Repeater Committee is a committee that functions at the region level to review and approve requests from the wings to make changes in the repeater infrastructure within the region. If needed, the committee may coordinate with adjacent region repeater committees to de-conflict assignments. Applications approved by the Region Repeater Committee are subsequently reviewed by the NRCG.

1-8. Supplements/Operating Instructions/Waivers. Supplements, operating instructions, or waivers will not be issued to this regulation without prior written approval of NHQ CAP/DO.

1-9. Protection of Radio Frequency Information. The radio frequency assignments provided by the USAF are sensitive information and require protection from unauthorized release. They are designated as UNCLASSIFIED//FOR OFFICIAL USE ONLY (U//FOUO).

a. Release of Air Force Frequencies. Most CAP members do not need to know actual operating frequencies, other than VHF-AM (aviation band) frequencies. In most cases, frequency designators of radios channel numbers are sufficient and make the communications system more user friendly. CAP members shall not release or comment on CAP radio frequencies to any person, business, or organization where there is not a legitimate need to know. Plans, instructions and other documents containing frequencies shall not be left unattended in non-secure locations, released to the general public, or made available to unauthorized viewing via the World Wide Web or by any other means. CAP-USAF approval is required for release of frequencies to outside agencies. Within CAP, frequencies may only be released to members who have a legitimate need to know, have taken the on-line OPSEC training, and have agreed to protect CAP frequency information. Where agencies, businesses, or individuals outside of CAP have a legitimate need to know, permission may be requested by an e-mail, containing full justification, sent to: commpermissions@capnhq.gov. In contingency situations, other national level offices such as the National Operations Center (NOC) may coordinate directly with CAP-USAF.

b. Marking of Documents. All documents containing frequencies will be marked "UNCLASSIFIED//FOR OFFICIAL USE ONLY" at the top and bottom of each page. And, the following statement will be clearly displayed on the front page of any document containing FOUO information:

<p style="text-align: center;">UNCLASSIFIED//FOR OFFICIAL USE ONLY (U//FOUO) Frequency information contained in this document is designated by the Department of Defense (DoD) as For Official Use Only. CAP-USAF approval, obtained through NHQ, is required for release of frequencies.</p>

CHAPTER 2 – COMMUNICATIONS PLANS

2-1. General. Communications plans for support of the CAP mission fall into three separate categories. Each category requires separate planning in order to effectively provide communications support for the type of mission being performed. The three categories are: (a) Emergency Communications Plan, (b) Operations and Training Plan, and (c) Repeater Plan. These categories may be combined into one plan, at the option of the unit communications officer. CAP networks at all levels must be ready to provide at least the minimum services required to support each mission, regardless of how small or large it may be. Simplicity and flexibility are the two most important factors to be taken into consideration when preparing a communications plan. Each unit should tailor its plans based on the resources on hand.

2-2. Communications Plan Requirements. Each CAP region and wing will develop and publish an Emergency Communications Plan, an Operations and Training Plan, and Repeater Plan. Communications plans will be written in support of the next higher headquarters. Such plans will be reviewed annually and kept current by supplements and changes as conditions require. Each wing will submit one copy of the plans and changes to their respective region DCS/Comm, one copy to NHQ CAP/DOS, and one copy to the NTC not later than 10 January of each year. Each region will incorporate the wings' plans into the region plans and submit the plans/changes to NHQ CAP/DOS and the NTC no later than 10 April. Region plans will become the basis for the National Communications Plan.

2-3. Planning Considerations. All plans should include provisions for the employment of all resources. In the event of an actual emergency, an effective emergency communications plan will provide critical, initial means of communications with a minimum time delay. Communications requirements will vary with each emergency. The activation of a minimum number of key stations at the onset of an emergency will permit more effective communications and a rapid analysis of what communications requirements will be. The geographical size of the state, type of terrain, location of major population areas, location of CAP units, and communications resources are all primary factors which influence the development of a sound plan. Selecting the state of Tennessee as an example, there are five major population areas: Memphis, Martin, Nashville, Chattanooga, and Knoxville. By dividing the state into five areas, we have basic boundary requirements for a task force area operation. Two key CAP radio stations are selected for each area; one assigned as area NCS and the other as ANCS. Key stations must be carefully selected. Ideally they should be operational stations and monitored daily, with transmitting and receiving capabilities on all authorized CAP frequencies. Geographical location of key stations within an area is also important since emphasis should be placed on the use of the VHF frequencies for communications with units within a task force area. (Note: For frequency designator definitions see the Downloads section of the Communications website at <https://ntc.cap.af.mil/comm/downloads.cfm>.) Sound frequency management and utilization to include the national emergency frequency must not be over-looked. With five stations of this category backed by an alternate station in each of the five task force areas, the foundation of a limited but dependable state-wide communications network is assured. Expansion of this network by the task force area NCS can be done by employing other stations within their area as needed.

2-4. Emergency Communications Plan. Answers to the following questions will aid in providing the basic requirements for an emergency communications plan at all levels:

- a. Considering key locations within an area (state, county, city, etc.), what would be the minimum number of radio stations required for initial support of an emergency condition?
- b. Considering topographical conditions of the area, where would these stations be located?
- c. What stations are presently located at the key locations? Selecting two stations for each location, which has the best capability from the standpoint of availability and resources?
- d. Is there a requirement for radio relay stations? Are they available? Do they meet frequency and power requirements?
- e. Considering propagation changes and other frequency problems normally encountered during a 24-hour period, what are the best locations for net and alternate net control stations?
- f. Has an alternate been assigned for each key station?
- g. Are provisions made for utilization of ground and air mobile stations?
- h. Are key stations equipped with auxiliary power?
- i. Are the key stations located where supplemental communications facilities may be available through federal or state government agencies (civil defense, state highway patrol, etc.)?
- j. Keep in mind that the initial requirement is for dependable communications with a minimum number of stations at key locations. Answers to the above questions will provide the basis for an emergency communications plan at all unit levels.
- k. **Format.** Format is important from the standpoint of presenting the plan in logical sequence for the purpose of being easily understood. Simplicity and flexibility is essential; however, this should not be accomplished by sacrificing the inclusion of facts and details essential to effectiveness and utilization of the overall plan.

2-5. Operations and Training Communications Plan. Operations and training plans, unlike emergency plans, are designed to provide a network of communications which will encompass the entire area of unit (region, wing, group, or squadron) responsibility. Such networks are primarily required for the support of normal day-to-day operational and training requirements. Maximum radio station participation should be encouraged. In some cases, it may be necessary to schedule more than one net period a day in order to permit effective net operations. This is especially true in wings with large numbers of stations. In all cases, operations and training communications networks must provide commanders at all levels with a command channel to his/her subordinate units and higher headquarters. See chapter 5 for training class requirements.

a. Preparation of Operations and Training Communications Plan. This is a simple, flexible plan effectively utilizing the maximum number of unit radio station resources on a daily basis for operations and training purposes.

b. Network Requirements. The number and types of nets organized for any unit is primarily dependent on three factors: type of unit organization, number of subordinate units, and number of radio stations assigned (land and mobile). The participation of mobile stations on a scheduled basis is strongly encouraged at all times. All ground stations should participate on a regular net schedule basis. See paragraphs 7-4 and 7-5 for descriptions of types of nets for which training may be required in the operations and training plan.

c. Network Functions. Networks provide an operations and training capability for incident commanders, communications sections and emergency services teams.

d. Frequency Planning and Utilization. Since the number of frequencies available to CAP is limited and multiple assignments are necessary, strict adherence to proper utilization is essential.

e. Net Composition.

(1) Networks of region, wing, and group will be comprised of the following ground stations: NCS, ANCS, and all remaining licensed ground stations. Stations appointed as NCS and ANCS should have single sideband and VHF facilities as appropriate to their network capability.

(2) Squadron networks will be tailored to conduct net operations to the extent possible, based on the number and types of radio stations licensed to the unit.

(3) Mobile stations are not normally assigned to specific net operations and schedules. However, when traffic and training requirements permit, blanket authority will be issued for net participation.

2-6. Repeater Plan. Effective radio coverage requires clear, thought-out repeater plans. The growth of the repeater system should be pre-planned to support communications objectives.

2-7. Special Planning. The CAP National Staff and/or CAP National Headquarters staff may task wings and regions to submit special plans for special programs or activities, such as the 2008-2009 Narrowband Transition. In such cases, formats or other guidance will be delivered to Directors of Communication by posting on the secure NTC website and/or delivery via the CAP-DC listserv.

CHAPTER 3 – CAP COMMUNICATIONS STANDARDS AND STATISTICS

3-1. General. The following establishes CAP communications standards, reporting, and data requirements. The information provided by these statistics will be used in the CAP Annual Report to Congress, and to keep the region/wing commanders and other staff members informed about the CAP communications program. The reports listed below are required.

3-2. Quarterly Station Statistics Report: H-1. The goal of the H1 report is to collect information not already available via CEMS and other reports. Items a. – e. should report the actual number of member-owned, NTIA compliant radios which have been authorized for use in the CAP communications system by the DC and which are available for service. If a radio is used in more than one mode (e.g., base and mobile) report the primary utilization only to avoid duplication. The H1 Report is filed on line at the NTC website and is due by the 15th day of each quarter.

- a. Number of member owned HF base stations
- b. Number of member owned HF mobiles
- c. Number of member owned VHF/FM base stations
- d. Number of member owned VHF/FM mobiles
- e. Number of member owned VHF/FM portables
- f. Number of users who received training in the previous quarter IAW Para 5-1
- g. Number of users who received training in the previous quarter IAW Para 5-3
- h. Narrative

3-3. Annual Communications Effectiveness Evaluations. The success of providing adequate communications support to CAP missions is largely dependent upon the reliability and effectiveness of the communications network. In order to assess this capability, a Communications Effectiveness Evaluation should be conducted annually in the form of a communications exercise.

a. Each region will conduct a communications effectiveness evaluation with no more than a twelve hour advance notice. Region effectiveness evaluations will include all region and wing radio stations. An after action report will be submitted to CAP-USAF LR/DO, NHQ CAP/DOS, CAP-USAF/XO, and the NTC within 30 days after the exercise.

b. Each wing will conduct an annual communications effectiveness evaluation with no more than a twelve hour advance notice. This exercise will be pre-coordinated and approved by the region DCS/Comm. An after action report will be submitted to the CAP-USAF State Director and region DCS/Comm within 30 days after completion of the exercise.

CHAPTER 4 – COMMUNICATIONS AWARDS, ACTIVITIES, AND PROGRAMS

4-1. General. The following awards have been established for the purpose of recognizing the service, achievements, and degree of proficiency attained by personnel who have applied their time and efforts to the CAP communications program. This includes cadets who meet the listed criteria specified in the Senior Member Training Guide, CAPP 214, Specialty Track Study Guide-Communications Officer.

4-2. Awards and Citations. The awards available within the communications program are designed to serve a distinct purpose:

- a. Recognize those communicators who have given time and effort to promote the communications function.
- b. Encourage the undertaking of communications related activities at all levels.

4-3. The Communicator Badge. The Basic Communicator Badge is designed to recognize those individuals involved in communications. It is awarded to those members who have achieved the Technician Rating in Communications (CAPP 214). The approving authority is the unit commander.

Required endorsement: Unit communications officer.

Award: Basic Communicator Badge to be worn IAW CAPM 39-1, Civil Air Patrol Uniform Manual.

4-4. The Senior Communicator Badge. The Senior Communicator Badge is designed to recognize the continuing participation of active communicators. It is awarded to those members who have achieved the Senior Rating in Communications (CAPP 214). The approving authority is the wing commander.

Required endorsement: Wing or higher director of communications.

Award: Senior Communicator Badge to be worn IAW CAPM 39-1.

4-5. The Master Communicator Badge. The Master Communicator Badge is designed to recognize those communicators who have mastered the communications specialty and have progressed to management of the CAP Communications Program. It is awarded to those members who have achieved the Master Rating in Communications (CAPP 214). The approving authority is the region or national commander.

Required endorsement: Region DCS/Comm.

Award: Master Communicator Badge to be worn IAW CAPM 39-1.

4-6. Application for Communicator Badge. The communicator badge (basic, senior, master) should be applied for on CAPF 2A, Request for and Approval of Personnel Action. The communications officer will sign as requester. At wing and region levels, the director of communications will initial the appropriate wing/region authorization lines and forward to the appropriate commander for signature. Documentation supporting the eligibility of the member will be listed in the remarks section. The CAPF 2A and all supporting documentation will be

sent to the appropriate approving authority. The cloth Communications Patch is the BDU/Utility uniform equivalent of the Communicator Badge. Any member authorized to wear any of the three levels of Communicator Badge may also wear the Communications Patch on the uniform(s) for which it is appropriate. The Communications Patch is NOT authorized for users of the communications system who have not entered into the Communications Specialty Track and achieved at least the Technician rating IAW CAPP 214.

4-7. Cadet Eligibility for Communicator Badge/Patch. Cadets are encouraged to pursue each level of the communicator badges. To do so, cadets must meet all the training requirements listed in the appropriate section of CAPP 214 with the exception of the portions specifically intended for the senior member training program. Application is made in same manner as detailed in para 4-6 above.

4-8. Communicator of the Year. This award has been established to recognize a current member who has made a significant contribution to the CAP Communications Program as a whole. This selection should be based on the member's lifetime contributions to the CAP Communications Program, not just the year of nomination.

a. Each wing and region will conduct this program and award a "Communicator of the Year" at their level. The winner of this award is submitted as the nomination to the next higher echelon. Units below wing level may also make this award at their level, if they desire. This is encouraged where practical.

b. Nominations, in narrative form, are to be submitted through channels in accordance with the following timetable:

15 January - Unit nominations due to wing for consideration as the "Wing Communicator of the Year."

15 February - Wing nominations due at region for consideration as the "Region Communicator of the Year."

15 March - Region nominations due at NHQ CAP/DOS for consideration as the "Civil Air Patrol Communicator of the Year."

In the event that no nomination is received NHQ CAP/DOS or the NTC will request a nomination from each of the region DCS/Comms for consideration.

c. NHQ/DOS will pass all nominations to Personnel and Member Actions for consideration by the CAP Awards Review Board.

d. At each echelon, the Communicator of the Year Award should be presented at an appropriate function such as the wing or region conference. The national award will be presented annually at the August National Board Meeting.

4-9. Accreditation. In order to provide uniform requirements, the following criteria for mission communications must be met in order to receive accreditation per CAPP 214 (any deviation must be pre-approved by region DCS/communications).

a. Primary duty on missions must be communications related (communications officer, radio operator, message clerk, logger, technician, etc.)

- b.** Any reimbursable mission qualifies.
- c.** Non-reimbursable missions may be accredited by the approving authority. The application for such accreditation should include the nature of the mission, scope, and scenario and must be endorsed by the commander.
- d.** For consideration for the Master Communicator Badge, accredited missions must be wider in scope than the member's home group, preferably statewide.

CHAPTER 5 – RADIO OPERATOR TRAINING

5-1. Requirements for Operating a CAP Radio Station. CAP radio stations are authorized by the Federal Government through the NTIA for emergency, training, and operational activities. Members are authorized to operate CAP radio stations upon certification by wing or higher authority. No CAP member may attend CAP radio operator training without first completing on-line CAP Operational Security (OPSEC) Training and having agreed to the on-line non-disclosure agreement.

a. Introductory Communications Users Training (ICUT). The CAP National Board has approved a plan that will introduce a new ICUT course, taken either on-line or in classroom settings. This course will replace both the Basic Communications User training (BCUT) described in para b. below, and the Advanced Communication Users training (ACUT) described in para 5-3 below. When introduced, interim guidance will be posted on the secure NTC website and announced on the CAP-DC listserv.

b. Pending introduction of the ICUT class, application for certification may be made after attending a communications orientation class, referred to as Basic Communications User training (BCUT). At wing level and below, this class is conducted under the oversight of the wing director of communications who will designate qualified trainers within the wing. The orientation class is encouraged for all CAP members -- seniors and cadets -- and will be composed of the following topics as a minimum.

(1) Part I. Standard Operating Procedures. Basic familiarization and demonstration of do's and don'ts IAW CAPR 100-3, including:

- (a)** Calling and answering
- (b)** Use of call signs
- (c)** Operating the radio
- (d)** Basic pro-words
- (e)** Prohibitions
- (f)** National communications policies

(2) Part II. Local Operating Procedures. Basic familiarization with the specifics applicable to the local area in which the communications user will operate including information such as:

- (a)** Location and use of local repeaters
- (b)** Local operating practices
- (c)** Special local procedures
- (d)** Local net schedules
- (e)** Region, wing, and local policies

5-2. Certification. Upon completion of the communications orientation class described in para 5-1, the class instructor forwards the recommendation for authorization up to wing or higher authority. Proof of this class must be retained in the individual's personnel records (CAPF 45, Senior Member Master Record, or CAPF 66, Cadet Master Record) and furnished to the appropriate wing/region officials upon request. When satisfied with the qualifications, the director of communications authorizes the operator IAW para. 5-4. Also see figure 5-1. Following introduction of the ICUT class, updated interim guidance may be posted on the secure NTC website and announced in the CAP-DC Listserv.

5-3. Advanced Communications User Training. Pending introduction of the ICUT course, members requiring advanced training take the Advanced Communications User Training (ACUT) course. Specifically, those individuals who operate their own radio station on CAP frequencies, who want to pursue the Communications Officer Specialty Training, or who assume staff positions requiring they be issued a corporate radio asset require advance training. This training will be conducted under the oversight of the wing director of communications who will designate qualified trainers within the wing. No card or form is required as proof of this training. It is simply recorded in the individual's personnel records (CAPF 45 or CAPF 66). Before registering a radio station to a member, the director of communications or licensing officer will validate that the member has met this training requirement.

a. Advanced Communications User Training will consist of these minimum topics:

- (1) Network operating procedures
- (2) Formal message preparation and handling
- (3) Familiarity with different radio modes and equipment, e.g., HF, VHF, SSB, FM
- (4) Working knowledge of CAPR 100-1
- (5) Rationale and process for national standardization of CAP's communications system.

b. Successful completion of Advanced Communications User Training Questionnaire, which is an open-book test. A passing score of 80%, corrected to 100%, is required. This test and scoring key may be downloaded from the secure NTC website by the wing Director of Communications or region DCS-COMM only. While ACUT is NOT a controlled test, the Director of Communication should provide it only to authorized ACUT instructors.

c. This training will normally require no more than 4 hours. If more than 4 hours of training is deemed necessary, a separate and optional class for those individuals interested in further training should be considered. It should be remembered that these two levels of training (paragraphs 5-1 and 5-3) are for the certification of communications users. Communications officers who manage the CAP communications system receive further training in accordance with CAPP 214.

5-4. CAPF 76. The CAPF 76, Radio Operators Authorization, is not required for CAP members to operate CAP radio stations, as long as the appropriate training has been accomplished and the wing or higher headquarters maintains a roster of authorized stations in its files and/or a secure unit website. The card may be issued by region and wing communications managers, as needed. If used, only the current version of the CAPF 76, shown in figure 5-1, may be used.

5-5. On-going Training. Communications training is an on-going requirement.

a. Communications Exercises. Communications managers at all levels should plan and execute communications exercises and other training on a regular basis to give operators the opportunity to remain proficient and to improve unit communications capabilities. Wings, regions, and National Headquarters shall each conduct at least one formal communications exercise per year, IAW Para. 3-3. In addition to requirement of Para.3-3, communications managers at all levels should develop diverse formal and informal exercises and other activities to provide members with practical experience in operating under anticipated mission conditions. After Action Reports should be prepared following all exercises and training activities in order to provide a self-critique and improve future performance. After Action Reports may be forwarded to the communications staff at the next higher headquarters when a report shows significant successes or challenges.

b. Communications Meetings/Conferences. Periodic meetings of communicators and communications managers from regions, wings, and subordinate units are essential to the maintenance of an effective communications program. This provides a forum for discussion of communications problems, new proposals, an exchange of ideas, development of mutual understanding, an opportunity for individual and unit recognition, discussion of program changes, and a renewal of interest by the members. This helps build a team concept which is crucial to the communications program. Each region and wing should conduct a minimum of one annual conference of all communicators and communications officers. Similar conferences/meetings below wing level are highly encouraged. A summary of the meeting, including a log of the participants, must be submitted to the next higher echelon within 30 days after the activity.


5-6. Operation of CAP Radio Equipment by Non-members.

a. The NTIA manual states that "the station should be operated by an employee . . . or by a person who operates under the control of the department or agency on a contractual or cooperative agreement and who is under the supervision of the department or agency sufficient to ensure that agency instructions and limits are met." (NTIA para 8.2.17.1.c). In short, any non-member may operate a CAP radio, for CAP business, provided they are directly supervised by a qualified CAP member.

b. For the purposes of liaison communications, representatives of Federal, state, and local agencies may occasionally operate CAP equipment without direct supervision. This would normally only occur under situations where an MOU or other formal relationship exists with that agency and where it is necessary in a contingency situation.

c. Representatives of certain Federal agencies may occasionally use CAP's repeater system for their own missions, normally using encrypted P25 transmissions. This use is authorized at the National level by CAP and the NTC will attempt to notify appropriate CAP personnel when this occurs. CAP communications managers observing unexpected communications using CAP's repeater system should report this immediately and directly to the NTC or the National Operations Center (NOC) before taking other action.

Figure 5-1. Radio Operator Authorization Card

 <p>National Headquarters Civil Air Patrol Maxwell AFB AL 36112-6332</p> <p>RADIO OPERATOR AUTHORIZATION</p>	
<p>Name and address of operator:</p> <p>John Doe 123 Main Street Montgomery, AL 36112</p>	
<p>Card # AL-00123</p>	<p>Expiration: 31 Aug 2009</p>

<p>Under the authority of the National Telecommunications and Information Administration (NTIA) the person identified on this form is authorized to operate radio equipment in accordance with frequency assignments granted to the Civil Air Patrol by the Air Force Frequency Management Agency.</p>
<p>Signature of Issuing Officer</p>
<p>THIS AUTHORIZATION IS NOT TRANSFERABLE. It remains the property of HQ CAP and will be returned promptly upon proper written notice.</p>

CAP Form 76, Aug 96

Previous edition is obsolete

CHAPTER 6 – COMMUNICATIONS MANAGEMENT

6-1. Unit Radio Authorization Application. Units may use formats such as figure 6-1 for collecting information to use in a request for a radio station authorization. This information should be provided to the wing/DC or the region DCS/Comm. The appropriate DC or designee will either grant authorization to use existing CAP frequencies or apply for a new authorization if necessary.

6-2. Posting of Station Authorization. Under NTIA and DOD frequency management rules, there is no requirement to post the station authorization at the operating console or at the transmitter site. Wing and higher headquarters should maintain a roster of authorized stations. The roster may be kept on paper or in electronic file form and may be in unit paper files and/or on a unit website (ensuring that secure information is not released to the public).

6-3. Revocation of Authorization. A wing or higher commander may, for reasonable cause, terminate the privileges of any CAP member in his or her command to participate in CAP radio activities.

6-4. Communications Monitoring. Communications managers at each level of the organization are responsible for ensuring CAP communications adhere to all applicable technical and procedural requirements. Members observing operation outside of these standards should notify the appropriate net control station, unit communications officer or wing DC. Reporting and corrective actions should normally be handled off the air.

6-5. Authorization Records and Inventory. An efficient filing system of all radio stations authorized is the responsibility of each region and wing director of communications. These records will document the most recent H-1 report, IAW para. 3-2, and include a current callsign roster. All files will be maintained in accordance with CAPR 10-2, Files Maintenance and Records Disposition. They may, however, be kept in electronic form as an alternative to paper records.

6-6. Authorization of Practice Beacon for Locator Training Purposes:

- a. Frequency.** CAP operates practice beacons on the frequency of 121.775 MHz only.
- b. Modulation Requirements.** 3K20A3X or 3K20A3N emission (wavering tone). Practice beacon frequencies shall not be used for voice transmission by CAP.
- c. Type Acceptance.** Practice beacons must be FCC type accepted or conform to the parameters of J/F-12 Number 7192 for Pointer Cadet 6000 practice beacon.
- d. FAA Notification.** Where possible CAP units will provide advance notification of intended use of practice beacon transmitters on 121.775 MHz to the appropriate FAA Regional Frequency Management Office, the FAA Flight Service Station, or the local air traffic control facility nearest the practice beacon transmitter(s) operating location(s). Notification should include: date of test, test location, geographical coordinates, and a local contact (individual). This is a professional courtesy extended to the FAA to reduce any possibility of confusion. Exercise managers should make every effort to provide this advance notice when possible.

6-7. Authorization of VHF/FM Repeaters. Fixed repeaters will not be placed into service without prior approval by the National Repeater Coordination Group. Wings will submit all requests for new repeaters or changes and modifications to existing fixed repeaters via the on-line Repeater Application and Review System at the NTC website.

6-8. Communications Property Management. All Air Force funded CAP communications equipment shall be assigned in accordance with the Table of Allowances (TA) as approved by CAP-USAF.

a. Table of Allowance Implementation. Commanders and their directors of Communications should be able to identify the line and column of the TA under which a given radio is assigned. National Headquarters may provide additional recommendations for compliance with the TA on the secure NTC website. See para 7-7 for further information. Other communications property management guidance is contained in CAPR 174-1, or successor regulation.

b. Effective Utilization of Communications Equipment. All Mission Critical and Mission Essential equipment, as defined in the Communications Table of Allowances (TA), will be distributed and utilized IAW the TA.

c. Communications Equipment Assigned to Region and National Staff. According to the Table of Allowances (TA), Mission Critical and Mission Essential radios assigned to staff by region and national headquarters are for Command and Control Communications (C3), not Tactical communications. Furthermore, under CAPR 60-3, CAP operational missions are staffed at the Wing level or below, not by Region or National Headquarters. Holders of Region or National staff positions who are fulfilling active operational roles for wings, such as Incident Commander, Ground Team leader, etc., may and should be issued radio equipment for those operational positions by the Wing they are supporting in those positions, IAW the TA. Staff on the region and wing charters who have been issued radios for Command and Control Communications may also use those radios on operational missions.

6-9. Reserved

6-10. Reserved

6-11. Reserved

6-12. Encryption. As CAP's missions transition further into the realm of sensitive and possibly even classified taskings, the issue of communications encryption becomes crucial. CAP-USAF has verified that DoD and AF policy guidance on encryption applies to CAP. Pending further development of implementation procedures, CAP will comply with the following requirements:

a. CAP encryption implementation must be IAW AFI 33-201, Vol 1, using NIST-validated equipment with current FIPS 140-2 certificates.

b. CAP must be prepared to use encryption IAW tasking agency requirements.

c. Before routine use of VHF-FM encryption will be possible, CAP NHQ and CAP-USAF must develop procedures for secure distribution and storage of encryption keys. Communications managers must take into consideration the possibility of secure communications as a mission requirement in the near future and plan accordingly.

d. Customer requirements for encryption may limit the usefulness of non-encrypted radios on AF assigned missions and some corporate missions, and communications managers must assign resources accordingly with this in mind. We anticipate that non-encrypted radios will still be useful for many support roles and most non-mission communications.

e. Systems used to interconnect repeaters and remote base stations must support encryption at all times. Any new system of this type must automatically retransmit original encrypted signals without unsecure intermediate decrypting and re-encrypting. In other words, signals that were originally encrypted may not be passed through unsecured networks unless preserved in their original encrypted form. Existing systems must be brought into compliance by 31 December 2012.

Figure 6-1. Station Authorization Request Form

Request for Station Authorization		
1. Requester:		
Name:	Grade:	Charter No:
Address:		
City:	State:	Zip Code:
CAPF 76 No:	Expiration Date:	Date of Advanced Training:
2. FAA Coordination.		
a. Will the antenna be over 500 feet above the ground? Yes No (Circle one) b. If the antenna is within 3 NM of an airport (remember that an airport could have the border placed beyond actual fencing): Will the antenna be at or above 200 feet above the airport elevation? Yes No (Circle one)		
<i>Note: If you have answered YES to either 2a or 2b above, FAA coordination will be required.</i>		
3. Landlord: (if your antenna is located on federal lands answer a & b below).		
a. Provide the agency/unit name: b. Provide the federal installation frequency manager's name. (If none exist, then provide the CAP unit that is responsible for the antenna. For example, if it is California Wing, then enter PACRCA.)		
4. Location (ground station):		
a. City, town or point of land on which the antenna is located: b. Coordinates for the transmit antenna expressed in latitude and longitude: _____ North _____ West		
5. Antenna:		
a. Generic name for antenna (collinear, whip, dipole, dipole array): b. Dbi gain of the antenna: c. Distance above sea level expressed in meters (feet times 0.3048): d. Distance above the ground to the antenna feed point expressed in meters: (Note: This is not the distance from the ground to the antenna tip.)		
6. Operational Frequency Bands and Modes: (Check as appropriate.)		
<input type="checkbox"/> VHF FM Base	<input type="checkbox"/> VHF FM Mobile	<input type="checkbox"/> HF SSB Base
<input type="checkbox"/> HF SSB Mobile	<input type="checkbox"/> VHF AM (Airband)	
7. Operating Radius:		
a. What is the <i>service area</i> or operating radius expressed in kilometers (miles times 1.609) <i>Note: This is not the greatest distance you can transmit, but the actual operating radius you will be using.</i>		
8. Coordination:		
a. Names of whom you coordinated with:		
Date Requested:	Date Approved/Disapproved:	Signature of Approving Authority:

CHAPTER 7 – RADIO STATION OPERATION AND PROCEDURES

7-1. Safety. Each CAP radio station should employ safety procedures appropriate to the equipment, facility, and installation. Communication officers at all levels are expected to exercise judgment and due diligence to maintain safe operation of equipment and safety of personnel.

a. Equipment Adjustments.

(1) Radio operators will make routine adjustments only. Adjustments which require the removal of panels or chassis from the equipment cabinet may be performed only by competent maintenance personnel as described in para.1-6.

(2) Maintenance personnel will not attempt to adjust any part of communications equipment when there is a possibility of receiving injuries from unprotected high-voltage components. Under no circumstances should equipment repairs be attempted on any electronic equipment with the power source connected.

b. Equipment Grounding. All base stations should be adequately grounded, as judged by the Communications Officer or CUL to be appropriate to the equipment, facility, and installation. Mobile equipment mounted to the body of the vehicle does not require an external ground.

c. Fuses. Replacement fuses should be of proper capacity per the equipment manufacturer. The use of tin foil, solder, or any other unauthorized material is forbidden. Such practice creates a potential fire hazard, may result in extensive damage to the equipment, and jeopardizes the safety of the operator.

d. Power Switches. All personnel having access to the radio station should be familiar with the location of the power switch(s), if such switch(s) or circuit breaker(s) exist and are available to operators.

e. Antenna. The primary power sources should be removed from all transmitters during periods of antenna maintenance. When there is a risk of lightning, fixed radio equipment should be disconnected from external antennas and the antenna leads grounded or removed from the building. It is good practice but optional to disconnect the antenna from the radio any time the building is not occupied, unless there is proper lightning protection. Other antenna lightning arrestors or grounding switches should be installed as appropriate or in accordance with the requirements of the site owner. Special safety precautions should be taken when erecting antennas in the vicinity of electric power lines.

7-2. Emergency Electrical Power. Each NCS and ANCS should be equipped with an emergency power source to permit operation should commercial power fail, whether battery or generator powered. Emergency power operation, including battery backups, should be scheduled during one regular net period each month to ensure operational readiness when needed. All operators will be trained in the following:

- a. Location of power unit and how to gain access.
- b. If a generator, how to refuel, check oil, and start and stop the engine.
- c. Ground safety rules concerning the operation of a gasoline engine, hazards involved in gasoline storage, carbon monoxide hazards, and the operation and location of a suitable fire extinguisher. Batteries require special safety procedures for venting and acid handling.

7-3. Station Logs. Radio logs are to be maintained by the NCS on all directed radio nets, nets in support of actual or training missions, any net where CAP regulations require maintenance of records, and on any net where formal traffic is passed. CAPF 110, Air/Ground Point to Point Log or software based logs may be used. If software logs are used the information must be stored in a form where the data can be easily retrieved and a back-up exists. All logs should provide for the use of designators instead of actual frequencies. The logs are kept for 6 months after which they may be destroyed. Note: Station logs and formal messages which include mission activity must be maintained for at least 1 year. The wing legal officer should be consulted prior to destruction of any mission related logs or messages. For stations that maintain logs, the logs will show hours of operation, frequency designators used, time and identification of formal messages sent and received, stations with which communications were held, and the signature of the operator on duty.

- a. The log shall be kept in an orderly manner and in such detail that required data is readily available.
- b. All time entries will be in Coordinated Universal Time (ZULU).
- c. No log or portion thereof shall be erased, obliterated, or willfully destroyed within the required retention period. Any necessary correction must be made only by the person originating the entry.

7-4. Net Operations: CAP uses a wide range of net structures to support command, control and communications (C3), tactical missions as well as other activities. All regularly scheduled nets must be coordinated and approved with higher headquarters. Short term nets for specific missions or activities are normally approved at the mission or activity management level. However, frequency authorization may also be required from higher headquarters.

a. The National corporate and volunteer staff may set and update the alert status of the CAP national communications system. Region Deputy Chiefs of Staff for Communications and Wing Directors of Communications may specify a higher alert level within their span of control, but may not set an alert status lower than the national level. All corporate radios not assigned to deployable kits shall comply with the confidence checks required by the CAP Alerting System Communications Actions guide on the secure NTC website.

b. National Net. The National Command Net operates in the Automatic Link Establishment (ALE) mode. It is composed of stations specifically approved by the NTC using equipment provided for this purpose. Most of these stations are "message center" stations which relay message traffic between the national and region levels of the CAP net structure.

c. **Region Net.** The Region Command Net is composed of stations representing the region headquarters and each wing headquarters within that region. The purpose of this net is to pass traffic among the region headquarters and the wings.

d. **Wing Nets.** The wing net is composed of stations representing the wing headquarters and subordinate units of the wing. The purpose of the wing net is to pass traffic among the wing headquarters and subordinate units.

e. **Group Nets.** A group net is composed of stations representing the headquarters of the group and its subordinate units. The purpose of the group net is to pass traffic among the group headquarters and subordinate units.

f. **Squadron Nets.** A squadron or flight net is composed of stations representing the unit headquarters and the unit's members. The purpose of the net is to pass traffic among the unit.

g. **Special Purpose Nets.**

(1) **Mission and contingency nets.** When mission needs dictate other nets may be established at any level within the communications system. These nets may be composed of stations from any combination of wings and regions as necessary to support the mission. Contingency nets may be established to support the readiness posture of CAP. Examples of contingency nets include hurricane watch nets and other precautionary activations.

(2) **Communicators' Net.** The daytime and nighttime communicators' nets are open to any communicator. The purpose of these nets is the free exchange of information. Questions of both a technical and administrative nature may be handled. Furthermore, the traffic originating on other nets may be handled on the communicators' nets to ensure widest dissemination.

(3) **Other Special Purpose Nets.** Other special purpose nets may be established as necessary to support CAP programs and activities. Where special purpose nets are established to support the Chaplain's program, net content shall conform to applicable standards and codes of conduct in CAPR 265-1 and CAPR 265-2 for other Chaplain's activities.

7-5. Net Control Stations. NCS and ANCS control and direct the flow of radio traffic within their nets. Thus, a wing net control station directs the activities of the group and squadron stations in its net.

a. The authority of the NCS is confined to the operational control and supervision necessary to promote net discipline. The decisions and instructions of the NCS in conducting the net are final and will not be contested on the air. However, should a NCS abuse or neglect its responsibilities or go beyond the limits of its authority, a report will be forwarded, through channels, to the authority which appointed the NCS. If the instructions of the NCS are repeatedly or flagrantly violated by a subordinate station, the NCS will submit a report, through channels, to the commander exercising jurisdiction over the violating station.

b. The NCS is responsible for the efficient movement of traffic within the net, for the relay of internet traffic, and for implementing the necessary measures to promote and ensure circuit discipline. In promoting circuit discipline, the NCS is authorized to initiate service messages to subordinate stations to correct communications discrepancies. All responsibilities of the monitor stations (para 7-5b) are also inherent to the NCS. The monitor stations will assist the NCS in detecting violations.

c. When the appointed NCS and ANCS temporarily leave the air, a competent provisional NCS will be appointed. The duties, responsibilities, and authority vested in the NCS will also apply to the provisional NCS. The provisional NCS must be a fully operational CAP station.

7-6. Net Schedules. All regions and wings are authorized to conduct net operations. The recommended minimum net schedules are: four per month for all regions and four per month for all wings.

7-7. Traffic Categories. CAP radio traffic falls into three categories: formal, informal, and administrative.

a. **Formal Traffic.** Official traffic transmitted for, by, or in the name of the commander. These involve policy matters, information of record value, instructions, or orders.

b. **Informal Traffic.** During actual missions or training periods, traffic other than formal or administrative types may be required. For example: instructions to air and ground mobile stations, rapid exchange of target information, preliminary status reports, etc. Such traffic does not lend itself to the preparation of formal messages and in most cases will be a direct exchange of information between various participants in the mission.

c. **Administrative Traffic.** The transmission of direct questions and answers between staff officers, relating to the official business of the unit to which the participating officers are assigned. Although this traffic may be informal, the inclusion of traffic that is personal in nature is prohibited.

7-8. Security of Transmitters. Transmitters should be installed and protected so that they are not accessible to unauthorized persons. Locks or other devices should be used to prevent operation of transmitters by unauthorized persons when the station is unattended. Access to rooms, buildings, or vehicles containing radio stations should be limited to authorized personnel.

7-9. Transmitter Testing. Adequate precaution will be taken to ensure that signals are not radiated when transmitter testing is in progress. A dummy antenna will be used whenever possible.

7-10. Out-of-wing Operation. Operators of mobile stations sometimes have occasion to travel outside of the wing in which they are licensed to operate. When operating in another wing, operators must be constantly aware of possible mission activity and must contact the appropriate NCS for permission to operate. Operation in another wing is solely for the conduct of official CAP business. Before using any radio in the states bordering Canada, you must check with the wing DC to learn what the operating restrictions are. Operation on CAP frequencies in Canada and Mexico is prohibited.

7-11. Inter-wing Traffic. Communications between wings of the same region is encouraged. Except for emergencies, scheduled net periods will not be interrupted unless prior coordination and approval is obtained from the wing director of communications. Communications between wings is permissible for official business only. Organized tests and exercises between wings of different regions are permissible during free net time providing concurrence is obtained from region and wing directors of communications. Inter-wing tests, training, and exercises are encouraged, but in all instances will be controlled by competent CAP personnel who will ensure that traffic transmitted meets the spirit and intent of this manual as official CAP business.

7-12. Voice Call Signs.

a. Within CAP, each region, wing and national level station is assigned a unit tactical call sign. The tactical call sign maybe suffixed with a serially assigned number. Serially assigned numbers will not exceed four digits.

b. Numerically suffixed tactical call signs one through five will change with changes in staffing and are as follows:

- (1) Commander
- (2) Vice commander
- (3) Chief of staff
- (4) Director of Communications
- (5) Chaplain

c. Functional Designator Usage. See CAPR 100-3, Radiotelephone Operations, paragraph 1-9.

d. Aircraft Call Signs. CAP corporate aircraft will use “CAP” (pronounced “cap”) at all times. Member-owned aircraft may also use the CAP call sign when on Air Force Assigned Missions (AFAM). Wings and regions will use the first two digits for their region/wing vehicle identity numbers, IAW CAPR 77-1, attachment 8b, as the first two digits of the call sign and will devise a suitable plan for assigning the second two digits. Controls must be present in this plan to prevent two aircraft from using the same call sign simultaneously. Wings with a zero as the first number of their vehicle identity number will drop the leading zero, therefore, their CAP call signs will be three digit calls. No other truncating of the call sign numbering is authorized, meaning both of the second two digits must be used.

(1) Flight Plans. The three letter identifier “CAP” is used within the FAA computer system in place of the spoken word “CAP.” For this reason, “CAP_____” will be used in place of the aircraft tail number on flight plans. In the remarks section, the voice identifier “CAP_____” must be included as well as the tail number of the aircraft.

(2) Exceptions. Wing or region commanders may approve the aircraft tail number as a call sign when an external “customer” has specifically requested it.

7-13. Frequency Interference. Increasing demand for radio channels has resulted in a continuing space reduction between channels and in a sharing of frequencies on the basis of time or geographic separation. Some interference must be expected as frequencies used by CAP are shared with Federal agencies. Certain voice, CW, and teletype signals audible on CAP channels are not illegal interference, as these signals may be from authorized government agencies.

7-14. Interference Reporting Procedures. During the narrowband transition, and its aftermath, it is particularly important to report interference from other agencies that degrades the ability of CAP to accomplish its missions. Such interference should be reported to National Headquarters and/or the NTC. Any station affected by recurring interference may request an investigation through channels to identify the source. Whether the interference can be fully identified or not, it should be reported to the next-higher level of communications management, including all pertinent details and also describing steps taken to investigate or resolve it. CAP members may not, under any circumstances, contact any outside entity (FCC, NTIA, Air Force, etc.) regarding interference issues without explicit authorization from the NTC.

a. Types of Reports.

(1) **Initial Report.** File a report as soon as possible after the beginning of the interference. Include all available data and send it up through wing/region to the NTC. You may ask for frequency management assistance in the initial report.

(2) **Supplemental or Follow-on Reports.** Submit supplemental reports when you need to add to or modify information previously submitted. Include the date/time group of the initial report and any previous supplemental reports and send them via the same route that you sent the initial report.

(3) **Closing Reports.** Issue a closing report when the interference incident is resolved or requires no further action.

b. Report Submission.

(1) Check with equipment maintenance personnel to determine if the interference is the result of maintenance actions or an equipment malfunction.

(2) Check with other stations in the geographical area to determine the area affected. Knowing if other nearby stations are experiencing the same type of interference may aid in determining the source.

(3) When you suspect co-channel interference (interference between systems that have been assigned similar frequency allocations), check with wing/region communications officers to determine the location of frequency assignments that fall within the bandwidth of the victim receiver.

(4) Determine the bandwidth, relative amplitude, and modulation of the interfering signal with a spectrum analyzer, if available. Find the approximate bandwidth by varying the receiver frequency to determine the affected frequency band.

c. Exceptions to Reporting. Do not report an incident when the interference is transient noise from natural sources (for example, rain, solar activity, lightning, and so forth).

7-15. Altitude Restrictions. National Headquarters may announce and modify altitude restrictions for operation on CAP VHF-FM frequencies. Where altitude restrictions exist, they shall not be more limiting than required by federal frequency management agencies and international agreements.

CHAPTER 8 – NARROWBAND VHF OPERATION

8-1. Concept of Operations. The CAP communications program relies heavily on the use of VHF-FM (very high frequency-frequency modulation) because VHF normally provides excellent dependable short-range communications. VHF is readily adaptable to ground and air mobile operations.

8-2. Standardized National Channelization and Programming Plan. VHF-FM operations by CAP is governed by the Standardized National Channelization and Programming Plan. Compliance with this plan is mandatory for all corporate radios able to function on more than 129 channels. It is recommended that member-owned radios comply with the plan, to the extent possible. The plan is available on the secure NTC website.

8-3. Simplex Operations. Simplex operations are those that are conducted on a single frequency. Within CAP, these frequencies must be used solely for communications between active CAP stations and must not be used to meet infrastructure requirements such as repeater inputs and similar applications. Any exceptions to this must be approved in writing by the NTC.

a. GUARD Channel. A Guard channel is a common channel monitored by all units to allow short-term contact, regardless of what other operational channels the station may be using. The channel designated "Guard 1" is restricted to use ONLY for calling and then immediately moving to another channel. All CAP stations should maintain a constant listening watch on this channel, to the maximum extent possible. It is essential that this channel remain available for use as a guard channel for all stations. Therefore, after making contact on this channel, stations must change to a different channel to conduct their business. Only in an actual emergency directly involving one of the stations may this channel be used for ongoing communications.

b. Simplex on Repeater Frequencies. The use of simplex operation on the repeater output channels, sometimes referred to as "Talkaround", is not authorized for regular communications. This mode may be used strictly as a "calling channel" to establish initial contact after which communications must move immediately to another channel. This use is limited to situations where no other mode is successful in establishing communications. Any other use of the output channels such as conducting nets, is not authorized. Use of repeater input channels for simplex operation is not authorized in any situation.

c. Subaudible Codes. All CAP Simplex channels have designated subaudible codes for both transmission and reception listed in the National Programming Plan. These codes, either analog or digital, shall be used at all times by all CAP stations unless otherwise authorized in writing by the NTC. Depending on mission requirements, CAP stations may temporarily disable tone reception.

8-4. Repeater Operations. Repeater stations provide significant benefits to CAP by increasing the effective range of base, mobile and portable stations utilizing them. However, this increased range can also cause interference problems between unrelated operations and missions. Proper planning must be used to ensure that repeater operations do not cause unacceptable interference.

a. Designators. Repeater stations in CAP are assigned Designators based on which frequency pair and Continuous Tone-Coded Subaudible Squelch (CTCSS) tone/Network Access Code (NAC) they use as their primary discrete access. These designators are in the format of: Rxx, where “xx” is a number between 01 and 99, and followed by a “P” when required to indicate Digital (P25) transmission. Leading zeros in these numbers must be included to avoid confusion. The repeater channels are programmed in accordance with the Standardized National Channelization and Programming Plan.

b. Access. Every CAP repeater, whether fixed or tactical, must be accessible with both a Primary Discrete Continuous Tone-Coded Subaudible Squelch (CTCSS) tone AND a Primary Discrete P25 Network Access Code (NAC) as approved by the National Repeater Coordination Group (NRCG). These two Primary Discrete codes must correspond based on Table 8-1. The Common Access Tone (CAT) formerly required on CAP repeaters is no longer mandatory. Additional codes may be installed if approved in writing by the NTC. Repeaters shall NOT be programmed to respond to carrier-only signals. All repeaters must encode their Primary discrete CTCSS tone or NAC, dependent on mode.

c. Tactical Repeaters. Tactical repeaters may be used in temporary fixed, mobile or airborne operations. Use of such systems is limited to emergencies, temporary fixed site restoration, scheduled tests, and other short term activities. Approval of the wing director of communications or higher is required before each use, except emergency use and during authorized missions. If interference to an adjacent wing or region might be experienced, in a non-emergency situation, the request must be approved by the Region Repeater Committee(s) prior to use. All technical standards, as described in this regulation, will be met by any equipment authorized as a tactical repeater system. A specific channel has been reserved for tactical repeaters, accomplished by a unique CTCSS tone. This tone shall not be used as an encode or decode tone on any permanently installed ground-based repeater station.

(1) Unique Frequency Pair. A unique channel (unique frequency pair) has been allocated for Tactical Repeaters ONLY. A total of five channels has been allocated using this frequency pair. These channels should be used for all Tactical repeater operations unless interference to the fixed repeater infrastructure has been fully precluded. See the national channelization and programming plan.

(2) Aircraft Connections. Members installing tactical repeaters in CAP aircraft MUST ensure that the aircraft has properly wired auxiliary power and antenna connections, or that appropriate adapter cords are used. Power and antenna connectors on the repeaters may not be modified to meet local aircraft wiring.

d. Repeater Control.

(1) When any station within reliable range of a repeater is keyed (mike button depressed), provided it is on the proper RF frequency and encoding the proper CTCSS tone or NAC, the repeater transmitter is automatically turned on. A drop-out delay of not less than 1 second or more than 6 seconds is required after the end of each transmission.

(2) A time-out timer is required on all repeaters. This device will turn off the repeater's transmitter if there has been a period between two minutes and five minutes with no break in the reception of an incoming signal. This will prevent jamming due to equipment malfunctions, stuck microphones, etc. This also will protect the repeater from possible damage.

(3) Remote control of repeaters may not be conducted on standard CAP narrowband frequencies. If remote control of a repeater by an RF link is desired, the NTC must be contacted to obtain authorized Air Force frequencies for this purpose. All equipment used for this purpose must be compliant with current NTIA technical requirements.

e. Dual Mode Required. All narrowband CAP repeaters, including tactical repeaters, must be capable and programmed to respond to either analog or digital P25 signals. Unless specifically authorized in writing by the NTC, no narrowband VHF-FM repeater may be operated with access limited to only one mode. Existing narrowband-capable analog-only repeaters currently in service may continue to be used through 31 December 2012.

8-5. FM Digital Communications. Project 25 (P25) digital communications may be conducted IAW the following guidance. Any other digital mode must be pre-approved by the NTC before use. P25 guidance is as follows:

a. Use: All Mission Communications nets or activities that do not involve a specific and identified complement of P25-equipped stations should continue to be conducted using analog mode. While specific, controlled portions of these missions may be operated using digital mode, care must be taken to ensure that no asset, unit, or member is inadvertently excluded from the ability to support these missions simply because they are not equipped with P25 radio equipment and assets.

b. Reporting. Units are encouraged to experiment and test their P25 capability, and these units are also encouraged to report their findings and impressions to the NTC and other communications program managers.

c. Compatibility. Care must be taken to ensure that these tests do not interfere with concurrent analog operations and activities. Conversely, users of analog-only equipment must similarly take appropriate steps to protect legitimate and authorized use of P25 from interference. All P25-capable radios will, to the maximum extent possible, be programmed as "Mixed-Mode" receive on both their analog and digital CAP channels. All CAP radio operators are required to "listen before transmit." Analog-only users should familiarize themselves with the sound of digital modulation in order to facilitate this process.

d. Standards. All digital audio operation will only use P25 Common Air Interface (CAI) modulation.

e. Coordination. DC's who authorize ongoing digital operations using repeaters will inform both their Region DC and also the DC's of any neighboring Wings who might be affected. If these operations change significantly, or if specific steps are necessary to preclude interference to analog operations, this should also be reported to the Region DC.

f. Access. All P25 Network Access Codes (NAC) will be in conformance with the CTCSS to NAC conversion table (shown at table 8-1) using the CTCSS tones currently authorized for the channel. These codes were determined by taking the CTCSS frequency and multiplying it by ten, then converting the integer result to a hexadecimal number. See attachment 1.

g. Crypto/Scrambling. Encrypted P25 transmissions of any kind are permitted ONLY if advance authorization is granted in writing by the NTC. Only approved keying material provided by the NTC will be used. Use of locally constructed encryption keys is prohibited. Only approved encryption algorithms may be utilized. When working with other agencies, CAP must conform to that agency's rules and procedures for using encryption systems.

8-6. Geographically Defined Restrictions. Because of international agreements and other legal issues, CAP may need to restrict its operations on certain frequencies when in the vicinity of the International borders. Restrictions will be announced to directors of communications in the CAP-DC listserv and compiled in the secure NTC website. Operators entering those areas should make themselves aware of any restrictions in effect.

CHAPTER 9 – FREQUENCY UTILIZATION AND NET SCHEDULES

9-1. CAP Frequency Policy. The radio frequency assignments authorized for CAP use are limited in number and vital to the support of the CAP mission. The extensive use of these frequencies requires strict control at all levels of command. For operational purposes, all references to CAP single-sideband frequencies should be to the carrier or dial frequency.

9-2. Frequency Utilization. Maximum frequency use will be made of all free frequency time on a first-come, non-interference basis. Alternate frequency assignments will be used only on a non-interference basis when propagation or interference precludes use of the assigned primary frequency. Net schedules are not permitted for alternate frequency assignments without coordination with the NTC.

9-3. Four Megahertz Frequency Assignments. Each CAP region is assigned a primary and an alternate frequency normally used in support of all communications requirements with the region. Primary and alternate frequency assignments are based on a checkerboard plan under which the least possible inter-region interference is experienced. National Communications System Shared Resources SHARES stations from government agencies may occasionally be heard using these frequencies to contact CAP stations participating in the SHARES program.

9-4. National Calling Frequencies. The frequencies AD and AE are designated as the national calling frequencies and will be used in accordance with the following guidelines:

- a. These frequencies are authorized for use by all CAP stations for communications concerning all matters relating to official CAP business.
- b. Emergency operations will take precedence.
- c. No scheduled nets will be conducted on these frequencies unless approved by the NTC.
- d. SHARES stations from government agencies may occasionally be heard using these frequencies to contact CAP stations participating in the SHARES program.

9-5. Frequency Priority. Emergency communications has priority over all other traffic on CAP frequencies. During periods other than emergency, primary frequency users will have priority over alternate frequency users.

9-6. Alternate Frequency Utilization. During region or wing communications exercises or tests approved by appropriate commanders, alternate frequencies may be used to supplement communications networks. However, verbal or written coordination and approval with the primary frequency user must be accomplished prior to the effective date.

9-7. Temporary Authorization for Net Changes. In the event that an assigned frequency is not usable for scheduled nets, frequency changes may be requested. Wings should coordinate with the region DCS/Comm for a regional solution. If a new frequency must be requested, the region DCS/Comm will coordinate the assignment with the NTC. Except as needed for emergency or mission communications, frequencies not assigned to regions may be coordinated through the NTC on a first-come basis. The duration of the any new frequency authorization under this paragraph will be set by the NTC as agreed upon by the wings and regions involved.

9-8. Radio Net Schedules.

a. Net schedules for operation on all authorized CAP frequencies will be coordinated and established at region level. Requests for schedule changes, additions, and/or deletions on CAP frequencies will be coordinated through appropriate region DCS/Comm. If the change will be outside times already allocated to the region, coordination with the NTC is required.

b. All net schedules will be prepared in ZULU time. Since the days of the week in the schedules are also according to ZULU time, conversion of the tables to local time will, in some cases, mean that a net will be held a day earlier on local time. For example, a net scheduled for 0100Z Sunday would actually be conducted on Saturday local time.

c. Net times listed for all schedules will be changed to 1 hour earlier during periods when daylight-saving time is in effect unless otherwise established by region policy. For example, during daylight-saving time, a net schedule listed for 1300Z will be moved back 1 hour and held at 1200Z.

9-9. Frequency List. Frequencies permanently authorized for CAP and associated frequency designators can be found on the members-only secure area of the NTC website. That site may be accessed by logging in at <https://ntc.cap.af.mil/login.htm>. Authority to operate is granted through normal wing/region channels IAW the appropriate sections of this regulation.

9-10. Net Participation by Aircraft. Air-to-ground and ground-to-air communications are essential for the support of emergency services missions. Regularly scheduled net operation of CAP air mobile stations is neither feasible nor practical; however, fullest utilization of this capability should be considered in all phases of communications training exercises and scheduled effectiveness tests.

9-11. Intra-Squad Radios (ISR). ISR radios are authorized for all CAP units and activities, except that they must NOT be utilized in flight. Only radios specifically manufactured for the ISR service (currently available only from ICOM) are authorized and they will not be modified in any way, including the addition of external antennas or amplifiers. Because these radios operate only on federal frequencies, personal use of ISR radios is prohibited. For this reason, wings will develop policies regarding personal purchase of these radios that will ensure they are not resold or used outside of CAP. Wing DCs have the information needed to purchase these radios directly from ICOM America.

9-12. Family Radio Service (FRS). While use of ISR is preferred, the use of FRS radios is authorized IAW NTIA Regulations section 7.5.8. FRS radios are authorized for all CAP units and activities not directly supporting Emergency Services (actual missions and training). Emergency/disaster response, medical communications, and command and control communications are examples of emergency services functions which are prohibited from using FRS.

a. **Limited Emergency Services FRS Use.** One exception to the prohibition against ES use of FRS is when attempting to contact victims or the objects of a search. If it is believed that the victims or search target may be carrying FRS, ES personnel MAY use FRS in an attempt to contact the victims directly. FRS will not be used for communications between ES personnel or for any other manner of ES communications support.

b. Permissible FRS Use. Some examples of permissible FRS activities would include encampments, air shows, fund raisers, model rocketry, conferences, meetings, and non-direct mission supporting activities of a similar nature. They would also be ideal as a hands-on training tool for communications classes such as demonstrating how to call other stations, transmitting and receiving formal traffic and simulated ES radio traffic. Do not use FRS radios while airborne.

c. All FRS radios and operations must meet FCC Part 95 rules, including the necessity of using FCC-certified FRS equipment. FRS radios must not be modified in any way, and modified/illegal FRS radios are subject to confiscation by the FCC.

9-13. General Mobile Radio Service (GMRS). GMRS is a separate FCC service which may operate on some of the same frequencies as FRS but at higher power. Unlike FRS, GMRS is a licensed service. A license for a specific geographical area is required and fees are charged by the FCC for this service. Use of GMRS radios by CAP is specifically prohibited by the Air Force.

9-14. FRS/ISR Procedures. Operations with either ISR or FRS radios should utilize normal CAP operating procedures, including callsigns. To operate either FRS or ISR without supervision, operators must be qualified as a radio operator under Para 5-1 of this regulation.

a. Shared Frequencies. Both ISR and FRS radios operate on frequencies shared with other users. In the case of ISR, these will be other federal spectrum users; with FRS, it could be almost any member of the general public. When establishing and conducting operations with these radios, operators must be alert and ready to take appropriate action if they encounter other users on the operating channel. Both ISR and FRS are "common use" channels and no user has priority over another. However, to avoid interference, moving to another channel may sometimes be the best course of action. While use of "tone codes" or "privacy codes" will reduce interference, they may not be sufficient, and an organized plan to change frequency if necessary to an alternate is recommended.

b. Monitoring. CAP's communications on these radios may be monitored, either by a federal agency or by the general public. It is important that CAP radio operators using these common resources conduct themselves professionally. Commanders and communications personnel should spot check ISR/FRS use to ensure CAP radio operators are using these radios properly.

9-15. Limited Support for Amateur Radio Training. In CAP units making use of Amateur Radio as a unit training activity, corporate radio equipment which is no longer NTIA compliant, and therefore is no longer authorized for operational missions, may be used on amateur frequencies, with advance permission from National Headquarters requested via wing and region headquarters. Equipment used for this purpose shall have all CAP frequencies and/or frequency determining elements removed. At no time shall Amateur Radio frequencies be used in conduct of Civil Air Patrol business or missions, IAW para 11-2. Operation on amateur radio frequencies requires an FCC-issued amateur radio license.

CHAPTER 10 – CAP FREQUENCY SPECIFICATIONS

10-1. Technical Requirements. The following technical requirements apply to all CAP frequency assignments:

a. NTIA Compliance. All radio equipment utilized by CAP on DoD-allocated spectrum must be compliant with NTIA requirements as listed in the current edition of the Manual of Regulations & Procedures for Federal Radio Frequency Management (“Redbook”). Copies of this manual may be downloaded from the NTIA website at: <http://www.ntia.doc.gov/osmhome/redbook/redbook.html>

b. Emission. The following types of emissions are used for CAP radio communications. Authorized emissions are:

- (1) 3K00J3E, single-sideband suppressed carrier (SSB). Upper Sideband (USB) only.
- (2) 11K00F3E, frequency modulation (FM).
- (3) 8K00F1D, P25 Digital voice modulation.

10-2. Standards for Radio Stations. To reduce interference in the overcrowded frequency spectrum and to comply with international agreements and NTIA regulations, CAP communications personnel will make certain that radio stations are on the proper frequency and the emissions meet the prescribed standards for the applicable CAP frequency assignment.

10-3. Frequency Measurement. The assigned carrier frequency of all CAP stations shall be measured by qualified maintenance personnel in accordance with para 1-6 of this regulation.

a. Frequency measurements will be required as follows:

- (1) At any time the station operator has reason to believe the frequency has shifted beyond the tolerance specified.
- (2) After a station has been cited for a frequency violation (either by competent authority or by any CAP station deemed capable of performing accurate frequency measurements).
- (3) When maintenance is performed that could affect frequency accuracy.
- (4) In accordance with other optional wing/region policy.

b. Each frequency measurement should be recorded and filed. Wings and regions may set policy governing such recording and/or filing.

c. Radio transmitters shall be silenced immediately upon determining that the transmitter frequency error exceeds the authorized tolerance. Notations of actions taken to re-establish the transmitter within authorized tolerance will be entered in the station log or kept in the station file. Maintenance actions should be entered in the CEMS maintenance record.

10-4. Transmitter Power. For CAP stations using amplitude modulation (AM) or frequency modulation (FM) emission, the transmitter power authorized will be the mean envelope power. For CAP stations using SSB, the power authorized will be in terms of peak envelope power (PEP). In any event, transmitter power output (TPO) will be limited to the following:

- a.** VHF base, mobile or portable ground stations: 50 Watts
- b.** VHF Repeaters: 100 watts
- c.** Aircraft stations are limited to 10 Watts on VHF FM. The VHF-FM frequency authorizations held by CAP prohibit higher power by airborne stations.
- d.** HF stations (National, region, and wing) shall not exceed the maximum limits of their station authorizations, typically the rated power of the NTIA compliant radio. External amplifiers for HF transmitters must be determined by the NTC to be NTIA compliant.
- e.** Because of international agreements and other legal issues, CAP may need to restrict transmitter power below these limits in certain geographical areas, including in the vicinity of the international borders. Restrictions will be announced to directors of communications in the CAP-DC listserv and compiled in the secure NTC website. Operators entering those areas should make themselves aware of any restrictions in effect.

CHAPTER 11 –INTERAGENCY OPERATIONS

11-1. General. Many federal and local agencies have installed radio systems to meet their day-to-day or emergency needs. These systems range from simple VHF/UHF repeater systems designed for local operation to HF voice/data systems designed for transcontinental use. CAP has memorandums of understanding (MOU) with a number of these agencies on file at National Headquarters.

11-2. Use of Amateur Radio Service by CAP. CAP members acting in any CAP capacity may not use amateur radio frequencies on behalf of CAP.

a. When the Civil Air Patrol conducts operational missions for the Air Force, it functions as an “instrumentality of the United States”, IAW CAPR 20-1, para 4. Because CAP uses federal frequencies managed by the NTIA and assigned to the Air Force, CAP is defined as a federal frequency user, regardless of the “customer.” Under federal law and regulation, instrumentalities of the United States and federal frequency users are prohibited from encroaching on civilian frequencies regulated by the Federal Communications Commission, including amateur radio frequencies.

b. FCC rules prohibit conducting the business of any organization on amateur radio frequencies for pecuniary (financial) interest. Because CAP members receive Federal Tort Claims Act (FTCA) insurance and Federal Employee Compensation Act (FECA) insurance, CAP members have pecuniary interest while signed in to Air Force tasked missions and have the status of a federal employee.

c. Where amateur radio “third party” traffic is needed to support a CAP mission, CAP communication managers may seek the support of local amateur radio clubs and organizations. CAP members who are licensed amateur radio operators and who are not acting in any CAP capacity (e.g. not signed into a mission) are not prohibited from exercising their amateur privileges and supporting affiliated amateur organizations using privately owned amateur equipment.

d. Amateur radio frequencies shall not be programmed into corporate radios, including those purchased with local assets, except as provided in para 9-15.

11-3. National Communications System Shared Resources (SHARES) HF Radio Program. The President of the United States issued Executive Order 12472 establishing interoperability objectives for all federal departments and agencies. In response to this order, the National Communications System (an element of the Federal Department of Homeland Security) established a program to identify federal HF radio assets and develop procedures to enable these resources to be used to pass National Security Emergency Preparedness (NSEP) message traffic (See NCS Directive 3-3). CAP was a major participant in the development and fielding of this program. CAP HF stations will pass SHARES message traffic on a non-interference basis with CAP traffic.

a. Concept of Operations. Federal entities rely on the public telephone system to conduct the government's day-to-day business. In emergency situations requiring coordinated federal response, the telephone system is expected to experience disruption and traffic congestion. Contingency communications must be available in such circumstances. Entities participating in the SHARES program have agreed to use their existing HF radio systems to pass emergency traffic for other agencies on a non-interference basis with their own missions.

b. Procedures for Use. CAP stations will normally be contacted on their assigned frequencies by federal agencies and asked to pass SHARES traffic. Since it is impractical to provide federal agencies with a list of all CAP stations, they will normally call us as follows - "ANY CAP STATION THIS IS (THEIR CALL SIGN) WITH SHARES TRAFFIC." Unless the CAP stations on frequency are handling PRIORITY or higher precedence traffic, they will be expected to take and make every effort to pass the SHARES traffic. In most cases, the traffic will be addressed to distant states and require multiple relays through the CAP network to get to the addressee. CAP stations are authorized to use any CAP frequency assigned to any region to pass this traffic. CAP stations are also authorized to access specified frequencies of participating federal agencies to pass this traffic if it cannot be passed on CAP's frequencies. Each region and wing DC has been furnished with a directory listing these federal frequencies and will distribute them as appropriate. The Federal Government has identified this information as "FOR OFFICIAL USE ONLY" and release to non-CAP personnel may only be authorized by the NTC.

c. Message Forms. All participating agencies have agreed to utilize the standard message form in passing SHARES traffic. This form may be reproduced locally, but not modified. Operators will relay message traffic exactly as received; do not change any part of the message. Operators may add clarifying routing instructions to the heading of a message, and, if necessary, operator notes to the end of a message.

d. Tests and Exercises. The federal frequencies used to support SHARES are also used daily by federal agencies to support essential government operations. CAP stations are not authorized on these frequencies to conduct radio checks. All CAP participation in SHARES tests and exercises will be coordinated, in advance, by the NTC.

e. Participation Requirements. CAP radio stations that are also designated SHARES stations must participate in at least one exercise or actual disaster in each calendar year. CAP-SHARES stations who do not meet this minimum requirement may lose their authorization to participate in SHARES.

11-4. FEMA National Emergency Communications Network (NECN). This net is designed to provide backup command and control communications to support the National Response Plan. It provides links directly to on-scene FEMA disaster response/control elements. All CAP stations are eligible to participate, however CAP participation in exercises may be restricted. Stations participating in NECN exercises will be pre-coordinated for each exercise by the NTC with FEMA.

11-5. CAP Participation in Government Agencies' Communications Programs. CAP stations operating on non-CAP frequencies must have written authorization from the licensed agency. A copy of the FCC license or the federal authorization must also be obtained. The letter (copy or original) and radio information are combined with a SFAF and sent to the NTC. (The original letter may be kept on file at the wing level.) CAP use of government agencies' frequencies is limited to liaison communications for coordination between the two organizations. Non-CAP assigned frequencies will not be used to satisfy internal CAP-to-CAP communications requirements.

11-6. Liaison Radios. Liaison radios are legal to be used in other radio services outside of CAP and are maintained in inventory for that purpose. A small number of these radios, as determined by operational requirements, may be used for communication with other departments and agencies. Such operations shall be used only on authorized frequencies to conduct official CAP business during Joint Operations, in accordance with a CAP and CAP-USAF approved Memorandum of Understanding.

11-7. CAP Support to Other Agencies. IAW para 5-6c, Department of Defense, Department of Homeland Security, or other authorized stations may appear on CAP frequencies and request support. The following is an example of a typical call from a DOD station, “Any CAP station, this is Rifle, over.” CAP stations should offer any assistance they can to these DOD stations, including phone patches or relaying messages.

CHAPTER 12 - NARROWBAND TRANSITION

12-1. Background. Since 1998, Civil Air Patrol has been on track to replace its VHF-FM Communications system. In mid-2008, the CAP national leadership determined that it is time to move ahead with the final phase of the transition to full compliance with federal standards in CAPs VHF-FM system. This chapter governs this final phase of the transition, beginning in the fall of 2008 and concluding with the final termination of use of wideband VHF-FM by the Civil Air Patrol. Portions of this chapter may be incorporated in other chapters of this regulation, following completion of the transition.

a. CAP is making the transition to a system which is principally corporate owned and centrally managed. Funding received from the Air Force to support the transition to NTIA compliance has made this possible. The Air Force agreed to fund the transition, which had the effect of replacing a decentralized Communications system that had been "built on the backs of members" because it largely relied on member-owned equipment. "Interoperability" has been a major goal in Emergency Services since 9-11 and Hurricane Katrina. Visionaries in the CAP Communications system saw over a decade ago that full compliance with federal standards set by the National Telecommunications and Information Administration (NTIA) would serve CAP well by providing full interoperability with other federal users.

b. After completion of the transition, CAP will have more frequencies to conduct missions, including two sets of replacement repeater frequencies and a third frequency pair for airborne and ground temporary repeater use. CAP will also have more simplex frequencies which are entirely separate from repeater frequencies. This will provide more flexibility and less congestion of mission radio channels. The result is a more effective and scalable system, in keeping with the NIMS/ICS program standards.

c. The Johnson base, mobile, and handheld radios that are already in service in the wings are part of this transition. The repeaters CAP is replacing in 2008-2009 will allow CAP and its federal "customers" to make maximum use of the capabilities of these radios.

12-2. Fundamental Requirements and Assumptions Used in Planning the Transition.

a. The decision to move toward compliance with NTIA standards was coordinated and approved by the National Board, National Executive Committee and by Command. It is fully endorsed by Operations.

b. Over \$30 million in Air Force funding was provided to CAP because the compliance with NTIA standards would remove much of the inventory of CAP VHF-FM radios from service, including a large number of member-owned radios. USAF funding was approved to replace these radios with a CAP-owned infrastructure designed to accomplish missions required of CAP by the Air Force.

c. The Air Force funded communications system now needs a significantly higher level of standardization than was appropriate or possible when the communications infrastructure was largely member owned. The result will be greater flexibility, greater intra-operability, an increase in mission effectiveness, and less expense to members.

d. The transition needs to have as minimal an impact as possible on operational missions.

e. The transition will begin with reprogramming of many corporate VHF-FM radios IAW this chapter, followed by replacement or reconfiguration of all repeaters in the CAP inventory, and a final reprogramming of every VHF-FM radio, corporate or member owned, to remove former wideband frequencies no longer authorized to CAP.

f. Effective with the date of narrowband transition in any given area, former wideband uses of packet radio and Single Frame TV (SFTV) shall cease because the only permissible emissions on the narrowband frequencies are voice.

12-3. Endorsement Letter. Before repeaters are shipped to a wing, the wing commander shall sign and return an endorsement letter from the CAP National Commander, dated 20 August 2008 with the subject Repeater Endorsement Letter: Requirements for Accepting Next Generation Repeaters. By signing this endorsement letter, commanders commit the wing to:

- a. Strictly prevent interconnection of outside equipment to the repeaters.
- b. Not permit reprogramming of repeaters.
- c. Not allow physical reconfiguration of repeaters.
- d. Liability for damage from unauthorized technicians or unauthorized modifications.
- e. Submit photos of completed installations.

Variances from these requirements may be requested IAW para 12-10.

12-4. Planning and Budgeting. Before repeaters are shipped to a wing, the director of communications, with concurrence of the wing commander, shall submit an updated transition plan and requested budget, in accordance with guidance provided by the Communications Team Leader, as coordinated with the national volunteer and headquarters staff. Upon receipt of the plan submissions, the staff may accept the plan or return it for more detail or modification. Budgets may be prioritized based on available funding.

12-5. Standardized Interim Channelization and Programming Plan. In order to provide full intra-operability during the transition, both within wing boundaries and across wing and region lines, radios assigned to Emergency Services functions must be programmed in accordance with a standardized plan to place the same channelization and button configurations in radios used for operational missions. Channelization plans for Johnson base, mobile and handheld; Technisonic and NAT radios are available for directors of communication only to download on the NTC website.

- a. This standardization is required for three reasons:

(1) **Internal.** Except for our smallest wings, repeater replacement may be spread out over several days or weeks. During the wing transition, the wing must still have radios ready for missions in all areas, including those that are using the new narrowband frequencies and those still using the old wideband frequencies.

(2) **Interoperability.** The national transition may last almost a year. During this time, a major mission may arise requiring support from units in other wings and regions. Arriving units (particularly aircraft and ground team vehicles) must have radios "ready to go" upon arrival. Delays that would result from impromptu radio reprogramming are unacceptable.

(3) Air Force. The \$30 million in taxpayer dollars CAP has received from the Air Force for VHF equipment is predicated on our being able to offer them a coordinated and integrated communication system. This will be true after completion of our transition, but is equally true during the process. Smooth coordination and effective completion of the narrow-band transition will demonstrate CAP's capability to execute future USAF-funded communications system upgrades.

b. During the transition, CAP radios shall be reprogrammed based on the following priorities:

(1) Must. Radios in operational aircraft, first response ground team vehicles and key radios used in mission operations, such as net control stations and GTM handhelds, must be reprogrammed with the official Interim Channelization and Programming Plan. All radios eligible for deployment with members to other wings for major missions must carry the Interim plan. Radios in areas that have not been reprogrammed where the repeater is operating on the new frequencies must be completely removed from service.

(2) Should. Remaining radios assigned to Mission Critical functions (IAW the Table of Allowances) should be reprogrammed to the Interim plan, because they are defined as a critical need for operational missions.

(3) May. Selected Mission Essential radios (IAW the Table of Allowances) may be temporarily reassigned to serve "side-by-side" with Mission Critical radios in the SHOULD category, with one radio on the old and one radio on the new frequencies.

c. National Headquarters and the NTC may also require or facilitate firmware upgrades and/or feature upgrades, in order to add to standardization and intra-operability.

d. Channels not reserved in the National Channelization and Programming plan may be used for local programming, in accordance with wing communications plans, IAW para 2-4 and 2-5. Interagency frequencies shall be programmed into corporate radios ONLY when CAP is authorized to use the frequency IAW para 11-5.

12-6. Disposal of "Old" Repeaters. All repeaters must be disposed of in accordance with CAP-USAF instructions. Coordination procedures for obtaining instructions are contained in CAPR 67-1, paragraph 2-25, or successor property management regulation. When requesting disposal instructions, clearly indicate whether or not you are aware of a recipient organization that would like to receive the repeater. CAP-USAF/LG and CAP NHQ/LG will work together to determine whether the organization can receive the equipment in accordance with DOD Manual 4160.21M and will coordinate the transfer to other recipients through DRMO channels. When requesting disposal instructions from the CAP-USAF State Director send an additional copy of the request to: lg@capnhq.gov.

12-7. Altitude Restrictions. In accordance with para 7-16, altitude restrictions may apply on some or all narrowband VHF-FM frequencies.

12-8. Air Force Mission Status. When wing budgets are approved, granted funds will be managed through the CAP Web Mission Information Reporting System (WMIRS) and the funded transition tasks will be granted Air Force mission status. Missions and sorties will be assigned and managed in a similar manner to other CAP operational missions. Details of this will be provided to the wing after its plan with budget is approved.

12-9. Use of Narrowband Versus Wideband Frequencies. Because frequency authorizations for base, mobile and handheld radios are fleet licensed based on the repeater Standard Frequency Action Format (SFAF) documents, use of narrowband frequencies shall not begin in any given geographic area before the fixed repeater serving that area has begun operating on narrowband frequencies, except as provided below. Furthermore, existing Quantar repeaters capable of narrowband operation shall not be reprogrammed to narrowband operation unless they also have digital and encryption capability, except if approved in advance by the NTC.

a. Tactical Repeaters. Narrowband repeater frequencies may be used with Tactical repeaters, regardless of whether any fixed repeaters have been placed in service in the wing.

b. Overlapping Repeaters. In locations where multiple CAP repeaters overlap, with one on narrowband and one on wideband frequencies, operators will make a “good faith” effort to comply with the intent of this paragraph.

c. Inter-operability. During the transition, radios which are relocated from their home base for operations in other areas shall use the frequency assignments in use in those geographic areas, IAW 12-9 above.

d. Deadlines. Wings should plan to complete their transitions and discontinue use of wideband frequencies not later than 30 September 2009. After this date, wings should not expect national funding to assist in the transition. Civil Air Patrol has no authorization to operate in wideband mode at any location after 31 December 2009. In addition, National Headquarters may direct wings to terminate all use of wideband repeater and simplex frequencies at any time, if required by supervising federal frequency management agencies, regardless of whether local narrowband repeaters are in service.

12-10.Special Permissions. Requests for variances to the requirements of this chapter, as well as requests to release FOUO information to individuals outside CAP who have a need to know, must be submitted by the wing DC with the wing commander’s written approval to proceed to commpermissions@capnhq.gov, per the guidance specified below:

a. Interconnection with equipment outside the repeater as supplied. Except for standard power, antenna and grounding connections, proposals to connect repeaters to other equipment shall be approved by National Headquarters prior to implementation.

(1) Following written coordination with the wing and region commanders, the director of communications shall e-mail the proposal and confirmation of the wing and region commanders’ approval to: commpermissions@capnhq.gov.

(2) The proposal should include justification of need, identification of the hardware proposed for connection, and connection technique.

(3) Currently approved connections of existing repeaters with outside equipment will expire upon installation of narrowband repeaters. Wings must reapply to continue the variation. This also applies when older, upgradable repeaters are converted to narrowband mode.

b. Reprogramming of repeaters. Proposals to reprogram repeater frequencies, access tones, or other programmable functions shall be approved by National Headquarters prior to implementation, except for programming that sets or returns repeater parameters to those authorized by the National Repeater Coordination Group (NRCCG).

(1) Following written coordination with the wing and region commanders, the director of communications shall e-mail the proposal and confirmation of the wing and region commanders' approval to: commpermissions@capnhq.gov.

(2) The proposal should include justification of need for the requested reprogramming.

c. Physical reconfiguration of repeaters. Proposals to permanently remove repeaters from cabinets or otherwise change the configuration in which they are shipped from the NTC shall be approved by National Headquarters prior to implementation. Temporarily disassembling repeaters for transportation does not require permission, as long as they are reassembled in their original configuration.

(1) Following written coordination with the wing and region commanders, the director of communications shall e-mail the proposal and confirmation of the wing and region commanders' approval to: commpermissions@capnhq.gov.

(2) The proposal should include justification of need, including building measurements and/or photographs to document the need, where appropriate.

(3) Currently approved or existing non-standard repeaters configurations will expire upon installation of narrowband repeaters. Wings must reapply to continue the variation. This also applies when older, upgradable repeaters are converted to narrowband mode.

d. Approval for local technicians. Proposals for local technicians to perform maintenance on repeaters other than standard functions shall be approved on a case-by-case basis by National Headquarters prior to any work being done. Standard functions are basic installation including connection of standard power, ground and antenna connections; fabrication of RF and grounding cables; measurement of modulation, forward and reflected power, transmitter frequency and receiver sensitivity; setting squelch and authorized power; and basic "housekeeping" including routine cleaning, tightening connectors, etc.

(1) Following written coordination with the wing and region commanders, the director of communications shall e-mail the proposal and confirmation of the wing and region commanders' approval to: commpermissions@capnhq.gov

(2) The proposal should include justification of specific maintenance functions to be performed and the need. Proposals should document the following information:

(a) Provide Name, CAPID (if applicable), General Radiotelephone Operator's License or industry equivalent certification, and experience/qualifications of the responsible technician (or company information for commercial providers). Be sure to address how often your proposed technician has done such functions (e.g. swapping out cards, repeater duplexer tuning, etc.) in the past.

(b) If the requested approval is for retuning/realigning the repeaters, the following additional items must be included in the request:

1 Test/Alignment Equipment. Identify the professional grade, full feature service monitor plus spectrum analyzer with tracking generator and/or wave analyzer your technician will use. Examples are IFR, Motorola, HP, etc. Hobby grade equipment is not acceptable.

2 Provide make, model and serial number of all test equipment used to retune/realign the repeater, and the owner of test equipment (company information if from a commercial provider). Not required if contracting with a commercial radio shop. Serial number not required if renting certified equipment.

3 Provide documentation of the most recent calibration of the test equipment to an NIST Traceable Standard. For rental equipment or contracted service providers, a statement of the calibration standards is sufficient.

e. Release of FOUO frequencies outside of CAP. Proposals to provide CAP frequencies to repeater site owners/managers, local partner agencies, or other entities outside of CAP shall be approved on a case-by-case basis by CAP-USAF via CAP National Headquarters prior to disclosure.

(1) Following written coordination with the wing and region commanders, the director of communications shall e-mail the proposal and confirmation of the wing and region commanders' approval to: commpermissions@capnhq.gov.

(2) The proposal should include justification of a need to know on the part of the proposed recipient.

(3) Previously approved releases of wideband CAP frequencies to outside entities shall not apply to narrowband frequencies, so wings must reapply for approval to provide such information to outside entities.

(4) When providing such frequency sensitive information, the CAP user shall state in writing that the frequency information is Department of Defense For Official Use Only (FOUO) and must be afforded a reasonable level of control.

ATTACHMENT 1 – LISTING OF STANDARD TONES**Listing of Standard Tones**

Tone Frequency	Tone Code	NAC Code (Hexadecimal)		Tone Frequency	Tone Code	NAC Code (Hexadecimal)
67.0	XZ	\$29E		69.3	WZ	\$2B5
71.9	XA	\$2CF		74.4	WA	\$2E8
77.0	XB	\$302		79.7	WB	\$31D
82.5	YZ	\$339		85.4	YA	\$356
88.5	YB	\$375		91.5	ZZ	\$393
94.8	ZA	\$3B4		97.4	ZB	\$3CE
100.0	1Z	\$3E8		103.5	1A	\$40B
107.2	1B	\$430		110.9	2Z	\$455
114.8	2A	\$47C		118.8	2B	\$4A4
123.0	3Z	\$4CE		127.3	3A	\$4F9
131.8	3B	\$526		136.5	4Z	\$555
141.3	4A	\$585		146.2	4B	\$5B6
151.4	5Z	\$5EA		156.7	5A	\$61F
162.2	5B	\$656		167.9	6Z	\$68F
173.8	6A	\$6CA		179.9	6B	\$707
186.2	7Z	\$746		192.8	7A	\$788
203.5	M1	\$7F3		206.5	8Z	\$811
210.7	M2	\$83B		218.1	M3	\$885
225.7	M4	\$8D1		229.1	9Z	\$8F3
233.6	M5	\$920		241.8	M6	\$972
250.3	M7	\$9C7				



NATIONAL HEADQUARTERS CIVIL AIR PATROL

CHANGE 1

CAP REGULATION 100-1

24 MARCH 2010

Communications – Electronics

COMMUNICATIONS

CAP Regulation 100-1, 28 August 2009, is changed as follows:

Page-Insert Change.

Remove	Insert
<i>21/22</i>	<i>21/22</i>
<i>25/26</i>	<i>25/26</i>
<i>27/28</i>	<i>27/28</i>

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NATIONAL HEADQUARTERS CIVIL AIR PATROL

CHANGE 2

CAP REGULATION 100-1

22 APRIL 2010

Communications – Electronics

COMMUNICATIONS

CAP Regulation 100-1, 28 August 2009, is changed as follows:

Page-Insert Change.

Remove	Insert
1/2	1/2
21/22	21/22

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NATIONAL HEADQUARTERS CIVIL AIR PATROL

CHANGE 3

CAP REGULATION 100-1

22 JULY 2010

Communications – Electronics

COMMUNICATIONS

CAP Regulation 100-1, 28 August 2009, is changed as follows:

Page-Insert Change.

Remove

Insert

23/24

23/24

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