NATIONAL HEADQUARTERS CIVIL AIR PATROL

CAP REGULATION 100-1

12 MAY 2008

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 to the CAP National Technology Center (NTC). **Note: Shaded areas identify new or revised material.**

SUMMARY OF CHANGES.
Changes from a multi-volume set to a stand alone number. Incorporates Interim Policy Letters on Information Security, equipment maintenance, P25 digital operations, ISR, FRS and GMRS. Removed references to packet and the National Digital Radio System (NDRS). Removed references to the old DOK office and replaced with DOS and NTC, as appropriate. Incorporated frequency designators in place of frequencies.

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CHAPTER 1 – GENERAL INFORMATION

1-1. Mission. The mission of the Civil Air Patrol (CAP) Communications Program is to organize and maintain a reliable, nationwide, 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 requiring the highest degree of flexibility.

b. Cadet Programs. Not only a prime training ground for tomorrow's leaders, but also a contributor of today's mission ready assets. Support provided to this function 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. As one of our congressionally-chartered missions, it plays an important part in the overall mission of CAP. Support to this function is primarily administrative in nature.

1-2. Purpose. The primary purpose of CAP communications is to provide commanders with the means for controlling units and activities. In addition, it provides commanders at each echelon the ability to communicate with superior and subordinate commanders.

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. The communications program provides day-to-day support of CAP's administrative functions.

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

1-4. Principles. To be effective in accomplishing its mission, the CAP communications system must follow certain principles. These principles are the characteristics of a good communications system and are, therefore, our guiding criteria for the planning and operation of our communications systems, networks, and facilities. These principles are survivability, reliability, flexibility, maintainability, speed, and security.

a. Survivability. In many instances, CAP goes to work when more routine portions of our social infrastructure are failing or are over-tasked. For this reason, our communications systems must be planned to survive when other communications fail. Emergency power, backup antennas, and standby stations are all good examples of planned survivability.

b. Reliability. This principle has two applications. They are (1) the dependability of a system, i.e., its failure rate; and, (2) the accuracy of the system, i.e., the amount of corruption that occurs to information sent through the system. The reliability of a communications system is derived from its structure, organization, and adherence to standards in operating procedures.

c. Flexibility. This is the ability to meet changing situations and operations with minimum disruption or delay. Flexibility is achieved through good system design, positioning of assets, and personal initiative (the ability to think under pressure).

d. Maintainability. This depends on both the status of the equipment and the readiness of the system operators to perform their duties. Therefore, both regular preventative equipment maintenance and operator training contribute positively to this communications system characteristic.

e. Speed. The quick movement of critical operations traffic and the vast bulk of support traffic is a continual and ever-present challenge. Delays caused by bad operating practices, improper or incorrect training, violations of established procedures, mismanagement, or poor system design must be kept to a minimum.

f. Security. This is the protection resulting from all measures designed to deny unauthorized persons access to sensitive information being transported through our communications system. Security procedures often require the sacrifice of some speed and, occasionally, reliability. But, under emergency conditions, the importance of speed sometimes outweighs the need for security. When the two conflict, serious decisions must be made as to which takes precedence.

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 installation, 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.

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 web site. 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 in 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, *CAP Radio Operator Authorization*. A CAPF 76 is 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).

1-8. Communications with Higher Headquarters. In general, problems and questions are best handled at the lowest echelons. Any problems or questions should be addressed to the next higher headquarters first. Only if no resolution is achieved should higher headquarters be contacted. Intermediate echelons must be kept informed on the resolutions of any problems or questions directed above their headquarters.

1-9. Supplements/Operating Instructions/Waivers. Supplements, operating instructions, or waivers will not be issued to this regulation without **prior** written approval of NHQ CAP/DO.

1-10. 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 Frequencies. Plans, instructions and other documents containing frequencies shall not be released to the general public or made available to unauthorized viewing via the World Wide Web or by any other means. CAP-USAF approval, obtained through NTC, is required for release of frequencies to outside agencies. Within CAP, frequencies may only be released to members who have a need to know, have taken the on-line OPSEC training, and have agreed to protect CAP frequency information. In contingency situations, other national level offices such as the National Operations Center (NOC) may coordinate directly with CAP-USAF; but will advise the NTC as soon as possible.

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:

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.

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 web site 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.

c. Types of Networks. Basically there are six types of unit radio networks to be considered:

(1) National Net

(2) Region Net

(3) Wing Net

(4) Group Net (optional)

(5) Squadron Net

(6) Emergency Net (for bona fide emergencies and emergency training)

d. Network Functions. Networks provide an operations and training capability to staff sections of its headquarters and to the headquarters of each subordinate unit.

e. 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.

f. Net Composition.

(l) 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. In some instances, the number of mobiles desiring to participate may create overcrowded net conditions and reduce network efficiency. Alternate action to such conditions will be the establishment of a separate schedule for mobile stations.

(4) Optimum net efficiency can normally be achieved with as many as 10 stations participating during the same period. As this number increases, network efficiency declines. Units having more than 10 stations to participate in net operations should establish additional net schedules, as required.

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.

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 web site 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 trained in the previous quarter IAW Para 5-1

g. Number of users trained 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-l.

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-l.

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.

4-10. Credit for Prior Accomplishments. Persons having previously completed any or all of the requirements for a particular level should note the date and circumstances on the application for the award. Persons who have already completed an item need not re-accomplish it, but will be given credit for properly documented accomplishments.

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. 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.

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

(1) Calling and answering

(2) Use of call signs

(3) Operating the radio

(4) Basic pro-words

(5) Prohibitions

(6) National communications policies

b. 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:

(1) Location and use of local repeaters

(2) Local operating practices

(3) Special local procedures

(4) Local net schedules

(5) Region, wing, and local policies

c. In the future, a video product may replace Part I of the class. The entire orientation class should nominally take no more than 1 to 2 hours. There is no test. Trainees are certified upon the recommendation of the instructor to the wing or higher director of communications.

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 issues a CAPF 76. See figure 5-1. This authorization must be in the operator's possession when operating CAP radio equipment or when operating on CAP radio frequencies.

5-3. Advanced Communications User Training. More advanced training, referred to as Advanced Communications User Training (ACUT), is required for some members. 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 issued 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

b. Successful completion of CAP Test 119, *Advanced Communications User Training Questionnaire*, which is an open-book test. A passing score of 80%, corrected to 100%, is required.

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 (paras 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. Holders of Obsolete CAPF 76. The old CAPF 76, *Radio Operators Permit*, is obsolete and no longer recognized. It has been superseded by the example shown in figure 5-1.

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.

Figure 5-1. Radio Operator Authorization Card

National Headquarters
Civil Air Patrol
Maxwell AFB AL 36112-6332

RADIO OPERATOR AUTHORIZATION

Name and address of operator:

John Doe
123 Main Street
Montgomery, AL 36112

Card #	Expiration:
AL-00123	**31 Aug 2009**

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.

Signature of Issuing Officer

THIS AUTHORIZATION IS NOT TRANSFERABLE.
It remains the property of HQ CAP and will be returned promptly upon proper written notice.

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. The rules only state that the document must be on file somewhere in the unit. This can include magnetic media, such as floppy disks or hard drives.

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

6-4. Communications Monitoring Program. As part of the CAP self-policing program, a CAP communications monitor program is maintained.

a. Purpose. The CAP communications monitoring program establishes an effective, reliable, self-policing program to ensure the maintenance of high standards, effective techniques, and efficient utilization of all CAP communications operations. This will be accomplished by surveillance of all authorized CAP frequencies in order to detect violations of operating procedures, transmissions of signals beyond permissible frequency tolerances, and faulty or improper emission.

b. Responsibility. This chapter applies to all CAP personnel.

(1) The operation and administration of region and wing monitoring stations are charged to the appropriate region and wing headquarters.

(2) Sanctions for discrepancies reported by region headquarters monitoring stations are the responsibility of the appropriate region commander. Commanders are also responsible for the operations of any station under their command.

(3) Sanctions for discrepancies reported by wing headquarters monitoring stations are the responsibility of the appropriate wing commander.

c. Definitions:

(1) Monitoring Station. A radio station charged with the responsibility of performing random frequency surveillance and reporting of technical and operational violations on CAP frequencies. This could be at the national, region or wing level.

(2) Technical Violations. The improper operation of equipment, such as off frequency operation, improper modulation, and unauthorized emission.

(3) Operational Violations. Unauthorized communications, poor radiotelephone procedure of a grievous nature, or unauthorized subject matter.

(4) Discrepancy Notice. CAPF 33, *Civil Air Patrol Radio Discrepancy Notice*, will be used when such action is required.

d. Region and Wing Monitoring Stations. Each region and wing commander will establish a communications monitoring program as required, depending on the geographical characteristics of the area to be served.

e. Monitor Operations. Region and wing monitoring stations will perform frequency surveillance operations in accordance with this chapter and respective region/wing policy. Special emphasis should be placed on frequency surveillance of the national calling frequencies, AD and AE. (Note: For frequency designator definitions see the Downloads section of the Communications web site at https://ntc.cap.af.mil/comm/downloads.cfm)

(1) Who may submit:

(a) Any member may submit a discrepancy notice on CAPF 33 for radio stations or operators which are in violation of regulations or directives.

(b) All appointed monitoring stations will submit discrepancy notices within a 24-hour period from the time the discrepancy was first noted.

(2) Routing. Discrepancy notices will be completed in four copies by the reporting station. An information copy will be sent to the appropriate monitoring station for all actions initiated by stations other than the monitoring station. Two copies will be submitted for action to the region or wing headquarters as appropriate, and one copy will be retained in the station file for a period of 6 months.

f. Action to be Taken:

(1) By Region/Wing Headquarters. The commander will be provided a copy of all discrepancy notices from national, region, or wing monitor stations. Notices pertaining to region/wing stations will be reviewed for sanctions as appropriate under para 6-4.g. of this chapter. Notices concerning stations other than those assigned to the region/wing will be forwarded to the unit headquarters of the station concerned.

(2) By Violator. The violator will acknowledge the discrepancy notice and return it through their unit commander to the region/wing commander with an explanation and, if necessary, any corrective measures taken.

(3) By Region/Wing Headquarters. Discrepancy notices and violator responses will be reviewed by the appropriate region or wing commander. If the explanation and/or corrective action is deemed adequate, the sanction imposed under para 6-4.g. of this chapter may be withdrawn. One copy of the completed notice will be retained in the radio station permanent file.

g. Sanctions:

(1) Willful Violations. Without excluding other appropriate definitions, violations of rules, regulations, or procedures will be considered willful when committed intentionally rather than unintentionally or accidentally. The appropriate commander will classify a violation of a rule, regulation, or procedure as willful if the evidence is sufficient to convince him/her that the above intent did exist. A CAP member who willfully violates rules, regulations, or procedures while operating a CAP radio station on CAP frequencies will be subject to disciplinary action as deemed appropriate by his/her commander.

(2) Non-willful Violations. In cases of violations not classified as willful by the commander, the following sanctions will be imposed for violations indicated:

(a) Sanction A. For the first violation, the person(s) charged as responsible for the violations(s) will acknowledge the violation notice indicating the cause of the violation, and the steps that have been taken to prevent repetition, within 7 days from receipt of discrepancy notice.

(b) Sanction B. For the second violation, Sanction A plus operator suspension for 15 days.

(c) Cumulative Violations. Upon receipt of a third violation during a 12-month period, the offending operator and/or station will be suspended until the appropriate region or wing commander authorizes reinstatement.

h. Monitor Station Equipment and Frequency Measuring Standards. Region and wing monitor station requirements will be established commensurate with the established monitoring program of the unit.

i. Records of Violations. Records of violations, with action taken, will be filed at region or wing headquarters as appropriate in such a manner as to reflect all violations charged against stations and/or operators.

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 reflect the station number, type, call signs, availability, and current status. To ensure accurate record keeping procedures and adequate control measures over authorized fleet stations, records of such authorizations (in the form of an original application from the stations) will be maintained and filed at region and wing headquarters levels. All files will be maintained in accordance with CAPR 10-2, *Files Maintenance and Records Disposition.*

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 must 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. Repeaters will not be placed into service without approval by the National Repeater Coordination Group. Exceptions to this policy may be granted, in writing, by the NTC to meet emergency mission requirements. Wings will submit all requests for new repeaters or changes and modifications to existing repeaters via the on-line Repeater Application and Review System at the NTC web site. All repeaters placed into service after the transition to narrowband frequencies are required to support Mixed-Mode operations. Repeaters are required to automatically shift between narrowband analog and P25 digital

operations without user intervention. These capabilities shall not be removed from any repeater without prior written authorization from the NTC. All existing repeaters that are not capable of supporting Mixed-Mode operations will be removed from service as soon as reasonably possible, but not later than 31 DEC 2012.

Figure 6-1. Sample 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) *Note: If you have answered YES to either 2a or 2b above, FAA coordination will be required.*			
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.) ☐ VHF FM Base ☐ VHF FM Mobile ☐ HF SSB Base ☐ HF SSB Mobile ☐ VHF AM (Airband)			
7. Operating Radius: a. What is the *service area* or operating radius expressed in kilometers (miles times 1,609)? *Note: This is not the greatest distance you can transmit, but the actual operating radius you will be using.*			
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 will establish and adhere to the following minimum safety standard operating procedures. The purpose of these procedures is to alert all personnel to the potential dangers of electronic equipment. All electronic devices carry certain hazards to which all operators and maintenance personnel are exposed. In spite of excellent training techniques and proficiency, complacency often leads to unsafe practices and procedures. Plastic frame eye glasses, instead of metal, should be used by personnel working on electronic equipment. All wrist watches, bracelets, and rings should be removed from the hands and arms.

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 1-7.

(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 communications equipment not in motion will be adequately grounded at all times. Conductors should be no smaller than a number 10 solid or stranded copper wire. Mobile equipment mounted to the body of the vehicle does not require an external ground, although grounding may improve station operation when practical.

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. Main Power Switches. All personnel having access to the radio station should be familiar with the location of the main power switch and properly instructed in the disconnect procedures.

e. Antenna. The primary power sources should be removed from all transmitters during periods of antenna maintenance. Lightning arrestors or grounding switches should be installed on all antennas. Special safety precautions should be taken when erecting antennas in the vicinity of electric power lines.

f. First Aid. Radio operators, maintenance personnel, and other personnel normally located in the vicinity of the radio station should be familiar with first aid procedures, including treatment for electrical shock and administering artificial respiration and CPR.

g. First Aid Equipment. A first aid kit will be available at all base stations. It may include such additional items as a flashlight, safety rope, direct breathing resuscitation kit, walking cane (non-conductive), and a blanket.

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 were 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. 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.

b. 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.

c. 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.

d. 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.

e. 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.

f. 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.

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. Effective Utilization of Communications Equipment. All AF funded/provided communications equipment will be distributed and utilized IAW the AF Approved Communications Table of Allowances (TA). The TA may be downloaded from the CAP Comm Program web site at: https://ntc.cap.af.mil/security/main.cfm?submenu=communications.

7-8. 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.

7-9. 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.

7-10. 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.

7-11. 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.

7-12. 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.

7-13. Voice Call Signs.

a. Within CAP, each region and 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-Flight" (pronounced "cap-flight") at all times. Member-owned aircraft may also use the CAP-Flight call sign when on Air Force Assigned Missions (AFAM). Wings and regions will use their charter number 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 charter will drop the leading zero, therefore, their CAP-Flight 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 "CPF" is used within the FAA computer system in place of the spoken word "CAP-Flight." For this reason, "CPF_____" will be used in place of the aircraft tail number on flight plans. In the remarks section, the voice identifier "CAP-Flight _____" 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.

7-14. 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.

7-15. Interference Reporting Procedures. The focus should be to resolve interference at the lowest level. Any station affected by recurring interference may begin an investigation 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. 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.

b. 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).

c. 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.

CHAPTER 8 – VHF OPERATION

8-1. General. The CAP communications program makes a major use of VHF (very high frequencies), because VHF normally provides excellent dependable short-range communications. VHF is readily adaptable to ground and air mobile operations. Due to the line-of-sight characteristics of VHF, a major advantage over HF (high frequency) is gained since the frequency can be effectively used by a greater number of stations without mutual interference problems.

a. Simplex operation on repeater input frequencies is authorized (at wing level and coordinated with the NTC) where such operations will not interfere with repeater operations. While simplex operations may be conducted, on a secondary basis to repeater operations, no protection will be provided to simplex users. It is recommended that Continuous Tone Coded Squelch System (CTCSS) tones not be used in this simplex mode. (Note: For frequency designator definitions see the Downloads section of the Communications web site at https://ntc.cap.af.mil/comm/downloads.cfm.)

b. The national standard frequency and tone encode assignment is mandated in corporate radios as follows:

Channel. 1 : V1

Channel. 2 : V2

Channel. 3 : V3

Channel. 4 : V4

This is also recommended for all non-corporate radios to assist in ease of operation.

8-2. Frequency Modulated (FM) Repeater Stations:

a. General. FM repeater stations may be authorized for use in the CAP Communications Program. Use of repeaters, while normally advantageous, can also be a disadvantage by creating unacceptable interference and compatibility problems.

b. 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 approved by the Region Repeater Committee(s) prior to use. All technical standards, as described in this chapter, will be met by any equipment authorized as a tactical repeater system. The CTCSS tone of 203.5 Hz has been reserved as the input tone for tactical repeaters. This tone will not be used as an encode or decode tone on any permanently installed ground-based repeater station.

c. Tone Signaling: All tone signaling, interconnection of devices, or control equipment intended for general membership use, will be accomplished using the standard Dual Tone Multi-Frequency (DTMF) tones found on 12-button keypads. Additional DTMF tones found on the 16-button keypad may be used for supervisory control.

d. Repeater Access:

(1) All installations of VHF-FM voice repeaters will employ CTCSS tone access. Each voice repeater will have, at a minimum, a primary discrete tone, selected from the Electronic Industries Association (EIA) standard CTCSS tone frequencies list (see table 8-1).

(2) Each voice repeater will have a primary discrete tone that is not in use by any other CAP voice repeater operating on the same RF frequency within 200 statute miles (exceptions are at the discretion of the Region Repeater Committee). 100.0 Hz will not be used as a primary discrete tone. No repeater will transmit or retransmit a 100 Hz tone.

(3) The universal access tone of 100.0 Hz will be installed in each voice repeater unless unique circumstances will prevent it. If the 100.0 Hz tone is not installed in a specific voice repeater, a written exception must be requested from the National Repeater Coordination Group chairman through the region headquarters.

(a) It is the duty of each station operator to utilize the correct primary discrete tone for the intended voice repeater. A visiting mobile may use 100.0 Hz, for a short duration, to contact a local station to determine the proper tone to use. Whenever possible the individual member will obtain the proper tones to use before going into another region or wing.

(b) Portable radios of 6 watts or less may use 100.0 Hz for routine operations only if the radio is incapable of using the primary discrete tone. Use of the primary discrete tone is required whenever possible to prevent interference.

(c) Fixed stations, while operating through a voice repeater, are prohibited from using 100.0 Hz.

(d) Use of 100.0 Hz by any radio has the potential to access multiple voice repeaters and cause considerable unnecessary interference. For this reason, any use of 100.0 Hz on voice repeater frequencies is STRONGLY discouraged.

e. Deviation: Transmitters used in the FM Voice Mode (16K00F3E) will not exceed 4 kHz total deviation. (Repeater deviation should be set for no more than 4 kHz. so as to limit interference to the adjacent splinter frequencies.) CTCSS tones should be set for 750 Hz deviation.

f. 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, the repeater transmitter is automatically turned on. A drop-out delay of not less than 1 second or more than 10 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) When 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. Obtaining such frequency assignments is extremely difficult and time consuming process and will be done only in the most pressing cases.

8-3. FM Digital Communications. Project 25 (P25) 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. UTILIZATION: 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 modulation. While specific, controlled portions of these missions may be operated using digital modulation, care must be taken to ensure that no asset, unit, or member is intentionally 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.

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.

8-4. Aircraft Operations. Aircraft operating on CAP VHF-FM will normally use the air-to-ground simplex frequency (V4) for communications with ground stations. If V4 is not usable in a particular area, then simplex operation on the repeater output frequencies ("talkaround") may be used, preferably using repeater output frequencies not being used in the area. Be aware that this operation may cause interference to repeater users in other areas. Due to the potential for interference, repeaters will not be used by aircraft except when communications on the simplex frequencies is not viable. Airborne use of 100.0 Hz on repeater input frequencies is prohibited. Airborne VHF/FM transmissions are limited to a MAXIMUM of 10 watts.

Table 8-1. Listing of Standard Tones

Tone Frequency	Tone Code	NAC Code (Hexadecimal)		Tone Frequency	Tone Code	NAC Code (Hexedecimal)
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				

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 he moved back 1 hour and held at 1200Z.

9-9. Frequency List. Frequencies permanently authorized for the CAP are referenced in table 9-1. The actual frequencies and associated frequency designators can be found on the members-only secure area of the Communications Program web site. 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. Inter-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. 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 have completed BCUT and possess a valid CAPF 76 Radio Operator Authorization.

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 to 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.

Table 9-1. Frequency List

CAP RADIO FREQUENCY ASSIGNMENTS									
Frequency and Emission	notes	**NER**	**MER**	**GLR**	**SER**	**NCR**	**SWR**	**RMR**	**PAC**
AA Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
AB Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
NA, SB Voice USB (3K00J3E)	1,2,3	P			S				
NB, SA Voice USB (3K00J3E)	1,2,3	S			P				
CA Voice USB (3K00J3E)	1,2,3					P			
CB Voice USB (3K00J3E)	1,2,3					S			
MB, PB Voice USB (3K00J3E)	1,2,3	*	S	*	*	*	*	*	S
MA, PA Voice USB (3K00J3E)	1,2,3		P						P
GB, RA Voice USB (3K00J3E)	1,2,3			S				P	
GA, RB Voice USB (3K00J3E)	1,2,3			P				S	
WA Voice USB (3K00J3E)	1,2,3						P		
WB Voice USB (3K00J3E)	1,2,3						S		
AC Voice USB (3K00J3E)	2,3	*	*	*	*	*	*	*	*
AD Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
PC Voice USB (3K00J3E)	1,2,3								*
AE Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
AF Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
AG Voice USB (3K00J3E)	1,2,3	*	*	*	*	*	*	*	*
M121.775 Practice Beacon (6K00A3N)	3	*	*	*	*	*	*	*	*
M122.9 AM Voice (6K00A3E)	3	*	*	*	*	*	*	*	*
M123.1 AM Voice (6K00A3E)	3	*	*	*	*	*	*	*	*
PB Input FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*
PA Input FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*
V1 FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*
V2 FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*
V3 FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*
V4 FM Voice (16K00F3E, 11K00F3E)	3	*	*	*	*	*	*	*	*

NOTES:

1. All SSB emissions will be upper side band (USB).
2. HF frequencies are window (or carrier); the center of the intelligence is 1.5 kHz above the listed frequency.
3. This table reflects the frequency authorizations of the CAP. It is provided for information purposes only and does not constitute authority to operate.
4. Numerous additional HF assignments are being added in preparation for a dedicated Automatic Link Establishing (ALE) HF net in each region. Check with your wing or region DC for details.

CHAPTER 10 – CAP FREQUENCY SPECIFICATIONS

10-1. Frequencies. The following frequencies may be used for CAP VHF-FM:

a. Voice Operations:

(1) V1 Repeater Output and Simplex

(2) V2 Repeater Output and Simplex

(3) V3 Ground Tactical Simplex

(4) V4 Air-to-Ground and Air-to-Air Simplex

Note: These frequency pairings are standardized nationally and will not be altered without the prior coordination through the appropriate region and approval by the NTC.

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) 16K00F3E, frequency modulation (FM).

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. This requires all radio equipment used on CAP assigned frequencies to be in complete compliance with equipment standards specified by the NTIA in the *Manual of Regulations & Procedures for Federal Radio Frequency Management.*

10-3. Frequency Stability. All CAP radio transmitters will have their frequency derived by crystal reference. The current frequency tolerances for CAP radio stations are in table 10-1.

10-4. Frequency Measurement. The assigned carrier frequency of all CAP stations shall be measured by qualified maintenance personnel in accordance with para 1-7 of this regulation.

a. Frequency measurements will be required as follows:

(1) When the transmitter is initially installed.

(2) At any time the frequency determining elements are changed.

(3) At any time the station operator has reason to believe the frequency has shifted beyond the tolerance specified.

(4) 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).

(5) In accordance with wing/region policy.

b. Each frequency measurement should be recorded in the station log. This log entry will be signed by the person making the measurement and will show the deviation above or below the assigned frequency in hertz or percentage of deviation plus or minus the assigned frequency. If a station log is not required, the written statement, listed above, must be kept in the station file.

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

10-5. 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). The power of CAP transmitters shall be no more than the minimum required for satisfactory operation. In any case, output power will be limited to the following:

a. VHF ground stations: 50 Watts

b. Aircraft stations are limited to 10 Watts on VHF FM. While communication is important, flight safety is a higher priority. Operations above 10 watts are prohibited.

c. HF stations (National, region, and wing) are limited to the minimum power required to establish communications, but shall not exceed the following maximum limits:

(1) National, region and wing stations: 1,000 watts

(2) Group and below: 500 watts

d. Tone Signaling: All tone signaling, or control equipment intended for general membership, will be accomplished using standard DTMF tones found on 12-button keypads. Additional tones on the 16-button keypad may be used for supervisory control.

Table 10-1. Frequency Tolerance (Source: NTIA Manual, Table 5.1)

Station Types	Frequency Band	Power	Tolerance	Notes
HF Point-to-Point				
Other than SSB	1605-4,000 kHz	Any Power	10 ppm	
	4-29.7 MHz	Under 500 Watts	20 ppm	k
		Above 500 Watts	10 ppm	
SSB		Any Power	20 Hz	
HF Ground to Air				
Other than SSB	1605-4,000 kHz	Under 200 Watts	20 ppm	
		Above 200 Watts	10 ppm	
	4-29.7 MHz	Under 500 Watts	30 ppm	
		Above 500 Watts	10 ppm	
SSB		Any Power	10 Hz	c
HF Base Station to Ground Mobiles				
Other than SSB	1605-4,000 kHz	Under 200 Watts	20 ppm	
		Above 200 Watts	10 ppm	
	4-29.7 MHz	Under 500 Watts	20 ppm	k
		Above 500 Watts	10 ppm	
SSB		Any Power	20 Hz	
HF Air to Air				
SSB	1605-4,000 kHz	Any Power	20 Hz j	
SSB	4-29.7 MHz	Any Power	20 Hz	
HF Ground Mobiles				
Other than SSB	1605-4,000 kHz	Any Power	50 ppm	
	4-29.7 MHz	Any Power	30 ppm	
SSB		Any Power	20 Hz	
Low Band VHF				
	29.7-100 MHz	Under 10 Watts	20 ppm	
		Above 10 Watts	5 ppm	
High Band VHF and UHF (100-470 MHz) Fixed Station				
	100-406 MHz	Any Power	5 ppm	
	62-174 MHz Narrowband	Any Power	3 ppm	
	406-470 MHz	Under 10 Watts	5 ppm	q
		Above 10 Watts	2.5 ppm	q
High Band VHF and UHF (100-470 MHz) Fixed Station to Air				
			20 ppm	

Station Types	Frequency Band	Power	Tolerance	Notes

Station Types	Frequency Band	Power	Tolerance	Notes
High Band VHF and UHF (100-470 MHz) Airmobile				
	100-156 MHz	Any Power	20 ppm	
	156-174 MHz	Any Power	5 ppm	s
	174-406 MHz	Any Power	20 ppm	
	406-420 MHz	Any Power	5 ppm	s
High Band VHF and UHF (100-470 MHz) Mobile				
	100-162 MHz	Any Power	15 ppm	v
	162-174 MHz	Any Power	5 ppm	n
	162-174 MHz (Narrowband)	Any Power	3 ppm	
	162-174 MHz (Narrowband Mobiles)	Any Power	5 ppm	
	62-174 MHz (Narrowband Portables)	Any Power	2 ppm	
	174-406 MHz	Any Power	15 ppm	v
	406-420 MHz	Any Power	5 ppm	

Footnotes:

c 20 Hz is applicable to other than aeronautical mobile (ROUTE) frequencies.

j The tolerance for aeronautical stations in the aeronautical mobile (ROUTE) service is 10 Hz.

k The indicated tolerance applies to new equipment after 1/1/87. A tolerance of 30 ppm applies to other equipment.

q Transmitter and receiver frequency tolerances: (Source: NTIA Manual Part 5.6)

Fixed Station	M30-50 and M162-174	5 ppm
	M406.1-420	2.5
Mobiles	M30-50, M162-174, and M406.1-420	5 ppm
Portables	M30-50	20 ppm
	M162-174 and M406.1-420	5 ppm

New standards for the new century; transmitter and receiver frequency tolerances will be:

Fixed Station	M138-150.8 (after 1 Jan 2008)	1.5 ppm
	M162-174 (after 1 Jan 2005)	1.5 ppm
	M406.1-420 (after 1 Jan 2008)	0.5 ppm
Mobiles	M138-150.8 (after 1 Jan 2008)	2.5 ppm
	M162-174 (after 1 Jan 2005)	2.5 ppm
	M406.1-420 (after 1 Jan 2008)	2.0 ppm
Portables	M138-150.8 (after 1 Jan 2008)	2.5 ppm
	M162-174 (after 1 Jan 2005)	2.0 ppm
	M406.1-420 (after 1 Jan 2008)	2.5 ppm

r This tolerance is applicable to all transmitters, including survival craft stations, after January 1, 1983.

s Except for the RR Appendix 18 maritime mobile frequencies, where the tolerance is 20 ppm except for transmitters put in service after January 1, 1973, a tolerance of 10 ppm shall apply, and this tolerance shall be applicable to all transmitters after January 1, 1983.

v The indicated tolerance applies to new equipment after January 1, 1987. A tolerance of 20 ppm applies to other equipment.

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, such as American Red Cross, Salvation Army, US Coast Guard Auxiliary, etc., which are on file at National Headquarters. While it is impossible to cover all such systems in this document, an overview will be provided of two of the largest programs.

11-2. Use of Amateur Radio Service by CAP. The use of frequencies in the amateur radio service to conduct CAP business including SAR/DR operations is prohibited by law. CAP members with amateur radio licenses may only use CAP frequencies for CAP operations.

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 to 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 authorized 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. CAP Support to DOD. Instructions to DOD elements explaining how to contact CAP HF stations exist in several formal DOD plans. As DOD uses many different call signs, it is impossible to list those that may attempt to contact a CAP station or even where they may be located. The following is an example of a typical call from a DOD station: "Any Alabama CAP station, Any Alabama CAP station this is Rifle, over". CAP stations should offer any assistance they can to these DOD stations, including phone patches or relaying messages.