

Arizona RACES Southern Region Home Unit Communications Plan

Concept

This communications plan provides the basis for Home Unit (HU) communications throughout the Arizona Southern Region comprised of Cochise, Pima, Santa Cruz, and Yuma counties. Within this region, county Emergency Operations Centers (EOCs) cannot communicate directly with officials and citizens groups in all locations because of its expanse, terrain and equipment incompatibility. The use of amateur radio repeaters add greatly to area coverage but cannot assure county wide communications, are not compatible with radios employed by other organizations, and become less reliable during power outages. Repeaters are also limited in number and need to be reserved for traffic that can only be facilitated by them. HU stations are organized by zip code to match area of responsibility with population density. A current list of HU stations, locations, zip codes and adjacent serviced zip codes are contained in Table I.

With the organization of HU stations a reliable means of EOC-to-community communications is established by operating primarily on HF for long distance and VHF simplex for local traffic. Both radios will be capable of backup power. This makes HU communications self contained and independent of the power grid and all auxiliary equipment. The HU VHF capability can also be used to form a relay in the event that ionospheric or atmospheric conditions render HF frequencies unreliable. VHF repeaters can also be used for HU operations, however, in a secondary role to reduce dependency. Bridging communications from the RACES amateur radio network to local citizens groups are accomplished by one of three methods:

- 1) Attaching an HT or mobile equipped ham (RACES or Non RACES volunteer) to the served organization.
- 2) Equipping the HU station with a radio compatible with the organization.
- 3) Local courier.

This network can also provide backup communications for first responders.

Additionally, in a wide area emergency or disaster the county EOC radio operator(s) and equipment may be saturated by the large quantity of communications. The HU can help alleviate this load by keeping track of the local community status details, consolidate information or “picture build” prior to forwarding traffic, and/or filter local messages for only those that require EOC attention. HUs in close proximity can also provide relief for the EOC by “answering the phone” when the operator is absent. The intent of the HU is fourfold:

- 1) Provide a reliable means of communication from the community to the state/county EOCs.
- 2) Provide a gateway between local organizations employing non compatible radios and the RACES amateur radio network.
- 3) Optimize the traffic load to the EOC.

- 4) Provide relief for the EOC operator(s).

HF Plan

HF will be the primary band for HU operations even for those stations within VHF range of its served EOC. This minimizes the number of frequencies the EOC has to monitor and allows nearby HUs to assist in handling an EOC communications overload for the frequency bands (HF/VHF/UHF) that it possesses. The HF bands used are primarily 80 and 40 meters with Near Vertical Incidence Skywave (NVIS) antennas. 160 Meters is used in a secondary capacity but its capability is highly encouraged because it may be the only band supporting NVIS propagation during nighttime.

The frequencies used are contained in Table II and conform to the subbands sanctioned by the FCC for RACES. Switchover times are predicated upon time of day, month, and sun spot cycle but generally conform to the formula: Switch 80M to 40M 3 hours after sunrise and switch back from 40M to 80M 1 hour before sunset. This formula may not be valid during periods of very high or low sunspot activity. Exact times for the current month will be disseminated via the Home Unit e-mail reflector, posted on the Pima County RACES web site, and announced on the Arizona Southern Region net.

The Arizona Southern Region net meets every Saturday at 0715 AM MST. This is a directed net for the purpose of training, emergency communications, and exchange of information. During a disaster or wide area emergency, the net can be activated as a tactical net by any EOC or HU station. The net control station (NCS) precedence is as follows:

- 1) EOC tasked with communications control for the emergency.
- 2) Pima County EOC
- 3) Any EOC
- 4) Any alternate EOC
- 5) Any HU tasked by the controlling EOC
- 6) First HU on the air.

VHF Plan

All HU stations will monitor the simplex National Calling Frequency (NCF) of 146.52 to the maximum extent possible. This common frequency will be used for initial contact between EOCs, HUs, or any other participating amateur stations. It can also facilitate the establishment of a communications relay in the event that regional HF communications become unreliable. The formal Arizona Southern Region net will be conducted over HF and will not normally be conducted on this frequency. HU stations will simply announce when they are monitoring or leaving the NCF so that stations waiting to make contact will be aware of their presence.

Once contact is established, HU stations will QSY to alternate working frequencies to conduct the traffic. These alternate working frequencies are published in Table II and are assigned by zip code to provide segregation from communications in adjacent areas. When local or relay communications are complete, stations will return to monitoring the NCF. Stations will refrain from passing traffic on the NCF.

HU stations may elect to conduct local operations on local repeaters or other simplex frequencies after notifying their respective EOC of their intent. This procedure provides a predictable means to re-establish immediate contact with the HU if it becomes necessary. If a local repeater is used, be cognizant that its backup power source may be limited or intermittent. If a repeater becomes inoperative, consider using the technique of operating simplex on the output side of the repeater so that it is apparent when/if the repeater returns to normal operation.

Some EOCs may require HU stations to monitor local RACES repeaters in addition to monitoring the NCF. If this is a requirement, consider the following options in order:

- 1) A separate transceiver/antenna for the NCF and RACES repeater.
- 2) Dual watch on 2M or 2M/440 if the rig and RACES repeaters are compatible.
- 3) Scanning the simplex NCF and RACES repeater(s).

Hours of Operation

Home Units are single operator stations that will require relief from continuous duty operations. Many factors will govern the HU schedule depending on disaster proximity, disaster timeline, and personal/family needs of the operator. Remember that the operators personal needs always come before communications. Phases of operation may include activation, emergency operations, sustained operations, and low activity periods.

Activation Phase

RACES stations must be activated by the government agency responsible for their organization and therefore self activation is not permitted. However, given an obvious catastrophic event or combination of lesser occurrences such as simultaneous loss of both power and phone services, HU operators should gain situational awareness by activating the Southern Arizona Regional net on the appropriate HF frequency. To assist with this, HUs should also monitor/scan the NCF, local RACES frequencies and/or first responder channels, as well as monitor local news broadcasts. If RACES HU stations are formally activated, they will be notified by a cognizant official via amateur frequencies.

Emergency Phase

At the onset of an emergency, the HU station may require high activity or longer duty periods depending on the stations relative proximity and importance to the disaster. Emergency operations may also dictate irregular hours. EOCs should anticipate HU operators' personal needs and allow a correspondingly longer non duty period following

unusual or odd operating hours. HU operators should help keep both EOCs and served agencies apprised of their personal requirements so that a proper balance of on/off periods can be achieved. If two operators exist within the same zip code then duty periods should be alternated to provide optimal coverage. HU operators in adjacent zip codes should also be utilized.

At the bottom of each hour the NCS will issue an HF roll call to inventory the current list of active stations. Each HU will respond in order. During this phase HU stations should announce their presence on the NCF at the top of each hour (“This is RACES HU station AB7AA monitoring the National Calling Frequency, 146.52”) and again when leaving at 10 minutes past the hour (“This is RACES HU station AB7AA clearing the NCF”). This facilitates an alternate means of contact by the EOC in charge or relay from another HU. It also allows non-RACES amateurs wanting to assist in the emergency an opportunity to join the network. Copying HU stations can then direct this station to the proper HU based on compatible zip codes. They can also inform the non-RACES station of the HU operators schedule if presently not on frequency. These additional stations can help assess the community status and also serve as communications relays between local Citizen Corp groups or other agencies.

Sustained Phase

After the initial stages of a disaster, the sustained or relief phase will be governed by the schedule contained in Figure I. This schedule provides system wide coverage from 8 AM to 8 PM. The nighttime hours of 8 PM until 8 AM are reserved for operator rest, power regeneration, and meeting home needs. The daytime schedule is broken down into 4, 3 hour periods and are designated even or odd. Even zip codes will operate during the even periods and vice versa. If communications are required during an operators daytime off period it can be serviced by an operator in an adjacent zip code. If two or more operators exist within the same zip code they can divide the duty periods amongst themselves. All EOCs, adjacent HUs, and local community stations should be notified of an HUs intended duty periods to set a predictable pattern for contact reestablishment. Staggered duty periods allow operators daytime hours to replenish resources as well as service personal and family needs. If the monotony of monitoring noisy HF frequencies becomes too great, then as a minimum, have the volume turned up for the 10 minute period of 30-40 minutes past each hour to answer roll call. During this phase HU stations should continue announcing their presence on VHF at the top of each hour to facilitate HU network contact or gain new non-RACES stations.

Low Activity Phase

Areas or periods of inactivity may allow HU stations to enter low activity phase. This mode gives the station a chance to further conserve resources if his participation is presently not required but still permits stations to call during predictable time segments. It is a self initiated phase based on the individual operators assessment of his/her value to the operation balanced with resource conservation and personal needs. In the low activity mode the HU station will continue to observe the even/odd schedule but only turn on

equipment during the periods depicted in Figure II. At the top of the hour, the HU station will announce his presence and monitor the VHF NCF for ten minutes. At the bottom of each hour he will announce his presence and monitor the appropriate HF frequency for ten minutes. Stations desiring to make contact or pass traffic can do so during these windows. No transmissions on HF are necessary unless specifically called. If reserve power is sufficient, then the HU can continuously monitor/scan VHF frequencies so that he can be immediately summoned by an adjacent HU or repeater.