General Mobile Communications Unit (MCU) Mission Procedures

MISSION PREPARATION

Individual mission preparation starts before you receive the page-out, phone call or radio alert. It should include preparation of your deployment kit containing necessary personal medications and necessary clothing for the prevailing weather conditions. A sample list of items for your 8-hr or 24-hr kit can be found in the RACES member manual. Although we try to keep the MCU stocked with bottled water and a few Army surplus Meals-Ready-To-Eat (MRE) or Heater Meals, it doesn't hurt to have some water and snacks to cover the first 6-8 hours of a deployment. Replacement MRE's may be purchased at the MI Store on Fry Blvd in Sierra Vista. Replacement Heater-Meals may be purchased on line at www.heatermeals.com. Search and Rescue (SAR) team members are instructed to be self sufficient for 24 hours. RACES members should meet that same standard. Extended missions will usually provide for some basic meals and water but sometimes it takes some time to get everything up and running for. If you do not have anything handy when called out, pick up a couple bottles of water and/or snacks at the first convenience store or gas station on the way out of town. A sleeping bag or blanket is also a nice thing to have handy on a mission. I have been able to use one many times, even if it was only for a short power-nap. We generally will try to schedule shift relief after 4-6 hours into a mission, but that is not always possible.

MCU Pre-Deployment Checks

Before you jump in and start down the road, there are a number of things that should be checked. Vehicle fluid levels (engine & generator) should be verified while you are still on relatively level ground at the vehicle storage point. If you wait to check the generator until you are on the scene, it may be too late to fill or you may not be able to check the fluids while the vehicle is level.

INCIDENT COMMAND SYSTEM

Most missions will be performed under the Incident Command System (ICS) for operational control. We will generally be co-located with the command post of the mission and perform communications functions for the Incident Commander (IC). Upon arrival to the mission location, your first task is to determine who the IC is and where he/she wants us to set up and receive a mission briefing. Your second task is to park the MCU where designated and get it operational. Your third task is to be sure all of our team members understand the mission support requirements as well.

PERSONNEL ACCOUNTABILITY

It is critical that all personnel sign in upon arrival at the mission location. It is just as important that everyone sign out upon departure. This will help us ensure that everyone is accounted for when the mission is complete and that no one is left behind. This sign-in sheet also ensures that you are covered for AZ Workmen's Compensation insurance if you become sick or injured anytime during the mission.

LOCATION

The IC will usually designate the location where the MCU will be parked. It will usually be co-located with the Command Post and physically separated from the staging area. If the MCU driver is aware of specific communications problems associated with the chosen location, such as no radio path to known repeater sites, please bring this problem to the attention of the IC and make a recommendation for a better location. The IC may or may not be able to accommodate the recommendation. Remember, ultimately the IC is responsible for the mission and it is our responsibility to aid him or her as best we can. Do not put yourself in a position that we appear to be argumentative or less than totally cooperative. The IC has a lot on his/her mind getting the mission underway and doesn't have time for prolonged discussion. Make the recommendation politely, and then accept the IC's direction. I recommend logging any mission directions/instructions in the Unit Log for use later in the After Action Report.

POWER

POWER DISTRIBUTION

There are three modes of operating: Battery power, Generator Power, and Shore (Commercial) Power. Most often we will be on Generator.

GENERATOR OPERATION

There is one 7.5 KW Onan diesel generator located on the curb side of the van body. Be sure all the switches on the large power distribution panel (located on the curb side in the shelter) are turned off before starting the generator. Also before turning it on, check wind direction to ensure that exhaust fumes will not blow back into the van. We

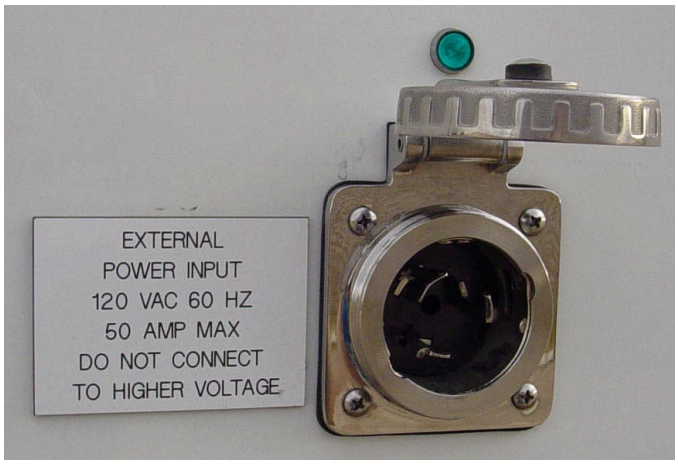
do have a Carbon Monoxide warning device in to the van to assist in protecting staff. Check the generator oil and coolant levels. Press the Red START rocker switch until the generator turns over. The Preheat light may flash initially for a few seconds, especially during cold weather, but the generator should start almost immediately. Allow the generator to run approximately 3-5 minutes to stabilize at 60 Hz. During very cold weather, it may take a little longer to stabilize. If, for any reason the generator starting batteries are too weak to start the generator, you may temporarily press and hold the "BATTERY PARALLEL" button long enough to parallel with the main vehicle battery to start the generator. At this point you can now switch the "Power Select" switch to generator and turn on the Main

AC Breaker and others as needed for operation.

SHUT DOWN

To shut down, reverse the procedure. Turn off all radios, turn off the all the breaker switches, Main Breaker, and then the Power Select switch to the Off position. Then turn off generator by pressing the red rocker switch down until the generator stops.

SHORE POWER



Conditions permitting, the van has an external power cord that allows it to be plugged into AC commercial power. On the Main Power Control panel, you must select the Shore Power position vice the generator position. When connecting the Shore Power cable to the van, always connect the van side of the cable first, then to the shore power source. Disconnect in the reverse order, Shore Power source first, then the van. The power cable is stored in the bottom of the Antenna Storage Locker, accessible from outside the van. It has a 30 amp RV style plug with a 20 amp adapter if necessary to plug into a standard plug. Just be aware that using lower than 30 amps restricts the ability to use things like the wall heater, microwave, or air conditioner etc at the same time.

BATTERY POWER

There are two deep cycle RV type operations battery that may be used for short missions. If they are fully charged, they will generally support 2-3 hours of operations. Unfortunately, lights have been left on in the past and drained down the operations battery and it only had enough charge from the drive out to last for an hour or so. This battery can be charged while driving or from the generator. The charger switch should be on whenever operating off the generator. All the mission radios except the ACU stack run off the van batteries. This is main reason the charger should always be turned on when the generator is on or shore power is plugged in. The ACU radios are provided DC by the 50 amp Astron power supply at the bottom of the ACU stack.

RADIO PROCEDURES

TACTICAL (Public Service) COMMUNICATIONS

Amateur operators or SAR team members are authorized under the county FCC radio license to use the Sheriff Department Public Service Band radios. While enroute to the mission the Van call sign is “**MCU**”. If dispatch wants to know who is driving, give the dispatch your RACES Card number, for example, "RACES Operator 123". Once in place, the van is usually designated as “**Command**”. People or teams may also call in

to the "**Command Post**" or **"Search Command**". If the Incident or Search Commander (IC) wants to designate the MCU another call sign during operations, use whatever call sign he/she designates. Search teams will usually be designated as "**Rescue One**", "**Ground Team One**", "**Horse Team One**", etc. It is a good idea to write down on one of the white boards the team names, who is in each team, and the last time you had contact and/or attempted contact with them. If it is necessary to operate on the Arizona Department of Emergency Management (ADEM) Channel (142.800 MHz), our ADEM assigned call sign for the MCU is "**HORNED TOAD**". The county EOC callsign is **"FIVE ONE CHARLIE HOTEL".** See the ADEM Manual for additional information.

AMATEUR COMMUNICATIONS

Only licensed amateurs are authorized to use the amateur equipment in the van on amateur frequencies without an amateur control operator present. The privileges used on the amateur bands are consistent with the privileges of the highest license class present as a control operator. This is particularly important on the HF band. We are also encouraged to use tactical call signs named according to your assignment, but please remember to still use your amateur call on amateur bands in accordance with standard FCC regulations (after a completed call or every ten minutes, whichever period is shorter). Of course non hams can talk on the amateur radio as long as a ham operator is present as the "control" operator.

MARS OPERATIONS

Operations on MARS frequencies are governed by Department of Defense regulations. You must be a licensed MARS operator to operate on the MARS frequencies or have a MARS control operator present. The MARS callsign used is AAT9CAI and is issued to the Cochise Amateur Radio Association as a club callsign. Manuals for MARS operations are also available in the MCU.

LEVELING JACK SYSTEM

The HWH hydraulic leveling system is designed to stabilize the vehicle before raising the pneumatic mast or the TracStar Satellite dish. The controls are located in the same compartment as the I/O Panel on the street side of the shelter. First, try to get the vehicle as level as possible before you lower the jacks. Be sure the "parking brake" is applied. Then activate the vehicle stabilization jacks to the "down" position and the van nearly level. There are leveling bubbles on the I/O – Jack panel to aid you in this procedure. The jacks will stabilize the vehicle from moving and provide a stable platform. Just remember, the direction of the arrows indicates the direction the truck moves. For example, Up Arrows means the truck moves up, Down arrows means the truck is moving down.

PNEUMATIC ANTENNA MAST

The 42' Will-Burt pneumatic mast is rated by the amount of square foot area of the antenna(s)

attached to the mast. With nothing mounted the mast is rated to 150 mph wind load. With the maximum square foot area of 10 sq ft the rating is reduced to 70mph. There are a variety of configurations that can be mounted. The most common is the so called "Big Stick" 106 inch tall antenna used for public service band operations. However, the Hamstick dipole adapter can also be easily used for HF operations. At night, you should also activate the Amber Strobe on top of the mast.

TRACSTAR SATELLITE DISH

The TracStar dish is rated at 125 mph in the stowed position and 60 mph winds in the up position. The purpose of the TracStar system is to provide Internet connectivity via satellite. Current service is 128 KB Uplink and 512 KB Downlink. We are allocated five (5) mission days (a 24 hr-period) per month. Any time we go beyond that, there is a $50 per day surcharge. At incident scenes, you can pull down current weather data, Google Earth Satellite imagery, send and receive email with attachments such as photos of the scene. There are a number of applications for this service. Both the Laptop used for the ACU control software and the Mapping and Digital Support Computer can be connected to the TracStar unit via the local area network. Other computer stations can connect via the WiFi network or the wired Local Area Network through the external I/O port on the driver's side of the van.

Operation of the TracStar is quite simple. Apply power to the TracStar system, press the "RUN" button and the dish will self deploy, search for the satellite, and maximize the signal automatically. This may take up to 4-5 minutes. Watch for "RX/TX" green lights above the Dish symbol on the panel to tell if you are locked on or not. When they are both green, you are ready to log on to the Internet. The MCU has a web-mail account at Hotmail. It is: "CC-MCU@hotmail.com". The password to access the account is posted on the laptop computer in the MCU and may change as needed.

To shut down the TracStar, press and hold the "-" key on the left side for 2 seconds. The display should now indicate that the antenna is stowing. When the Antenna warning lights stop flashing on the main control panel and the dash board, you will know that the antenna is in the "stowed" position.

RADIOS

SELECTION OF ANTENNAS

There is an antenna patch panel located above the ACU-1000 stack. For most operations there will be no need to change the default patching configuration. However, to use antennas mounted on the pneumatic mast such as the “Big Stick” on the Public Service Band Radios or a Hamstick dipole for HF, you may need to change one of the patches. They are cleared labeled. Be careful when pulling one of the radio cables and to allow sufficient loop for the RF cable to bend gently. If you do choose one of the antennas mounted to the top of the mast, ensure you match the radio to the proper Mast position at the top of the mast and as well as the proper patch position on the panel. There are three RF cables labeled “Mast-1, -2 & -3” running between the top of the mast and the Antenna Patch Panel.

PUBLIC SERVICE BAND RADIOS

There are three Sheriff public service band radios mounted in the MCU. One is in the cab and is used primarily enroute or returning from a mission to maintain contact with CCSO Dispatch. Use the callsign “MCU” when checking in with dispatch. Channel assignments are posted on the back wall of the cab. “SO-2 CW” (Sheriff’s Office Channel 2 County Wide) is normally used as the primary channel to and from a mission. The cab radio uses a 5/8 wave mounted on the cab.

The Motorola radio mounted on the counter top on the street side in the van is the main mission radio and includes the new narrow band channels used by the county. A second radio (Motorola) is mounted on the wall and does not have the new narrow bands but does have a full 100 watts. For simplex operations in the mountains, it may provide you a better option for reaching search teams.

Connecting it to the "Big Stick" and pushing up the pneumatic mast may give you your best combination for search operations. The antenna mast adapter to mount this antenna is found in the tall storage compartment next to the side entrance door. This antenna is normally stowed in a big black plastic

pipe stowed on the floor while traveling.

ACU 1000 OPERATIONS

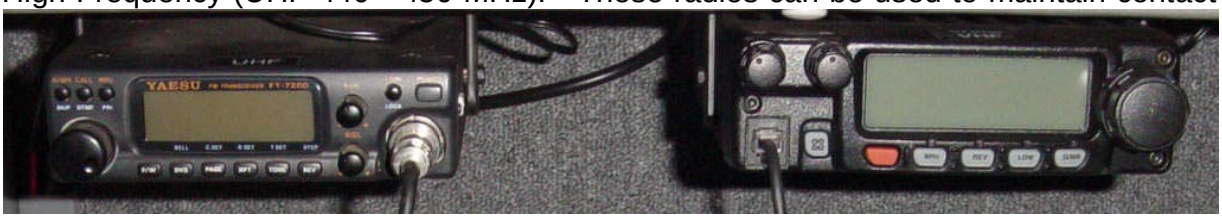
The Audio Control Unit (ACU) 1000 is a computer controlled device used to interconnect agencies or units that do not have compatible radios. It allows the control operator to program radios in the ACU Stack to match radios from other participating agencies who may not have compatible frequencies with other responders. The ACU stack has eight radios currently configured (5 ea VHF, 2 ea UHF, 1 ea 800 MHz). The control operator can match up audio channels to allow the agencies to work together using a channel already in their organic radios. Many of the channels may already be programmed into one of our Kenwood's and will only need to be selected on one radio and then matched up with one of the other radios in the stack. Once a pair of radios has the proper channel or frequency selected the Control Operator simply does a couple mouse clicks in the ACU software to match the two audio channels for the two agencies to work together. Actually up to four different links can be made with the software. Use of the ACU 1000 or the Kenwood programming software is taught in a separate hands-on class.

Be prepared to use whatever channel or combination the IC wants or needs us to communicate on.

AMATEUR RADIOS

There is one mobile (FT8800 Dual Band) located in the cab for use to and from a mission. It is switched through the vehicle ignition and uses an antenna mounted on the top of the cab. It is still a good idea to turn it on and off using the radio switch.

The other amateur radios are located inside the Van for communicating on amateur bands. There is one High Frequency (HF .5-30 MHz), two (Yaesu FT2800 and FT-2600) Very High Frequency (VHF 144-148 MHz) radios and one (Yaesu FT-7200) Ultra High Frequency (UHF 440 - 450 MHz). These radios can be used to maintain contact



with other amateurs acting as relays to other agencies who may not have direct communications to the van on our channels. We may use amateur repeaters or simplex communications as appropriate. Operating Manuals for these radios are located in the supply cabinet (Top right on Street Side). One of the VHF radios may also be used to contact the AZ Department of Emergency Management via the ADEM radio network. The frequency is 142.800. Offsets and PL are preset. Our callsign on that channel is “Horned Toad”.

The second VHF radio (FT2600M) is located in the digital workstation on the curb side

of the vehicle and is used primarily for packet or APRS operations. If not required for packet or APRS, it may also be used to support voice operations. The antenna for this radio is mounted near the telescoping mast at the back of the van. The KAM TNC is above the radio and below the upper storage cabinets. The computer is located on the operations bench on the left. The keyboard is on a pull out shelf, and the flat screen monitor is attached to the wall. We use the PACTERM software package for packet operations, Airmail 2000 for HF PACTOR operations, and UI-View for APRS. A separate guide has been prepared to assist computer operations. In the photo below, it is on top of the Icom 706.

The HF rig is an ICOM IC-706 IIG. A remote antenna tuner is mounted in the storage cabinet and controlled from the front of the IC-706. This set can be used for HF

Amateur or MARS operations. A set of Hamstick HF antennas are stored in the Antenna Cabinet to the right of the main van entrance and accessible only from outside the truck. Select the one you need for the band you wish to operate on, attach to the "Quick Disconnect" mount on the roof of the shelter, and press the "TUNER/CALL" button to match the transceiver to the antenna and you are ready to operate.

The mounting stub is on the street side roof of the van at the rear of the antenna "Z-Rail". Push down and twist to lock in place. Be sure it is removed before moving the truck. Please note that the antenna stinger is color coded to match the black coil bottom. If you mismatch the coil with the stinger, your standing wave ratio (SWR) will not be optimal.

AIRCRAFT RADIO

There is also an Icom aircraft band radio located above the ACU-1000 stack. This radio is licensed by the FCC to the County Sheriff's Office for use on the nationwide SAR channel (123.30 MHz, AM). The FCC registered call sign assigned to the Sheriff's Department for the unit is: **K E 5202**. This radio may be used to contact aircraft responding to out SAR mission as required. In the past it has been used to work with military aircraft or CAP search aircraft. Many of the medical response or AZ DPS aircraft are authorized and equipped to operate on the sheriff's tactical channels, but some are not. The military response helicopters will usually not have access to our public service channels and will rely on this radio for contact.

TACTICAL HANDHELDS

We also have ten Icom VHF hand-helds in a tray in the storage cabinet located below the counter on the street side of the van. These radios have sixteen Sheriff and other public service frequencies programmed into them. One of the MCU operator responsibilities is to sign out these out as required or requested by the mission IC. Each individual radio will be signed out on the radio log identifying radio # (a white # on top front of radio), name, phone number and agency. Channel assignments are attached to the front of the battery case. They are usually used on the CCSO SAR channel. A charger for these radios (BC-121N) is located on the street side below the counter top and between the two operator positions. The charger is a fast charger and can recharge the radios quite quickly. The LED lights on the charger go from Orange to Green when the radio is fully charged. Be sure that the radios are recharged after each mission. If you do not have time to recharge at the end of the mission, be sure the RACES Officer is aware of that issue so that they can be recharged as soon as possible (usually the following Saturday morning). An operations manual for these radios is maintained in the supply cabinet and in the MCU Manual. The RACES Officer usually fully discharges and recharges these radios on a quarterly basis.

PHONES

Cell Phone

A Verizon cell phone is kept in the van and billed to the Sheriff's department. Another of the MCU operator's responsibilities is to ensure that outgoing calls are logged to phone number, person calling, and agency of person using the phone. A clipboard with a cellular log should be maintained near the phone for this purpose. All documented official calls on valid missions can be reimbursed by the state. Logs should be turned into the mission commander after the mission is over or to the RACES Officer.

VOIP Phones

When we are connected to the satellite internet, we also have voice-over-Internet-Protocol or VOIP. We basically piggy back on to the satellite network and have connectivity to the county telephone network. There are four instruments in the cabinet. We have the traditional phone instrument and three 5.6 GHz phones that can be plugged into the one of the four telephone jacks in the MCU. The 5.6 GHz phones can also be used as wireless intercoms. Plug the base units into wall jacks and electric power. Be sure the batteries are connected inside. We unplug the batteries in between missions to keep them from running down. To use a phone, press the send button, wait for the dial tone. If you are dialing within the county network, you need to only dial the last 4 digits of the county number. For an outside line, press "6" and again for the dial tone. You may now dial any local number that is normally considered a local number from Bisbee. There is a slight, satellite induced, delay when talking to folks on this circuit that may take some getting used to.

COMPUTERS

There are two computers in the MCU. Each has a primary purpose and they will be

discussed separately. The laptop is stored in the upper cabinet above the printer.

ACU 1000/MISSION SUPPORT LAPTOP

As the title suggests, the laptop is primarily used to control the ACU 1000 switching unit. Using the JPS software, it is used to connect radio channels from different agencies to each other. The software to reprogram the Kenwood radios in the ACU stack is also installed on this computer should it become necessary. When the TRACSTAR is activated, it may used for Internet access and to send and receive emails through the MCU Hotmail Account. This was discussed earlier. The SOFTROS Instant Messaging software is also installed allowing text messages to be sent between any of the computers connected to the local area network via Cat 5 connection or through the Wi-Fi network. Many of the SAR Coordinators also have this software installed on their laptops and it can serve as an easy way to relay notes or messages coming in from the field over the radio. Plug in the network (Cat 5) cable, the mouse and power connector before turning on. This computer should be turned on before the Mapping and Digital Support Computer when setting up to properly allow the network to be established. The large computer screen over the pass thru to the cab can also be connected to this computer by connecting the VGA cable to the back.

MAPPING AND DIGITAL SUPPORT COMPUTER

The mapping and digital support computer will be used to primarily to provide digital communications support when needed. Topographic and street maps are also loaded on this computer. It may also be used to keep missions logs and Instant Messaging (SOFTROS Software) when collocated with the SAR Command Van and its WiFi Router. Copies of the various ICS forms such as the ICS 214 (Unit Log) and ICS 309 (Comm Log) are also stored on this computer. Specific instructions on using this computer and the various software packages are documented separately.

MISSION OPERATIONS

As soon as the MCU is operational, advise the IC. The team leader should establish a **Unit Log** (ICS-214) and log the time and mission identifier. The primary communications operator should also open a **Communications Log** (ICS-309). If multiple mission radios are active, each assigned operator should keep a log for that position. Record key communications events on the log such as special instructions provided, times and call signs when teams deploy, team welfare checks (Code 900), when teams return to base, etc. Key events should be logged whether they are between the MCU and another unit or overheard between other deployed elements. The IC may already have teams in the field when the MCU is operational. Try to ascertain their tactical assignments and perform a radio welfare check with them. Using the white board above the desk, maintain a status board identifying teams in the field, call signs and status. Status should indicate time of last successful, or unsuccessful, welfare check, and time of return if they have completed assignment. Blank logs are

found on a clipboard on the workbench and in the racks above the radios.

During Search Missions, ask the IC to instruct the search teams to do a communications check before teams depart the base camp area for their field assignment. This will ensure that the teams are on the correct channel and that their radio is working. It is just as important that the teams report in when they return from the field so that we can clear our status board. We do not want to leave any teams or personnel left in the field when we pack up and go home.

As the ears for the IC we must be sure to pass along critical mission reports as soon as they come in to the IC or his/her designated representative. This means someone should be on duty in the van and able to monitor the radios at all times. Normally at least two persons are assigned per shift. This allows one operator to depart periodically to run errands, eat, take potty breaks, etc.

MISSION COMPLETE

AFTER ACTION REPORTS

At the end of each mission, each communications operator involved (deployed or home unit) should turn in to the Communications Team Chief an After Action Report or AAR with a summary of their participation and any lessons learned. Lessons learned may include good things you learned, areas where you need more training, or items that need follow up such as radio, vehicle or equipment problems and potential solutions to the problems found. Any of these items are appropriate. These items will be included as the Team Chief writes his/her summary report to be filed with the County Emergency Service Coordinator. The RACES Officer/DEC also needs to file a Public Service Report with the ARRL and this is based on the information provided in the logs as well as information provided in your AAR. Look at the FSD Report # 157 to see what is included in the Public Service Report.

REFUEL

Before putting the MCU away after a mission, please refuel. This ensures that the MCU is ready to roll for the next mission. It may be days, hours, or even minutes between missions. The most common after-hours refuel point will be the “Gas City” station at the corner of Fry Blvd and the 90/92 intersection in Sierra Vista. Use the pumps to the rear marked for RVs and large trucks. The pump on the far left as you pull in is for non-commercial and trucks less than 26,000 lbs. That’s us. Follow the instructions at the refuel point. You will be asked to enter the vehicle mileage off the odometer, then “swipe” the county gas card, and then the vehicle or driver ID number. The ID number will be “7xxx7” where xxx equals the proper vehicle number.

Appendix A – Acronyms used in this manual

AAR	After Action Report
APRS	Automatic Position Reporting System
ARES	Amateur Radio Emergency Service
ARRL	Amateur Radio Relay League
ACU	Audio Control Unit
ADEM	Arizona Department of Emergency Management
CAP	Civil Air Patrol
CCSO	Cochise County Sheriff's Office
CW	County Wide
DEC	District Emergency Coordinator
DPS	Department of Public Safety
FCC	Federal Communications Commission
FSD	Field Support Division
HF	High Frequency
IC	Incident Commander
ICS	Incident Command System
ID	Identification
I/O	Input/Output
MARS	Military Affiliate Radio System
MCU	Mobile Communications Unit
MI	Military Intelligence
MRE	Meals-Ready to Eat

PL	Private Line
RACES	Radio Amateur Civil Emergency Service
RV	Recreational Vehicle
Rx/Tx	Receive/Transmit
SAR	Search and Rescue