

SAR VHF Communications Tech Notes

From the NZLSAR Communications Sub-Committee

Antennas

The antenna provided with the SAR HandHeld 6-packs is cut for optimal use on the old SAR/CD Channels. [150MHz –foil length 900mm (923mm top to base step)] [It is suggested that you use a red band to identify the antenna for this frequency range]

The antenna provided with the SAR Portable repeaters is cut for optimal use on the ESB Band Channels. [141MHz –foil length 1060mm (1080mm top to base step)] [It is suggested that you use a blue band to identify the antenna for this frequency range]

The antenna provided with the SAR Portable Base Sets is cut for optimal use on the ESB Band Channels. [This is the same as for the Repeater antenna, and should be labeled the same]

It is suggested that the antennas be labeled and/or colour coded (as suggested above) to be able to identify which is which. One suggestion, based on a group that has already done this, is to use a Red band for the Hi Band and a Blue band for the ESB (Lo Band) antenna. Extra antenna foils can be purchased from R.F.Industries, 18 Indus Pl Halfmoon Bay, Auckland, Ph (09) 537-2683. Don't forget the Allen key – 2.5mm – attach it to the case or base set so it doesn't get lost!

Base Set

Note that the base sets are sensitive to high SWR, and if used with the provided antenna which is cut for the ESB Band it will have reduced efficiency and may shut down on the E Band SAR/CD or in particular on the Marine channels. You should use the antenna provided with the Hand-Held 6-packs for use on the old E Band or Marine channels. An extra foil with instructions is the best option.

Some of the base sets were initially delivered with minor problems. The first was a programming issue for the mute, it was set to zero for ctcss control ie continuously open. The second was a synthesizer problem with [lock failure at lower frequencies (press to talk and transmit light extinguishes immediately). If you experience these problems then you should send the set to Police I&T. They will then return it to the supplier so that these problems can be fixed.

Repeaters

Note that there have been a number of incidences where the internal battery has had reduced capacity.

You should make sure that the charging instructions included with the charger are followed – *to the letter*. The charger must be connected to the repeater before plugging in the mains cord or it may not charge correctly. The charger is operating in boost mode when the LED is red. At the end of the boost cycle, the LED goes green indicating end of boost charge (80-90% of charge) and the presence of float charge. Note the battery will take a further 24-48 hours to reach full charge. The repeater battery should be left permanently on float while in storage. You should charge the battery for at least 48 hours after use, after this the use of a timer in conjunction with the charger set to be turned on for around 3 hours a day helps get around some of these issues. It is also noted that due to the temperature sensitive nature of batteries and charging the charger should be located as close as practicable to the repeater so both are at the same temperature. You should avoid long-term storage of the repeater in a cold location; storage at normal room temperature is preferred. Always charge promptly after use.

An external battery connection cable is available, and is recommended as part of the repeater kit for all areas (from Halswell Technical Services, Christchurch – approx \$50). For it to be used the repeater switch needs to be switch to the OFF position.

It is desirable that batteries are load tested every 1 - 2 years. A 40watt car headlight bulb (3-3.5A load) should give between 3 and 4 hours for an end-point of 10.5volts – DO NOT DISCHARGE BELOW 10.5V OR BATTERY LIFE WILL BE REDUCED OR TERMINATED. Police Technicians should undertake this test and any replacement of the battery.

Hand-Helds

Note that there are two versions of the IC-F3 Handheld. This has implications for programming. The later model has a serial number of 50000 or greater. The newer model requires a newer version of programming software than the older version. Also note that the cloning process only works between units of the same model. Any programming should be done through Police Information and Technology, a local Icom Radio dealer, or through your AREC section if they have someone with the equipment.

Note that Bank 1 should remain programmed as supplied with the National channel selection, (this is a standard programming that allows radios to be used in any part of the country). Bank 2 can be used for any additional local requirements.

Good quality Fresh Alkaline batteries are recommended as a minimum, and Lithium Batteries are highly recommended if you can get them. Do not leave batteries in the hand-helds for any length of time, even alkaline batteries can leak and cause corrosion. Batteries will perform better if used at body temperature; capacity is reduced considerably when used in cold conditions. High current capacity (transmitting) may also be reduced if new batteries are stored for more than 12 months before use.

Aviation Comms

While use of Air to Ground frequencies is preferred there might be some instances where SAR teams need to communicate directly with Helicopters etc when they do not have Air to Ground radios available.

Note that if an Iroquois or other aviation resource is unable to make use of the SAR ESB Band channels then they may have other channels available. In particular for the Iroquois our Hand-Held Channel 5 (MS08 Simplex) can be used, as it is available on the Marine section of their older communications equipment. While their equipment can operate on channels with 25KHz spacing they will need to manually set the mode to FM for channels between 130 and 150MHz. Also their equipment is for wider-band FM and not the narrow-band that is used on the new ES Band equipment, so this should be a last resort only, especially if other agencies are also using ES Band in the area.

While many aircraft operators may have ESB Band equipment installed not all do. You are encouraged to make local arrangements, however note that the preferred method of communications between Air and Ground is on Air to ground radios.

When further range is required in hill country use of HF (5680MHz) is the best choice.

Repairs

Note that the radio equipment is the property of the Police, and except for emergency field repairs required for an operation; all repairs should be handled through Police I and T section.

Other Documents

Available on the NZLSAR Web Site

ICF3 Radio Information	see	http://www.nzlsar.org.nz/comms/f3sinstr.pdf
VHF Radio Training info	see	http://www.nzlsar.org.nz/comms/vhfradiotraining.pdf
Siting of Repeaters	see	http://www.nzlsar.org.nz/comms/repeaters.pdf