

Instructions

These trackers are tiny radio transmitters designed to help the retrieval whenever the model is difficult to find after landing. The tracker installed on the model will be transmitting a short impulsive signal for days, being promptly locatable through a hand-held receiver.

Receiver requirements - Most popular frequency synthesised VHF walkie-talkies (e.g. YAESU FT-23 or similar radios) will work for tracking in conjunction with these trackers.

Positioning the tracker - The tracker must be installed with the antenna straight and vertical, coming out of the upper side of the fuse in order to have a good propagation when the model is placed on the ground. Be aware that a bent, slanting, or horizontal antenna wire, may result in a poor ground range. Do not lay the antenna into carbon tubes or tail booms, since this material may consistently interfere with the emitted signal.

Turning-on the tracker – the tracker is turned on just by inserting the battery into its holder by the side of the axial contact lead located on the bottom of the printed circuit board. This easy procedure should be executed carefully in order not to force or detach the tiny carbon tube. Insert the battery by turning it slowly, and gently push until it drops in its final position (stroke of about 5 mm.):

Tuning-in the receiver - Tune-in the receiver on the exact frequency of the tracker, then completely turn-off the 'squelch' knob: this will temporarily disable the 'squelch' making only the typical ground noise (no-signal noise) audible. Then, adjust the 'volume' knob the around its middle position: short and regular pulses will be heard on the receiver accurately turn the 'squelch' knob up to the point where the ground noise ceases: this way, the signal 'breaks' the squelch and the pulses will sound like short and clear knocks Be aware that the squelch may tend to cut-off a very weak signal, thus its threshold must be adjusted carefully in order not to reduce the range of the whole system.

Tracking and retrieving the model - The VHF waves propagation is mainly along a straight line. In addition, the field strength of these wavelengths is affected both by the shape of the ground surface and by the presence of possible interposed obstacles. The maximum range depends both on the receiver sensitivity and the gain of the receiving antenna. With a common hand-held receiver using the short rubber antenna supplied with it, the ground range should be of about 500 Mts. and the signal of a flying model

should be received from many kilometres. The range may be sensibly increased simply by providing the receiver with a good directional antenna mounted on a short pole (e.g. HB9CV antenna, 6 dB gain, or a 2 or 3 element Yagi) which can be used when the model lands really far from the launching point.

Body Shielding Technique: this technique is used when a directional antenna is not available and works well provided that the received signal is kept as weak as possible in order not to saturate the receiver. When applying this technique, it is very helpful to take advantage of the received field strength indicator (S-meter) on the receiver.

When the model is on the ground behind us, our body is interposed between the transmitting and the receiving antennas which are mutually covered, and this decreases the signal detected by the receiver. On the contrary, if the model is placed in front of us, the two antennas are 'visible' each other and the received signal is virtually not affected by the presence of our body. Suppose we are receiving the signal coming and the signal is not too strong to saturate the receiver. Let's start turning around slowly, until the received pulses seen on the S-meter and/or heard on the loudspeaker have maximum fading: in this position we are sure we are damping the received signal. Our body is interposed between the transmitter and the receiver and, since we hold the walkie-talkie in hand, the model is placed along the direction our back is pointing to. While slowly turning around, the readings of the S-meters will provide a precise indication of the direction the signal comes from.

Retrieving the model by using the short rubber antenna on the receiver: the standard short rubber antenna supplied with the receiver allows in most cases the localisation and retrieval of the model. If the model was lost when still flying, we will keep on 'hearing' it for many kilometres and this will give us an indication about its position. If the model gets out of sight before landing, or it lands in tall grass, in a corn field or on a tree, we will always have an estimation of the direction leading to the final location. If the model is farther than the maximum ground range, and lands due to the dethermalizer, the signal will be temporarily lost when it approaches the ground. If the signal is not received from the launching point we will have to start walking towards the approximate landing direction with the receiver already tuned-in and properly adjusted and held with the arm kept straight and lift up and with the antenna in vertical position. When we are close enough to the model to receive the pulses, we will stop and start turning round and, through the body shielding technique, we will be able to accurately determine the lo-

cation the signal comes from. Then we will turn back and start walking again. The farther the model is, the more directional the received signal is. The model is always placed behind us when, by turning our body, we have reached the position of maximum shielding.

The maximum range is achieved by holding the receiver with the arm kept straight and lift up, and the antenna kept vertical. On the contrary, if the model is not far the receiver tends to saturate: just keep the receiver close or also stuck to the chest while turning round in order to enhance the shielding effect of our body. While approaching the model, since the signal gets stronger, it may seem to come from everywhere: if it is very strong, but the model is still not visible, it is necessary to replace the rubber antenna with a shorter hand-made antenna (see forth), in order to reduce the signal detected by the receiver.

Replacing the antenna with a short piece of wire: when the model is at an intermediate distance (10-50 m), it is very helpful to replace the antenna with a short piece of wire (dia 15 mm, length 1-2 cm). The short wire can be directly soldered on the axial contact of a BNC connector so that it can be connected and disconnected to the receiver antenna input like a very short antenna. The length of the wire must be experimentally determined in advance by gradually cutting the wire until the required range is reached. This provides a known short range and the body shielding technique can be successfully applied again.

Retrieving the model by using a portable directional antenna on the receiver: the HB9CV is the typical R.D.F. antenna (Radio Direction Finding) used by most radio amateurs in their fox-hunting contests, where they have to look for a hidden transmitter. A multi-element YAGI antenna would give even longer range and more directionality, but it is less handy. Directional antennas can extend the ground range up to a distance that would never be reached using the short rubber antenna. This can sensibly speed-up the localisation of the model when it is very far from the launching point. They can also be very useful when the model is not far but hidden by the crops, taking advantage of their directional properties. By rotating the pole which the antenna is mounted on, the S-meter will clearly show the direction the signal comes from.

It is recommended to practice in advance and simulate possible real situations, in order to get familiar with the combination of these trackers and the receiver-antenna system.

Battery lifetime - The BR435 Lithium battery has a typical life time of more than a week in safe conditions, should the retrieval take time for any reason. It

has an excellent storage life. These batteries are also used in electronic fish floats and then available in sport fishing shops.

Hints and Warnings

- Large metal structures such as wire nets, metal gates or buildings, may originate unwanted reflections, indicating the signal comes from a false direction. In these cases just try approaching the model by the opposite side, trying to get far from the reflecting structure
- Do not bend or shorten the antenna: this may cause a reduction of range and crack thin wire.
- The antenna wire must not touch the battery body
- The micro-transmitters may be damaged by violent bumps, shocks or strong vibrations as well as if exposed to high temperatures, dust or damp. In engine powered models, it is recommended to install them free from vibrations. Due to the epoxy encapsulation, any servicing or repairing of the tracker is impossible

Model Radio Tracker

For radio-retrieval of free-flight models

- Weight 185 grams
- Extended range and battery life
- Carbon battery holder
- Gold plated battery contact leads
- Surface-mount crystal controlled circuit

batteries

