

## Tips for High Quality Foxhunting Gear

After several years of foxhunting and trying different types of antennas, radios and direction finding gadgets, I have found that the following setup works best for long distance (requiring driving) or local (walking in a field) foxhunts on the 2 meter band.

**(1) The antenna:** A simple tape measure Yagi is all that is required for high performance foxhunting. These antennas can be built for less than \$20 in parts. You basically need some 3/4 inch PVC pipe and fittings, six hose clamps, a tape measure and some coax with the fitting that is required for your radio. The three element design (director, driven element, reflector) gives optimal directivity without so much gain that the pattern is too sharp for practical direction finding use. A good description of how to build these devices appears here: <https://w5nor.org/tape/>

**(2) The radio:** It is crucial that you have a radio allowing accurate assessment of signal strength. When you are hunting a transmitter, you will need to assess whether the signal is stronger or weaker as you turn your direction finding Yagi. Also, you a good signal strength meter will tell you whether you are getting closer to the hidden transmitter as you proceed along your best bearings. **This means the inexpensive Chinese HTs that are ubiquitous (Baofengs for example) are not good for foxhunting.** They have two problems: they are not well shielded, and they do not have good signal strength meters.

My personal favorite is the Icom IC-W32. These radios can be found for \$50 to \$100 on e-Bay or at hamfests. These radios are no longer manufactured. The features on this radio that make it great for foxhunting include:

-Good shielding: The case is all metal, and the only signals getting to the receiver are coming through the antenna.

-A prominent S-meter with wide dynamic range: this feature enables you to get an accurate assessment of signal strength

-BNC connector for the antenna: These are sturdier than SMA connectors, which is particularly important when you start hanging devices like offset attenuators on them.

Specifications for this radio can be found here: <https://www.universal-radio.com/catalog/ht/0838.html>

One is currently for sale on eBay for \$75: [https://www.ebay.com/itm/156553638507?\\_skw=Icom+W32+Ic-w32a+Dual+Band+FM+Transceiver&itmmeta=01JE1TMYZETYD6462Z7H6RVHRG&hash=item247352f26b:g:GY8AAOSwigZnS4kl](https://www.ebay.com/itm/156553638507?_skw=Icom+W32+Ic-w32a+Dual+Band+FM+Transceiver&itmmeta=01JE1TMYZETYD6462Z7H6RVHRG&hash=item247352f26b:g:GY8AAOSwigZnS4kl)

A review of this radio appears here: <https://www.eham.net/reviews/view-product?id=297>

This is not the only radio that will work well for foxhunting. I suggest looking at the used market for a good Icom or Yaesu 2m/440 MHz dual band radio – late 1990s or early 2000s

vintage. They will be inexpensive, have BNC connectors and are well built. One with a bad transmitter is perfectly fine (and can probably be had for a deep discount). All you need is a working receiver. Note that for any secondhand radio, you can expect the battery to need replacement, so do your research ahead of time to identify a vendor for battery packs. It is better to buy a brand new battery pack than a used one, as rechargeable batteries have a limited number of charging cycles, and you will need one that lasts a few hours for foxhunting.

Why dual band? If you want to search on the third harmonic as you get closer to the fox, you will need a radio capable of receiving on 440 MHz. This is optional, but it's a handy feature. The most important features are a good S-meter (check out the one for the W32 – it's the long horizontal bar graph underneath the frequency display in the image below. You want a big display with significant demarcations (resolution) – at least 5 segments is desirable. The Yaesu FT-65R looks like another good choice (although I have never tried it). From the picture below, you can see it has a nice S-meter bar graph display. This radio is still in production (HRO has them for \$100 – on sale for the Holidays). Note this radio has the SMA connector, so you will need adapters to use it with the Arrow attenuator.



- (3) **The attenuator:** You will need an attenuator to handle strong signals when you get close to the fox. The best attenuator is a variable offset design. Essentially this design uses a 4 MHz oscillator, the output of which is variable. When mixed with the fox's signal, two products are produced:  $F + 4$  MHz and  $F - 4$  MHz, where  $F$  is the frequency of the fox (in MHz). Since the oscillator has an adjustable output, these two mixing products can be varied in signal strength. That is where the attenuation comes in. You tune your HT to one of the mixing product frequencies and adjust the knob on the attenuator until the maximum received signal is at half scale on your S-meter. You now have optimum dynamic range to find the fox close in. The offset attenuator is not to be used until the fox signal is saturating your receiver (maximum S-meter indication when receiving the fox). Otherwise, you will have too low a signal reading to zero in on the fox.

I like the Arrow OFHA offset attenuator shown below. This device attaches to the antenna port on your HT. The other end goes to your tape measure Yagi. Giga Parts and HRO sell these units for \$60. They offer 30 dB to 80 dB of attenuation (that's 1000 fold to 100 million fold, continuously adjustable – enough to let you walk to inches from the fox antenna and still not saturate your receiver!).



A less expensive alternative is the KC9ON offset attenuator, which comes as a kit for \$10 (assembled board for \$15): <https://kc9on.com/product/fox-hunt-offset-attenuator/>. Note that you will need to supply the connectors and the case (which should be all metal, to shield the attenuator from stray RF).

#### **Conclusion:**

So, there you have it: A complete high end foxhunting solution for ca. \$200 (assuming you currently have none of this gear). While that is a significant investment, it will offer a lifetime of fun and tremendous satisfaction when you have no trouble sniffing out the fox. Moreover, the HT can be used for other purposes.