



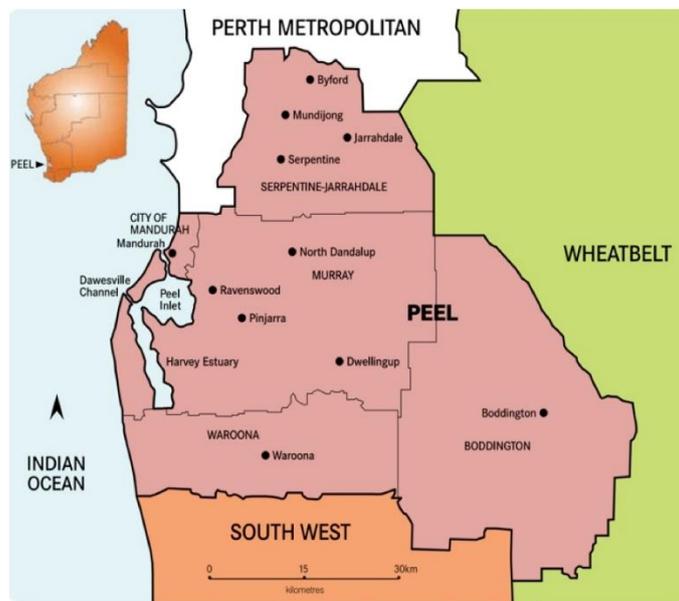
What is Fox Hunting?

Fox Hunting (also known as *'hidden transmitter'* or *'radio direction finding'*) is a popular amateur radio (AR) and short-wave listener (SWL) enthusiast *'sport'* or *'activity'*. It is an electronic variation of the *'hide and seek'* game. No actual foxes or hounds are involved or harmed in this sport.

A variant of AR Fox Hunting is used in tracking animals, weather balloons and other transmitters for science and technology. It is also used by ham radio operators to locate 'noisy' RF interference by mains electricity transformers.

The 'Fox' is a hidden transmitter which is usually remotely controlled. It is programmed to intermittently transmit a series of tones and a Morse Code (CW) identity. 'Hounds' are trackers who use receivers and directional antennas.

When the Fox is on the air, the Hounds take radio bearings with their directional antennas (such as the popular home brew *measuring tape Yagi antenna*. See photo below). Hounds determine the direction of the strongest radio signal from the Fox. Hounds ignore reflections. This is done throughout the Fox Hunt until the Fox is found! PARG Fox Hunts may venture anywhere within the Peel Region, which includes the municipalities of Boddington, Serpentine-Jarrahdale, Waroona, Murray, City of Mandurah, and also City of Rockingham (shown in white on the map directly west of Byford and Mundijong on the coast) in Western Australia..



Map of the Peel region of WA

Although Fox Hunts will often commence in the City of Mandurah, the Fox Hunt could end almost anywhere on the map. They may commence in the City of Rockingham or Perth Metro.

The great thing to be aware of is anyone, licenced amateur radio operator or not, can be involved because it does not involve actual transmissions – only receiving the radio signal from the ‘Fox’ Therefore the Peel Amateur Radio Group (PARG) welcomes the participation of ALL Fox Hunt enthusiasts from far and wide to attend and take part in the fun.

PARG Fox Hunt Competitions

There are usually three different PARG Fox Hunt competitions on the day. They increase in difficulty, time, and skill. Every Hound can easily hunt the Fox in the first competition. The second competition is more difficult, yet every Hound should be successful. The third is challenging and some Hounds may not find the Fox. However, it is a great way to develop skills and techniques for the next competition.

Competitions are generally conducted with the Fox transmitting somewhere within the FM simplex portion of the two-metre (VHF) amateur band (144.7 to 147.6 MHz) or the data portion of the band (144.4 to 144.6 MHz).

PARG Fox Hunts usually commence with a simple ‘YES’ and ‘NO’ warm-up competition using the PARG Repeater VK6RMH in or near the City of Mandurah or the City of Rockingham. Tune to 146.850 MHz with .600 MHz -ve offset. The repeater also requires a sub tone of 91.5 to activate it. No direction finding is relevant for this competition as all Fox transmissions only come from the VK6RMH repeater.



While only participating licenced amateur radio operators can ask the Fox clues for their location, because only they are licenced to transmit. (The response from the Fox is only ‘Yes’ or ‘No’.) participating short wave listeners (SWL) can listen for clues and seek out the Fox. Hounds cannot cheat by listening to the repeater input frequency because the Fox will use either Echo Link or Mesh to access the repeater. Therefore, the Fox cannot be heard on the repeater input, and everyone has the same chance of finding the Fox based on logic and luck. While this competition will usually conclude on public land such as parks and reserves, we reserve the right to conclude this competition on private property (including indoors), with prior permission of the property owner.



Photo: Typical tape measure Yagi antenna, attenuator, and receiver.

1. The second competition is typically a low-power intermittent Fox transmission, where Hounds will likely spend more time walking rather than in their vehicles. The Fox may be a Baofeng transceiver running about 1 watt. Hounds will be advised of the Fox frequencies prior to the start of the hunt.
2. Each Fox will generate and transmit a unique series of tones followed by a Morse Code (CW) identifier.

Important; When a Hound has located a Fox they will see an identifying code or word on the Fox transmitter. Remember the code because that is proof you saw it. Do not tell anyone you found the Fox. Instead, discreetly move away, perhaps playing as if you are still searching for it. Hounds must NOT interfere with or move the Fox. In that way everyone has a chance to find the Fox for themselves. Every Hound should be given an opportunity to find it.

Once a Fox has been found it is time to search for the next Fox usually on the two-metre (VHF) AR band. However, it may be on the 70 CM (UHF) AR band. Elements of skill and good luck will be required, yet every Hound will have a reasonable chance of finding the Fox. This competition will conclude on public land such as parks and reserves, unless otherwise stated by the Fox. There are a number of safety rules for all participants listed below.

PARG will usually award place getter certificates and all Hounds may be emailed a Certificate of Participation.

We may get together at the end of the second competition for a BBQ and discuss our experiences in preparation for the third and most challenging competition to follow.

3. The third Fox Hunt is the most challenging. The Fox is of micro or low (1 watt or less), medium power (5 to 10 watts) to higher power (25 watts or more). The Fox could be found almost anywhere in the afore mentioned municipalities, and sometimes in the Perth Metro area. This Fox Hunt requires more time and skill over longer distances. Map reading skills are valuable. Hounds are required to read their vehicle odometer at the start and end as the results may be calculated on the number of kilometres travelled rather than by time. In that way we emphasise safety and the skill component rather than time factor. This competition

may include some questions to be answered during the Fox Hunt, (usually AR regulations and theory) which will be worth extra points. Therefore, accuracy is more important than speed in this competition. This is to prevent dangerous driving and risk taking by Hounds. There are a number of safety rules for all participants listed below.



Photo: Inside the low power, remote controlled Fox.

The third Fox Hunt competition could involve any devious tricks the Fox can use to hide. It is possible the Fox coordinators may plant dummy transmitters in the vicinity of the real Fox. The intermittent tone periods may be adjusted during the Fox Hunt to make it easier or more difficult to discover. For example, it could be set to continuously transmit so it is easier to find, or it could transmit for shorter periods and/or more infrequently to make it more difficult to discover. The Fox may or may not be vertically polarised. It may be using any type of antenna. It may change antennas during a Fox Hunt. The Fox may change power levels during the Fox Hunt. Therefore, it will be more advanced than the previous competitions. This is an excellent opportunity to learn firsthand about high band VHF propagation characteristics. UHF (70 CM) and HF foxhunts will be organised in the future which will require antennas and receivers to suit.

The Fox may transmit clues from time to time to assist the Hounds. Once found, Hounds must NOT interfere with or move the Fox. Every Hound should be given an opportunity to find it. Hounds may use maps and any Fox Hunting software and devices (including multi doppler antennas, triangulation, delta loop antennas, drones, you name it) that may assist them to quickly locate the Fox. No external, vehicle-mounted rotatable antennas are permitted because they can create traffic hazards. This competition will conclude on public land such as parks and reserves, unless otherwise stated by the Fox.

Again, the information about the second Fox Hunt (Fox frequencies, intermittent transmissions, identifying code on the Fox transmitter, discreetly move away etc) also applies to the third Fox Hunt. More detailed safety rules are listed below.

You will also see a message explaining the Fox purpose for the general public (if they inadvertently discover the Fox) on the Fox to allay any concerns. The Fox may have cards to be retained by the Hounds as proof of their success. The Fox device will typically be chained and padlocked into location to prevent it being moved before the Fox Hunt has been completed by all Hounds.

PARG will usually award place getter certificates and perhaps sponsors prizes. The overall winner of the third competition will usually be invited to take part as a Fox in the next PARG Fox Hunt competition.

What do I need to know about PARG Fox Hunts?

The information listed below includes basic equipment and methods needed to take part as a Hound participant in PARG Fox Hunts. Important rules are listed. All participants must agree and abide by these rules otherwise they will be immediately and automatically expelled from the competitions. Making the whole experience safe is the responsibility of everyone concerned. Having fun is mandatory.

A Hound does not need expensive equipment to Fox Hunt. But you will need the following.

- A receiver (perhaps a scanner) for the Fox frequency somewhere within the data portion of the two-metre amateur band. Hounds will be advised of the exact frequency at the start of the Fox Hunt.
- Some sort of analogue, LED or digital meter read out to indicate to the Hound the strongest signal direction. These are incorporated into the design of most scanners, receivers and transceivers.
- A directional antenna. From time-to-time PARG conducts construction workshops. All enthusiasts are welcome to participate. Instructions are also available online at www.PARG.AU

- PARG Fox Hunt VHF tape measure Yagi preconstructed may be available for hire or purchase.
- Cheap Baofeng dual band (VHF/UHF) transceivers may be available for hire or purchase.
- Some sort of attenuator to decrease the signal strength of the Fox transmitter as you come closer to the Fox will help. There are other techniques you can practice, such as changing antenna polarity or receive frequency, inverting your antenna 180 degrees, or disconnecting your antenna and using your own body as an attenuator when close to the Fox.



- There are various devices and software programs (including multi doppler antennas,



RDF loop antennas



and the MK4 sniffer from www.FoxHunt.com.au)



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- that can assist Hounds. Experimentation and practice by Hounds is encouraged.
- If members of the public ask what you are doing please give them a PARG information pamphlet. These will be shared at the completion of the 'YES' and 'NO' warm-up competition. This is a public relations exercise. DO NOT distress the general public with untrue or misleading stories.
- We stress safety above all else. Therefore, no vehicle-based competitions are based on speed.
- All vehicles must have a dedicated licensed driver and at least one navigator. Vehicle drivers are not to

participate in navigation or radio use while driving.

- Vehicle-based Hound participants will only take bearings when the vehicle is stationary and parked safely off the road.
- No external, vehicle-mounted rotatable antennas are permitted. These only distract other drivers, and may cause accidents.
- Direction-finding antennas must be made safe with eye-protection over protruding elements.



- Appropriate high-visibility clothing and foot protection should be worn by all Hound participants.



- We encourage children to be involved, but they must be appropriately supervised by a

responsible adult. Take special care around waterways and traffic hazards.

- The liaison frequency is the PARG repeater VK6RMH. Tune to 146.850 MHz with .600 MHz -ve offset. The repeater also requires a sub tone of 91.5 to activate it. Only licensed Amateur radio operators may use it, but others may listen. Co Ordinator phone numbers will be provided to Hounds.
- The PARG Fox Hunt coordinators are Peter VK6 PBS and Jenny VK6 JEN.
- All Hounds and Foxes may get together at the end of the competition for a BBQ. Following calculations by the Fox Hunt organisers awards may be presented at that time.
- Results will be posted on the PARG web site (www.PARG.AU) following the event.
- Fox Hunting is great fun for enthusiasts, including amateur radio operators, short wave listeners, and their families. You can get the children involved for a wonderful day out in the Peel Region and around the extensive Mandurah, Murray and Rockingham waterways.
- Having fun is mandatory - anyone taking the events too seriously will be penalised.
- Legal Disclaimer: PARG members and Fox Hunt

coordinators take all reasonable precautions but cannot take any responsibility for participants and others own actions and behaviours. You are expected to abide by these rules, the road laws and good sense for your own safety and the safety of others.

- All Fox Hunt participants agree to abide with these rules otherwise they are immediately and automatically expelled from the competitions.
- Contact us (via the PARG secretary at www.PARG.AU) for more information and Fox Hunt dates and locations.

Additional resources

<http://www.arrowantennas.com/main/fhl.html>

<https://foxhunt.com.au/microsniffer/microsniffer.html>

orders@foxhunt.com.au

<https://www.vk3vt.net/VTbeam.html>

<https://www.dxengineering.com/parts/dxe-noiseloop>

<https://www.dxengineering.com/parts/msq-2m3ss>

<https://www.amateurradio.com/foxhunt-gear-%E2%80%93-offset-attenuators/>

<https://kc9on.com/product/fox-hunt-offset-attenuator/>

<https://www.everythinghamradio.com/2014/07/fox-hunting/>

<http://www.homingin.com/DSEfix.html>

<http://www.rdfproducts.com/dma-1315b2.htm>

<http://www.rdfproducts.com/dma-1309b1.htm>

<https://www.amazon.com/Arrow-Fox-Hunting-Loop-Bidirectional/dp/B00TGE6456>