

Tour of Mull Course Vehicle Tracking

Otherwise known as “APRS”

Since 2001, all official vehicles connected with the rally have their exact location tracked using GPS and Radio technology called APRS, enabling officials to have a real time map display of the rally progress.

Firstly a jargon buster: APRS stands for **A**utomatic **P**osition **R**eporting **S**ystem.

Not to be confused with GPRS, which is the mobile phone data service

What is it?

Originally developed in the late 1980's by Radio Amateurs in the USA, it is a system that allows a radio station to broadcast information about itself. This can be its position, local weather information, short messages and a whole host of other details.

The key detail is that the information is real-time, so the position or weather details etc. are correct at the exact time they are transmitted.

On the Tour of Mull we use the position features, plus an ability to regularly send information about the state of batteries connected to the hilltop equipment.

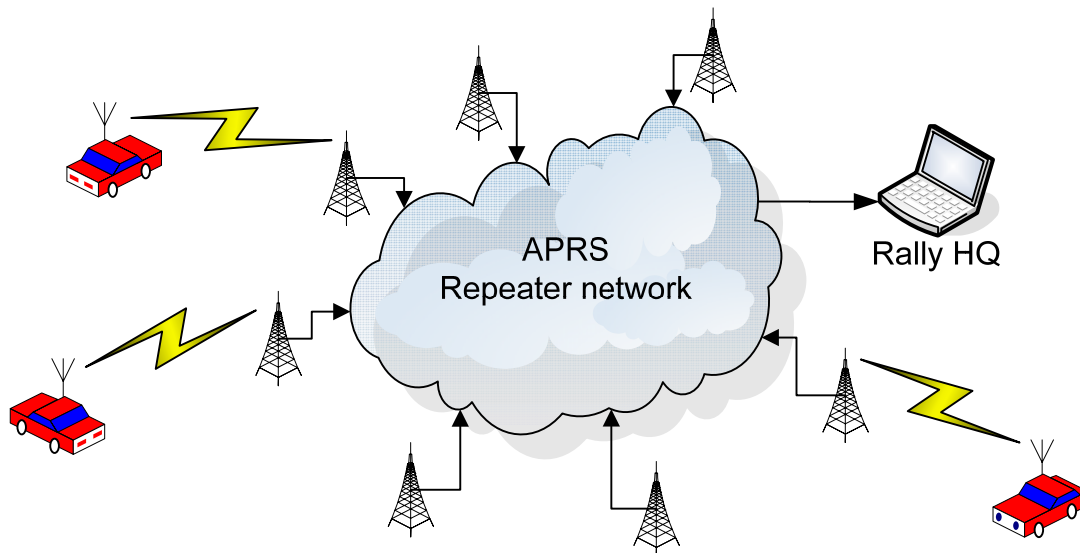
How does it do it?

Each location that is to send information has a radio transmitter and a unit that allows the data to be sent. If information about the position is required, a GPS is also connected.

The station is configured to send the information on a regular basis.

At the other end, a PC-based system interprets the information and displays it in a way that is easily understood by humans! This can be a position on a map, status information, message prompts etc.

To get the information to Rally HQ in Salen, a network of seven repeaters is installed around the island which provides 100% coverage of the rally route and intermediate roads.



How does this benefit Rally HQ?

At any time they accurately know the position – and therefore progress – of the road closing car, safety vehicles, chief marshal, car 00 and road opening, plus a number of rescue & recovery units and doctors.

Positions are updated every 30 seconds, meaning their position is known to within about 500m when moving and 15-20m when stationary.

In Rally HQ, each radio operator position and Rally Official “desk” has a laptop enabling them to examine in detail the position and progress of any vehicle.



On various stages, particularly the longer ones, rally officials rely heavily on the information provided to make safety critical decisions about (e.g.) when to send in the flying control car (00), based on the known position of the safety vehicles.

If any of the vehicles have to stop in stage to sort out problems, or travel to an incident, the location is immediately known to Rally HQ and the Police. This detailed information avoids any misunderstandings or ambiguity, particularly if additional resources are required to be sent in.

The benefits of APRS are immense. The radio systems used to communicate on each rally stage are separated from each other and there are limited direct radio links back to rally HQ, therefore it provides a level of real-time management information and overview that it would otherwise not be possible to have.

What is involved in setting up the system?

To give you an idea of the size of the APRS operation for the Rally, the following equipment is installed by a team of about ten RAYNET volunteers in a (short!) period of about 12 hours.

- 11 Mobile tracking kits – Radios, tracker, aerial and GPS
- 6 hilltop repeaters stretching from Calgary to Bunessan
- 3 Internet Gateways in outlying areas of the island
- 4 Reception and map display locations

As with anything to do with the Rally, all the kit has to be brought to the island and a significant logistical operation ensures the equipment is configured and put into kits prior to the event.

All equipment is supplied and managed by RAYNET and its volunteers. Most kit is owned by the Leicester and Aylesbury RAYNET Groups, plus some by the 2300 Club.

If you want to know more...

If you would like to find out more, you can contact the Mull APRS team at mullaprs@raynet-uk.net
Due to the pressured time around the rally, it is not feasible to answer questions during the weekend.

Glossary

<i>APRS</i>	Automatic Position Reporting System
<i>Digipeater</i>	Same as Repeater (stands for Digital Repeater)
<i>OpenTracker</i>	See Tracker (OpenTracker is a specific brand of unit)
<i>Packet</i>	The way the information is sent around the system – i.e. in data “packets”
<i>RAYNET</i>	Radio Amateurs’ Emergency Network – Voluntary Emergency Communications
<i>Repeater</i>	A unit that rebroadcasts information over a wider area
<i>TinyTrak</i>	See Tracker (TinyTrak is a specific brand of unit)
<i>TNC</i>	Terminal Node Controller – The intelligent box that is used on the hilltop repeaters
<i>Tracker</i>	Generic name for the unit that takes GPS input, connects to a radio and sends the location