



RAYNET and The Cup

RAYNET is an acronym for the Radio Amateurs Emergency Network, the UK's national voluntary communications service provided for the community by Radio Amateurs.

RAYNET was formed in 1953 following the serious floods on

the East Coast, when Radio Amateurs provided emergency communications which, at that time, were not permitted by their Licence conditions.

Since then, the value of such communications links have been acknowledged by the government, and the Radio Amateur Licence conditions were amended to allow RAYNET members to pass third-party messages on behalf of a wide range of Emergency Services; from the Police, Fire and Ambulance services, to voluntary agencies such as the Red Cross, St John Ambulance and the WRVS.

The RAYNET Cup is an annual trophy, presented to the RAYNET Group that has carried out significant work to enhance the image of both RAYNET and Amateur Radio. In his report put to the Radio Society of Great Britain's Board, the RSGB Radio Communications Volunteer Services Co-ordinator, Paul Gaskell, proposed the Gwent RAYNET Group "in view of the substantial work done by them in Tunnel communications, proving through a series of User Service exercises, that the use of 23cm [radio frequencies] works effectively in a number of Tunnels – thus gaining more interaction, support and confidence of the User Services and in doing so, significantly enhancing the image of RAYNET and Amateur Radio as a whole".

Two members of the Gwent RAYNET Group travelled to Belfast on Saturday 6 May for the presentation at the RSGB's Annual General Meeting. ■



Mike Biddiscombe and Terry Bowen of the Gwent RAYNET Group, with the RAYNET Cup at the RSGB AGM (06 May 2006)

Caerphilly Tunnel – the first exercise

The first tunnel-based communications exercise Gwent RAYNET were involved with, was at the Caerphilly Railway Tunnel on 16 January 2005.

Members of the Gwent and South Glamorgan Groups established radio stations at Lisvane Station and the Van Road overbridge in Caerphilly. A further radio station was established at the old station at Cefn Onn, where the 23cm radio equipment was set up, with a multi-element aerial pointing directly at the Tunnel portal.



RAYNET operators set up at the old Cefn Onn station with the 23cm aerial.

A RAYNET operator was also aboard an Exercise Train which travelled from Lisvane Station toward Caerphilly, before reversing back to Lisvane. The Caldicot-based "Unimog" of South Wales Fire & Rescue Service was railed at Lisvane and traversed the same route, on the adjacent line, into the Tunnel alongside the Train.

Using the 23cm radio frequency, RAYNET operators maintained communications with the Train throughout its entire journey. There was a certain amount of signal degradation as the train entered the Tunnel, but acceptable communications were maintained throughout.

There was a further exercise at the Caerphilly Tunnel in March 2005, at which RAYNET were able to participate again.

The basis of this second exercise was for the Emergency

Services to try out their equipment again, having identified a few problems at the first exercise.

At this second exercise, RAYNET "fine-tuned" their operating capability by having an operator aboard the Unimog; there was no exercise train on this occasion. Our thanks to SWF&RS for allowing us to position a radio operator aboard the Unimog. ■



The SWF&RS "Unimog" on its way into the Caerphilly Railway Tunnel. The Exercise Train was stopped in the Tunnel on the opposite line.



Avon Fire & Rescue Service "Road/Rail" LandRover railed and ready-to-go at the Severn Railway Tunnel Rendezvous Point, Pilning as part of Exercise "Avon Express" which took place on 17/18 September 2005.

“Avon Express” – the big one!

Exercise “Avon Express” was a major exercise held in and around the Severn Railway Tunnel, overnight on 17/18 September 2005. The exercise involved all of the Emergency Services, and support from the WRVS.



The view toward the Welsh portal from the location used by RAYNET operators during Exercise “Brunel”. A fair distance to get the radio signals into the tunnel before exiting the other end!

First Great Western provided an “exercise train” which carried around 70 volunteers who were to be “evacuated” from the train after a simulated incident. A RAYNET operator was also allowed aboard, with the intention of establishing a communications link between himself and

RAYNET operators located at the Pilning Rendezvous Point.

At the start of the exercise, the train was taken into the tunnel, and came to a halt some 2.4-miles from the English-end of the Tunnel. Two-way communications were successfully established with the RAYNET operator aboard the train using 23cm radio frequencies. Information received from the train was passed to the “Silver Control” at Sudbrook Pumping Station and, subsequently, to Network Rail staff based at Cardiff. Likewise, information was dealt with in the opposite direction.

It should be noted that RAYNET communications to and from the tunnel were made via a “direct route”, whereas the Fire Service have a special system that acts as a repeater to allow their radios to work within the tunnel – RAYNET do not have any form of repeater to assist their radio signals within the tunnel environment.

The RAYNET operator aboard the train used a handheld, low-power radio with a home-made “copper-tube” aerial attached. The operators located at the RVP used a higher-power radio, with a multi-element aerial similar to that used during the Caerphilly Tunnel Exercise. The quality of communications between the train and Green Lane were excellent considering the on-train operator was in the rear coach of the train, furthest away from the Green Lane tunnel portal.

At one point, there was some scepticism as to whether RAYNET really did have communications with the train and a senior Police Officer (at Sudbrook) requested information from the train driver. This was duly collected and returned to the Officer concerned.

With the exercise train being stopped for some time, in the middle of the tunnel, with all lights out, there was a case of a “passenger” becoming uncomfortable in the conditions. With the RAYNET operator aboard the train,



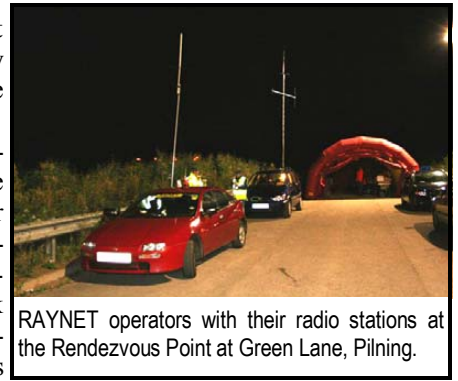
The home-made aerial used by the on-train RAYNET operator.

information about this real casualty was passed to the Ambulance Service.

As well as the radio link with the RAYNET operator on the train, a separate link was established, for Network Rail, between tunnel-area locations and the local Control

Office in Cardiff. This link was used to pass information to/from the tunnel-area and other, railway-specific message traffic which was a good test for RAYNET operators who are not normally dealing with such technical jargon.

Exercise “Avon Express” was an excellent test for RAYNET and proved that it is possible to establish direct communications into the Severn Tunnel. ■



RAYNET operators with their radio stations at the Rendezvous Point at Green Lane, Pilning.

Exercise “Brunel” – an ideal follow-up

From a RAYNET point of view, it is difficult to know how to follow-on from the success of establishing a radio link into the “black hole” of the Severn Tunnel.

On a bitterly cold night in January 2006, we had an opportunity to “try something else” at the Severn Tunnel, through participation in what was a “Familiarisation Exercise” for the Fire Services.

For this exercise – we called it “Brunel” – we decided to attempt to communicate through the tunnel (end-to-end) with operators at the Green Lane RVP and at a location opposite Caldicot Railway Station.

Again, with the help of members from the South Glamorgan RAYNET Group, we successfully established two-way communications between tunnel portals using the 23cm frequencies. The radio stations at each end were located approximately 1/3-mile from the tunnel, adding to the “distance” the radio waves had to travel before entering the tunnel.

With these successes, we really do now have a problem as to what can we do next? ■

And finally. . .

The members of the Gwent, South Glamorgan and Bristol RAYNET Groups would like to thank Network Rail and Avon Fire & Rescue Service for granting RAYNET permission to participate in these exercises. Such exercises have expanded the technical knowledge of what RAYNET can provide for those that may call upon RAYNET for assistance. We hope that RAYNET may become involved in future exercises.

Photo Credits:

Avon Fire & Rescue, Adrian Balch (NR), Alun Thomas (NR), Terry Bowen (GRG), Kevin Snelling (GRG).

If you would like more information about RAYNET or the content of this newsletter, please contact mw1azr@btinternet.com or phone 07010726248.