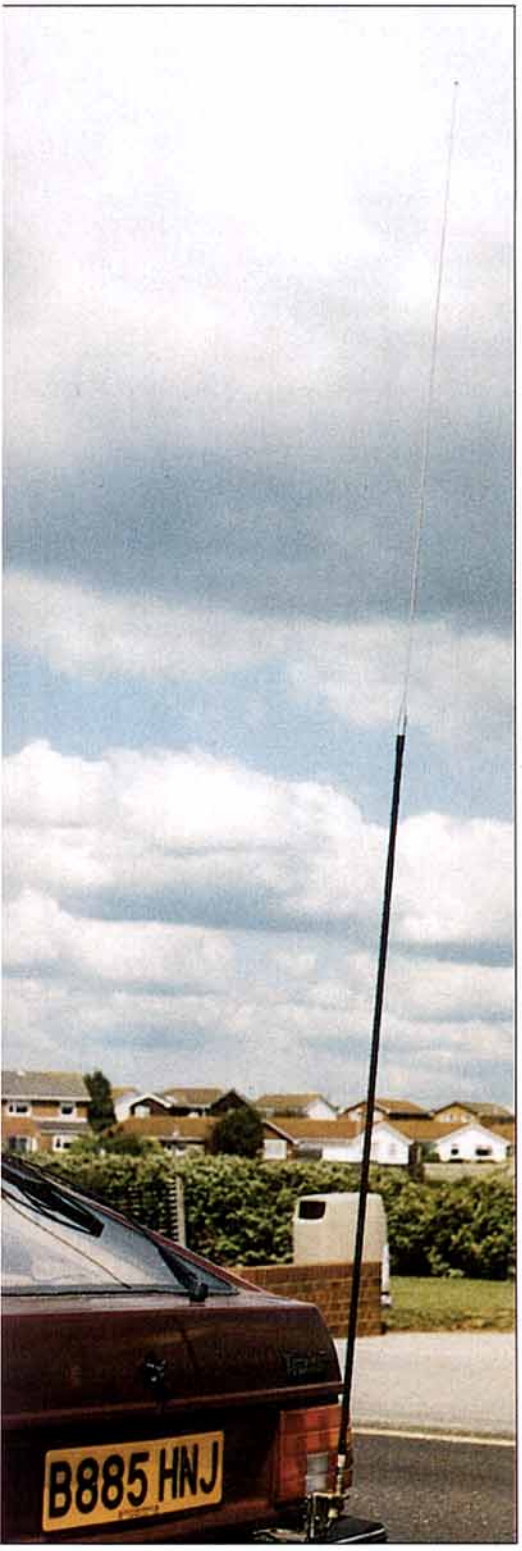
RADCOM USER REVIEW

Pro-Am Series of HF Mobile Antennas

Reviewed by RSGB HQ Staff



THE PRO-AM ANTENNAS are a range of mobile antennas, manufactured by Valor Enterprises Inc, Ohio, USA, for the HF bands. A list of antennas available is given at the end of this review.

This review covers two of the antennas in the range, namely the PHF80 for the 80 metre band and the PHF20 for the 20 metre band.

The Pro-Am antennas are very slender and have a low visual impact, see photograph (left). On the PHF20 the lower section of the antenna comprises a 125mm long fibreglass tube, only 10mm in diameter and the loading coil is wound as a helix along the full length, using a method called continuous loading. On the 20 metre antenna the coil is wound with a winding spacing of 18mm from the bottom to 24cm from the top. The coil is then close wound for 55mm followed by three turns over the last 17cm length of the fibreglass tubing. This last section is to accommodate the adjustable whip section; more about this later.

Construction of the PHF80 is similar except that the coil is close wound from the bottom to within 17cm of the top; nearly the whole length of the fibreglass tube.

AJUSTMENT OF RESONANCE

THE ADJUSTABLE WHIP section is fixed to the top of the fibreglass tubing coil with a stainless-steel bush and held in place with a couple of Allen screws. The effective length of the whip section is achieved by sliding the whip into, or out of, the fibreglass tube to set the resonant point of the antenna to the preferred section of the band.

The instructions with the antenna advised against a setting that results in the lower part of the whip inside the coil. They suggest that if operation is required at the top end of the band (where the whip section is shorter) then a short length should be pruned from the bottom of the whip section; steel cored coils are very lossy! This can easily be read as 'none of the whip section should be inside any part of the coil'. Subsequent examination of the whip section showed that the coil was designed so that part of the whip could be inserted into the top section of the coil with very little loss, see photograph (right).

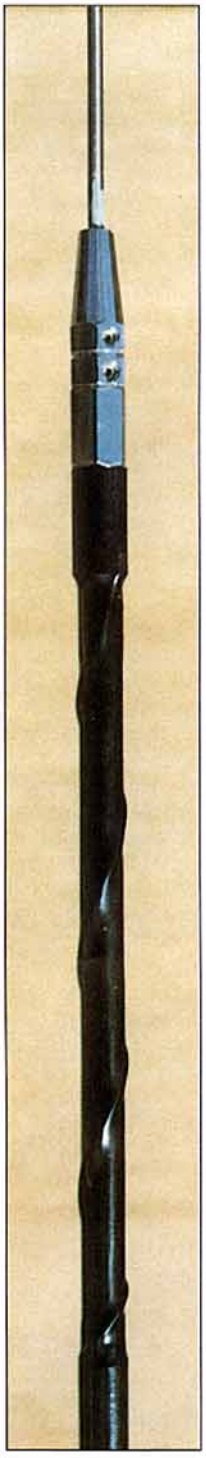
Left: The Pro-Am antenna has a low visual impact so is difficult to photograph.
Right: Top section showing the construction of the coil and the arrangement to accommodate the lower section of the whip without noticeable loss.

HELICAL WINDING

TRADITIONAL wisdom regarding mobile antenna design in most antenna handbooks favours relatively short, larger diameter coils with a high Q [1].

However, in a recent *RadCom* [2] Denis Walker, G3OLM, noted that an important parameter of mobile antenna design is low self capacitance of the loading coil; and that this may account for why the very long coils, favoured by the commercial manufacturers, have proved to be so successful. This view was also stated by John Belrose [3] who said: "Since the Q-factor for a helix can be the same or better than the Q-factor for a centre loaded whip, its radiation efficiency can be at least as good . . ."

The G6XN analysis [4] of an 80 metre quarter wavelength of wire helically wound on an 8ft former (1in diameter) is that its efficiency would be 3.6% compared with an efficiency of 4% for a centre loaded design. He does then goes on to say that the helix would be somewhat improved by coil spacing tapering, ie wider spaced winding for the lower half and closer spacing for the top half (this construction is used on the Pro-Am antennas).



CONTINUED ON PAGE 80

RMS VOLTAGE

I THINK IT should be mentioned that the RF RMS voltage probe (*RadCom*, April, p67) is not named according to normal practice and therefore might mislead those without experience of measurement errors. The .707 calibration factor used applies only to sinusoidal waveforms (and very rare oddities that give the same result).

Most commonly available AC voltmeters respond either to rectified average, or as in this case, peak voltage. By long standing convention, more appropriate in the electricity supply industry, a scaling factor then sets the scale to read RMS on the assumption that the waveform is sinusoidal. Also by convention, the term RMS meter or TRUE RMS meter is reserved for instruments that really do respond to the RMS magnitude of the signal to be measured whatever its waveform. This requires one of several possible special techniques for processing the waveform. Such instruments are normally very limited in frequency response or very expensive.

R H Pearson, G4FHU

Technical Update

COHERENT CW, LATEST

Since the article on page 38 was written there have been important new developments. The original frequency suggested has now been changed to 35kHz up from the bottom of each band.

A new program called PCW (Precision CW) has been written by Dr.-Ing. Ernst Schroder DJ7HS developing COHERENT further and making it more acceptable to the average operator - COHERENT is more for the experimenter and includes features not available in PCW. However, PCW is an excellent program for the operator who just wants to operate CW coherently. It uses the same interface board as COHERENT and will not work without it. The program is shareware and should be available from shareware dealers in the near future. In the meantime if anyone would like a copy I will be pleased to supply one. In America copies can be obtained from W6HDO, 950 Pacific Street, Morro Bay CA 93442.

In both cases a contribution towards the cost of the disk and postage would be appreciated. DH7HS is making his own arrangements to distribute the program in Germany.

Peter Lumb, G3IRM

THE AMAZING ERROR

IN THE JUNE EDITION, we published Part Two of 'The Amazing 1-T-1 Receiver'. Amazingly we managed to get the callsign of the author wrong both in the article's byline (G3DXW) and on the contents page (G3DXN). Chas Fletcher's real callsign is G3DXZ - apologies to him. *RadCom's* Technical Editor has been sent on a typing course. ♦

PRO-AM SERIES OF HF MOBILE ANTENNAS

CONTINUED FROM PAGE 44

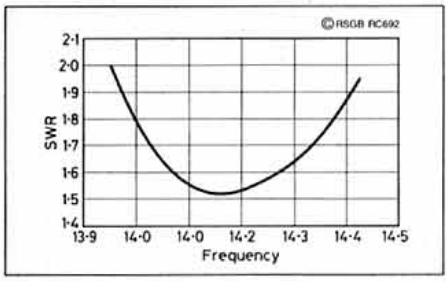


Fig 1: SWR curve for the PHF-20.

PERFORMANCE

IT WAS INTERESTING to see how the Pro-Am would perform. The ideal antenna test arrangement is to be able to compare one antenna with another. This is not a practical solution for mobile and the best that can be done is to use it over a period of time and the log book should tell its own story.

The antennas were rear bumper mounted (although well earthed to the car metalwork) and connected directly to the transceiver via 50Ω coax without any matching arrangements. SWR curves for these antennas are given in **Figs 1** and **2**.

The first test QSO on 80 metres was with LX5OV. QSOs throughout the UK and Europe were easy to achieve although the narrow bandwidth (in common with all small 80 metre mobile antennas) restricted one to a relatively small section of the band while driving.

On 14MHz European contacts were achieved even under even the most difficult conditions and DX contacts were possible when the band was open. Stateside QSOs were fairly common, usually with 5/5 reports. One unusual mobile contact was with W4XJ, which lasted over an hour, on a journey from the south coast to Potters Bar.

CONCLUSION

THESE ANTENNAS performed better than expected for such a low profile design. Some earlier commercial helix designs were not always successful, possibly because of the choice of wire and the winding spacing.

It would appear that, performance-wise, there is little to choose between the helix and the conventional centre loaded design. Where the Pro-Am scores is in the mechanical construction. Not only does it have a low profile and low windage but the manufacturers appear to have addressed the problem of weatherproofing. There is no sign of corrosion on either of these antennas after a year of use.

The only criticism is the documentation. The description of setting the resonant length is a bit ambiguous. And additional information on how to use shunt capacitor matching to obtain a lower SWR than shown in Figs 1 and 2, would have been useful.

The antennas are available for all bands from 160 to 6 metres. Pro-Am antennas are available from Martin Lynch, 140-142 Northfield Avenue, Ealing London W13 9SB. The prices are as follows: PHF6 to PHF20 £19.95; PHF30, £26.95; PHF40, £22.95;

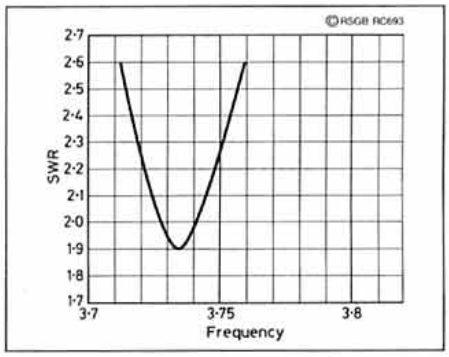


Fig 2: SWR curve for the PHF-80.

PHF80, £24.95; PHF160, 54.95. (The PHF160 is a much larger antenna than the ones described in this review).

REFERENCES

[1] *The ARRL Antenna Book*, 17th edition, chapter 16.
[2] *Technical Update*, *RadCom*, June 1995, Denis Walker, G3OLM (see also *Technical Update*, July 1995).
[3] *The Handbook of Antenna Design, Volumes 1 and 2*. IEE, page 1323.
[4] *HF Antennas for All Locations*, (RSGB) L A Moxon, G6XN. ♦