The Use of an ATU

Hi Members of Famparc.

During a recent club meeting, a conversation regarding the use of an ATU developed. Some members believe. wherever possible you should tune your antenna to resonance and not use an atu.

The obvious question "why not" what is the advantage in not using an atu? Good question.

Normally fi one is erecting a simple dipole for any HF band is it usual to tune it for the middle of the band and except you may have to use an ATU when using the lower and higher ends of the band. Some would argue why mess about tune the antenna as best as you can and use your atu constantly.

A reasonable comment one would think. To my mind it isa very similar comment, why do we use Coax feeder including all it's losses. When we can use balanced feeding with virtually no losses? Convenience.

I thought this question was worth perusing in the simplest of testing. However please note this exercise applies to antennas fed with coaxial cable and not balanced feeders .

I tuned my six band vertical on the 30metre band which is only 50k's wide. It was tuned to resonance on 10.110 so did not require the use of an atu on any part of the band. I ran a full 100 watts from my TS2000x. My coax feeder is approximately 100 ft or 30 metres long.

Without ATU		**Using an ATU**
10.102	90 watts output	75 watts output
10.105	90 watts output	75 watts output
10.110	90 watts output	75 watts output
10.110	90 watts output	75 watts output
10.120	90 watts output	75 watts output
10.130	89 watts output	74 watts output
10.140	88 watts output	72 watts output
10.150	87 watts output	71 watts output

What do these figures mean. With a resonant antenna there is a ten watt/10% loss in the feeder, which may be reduced fil made my feeder an electrical half wavelength or a multi electrical half wavelength.

However, as my antenna is multi band, this is impractical. Also note the further I move away from the resonant point: my power loss is greater.

Now let us look at the same antenna using an atu. At 10.110 there is a 25 watt loss, which represents a quarter of your power is being lost. I realise the feeder loss is included in the above figure, however, this exercise is simply to give you a guide of output power losses.

Roy VK3GB