I have reverse engineered this from an old VECTRONICS ATU Model VC300LP(PreMFJ) which has a 48 turn sliding contact high Q ferrite L. But it looks the same as the VC-300DPL, & also the Canadian AEA’s QT-1 model, but they only have a 12 tap L switch & large lossy air inductor!

It is a small cheaply made unit, but it does have many advantages as there is a lot in the one box.

Aerial Tuning Units are also called Aerial Matching Units. But the best aerial is one that is already "tuned by design" (cutting) & a good match (tap point)!

**FEATURES**

- **8 Position Switch:** - 4 Aerial Choices, Bypass, Coax 1, Coax 2, & Wire.
- **4 Option with ATU:** - 3 Aerials & 1 Dummy load for pre tuning.
  - 300W max. (150W @ 1.8MHz) SSB ATU Rating. 4:1 Max SWR @ 300W.
  - ATU is "T" Type, 48 tapped ferrite inductor, 2 tuning Caps (1000V rating).
  - 30W & 300W Forward scale cross needle power meter.
  - 6W & 60W Reverse power scales, for increased SWR sensitivity.
  - Average & PEP meter modes. (PEP poor design)

- **Built in dummy Load** (50W cont, Max 10 seconds @ 300W?).
- **4:1 BALUN option** for balanced aerials (link from wire ant)
- **12V Meter scale Lamp & on/off switch.**
- **Size** 10.2 x 9.4 x 3.5" or 257 x 85 x 197mm, weight 3.4LBS
CIRCUIT

The SWR bridge is quite conventional. The PEP mode with large 47uF is not effective, an active system is really needed for true PEP!

**CONSTRUCTION**

It uses thick 2 U part aluminium case, thick open wire for all internal connections & the impedance is then tamed by the addition of extra caps to ground. (e.g. 68pF across the internal load & 30pF after the SWR Bridge.)

The toroid ferrite inductor has a sliding contact over 48 separated turns on a moulded former, some similar models just have 12 taps to a switch.

A single PCB provides for all the component mounting except the main switch, ATU components, & dummy load. All earths are to the local chassis with locking washers.

The SWR bridge circuit has a few added components to ensure accuracy over the whole HF frequency range.

**TUNING UP**

If doing this on someones operating frequency, DO QSY 3kHz first! The best tuning method is to use the ATU into the dummy load first at low power (between 10 & 30W) & pre-tune it, set the ATU with both Cs @ 50% & adjust the L tap for initial minimum SWR. Then tweak (rock too & throw) both the Cs for a perfect 1:1 match. This can take time as they are interdependant, & their combined capacitance tunes the L for the frequency used. On a 50Ω source & load the Cs should end up being equal in value. After that, switch to the aerial & re-tweak just the Cs for 1:1, they will no longer be equal on a non 50Ω load!

LOW POWER is the kindest tuning method for the ATU & also for minimum QRM. A very briefly re-tweaking of Cs only at full power may be an advantage as the meters are more sensitive to reflected SWR, with more power.

Both the output select switch & the ATU variable L, should not be changed if there is any great power flowing, as the contacts could be damaged with arcing!
IN USE

The ferrite balun & tapped ATU inductor can suffer saturation losses if used in-appropriately. But in general there is much less loss with a ferrite cored device, than the much bigger air spaced equivalents, as there is many times less wire needed & associated copper loss. Typically power loss is only 5% (0.2dB) @ 100W (100W in 95W out) on any band at any SWR (due to the "T" type ATU's high Q) which is quite low for a combined ATU & SWR bridge.

If the random wire aerial won't tune up to give 1:1 SWR then try a different length wire (shorter or longer by a metre or so) or add a series cap (200pF) or L (20 turns 3cm dia) can help.

The "T" type ATU is easy to use, although it is not so good at removing Tx harmonics as the Ø (pi) type. But it does an excellent job of protecting the Rx from DC static, & strong signals on lower bands, that some poorly filtered SRD Rx can suffer from! (e.g. removing MW Broadcast signals as it is >-18dB for each frequency halving.)

MODS

1/ The black knobs on black background are not that visible, I have painted white lines on mine, so I can easily see their directions in low light.

2/ I blackened the dummy load & the aluminium plate it is on, with spray mat black, & used heat compound between that & box bottom. This all improves the load's dissipation, so more power for longer is possible, or less chance of burning it out!

3/ The cross needle meter needed damping as it is, is very swingy, see my Meter damping/speed up bulletin for corrective action.

See also my Tech buls on "HF ATU & SWR Bridge MFJ-904H", "Palstar AT1500CV ATU" "Drake WH7 QRO HF SWR Bridge", "A Homebrew HF SWR Bridge", "PEP Meter modification", "Meter Damping & Speed Up" & "QRP SWR Bridge".

Why don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP