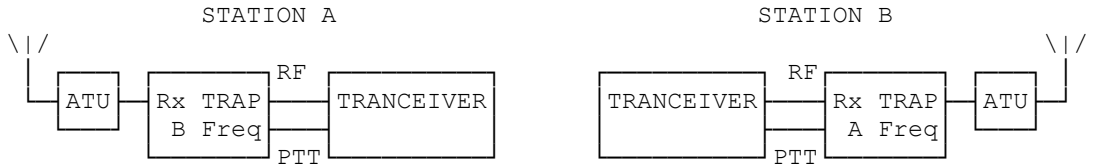
By G8MNY (Updated Sep 08)
(8 Bit ASCII Graphics use code page 473 or 850)
When doing demo stations with more than 1 Tx on different bands (or with a nearby ham), QRM between stations is quite normal, even with the high Q tuned circuit of an ATU.

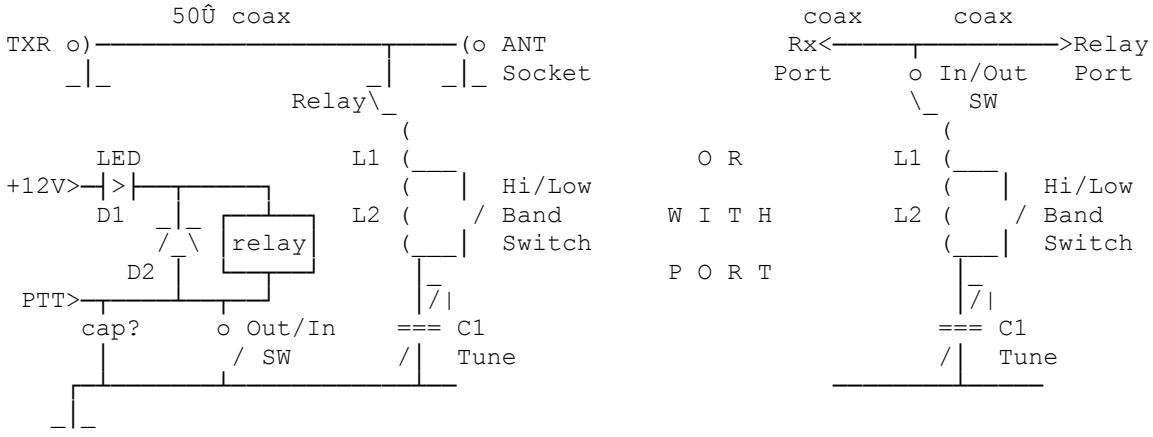
Here is one method to remove most of the problem from the aerial lead. (from a system built up for 2 FT101s by G0SYR years ago & revisited for more modern rigs.)



It uses switchable Teed in series tuned traps (notch) that are only in circuit on Rx. If the transceivers have a transverting loop through ports, then the circuit is quite simple, otherwise a relay operated by the PTT is needed as well.

This device also stops the Rx safety lamps (if fitted) from blowing up.

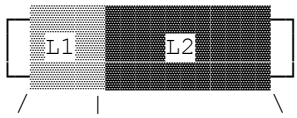
THE TRAP
It is only connected in Rx mode, so there is no high voltages, but good quality components & layout in a sold metal box are needed to give the good Q & deep reject notch on the 50Û line.



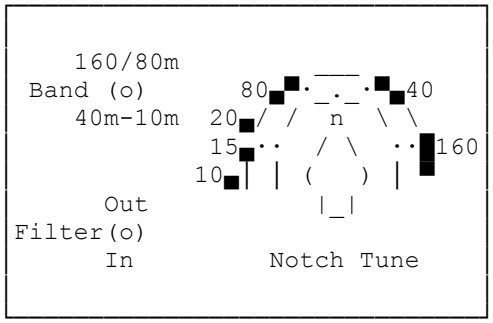
D1 LED/1N4001
D2 1N4001
C1 2x 350pF Air spaced (MW radio cap)
L1 1uH, 12 Turns 1mm Enamelled Copper Wire on 1cm former (oval egotube).
L2 10uH, 44 Turns of 0.7mm ECW on 1cm former (oval egotube).

If your using a rig accessory socket for ptt relay power, be careful not to short it, Andy G0FTD recommends a series LED as a fuse. If your relay is no too RF isolating to the winding or you experience Tx mode lock up add a capacitor (1nF) across the PTT line.

Both coils are on the same former in line, wound in the same direction. So more L in series & less L when L2 shorted.



FRONT PANEL

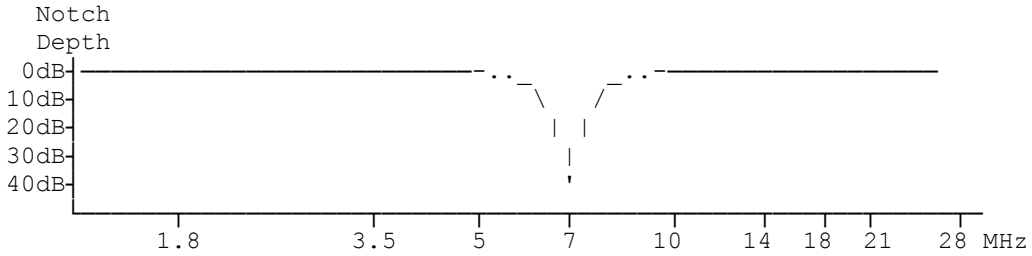


Scale calibrating:-
connect to Rx & mark
the band ends etc.
by nulling signals.

The band switch is
colour coded, & the
same colours mark
the ham bands on
the dial.

IN USE
Typical notch depth is 30-40dB, but tuning is critical for the peak. However notching the QRM down by 20dB or so, generally removes all Rx overload QRM.

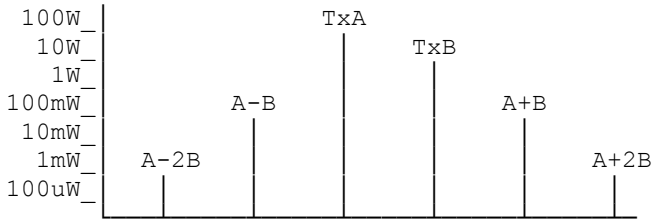
Notch Rx attenuation width, does not extend to the next ham band, so adjacent bands like 5MHz & 10MHz can just be used while notching out 7MHz.



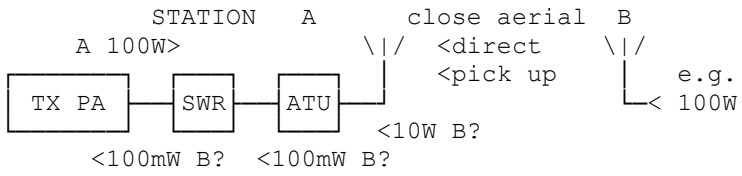
Note that 2 stations operating locally, have QRM paths other than the aerial! e.g. via mains/12V leads, poor coax, poor metal case screening etc.

Also of course the trap does NOT remove any of the other station's Tx harmonics so you still will have some spot frequencies to avoid. e.g. a 100W of CW on 3.510 MHz will give a strong signal on 7.020 MHz & that can't be notched out!

TX MIXING & ATU BAND FILTER ACTION
High levels of coupling between Tx aerials can cause QRM to other HF services as the Tx PA can mix its own signal & with other strong ones!

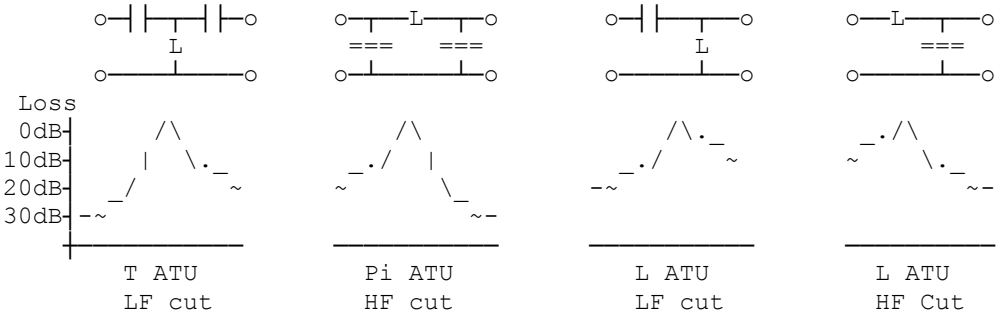


So there is still a need to have the aerials separated enough, so that there is next to no power seen by the PA. e.g. the SWR bridge ATU on station A (between ATU & Tx) should not be indicating power from station B (SWR direction).



With a good enough Q between the aerial & the Tx stage in this example 100mW (-20dB of aerial signal) gets to the PA & will produce unwanted products in the PA (acting as a Mixer) say at 10mW each, these then have to go back through the same tuned circuit to reach the aerial @ 100uW each. With valve PA equipment the high Q of the PA tank circuit also helps a lot, but this is not present on a modern solid state broadband HF PA.

This is where a manual "T" or "Pi" Hi Q ATUs come in to their own, by providing more band isolation (20dB off resonance & 18dB/O cut off), compared to the simpler 2 component "L" type ATU (Automatic types).



Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP