



## Subject: AR7030 Sync detector

A 30Hz error in initial tuning is quite in order - this phase is only to get the receiver roughly tuned and the filters in the right place and this error should not affect subsequent Sync tuning.

If you hear a beat tone when the receiver switches from wide sync bandwidth to narrow, it is almost certainly due to a small alignment error causing an offset between the different bandwidths.

Re-adjustment is quite straight forward (instructions follow). Ideally you should have a digital voltmeter to fully align the detector. If you haven't, and can't borrow one, then omit step 5 of the alignment and make no adjustment of VR2.

### Field alignment of AR7030 Sync Detector.

#### Equipment required : DVM

- 1) Switch on the receiver and allow 15 mins warm up.
- 2) Remove top cover. Leave the internal LS connected, or connect external LS or 'phones. If the NB7030 option is fitted, leave this in situ.
- 3) Remove any aerial and operate 'Default Set'.
- 4) Select AM Mode and tune the receiver to zero (000.00 kHz)
- 5) Connect the DVM between TP3 and TP4 (near to the centre of the PCB) then adjust VR2 for a reading of 0V (less than 10mV is optimum).
- 6) Choose the CONFIG menu and select 'Sync Detector' - Select 'Narrow'.
- 7) Select Sync Mode and adjust VR3 for zero beat. (Adjust the volume setting as required).
- 8) Change the Sync Detector setting to 'Auto' and check that the auto process cycles until 'Snc' is displayed with no beat note. Change between AM and Sync modes if required, repeat the process above.
- 9) Replace the top cover. Be sure that the cover is fully down (press firmly) before inserting the four fixing screws. Do not over-tighten the screws.

## Subject: AR7030 Sync detector heterodynes

Well, I was wondering when someone would mention the background heterodynes on the 7030's Sync AM mode. Given a few more components, a bit more PCB space and a bit more money (all in short supply) the problem could be fixed, but as it is there's just a good old engineering compromise.

The effects come from harmonic mixing in the Sync Car mixer where the Sync VCO is combined with the DDS signal (check it out on the block diagram). Mostly the spurs are at least 40dB down and are barely audible on a well-modulated AM signal, but their level and pitch are dependent on alignment, PBS setting and temperature. A small adjustment of VR3 will move them around and you may be able to improve things. Since you have the alignment instructions you can always return to the factory settings if needed. No damage will occur to the receiver from adjusting VR2 or VR3.

A further improvement may be obtained by reducing the value of R109 (I suggest adding 4k7 or 10k in parallel). This increases the injection into the product detector and helps to suppress AM sidebands on the carrier signal. The downside of this is that carrier coupling into the IF chain is increased, and this may result in a small residual S-meter reading on LSB or USB mode at certain PBS control settings. The carrier leakage into the IF is by magnetic coupling between the carrier filter (X13) and the selected IF filter, so it is dependent on bandwidth and may not occur at all with a Kiwa filter.