

E3750 Notes – Compliance CZH15a LPFM Transmitter

REF: Gazette Notice - 2015(go694) dated Feb 12 2015

Sect 48 Radio Communications Act 1989

Application: These LPFM transmitters are sourced primarily for use in New Zealand schools as a valued educational tool. They are an integral part of a broadcasting studio set up within the school confines. All associated studio equipment is supplied by Si Tech, Hamilton, who as suppliers of a wide range of educational resources, are our exclusive sales agents for this application and deal directly with the schools' representatives.

A photo showing the standard studio equipment and school studio set up is included in the compliance folder.

Compliance Modifications to Transmitter:

- 1** The ability to switch between Low and High power via a combination of buttons on the front panel is completely disabled.
- 2** The circuitry is internally modified to set a maximum power output fixed at 1.85W (+/-3%) mid band, nominally 93 MHz. This provides a measured output in the upper and lower guard bands allocated for LPFM that is lower than this setting. Given the gain (approx 2.15dB) of the DP100 antenna we supply and offset against the losses expected from the RG58 feedline we recommend be used, it is calculated the final EIRP will fall within the field strength allowed (95dBuV/M 100M).
- 3** A realignment of the Transmitter's LPF network is undertaken and a spectrum analysis performed on each unit to ensure any spurious emissions, particularly any in the Aeronautical band 115 -135Mhz, are near or fall below the noise floor of test equipment (below -110dBm) and therefore compliant with Table 2 Gazette Notice 2015 go694.
- 4** Each unit is labelled externally (and internally) with our ERAC identification # and a serial number.

Table 3 Spurious emission measurements.

A measured RF output (Nominally <1.7W) is connected via an RF "sniffer" to the analyser. Modulation, (a musical track) is sourced from the output of a computer sound card, and the levels set to provide as full a band occupancy as would be expected from 256KF3E/F8EHF, without any distortion.

All analyses are then completed as per defined parameters in Table 3, for the duration of the music track – representing a hold time in excess of 10 minutes.

A separate analysis is provided at both ends of each guard band allocation on 87.6 and 88.3MHz and 106.7 and 107.7MHz respectively for lines 1 and 2 of Table 3. Line 3 specification is measured on the upper and lower frequency limits - 87.6 and 107.7 Mhz.

The *x axis* is an equally partitioned display of the frequency range in MHz, the *y axis* is expressed in dBm, where -40dB represents the transmitter output power of 1.5W.(+/-2%)

Appendix – Practical considerations for setting deviations levels in situ.

Given our schools LPFM stations are run by non-technical persons, ensuring correct deviation levels are maintained is not easily monitored. After setting up the station, we strongly urge a "no fiddling" policy be enforced by school staff. In practice one of the easiest methods is to ensure they check the "volume" level of their on-air signal against a local FM radio station, using a standard FM receiver. We suggest their signal should never sound louder than the local station – in fact they should need to turn the volume up slightly on the receiver to achieve the same volume levels. It is difficult to assure non-technical personnel that volume has nothing to do with signal strength or local coverage. A plus is, in practice, discernible distortion occurs before "full band occupancy" is attained.

All sound desks are equipped with adequate audio level displays in the form of an LED scale or active VU meter that we insist be carefully monitored to ensure a high quality signal without distortion.