**K9HZ LPF V1.00**

**DESIGN PREMISE**

**SWR/POWER MEASUREMENT.**

The SWR/Power measurement section on the K9HZ LPF Control board was designed to measure a power range from either 0-20W or 0-100W, to match the power level of the installed PA and yet still stay within the input range of the AD8307 Log Amplifiers (U14 and U19) input ranges. This can be accomplished by either selecting resistors for the input pads to the Log Amplifiers (R16, R17, R18 for U14, and R22, R14, R25 for U19), or how the coupler/ transformer is wound.

A diagram of a circuit board

Description automatically generated

The input range of the AD8307 is -75 dbm to +16 dbm. Also, 20W is 43 dbm, and 100W is 50 dbm. For a maximum input of +16 dbm, the coupler/ transformer and the pads must have a power reduction of 43 - 15 = 28 dbm for 20W. With windings of 10 (secondary) to 1 (primary) we get a reduction of 20 dbm, Therefore, the pad must be 28 – 20 or 8 dbm.

Using the equations for a pi-type pad at 50 ohms that gives 8 dbm reduction for R16-R18 (R22, R24, R15 is an identical pad)

A diagram of a circuit

Description automatically generated A math equations with numbers and symbols

Description automatically generated with medium confidence

The schematic shows the option where we change the winding of the coupler from 10 to 20 turns (-20 & -26dB respectively) and use the same attenuator resistor values (498R and 55R2, -26dB) for the 20W and 100W versions.

The other option is to keep the coupler windings fixed at 10 turns (-20 dB) and instead change the resistors to (1116R and 52R3) to get appropriate attenuation (-33dB)

Either option works equally well, so why don't we simplify the BOM by going with option 1 (same resistors, vary the coupler windings)? I won't be able to update the spreadsheet myself until I get back to Virginia mid-week.

design of the transformer, L44 (BN43-202) is to be