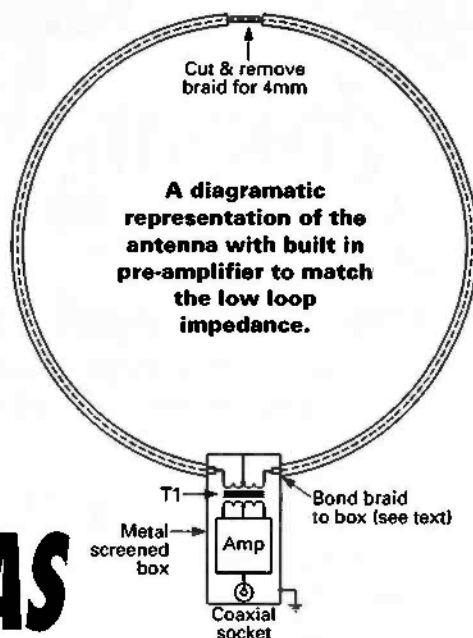


Having been a dedicated, maniacal loop antenna designer and experimenter for many years, Richard Q. Marris G2BZQ describes a pre-amplifier kit* for use between coaxial loops and shows how the range can be extended to cover the m.w. and 1.8-3.5MHz bands.

WIDE-BAND VLF/LF/MF AMPLIFIERS & COAXIAL LOOP ANTENNAS



Back in 1987, I read a write-up describing the H-86 pre-amplifier kit circuit by Ralph Burhans. The H-86 is a 10-400kHz kit for use as a pre-amplifier between coaxial loops and receivers. The kit then cost \$25.

It was even more interesting to me, because many years ago, at this QTH, experiments were conducted along similar lines using two valve (r.f. pentode with cathode follower) pre-amplifier, plus power unit, that used a large multi-tapped output audio transformer, to match the loop to the amplifier input. It was highly successful for v.l.f., l.w., m.w. reception, apart from the fact that it weighed as much as the accompanying receiver!

There is the GOOD and the BAD about using an untuned coaxial screened loop, with a wide-band pre-amplifier. The GOOD is that no tuning is involved, and one loop covers the whole frequency range. The BAD is that the loop and amplifier are wide-band/untuned giving a near certainty of signal breakthrough from a local high power station or one of its harmonics.

The advantage of a coaxial shielded loop, is that the ambient noise is considerably lower than any other receive antenna type. Also it is directional thus eliminating or reducing QRM/QRN by simple rotation.

The interesting thing about the H-86 was the use of a miniature 1:5 turns ratio audio transformers (primary and

secondary centre tapped) as input and output matching transformers. The balanced input circuit T1 covers inputs of about 1 to 10Ω impedance, and the loop is connected across the low impedance winding. Half of the other winding (P) is connected to a two-stage amplifier using a J310 and 2N3904.

The other half, of this winding marked AUX can be used to connect a signal generator or for an auxiliary long wire antenna if required. A similar type output transformer is used to connect the amplifier to the 50/70Ω receiver input via coaxial feedline. The amplifier gain was said to be 30-35dB.

In the circuit, capacitors C1 and C3 provide a low pass filter with about 400kHz roll off; and L1 and C2 are a wave trap to filter any interfering local signal (or harmonic). Two or more such wave traps could be fitted in series if more than one signal is breaking through. The L1 and C2 combination will obviously have to be resonated at the frequency of the offending signal or harmonic.

Ralph Burhans said that for use on medium wave or the 1.8-3.5MHz bands, T1 and T2 could be replaced with home-brew transformers using a few turns of wire on Amidon FT50-75 cores. It seems that in this case, the values of C1 and C3 in the low pass filters would have to be reduced or eliminated.

An f.e.t./bipolar cascode amplifier circuit gives low input impedance and high gain. Power is supplied down the coaxial lead to the receiver.

