

MSF Time Signal Clock Feed

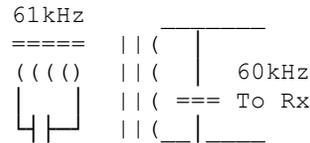
By G8MNY

(Updated Oct 08)

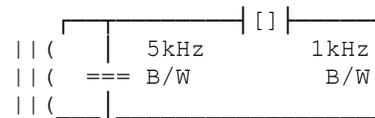
Dave M1CTK reminded me of a cure for the weak 60kHz time signal, I have used for Radio Studio Clocks that would not work in metal framed buildings due to the weaker signal & local QRM sources (PC/TV Screens). The system is also usable for the clocks tuned to the more distant German DCF (Deutschlandfunk) time standard Tx on 77.5kHz.

CLOCK CIRCUITRY

These often have just 1 small ferrite rod tuned to 60kHz, but on a German clock, I have seen 2 rods used at 90°, the idler one being tuned a few % off frequency, giving true omni Rx.



To get the narrow bandwidth needed with a TRF design, often a Xtal element at 60kHz is in series with the tuned circuit to the Rx. This gives less than 1kHz & is ideal way to remove unwanted bandwidth & QRM from the Rx signal.



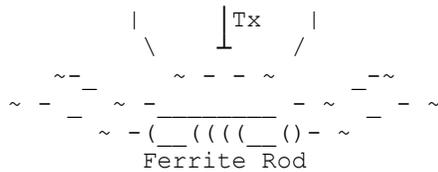
MSF MOVE

Now that the MSF Tx has moved from its central UK site at Rugby, to Anthorn Cumbria near Scotland, the signal in London has dropped 12dB. This is at a time when there is more & more QRM on the frequency, from broadband telephone wiring, digital TV, computer PSU etc. etc.

Just before the MSF Tx changeover, I visited a commercial radio station that had several radio controlled studio clocks, & said I doubt they will stay working, & I was right, they all stopped receiving the signal! They had to move clocks outside weekly for 30 mins, in order to have any sort of time keeping!

SIMPLE CURES

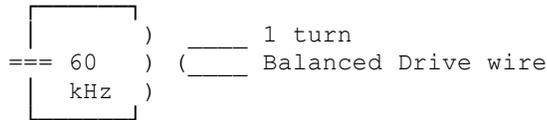
One reason for lack of service with a weaker signal is of course QRM, or poor location in a metal framed building, or just mounted with the aerial in the wrong direction.



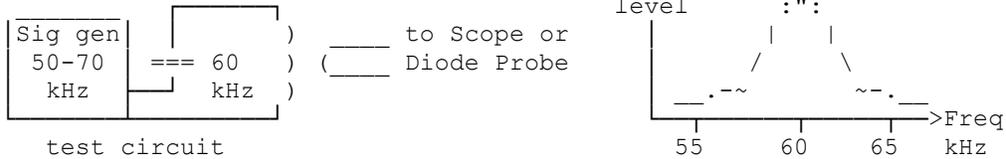
So try to relocate the clock (Rx) so that its' ferrite rod is perpendicular to the Tx, & away from QRM sources like TVs (4x 625 line TV timebase 62.5kHz!) or PC screens all SMPSUs & mains wiring. Then you may be lucky & it hears the MSF transmission for a few minutes a day & stays in reasonable time lock.

MY WEAK SIGNAL CURE

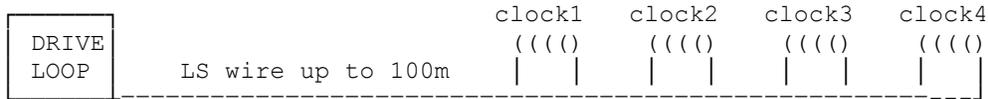
I used an external tuned frame aerial, to feed a set of these clocks. The frame was about 60cm square & made of plastic trunking to house 30 or so turns & a fixed capacitor (selection of) to tune it to 60kHz. Remember to make it water proof, e.g. drill holes in the bottom to let any tapped water out!



With an indoor location a variable capacitor can be used. Tuning will need some sort of 60kHz Rx or a GDO etc. Or drive the loop with the capacitor in series from a signal generator & monitor the field on the drive loop (e.g. scope/diode probe & meter).

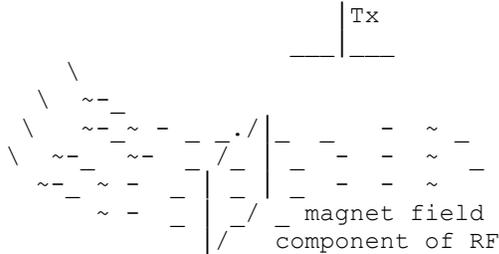


One turn is added to take the drive away on a balance line. The balanced drive line feeds 20 turns on a small ferrite rod glued on the back of every clock beside it's ferrite rod aerial.



The clocks are all paralleled up to the line, small chock block screw connectors work fine at 60kHz for this. Such a drive system from a large loop should provide ample signal. Further optimisation of the ferrite couplers can also be done with series tuning C tuned up as in the main loop, if maximum sensitivity is wanted.

LOOP AERIAL ORIENTATION



As MSF is vertically polarised ground loop orientation needs to be in the vertical plane with one edge pointing at the Tx for the maximum Rx signal.

QRM SOURCES

Do not put loop aerial too near mains wires running vertically in walls. TV sets & computer screens, have strong high frequency AC magnetic fields & can cause problems. SMPSU in computers, economy lamps & even remote controls, can all cause QRM, but normally only to weak signals.

Do not use it beside metal framed windows/doors/tin foil backed board walls, as these can effectively be a shorted loop & de-tune the loop as well as reduce the Rx signal.

Why Don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP