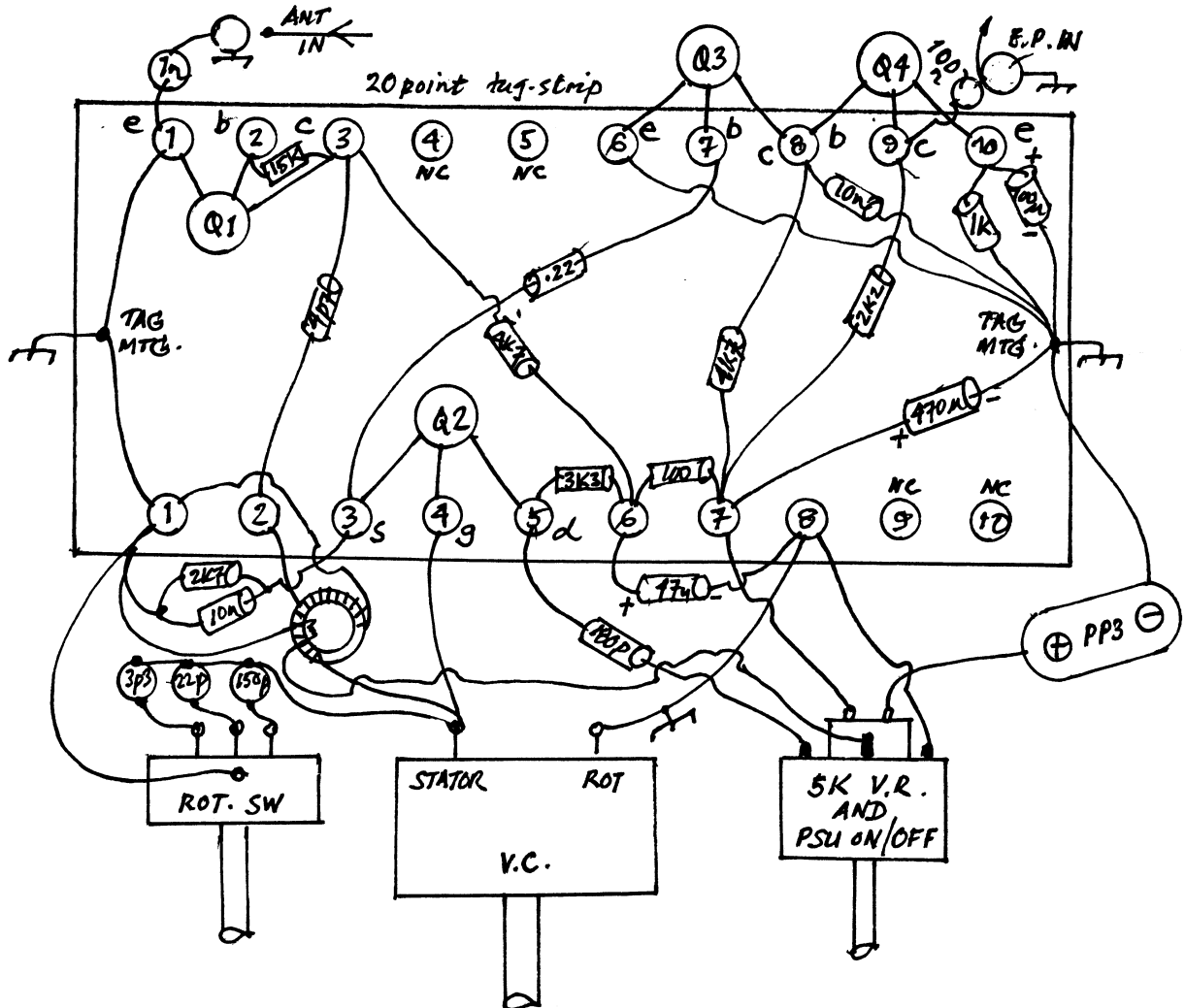


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The MB4 Portable SW Receiver

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Correspondence received has shown that a simple yet reliable DX receiver like the author's HF9 design (published in "Sprat" 82) is likely to be built and effectively used by not a few G QRP Club members. Some have requested point to point wiring diagrams to aid construction of such projects. This article offers such help and describes a circuit which pulled in a JA station at good strength the first day it was tested on 17 metres, the aerial being only a 3m throw-out wire lying in untidy coils on the floor. It is a simple, easily reproduced, sensitive, selective and stable, no nonsense design that can confidently be expected to pull in the DX when properly constructed.

The prototype was built in a very small aluminium enclosure measuring 100mm by 70mm by 60mm purchased cheaply from Maplin Electronics. This makes for very convenient portable use. With a current drain at 9v of only 4mA, a PP3 battery is all that is needed. I found I could squeeze one into this enclosure. The prototype happily accepted supply voltages of between 4.8 and 12 v without complaint or significant difference in performance. No hum worth reporting was noticed when a stabilised mains supply was used instead of a battery. Four clear miniature plastic and self-adhesive feet were attached to the bottom of the enclosure and labelling done using Dymo.

Only three panel controls are required for the MB4 (Multi-Band 4), compared to five for the earlier HF9. The output (to keep the truly portable emphasis) is to a crystal earpiece, which gives excellent reception (it is also XYLO/OM-friendly; should you so desire, you can listen to what she/he says with one ear and DX with the other, a feat less easy when wearing headphones!). High resistance headphones can also be used very effectively but please note that low resistance (e.g. 8 ohm) earpieces or headphones will prove disappointing. Do not use them for this receiver! A crystal earpiece gives correct impedance matching and very ample volume with this circuit without actually requiring an AF gain control.

This project can be built for very little expense but do not try to cut corners in buying the main tuning control, which must be a top quality air-spaced capacitor. Do not seek to economise here! A good sized tuning knob should also be used as tuning is sharp and especially so if your main interest is receiving SSB. Both SSB and CW are received with the circuit gently oscillating.

The only areas where difficulty is likely to be encountered is in winding the tuning coil and providing the exact amount of capacitance for connection to the rotary switch to cover three or more amateur bands. I offer the following for general guidance only - your version of this circuit could provide different stray capacitances to mine, so experimentation to cover the exact amateur frequencies desired must be an accepted principle. I decided that my own MB4 should cover the 17, 20 and 40m bands. I wound the tuning coil using a total of 28 turns of 26 swg enamel covered copper wire, centre-tapped (at 14 turns) for the input form Q1, on a T-50-2 red toroid core. The exact capacitance required to give me the three desired bands was 3.3pf (17m), 22pf (20m) and 150pf (40m). Had I wished to, a fourth position on the rotary switch with a capacitance of perhaps 68/100pf could have given me the 30m amateur band, but this is normally CW only and although all my HF transmitting is done on CW. I wanted just three DX bands where I could listen routinely to SSB as well. "Cut and try" methods WILL produce results - HAVE PATIENCE and the result will be coverage of three or more of your favourite bands with only one coil to be wound. If you wish to receive any two bands - for example, 20 and 40, the rotary switch can be done away with and a simple two-way miniature toggle switch used in its place.

For more experienced constructors, this circuit abounds with prospects for modifications! Some suggestions would be: - provide a 150pf polycon tuning capacitor for continuous coverage and do away with the need for rotary switch/capacitors for individual bands; try the use of an outdoor aerial. (Warning: you might need an eardrum transplant afterwards!). Change the three side by side panel controls

configuration described below to having the rotary control above the regen control with the tuning control/large knob on the left - in the interests of using a smaller aluminium enclosure (performance should be the same. I have tried it. Replace the 2.2K resistor in the collector lead of Q4 with a step-down miniature output transformer such as the LT700 (available from Cirkit) for 8 ohm earpiece or headphone use; via an AF volume control. Feed the circuit into a LM386 chip for powerful loudspeaker use (PP3 battery no longer sufficient). This modification will draw significantly higher current! Use a slow-motion dial to make SSB reception particularly, much easier. The experiments and refinements are over to you!