

## NEWSLETTER ARCHIVES

### 23 cms ATV SWR/POWER Meter - G3KAU

The meter was built with the ATV fraternity in mind. The simplified version using a single sensitive meter works fine for ATV (rms). However a 50microamp meter can be expensive and not everyone will want to disassemble it and install a new scale.

Adding an op-amp chip and a few components allows the use of a cheap ammeter of one or two mA full scale deflection. In addition the amplifier enables the use the instrument for pep measurements. If one feels flush with cash and a has a bit of expertise two ammeters version can be made giving simultaneous indications of forward and reflected power and, rms or pep.

Attached drawings show how to construct all versions. If single ammeter only is required with pep facility use only the one half (left or right) of the LM324, leaving the other side bare but tie the unused gates to ground.

The prototype of the meter employed 10GHz gallium arsenide diodes of unknown manufacture in a stripline package. These are no longer obtainable. Alternative is a Schottky diode BAT81 of a very small size, mounted radially across a 3mm dia hole with the leads lying flat on the striplines. This works well, though not as well as the original diodes. Indications of as little as a few tens of milliwatts can be obtained.

The strip line board is etched on a good quality double sided material. It is based on a drawing shown in the RSGB book but modified for use with 3mm smd components and employing 10GHz technique of grounding via the one mm dia. terminal pins. The pins are inserted from the top of the board, soldered from both sides with minimum of solder and trimmed flat to the ground plane.

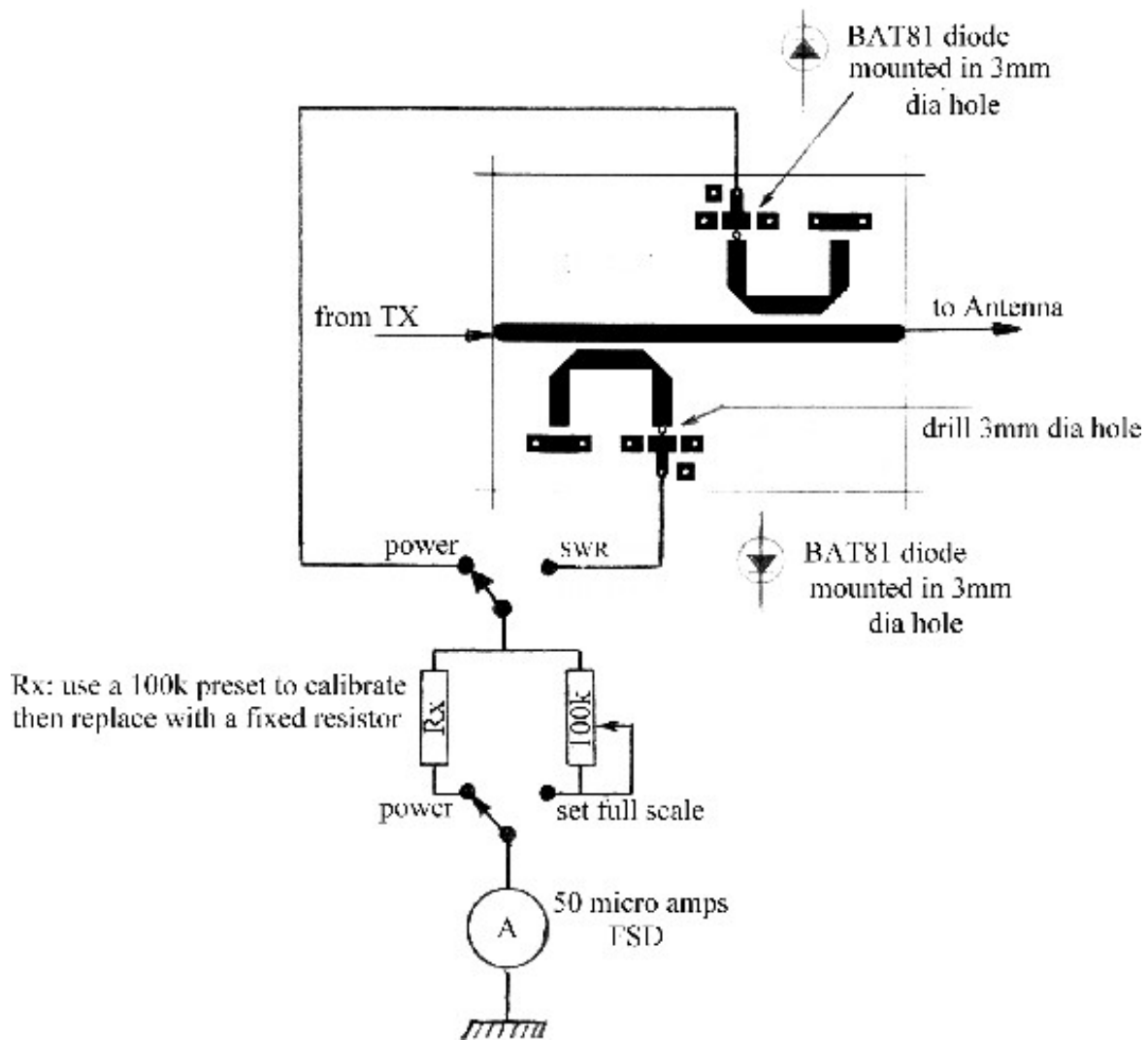
All strip lines are 2.7mm wide (for 1/16 inch board but it depends on the insulating material), the spacing between the main and coupling lines is 1mm and the U of the coupling lines is 9mm wide on the inside of its arms. The main strip line is 45mm long to the outside of the rounded ends. Other dimensions can be scaled from the drawings. Pcb's will be available from G3KAU on request.

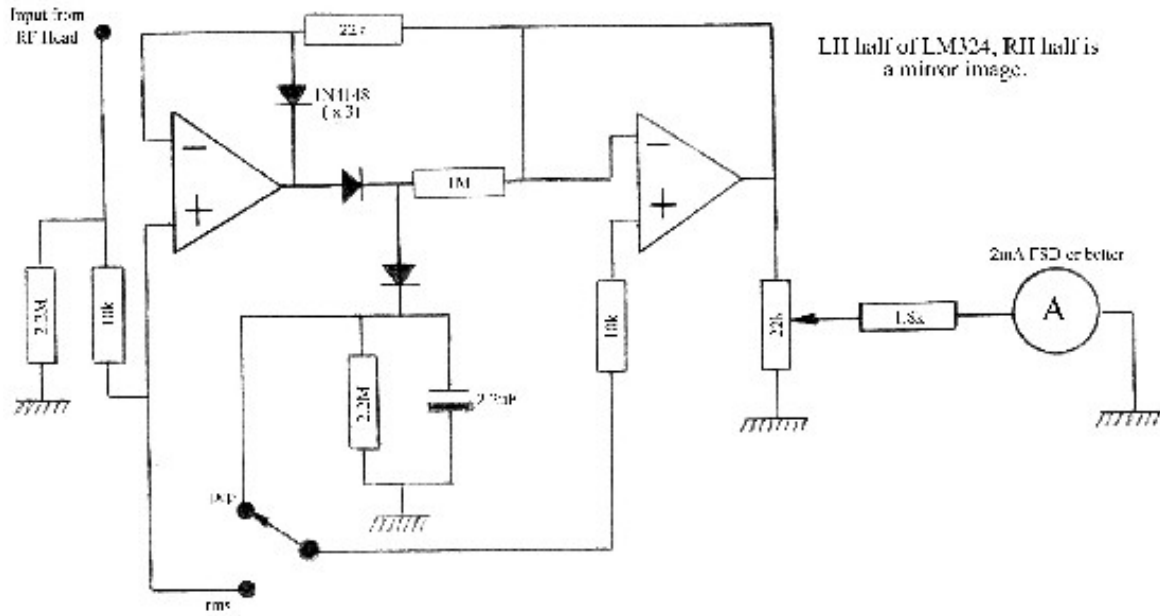
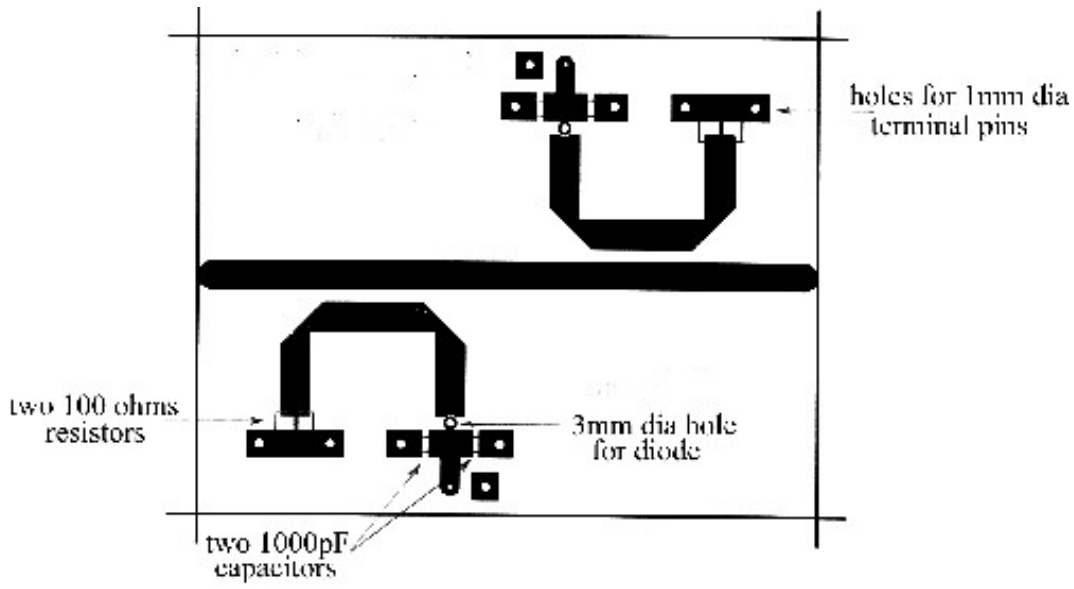
G3KAU made a new scale for the meter using the computer and printer. Below one watt indications are very non linear, from about 1 watt up the scale follows pretty closely the square law.

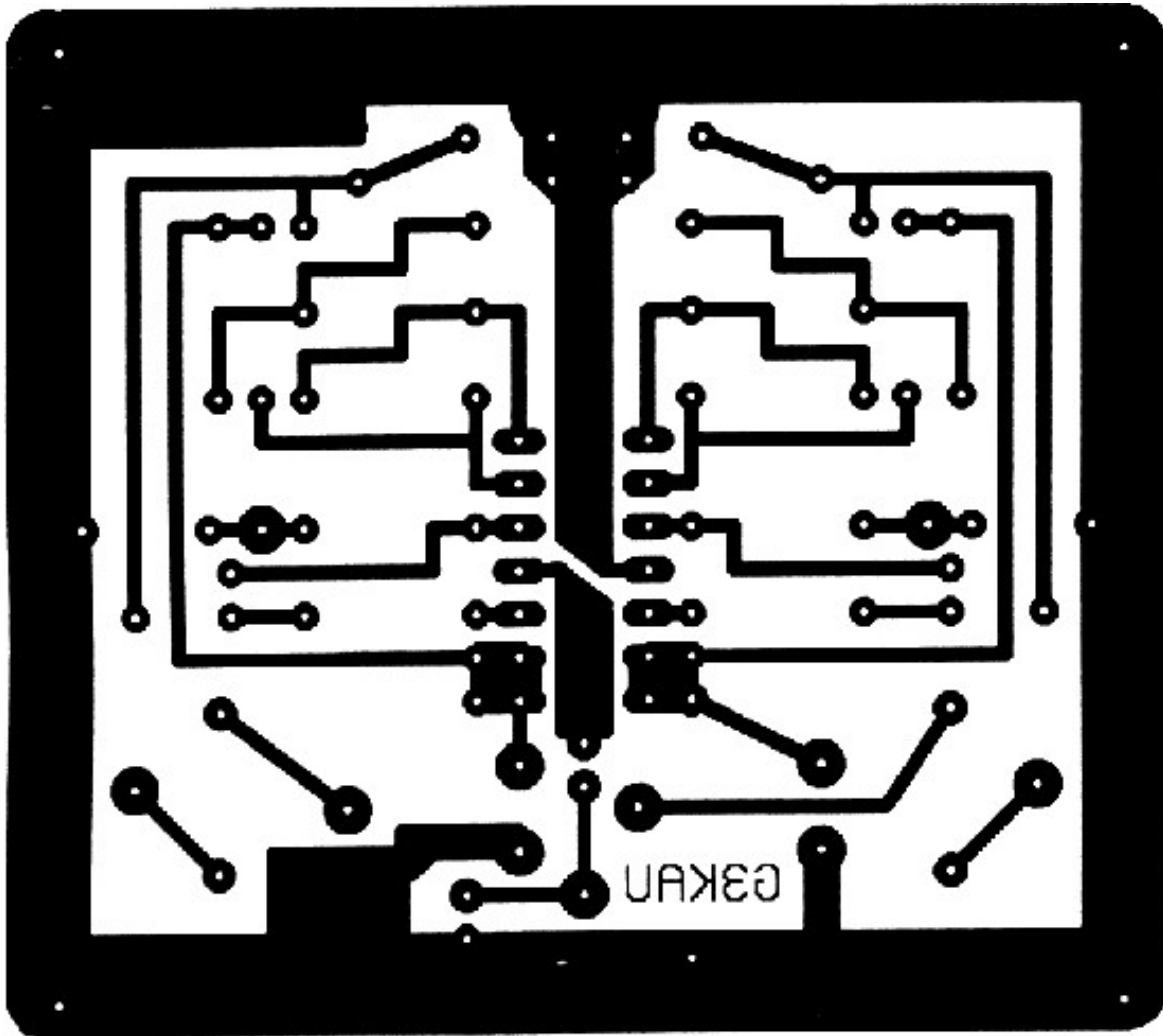
3:1 SWR is at half scale (50%), 2.5:1 is at 42.5% scale, 2:1 is at 33% scale and 1.5:1 is at 20% scale. From this information a scale can be drawn albeit laboriously! There is software in existence for making various scales that will do the work for you making life easier. Or you can use the existing scale and make a graph for conversion.

The cost needs be no more than £10 as opposed to some £100+ of the commercial instrument. For better accuracy in the simple version the diodes can be matched by selection. In the quad op amp version matching is not so important since the balance can be adjusted by the potentiometers on the amplifier board..

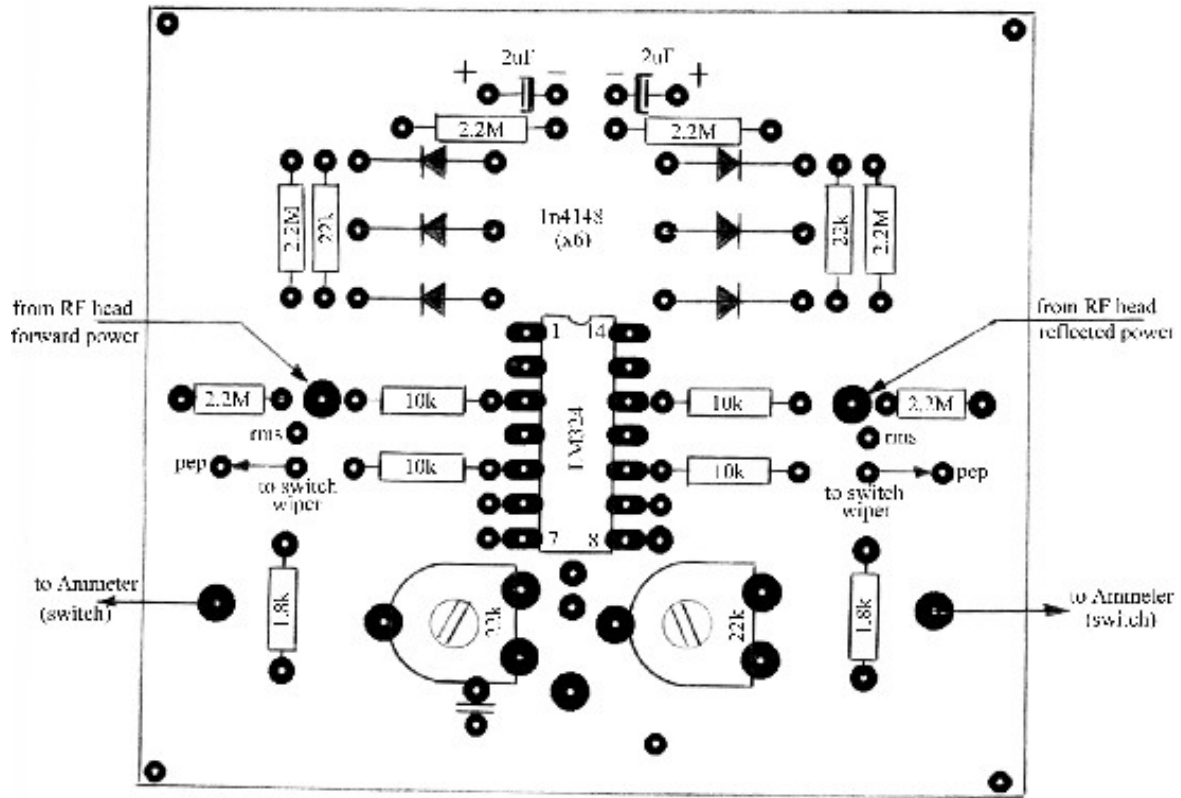
### Single meter simple arrangement using a sensitive micro meter







PCB for dual ammeters layout



Components side

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