MORE ON GATE DIP METERS

– by B.K. Banerji, VU2BD.

In our Jan-March 1995 issue of Ham Radio News, we had published an article on a GDO circuit, together with the coil data, for a range of frequencies covering 4 to 30 MHz approximately. Since this instrument is essential for a home brewer, a few more circuits are described here to help the new comers to choose from any one of them, as their first project.

(i) The simplest GDO which I had designed and assembled for my home brewing work, and which is still going strong is, built around a BC 149. You may use BF 194, BC 549 or even BF 200 equally successfully. The circuit is self explanatary. The collector has a tuned circuit, where the variable capacitor (single section 2J-capacitor, 280 pf two gang PVC condencer as used in transistor radio recievers) is fixed inside a suitable box and its leads are soldered to a phono plug socket, on which the coils of various ranges can be wound and plugged in, from outside. A feed back is provided through the 100 pf disc capacitor to the hot point of the emitter, to sustain oscillation. The emitter is grounded through a 2k2 resistor , duly bypassed with a 100 pf disc capacitor. The base is given a fixed bias through the voltage dividing resistors 100 k and 65 k. The out put is taken out through a 10 pf disc capacitor, to a diode rectifier, which provides the current to the 250 micro amps VU meter. When the resonant circuit at the collector is not loaded by any external load, mximum RF voltage is available to the meter and it gives maximum deflection. However when the oscillation is stopped or reduced by putting your fingers on the coil, the meter will show zero or reduced deflection. If a resonant circuit is now coupled with the coil, energy will be transfered to it from the oscillator which will get loaded and the deflection of the meter will drop. By varying the tuning capacitor, the point at which a sharp drop in deflection is noted. This will tell what is the resonance frequency. You have to callibrate the variable capacitor dial before hand, by taking help of a good reciever or with a counter borrowed from a friend !

The capacitor and resistor values shown in fig. I are not critical and they may be varied widely. I have used this circuit for VHF range, with 2 turns and 22pf Philips trimmer in the tank circuit and 4.7pf feedback and 27pf as emitter bypass. Transistor is BF 200 the range is 130 to 150 MHz ! The GDO can be used to determine the frequency of an LC circuit, tuned transformers like the IF, resonant antenna etc. It can also be used as a frequency generator. It cannot be used as a VFO, because the frequency drifts considerably, especially in the simplest transistor unit just described Modern GDOs use MOSFETs. A few circuits are shown here. In case you wish to avoid using a VU meter, then the circuit using LEDs as dip indicators could be setup. On a dip, either the LED lights up or it goes dark, depending upon your choice!

Keep the coupling very loose to get a sharp dip. For example, while testing the IF coils of NR-60 and other home brewed set, fix the capacitor required for resonance on the high turn side of the winding and fix a one turn loop on the secondary. The GDO may then be coupled to this loop inductively by bringing in the dip meter close to it and rotate the dial, to observe a dip. The frequency of resonance as shown by the GDO will however be only approximately correct. If the coil is defective it will not dip at all.

In fig.1, if you use one section of the receiver type 2J pvc capacitor, then for guidance, the coil details as given below may be tried.

i) For a range of 5 to 14 MHz: 6mm dia 10mm long 20 turns 33 swg.

ii) For a range of 11 MHz to 28 MHz: 16mm dia, 6mm long, 4 turns, 20 swg.

You may vary the diameter and number of turns to suit your range and depending upon the ready availability of materials. All these coils are air cored. You have only to callibrate the coils of your desired range.

In fig-2, a circuit shows how a LED can be used as an indicator for resonance in place of a micro amp.meter (VU meter). The transistors BF 549 and 2N2222, are wired as a Darlington pair. The voltage drop across the 270 ohms resistor on the positive supply line, supply the neccessary current either to glow or dim on resonance depending upon the position of the DPDT switch.

Figures 3 & 4 show two other versions of GDOs with FETs. The drawings are self explanatory. Most of these circuits had appeared in different magazines contributed by Australian and Indian HAMs. My thanks to all these contributors. I hope you will now be building your own GDO soon.

(For figures please refer next page)

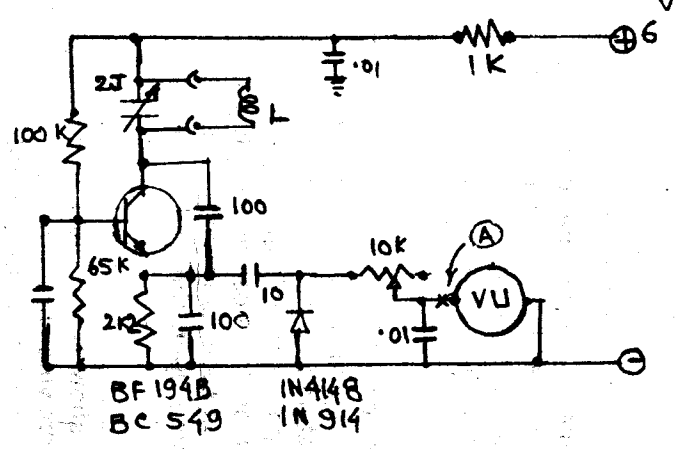


Fig 1 Simlest GDO

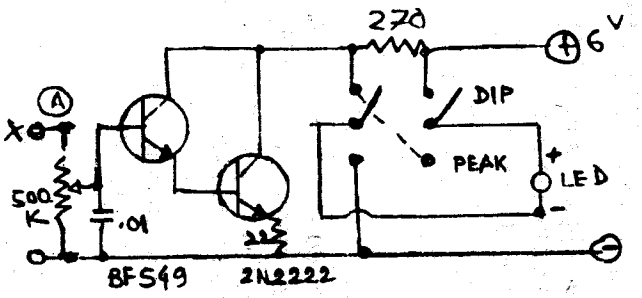


Fig 2 Using LED in Place of VU meter

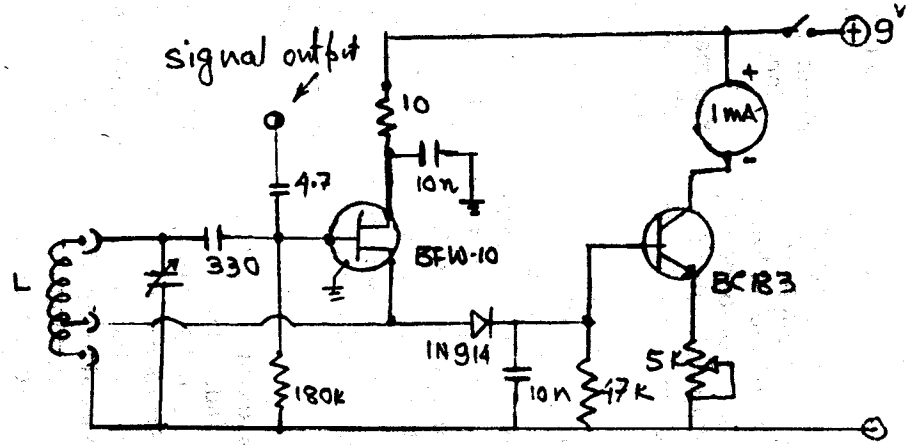


Fig 3 GDO with Hartley oscillator

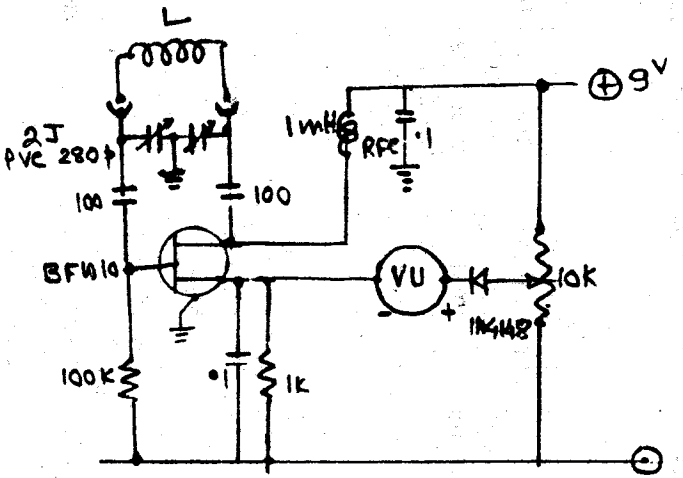
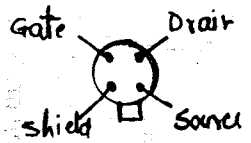
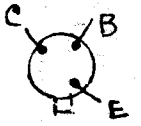


Fig 4 Another GDO with FET



BFW-10/11 TOP VIEW



2K2222A - TOP VIEW

BC 549 - TOP VIEW