FM Repeater Topics 1

Two Solid State Monitoring Circuits

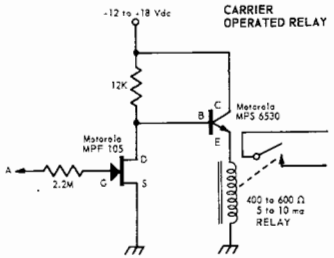
by Murray Ronald, VE4RE

One of the problems in using bi-polar transistors in a C.O.R. (Carrier Operated Relay) circuit or Call Monitor in conjunction with a tube-type FM transceiver is the undesirable loading effects when the C.O.R. input is hooked into the I.F. grids or the squelch circuitry. It can upset circuit operation considerably.

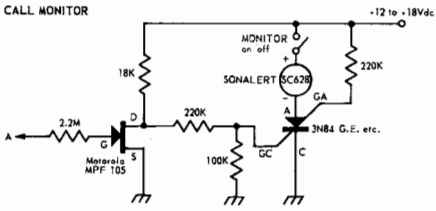
By prefacing the relay driver, etc. with a F.E.T. which has a very high input impedance we can hook up without disturbing results.

The C.O.R. and Monitor have been tried in a number of Motorola Sensicon "A" and "G" receiver strips. The C.O.R. works best attached to the grid of the last I.F. amplifier (455 kHz). The Monitor is best attached at the grid of the D.C. amplifier in the squelch circuit. This is because the monitor should be biased positively in the No Call mode to prevent noise from inadvertently triggering the 3N84. Typical swing in the Sensicon "G" receiver at the grid of the DC amplifier is +3 (no signal) to −3 (0.5 μV signal).

Swings at the grid of the I.F. amp are from about −1 (no signal) to −4 (1.0 μV signal).



A negative voltage at point "A" (about −3. Ovolts or greater) will stop the F.E.T. conducting and allow the base voltage on the transistor to rise so that it will conduct thus operating the relay.



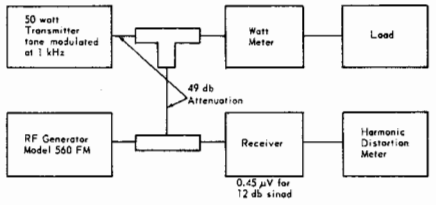
A negative voltage at point "A" will stop the F.E.T. conducting allowing the voltage at GC to rise sufficiently to fire the 3N84. The Sonalert will stay activated until switch is reset. A suitable lamp or relay could be used in place of the SC628 Sonalert.

2

Frequency Separation and Desensitising

by S. N. Simons, VE6HR

Tests were recently made with GE Progress line equipment to determine repeater performance with 300, 540 and 870 kHz separation between transmitter and receiver frequencies. Equipment arrangement is shown in the block diagram.



With 300 kHz separation (tx 147.00, rx 146.70) receiver sensitivity with transmitter off was 12db sinad* and −108 dbm. Desensitising amounted to 33db which, with the 49 db attenuation already in the circuit, totalled 82 db.

Similar measurements with 540 kHz separation (tx 147.00, rx 146.46) produced desensitising of 9.5 db. This plus the 49 db amounted to 58.5 db attenuation.

With 870 kHz separation (tx 147.33, rx 146.46) desensitising was 4 db. Total attenuation was 53 db.

When transmitter and receiver are at the same site the attenuation required to prevent receiver desensitising is usually achieved by antenna separation and the use of cavities.

* sinad is the abbreviation for the ratio

$$\frac{\text{signal + noise + distortion.}}{\text{noise + distortion}}$$

It is used in sensitivity measurements where the standard criterion is the amount of signal, in microvolts, required for 12 db sinad.