



**ELECTRONICS**

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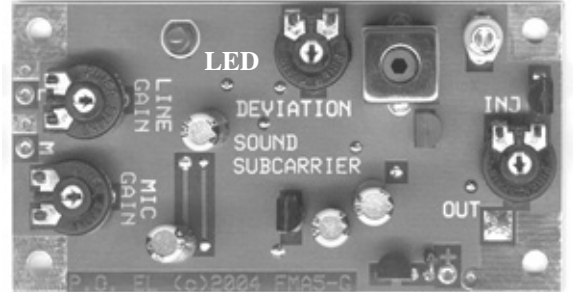
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## **NEW FMA5-G Sound Subcarrier board with AGC**

The prior versions of the FMA5 Sound Subcarrier boards all used what is called a soft limiter. When audio peaks exceeded the set deviation, back to back diodes conducted and instantaneously changed the voltage gain in the op amp from 100 down to as low as 5 depending on how hard they were hit. Only the positive and negative peaks got the reduced gain which resulted in a rounding of the wave form or “soft limiting” versus hard limiting if they were flattened instead. If the gain is cranked up too high, or the speaker has a tendency to vary how loud they speak, the result is audio distortion. There was no way to know if you were over deviating into distortion unless the ham on the other end said something.



The new FMA5-G has automatic gain control or AGC which changes the gain of the whole waveform. The circuit has a full wave detector that proportionally varies the gain by means of the variable resistance characteristics of a FET and therefore does not distort like the soft limiter. A full wave detector is necessary because voice characteristic wave forms are not symmetrical. Attack and decay times are set to optimize voice characteristics like broadcast wireless mics and the LED indicator can tell the user when the gain controls are set too high or they are shouting. The AGC/LED is independent of the deviation 20 kHz to 50 kHz set range.

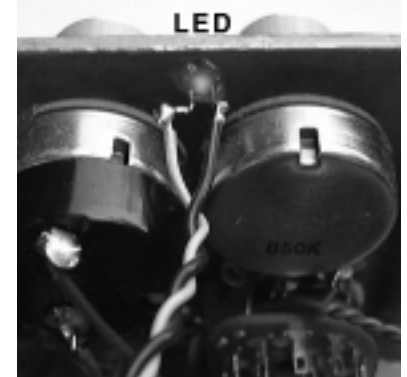
The new board is 1 for 1 replaceable with older boards; same size, mounting and connections. 4.5 MHz is standard for NTSC AM ATV, but the board can be reset up to 6.8 MHz for PAL or FM ATV transmitters.

### **Audio Over Modulation LED TC70 Transceiver Installation**

The supplied LED actually serves two purposes; besides blinking off when you hit the mic or line audio too hard, it will indicate that you have the sound subcarrier turned on in transmit.

The logical place to mount the LED is right between the MIC GAIN and LINE GAIN lettering above their respective pots. There is room to drill a .125 diameter hole centered on a line across the top of the lettering (about .2 inches from the top edge of the chassis). Take care in drilling the hole so as to miss hitting the pots. Shake out all drilling chips and debur the hole.

Bend the leads at right right angles in opposite directions as shown in the photo about 1/4 inch from the LED. Hook and solder a twisted pair of different colored wires to the leads. To ID, we put a black wire to the lead on the side of the LED with the flat since the cathode goes to the ground LED solder pad on the FMA5-G board. Enter the wires from the top side of the FMA5-G and solder on the bottom. Turn on the transmitter, if the light does not light, make sure the line audio pot / subcarrier power switch is turned on and reverse the LED leads if necessary. If all is working correctly, put some glue or epoxy around the rim of the LED and reinsert into the hole and you are ready to modulate. Speak in a normal voice and increase the audio gain until the LED blinks, then back off just a little.



W6ORG (c) 7/2004