

Transistorized Squelch

David Cabaniss W1TUW

HERE IS A SIMPLE little circuit that will open the eyes of all mobile men. It is simple, cheap and you can build it in about an hour's time. The few parts required can be squeezed inside most any radio. Here is how it works.

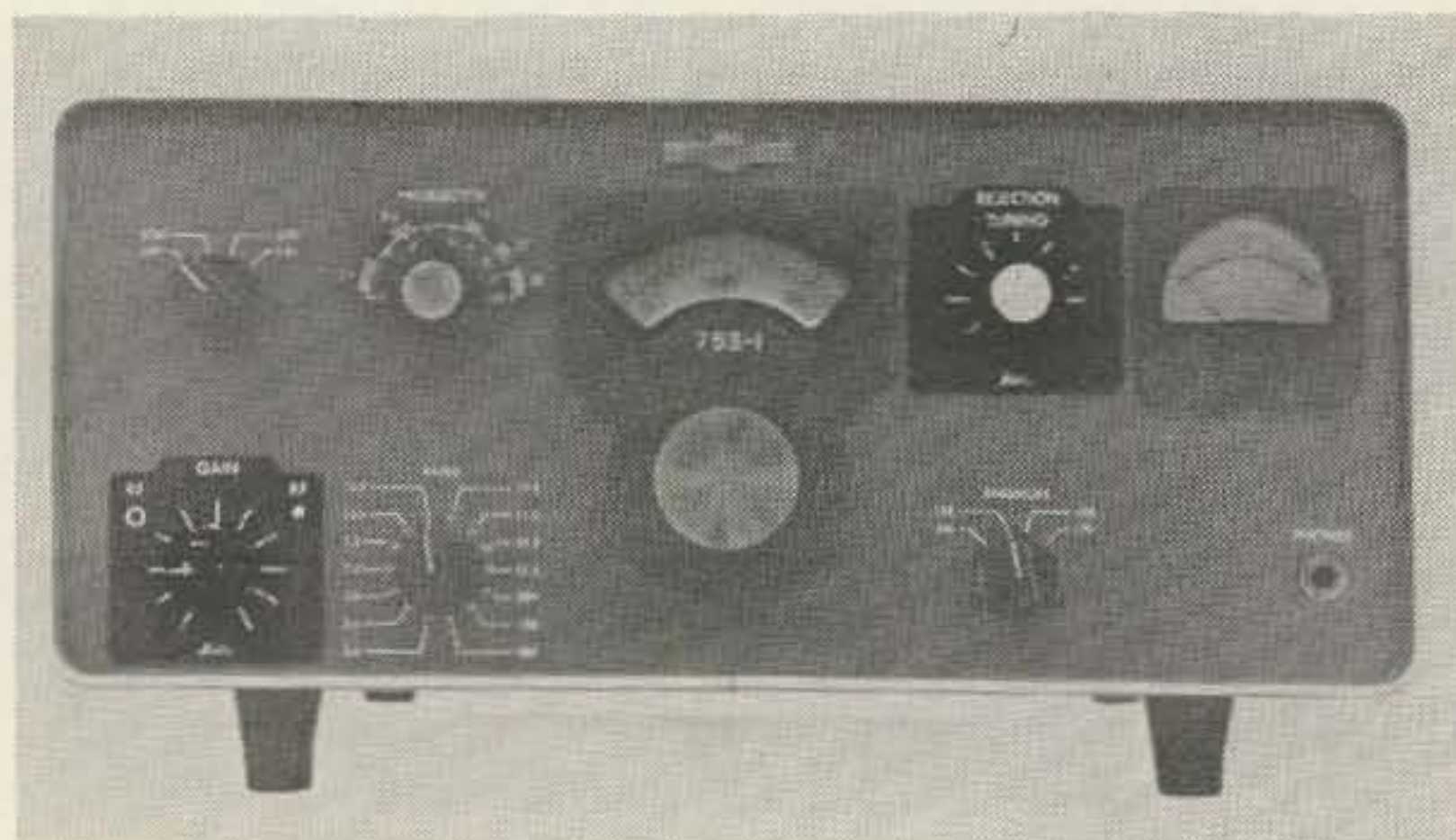
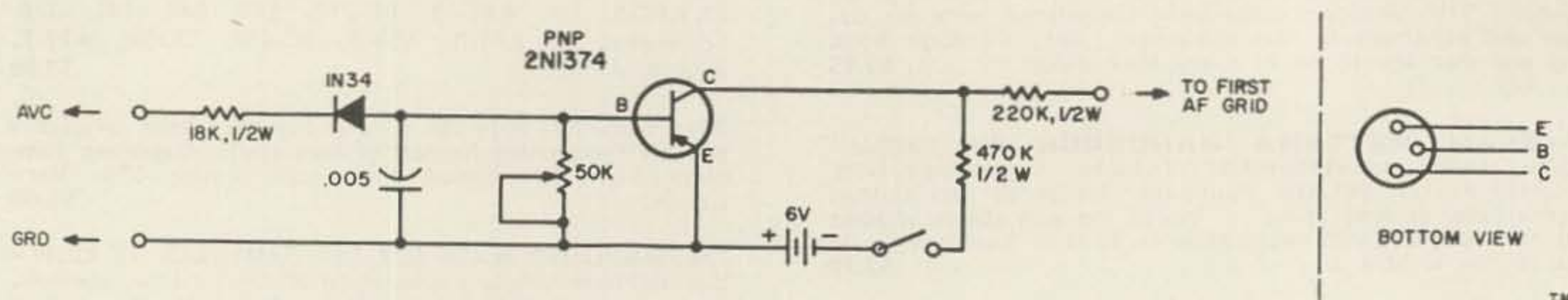
With no signal being received, the negative AVC voltage present at the base of the transistor is low. The transistor is therefore "Cut-Off," and there is no current flow through the 470K collector resistor. The voltage at the collector is now a negative six volts. This negative six volts is applied directly to the grid of the 1st Audio tube, through a 220K resistor, driving this tube to cut-off, thus silencing the receiver. When a signal is received, and the negative AVC voltage is applied to the base of the transistor, the transistor conducts, thus pulling current through the 470K collector resistor. The voltage at the collector drops almost to zero, thus removing the negative voltage from the grid of the 1st Audio stage, allowing the receiver to operate in a normal manner.

The setting of the 50K potentiometer determines the level of AVC voltage necessary to operate the squelch. The 1N34 diode prevents the negative voltage from the battery from being applied to the AVC line. (When wiring this circuit, be sure to note the polarity of the diode.)

The component values shown on the circuit diagram were optimum for the particular receiver in which the author's squelch was installed. When this circuit is installed in other receivers, it may be necessary to lower the value of the collector resistor (470K) or increase the value of the input resistor (18K) (or both) due to the various levels of AVC voltages available from different receivers. Almost any inexpensive PNP type transistor can be used.

The author has spent many agonizing hours "trying" to build various types of squelch (and ANL) circuits using conventional electron tubes; after building this gimmick, I'm convinced that transistors are "Here to Stay."

... W1TUW



The Waters Notch Filter

Tom McCann K2CM
146 Hillcrest Avenue,
Morristown, New Jersey

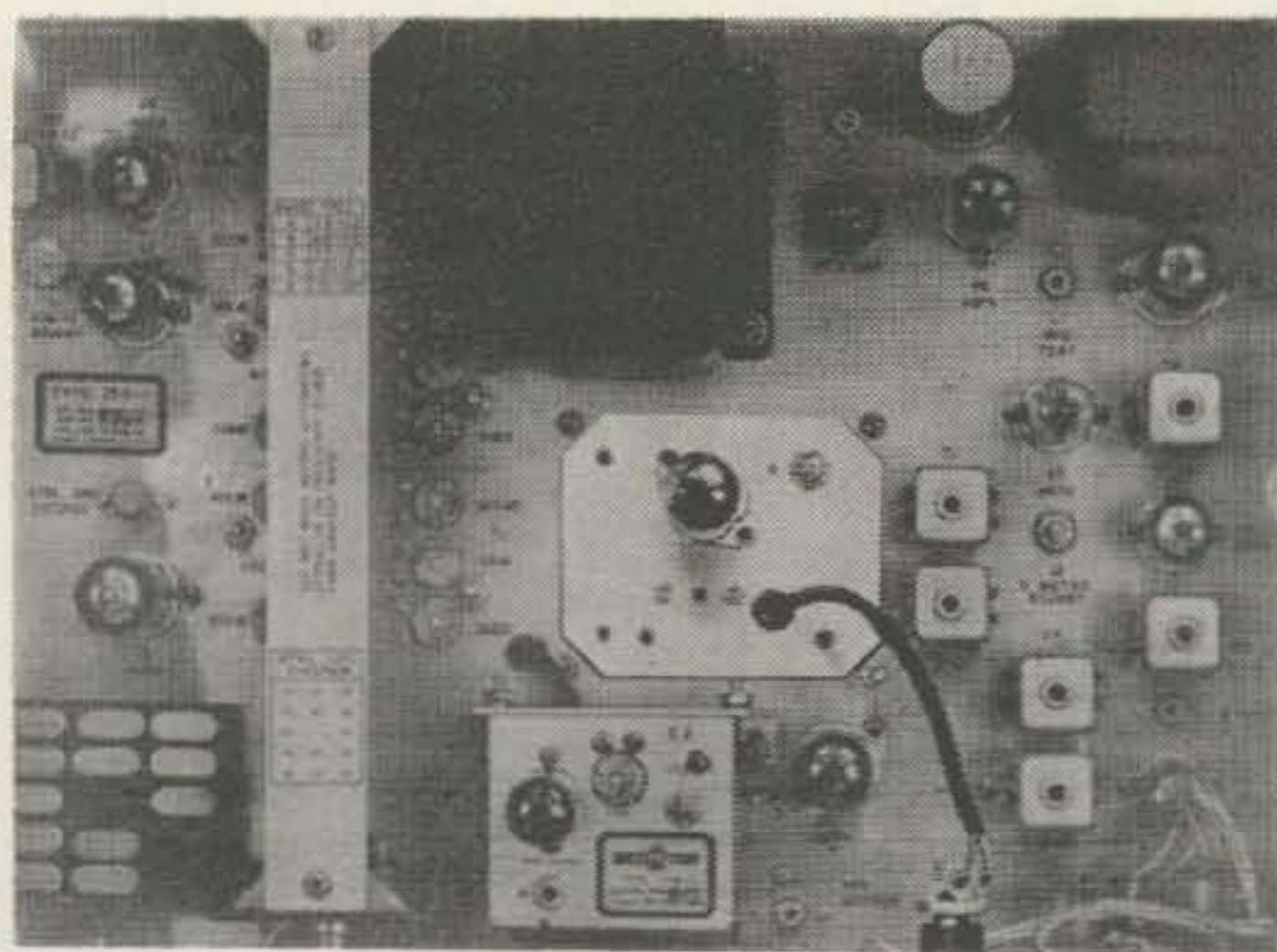
TIMELY RELIEF is at long last afforded owners of KWM-2 transceivers and 75S-1 receivers who have frustrated when a big, hot heterodyne parked in their passband and swamped out the wanted signal. Waters Manufacturing has an *inboard* notch filter for these luxurious rigs at less than three percent of the bucks you put into the transceiver and an hour or less of installation time.

Coded 337-S-1 and 337-M-2, either model at \$33.95 net, these new units are furnished assembled, complete with the knobs and escutcheon plates matching the Collins panel. When the unit is mounted, it looks, performs and handles like Mr. Collins himself furnished it with the equipment in the first place.

No drilling is necessary to mount these units or the controls, except for one hole in the

KWM-2 panel which is thin aluminum at the point selected and is an easy operation with the template provided. Installation and connecting instructions are furnished in the form of clearly stated numbered items of procedure. For those who are nervous about "lifting up the hood" of these pretty boxes, we understand the Collins service stations will gladly do the installation job for a nominal charge.

Q-multipliers and their equivalent have been available to us now for several years. They can be tempermental things. My own experience with them covers varieties all the way from home-spun, through kits to various commercially available units. Some have been unstable, some have a good depth of notch but take out too much of the wanted signal, others have required a critical adjustment of balance to attain satisfactory suppression without impairment of the wanted signal. So my curiosity was more than a little aroused as to how Waters achieved a remarkably narrow notch



which is effectively deep (40 db) and is at once so stable and easy to adjust to the interfering signal.

Its quite apparent that Waters engineers have shrewdly taken full advantage of the specialized characteristics of the Collins equipment for which their unit is specifically intended. They use a bridge T network with a carefully designed high Q shunt-tuned coil as the series element. This network is in the plate circuit of a 12AX7 tube which serves as a cathode follower coupled to a regenerative amplifier. This combination is connected in series with the *if* amplifier of the set at the low level end. The regenerative amplifier is adjusted below the point of oscillation where the plate circuit has a very high Q and introduces a high loss to a very narrow band of frequencies. The front panel tuning control moves the notch from well outside one edge of the passband, through the passband to well out the other side. Dealing with the uniformly excellent shape factor of the mechanical filter and a fixed passband of 2.1 kc, Waters adopted a tuning range of 455 ± 2.5 kc, so when not required, the rejection notch is simply dropped over the steep slope of the mechanical filter by tuning it to either extreme. The insertion loss with the tuning control in either extreme position is less than a quarter db.

The Waters 337 unit provides amazingly satisfying relief both from heterodynes appearing in the receiver passband and from "monkey chatter" slopping into the passband from signals just above or just below the selected channel. Sophisticated operators seldom operate their receivers at maximum rf gain unless they are "digging for the weak ones." They run their gain at the point where the incoming signal at its lowest fading level just ticks the S-meter. Operated in this manner, the Q-notch will suppress practically any heterodyne except from the KW next door. While the Q-notch is inherently a very narrow band device, smart operators are finding them remark-

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ably effective in suppressing "monkey chatter" by setting the notch just inside the high or low edge of the passband. This has the effect of narrowing the receiver passband, which under conditions frequently encountered, can make the difference between "getting the message through" or having to give the whole thing up in disgust.

A Q-notch Model 340-PT (\$44.95 net) has recently been made available for transceivers associated with a separate PTO for separate receive and transmit frequency control of the KWM-2. No Q-notch is presently available for the KWM-2A equipment equipped with extra crystals for Mars and other frequencies as Collins has used the rejection tuning control mounting hole in these models.

You'll like this Waters Q-notch. It performs beautifully and looks good. It certainly will enhance the value of your current equipment.
... K2CM

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