

improvement upon substitution of the triode. That old 6K7, 6SK7, 6SG7, or 6S7 should come out—it is probably acting like a diseased tooth.

As for the circuit used, we chose the cathode-coupled circuit, because it is very simple, requires no neutralization for stability and is easily adapted to control by AVC. The input half of the 6BK7A operates as a grounded-plate cathode follower, with the second half operating as a grounded-grid cathode-input amplifier. The two cathodes use a common cathode resistor. The overall gain of the combination is almost equal to that of a pentode, but the input stage noise is greatly reduced, and selectivity and sensitivity are improved.

The actual physical modifications will not be described here, because the reader will have to look at his own input stage and see what is required after reference to *fig 2*. The main thing will be a small adapter plate to hold the 9-pin socket in the larger octal socket hole. We made ours out of 1/16" aluminum. The socket should be one fitted with a retaining ring for the tube shield, which should be grounded.

Operating Advantages

After making the modifications, and realigning the input stage of the receiver, the thing first noticed will be the great reduction in receiver background noise, especially on the higher frequency bands such as 14, 21, and 28 mc. If there is no external QRN present, sometimes it is difficult to tell whether the receiver is turned on or not, until a signal is tuned in, and then it comes in with plenty of "sock." Another immediately noticeable improvement will be the sharpness with which the antenna trimmer tunes, with the triode in use. The input circuit "Q" is greatly increased by use of the triode and consequent reduction in circuit loading, especially in the reception of strong signals. AVC action is excellent, and no cross-modulation is experienced, even on the strongest signals.

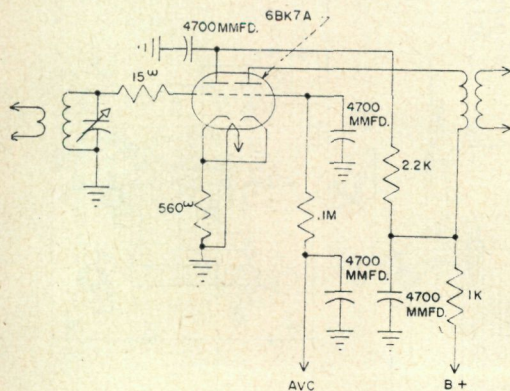


Fig. 2. New 1st r-f Stage

The second modification we can make in the way of modernization is the substitution of a mixer-type second detector for the beat frequency oscillator, for SSB and C-W reception. This type of detector is no good for AM, but it works like a charm for SSB. The CR-88A had a 6J5 b.f.o., and here again we substituted the miniature socket, this time a 7-pin variety, for the octal socket. *Fig 3* shows the b.f.o. before conversion, and *fig 4* shows the new, alternate second detector. The original second detector, a 6H6 diode, is left alone, and is still used for AM reception. The AM/CW switch was modified to include contacts for switching the audio input of the noise limiter from the 6H6 to the 6BE6. When the 6BE6 is in use on the C-W position of the switch, the 6H6 is still functioning, but its sole use then is to continue to provide AVC, which is used for SSB and c.w. as well as AM reception. The noise limiter in this particular receiver still functions for SSB and c.w. Whether the reader's noise limiter will or not, depends on the particular type of receiver he has and the type of noise limiter used in it. By way of explanation, in *fig 4*, RFC₁ is needed because the b-f-o coil used in the CR-88A has no tap, and the condensers across it act as the voltage divider circuit for the cathode connection. Obviously the cathode of the 6BE6 had to have d-c ground return, hence the use of RFC₂.

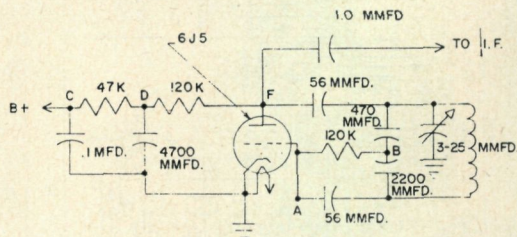


Fig. 3. Old BFO

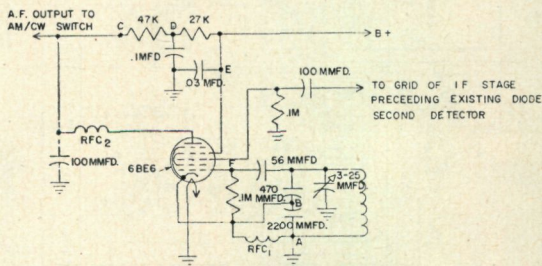


Fig. 4. New SSB/cw detector

A conventional type of b.f.o. coil could be used, with simplification of the circuit shown. However, we used the one already available in the CR-88A, with these modifications. The reader's own receiver will probably have another type of coil which will work equally well. The plate choke RFC₂ is an i-f filter to keep the 455 kc out of the audio stages. The

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