

maximum bias developed should approach the peak value of the maximum amplitude of the applied audio signal. Therefore, if the time constant is made long enough, a bias sufficient for essentially Class A operation of the modulator should be held over from one maximum peak to the next.

On the other hand, it is desirable to make the time constant as short as possible while still approaching the Class A condition, because a short time constant reduces the duty cycle and a greater peak input can be used, as mentioned previously. The best time constant is one that allows the carrier to vary at approximately a syllabic rate. A time constant of about 0.25 second has been found to be about right. The values

used were a 0.25- μ fd. condenser and 1-megohm grid resistor.

In practice, the results do not agree completely with the theory. The reason for this is that the theory holds true only if the impedance of the audio source is low so that its output voltage does not vary appreciably with the varying load of the modulator grid circuit. A microphone transformer is not such a source and the positive peaks in this circuit will be clipped almost as badly as they were by the selenium rectifier. However, even in this case, comparative checks have shown that there is a reduction in distortion compared with that of the circuit with the rectifier.

— D. H. M.

YRS-1 Modifications and Experiments

I HAVE BEEN modifying my YRS-1 single-sideband adapter,¹ and some may be interested in certain changes I have made in this truly wonderful gimmick.

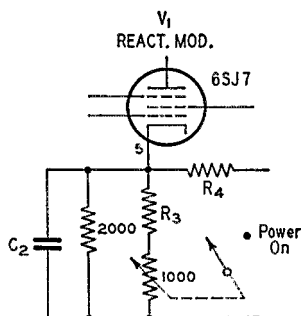
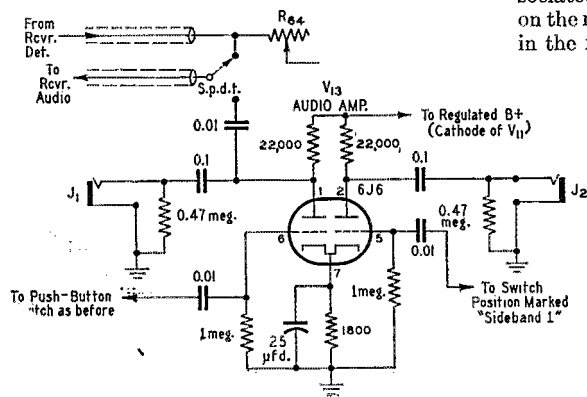


Fig. 1 — Wiring diagram of the modified YRS-1 reactance modulator to allow panel control. C_2 , R_3 and R_4 refer to original components that are unchanged.

First, I replaced the toggle-type power switch on the panel with a gain-control-and-rotary-switch combination. The variable resistance is connected into the cathode circuit of the reactance modulator to control the frequency of the

¹ The YRS-1 is the commercial adaptation of the selectable-sideband adapter designed by W2KUJ. See Norgaard, "Practical S.S.B. Reception," *QST*, July, 1948.



reinserted carrier (Fig. 1). This provides panel control for oscillator readjustment and for tuning s.s.b. stations, but, more important, it allows for compensation of warm-up drifts. After initial alignment, any drift in either the receiver or the adapter requires (otherwise) that the receiver be detuned. Oscillator frequency control further permits deliberate detuning of the receiver when desired, in order to favor the outer sideband frequencies or as an aid in avoiding interference.

Secondly, I provided a panel switch in the audio circuitry to permit normal operation of the receiver without turning on the 14 tubes in the YRS-1. This switch merely connects the audio from the receiver detector directly back into the receiver audio system.

Most interesting of all, I have rewired the 6C4 audio output stage to take a 6J6, with the grids connected to the phasing networks, and the plates connected to two 'phone jacks (Fig. 2). This enables one to hear the sidebands separately on headphones, in addition to the operation through the receiver. With separate cords connected to each of the 'phones, the left ear hears the upper sideband, and the right ear hears the lower sideband.

This modification not only aids reception, but provides a certain "sense of direction." A heterodyne and the accompanying monkey-chatter associated with an interfering signal which appears on the right side of the panoramic adapter is heard in the right ear. Another interference on the left side may reach only the left ear. The brain tends to ignore the one-ear signals and

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Fig. 2 — Wiring diagram of the modified audio amplifier to allow the use of split headphones. V_{13} is a 6C4 in the original unit — the connections to Pin 6 of the socket remain unchanged. With most receivers, J_2 will provide the upper sideband. The sideband from J_1 is selectable.

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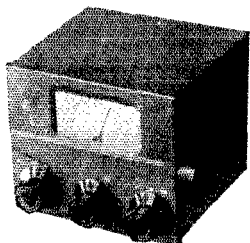
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Turret Switching

(Continued from page 35)



Even the chassis and cabinet are homemade in this double-conversion turret-tuned receiver.

ments are complete, the coils are made secure with a thin coat of coil dope.

The front end was aligned by first adjusting the oscillator coil so that it would cover the desired frequency range (the limits are 1700 kc. added to the limits of the tuning range of the particular band). Then the r.f. and mixer coils were pruned until they could be peaked in the middle of the band, and the bandspread taps were then adjusted to cover the range.

Two positions on the bandswitch are not being used yet, but they are available for 21 Mc., 160 meters, the CAP frequencies, or even 50 Mc.

Tech Topics

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favors the information from both ears. (Don Norgaard has mentioned this psychological effect.) With exalted-carrier reception, as you tune across a signal, the heterodynes seem to move right straight through your head. You know by "feel" which way to turn the tuning knob for oscillator lock-in.

With this binaural system, there seems to be a new realism. Voices (and music, too) seem to come to life. It is almost like walking into a broadcasting studio. Friends concur with me on this. I cannot understand why the difference should be so great nor why the binaural way is more pleasant. Adjusting the level of the 'phones independently proves nothing. Tests made with both 'phones on show a marked difference in "realism" when one 'phone is switched from one sideband to the other, yet tests with only one 'phone show no difference when that 'phone is switched in the same manner.

Properly operated, the YRS-1 with exalted carrier greatly reduces the harmonic distortion normally heard on foreign 'phones, and makes listening to music from such stations much more pleasant. However, the selective fades on such stations, which affect the sidebands separately and produce dissimilarities between them, give a very interesting "three-dimensional effect" when heard this new way. It is very difficult to describe. Perhaps you have heard it. I don't mean to con-

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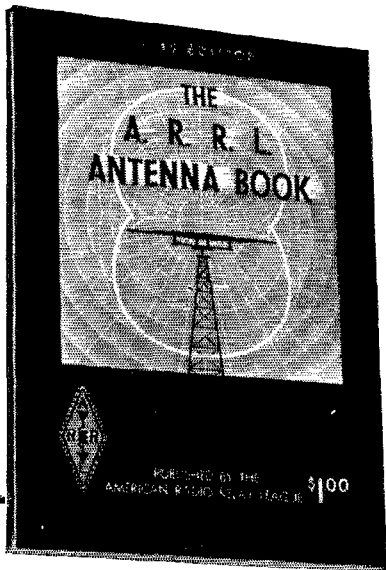
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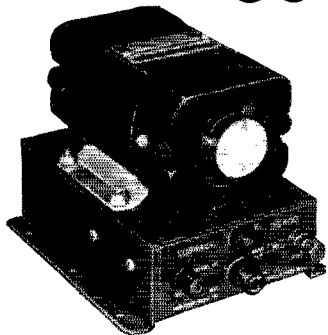
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vey the impression that I am a dramatic type, but there is something mesmerizing about it. I have observed some interesting reactions and comments. Some people can't get enough of it; others seem to be a little frightened by the eerie sounds.

This new venture into "three-dimensional music" is startling, at first. The sound seems to flow around inside your head. There is a tendency at times to turn as though looking for the source of music. Choral music is weirdly beautiful and exciting. Pipe organ recitals reverberate mysteriously, and make you feel you are sitting high up in the belfry of a cathedral. To quote E.T. Canby,² switching from one to both sidebands gives "an impression of a tremendous bursting-outward into space." Sound suddenly "jumps away in all directions as though the performers had leaped into the air. Suddenly they are more than room distance away and fully sized, alive."

The usual question is, will it work with two loudspeakers? The answer is "yes and no." The effect is not nearly so interesting with speakers because both ears hear both speakers. However, I do often use the receiver speaker on the left side and a separate amplifier and speaker on the right side, and find it an improvement. I would like to get some more opinions and expressions from others who have tried dual single-sideband reception, or can be induced to make the simple changes (it took about half an hour) to add one more feature to the YRS-1.—*Al Dinsmore, W8AUN*

² *Audio Engineering*, January, 1952.

Correspondence

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eventually for the commercials by crowding us out of existence with stifling regulations. All are of the opinion that someone in Washington, the guy that gets all these ideas, should be fired, banished, throttled, or maybe boiled in transformer oil. We don't like it. We deeply resent having a government agency, rather than the amateurs themselves, propose these things. . . .

— *Harvey R. Pierce, W9OPA*

792 Oaklawn Avenue
Winston-Salem, N. C.

Editor, *QST*:

. . . The aspect of the proposal contained in Docket 10237 which is most disturbing to the amateurs whom I know is the expressed attitude of the Commission to tell the amateurs what is good for them rather than meet the request of amateurs for action to solve a specific problem. . . . It is regrettable that the Commission no longer looks to organized amateurs as represented by the American Radio Relay League for proposals to changing requirements on the amateur bands.

— *Roy C. Corderman, W4ZG*

1000 Overlook Avenue
Chattanooga, Tenn.

Editor, *QST*:

. . . Why not consult with representatives of the amateur service prior to releasing controversial proposals? It is obvious that the proposal in question is not the result of collaboration, consultation or cooperation with the 100,000 or more amateurs whom it would affect seriously and adversely. . . .

In general, the activities of the Commission in recent years have not been creditable. The confusion and ill will resulting from Docket 9295 have left scars which will require some time to heal. The arbitrary attitude displayed in im-

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