

# Tricks With The Collins 75A-2

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In many cases communication receivers are mis-used or not used to their full capabilities. Sometimes features built into the receivers are not utilized at all due to a misunderstanding on the part of the operator as to *how* to use them. Probably while attempting to use them at one time or another, they seemed to degrade the receiver performance. From then on they remain dormant. This is true of crystal filters, Q-multipliers etc.

It is the purpose of this paper to present information to aid the user of the Collins 75A-2 receiver. Of course, these instructions can be modified or expanded as desired for other equipment.

A serious drawback of the receiver is apparent splatter from an SSB signal when trying to copy a nearby (frequency wise) AM signal. This splatter is generated in the receiver due to a characteristic of the *agc* system. When the receiver is switched to the AM position, *agc* is automatically switched on. To avoid splatter, it is necessary to disable the *agc*. To do this, turn the AM-CW-FM switch to CW. Slowly turn the switch toward AM until the *bfo* stops working. Leave the switch in this position, halfway between CW and AM. You can now receive AM with no *agc* action. Of course, the *rf* gain must now be operated manually to prevent front end overload.

In cases of extreme pulse type noise such as power line leakage, this same position of the switch can be used for additional limiting afforded by the *cw* limiter. Merely advance the *cw* limiter control for the desired amount of limiting. The AM limiter is still operative.

Now let's set the receiver up for SSB reception. The instructions given here are somewhat different than the instructions given in the handbook and other similar sources. However, due to the characteristics of this receiver, these instructions should be followed.

First, it is necessary to align the *bfo* internally so the front panel *bfo* calibration can be relied on. To do this, set the receiver up for AM with the selectivity on "4". Tune in a calibration signal, preferably a 100 *kc* crystal calibrator. Tune for the sharp peak in the S-meter. Switch re-

ceiver to *cw* and reduce the *rf* gain to a suitable level. Turn the *bfo* pitch control to the center line. Open the lid on the receiver and locate the *bfo* coil. It is the can that the pitch control shaft runs to. Adjust the top slug for zero beat. Turn selectivity to "O". With the Zero set, move the fiducial (kilocycle hairline) to cover one of the kilocycle marks. Move *bfo* pitch control to "-1". Move the tuning knob higher in frequency until zero beat is obtained. See if the kilocycle dial scale has moved **exactly one kc**. If zero beat can not be obtained by tuning higher in frequency, loosen the *bfo* pitch knob and rotate it 180° on the shaft.

The *bfo* panel markings can now be relied on. When tuned to "-1", it means the *bfo* is operating one *kc* below the *if* of 455 *kc*, or 454 *kc*.

The position of the *bfo* pitch control to receive upper sideband will be in the vicinity of "-1". However to obtain the exact position proceed as follows.

Set selectivity to "1" or "2" depending on how much interference is present on the band. Tune in the calibration signal and peak it on the S-meter. Be sure the phasing control is on the center line. With the antenna trimmer, adjust for an S-meter reading of S-9. If this can not be obtained, try it on another band. Tune the receiver higher in frequency until the S-meter drops to S-6 or about 18 *db*. Switch the receiver to CW and adjust the *bfo* pitch for zero beat. It should be in the vicinity of "-1". This is the correct position of the pitch control for receiving upper sideband. Do all the tuning with the tuning control. The only time the pitch control should be moved is if the selectivity is changed. As the selectivity is increased, the *bfo* pitch moves closer to the center line. For lower sideband, tune the receiver lower in frequency in the above instructions.

For accurate frequency reading the SSB signal, it is necessary to offset the fiducial the same amount the *bfo* pitch is set away from the center line. This is a simple matter. After the receiver controls are set for SSB, tune in the calibration signal and adjust the tuning control until it is zero beat. Move the zero set until fiducial indicates the calibration signal frequen-



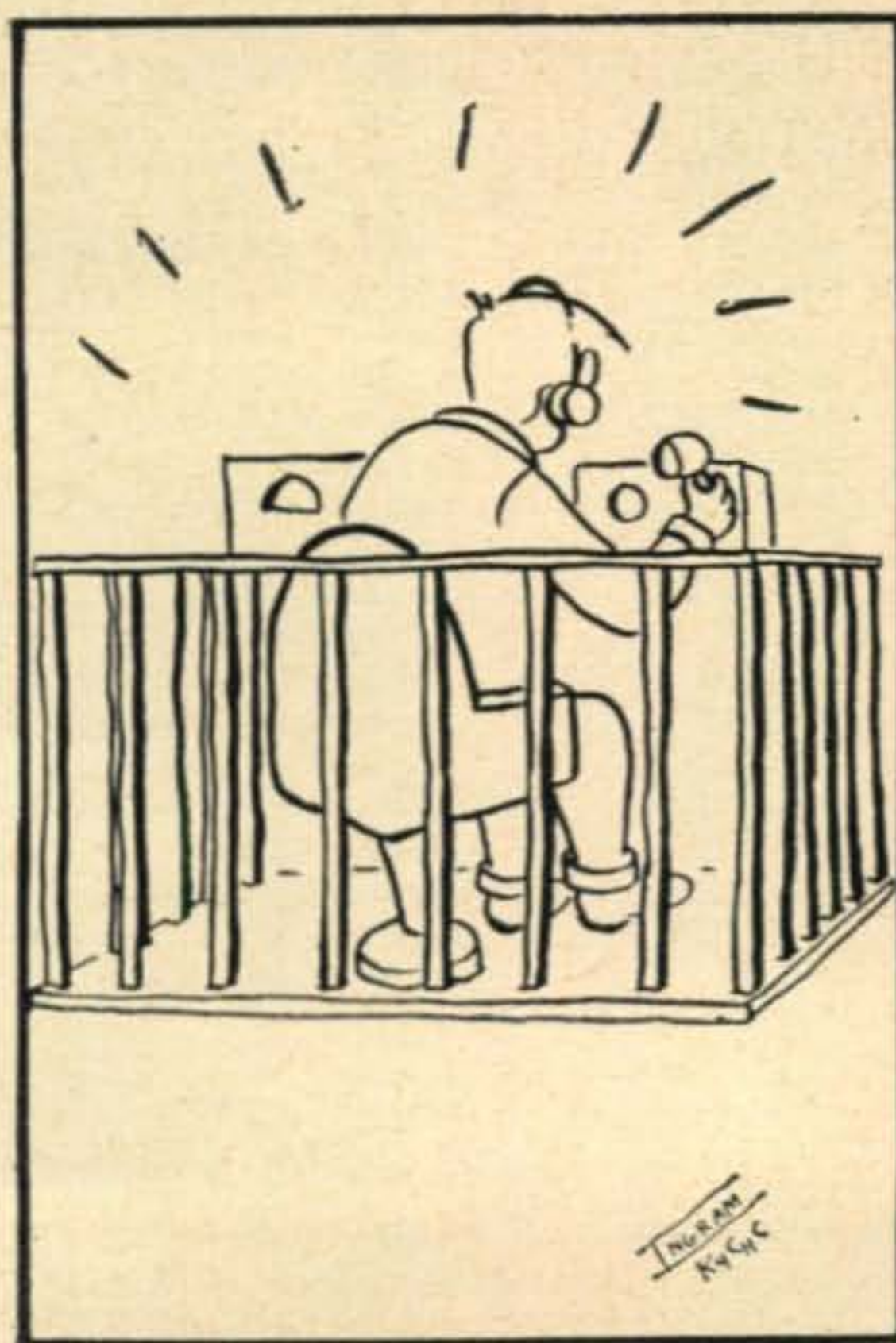
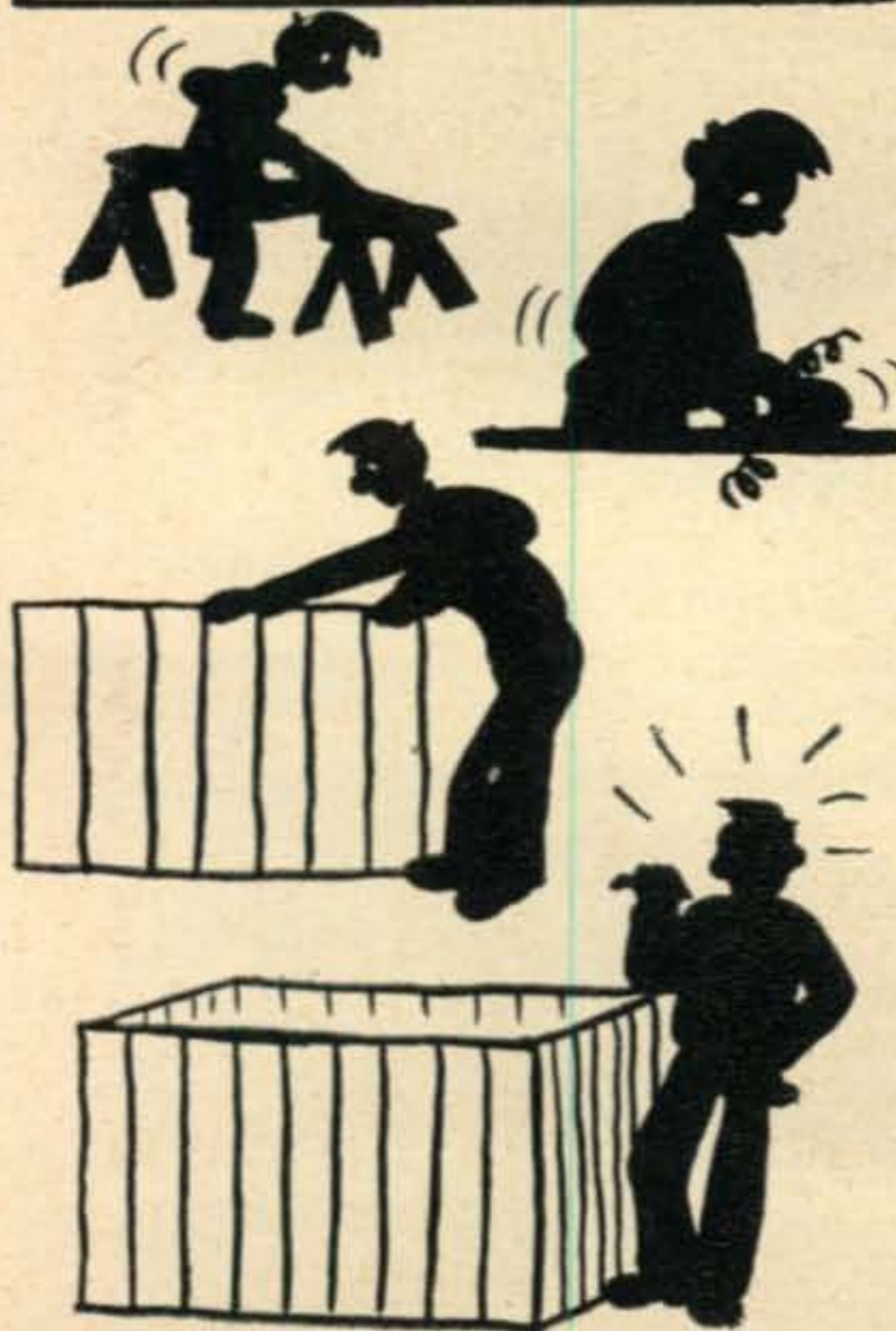
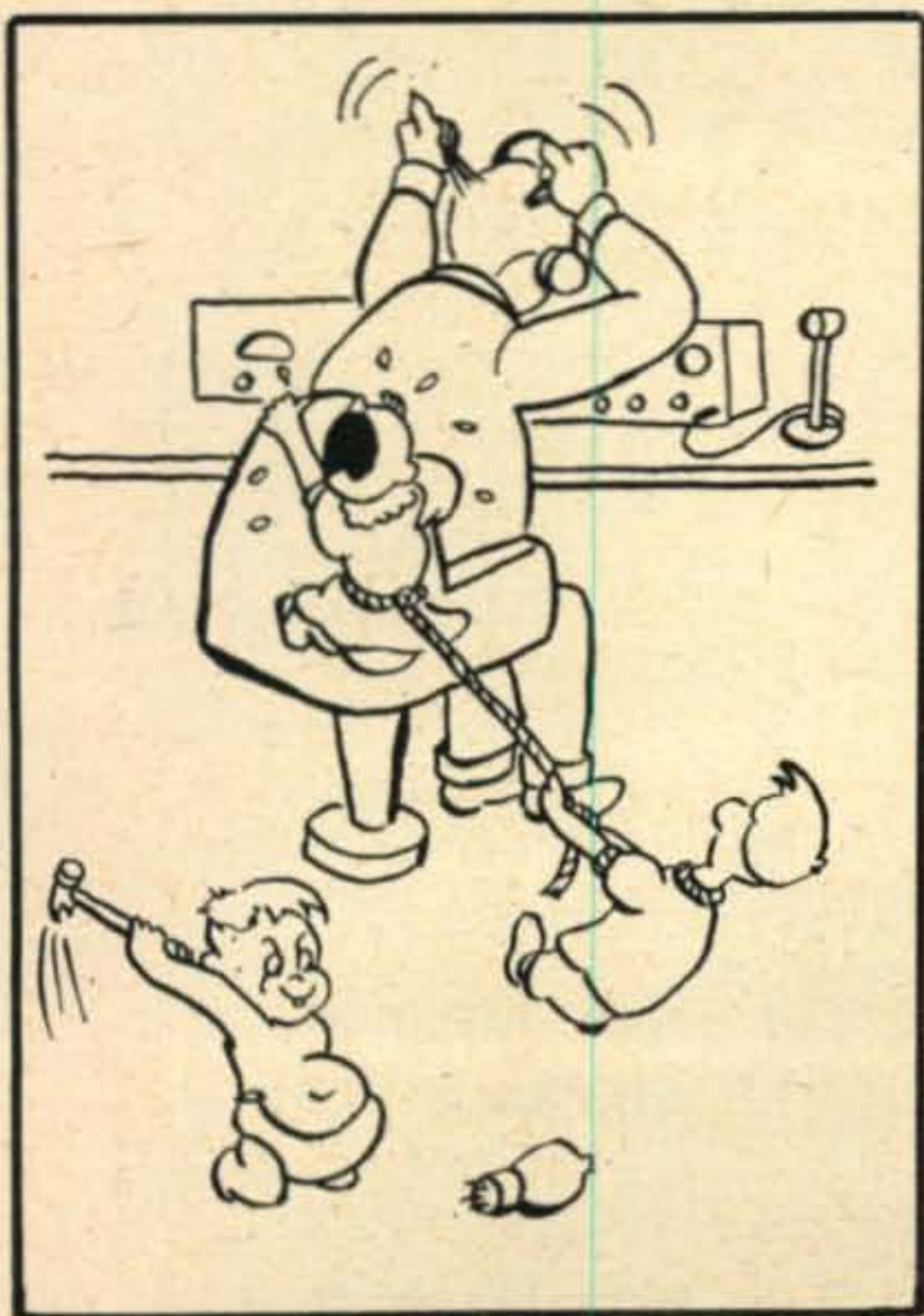
cy. The calibration frequency must be known to within a few hundred cps to make this adjustment worthwhile. Now, when an SSB signal is tuned in and sounds natural, the dial will indicate the SSB signal frequency. For upper sideband, the fiducial will be displaced about one *kc* to the right.

Now we will try our hand at exalted carrier reception. First, let's see what we can gain by using this method of reception. You have probably been in a QSO with a station running about S-9 on the meter. Very solid copy up until the time someone throws on a 20 *db* over S-9 signal. The voice you were listening to is no longer readable as it is crushed under this heavy signal. Switching to exalted carrier reception changes the situation. Instead of hearing one strong signal covering up a weak one, you can now hear

two distinct voices, both of them readable. You just have to separate them with your mind; concentrate on the one you want to hear. Also, you have probably tried to pull in that DX station that was way down in the receiver noise level. By using exalted carrier reception, his voice now comes through quite readable.

You are probably wondering why I keep referring to voices. Well, the reason is because when we adjust the receiver for exalted carrier reception, that's all there is left of the incoming signal, just the voice. We have in a sense turned the AM signal into an SSB signal and then supplied a large QRM free carrier to demodulate it. In fact, it is difficult to distinguish AM from SSB when the receiver is set up properly.

Here's how to adjust the receiver. Tune in  
[Continued on page 104]





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## 2 M. ANT. [from page 57]

clothes line (wire) is then fitted into the coax coupling through center of 5/8" tubing. (The wire fits snugly in center of coupling.)

5. The insulator made in step 2 is now passed over the wire and fitted in the top of the 5/8" tubing.

6. The 1¼" I.D. x 19¼" length of tubing is drilled and tapped ¼" from one end to receive four 10/32 screws.

7. Insert the four 10/32 screws. These should be at least ½" long.

8. This tube is then slipped over the smaller tube assembly and the screws tightened. It will be necessary to sight center the two tubes so inner tube is close to exact center as shown in the photographs.

9. Mount the assembly on transmitter and you are in business. ■

## 75A-2 [from page 63]

the calibration signal as before in the AM position with the selectivity on "2". Switch to CW and turn the pitch control toward the "—1" position, about one third of the way. You should now be hearing a single audio tone of about 400 cps. Tune the receiver higher in frequency (which will make the audio tone go lower) past zero beat until you hear the same 400 cps pitch on the other side of zero beat. The kilocycle dial scale should have moved a little less than one kc during this operation. With the phasing control reject this 400 cps tone now coming from the speaker. Now the tricky part. Adjust the bfo pitch for zero beat. This is difficult because you have just eliminated the signal you are supposed to zero beat! However, you can bring it in for this last operation by moving the phasing control slightly. Be sure to put the phasing control back where it was after you finish zero beating. Now the receiver is set up. The bfo pitch control should be near the "—1" position and the phasing should be a little to the right of the center mark.

Try tuning in an AM signal now. Tune to zero beat the carrier. As the carrier approaches zero beat it falls into the rejection notch of the crystal filter and is eliminated. AM signals now tune like SSB signals. To make sure you have the phasing control in the right position, momentarily switch to AM after you have an AM signal tuned to zero beat. It should sound very distorted. If not, adjust the phasing control slightly until severe distortion results. Then when you switch the receiver to cw, it will sound normal. Slight readjustment of the bfo pitch may be necessary.

For frequency reading, follow the same procedure as with SSB. ■

For further information, check number 32 on page 126.