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CB to 10

— part XXVIII: double your channels in SSB conversions

In the course of converting several different types of SSB CB rigs for 10-meter amateur use, I've come up with a simple, no-cost modification which will *double* the number of channels available on these rigs. The idea seems to be applicable to almost all types of SSB CB transceivers, whether they use crystal-plex or synthesized circuits for frequency generation. Instead of having 23 (or 40) channels spread at 10-kHz intervals, you'll wind up with 46 (or 80) channels at about a 5-kHz spacing. And, if you modify the delta-tune circuit found on most of these rigs to swing ±2.5 kHz, you'll have just about continuous coverage on 10 meters. Sounds too good to be true? Read on!

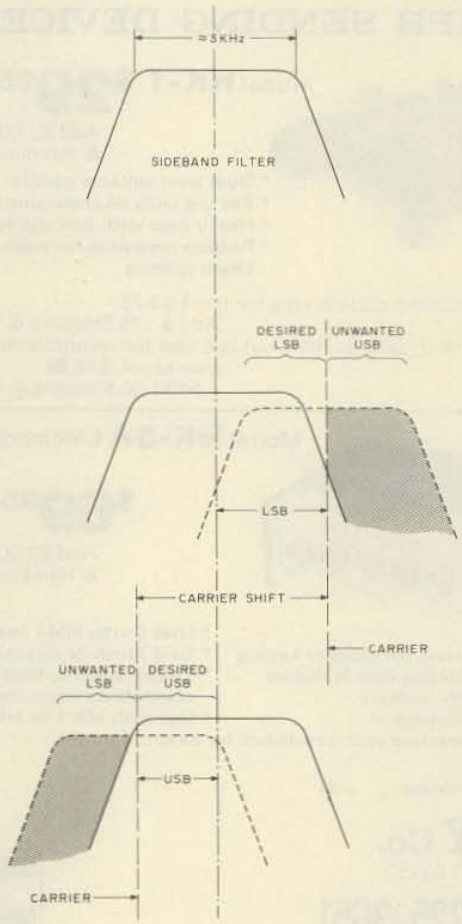

Fig. 1.

The seed of the idea comes from the fact that *all* 10-meter SSB activity is on upper sideband. Therefore, the lower sideband function of the transceiver will never be needed and can be deactivated at no loss. Now the upper and lower sideband signals are generated by one or more carrier oscillators, sent to a balanced modulator (gets rid of the carrier), and then to a filter which selects the desired sideband and rejects the other, unwanted, sideband. Sideband selection is accomplished by shifting the carrier oscillator frequency in such a way as to place the desired sideband *inside* of the filter's bandpass and the unwanted sideband *outside* of the bandpass. See Fig. 1.

Note that the carrier is shifted by about 3 kHz, to put the desired sideband into the filter's passband. This means that the signal's actual frequency will be shifted by the same amount, i.e., changing sidebands also would move you by 3 kHz. To keep the signal on the same frequency (channel) regardless of the sideband selected, these rigs all shift another oscillator somewhere in the frequency generation chain by 3 kHz, but in the opposite direction. This exactly cancels out the frequency shift caused by the sideband change.

Suppose that we rewire the sideband selector switch so that the carrier oscillator ran in upper sideband mode at all times but left the other frequency shifters intact. Then, switching from USB to LSB still would give us a USB signal, but shifted in frequency by 3 kHz, providing a new set of 23 (or 40) channels offset between the original channels. Further, it is usually possible to readjust the USB frequency shifter up (or down) in frequency a kHz or so and the LSB frequency shifter down (or up) a kHz also, by means of the built-in trimmers. This results in about 5-kHz spacing between the two sets of channels with practically gap-free coverage.

Then, dig into the delta-tune circuit, modify it for ±2.5-kHz swing, and rewire it (if necessary) to make the delta-tune function on transmit as well as receive. That's all, folks! ■