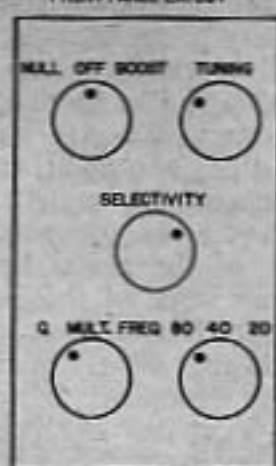


Side view of the Single Sideband Q5'er converter. If you don't have a "parts press," better build it on large chassis.

FRONT PANEL LAYOUT



subject was written by Charles Welch, W5MHK, in the October 1950 issue of *CQ*. The name of the article is "Suggestions on How to Dress up Your Station" and it is recommended reading. At the risk of sounding like a politician proclaiming his platform, I would like to promise something in the way of war surplus conversions that are a little out of the ordinary. The constructor can add the finishing touches or omit them as he desires, but they will be included for those who desire the "factory look."

This conversion is an example of the "spit and polish" technique. Believe it or not, but this is the same receiver that was used in the Novice Q5'er article in the January '56 issue of *CQ*. Not more than a total of 3 hours was spent shining up the old BC-453, but what a difference in the external appearance! A full cover and back plate were constructed out of Reynolds "do it yourself" aluminum to replace the original one that was badly dented. Then a liberal coat of glossy grey paint was applied to the whole shebang. In addition, the circular dial was discarded and replaced with a spare scale from a commercial dial assembly. A plastic dial cover and pointer with a scribed line, and a large, shiny knob completed the de-surplusing treatment. Remember, war surplus does not have to look like war surplus!

Because a great number of readers will probably be new amateurs, every effort will be made to keep the conversion instructions clear and concise. Future conversions should be of particular interest to the Novice and Technician, and for the most part will feature step by step instructions from start to finish.

Additional Notes on The Novice Q5'er

After my wrists healed (where I slashed them) I answered 121 letters from interested constructors. (I am referring to the Novice Q5'er error.) One of the questions most often asked (in addition to "Why doesn't it work?")

was "How can I add 10, 15 and 20 meter coils?" To provide these readers with a satisfactory answer, several coils were tried in the Novice Q5'er circuit. The results were very unsatisfactory, to say the least. On the 15 meter band the images of commercial stations were all over the place. On ten meters, amateurs operating in the high end of the band appeared on the low end and vice versa, ruining the excellent calibration of the Novice Q5'er. In short, because the oscillator was so close to the incoming signal frequency, images made the Q5'er unusable on these bands. Further experimentation led us around to Bill Scherer's (W2AEF) "Converter-ettes" as described on page 42 of the *CQ* "Mobile Handbook." Several of these converters were constructed and connected to the Novice Q5'er. The converters were adjusted (as described by W2AEF) to produce an i.f. of 7 megacycles and the Novice Q5'er was tuned to this frequency. The results were amazing! The stations rolled in from all over the place, and there was not an image to be found. The constructor might look down his nose at a high frequency converter that was not crystal controlled because a tunable converter might destroy the high stability characteristics of the Novice Q5'er. This is definitely not the case, after a few minutes of warm-up, the Converter-ette shows no signs of thermal instability. By closely following Bill Scherer's layout and construction, the mechanical stability is excellent. Fig. 1 shows a coil chart for adapting the W2AEF "Converter-ettes" to the Novice Q5'er or the Single Sideband Q5'er.

Tuning twenty meters on the Novice Q5'er was a different story. By using high "Q" coils in the antenna and r-f amplifier circuit the images were down about 35 db from the incoming station. Not the last word in image rejection, but quite satisfactory for general operation on 20 meters. Because of the simplicity of adding 20 meters to the Novice

(LMB) 753 "Flangelock." The beginning amateur would be wise to mount the components on a regular chassis of somewhat larger dimensions. The location of the parts does not seem to be critical and the same general layout as the Novice Q5'er should be satisfactory. For those desiring to duplicate the converter construction, the approximate dimensions of the converter chassis and panel layout are shown in Fig. 3. Power for the converter chassis is swiped from the BC-453 through a 4 pin barrier strip, mounted on the rear apron of the converter. The B plus voltage can be obtained at pin 4 of the 12A6 tube, filaments at pin 7 of the 12SR7 tube, and the ground connection is automatic when the two units are bolted together. However, to avoid getting shocked whenever the units are separated, connect a ground wire between the chassis of the converter and the BC-453 chassis.

Several readers advised me that they were having trouble locating the *Chicago* or *Thorndarson* power transformer for the conversion of the BC-453. A short time after the manuscript was published, a nifty little transformer that just fit the bill, was located in the *Triad* transformer catalog. This transformer is *Triad* part number R-6A and because of its small size, is easily mounted on the rear apron of the BC-453.

The converter is aligned in exactly the same manner as the Novice Q5'er, however, on 20 meters the slugs in the 20 meter coils are used for alignment, rather than the trimmer capacitors on the side of the tuning capacitor. Start the alignment job by placing the band switch in the 40 meter position and obtain the loudest signals by adjusting C1, C2 and the associated trimmer capacitors. Then switch down to 80 meters and adjust the slugs in L1 and L3 for the loudest signals. It will probably be necessary to repeat this two or three times until both bands track. Incidentally, the slugs in the coils for the original Novice Q5'er were removed. Although these coils are listed as having a top frequency of 6300 kc, they go well beyond 7500 kc, even with the slugs left in the coil, as in this particular circuit. Once the 80 and 40 meter bands have been aligned, switch over to 20 meters, and peak the slugs in L2 and L4 for the loudest signals at some clockwise setting of C1-C2. This completes the alignment of the converter section. The inductance, L7, in the Q Multiplier section is peaked for maximum signal on any band, with switch S2 in the off position. When S2 is changed to the peak position, the signals will probably decrease in volume because of the detuning effect of L6. By adjusting R13 and L6, the signals will get much stronger, and as resonance is approached, the Q Multiplier will almost break into oscillation (it will break into oscillation if R13 is advanced too far) and the characteristic sound (ringing) of high se-

lectivity will be heard. R13 is a front panel control and is used to control the selectivity. Greatest selectivity will be obtained just at the point where the Q Multiplier starts to break into oscillation. The capacitor C6 should be set at mid-capacity so that the Q Multiplier can be moved to either side of the receiver band pass after the adjustments are complete. Incidentally, capacitor C6 is somewhat of a "jury-rig," because it was not possible to find exactly the right capacitor for the job. Actually, a 140 μ fd. Hammarlund unit was used, but it was necessary to solder a 1 1/4 inch piece of 1/4 inch brass shaft stock to the rotor, so that a knob could be attached. (This type of capacitor uses a hex wrench or screwdriver for adjustment.)

Changing over to the null position should not decrease the volume to any great extent. However, you will probably notice that when C6 is adjusted to null out the carrier of an incoming phone station, the station will sound as though it was transmitting single sideband. This is because the Q Multiplier is selective enough to null out the carrier, but leave the voice sidebands intact. By juggling C6 and R14, a point of maximum rejection should be found and in this particular receiver it was about 45 db down. Once R14 is properly adjusted it requires no more attention, and therefore was mounted internally.

Conclusion

The Single Sideband Q5'er has been used at W6TNS for a period of 3 months now, and during this time I have found it to be one of the best means of copying SSB signals with the possible exception of the Collins 75A4. I personally prefer it to any of the "signal slicers" because it does not leave you at the mercy of the poor selectivity of most communications receivers. For mobile reception, it is unexcelled. Even on rough roads it is not necessary to constantly retune the receiver as is usually the case.

Well, that is about all there is to tell about the SSB Q5'er.

Fig. 3.
Top panel layout

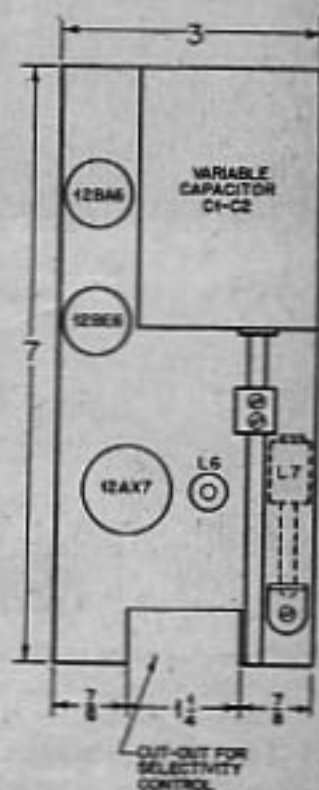


Fig. 1. The completely assembled double conversion receiver. Dial calibrations start at 0 above the line and 500 below the line. The 0 represents 7000 kc and 14,000 kc, while 500 represents 3500 kc. 50 kc is visible in the window. The BC-453 receiver is located in the center, tuned by the large knob. The r-f gain control and a-c switch is below the inset panel. The b-f-o switch is in the upper right corner.



BC-453 WITH DUAL CONVERSION

HERE is a relatively simple method of constructing a communications receiver, the performance of which is comparable to a far more expensive unit. Application of the fixed converter principle permits use of crystal-controlled high-frequency oscillators which provide stability that is unsurpassed. Combining fixed crystal-controlled converters with the BC-453 low frequency receiver results in exceptional stability and selectivity with an excellent degree of bandspread.

The circuit in Fig. 2 shows a converter which gives excellent results when used in conjunction with the BC-453 receiver. This converter uses a crystal oscillator which is 200 kilocycles lower in frequency than the low frequency end of the amateur band desired. Tuning is accomplished with

the BC-453 functioning as a tunable intermediate frequency. The BC-453 tunes from 190 kilocycles to 550 kilocycles, a range which is sufficient to cover the 3.5 mc, 7 mc and 14-mc bands. The 3.85 to 4-mc phone band may be covered by plugging in another crystal which is 150 kc higher in frequency than the 3.5-mc band crystal.

The converter tube, a 6AC7, gives excellent gain and signal-to-noise ratio. The oscillator is an untuned Pierce which adds to the simplicity. If plug-in coils were used, one converter could be used to cover the 3.5-mc, 7-mc and 14-mc bands. The crystals could be either switched or plugged in. The image ratio would be good on the two lower frequency bands and fair on the 14-mc band.¹ However, because of the low cost of the individual converters our receiver employs a separate unit for each band.

A Simple Super

Using these principles the author has developed a receiver which gives extraordinary performance considering the investment involved. The unit pictured in Fig. 1 costs approximately \$30.00 to assemble. It incorporates a converter for each of the three bands covered, 3.5 mc, 7 mc and 14 mc. The 7-mc and 3.5-mc units are identical except for the coils. The 14-mc converter uses a stage of tuned preselection and a converter tube which gives better selectivity than the 6AC7 in order to reduce the image response. This arrangement will give reasonable image rejection ratio on this band.

Bandswitching is accomplished by switching the output of each converter to the antenna circuit of the BC-453 receiver and simultaneously switching the positive plate voltage to the converter units. The addition of a new dial, calibrated from 0 to 35° above the center line and from 500 to 850 below the

¹ The image ratio will be quite poor on all bands. It may be inferior to a conventional receiver with no r-f stage.

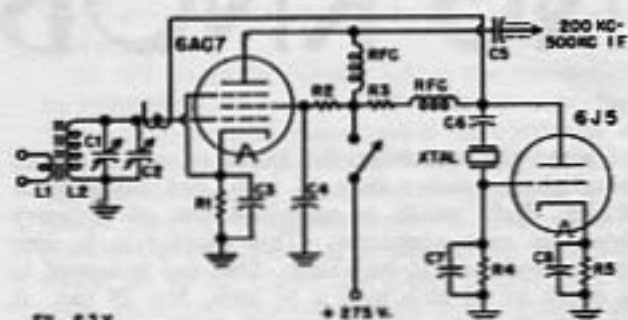


Fig. 2. Crystal controlled 3.5 and 7-mc converter.

- | | |
|--------------------|------------------------------|
| C1, C7—50 μ f | R4—25,000—50,000 ohms |
| C2—30 μ f | R5—1000 ohms |
| C3, C8—.01 μ f | RFC—2.5 mh |
| C4—.05 μ f | Coils—3.5 mc: L1, 8 turns; |
| C5—.005 μ f | L2, 50 turns; 7 mc: L1, 5 |
| C6—.001 μ f | turns; L2, 30 turns |
| R1—620 ohms | XTAL—3.5-mc converter, 3300 |
| R2—150,000 ohms | kc. 7-mc converter, 6800 kc. |
| R3—10 megohms | |

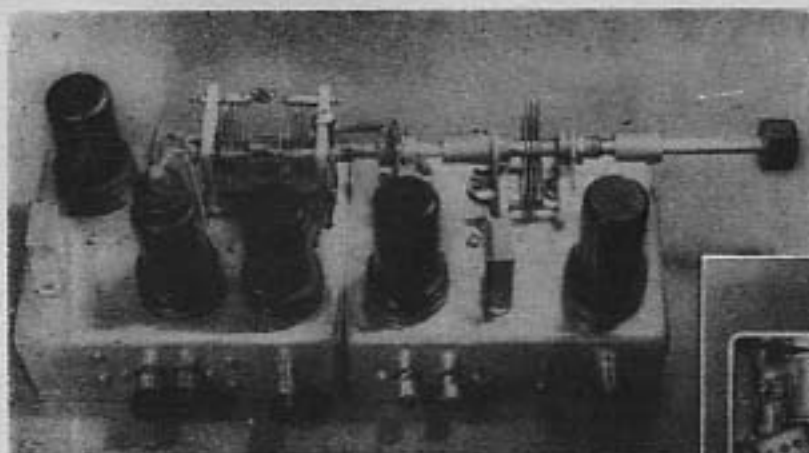
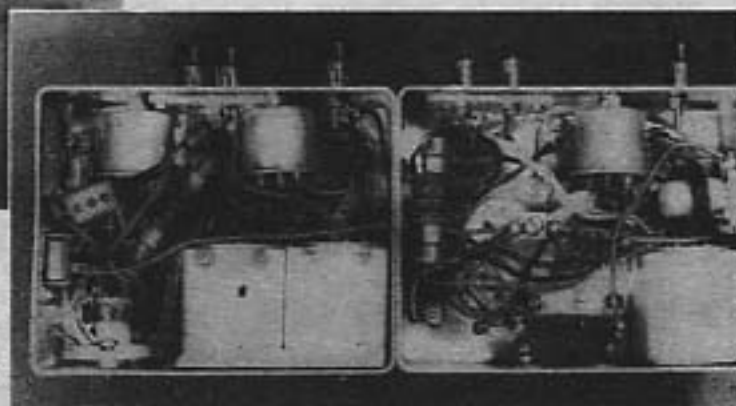


Fig. 4 (right). Under chassis view. The by-pass capacitors, resistors, resistor holders and iron core coil forms, including shields, were obtained from surplus BC-453 receivers. A common power receptacle located on the extreme left supplies power to both units.

Fig. 3 (left). 7 and 14-mc converters. The tuning of both units is ganged to reduce the number of controls. The 7-mc converter with the trimmer condensers removed is on the right. The crystals are plug-in and different crystals may be used to cover other frequencies than the amateur bands. The individual chassis measures $3\frac{1}{2}$ " by 5".



center line allows direct reading of frequency on all bands. Zero on the dial represents either 7,000 kc or 14,000 kc and 500 represents 3,500 kc. The dial is constructed by cutting an aluminum disk $3\frac{3}{4}$ " in diameter. Draw the new scale on a good grade of writing paper so that "0" corresponds to 200 on the original dial and 50 corresponds to 250, etc. This will provide accurate calibration provided the crystals are carefully chosen for the proper frequencies. Crystals may be obtained for less than one dollar on the surplus market. But if surplus crystals are used, purchase frequencies somewhat lower than those desired and carefully grind the crystals to the exact frequencies.²

The type of construction used for the converters is patterned after the BC-453 and most of the parts were obtained largely from two of these receivers that were "cannibalized." These receivers can be purchased for around \$2.00 to \$3.00 less tubes. One caution—do not attempt to use the radio frequency chokes found in this type of receiver because their inductance is much too low for successful use in the converters.

The conversion of the BC-453 receiver is not difficult. The filaments are wired in parallel instead of series parallel as is required for 28-volt operation. A 50,000-ohm variable resistor is added

between pins number 8 and 1 (see Fig. 7) on the rear power socket and serves as a gain control. An off-on switch for 117-volt a.c. may be added to this control. A switch for b.f.o. is added between pins number 4 and 1. The headphone jack is wired to pins number 2 and 1. Filament voltage is connected to pins number 6 and 1. The plate voltage is connected to pin number 7. Loudspeaker operation is obtained by connecting an output transformer with an 8000-ohm impedance primary to pins number 2 and 1. Make sure that number 2 is connected to lug number 3 on the output transformer of the BC-453, as this is the 8000-ohm tap. Power supply requirements are 250 to 300 volts at 60 ma, and either 6.3 volts or 12.6 volts for the filaments, depending on the tubes used.

Receiver Alignment

Adjustment of the receiver for initial operation is as simple as the modifications. With the band-switch set for the band desired, turn up the gain control on the BC-453 and set the alignment tuning condenser on the converter at half scale. Next tune the associated trimmer condenser for a distinct increase in noise level. This will be either the frequency desired or, possibly, the image frequency. The image frequency can be easily checked because it falls outside of the amateur band.

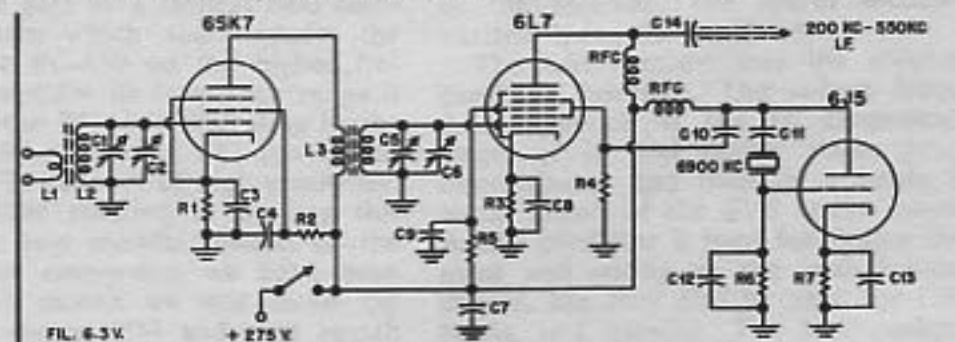


Fig. 5. Crystal controlled 14-mc converter for the BC-453.

C1, C5—15 μ f
C2, C6—40 μ f
C3, C8, C13—.01 μ f
C4, C7, C9—.05 μ f
C10—30-50 μ f

C11—.001 μ f
C12—50 μ f
C14—.005 μ f
R1, R3—620 ohms
R2, R4—50,000 ohms

R5—15,000 ohms
R6—25,000—50,000 ohms
R7—1000 ohms
KFC—2.5 mh
L1—3 turns
L2—15 turns
L3—10 turns
L4—15 turns

Fig. 1—Coil chart for adapting W2AEF's Converter-ettes to the Novice or SSB Q5'er.

Conv. Freq.	L1	L2	C _a	L3	C _b	L4	C7 & C8 silver mica
28 mc.	2 turns #20 enam.	Miller #4404	5 μ fd.	Miller #4404	5 μ fd.	Miller #4403	100 μ fd.
21 mc.	2 turns #20 enam.	Miller #4404	10 μ fd.	Miller #4404	10 μ fd.	Miller #4403	100 μ fd.
14 mc.	3 turns #20 enam.	Miller #4405	5 μ fd.	Miller #4405	5 μ fd.	Miller #4404	100 μ fd.
Miller #4403 9 turns, #22 enam. wire, wound on $\frac{3}{8}$ " slug tuned form							
Miller #4404 12 turns, #24 enam. wire, wound on $\frac{3}{8}$ " slug tuned form							
Miller #4405 19 turns, #26 enam. wire, wound on $\frac{3}{8}$ " slug tuned form							

The June issue of *CQ* contained a very interesting letter by Fred Nazar, W8RNA. Fred discovered that the 3500 kc crystal could be used on its various overtones and actually made one crystal work for all three bands. This is an excellent idea but does have the disadvantage of locating the 20 meter band down on the low frequency end of the Q5'er dial, where image rejection is not too good. However, for constructors who want to save space (by eliminating the crystals and the band switch), this is recommended reading also. W8RNA also noted that the BC-453 makes an excellent mobile receiver. As a matter of fact, I believe it is one of the few receivers in existence that can be used for mobile SSB reception, with the possible exception of those with crystal controlled converters.

The Single Sideband Q5'er

Fig. 2 is the complete circuit for the SSB Q5'er converter and Q Multiplier. Coils L2

and L4 are the added 20 meter Miller coils. This converter differs from the Novice Q5'er in that the coils and crystals are switched by a 6 pole, 5 position miniature ceramic switch. Only 3 positions of this switch are actually needed, but it seemed a shame to waste the extra positions. The fourth position of the switch is wired for straight through operation so that the BC-453 can be used with a regular communications receiver. The contacts on the fifth position were used as tie points and the switch stop was set to block the rotor from contacting them. The crystals were soldered directly to the switch terminals. Do this as rapidly as possible to avoid damaging the crystal. As you can see from the photographs of the side view of the converter, the parts are really crammed into a small space. I must confess that I first mounted the tuning capacitor, and then started packing in the rest of the parts as tight as I could get them. The cabinet used to hide this atrocity was an L. M. Bender

Parts List

C1, C2—Dual section 365 μ fd. variable capacitor (Miller #2112 or equiv.)
C3, C4, C5, C7, C10, C14, C15—.005 μ fd. disc ceramic capacitor
C6—140 μ fd. variable capacitor (Hammarlund APC-140 or equiv., see text)
C8—50 μ fd. disc ceramic capacitor
C9—200 μ fd. disc ceramic capacitor
C11, C12—.001 μ fd. silver mica
C13—500 μ fd. silver mica
C16—.002 disc ceramic capacitor
C17—10 μ fd., 450 volt electrolytic capacitor
J1—Amphenol coaxial connector (UHF style)
J2, J3—RCA phono jack
L1—2100-6300 kc antenna coil (Miller #B-320A) Primary, 50 turns #30 scramble wound at the ground end of the secondary. Secondary, 50 turns

#26 enam. wire wound on $\frac{3}{8}$ " slug tuned form.
L2—6.0-18.0 mc antenna coil (Miller #C-320a) Primary, 20 turns #26 enam. wire wound at the ground end of the secondary. Secondary, 20 turns #24 enam. wire wound on $\frac{3}{8}$ " slug tuned form.
L3—2100-6300 kc r-f coil (Miller #B-320RF) Primary, 100 turns #30 scramble wound at the ground end of the secondary. Secondary 50 turns #26 enam. wire wound on $\frac{3}{8}$ " slug tuned form.
L4—6.0-18.0 mc r-f coil (Miller #C-320RF) Primary, 30 turns #30 scramble wound at the B plus end of the secondary. Secondary, 20 turns #26 enam. wire wound on $\frac{3}{8}$ " slug tuned form.
L5—100 millihenry r-f choke, iron core (Miller #960)

L6—5-5 millihenry TV width coil (Miller #6313)
L7—15-60 millihenry TV width coil (Miller #6319)
R1—82 ohms
R2—47K ohms
R3—2.2K ohms, 1 watt
R4—150 ohms
R5—22K ohms
R6—27K ohms
R7—47K ohms
R8, R15—10K ohms, 1 watt
R9, R11—2 megohms
R10—180K ohms
R12—1.5K ohms
R13, R14—10K ohm pot, linear taper (Centralab #B-14)
S1a, b, c, d, e, f—6 pole, 5 position miniature ceramic switch (Centralab #PA-2021 with 4 positions used.) Band change switch.
S2a, b, c—3 pole, 5 position miniature ceramic switch (Centralab #PA-2007 with 3 positions used.) Q Multiplier switch.
X1—80 meters, 3500 kc crystal

X2—40 meters, 6800 kc crystal
X3—20 meters, 6900 kc crystal
Miscellaneous parts required: Barrier terminal strip (three terminals required)
Cabinet: L. M. Bender (LMB) 753 "Flange-lock" Tubes: 12BA6, 12BE6, 12AX7 shielded wire and male connectors for cables
V1—12 BA6
V2—12 BE6
V3—12 AX7

Parts Required for the BC-453 Conversion (CQ, Jan. 1956)

20-20 μ fd. 450 WVDC—Sprague TVL-2755 filter capacitor
20,000 ohm pot with SPST switch
Toggle switch SPST
Phone jack (open circuit)
Power transformer: TRI-AD R-6A, 450 volt ct., 50 ma., 5 volts, 2 amps., 6 volts, 2 amp

Q5'er, it was included in the Single Sideband Q5'er. In this receiver, best image rejection is obtained by selecting a crystal that puts the desired section of the 20 meter band at the 550 kc end of the Q5'er dial. Down at the 190 end of the dial, the image rejection is in the order of 10 db and is quite unsatisfactory.

Another request from readers of the Novice Q5'er article was (believe it or not) "How can I obtain more selectivity for SSB operation?" There have been many tricks for improving the selectivity of the BC-453 such as sawing off part of the coils to obtain greater separation, decoupling the coils from the tubes and so on. A little more experimentation on the Novice Q5'er produced a good working Q Multiplier at 85 kilocycles. Although there is no literature on using the Q Multiplier on frequencies other than 455 kc, it would appear entirely feasible and desirable. By substituting the Ferri-Loopstick with a Miller television width coil and juggling the values of the shunting capacitors the Q Multiplier seems to work just as well on 85 kc as on 455 kc. The measured selectivity of the SSB Q5'er with the Q Multiplier at minimum bandwidth is 85 cycles (yes, I said cycles). I make that statement with a great deal of reservation but I have the curve

to prove it. The bandpass was checked with an LM frequency meter (with both hands on the dial). Even with the Q Multiplier full on, the drift in the BC-453 is not noticeable. This desirable feature can also be added to existing Novice Q5'er receivers with the same excellent results. It is really a sensation to copy c.w. with this kind of selectivity. Drift in crystal controlled Novice transmitters is easily detected and a chirping signal is impossible to copy. Single side-band stations are easily tuned in by backing off the selectivity to about 1600 cycles. Switching on the Q Multiplier sucks the sideband station right up out of the heterodynes caused by the old fashioned transmitters with the carriers. The 12AX7 portion of Fig. 2 is the 85 kc Q Multiplier and this part of the circuit could be removed bodily and added to existing Q5'ers. Because of the high inductance involved in the 85 kc tuned circuit, it may be necessary to change the values of $C11$ and $C12$, one way or the other. The adjustment of the Q Multiplier has been well covered by Champlin (*CQ*, Oct. '53) and Bill Scherer (*CQ*, Jan. Mar. Apr. '55) and the constructor should have no trouble obtaining the additional selectivity if their directions are followed to the letter.

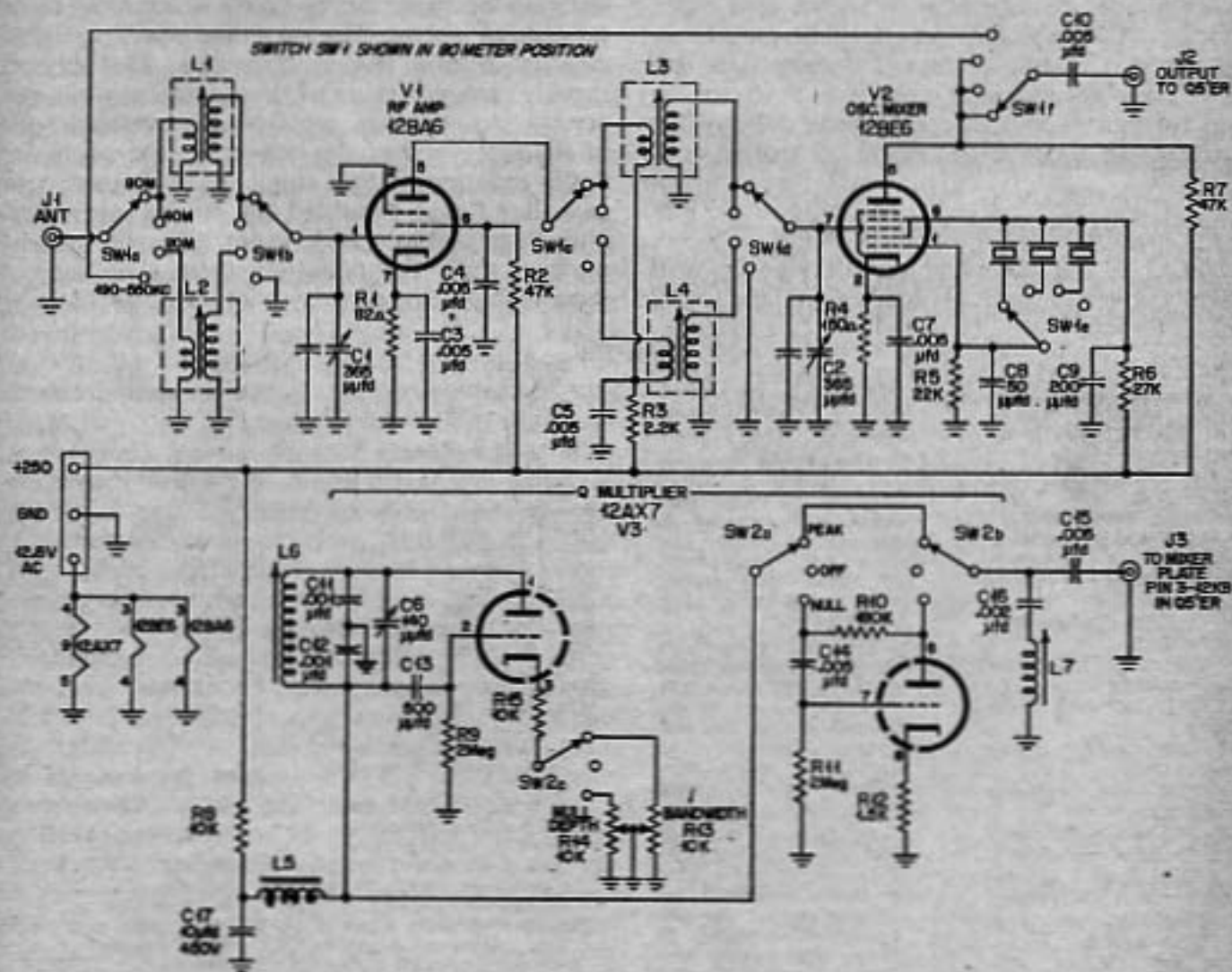
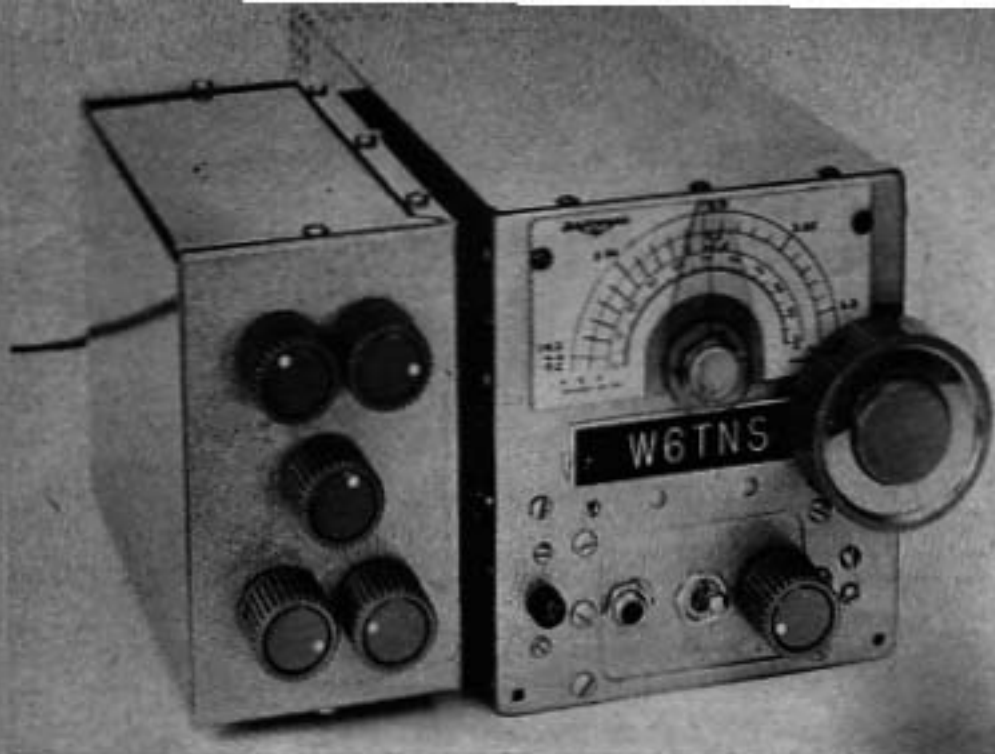


Fig. 2. Schematic diagram of the SSB Q5'er. The 12AX7 section is the Q Multiplier and can be used with the Novice Q5'er also.



The Single Sideband Q5'er. Under that shining exterior is, believe it or not, a BC-453 Command receiver. The upper left knob is the null-off-peak switch for the Q Multiplier. The upper right knob tunes the variable capacitor, C1-C2. Selectivity is controlled by the center knob and the Q Multiplier frequency is changed with the lower left knob. Band changing is accomplished with the lower right knob.

Donald L. Stoner, W6TNS
Engineering Consultant
Box 137, Ontario, Calif.

Surplus Conversions

The Single Sideband Q5'er

War surplus equipment is many things to many people. To the Novice, it is a god-send. One can assemble a complete station, composed entirely of war surplus equipment at very low cost. However, there are pitfalls to be avoided, such as equipment that cannot be converted to anything except parts, or receivers and transmitters that are difficult to convert to amateur bands. One such unit is the APX-1 and 2. Just off hand, I can't think of anything that this unit could be converted to, except possibly a 110 volt IFF interrogator (it was 28 volts) and who needs one? However, looking at it from the other standpoint, there must be \$50.00 worth of parts in that gizmo. There are at least 2 dozen good ceramic sockets, maybe 100 ceramic capacitors (all popular values), not to mention motors, coils, plugs, thigamo-bobs, franastats and last but not least, left hand Romit rods. I digress.

For the Technician, surplus equipment is a means of getting on the high frequency bands, with units that would be unobtainable, at any price, on the commercial market. As a Technician, my first 420 megacycle rig was a moldy old APS-13 that looked like it had been used to keep the mud from shifting on the bottom of some harbor. The dirt was at least a quarter inch thick but it was fun cleaning it up, installing a 110 volt power supply in it and using

it on the 420 band. I'll never forget the thrill I got from working a station in Los Angeles, from San Diego, 110 miles away. Even though it was a modulated oscillator and the modulation was "raunchy," the APS-13 rig provided many fine contacts and at a total cost of less than \$10.00.

The old timer can fill out his station with surplus gear. There is a definite increase in the number of hams getting on 2 meters for good old rag chews. 80 and 40 meters have become so crowded that it is difficult to get a solid QSO. 2 meters provides the old timer with a band that is, for the most part, QRM free, static free, and free of QSB. Nine out of ten hams on the two meter band do not even use a v.f.o. All they need are two or three crystals and QRM ceases to be a problem.

To the manufacturer of commercial equipment, war surplus is a dirty word (or at any rate, it used to be). Back in the early days of war surplus, there was so much quantity and the price was so low, that it was pretty tough to sell any piece of commercial equipment. Many manufacturers went on the rocks because they could not compete with war surplus prices. Looking back through some old copies of *CQ*, I find selsyn indicators for \$5.00 a pair, a 6 foot enclosed relay rack (brand new) for \$18.50, BC-221 frequency meters for \$39.00,

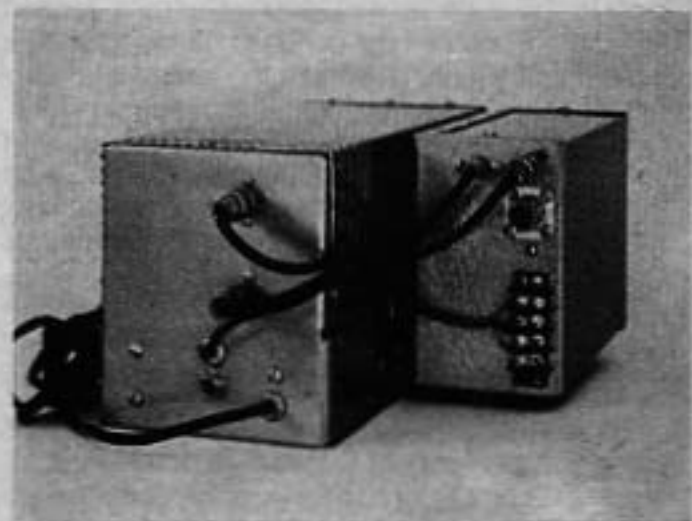
PE-103 dynamotors (also new) for \$5.00 (Gad!), the complete SCR-274/N units including 3 Command receivers, 2 Command transmitters, 4 dynamotors, racks, cables, control boxes and spare tubes for \$30.00. It is pretty easy to see why the ham gear manufacturers did not do much business with these odds. All this has changed, of course, and the surplus store of today has only a fraction of the gear of "the good ole days." And today, manufacturers of amateur gear are turning out equipment at an unprecedented rate.

Some of the newer hams probably do not remember some of these early bargains. Actually, right after the war, electronic surplus was even cheaper than these previous examples. The first "goodies" to appear on the surplus market went just like hot cakes and the dealers did not need to advertise. For this reason, some of the better bargains were never recorded for posterity in the pages of *CQ*. If I may reminisce for a moment, I can still remember a cold winter day in early 1946. I was still in high school then, and for weeks I had dreamed of my safari to the surplus stores in Detroit. Finally, that morning arrived and at the crack of dawn, several hams and I headed for that fair city. I believe, at the time, I was shopping for Command receivers and one of the big surplus emporiums was having a special on them. With a fluttering heart and eyes as big as 3 cm radar reflectors, my friends and I bolted down the rows of plexiglas B-17 bubbles and the Mark II cotton pickers (brand new) and headed for the electronics section. One could spot the gear a half mile away. It was shining like a sea of black crackle, ship grey and olive drab. Upon inquiring about Command receivers, the salesman showed me a 3 to 6 megacycle and a 6 to 9.1 megacycle demonstrator that was just like the ones in the overseas shipping boxes. I believe the dialogue went something like this: Placing my eyeball to his eyeball, I shrewdly asked "How much for the two of 'em?" (This was the fashionable way to dicker in those days.) After sizing me up for a hot one, the salesman says, "Two Ninety Eight" and with a flourish, waves toward the sparkling brand new receivers. "What," I bel-lowed, "you raised your price! The ad says a Dollar Ninety Eight!" "So we got overhead" shoots back the salesman. (It was a big circus tent, if my memory doesn't fail me.) "Tell you what I'm gonna do" (a popular expression back then), "I'll throw in one of these 190 to 550 kilocycle jobs (brand new of course), nobody wants the darn things." (I knew that I could have gotten a better deal at another store on the other side of town, but it was starting to snow and the streets of Detroit can get pretty slippery, almost as slippery as that salesman. I had better quit reminiscing, the manuscript is getting tear stained.) However, if you think I could be spreading the facts a little thin, look

through some of the old copies of *CQ*. Boy! What deals—those were the good ole days!

In presenting surplus conversions I have several ulterior motives (besides money). It seems to me, and quite a few others, the experimenting phase of amateur radio is a lost art. The current "do it yourself" trend certainly is not getting its message across to the amateurs. Too many amateurs would rather put the green on the line and bring home a factory made ham station, never more to get burnt by a hot soldering iron. Some hams have never seen the insides of those mysterious boxes upon which are mounted the switches they flip and the knobs they turn. To me, it makes about as much sense as a sailor spinning the little green propeller on the end of a torpedo. Don't get me wrong, I have nothing against commercial equipment. Over the past few years I have purchased several pieces of ready made equipment, but like liquor, cigarettes, women and DX contests, excesses should be avoided. The satisfaction that you receive when you "roll your own" cannot be measured. Invariably, when a ham constructs something, it does not work right off the bat, and the person has to think a little before the trouble resolves itself. Back to the soldering iron, men!

All too many of the conversions that I have seen are simply an attempt to get the units working with a minimum of effort. Painted over panels, dangling power supplies and out-rigger tubes prevail. The old axiom "a job worth doing is worth doing well" certainly applies in this case. If one spends ten or twenty hours converting a piece of war surplus, why not spend a couple more hours sprucing it up? With a very little work it is possible to do a nice job of de-militarizing surplus gear. A little paint to cover the battleship grey or olive drab and the unit begins to take on a commercial appearance. Take a hint from the manufacturers. Some chrome here and a few shiny knobs there, and it will take a seasoned "sur-pluser" to detect any resemblance to military equipment. One of the best articles on the



Rear view of the 55B-Q-5er

Now tune in a signal and adjust the trimmer for maximum signal strength. Once this setting is found it will need changing very little during complete band tuning. Repeat this process for each converter unit.

If the receiver does not operate check the appropriate crystal for oscillation. If it is oscillating sufficiently for adequate voltage injection to the converter the noise level will decrease noticeably when it is removed. Very little oscillator injection

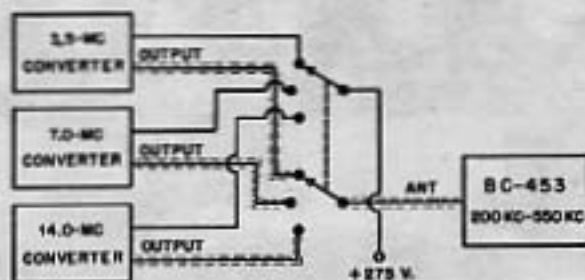


Fig. 6. Block diagram of receiver-converter arrangement.



Fig. 7. Rear view of power receptacle connections.

voltage is actually required for the proper operation of the 6AC7 converters. For this reason the crystal oscillator plate voltage should be limited to 35 or 40 volts.

The over-all selectivity of this receiver is excellent. Single-signal reception is almost realized, one side of zero beat being very low. Additional selectivity would make intelligibility of phone signals poor. The substantial "skirt" selectivity offered in this receiver makes copying of weak signals possible right up to that kilowatt signal a few blocks away. As an interesting application of surplus and a good receiver at a modest investment this little super is a worthwhile shop project.