

Fig. 5. Suggested schematic diagram of a G-E 6AR8 sheet beam tube operating as a combined tunable oscillator (VFO) and mixer. Circuit values are shown for a tunable oscillator operating at 3.3 to 3.6 megacycles, with a 455-kilocycle SSB signal applied to one beam deflection plate. The sum of the two input frequencies appears in the output circuit, T_1 , tuned to the 3.8 to 4.0-megacycle range. The oscillator coil, L_4 , has an inductance of 4.7 microhenries. It was wound on a 3/4-inch diameter ceramic coil form, with 21 turns of No. 20 enameled wire spacewound 1 inch long. The cathode tap is 3 turns, and the grid tap 10 turns, from the grounded end.

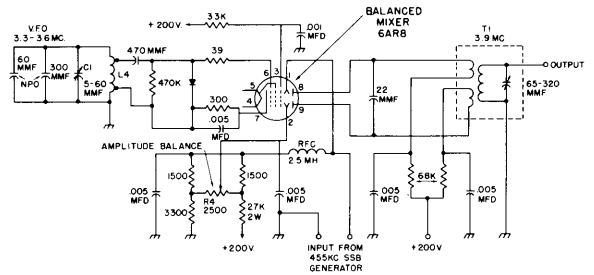


Fig. 6 Suggested schematic diagram for a 6AR8 tube in a balanced mixer circuit. This circuit is suitable for combining two input signals from a SSB generator and tunable oscillator (VFO), and obtaining either the sum or difference signal in the tuned output circuit, C_1 -- L_1 . Conventional tuned circuits may be used here, and in T_1 . All resistances are in ohms, 1/2 watt, unless specified. Capacitances are in microfarads (mfd). A linear taper composition potentiometer should be used for R_1 .

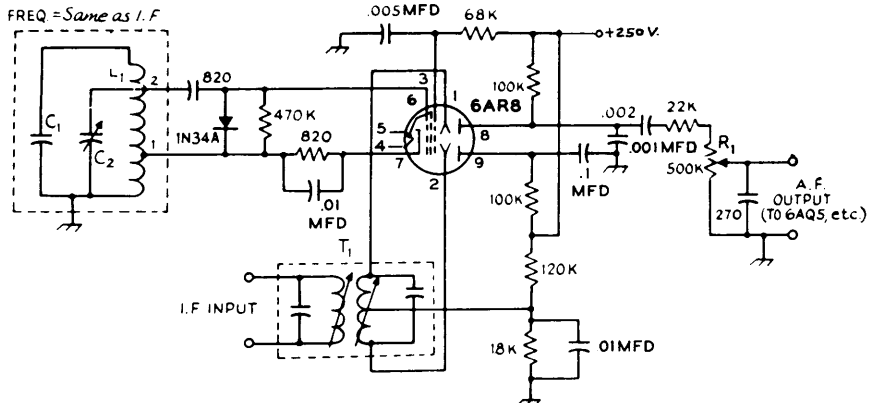
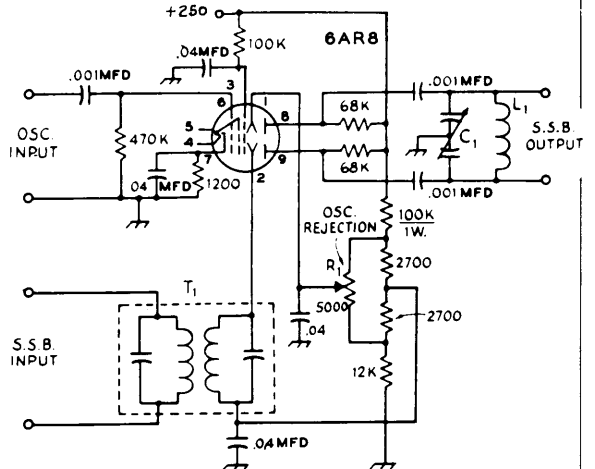


Fig. 7. Suggested circuit for a 1-tube product detector using the G-E 6AR8 sheet beam tube. The circuit contains its own carrier oscillator utilizing the cathode, control grid and number three grid elements. The beam deflecting plates are in the detection circuit, and the audio output signal is taken from the plates. The oscillator tuned circuit should have high capacitance for best stability. Taps 1 and 2 on L_1 should be about 5 and 25 percent, respectively, from the grounded end. Resistances are in ohms, 1/2-watt rating. Capacitances in decimals are in microfarads (mfd); those in whole numbers are in micro-microfarads (mmf).

BALANCED MODULATORS

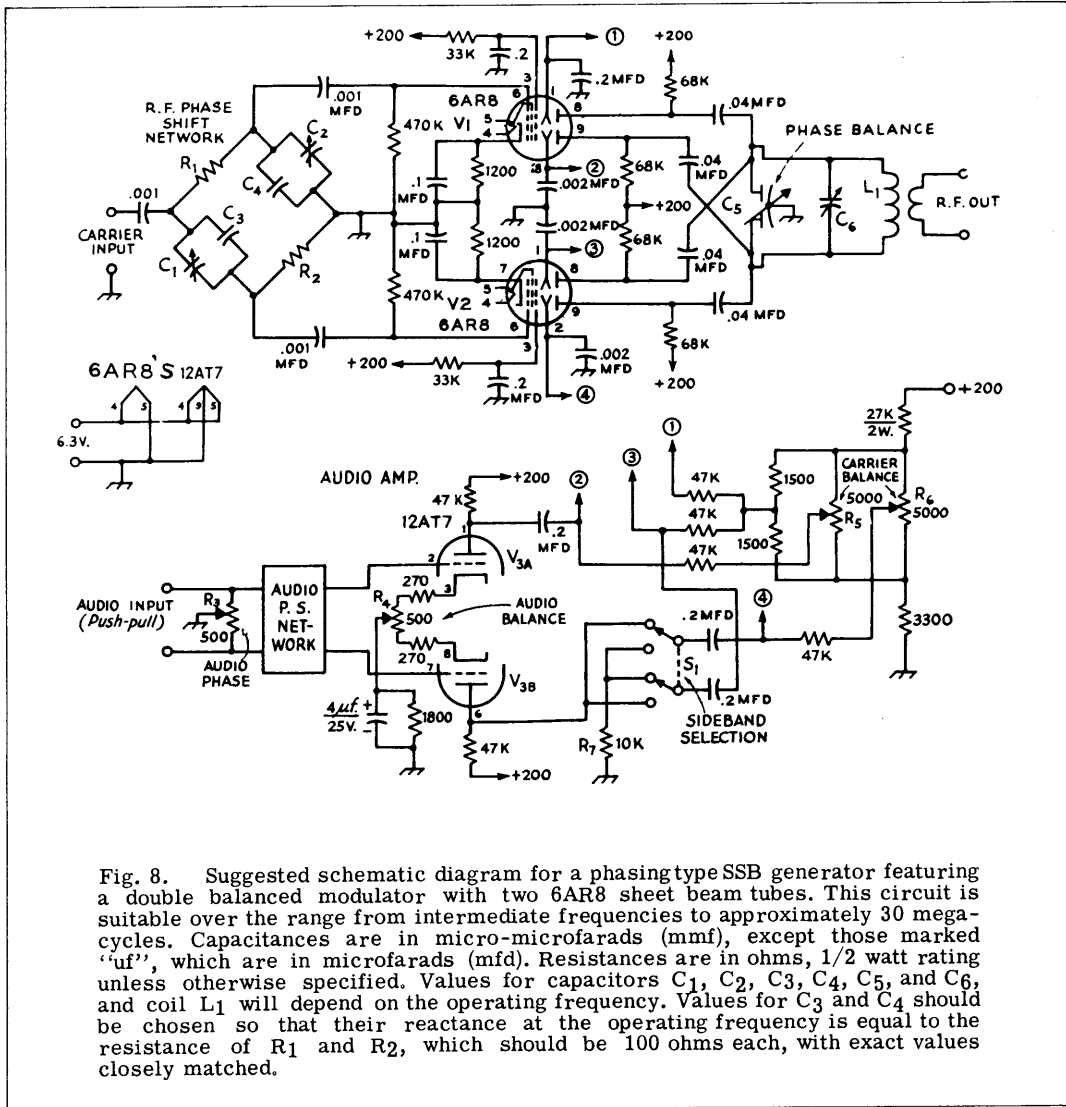


Fig. 8. Suggested schematic diagram for a phasing-type SSB generator featuring a double balanced modulator with two 6AR8 sheet beam tubes. This circuit is suitable over the range from intermediate frequencies to approximately 30 megacycles. Capacitances are in micro-microfarads (mmf), except those marked "uf", which are in microfarads (mfd). Resistances are in ohms, 1/2 watt rating unless otherwise specified. Values for capacitors C₁, C₂, C₃, C₄, C₅, and C₆, and coil L₁ will depend on the operating frequency. Values for C₃ and C₄ should be chosen so that their reactance at the operating frequency is equal to the resistance of R₁ and R₂, which should be 100 ohms each, with exact values closely matched.

A SSB exciter construction article with the 6AR8 as a balanced modulator was described in the July, 1956 issue of CQ, on pages 24 to 31. This filter type exciter was designed and constructed by William I. Orr, W6SAI.

Additional material on applications of sheet beam receiving tubes has been published in the March, 1960 issue of QST magazine.

A new article showing the G-E 6AR8 as a balanced modulator in a simple double sideband transmitter, reconstructed from a surplus Command Set transmitter, appears in the May, 1961 issue of CQ magazine, on pages 48 through 51.

A new type of miniature sheet beam tube which has low output capacitances, and thus is capable of operating in balanced modulator circuits well into the VHF region, has just been announced by the General Electric Receiving Tube Department. It is known as the 7763 and will appear in G-E HAM NEWS articles during 1962.