III MODEL 420 FREQUENCY CONTROL UNIT

Model 420 Frequency Control Unit is designed for full band coverage of 80, 40, 20, 15, and 10 meters, through twenty 200-kc segments. The unit is specifically intended for fixed and portable operation but may also be used for mobile operation, if space permits.

CIRCUIT THEORY

Q1, the 2N706 Oscillator, operates in the Common base configuration as a Colpitts oscillator. See Figure 7. Capacitors C1901 and C1902 are in parallel with C1931, the main tuning control, across the coil, L1901. Capacitors C1933, C2001 and C2004 effectively tap the oscillator across only about 10 percent of the tank circuit. This results in exceptional stability. Q2, the Emitter Follower, is used for matching the impedance of the coaxial cable to the transceiver, not for stability purposes. Bandswitching is accomplished by tapping the main coil L1901, and providing vernier adjustments coils, L1902 through L1921 for setting the low end of the tuning range. C1932 provides vernier dial setting when using the crystal calibrator.

INSTALLATION

Model 420 is furnished with a mounting base for common mounting with the transceiver. The Frequency Control Unit may be mounted on either side of the transceiver.

ALIGNMENT

Alignment of the Model 420 requires only the use of a general coverage receiver tuning the frequency ranges between 8 mc and 24 mc. Calibration of the receiver is not critical since the crystal calibrator in the transceiver is used for final adjustment, but the receiver must be accurate within 50 kc to permit selection of the proper 100 kc harmonic. Vernier dial set alignment may be made with the dial set knob.

FOR MINOR FREQUENCY ADJUSTMENTS, which may be required after the initial aging period, simply remove the cabinet cover and very carefully adjust the trimmer capacitor marked for the specific range.

FOR MAJOR FREQUENCY ADJUSTMENTS

Tune Frequency Control Unit to low end of frequency range, and locate heterodyne with general coverage receiver at frequency indicated in following table with dial set at midpoint (dot straight up), adjust vernier coil to bring heterodyne within a few kc of the receiver frequency, then switch on calibrator and adjust vernier coil for zero beat with calibrator. Move tuning to high end of tuning range and adjust trimmer capacitor for zero beat. Repeat high and low end adjustments until calibration is correct at both ends. Coil and capacitor locations are marked in the unit

BAND	RCVR FREQ. (kc)	ADJUST COIL (low end)	ADJUST CAP, (high end)
3.4-3.6	8573	L1921	C1929
3.6-3.8	8773	L1920	C1927
3.8-4.0	8973	L1919	C1925
7.0-7.2	12,173	L1918	C1923
7.2-7.4	12,373	L1917	C1921
14.0-14.2	8827	L1916	C1920
14.2-14.4	9027	L1915	C1918
14.8-15.0	9627	L1914	C1916
21.0-21.2	15,827	L1913	C1914
21.2-21.4	16,027	L1912	C1913
21.4-21.6	16,227	L1911	C1912
28.0-28.2	22,827	L1910	C1911
28.2-28.4	23,027	L1909	C1910
28.4-28.6	23,227	L1908	C1909
28.6-28.8	23,427	L1907	C1908
28.8-29.0	23,627	L1906	C1907
29.0-29.2	23,827	L1905	C1906
29.2-29.4	24,027	L1904	C1905
29.4-29.6	24,227	L1903	C1904
29.6-29.8	24,427	L1902	C1903