

COIL SET C-184 FOR USE WITH
RADIO TRANSMITTERS BC-AG-230, BC-AH-230 AND BC-AL-230
INSTRUCTIONS FOR USE

I. General Description

Coil Set C-184 procured on Order No. 18825-NY-39 and Order No. 737-NY-40, when used with Radio Transmitters BC-AG-230, BC-AH-230 or BC-AL-230 and in conjunction with Crystal Unit DC-10, provides for crystal-controlled radio transmission within the range 4000 to 5000 kc. CW, voice- or tone-modulated transmission may be selected in the usual manner by means of the selector switch on the radio control box. Coil Set C-184 differs from Coil Sets C-218 and C-273 in the oscillator (shielded) section. The antenna sections of both coil sets are essentially alike and instructions as to the use of the antenna tap on Coil Sets C-218 and C-273 apply to Coil Set C-184. These instructions will be found in the applicable instruction book for the radio set used, under "Adjustment of Transmitter." The power amplifier current should not exceed 30 milliamperes.

The antenna current obtained when using Coil Set C-184 will, under average conditions, be slightly less than obtained when using Coil Sets C-218 and C-273. All other performance characteristics will be equal to or better than with Coil Sets C-218 and C-273.

II. Detailed Description of Components

The antenna section of Coil Set C-184 uses essentially the same components as Coil Sets C-218 and C-273 and is described under "Transmitter Coil Sets" in the applicable instruction book. The neutralizing winding 506c of Coil Set

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C-184 has a different number of turns than the corresponding winding 121c of Coil Sets C-218 and C-273, but in all other respects the antenna sections of both coil sets are alike.

The oscillator section of Coil Set C-184 is enclosed in a metal shield with one side cut away to permit mounting of the crystal unit and comprises the following electrical equipment:

Crystal Unit DC-10 (501) is a moulded bakelite holder containing the frequency-determining quartz plate.

Oscillator Grid Coil (502A) is wound of bare tinned copper wire on a 1-5/16" diameter Isolantite form. This coil, in conjunction with tuning condensers 116, 117, and 120, tunes the oscillator circuit to the frequency of the Crystal Unit DC-10.

Amplifier Coupling Coil (502B) is wound between the turns of the oscillator grid coil (502A) and serves to couple the oscillator and amplifier grid circuits.

Oscillator Plate Coil (503) is wound on a 3/8" diameter Isolantite form and serves as a means for supplying plate voltage to the oscillator vacuum tube.

Crystal Series Coil (502C) is wound on a 3/4" diameter Isolantite form mounted within the oscillator grid coil form and serves to reduce the radio-frequency voltage applied across the quartz crystal to values which will not damage the crystal or allow excessive heating of the crystal.

Resistor (505) serves to reduce the output of the oscillator to the proper value.

III. Installation and Operation

Coil Set C-184 is inserted in the radio transmitter in the same manner as any other coil set. Before insertion of Coil Set C-184, a Crystal Unit DC-10 of the desired carrier

frequency is first mounted on the brackets provided in the oscillator (shielded) section of the coil set. The crystal unit must be inserted so that the frequency stamping on its case faces outward. It is held in position by means of two thumbscrews provided on the brackets.

The oscillator is tuned by means of frequency control knob 241 of the radio transmitter. The approximate dial setting for this control is given on the calibration chart mounted on the front plate of Coil Set C-184 and when adjusted to this dial setting, the Crystal Unit DC-10 will oscillate at the desired frequency. Set the transmitter for VOICE operation and tune the antenna circuit in the usual manner by means of control 243 of the radio transmitter until the minimum amplifier plate current is obtained as measured by a milliammeter plugged into jack 128 (amplifier plate current). Neutralization is accomplished in exactly the same manner as for any other coil set, although this adjustment is not necessary if the transmitter has been previously neutralized for the power amplifier tube in use. After proper neutralization has been accomplished, retune the antenna by means of control 243 until minimum amplifier plate current is obtained. The adjustment of the antenna tap 130 is exactly the same as for Coil Sets C-218 and C-273.

Plug a milliammeter into jack 127 (modulator plus oscillator plate current). After having made the adjustments outlined in the previous paragraph, readjust control 241 until the modulator plus oscillator plate current is a minimum, which will correspond to maximum antenna current; then turn the control 241 in the direction of increasing dial readings until the total plate current of the transmitter (amplifier plus modulator plus oscillator tube plate currents) is approximately 130 milliamperes. The radio transmitter should not

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be operated with dial 241 adjusted for maximum antenna current, since under this condition the modulator plate current will in general be too low for satisfactory modulation. With the total plate current at 120 milliamperes, power output and modulation capability will be normal. With lower total plate current, the power output will increase slightly, but the percentage modulation will decrease; and with higher total plate current, the power output will decrease with but little gain in modulation capability.

Normally the optimum operating setting for control 241 will be within 20 or 30 divisions of the value shown for the approximate calibration. In extreme cases, the difference may be as great as 50 divisions. While the equipment may be tuned and operated at the approximate calibration dial setting, it is strongly recommended that this practice be followed only in cases of emergency. For all normal operation, Coil Set C-184 should be tuned by the use of a plate milliammeter as outlined in the previous paragraph.

In order to operate on another frequency in the 4000 to 5000 kc band, it is only necessary to remove the coil set from the transmitter, replace the Crystal Unit DC-10 with another of the desired frequency, and retune the equipment as noted above.

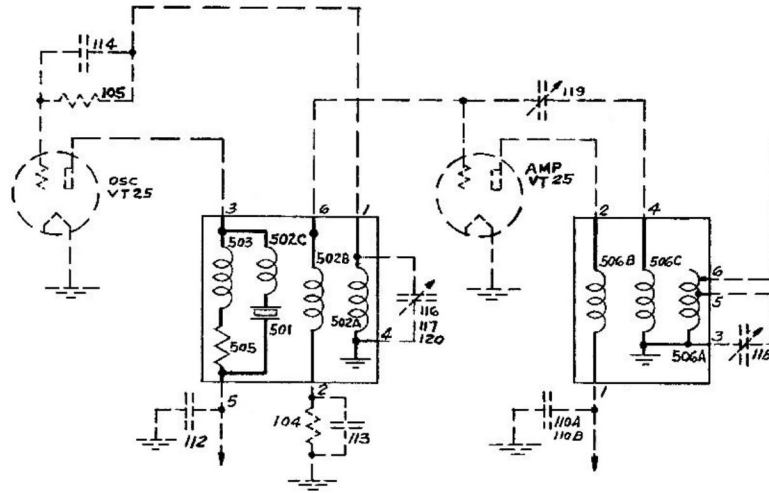
The various voltages and currents in the radio transmitter when using Coil Set C-184 are essentially the same as when using Coil Sets C-218 and C-273, and these values are given in Tables under "Maintenance" in the applicable instruction book.

REFERENCE LIST OF COMPONENTS OF COIL SET C-184

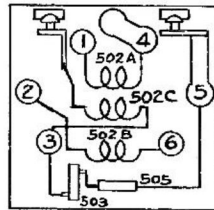
Reference No.	Description	Mfr.	Mfr. Drawing No.	Signal Corps Drawing #
501	Crystal Unit DC-10	Western Electric Co.	ESO-675383-1	
502	Oscillator Coil Assem.	Graybar Electric Co.	ESO-675512	
502A	Grid Coil			
502B	Coupling Coil			
502C	Series Limiting Choke			
503	Oscillator Plate Coil	Graybar Electric Co.	ESO-675512	
505	Oscillator Plate Resistor, Type BW-1 100 ohms \pm 10%	International Resistor- ance Company	ESO-675512**	
506	Antenna Coil Assembly	Graybar Electric Co.	ESO-675511-1	
506A	Antenna Coupling Coil			
506B	Amplifier Plate Coil			
506C	Neutralizing Coil			
130	Antenna Tap	Graybar Electric Co.	2052-1	
254	Snapslide	Graybar Electric Co.	2540-1	Item 1 of SC-D-2024
507	Nameplate	Graybar Electric Co.	ESA-675878	

**Number of Graybar Electric Company drawing from which this item must be made.

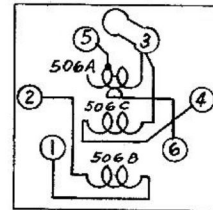
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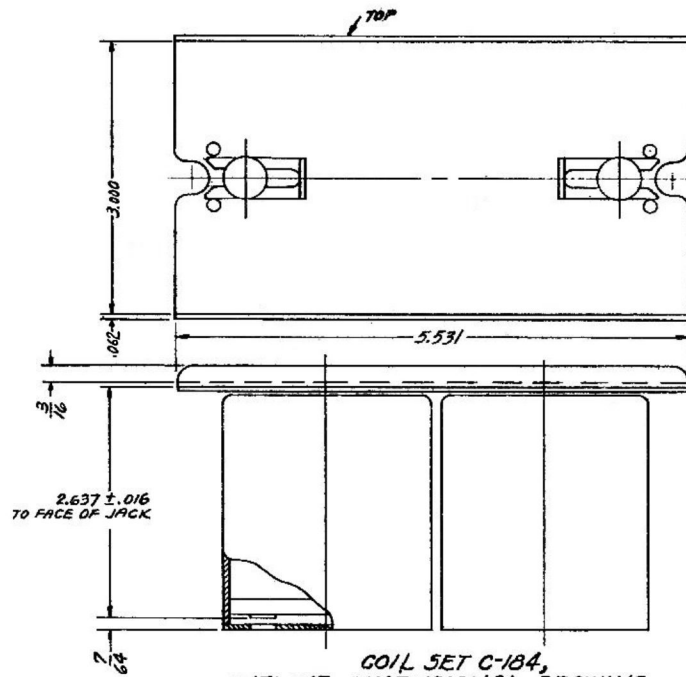
COIL SET C-184,
SCHEMATIC DIAGRAM AND ASSOCIATED CIRCUITS.



COIL SET C-184,
OSCILLATOR COIL SECTION
(SHIELDED)
WIRING DIAGRAM LESS CRYSTAL
UNIT.

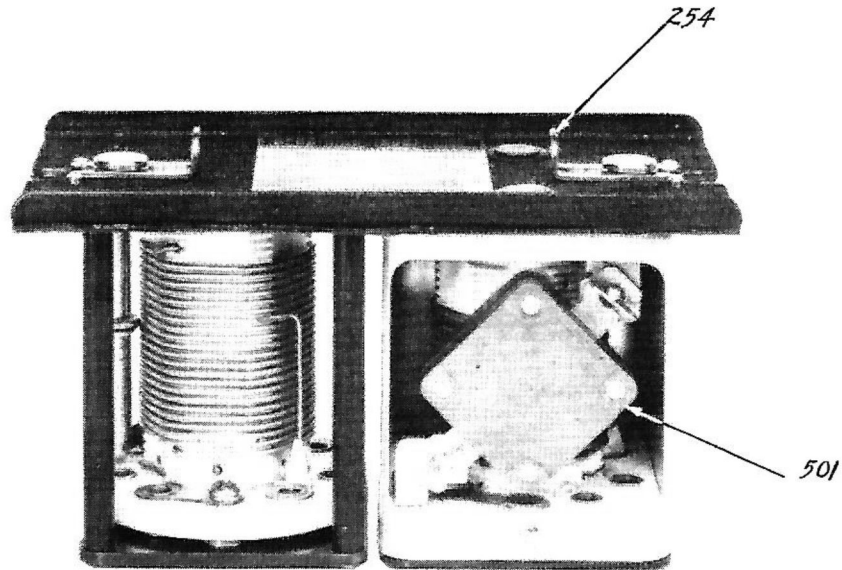


COIL SET C-184,
ANTENNA COIL SECTION
(UNSHIELDED)
WIRING DIAGRAM.

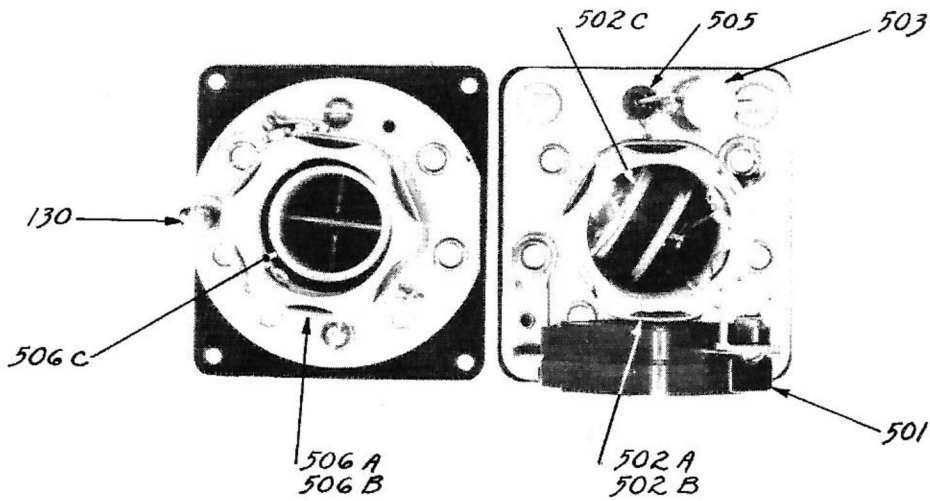


COIL SET C-184,
OUTLINE DIMENSIONAL DRAWING.

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COIL SET G-184
WITH CRYSTAL UNIT DC-10 IN PLACE.



COIL SET G-184
ANTENNA COIL SECTION

COIL SET G-184
OSCILLATOR COIL SECTION