

RADIO-PHONOGRAPH

Model, 42-1015, Code 121

SPECIFICATIONS

MODEL 42-1015, CODE 121

Model 42-1015, Code 121 is a radio-phonograph consisting of a twelve (12) tube superheterodyne radio with four (4) tuning bands including a frequency modulation band, electric push-button tuning and a Philco De Luxe Automatic Record Changer with a photo-electric reproducer.

RADIO SECTION

The radio incorporates the Philco Built-in Super Aerial System for reception of standard and short wave broadcast stations; a Philco F. M. Dipole Aerial for reception of frequency modulation stations; twelve (12) electric push-buttons for automatically tuning six (6) stations in the standard broadcast band, turning the A. C. power off and selecting the phonograph circuit, standard, short-wave and frequency modulation bands; three (3) I. F. amplifier stages; two (2) variable tone controls which vary the bass and treble audio frequencies; automatic volume control; push-pull beam power pentode audio output stage; Philco LOKTAL tubes; illuminated horizontal dial, illuminated tuning band and station indicators; concert grand balanced field electro-dynamic speakers; and a dual section tuning condenser. In addition this model is designed to receive the sound of a television program tuned in by special Philco Television Receivers.

Tuning Band Frequencies: Broadcast, 540 to 1720 KC; Shortwave 1, 9 to 12 MC; Shortwave 2, 13.3 to 18 MC; Frequency Modulation 42 to 50 MC.

Intermediate Frequencies: Standard, 455 KC; F. M., 4.3 MC.

Audio Output: 14 watts.

Power Supply: 115 volts, 60 cycles AC.

This model can also be operated on 115 volts, 50 cycle current by changing the phonograph motor parts as listed in the parts list.

Power Consumption: 145 watts.

PHILCO Tubes: XXL, oscillator; XXL, converter; three 7B7, I. F. amplifiers; XXFM, second detector, A. V. C., first audio; 7C5, phono light oscillator; 7A4, audio phase inverter; two 6L6G audio output; 7C6, phono pre amplifier and a 5X4G, rectifier.

PHONOGRAPH SECTION

The phonograph of each model consists of the PHILCO Automatic Record Changer with a stroboscope pitch and tempo control; a dual speed motor that can be adjusted to play not only normal speed records (78 RPM) but also slow speed records (33-1/3 to 39 RPM); the Philco Photo-Electric Reproducer with a floating jewel which reproduces sound on a beam of light, and a special phonograph amplifier stage for operation through the push-pull output tubes of the radio. The automatic record changer plays 12 ten-inch or 10 twelve-inch records at one loading. The automatic record changer is also equipped with provision for attaching a Philco Home Recording Unit Model HR-2 for making phonograph records in the home. The Home Recording Units can be obtained from your Philco distributor with complete instructions for installation and operation.

AUTOMATIC RECORD CHANGER

The Service Procedure for adjusting the Automatic Record Changer Mechanism will be found in Radio Service Bulletin No. 402.

EXTERNAL AERIAL CONNECTIONS

The built-in aerial system is designed to operate without an outside aerial or ground and to give exceptionally high receiving performance of stations in the standard, shortwave, or FM bands.

To operate the radio in steel reinforced buildings and other shielded locations where signal strength is weak, an external aerial is recommended. Three different types of aerial combinations are available, to improve reception on the standard, shortwave, or FM bands.

1—For Additional Sensitivity on Frequency Modulation only:

*Philco Dipole Outdoor Aerial, Part No. 45-2926.

The plug at the end of the transmission line is inserted in the socket at the back of the chassis in place of the plug connected to the F. M. loop in the cabinet.

2—For Additional Sensitivity on ALL ranges:

*Philco Dipole Outdoor Aerial, Part No. 45-2926.

Philco Aerial Coupler, Part No. 76-1361.

The coupler plugs into the socket at the back of the chassis in place of the plug connected to the FM loop. The aerial transmission line then connects to the terminals on the coupler marked "red" and "black". The local-distance switch on the coupler connects or disconnects the outdoor aerial from the standard broadcast and shortwave tuning ranges. The dipole remains connected to the FM band regardless of the position of the switch.

3—For Additional Sensitivity on Standard Broadcast and Short-wave only in Areas where FM reception is not available.

Philco Safety Aerial, Part No. 40-6370.

Philco Aerial Coupler, Part No. 76-1361.

Connect the single wire lead-in of the aerial to the "black" terminal on the aerial coupler.

*Accessories for this aerial are the Philco Aerial Mast Kit, the Philco Reflector Kit and Philco High Efficiency Transmission Line. See Service Bulletin No. 396 on Dipole Aerials.

NOTE: When installing the FM Philco Outdoor Dipole Aerial, it is very important that the aerial compensating condensers of the standard and shortwave band are repadded.

ELECTRIC PUSH-BUTTON ADJUSTMENTS

The electric push-button tuning mechanism consists of twelve push-buttons. Six push-buttons control and select power supply, broadcast, shortwave 1, shortwave 2, and frequency modulation bands, and Phonograph Operation. The remaining six push-buttons are used for automatically selecting six standard broadcast stations.

Select six of the most popular stations received in the locality. Insert the station call letters into the spaces above the buttons. The station with the lowest frequency is placed in the second button from the left and the highest frequency is placed in the seventh push-button from the left. Each push-button is adjusted by two adjusting screws located on the rear of the chassis. Each set of screws is numbered and labeled "Ant.", "Osc." and covers a frequency range as shown in Fig. 1.

Looking at the front of the cabinet, the second button from the left is adjusted by adjusting screws No. 1. The next push-button by adjusting screws No. 2, and the remaining push-buttons in order.

To adjust the electric push-buttons accurately for reception of broadcast stations, a vacuum tube voltmeter such as Philco Models 027 and 028 should be used. In addition, an insulated padding screw driver, Part No. 45-2810, and a PHILCO Model 070 Signal Generator are required. With this equipment at hand proceed as follows:

1. Press in "Broadcast" push-button.

2. Set up a Model 070 Signal Generator near the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON."

Connect the negative (—) terminal of the vacuum tube voltmeter to the aligning test socket on the top centre of the chassis. Attach the positive (+) terminal of the voltmeter to the chassis.

3. Manually tune in the station to be set up on the first station push-button. After doing this set the indicator of the 070 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point.

(Continued on page 2)

4. Press "in" the second push-button from the left of cabinet. Using the insulated screw driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 1 "Osc." and "Ant." screws for maximum deflection of the vacuum tube voltmeter pointer.

After setting up the first station the same procedure as outlined above is used for the remaining stations. When these models are set up to receive the sound of a television program tuned in by the special type Philco Television Sets or if it is to be used in conjunction with a Philco Record Player, the lowest frequency push-button should be used. To tune in these programs, the same procedure as given for broadcast stations above is used.

Further details for setting up these Radios for operation with Philco Television Sets or Record Players are supplied with the instruments.

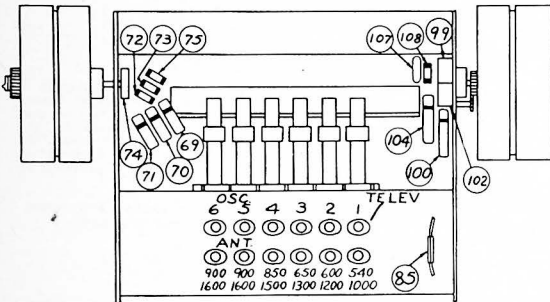


FIG. 1—LOCATIONS OF PARTS AND PUSH BUTTON COMPENSATORS ON TUNING UNIT

PHONO REPRODUCER ADJUSTMENTS

To reproduce the sound from a record, the light beam of the reproducer must be carefully positioned on the light sensitive cell. If the light beam is not carefully set, the sound reproduction will be distorted, weak or, if the light beam is completely on or off the cell, the phonograph will be silent.

If any of these conditions exist, the following adjustment procedure should be made:—

NOTE—These adjustments should be made with the power line voltage at 118 volts AC.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond light cell. This point until the rectangular spot of light is $5/32$ " in width. The socket assembly is now rotated so that the spot of light is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 117 located on the rear of the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 117 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

D. INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.

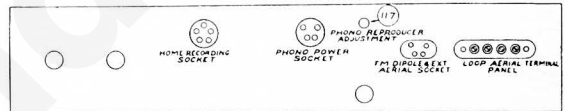


FIG. 2—REAR VIEW OF CHASSIS SHOWING SOCKET LOCATION AND PHONO COMPENSATOR

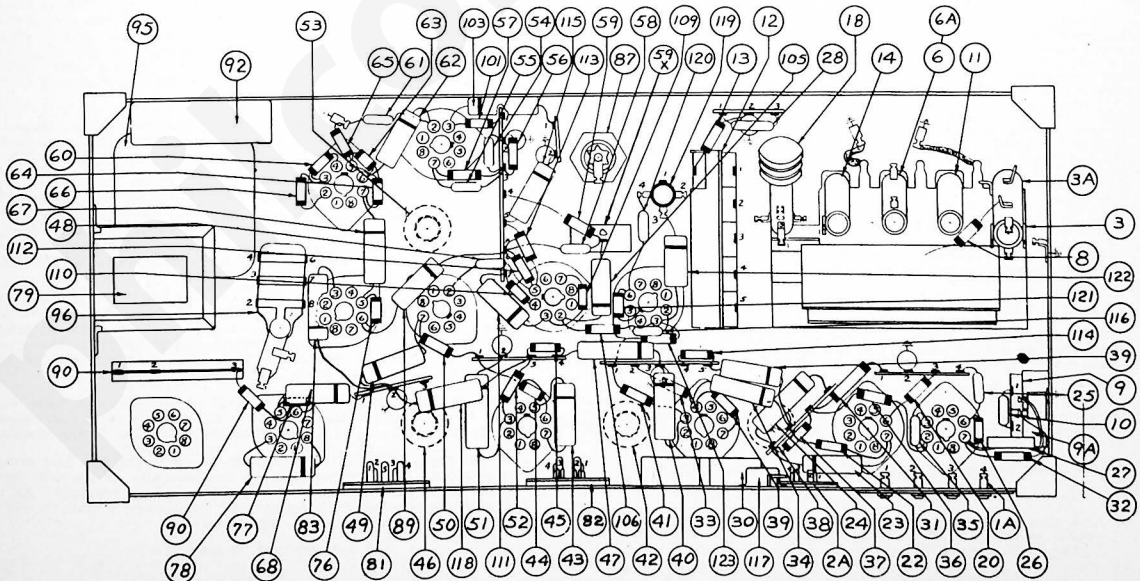


FIG. 3—LOCATIONS OF PARTS—UNDER CHASSIS MODEL 42-1015, CODE 121

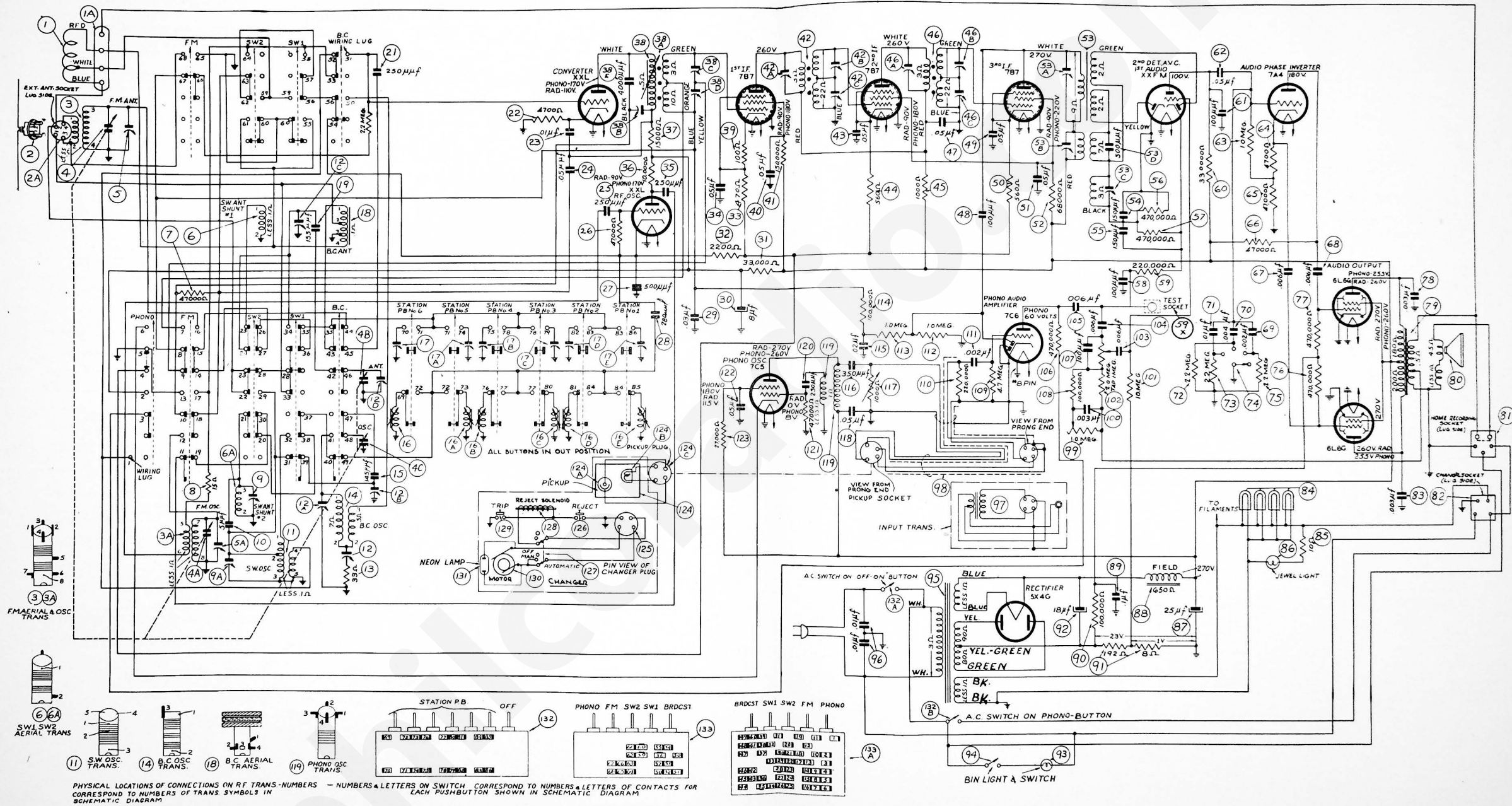


FIG. 4—SCHEMATIC DIAGRAM—MODEL 42-1015, CODE 121

The D. C. Voltages indicated at the tube elements in the above diagram were measured in the radio and phonograph position, with a 1,000 ohms per volt voltmeter, Philco Model 027; power line voltage 117 volts; no signal being received.

ALIGNING R. F. AND I. F. COMPENSATORS EQUIPMENT REQUIRED

1. **SIGNAL GENERATOR:** Covering the frequency of the receiver, such as the Philco Model 070.
2. **ALIGNING INDICATOR:** Audio Output Meter, Philco Models 027 and 028. Circuit testers contain a sensitive output meter and are recommended.
3. **TOOLS:** Philco Fiber Screw Driver, Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

AUDIO OUTPUT METER: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts.)
The audio output meter can also be connected between the plate of the output

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet and dipole aerial lead. Do not remove the receiving loops from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

After connecting the aligning instruments adjust the compensators in the order shown in the tabulation below. Location of the compensators are shown in Fig. 5. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

STANDARD AND S. W. BANDS ALIGNING PROCEDURE

Operations In Order	SIGNAL GENERATOR		RECEIVER			Special Instructions
	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	Aerial Section of Standard Tuning Cond & Grd	455 KC	550 KC	Vol. max. push-button Bdcst. "IN"	53B, 46C, 42C, 38C, 35A	
2	Use loop on generator	1500 KC	1500 KC	Vol. max. push-button Bdcst. "IN"	12A, 12D	Note A
3	Use loop on generator	580 KC	580 KC	Vol. max. push-button Bdcst. "IN"	12	Roll Tuning Condensers Note B
4	Use loop on generator		Readjust as given in Operation 2			
5	Use loop on generator	12 MC	12 MC	Push-button SW-1	12B, 12C	Note C
6	Use loop on generator	18 MC	18 MC	Push-button SW-2	9A, 9	Roll Condensers Note C

FREQUENCY MODULATION ALIGNING PROCEDURE

Note: The Frequency Modulation Circuits Must Be Adjusted With the Dipole Aerial Connected

F. M. BAND ALIGNING PROCEDURE

Operations In Order	SIGNAL GENERATOR		RECEIVER			Special Instructions
	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	3rd I. F., F. M. input connection	4.3 MC	1400 KC	Vol. max. F. M. push-button "IN"	53C (Note D) 53A (Note E)	
2	2nd I. F., F. M. input connection	4.3 MC	1400 KC	F. M. push-button "IN"	46B, 46A (Note F)	
6	1st I. F., F. M. input connection	4.3 MC	1400 KC	F. M. push-button "IN"	42B, 42A, (Note F)	
3	Ant. Section of F. M. Tuning Cond. and Grd.	4.3 MC	1400 KC	F. M. push-button "IN"	38D, 38B (Note F)	
4	Use test loop on generator; place near dipole aerial	48.5 MC	85 (Note G)	F. M. push-button "IN"	5A (Note G) 5 (Note H)	Roll tuning condenser when adjusting 5. See Note B.
5	Use test loop on generator; place near dipole aerial	48.5 MC	85	F. M. push-button "IN"	5A	

NOTE A—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial pointer must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B—When adjusting the low frequency compensator of the broadcast or the aerial padders of the high frequency tuning range, the receiver tuning condenser must be adjusted (rolled) as follows: First, tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

NOTE C—Adjust compensators (12B and 9A) to the second signal peak from the closed position (maximum

capacity). The aerial compensators (12C and 9) must also be adjusted to maximum on the first signal peak by rolling the tuning condenser. (See Note B.)

NOTE D—With the signal generator set to 4.3 MC, padder (53C) is adjusted to the point where minimum signal indication is observed on the output meter.

NOTE E—Turn the signal generator first to approximately 125 KC below 4.3 MC (4.17 MC) and then 125 KC above 4.3 MC (4.42 MC). A signal peak should be observed on the output meter at approximately each of these points (4.17 and 4.42). The two peak signals should be of equal reading on the output meter and equally spaced in frequency each side of 4.3 MC. If the peaks are unequal in amplitude, padder (53A) must be adjusted in the direction necessary to make both peaks equal. This is done by slightly turning padder and then turning signal generator above and below 4.3 to observe peaks. After equal peak readings are obtained, set the signal generator to 4.3 MC. The output meter should show zero reading at 4.3 MC. If a signal

indication is observed readjust padder (53C) until zero reading is obtained on the meter. After this adjustment is made padder No. 53A should be reset for equal peaks as given above.

NOTE F—Adjust padders 46B, 46A, 42B, 42A, 38D, 38B for equal signal peaks and equal frequency spacing each side of 4.3 MC.

NOTE G—The dial scale numbers are listed in tenths of megacycles less the first digit; i. e.: 49 MC is 90, 48.5 is 85. Set the tuning dial pointer to 85 on the FM scale. Adjust padder (5A) to the point where minimum signal indication is observed on the output meter.

NOTE H—In order to adjust padder (5) the signal generator should be set to either the signal peak approximately 125 KC below 48.5 MC (48.375 MC), or 125 KC above 48.5 MC (48.625 MC). Adjust padder (5) to maximum output reading on either of these peak signals. As padder 5 is being adjusted roll the tuning condenser as given in Note B.

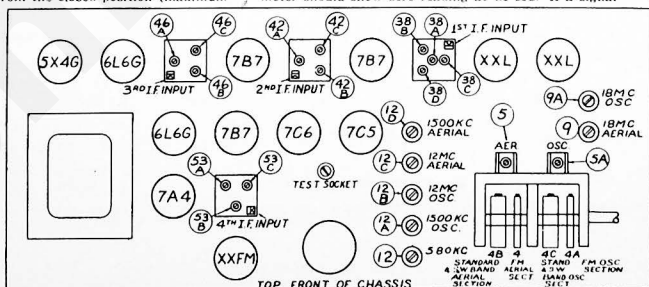


FIG. 5—LOCATIONS OF ALIGNING COMPENSATORS
MODEL 42-1015, CODE 121

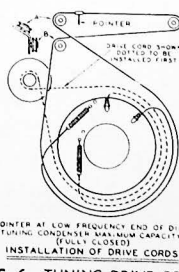


FIG. 6—TUNING DRIVE CORD
ARRANGEMENT