

Allied Radio Corp.

Model: 10C-249

Chassis:

Year: Pre 1950

Power:

Circuit:

IF:

Tubes:

Bands:

Resources

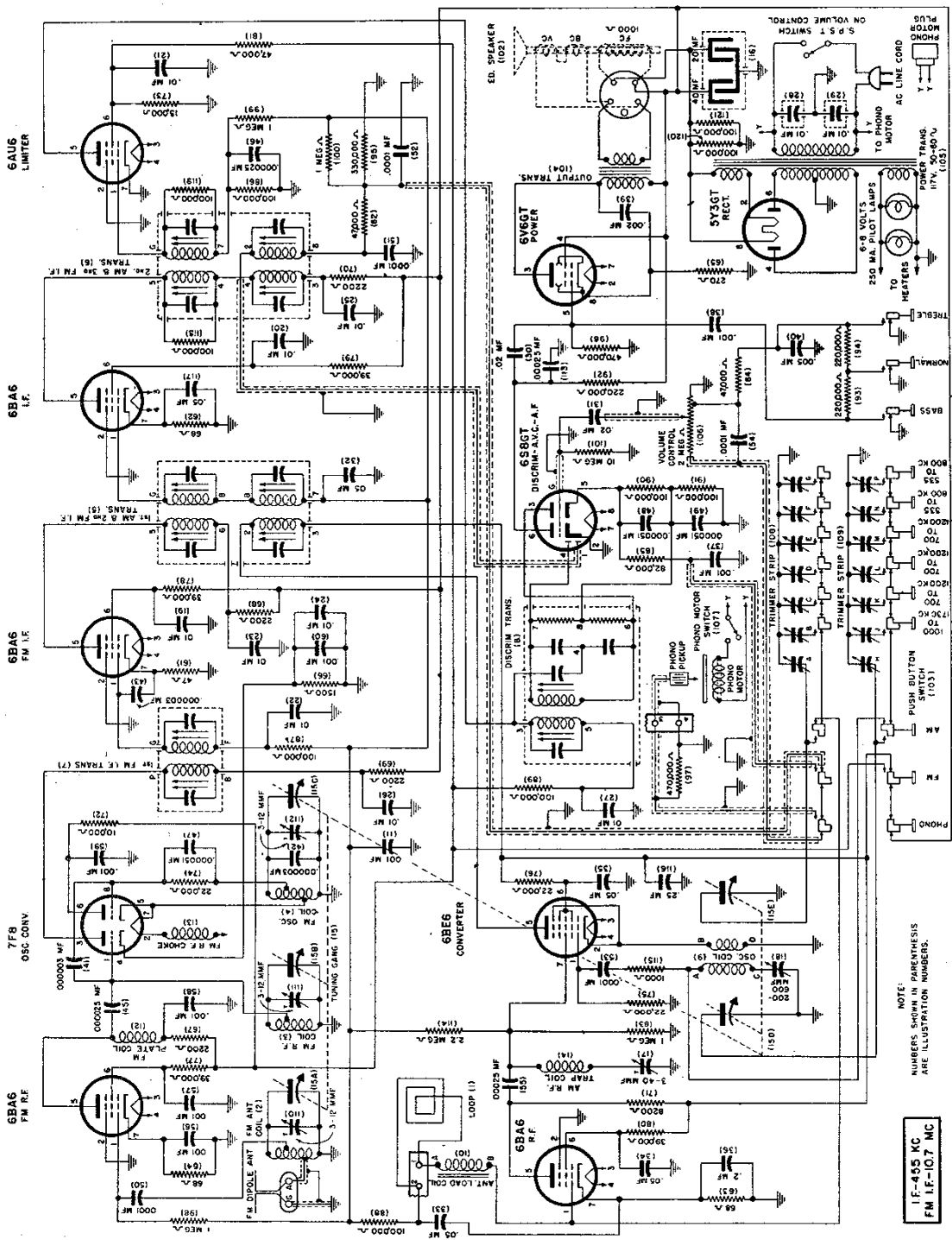
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NOTE:
NUMBERS SHOWN IN PARENTHESES
ARE ILLUSTRATION NUMBERS.

IF-455 KC
FM I.F.—10.7 MC

FM ALIGNMENT

Instructions for Alignment of the Frequency Modulation I. F. Transformers, Discriminator, Oscillator, R. F. and Antenna Circuits, with AM equipment generally available to the service man.

The equipment necessary for this procedure consists of the following: D.C. Vacuum Tube Voltmeter of the Volt-Ohmyst Type. An AM Signal Generator that will supply:

- (1) A 10.7 M.C. Signal for I. F. alignment.
- (2) A 105 M.C. and 109 M.C. Signal—a Signal Generator that only goes up to 30 M.C. but which has sufficient fourth harmonics present in the carrier could be used for this purpose.

THE GENERATOR USED NEED NOT BE FREQUENCY MODULATED.

IT IS ALWAYS DESIRABLE TO ALIGN THE "AM" I. F. TRANSFORMERS BEFORE MAKING ANY OF THE "FM" I. F. ADJUSTMENTS, and to RECHECK "AM" I. F. TRIMMERS AFTER COMPLETING "FM" I. F. ADJUSTMENTS.

BE SURE TO MAKE THE "FM" ADJUSTMENTS IN THE ORDER GIVEN BELOW.

(1) PROCEDURE FOR ALIGNMENT OF FM DISCRIMINATOR TRANSFORMER:

- (A) Connect the Voltmeter from Pin No. 5 of the 6S8GT tube to chassis.
- (B) With a .002 Mfd. Isolation Condenser in series with hot Signal Generator lead, connect generator from Pin No. 1 of the 6AU6 Limiter tube to chassis.
- (C) Set Signal Generator to EXACTLY 10.7 M. C.
- (D) Adjust 10.7 M. C. Discriminator Primary Trimmer for MAXIMUM reading on Voltmeter.
- (E) Leave Signal Generator set at 10.7 M. C. and modulate with a 400 cycle note.
- (F) Adjust 10.7 M. C. Secondary Discriminator Trimmer for MINIMUM 400 CYCLE RESPONSE IN THE SPEAKER. IMPORTANT: The reading on the Voltmeter should be ZERO. MINIMUM AUDIO RESPONSE WILL BE RATHER CRITICAL IN ADJUSTMENT.

- (G) To check adjustment, swing Signal Generator to one side of 10.7 M. C. until MAXIMUM reading is obtained on Voltmeter and NOTE FREQUENCY and VOLTAGE READING. Then swing Signal Generator to the opposite side of 10.7 M. C. until MAXIMUM reading is obtained on Voltmeter and AGAIN NOTE VOLTAGE AND FREQUENCY READINGS. The two Voltmeter readings should be similar within 3 DB. and the two Signal Frequency readings should be a reasonably equal distance from 10.7 M. C. The difference in K.C. between the center frequency and one side should not exceed the difference between the center frequency and the other side by more than 50 K. C.

NOTE: If reliable FM Generator is available at 10.7 M.C., the procedure outlined in Paragraph (G) will be simplified by aligning to the proper pattern on an Oscilloscope. 100 K. C. deviation should be used.

CAUTION: Care should be taken to align the I. F. stages at the EXACT same center frequency as the Discriminator Coil. Switching from FM to AM on some generators may shift the carrier frequency somewhat.

(2) PROCEDURE FOR ALIGNMENT OF "FM" I. F. TRANSFORMERS:

- (A) Connect the Voltmeter from the junction of the two 1 Megohm Resistors, (Illus. 99 and 100) to chassis.
- (B) Connect Signal Generator to Input Grid (Pin No. 1) of 7F8 Converter tube.
- (C) Set Signal Generator to EXACTLY 10.7 M. C.—if possible, mark the position where this occurs right on the Generator's calibrated dial because this becomes a reference point in checking for proper FM I. F. alignment.
- (D) Adjust each of the 1st, 2nd and 3rd FM I. F. Transformers' 10.7 M. C. trimmers for MAXIMUM reading on Voltmeter. KEEP OUTPUT OF SIGNAL GENERATOR SO THAT A READING OF APPROXIMATELY 2 to 4 VOLTS IS OBTAINED ON THE VOLTMETER.
- (E) After all the above FM I. F. Transformer Trimmer adjustments have been correctly completed, MAKE A NOTE OF THE READING ON THE VOLTMETER.
- (F) Next, detune the signal generator to a slightly HIGHER frequency (higher than the 10.7 reference frequency); until the Voltmeter reads ONE-HALF of the figure noted in (E) above, and MAKE A NOTE OF THE GENERATOR FREQUENCY AT WHICH THIS OCCURS.

- (G) Now, detune the signal generator to a LOWER frequency (lower than the 10.7 reference frequency), until the Voltmeter again reads ONE-HALF the original figure noted in (E), and AGAIN NOTE THE GENERATOR FREQUENCY AT WHICH THIS OCCURS.

The difference between the two above frequencies obtained in (F) and (G), the one lower than 10.7 M. C. reference point and the one higher, is the "Half-amplitude" Band width of the FM-I. F. system. These two frequencies (F) and (G), should be somewhat uniformly spaced on either side of the 10.7 M. C. (C) reference frequency. A SLIGHT DIFFERENCE IS NOT SERIOUS. Only when one is more than twice as far as the other from the 10.7 M. C. reference frequency, or when there is a double peak, is the discrepancy serious. Assuming the FM I. F. Transformers have been properly adjusted, a double peak, or extremely one-sided "half-amplitude" band width, is usually caused by regeneration or a defective FM I. F. Transformer.

(3) PROCEDURE FOR THE ALIGNMENT OF THE "FM" ANTENNA, R.F., AND OSCILLATOR CIRCUITS:

- (A) Leave Voltmeter connected as it was for FM I. F. Alignment.
- (B) Connect the hot Signal Generator lead through a 300 Ohm Resistor to the FM Antenna Post, marked "ANT" on back of chassis, and the other lead to the post marked "GND".
- (C) Set Signal Generator so that it will deliver a modulated 108 M. C. signal. If the generator available is not de-

AM ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. Make the adjustment marked (1) first, (2) next.

Before starting alignment:

- (A) Check tuning dial adjustment by turning gang condenser until plates reach maximum capacity stop (completely in mesh) at which point the dial pointer must be exactly even with the last line at the low frequency end of the AM dial calibration. If dial pointer does not point exactly to last line move to correct position.
- (B) Use an accurately calibrated test oscillator with some type of output measuring device.
- (C) WHEN ADJUSTING THE 1730 KC OSCILLATOR TRIMMER, THE 455 KC TRIMMER, remove chassis from cabinet and disconnect the loop connection wires from the set. Attach a 1 megohm resistor across these connections and feed output of test oscillator across the 1 megohm resistor.
- (D) THE 1400 KC LOOP ANTENNA TRIMMER and 600 KC PADDER should be adjusted only after all other adjustments have been made and with the set mounted in the cabinet, and the loop in position. When aligning the 1400 KC Antenna Trimmer and 600 KC Padder, couple test oscillator to receiver loop by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.

Steps	Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR		Refer to parts layout diagram for location of trimmers mentioned below:	
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:		Attach output of test oscillator to:
1	AM Band position	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser	Adjust each of the 2nd and 455 K. C. AM I. F. transformer trimmers for maximum output, then adjust each of the 1st 455 K. C. I. F. transformer trimmers for maximum output.	
			Exactly 1730 K. C.			Adjust 455 K. C. trap trimmer for MINIMUM 455 K. C. Signal. Adjust 1730 K. C. oscillator trimmer for maximum output.
2	AM Band position	Rotate gang condenser to maximum capacity	Exactly 455 K. C.	.00025 Condenser	High side to AM-Osc. stator plates of tuning condenser (15D). Low side to frame of condenser through .01 Mfd. condenser. See Paragraph (C) above.	
		Exactly 1730 K. C.	Exactly 1730 K. C.			Adjust 1400 K. C. AM Ant. trimmer for maximum output.
		Approx. 1400 K. C.	Approx. 1400 K. C.			While rotating gang condenser, adjust 600 K. C. oscillator padder for maximum output.
		Approx. 600 K. C.	Approx. 600 K. C.			

PARTS LIST

Illus. No.	Part No.	Description	Part Name	Illus. No.	Part No.	Description	Part Name
1	20E235	Loop	Antenna	62	27E580-2	Resistor	Resistor
2	2E48	FM Antenna	Coil	63	27E580-2	Resistor	Resistor
3	2E49	Coil	Coil	64	27E680-2	Resistor	Resistor
4	2E50	Coil	Coil	65	27E271-3	Resistor	Resistor
5	20E216	1st AM & 2nd FM I.F. Trans.	Trans.	66	27E152-2	Resistor	Resistor
6	20E217	2nd AM & 3rd FM I.F. Trans.	Trans.	67	27E222-2	Resistor	Resistor
7	20E218	1st FM I.F. Trans.	Trans.	68	27E222-2	Resistor	Resistor
8	20E219	Discriminator	Oscillator	69	27E222-2	Resistor	Resistor
9	20E221	Oscillator	Ant. Loading	70	27E222-2	Resistor	Resistor
10	23E2012	Condenser	Fixed Ceramic, .001 Mfd.	71	27E103-3	Resistor	Resistor
11	2E52	Coil	FM Plate	72	27E103-3	Resistor	Resistor
12	2E47	Coil	FM R.F. Choke	73	27E103-2	Resistor	Resistor
13	2E19	Coil	455 KC Trap	74	27E225-2	Resistor	Resistor
14	20E27	Condenser	Tuning Gang	75	27E225-2	Resistor	Resistor
15	23E20	Condenser	Elect. Dry 20-40 Mfd. 400 V.	76	27E225-2	Resistor	Resistor
16	20E16	Condenser	Trimmer, 3-40 MMF.	77	27E395-2	Resistor	Resistor
17	20E16	Condenser	Padder, 200-600 MMF.	78	27E395-2	Resistor	Resistor
18	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	79	27E395-2	Resistor	Resistor
19	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	80	27E475-3	Resistor	Resistor
20	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	81	27E475-3	Resistor	Resistor
21	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	82	27E105-2	Resistor	Resistor
22	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	83	27E475-2	Resistor	Resistor
23	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	84	27E475-2	Resistor	Resistor
24	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	85	27E823-2	Resistor	Resistor
25	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	86	27E104-2	Resistor	Resistor
26	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	87	27E104-2	Resistor	Resistor
27	23E11	Condenser	Fixed Paper, .01 Mfd. 400 V.	88	27E104-2	Resistor	Resistor
28	23E250	Condenser	01 Mfd. 220 V. Metal Container	89	27E104-2	Resistor	Resistor
29	23E250	Condenser	01 Mfd. 220 V. Metal Container	90	27E104-2	Resistor	Resistor
30	23E213	Condenser	Fixed Paper, .02 Mfd. 400 V.	91	27E104-2	Resistor	Resistor
31	23E213	Condenser	Fixed Paper, .02 Mfd. 400 V.	92	27E224-2	Resistor	Resistor
32	23E2014-8	Condenser	Fixed Paper, .02 Mfd. 400 V.	93	27E224-2	Resistor	Resistor
33	23E416	Condenser	Fixed Paper, .05 Mfd. 400 V.	94	27E224-2	Resistor	Resistor
34	23E416	Condenser	Fixed Paper, .05 Mfd. 400 V.	95	27E224-2	Resistor	Resistor
35	23E416	Condenser	Fixed Paper, .05 Mfd. 400 V.	96	27E334-2	Resistor	Resistor
36	23E2014-10	Condenser	Fixed Paper, .05 Mfd. 400 V.	97	27E474-2	Resistor	Resistor
37	23E204	Condenser	Fixed Paper, .01 Mfd. 200 V.	98	27E474-2	Resistor	Resistor
38	23E204	Condenser	Fixed Paper, .01 Mfd. 200 V.	99	27E103-2	Resistor	Resistor
39	23E605	Condenser	Fixed Paper, .005 Mfd. 600 V.	100	27E103-2	Resistor	Resistor
40	23E208	Condenser	Fixed Paper, .005 Mfd. 200 V.	101	27E103-2	Resistor	Resistor
41	23E20	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	102	27E103-2	Resistor	Resistor
42	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	103	27E103-2	Resistor	Resistor
43	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	104	27E103-2	Resistor	Resistor
44	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	105	27E103-2	Resistor	Resistor
45	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	106	27E103-2	Resistor	Resistor
46	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	107	27E103-2	Resistor	Resistor
47	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	108	27E103-2	Resistor	Resistor
48	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	109	27E103-2	Resistor	Resistor
49	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	110	27E103-2	Resistor	Resistor
50	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	111	27E103-2	Resistor	Resistor
51	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	112	27E103-2	Resistor	Resistor
52	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	113	27E103-2	Resistor	Resistor
53	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	114	27E103-2	Resistor	Resistor
54	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	115	27E103-2	Resistor	Resistor
55	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	116	27E103-2	Resistor	Resistor
56	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	117	27E103-2	Resistor	Resistor
57	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	118	27E103-2	Resistor	Resistor
58	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	119	27E103-2	Resistor	Resistor
59	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	120	27E103-2	Resistor	Resistor
60	23E13	Condenser	Fixed Ceramic, .00003 Mfd. 500 V.	121	27E103-2	Resistor	Resistor
61	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt.	122	27E104-5	Resistor	Resistor

MISCELLANEOUS PARTS

Part No.	Description	Part Name
64E9	FM Di Pole	Dial Light
7E116	For Cabinet	Knob
53E128	Complete Set Station Call Letter Sheets	Knob
53E129	"AM-FM," "Phono," "High," "Med."	Knob
	"Bass" on Sheet.	Knob
36E29	Calibrated Scale	Knob
20E270-6	Drive Shaft Assembly	Plug
20E253-10	Drive Cord	Post
65E2	Tension Spring for Dial Cord	Post
20E174-4	Dial Indicator	Slide Rail
48E5	Fits around Dial Scale and Push Buttons for 295M	Socket
48E5-2	Fits around Dial Scale and Push Buttons for 296B	Socket