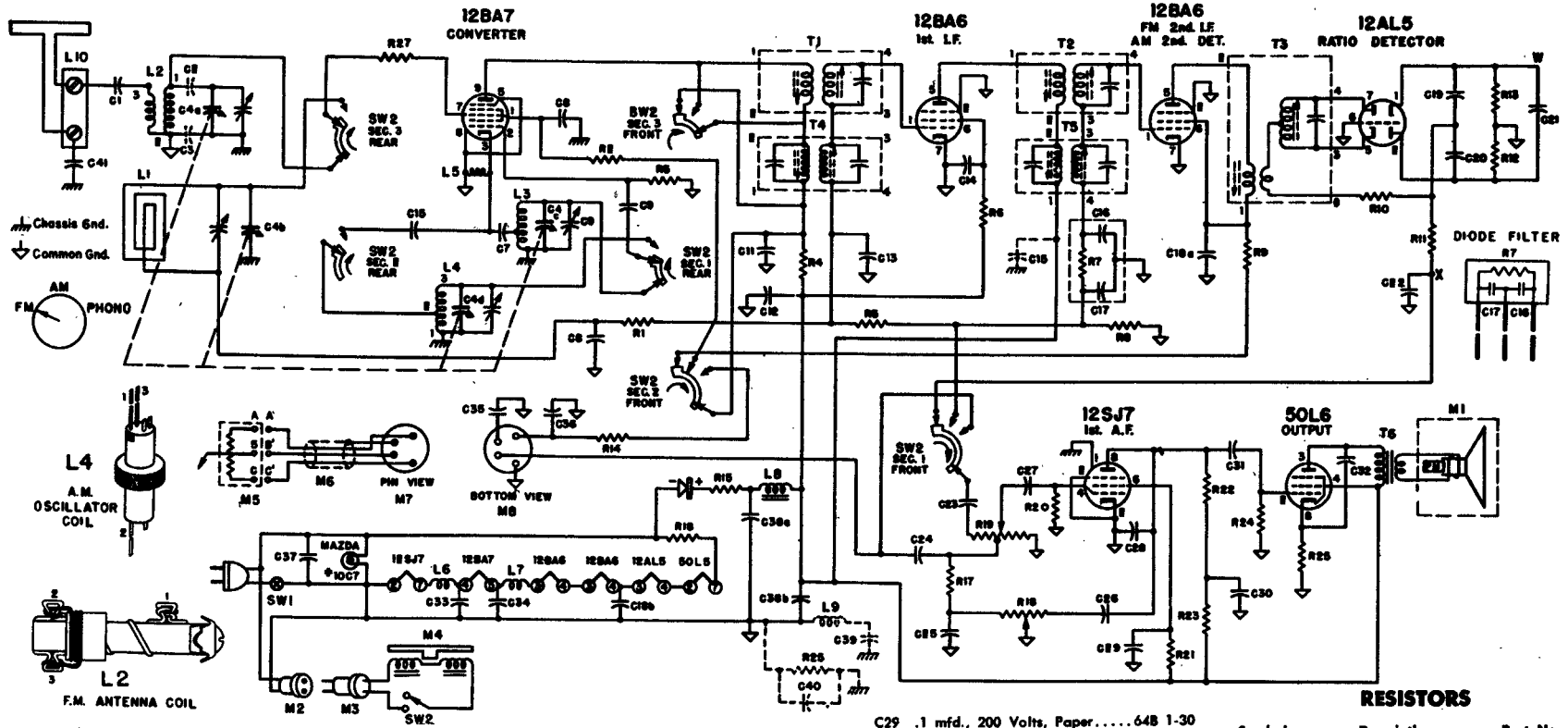

CONDENSERS

Symbol	Description	Part No.
C1	200 mmfd., Ceramic	65B 9-15
§C2	.0015 mfd., Ceramic	65B 9-63
§C3	.005 mfd. min., Ceramic	65A 10-1
C4a	15 mmfd. (max.), FM RF	A1B14 Gang
C4b	485.8 mmfd. (max.) AM RF	A1B14 Gang
C4c	15 mmfd. (max.) FM osc.	A1B14 Gang
C4d	142.6 mmfd. (max.) AM Osc.	A1B14 Gang
C5	.01 mfd., 400 Volts, Paper	64B 1-25
C6	3-12 mmfd. Trimmer (Silver mica)	66A 19-2
C7	50 mmfd., Ceramic	65B 6-4
C8	.005 mfd. min., Ceramic	65A 10-1
C9	35 mmfd., 10% Zero Temp. Coeff., Ceramic	65B 6-57
C10	.005 mfd. min., Ceramic	65A 10-1
C11	.005 mfd. min., Ceramic	65A 10-1
C12	.005 mfd. min., Ceramic	65A 10-1
C13	.005 mfd. min., Ceramic	65A 10-1
C14	.01 mfd. min., Ceramic	65A 10-3
§C15	.005 mfd. min., Ceramic	65A 10-1
†C16	100 mmfd., Mica	
†C17	100 mmfd., Mica	
C18a	.004 mfd. min. Dual Ceramic	65A 17-1
C18b	.004 mfd. min. Dual Ceramic	65A 17-1
C19	100 mmfd. 5%,—.00075 Temp. Coeff., Ceramic	65B 6-7
C20	100 mmfd. 5%,—.00075 Temp. Coeff., Ceramic	65B 6-7
C21	4 mfd., 50 Volts, Elect	67A 4-8
C22	.002 mfd., 600 Volts, Paper	64B 1-14
C23	.001 mfd., Ceramic	65B 9-31
C24	500 mmfd., Ceramic (Used in early production only; removed to prevent detuning on FM.)	65B 9-24
C25	.005 mfd., 600 Volts, Paper	64B 1-12
C26	.002 mfd.,600 Volts, Paper	64B 1-14
C27	.01 mfd., 400 Volts, Paper	64B 1-25
C28	50 mmfd., Ceramic	65B 6-4
C29	.1 mfd., 200 Volts, Paper	64B 1-30
C30	.1 mfd., 200 Volts, Paper	64B 1-30
C31	.01 mfd., 400 Volts, Paper	64B 1-25
C32	.01 mfd., 400 Volts, Paper	64B 1-25
C33	.0015 mfd. min., Ceramic	65A 14-2
C34	.0015 mfd. min., Ceramic	65A 14-2
C35	.01 mfd., 400 Volts, Paper	64B 1-25
C36	.1B mfd., 200 Volts, Paper	64A 2-2
C37	.05 mfd., 200 Volts, Paper	64B 1-32
C38a	70 mfd., 150 Volts Elect	67C 6-40
C38b	30 mfd., 150 Volts Elect	67C 6-40
§C39	.1 mfd., 200 Volts, Paper	64B 1-30
§C40	.01 mfd. min., Ceramic	65A 10-3
C41	.0015 mfd. min., Ceramic (Used only in sets with model numbers ending in "N".)	65A 14-2

† Part of encased Diode Filter Unit 63A3-1. This unit consists of R7, C16, C17 (see schematic). If a section of the unit becomes defective, it may be replaced with a component of proper value.

§ Used only in sets with model numbers ending in "UL".

COILS, TRANSFORMERS, ETC.

L1	Antenna, Loop (AM)	69B 73
L2	Coil, RF (FM)	69A 68
L3	Coil, Oscillator (FM)	69A 69
L4	Coil, Oscillator (AM)	69A 20-3
L5	Choke, Cathode RF	AA139-5
L6	Choke, Heater RF	73A 2-3
L7	Choke, Heater RF	73A 2-3
L8	Choke, Filter	74A 15-2
§L9	Coil, IF Trap Approx. 5 turns (1B") of solid No. 22 hook-up wire wound on C39. Solder one end to inside foil lead of C39.	

RESISTORS

Symbol	Description	Part No.
R1	470,000 Ohms, ¼ Watt	60B 2-474
R2	1,000 Ohms, ¼ Watt	60B 2-102
R3	22,000 Ohms, ¼ Watt	60B 2-223
R4	470 Ohms, ¼ Watt	60B 2-471
R5	470,000 Ohms, ¼ Watt	60B 2-474
R6	1,000 Ohms, ¼ Watt	60B 2-102
†R7	47,000 Ohms, ¼ Watt	
R8	220,000 Ohms, ¼ Watt	60B 2-224
R9	1,000 Ohms, ¼ Watt	60B 2-102
R10	390 Ohms, ¼ Watt	60B 2-391
R11	27,000 Ohms, ¼ Watt	60B 2-273
R12	6,800 Ohms, ¼ Watt, 5%	60B 1-682
R13	6,800 Ohms, ¼ Watt, 5%	60B 1-682
R14	100,000 Ohms, ¼ Watt	60B 2-104
R15	33 Ohms, 1 Watt	60B 14-330
R16	47 Ohms, 1 Watt	60B 14-470
R17	27,000 Ohms, ¼ Watt	60B 2-273
R18	2 Megohms Tone Control and ON-OFF Switch SW2	75B 1-12
R19	1 Megohm Volume Control (Tapped at 500,000 Ohms)	75B 2-12
R20	4.7 Megohms, ¼ Watt	60B 3-475
R21	1.8 Megohms, ¼ Watt	60B 3-185
R22	470,000 Ohms, ¼ Watt	60B 2-474
R23	47,000 Ohms, ¼ Watt	60B 2-473
R24	470,000 Ohms, ¼ Watt	60B 2-474
R25	150 Ohms, ½ Watt	60B 8-151
§R26	150,000 Ohms, ½ Watt	60B 2-154
R27	10 Ohms, ¼ Watt	60B 2-100

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Alignment information on the next two pages.

IMPORTANT PRELIMINARY ALIGNMENT STEPS

In FM alignment, it is essential that every step be followed. Especially important is picking the center of the IF curve (step 4 in the FM-IF alignment instructions). During this portion of the alignment it is necessary to tune the signal generator very carefully; it may necessitate having to estimate the dial readings to a tenth of a division.

Under normal operating conditions or use, misalignment of RF or IF circuits with age will be slight. Lack of sensitivity and poor tone quality may be due to causes other than alignment. Do not attempt to realign the receiver until all other possible causes have first been thoroughly investigated.

If complete alignment is necessary, it is essential that proper sequence be followed as tabulated in the alignment chart. However, if only the AM band or a portion of the FM circuit are to be aligned, proceed from that point on the chart being sure to follow all remaining steps.

Adjustments made to FM-IF's at 10.7 MC, will require realignment of AM-IF slug adjustments.

Check pointer position. With tuning gang closed, the tip of the pointer clip should be over the 1/16" circular punch at the extreme left end of the dial background (see stringing diagram).

Use an isolation transformer if available, otherwise connect a .1 mfd. condenser in series with low side of signal generator and attach to B minus of chassis.

Be sure both the set and the signal generator are thoroughly warmed up before starting alignment.

FM I.F. AND RATIO DETECTOR ALIGNMENT

- Keep output indicator leads well separated from signal generator leads and chassis wiring.
- Band switch in FM position (fully to the left).
- While peaking IF's, keep reducing signal generator output so VTVM reading is approximately +1.5 volts DC with exception of Step #5.
- To avoid splitting the slotted head of iron core tuning slugs in the IF transformers, use an insulated alignment tool with a ⅛" wide screwdriver blade. Do not exert undue pressure as threads of slugs may strip.
- Speaker must be connected during alignment.
- FM antenna disconnected during alignment.

Before proceeding, be sure to follow all steps listed above, under "Important Preliminary Alignment Steps."

	Connect Signal Generator	Generator Frequency	Receiver Dial Setting	Output Indicator and Special Connections	Adjust as Follows (very carefully)
1	Thru .001 cond. to 2nd IF grid (pin #1 of 12BA6 2nd IF)	10.7 MC unmodulated.	Tuning gang wide open	Connect VTVM (DC probe) from point "W" to B minus ("Y"). (See Fig. 7.)	"A" (ratio detector primary) for maximum reading on VTVM.
2	**Thru .001 cond. to 1st IF grid (pin #1 of 12BA6 1st IF)	"	"	" "	Iron cores "B" and "C" (2nd IF trans.) for maximum reading on VTVM.
3	High side FM antenna terminal	"	"	" "	Iron cores "D" and "E" for maximum on VTVM. Readjust A, B, C, D, E, for maximum. (Keep reducing generator output to keep VTVM at 1.5 volts)
4	"	a. Reduce output of signal generator until VTVM reads exactly +1.5 volts DC. b. Tune generator frequency above 10.7 MC until VTVM reads exactly +1.0 volt. Note exact generator frequency. Extreme care in reading this is essential. c. Tune generator frequency below 10.7 MC until VTVM reads exactly +1.0 volt. Note exact generator frequency. Extreme care in reading this is essential. d. Add generator frequency in step c to generator frequency in step d and divide by 2. The result is the center frequency of the IF curve to be used in step 5. See example on next page. e. Tune generator frequency above and below 10.7 MC and note voltage reading on VTVM at different frequency points until you have a good impression of the shape of the selectivity curve. If you have two peaks as in Figures 5 or 6, note readings (voltage) of both peaks. If one peak is over 20% higher than the other one, it will be necessary to realign IF's. A selectivity curve that would require realignment is illustrated by Figure 6.			
5	"	Center of IF selectivity curve per step 4d above. See "EXAMPLE" on next page.	Tuning gang wide open	Connect VTVM (DC probe) from point "X" to B minus ("Y"). (See Fig. 7.)	Iron core "F" (ratio detector secondary) for zero voltage reading on VTVM. (The correct zero point is located between a positive and a negative maximum.)

If any adjustments were very far off, it is desirable to repeat steps 3. 4 and 5.

**Do not feed I.F. signal into converter grid as this will cause mis-alignment.

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SETTING SIGNAL GENERATOR TO CENTER OF I.F. SELECTIVITY CURVE

CAUTION: Due to the difficulty of setting a signal generator to the accuracy required by this operation, extreme care must be exercised in making each setting. Otherwise, improper alignment of the ratio detector and consequent audio distortion will result.

EXAMPLE: (See Figures 1 and 2)

Voltage reading in Step 4a is + 1.5 volts.

Generator frequency on low side of 10.7 MC for a reading of + 1 volt DC = 10.640 MC.

Generator frequency on high side of 10.7 MC for a reading of + 1 volt DC = 10.800 MC.

Center frequency is obtained by adding 10.640 and 10.800, then dividing by 2. For these readings it will be 10.72 MC.

Set generator frequency to 10.72 MC as this is center of selectivity curve as shown in Figure 2.

Note: Numerical vernier dial readiugs may be used instead ef MC.

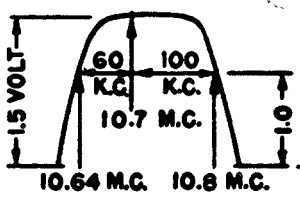

Fig. 1

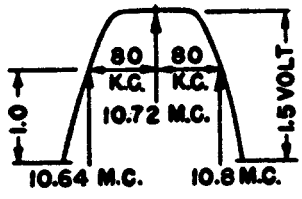

Fig. 2

TYPICAL SELECTIVITY CURVES

Fig. 3

Fig. 4

Fig. 5

Fig. 6

FM RF ALIGNMENT PROCEDURE

	Connect Signal Generator	Generator Frequency	Receiver Dial Setting	Output Indicator and Connectiens	Adjust as Follows
6	Thru 270 ohm carbon resistor to high side FM antenna terminal	109 MC† (unmodulated).	Tuning gang wide open	Connect VTVM (DC probe) from point "W" to ground.	*G for maximum VTVM reading.
7		102 MC† (unmodulated).	102 MC	"	*Tune in generator signal on receiver. Adjust H for max. VTVM reading.

* It is advisable to adjust generator output so VTVM readings do not exceed approximately + 1.5 V. DC after peaking.
† If your signal generator does not reach this frequency, use harmonics as described in "FM Alignment Equipment."

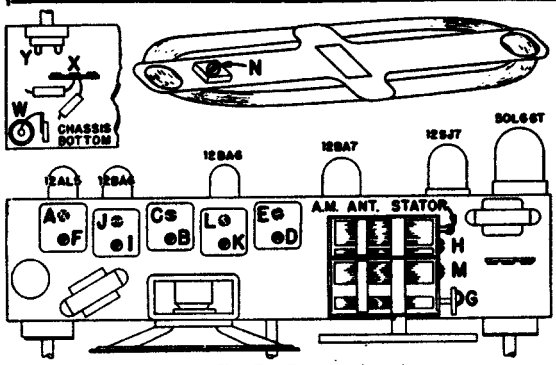

Fig. 7. Trimmer Location

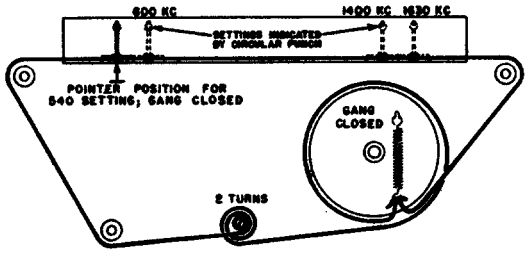

Fig. 8. Dial Stringing and Pointer Setting

With the gang fully closed, the tip of the pointer clip should be in line with the 1/16" circular punch at the extreme left end of the dial background.

AM ALIGNMENT PROCEDURE

- Use regular output meter connected across speaker voice coil.
- Turn receiver Volume Control full on; Tone Control full treble.
- AM loop antenna must be connected and placed in the same relative position to the chassis as when in cabinet.
- Use lowest output setting of signal generator that gives a satisfactory reading on meter.

	Connect Signal Geuerator	Dummy Autenna Between Radio and Signal Generator	Signal Generator Frequency	Receiver Dial Setting	Adj. Trimmers iu Following Order to Max.
	Set Band Switch to Broadcast Position (center) and be sure to follow instructions under heading "Important Preliminary Alignment Steps." Loop antenna must be connected.				
1	Gang condenser antenna stator	.1 MFD	455 KC	Tuning gang wide open	I, J, K, L
2	AM Antenna Stator	Direct connection	1620 KC	Tuning gang wide open	M
	Install chassis and AM loop in cabinet.				
3	Place generator lead close to loop of set to obtain adequate signal. No actual connection (signal by radiation).		1400 KC	Tune in signal	N