Admiral **CHASSIS 9E1**
MODELS 9E15, 9E16, 9E17

Data on alignment of these models is continued on page 13, the schematic is on page 14, and the parts list and other facts are on page 15.

FM ALIGNMENT EQUIPMENT

Any standard brand vacuum tube voltmeter with a DC scale of not over 5 volts is suitable. A 3-volt zero center scale is desirable. A signal generator with a frequency range up to 110 MC. is desirable. It is possible however, to align the receiver with a signal generator going to 20 or 30 megacycles, by using the harmonics

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.

Step	Connect Signal Generator	Dummy Antenna Between Radio and Signal Generator	Signal Generator Frequency	Receiver Dial Setting	Adj. Trimmers in 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	A-B (2nd IF) C-D (1st IF)
2	Lug on AM Antenna Stator	.1 MFD	1620 KC	Tuning gang wide open	E (oscillator)
3	Place generator lead close to loop of set to obtain adequate signal. No actual connection (signal by radiation).		1400 KC	Tune in signal	F (antenna)

AM antenna trimmer adjustment "F" in step 3 should be repeated after set and antenna have been installed in cabinet. Important: AM antenna trimmer may not peak properly if antenna leads are not routed properly or separated as originally made.

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 dectector and consequent audio distortion will result.

EXAMPLE: (See Figures 4 and 5)

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 5.

Note: **Numerical vernier dial readings may be used instead of MC.**

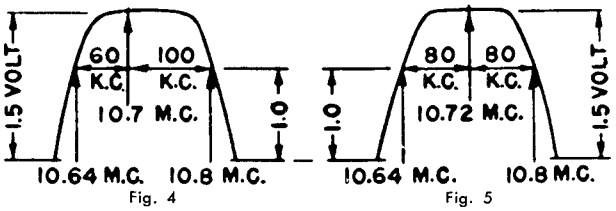

Fig. 4 Fig. 5

TYPICAL SELECTIVITY CURVES

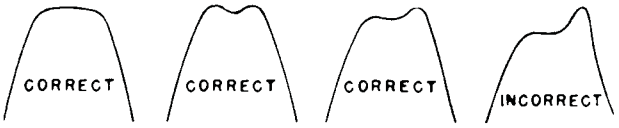

Fig. 6 Fig. 7 Fig. 8 Fig. 9

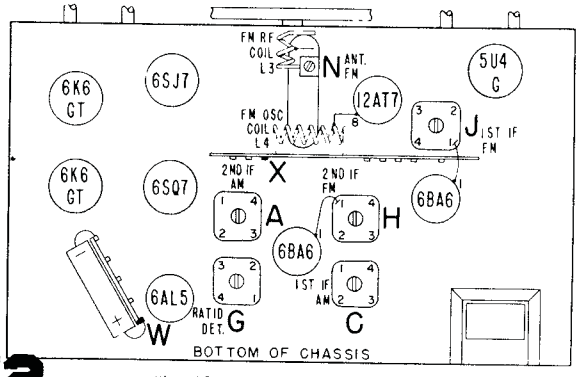

Fig. 10 Bottom Trimmer Location

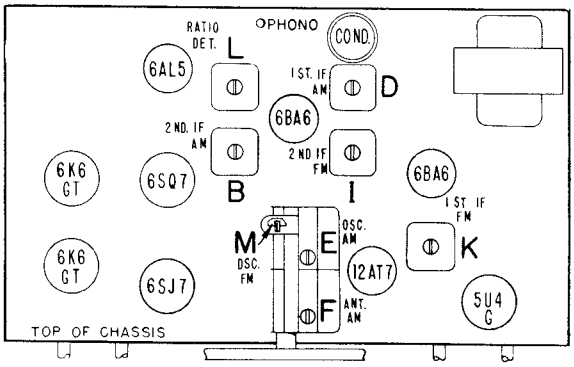

Fig. 11. Top Trimmer Location

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CHASSIS 9E1
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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 right).
- 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.

	Connect Signal Generator	Generator Frequency	Receiver Dial Setting	Output Indicator and Special Connections	(Adjust as Follows very carefully)
1	Thru .001 cond. to pin #1 of 6BA6 2nd IF. (Ground to chassis, close to tube.)	10.7 MC unmodulated.	Tuning gang wide open	Connect VTVM (DC probe) from point "W" to chassis. (See Fig. 10)	"G" (ratio detector primary) for maximum reading on VTVM
2	**Thru .001 cond. to pin #1 of 6BA6 1st IF. (Ground to chassis, close to tube).	"	"	" "	"H" and "I" (2nd IF trans.) for maximum reading on VTVM.
3	Across ends of FM antenna twin lead	"	"	" "	"J" and "K" (1st IF trans.) for maximum on VTVM. Readjust G, H, I, J, K, 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 b and divide by 2. The result is the center frequency of the IF curve to be used in step 5. See example under heading "Setting Signal Generator to Center of I.F. Selectivity Curve". 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 7 or 8, 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 9.			
5	"	Center of IF selectivity curve per step 4d above.	Tuning gang wide open	Connect VTVM (DC probe) from point "X" to chassis. (See Fig. 10.)	"L" (ratio detector secondary) for zero voltage reading on VTVM. (The correct zero point is located between a positive and a negative maximum.)

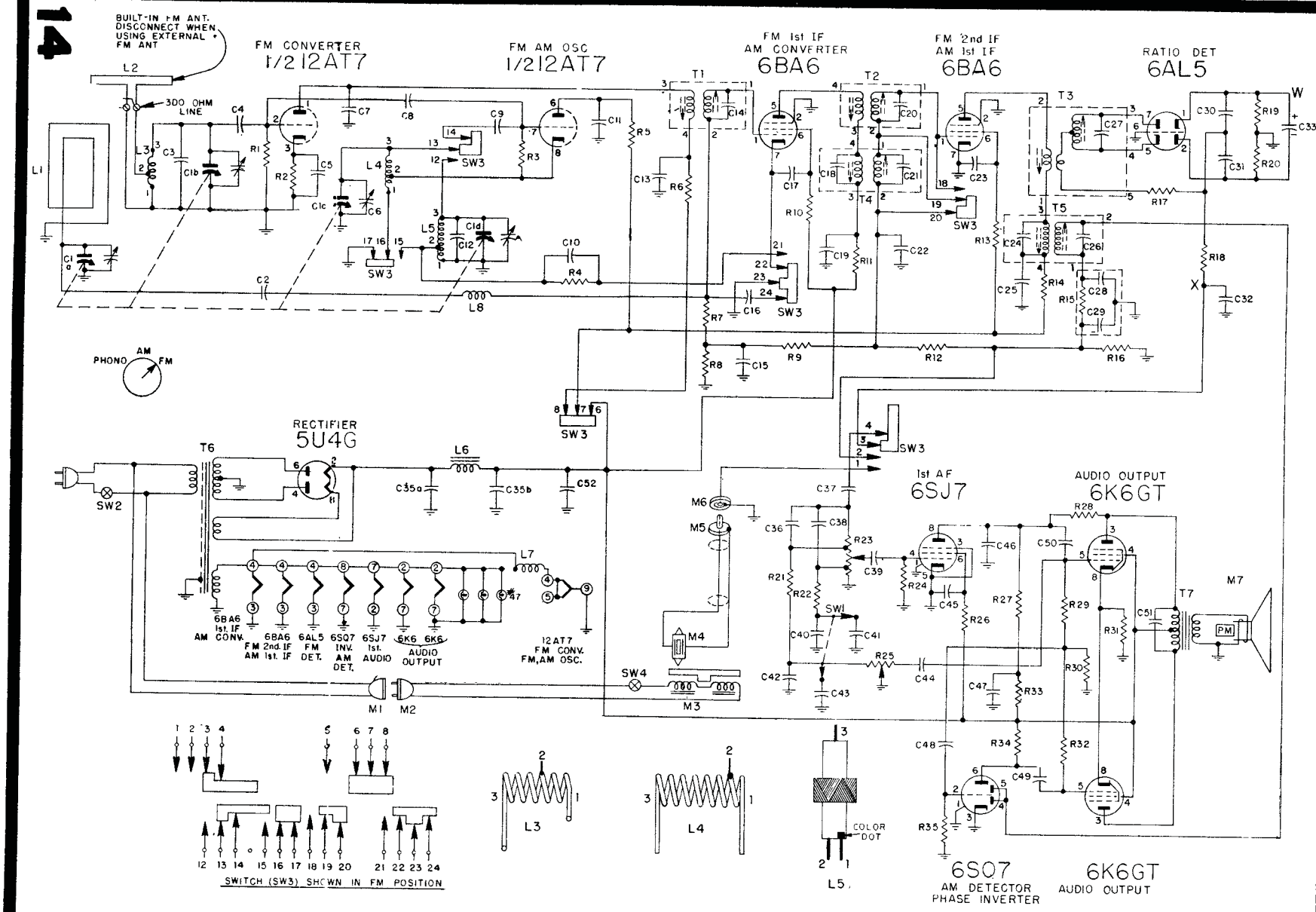
If any adjustments were very far off, it is desirable to repeat steps 3, 4 and 5.

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

FM RF ALIGNMENT PROCEDURE

Step	Connect Generator	Generator Frequency	Receiver Gang or Dial Setting	Output Connections	Adjust as follows (very carefully)
1	To ends of FM antenna twin lead thru 120 ohm carbon resistors in series with each generator lead.	†109 MC (unmodulated)	Gang fully open	Connect VTVM (DC probe) from point "W" to chassis.	*M (oscillator) and N (antenna) for maximum
2		87 MC (unmodulated)	Tune in Signal. (Gang should be closed or almost closed.)	"	If signals in steps 1 and 2 will not tune in at gang tuning extreme (±0.5 MC), it will be necessary to spread or squeeze oscillator coil turns and then repeat steps 1 and 2 until correct results are obtained.
3		106 MC (unmodulated)	Tune in Signal	"	Readjust N for maximum VTVM reading, while rocking gang. If trimmer does not peak, it will be necessary to squeeze or spread turns of FM antenna coil. Check calibration and tracking at 90 MC. Calibration error should not exceed ±0.5 MC. If necessary, repeat steps 1, 2, 3 until correct results are obtained.

* It is advisable to adjust generator output so VTVM readings do not exceed approximately +1.5 V. DC while peaking.
† If your signal generator does not reach this frequency, use harmonics



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CHASSIS 9E1
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Alignment on pages 12 and 13, list of parts on page 15.

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CHASSIS 9E1
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RESISTORS

Symbol	Description	Part No.
R1	1 Megohm, ½ Watt	60B 8-105
R2	470 ohms, ½ Watt	60B 8-471
R3	22,000 ohms, ½ Watt	60B 8-223
R4	470 ohms, ½ Watt	60B 8-471
R5	4,700 ohms, ½ Watt	60B 8-472
R6	27,000 ohms, 1 Watt	60B 14-273
R7	1.5 Megohms, ½ Watt	60B 8-155
R8	1.5 Megohms, ½ Watt	60B 8-155
R9	1 Megohm, ½ Watt	60B 8-105
R10	27,000 ohms, 1 Watt	60B 14-273
R11	4,700 ohms, ½ Watt	60B 8-472
R12	1 Megohm, ½ Watt	60B 8-105
R13	27,000 ohms, 1 Watt	60B 14-273
R14	4,700 ohms, ½ Watt	60B 8-472
*R15	47,000 ohms, ¼ Watt	
R16	220,000 ohms, ½ Watt	60B 8-224
R17	390 ohms, ½ Watt	60B 8-391
R18	27,000 ohms, ½ Watt	60B 8-273
R19	6,800 ohms, ½ Watt, 5%	60B 7-682
R20	6,800 ohms, ½ Watt, 5%	60B 7-682
R21	47,000 ohms, ½ Watt	60B 8-473
R22	10,000 ohms, ½ Watt	60B 8-103
R23	1 Megohm Volume Control	75B 3-6
R24	4.7 Megohms, ½ Watt	60B 8-475
R25	2 Megohms Tone Control	75B 1-33
R26	1.5 Megohms, ½ Watt	60B 8-155
R27	330,000 ohms, ½ Watt	60B 8-334
R28	1.5 Megohms, ½ Watt	60B 8-155
R29	270,000 ohms, ½ Watt	60B 8-274
R30	270,000 ohms, ½ Watt	60B 8-274
R31	270 ohms, 2 Watt	60B 20-271
R32	270,000 ohms, ½ Watt	60B 8-274
R33	47,000 ohms, ½ Watt	60B 8-473
R34	470,000 ohms, ½ Watt	60B 8-474
R35	4.7 Megohms, ½ Watt	60B 8-475

CONDENSERS

Symbol	Description	Part No.
C1a	486 mmfd. (max) AM RF	Gang 68 B25
C1b	15 mmfd. (max) FM RF	Gang 68 B25
C1c	15 mmfd. (max) FM Osc.	Gang 68 B25
C1d	143 mmfd. max) AM Osc.	Gang 68 B25
C2	35 mmfd., Zero Temp. Coeff., Ceramic	65B 6-57
C3	7 mmfd., ± 1 mmfd., —.00047 Temp. Coeff., Ceramic	65B 6-45
C4	.002 mfd., "Hi-K" Ceramic	65B 9-38
C5	.001 mfd. min., Ceramic	65B 6-41
C6	3 to 12 mmfd., Trimmer (Silver Ceramic)	66A 19-2
C7	49 mmfd., 2%, Zero Temp. Coeff., Ceramic	65B 6-22
C8	2 mmfd., ±5 mmfd., Zero Temp. Coeff., Ceramic	65B 6-58
C9	50 mmfd., Ceramic	65B 6-4
C10	.005 mmfd., "Hi-K" Ceramic	65B 9-51
C11	.005 mfd. min., Ceramic	65A 10-1
C12	10 mmfd., Zero Temp. Coeff.	65B 6-44
C13	.01 mfd. min., Ceramic	65A 10-3
C14	100 mmfd., 3%, Silver Mica	Part of T1
C15	.01 mfd. min., Ceramic	65A 10-3
C16	.01 mfd. min., Ceramic	65A 10-3
C17	.01 mfd. min., Ceramic	65A 10-3
C18	200 mmfd., 3%, Silver Mica	Part of T4
C19	.01 mfd. min., Ceramic	65A 10-3
C20	100 mmfd., 3%, Silver Mica	Part of T2
C21	200 mmfd., 3%, Silver Mica	Part of T4
C22	.01 mfd. min., Ceramic	65A 10-3
C23	.01 mfd min., Ceramic	65A 10-3
C24	200 mmfd., 3%, Silver Mica	Part of T5
C25	.01 mfd. min., Ceramic	65A 10-3
C26	200 mmfd., 3%, Silver Mica	Part of T5
C27	90 mmfd., 3%, Silver Mica	Part of T3
*C28	100 mmfd., Ceramic	
*C29	100 mmfd., Ceramic	
C30	100 mmfd., 5%, —.00075 Temp. Coeff., Ceramic	65B 6-7
C31	100 mmfd., 5%, —.00075 Temp. Coeff., Ceramic	65B 6-7
C32	.002 mfd., 600 Volts, Paper	64B 1-14
C33	4 mfd., 150 Volts, Electrolytic	67A 4-2
C35a	30 mfd., 350 Volts	Electrolytic 67C 6-22
C35b	30 mfd., 350 Volts	Electrolytic 67C 6-22
C36	200 mmfd., "Hi-K" Ceramic	65B 9-14
C37	.005 mfd. min., Ceramic	65A 10-1
C38	100 mmfd., Ceramic	65B 6-3
C39	.005 mfd. min., Ceramic	65A 10-1
C40	.01 mfd. min., Ceramic	65A 10-3
C41	.02 mfd., 400 Volts, Paper	64B 1-24
C42	.005 mfd. min., Ceramic	65A 10-1
C43	.005 mfd. min., Ceramic	65A 10-1
C44	.005 mfd. min., Ceramic	65A 10-1
C45	.1 mfd., 400 Volts, Paper	64B 1-20
C46	100 mmfd., Ceramic	65B 6-3
C47	.1 mfd., 400 Volts, Paper	64B 1-20
C48	.01 mfd. min., Ceramic	65A 10-3
C49	.01 mfd. min., Ceramic	65A 10-3
C50	.01 mfd. min., Ceramic	65A 10-3
C51	.002 mfd., 600 Volts, Paper	64B 1-14
C52	.01 mfd. min., Ceramic	65A 10-3

* Part of encased Diode Filter Unit 63A3-1. This unit consists of R15, C28, C29 (see schematic). If a section of the unit becomes defective, replace with exact duplicate or individual components of proper value.

POINTER SETTING

With the gang open, the pointer should be at the position as shown in the stringing diagram, that is, the end of the pointer should line up with the "AM" lettering on the dial scale. If the pointer is in a different position, move it by hand while keeping the gang open.

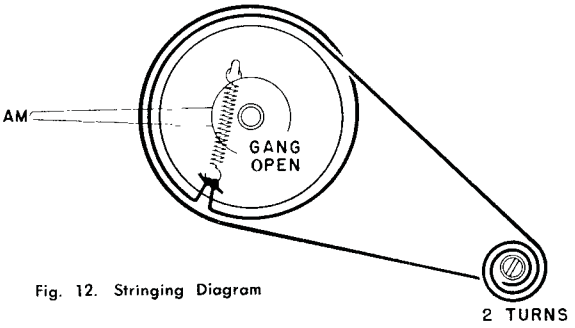
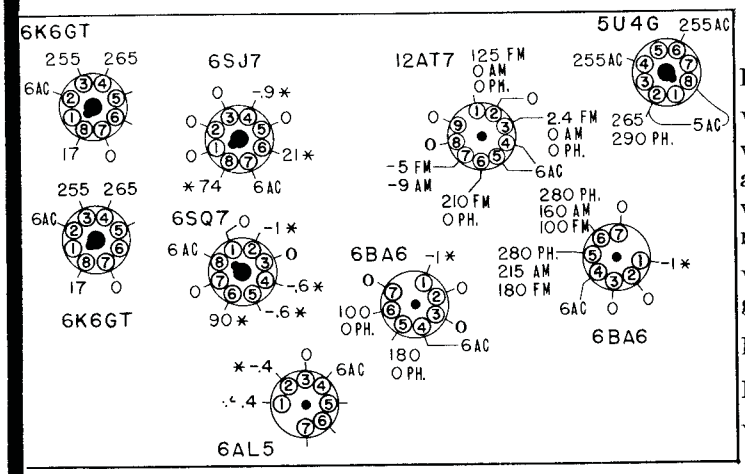


Fig. 12. Stringing Diagram



*If taken with a 1000 ohm-per-volt meter, readings will be lower or zero.

VOLTAGE CHART

Line Voltage 117.

Voltage readings taken with a vacuum tube voltmeter. Socket terminals marked with an asterisk * indicate much lower voltage or zero voltage if measured with a 1000 ohm-per-volt meter.

Voltages read between socket terminals and ground, unless otherwise indicated.

Band switch in FM position.

Dial turned to low frequency end.

Volume Control—minimum.

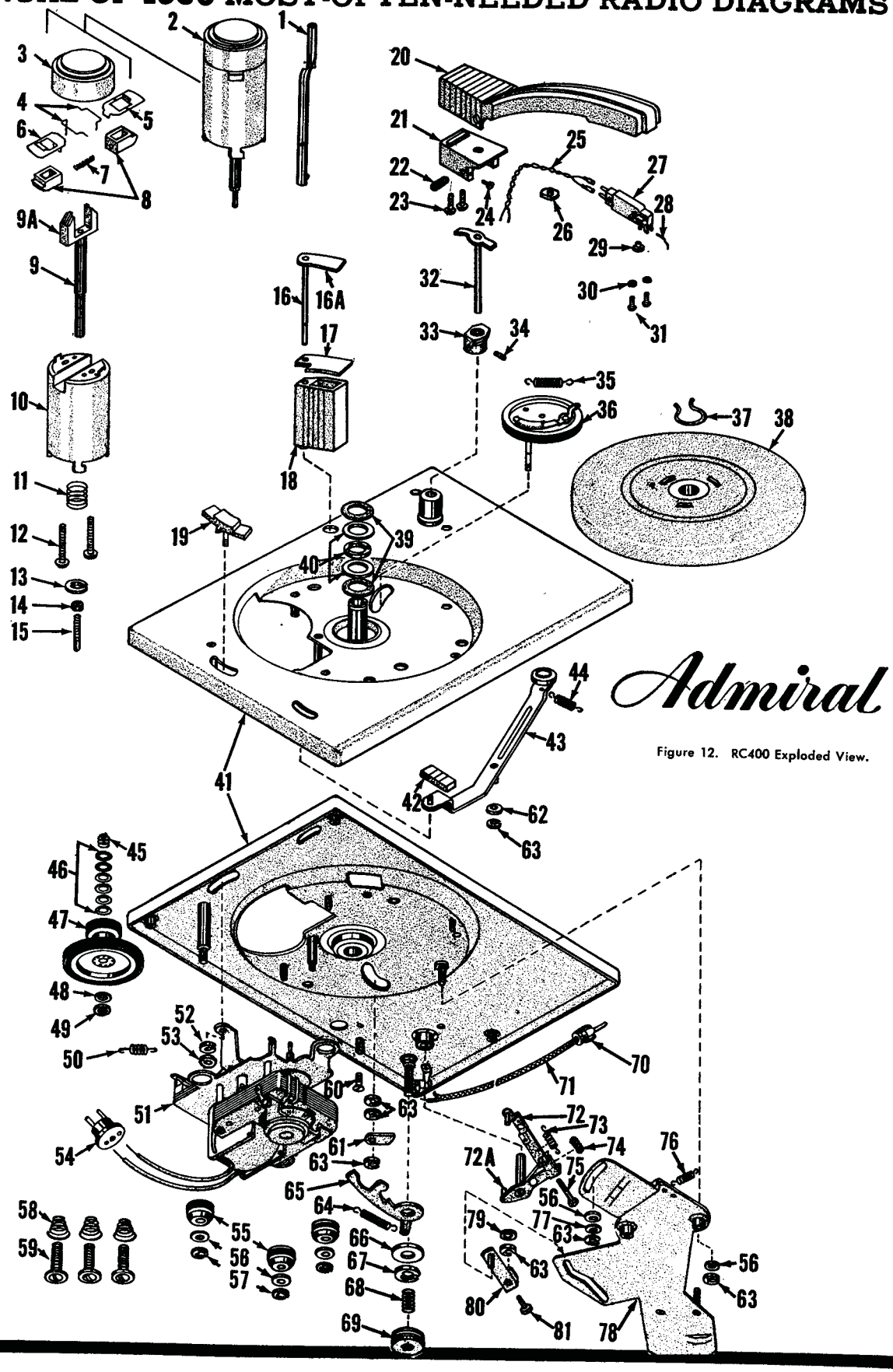


Figure 12. RC400 Exploded View.