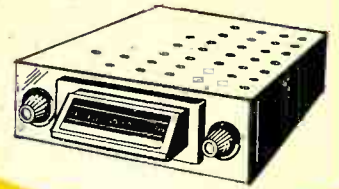
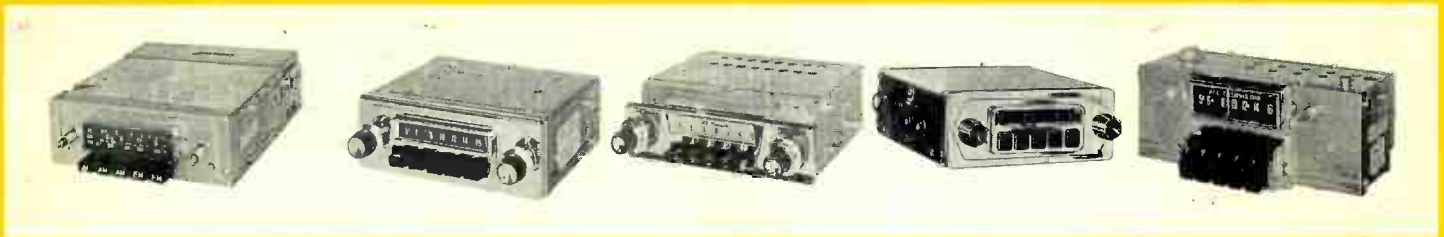


# SAMS PHOTOFACT<sup>®</sup>



## AUTO RADIO SERIES

AR-27  
**27**  
NOV. 1964



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**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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# SAMS PHOTOFACT<sup>®</sup> AUTO RADIO SERIES

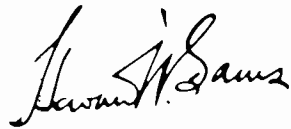


VOLUME

**27**



by the



ENGINEERING STAFF



**HOWARD W. SAMS & CO., INC.**

INDIANAPOLIS 6, INDIANA

**FIRST EDITION**  
**FIRST PRINTING—NOVEMBER, 1964**  
**SECOND PRINTING—MARCH, 1966**  
**PHOTOFACT<sup>®</sup>**  
**AUTO RADIO SERIES**  
**VOLUME 27**

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Library of Congress Catalog Card Number: 49-11493



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**AUTO RADIO SERIES**

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# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

TRADE NAME : Allstate Model 833.50181  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 8 Transistor FM Converter  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .330 Amp. @ 12.6 Volts DC  
 TUNING RANGE : FREQ. MOD. 88-108MC



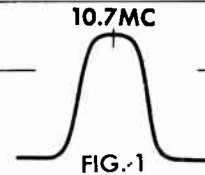
## ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
**CAUTION:** Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
 Suggested Alignment Tools:  
 A1 thru A13      GENERAL CEMENT: 5009, 8728A, 8987      WALSCO: 2531X, 2536

### FM ALIGNMENT USING AM SIGNAL GENERATOR — SELECTOR IN FM POSITION

High side to of generator thru .01mfd to point **A**, low side to ground for IF.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point <b>B</b> ; common to ground.	A1 thru A8	Adjust for maximum.
"	"	DC probe to point <b>C</b> ; common to	A9	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.



### FM IF ALIGNMENT USING FM SIGNAL GENERATOR — SELECTOR IN FM POSITION

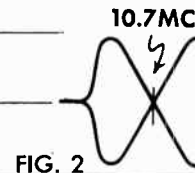
High side thru .01mfd to point **A**, low side to ground. Use 60% frequency modulated signal with 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point <b>B</b> ; low side to ground.	A1 thru A8	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C3.
"	"	Vert. amp. to point <b>C</b> ; low side to	A9	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator across antenna input with 120Ω carbon resistors in series with each lead.

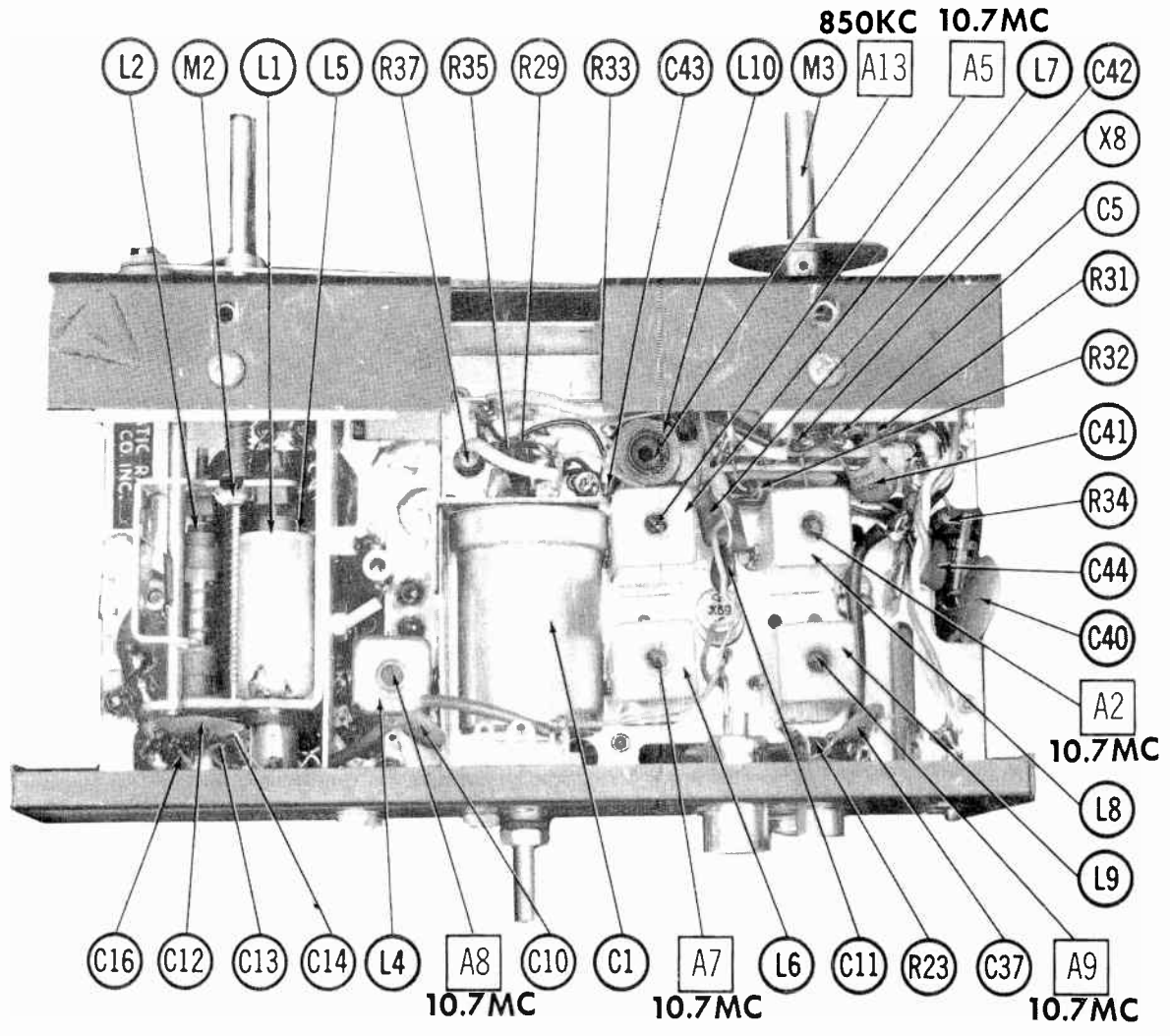
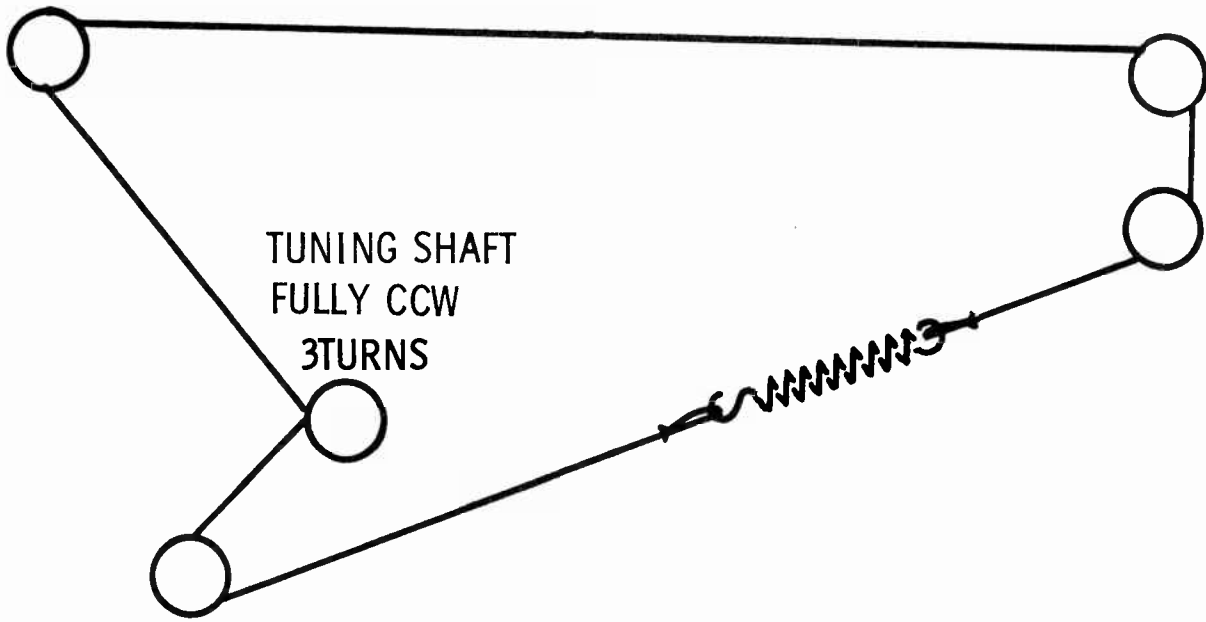
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MC	108MC	DC probe of VTVM to point <b>B</b> ; common to ground.	A10, A11, A12	Adjust for maximum.



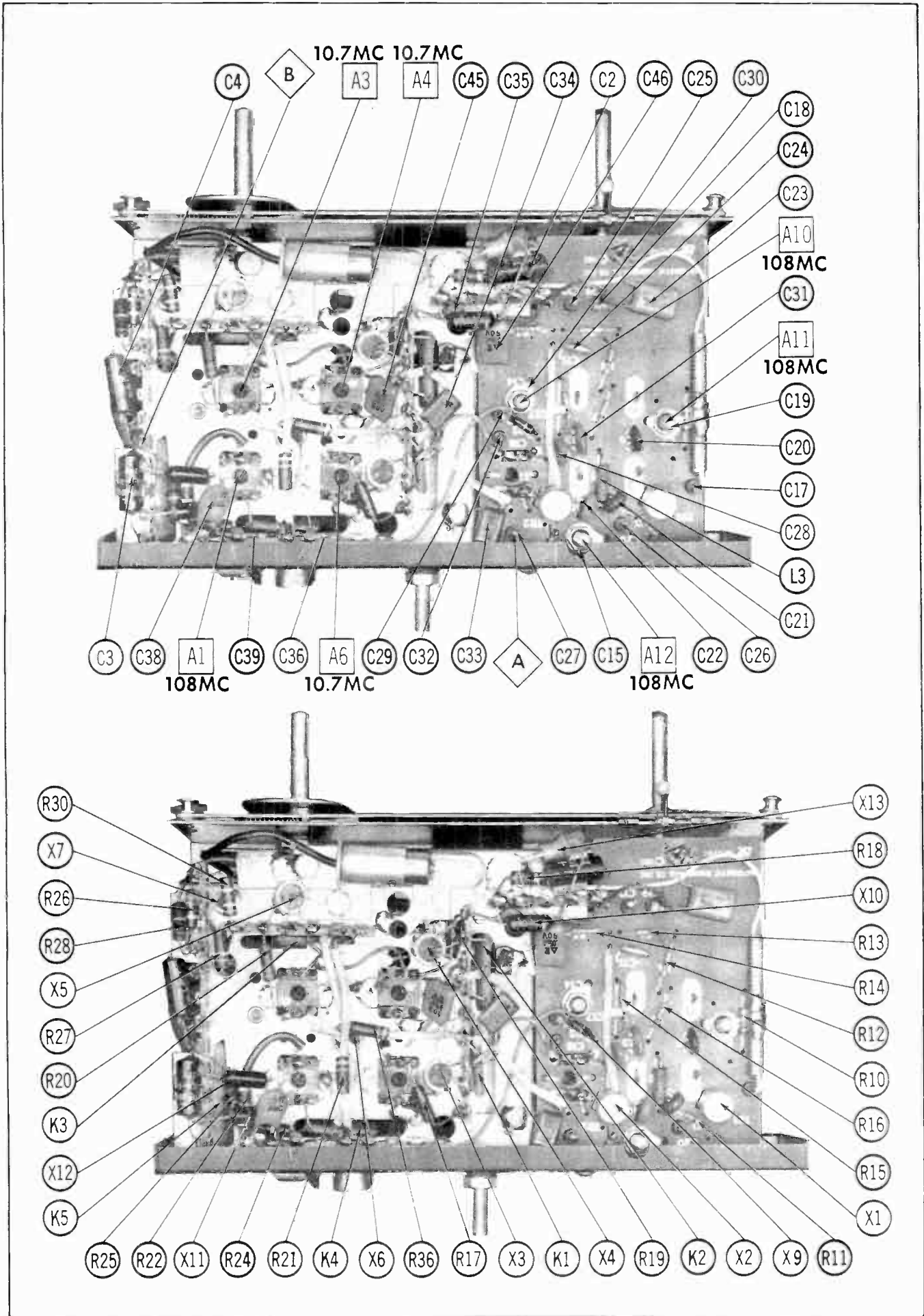
After unit is installed in car, tune in the AM receiver to a point of noninterference near 850KC. Tune in an FM signal and adjust A13 for maximum output.

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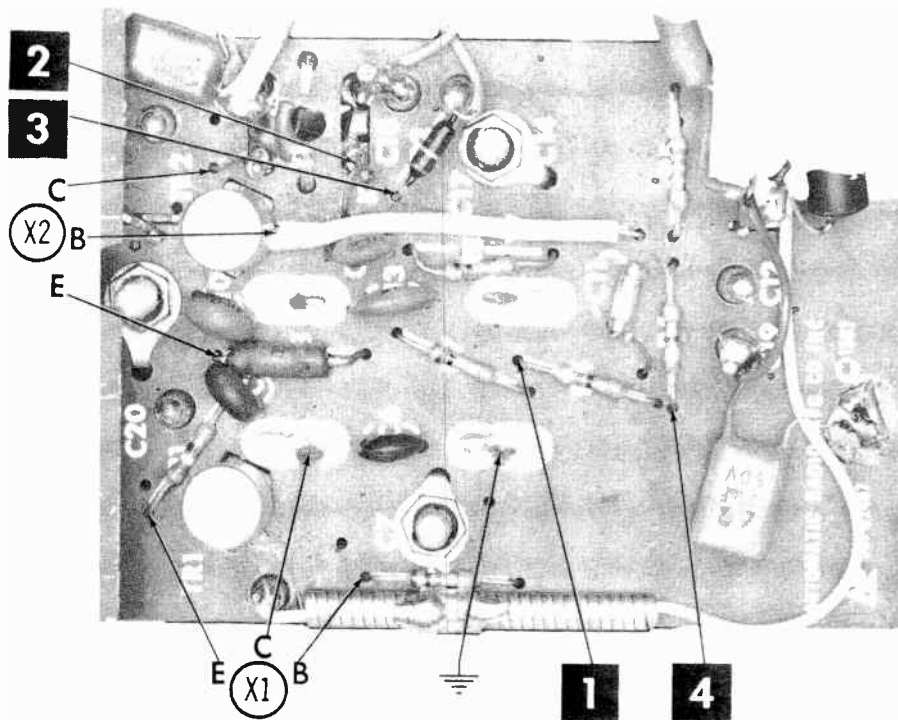
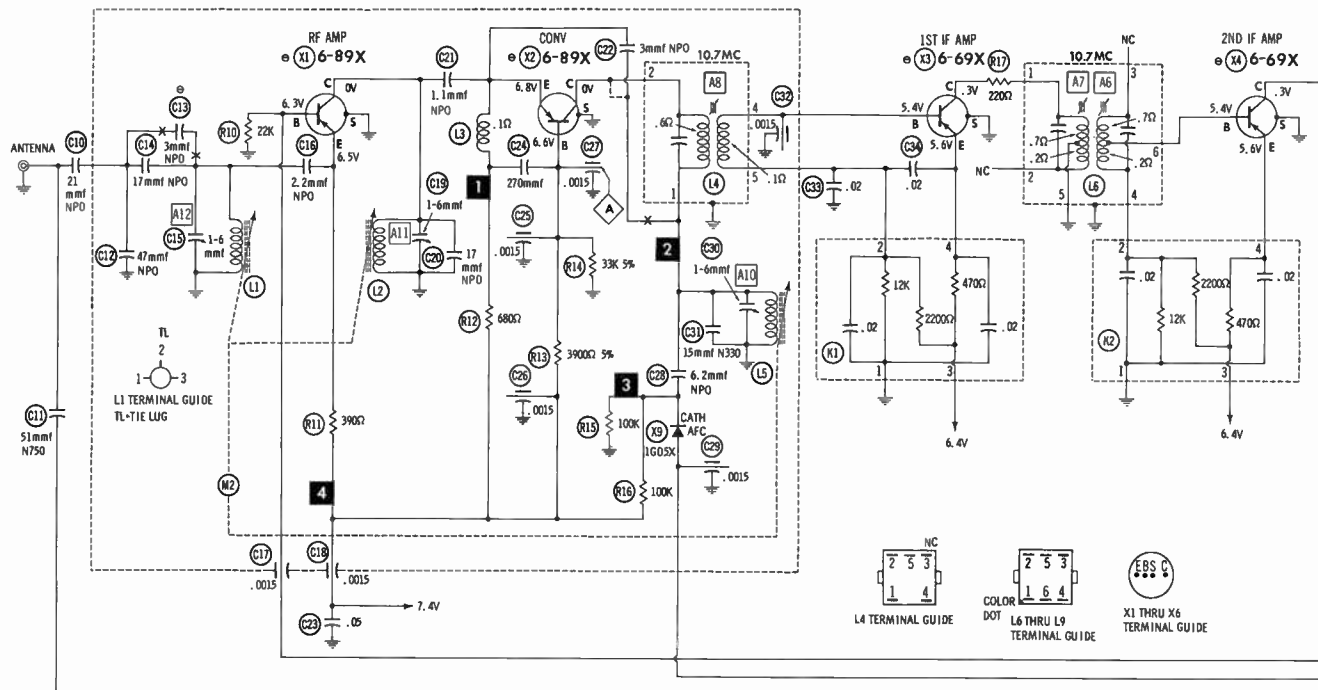
# DIAL CORD STRINGING



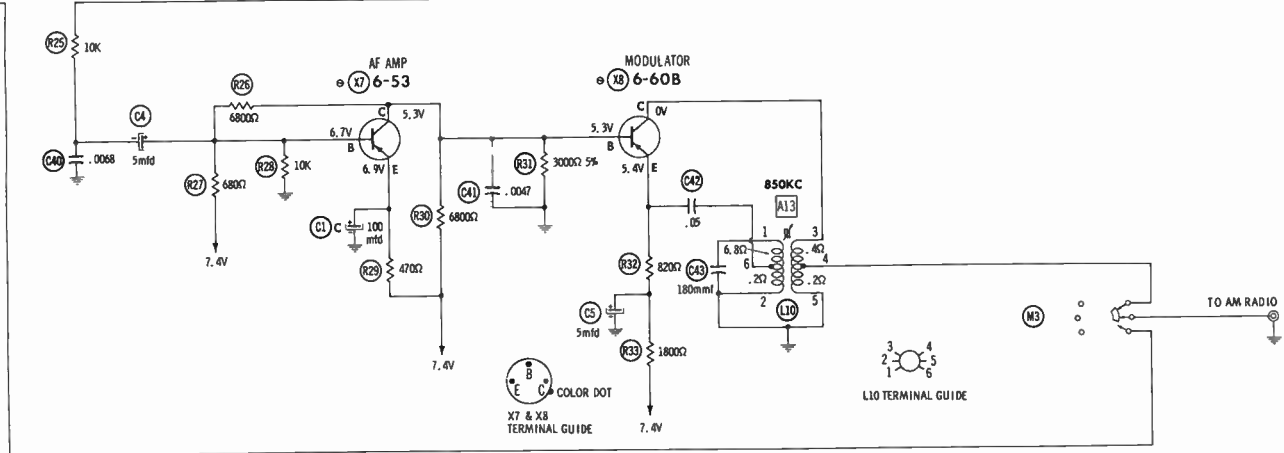
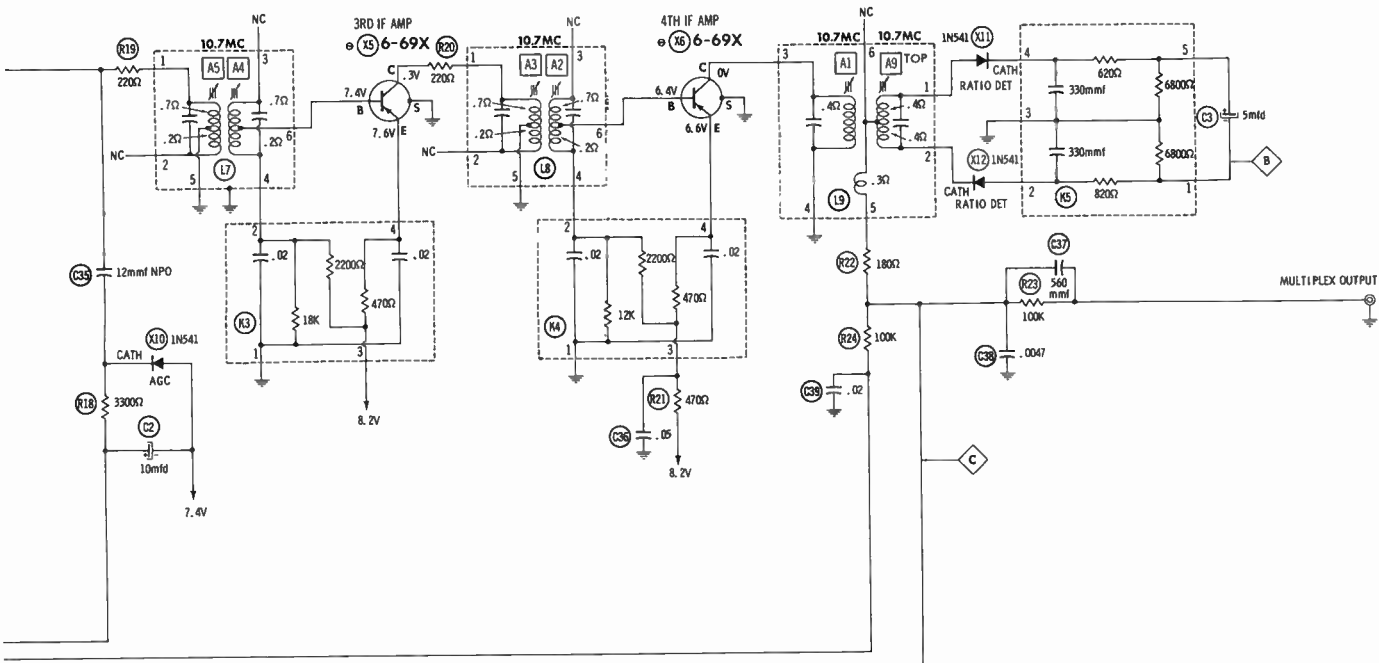




ALLSTATE MODEL 833.50181

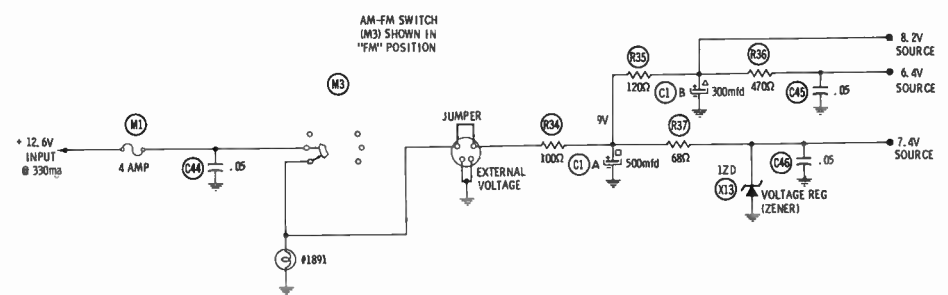


A Howard W. Sams CIRCUITRACE® Photo



- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- See parts list for alternate value or application.
  - Voltage measurements taken with vacuum tube voltmeter.
  - All controls set for normal operation, no signal applied.
  - Measured values are from socket pin or terminal to common ground.
  - All terminals viewed from bottom unless otherwise designated.
  - Numbers assigned to terminals may not be found on the unit.
  - Supply voltage maintained at rated value for voltage readings.
  - Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC with CIRCUITRACE  
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ALLSTATE MODEL 833.50181

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.

Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	8-89K (2N2089)†	RF Amp.	DS-41		2N1177	PNP
X2	6-89K (2N2089)†	Conv.	DS-42		2N1179	PNP
X3	6-89K (2N2090)†	1st IF Amp.	DS-37		2N1180	PNP
X4	8-89K (2N2090)†	2nd IF Amp.	DS-37		2N1180	PNP
X5	6-89K (2N2090)†	3rd IF Amp.	DS-37		2N1180	PNP
X6	8-89K (2N2090)†	4th IF Amp.	DS-37		2N1180	PNP
X7	6-53 (2N591)†	AF Amp.	DS-28	GE-2	2N591	PNP
X8	6-60B (2N840)†	Modulator	DS-25	GE-1	2N1639	PNP

† Alternate type number.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X9		1GD5K					1N34AS
X10		1N541					1N34AS
X11		1N541*					1N34AS
X12		1N541*					1N34AS
X13		1ZD8.2V					1N34AS

\* Matched pair.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2853	AFH3-00-94.5	CC0012	XC3-48.1		FP300.88	TVLS-8026.1*
B	300	18							
C	100	18							
C2	10	15	20-106	CRE457A	NLW10-15	MTI-5	MLV10-15	TT15X10	TE-1155
C3	5	15	20-505	CRE454A	NLW5-15	MTI-3	MLV5-15	TT25X5	TE-1152
C4	5	15	20-505	CRE454A	NLW5-15	MTI-3	MLV5-15	TT25X5	TE-1152
C5	5	15	20-505	CRE454A	NLW5-15	MTI-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	21	NPO	NPO-DI20	DTZ-20	C10Q2C	CCTO-200	CNO420	10TCC-Q22
C11	51	N750	N750-SI50	TCN-51	C10Q5U			10TCU-Q50
C12	47	NPO	NPO-DI47	DTZ-47	C10Q47C	CCTO-470	CNO447	10TCU-Q47
C13	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C14	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C15	1-6							
C16	2.2	NPO	NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22
C17	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C18	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C19	1-8							
C20	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C21	1.1	NPO	NPO-DI1	TCZ-1	C10V15C		CNO510	10TCC-V10
C22	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C23	.05		TTD-05	CK-503	H5		TA150	TG-850
C24	270		NPO-SI270	TCZ-270	LA10T27-C4	CCD-271	CNO327	10TCC-T27
C25	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C26	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C27	.0015		EF-001	MFT-1000		CCF-102	CT280A	

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C28	6.2	NPO						
C29	.0015		EF-001	MFT-1000				
C30	1-6							
C31	15	N330						
C32	.0015		EF-001	MFT-1000				
C33	.02		BPD-02	DD-203	BYA6S2	CCD-102	CT280A	10TCC-Q15
C34	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-820
C35	12	NPO	SI-12	TCZ-12	LA10Q12-SL	CCO-120	CNO410	10TCC-Q12
C36	.05		TTD-05	CK-503	H5		TA150	TG-850
C37	580		DI-580	DD-581	LA10T58-C4	CCD-581	GP356	5HK-T56
C38	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C39	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-820
C40	.0088		DI-6800	DD-682	BYA10D68	CCD-682	GP288	10TCC-D68
C41	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C42	.05		TTD-05	CK-503	H5		TA150	TG-850
C43	180		DI-180	DD-181	LA10T18-S3	CCD-181	GP318	5GA-T18
C44	.05		TTD-05	CK-503	H5		TA150	TG-850
C45	.05		TTD-05	CK-503	H5		TA150	TG-850
C46	.05		TTD-05	CK-503	H5		TA150	TG-850

① Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.						
L2	RF						
L3	RF Choke	14-.82	TV-182	4594			① Part of M2.
L4	1st IF	14-2520				T804	
L5	Osc.						
L6	2nd IF	14-2933					
L7	3rd IF	14-2933					
L8	4th IF	14-2933					
L9	Ratio Detector	14-2522					
L10	Osc.	14A3384					

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K1	1st IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K2	2nd IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K3	3rd IF Network	470Ω, 2200Ω, 18K, .02mfd, .02mfd	89A2014	
K4	4th IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K5	Ratio Detector Network	880Ω, 820Ω, 6800Ω, 6800Ω, 330mmf, 330mmf	89A2538	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A						

## MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Tuner	78B2487	
M3	Selector SW	94A3018	

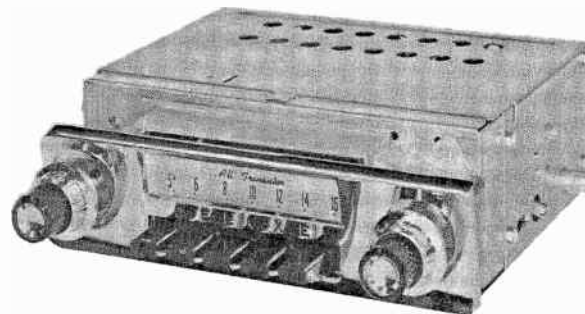
## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8861 (3/8 In.) or 8870 (5/4 In.)



# PHOTOFACT<sup>®</sup>

TRADE NAME : Allstate Model 833, 50202  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 5 Transistor AM Receiver  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .740 Amp. @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC



## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4  
 A5, A6, A7

GENERAL CEMENT: 8606, 8606L, 8869  
 GENERAL CEMENT: 8290, 8868, 9087

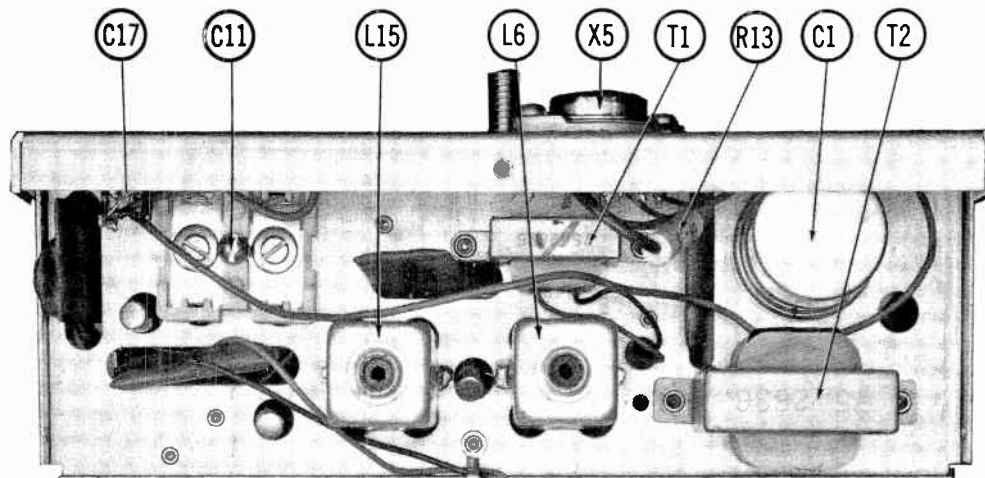
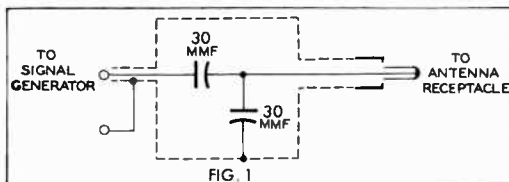
WALSCO: 2543, 2544, 2588  
 WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400 $\nu$ Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

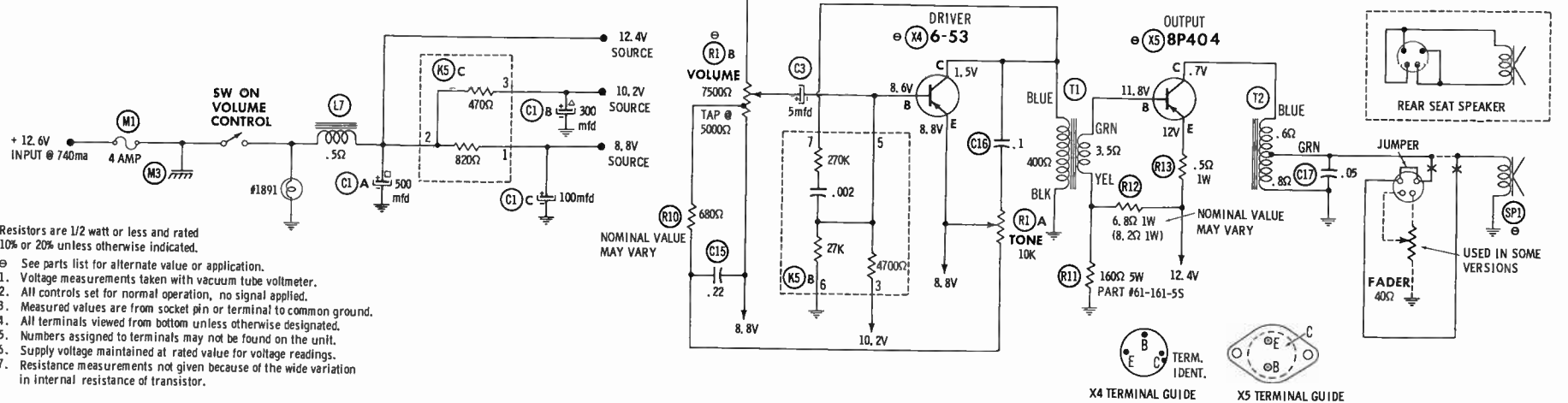
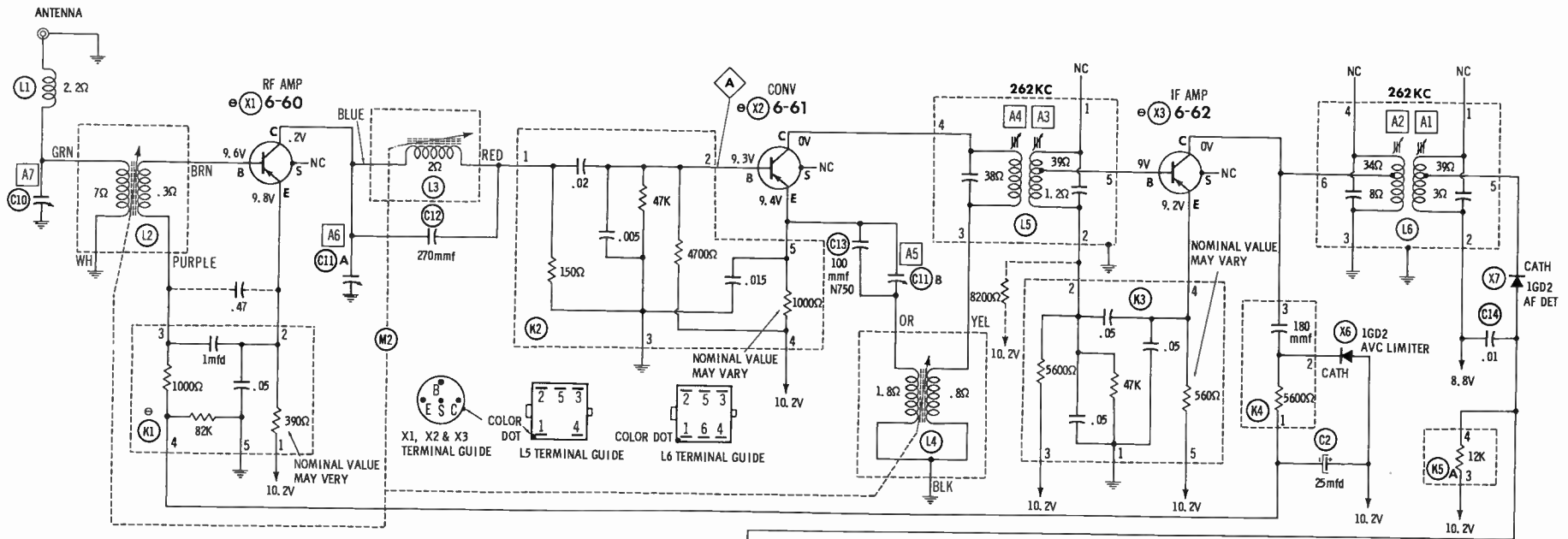
### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- ⊖ See parts list for alternate value or application.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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ALLSTATE MODEL 833.50202

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-60 (2N640)†	RF Amp.	DS-25	GE-1	2N1837	PNP
X2	6-61 (2N642)†	Conv.	DS-25	GE-1	2N1839	PNP
X3	6-62 (2N641)†	IF Amp.	DS-25	GE-1	2N1838	PNP
X4	6-53 (2N591)†	Driver	DS-26	GE-2	2N591	PNP
X5	8P404 (2N176)†	Output	DS-520	GE-3	2N301	PNP <sup>A</sup>

† Alternate Type Number.

▲ When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X6		1GD2 (1N295)†					1N34AS
X7		1GD2 (1N295)†					1N34AS

† Alternate type number.

## ELECTROLYTIC CAPACITORS

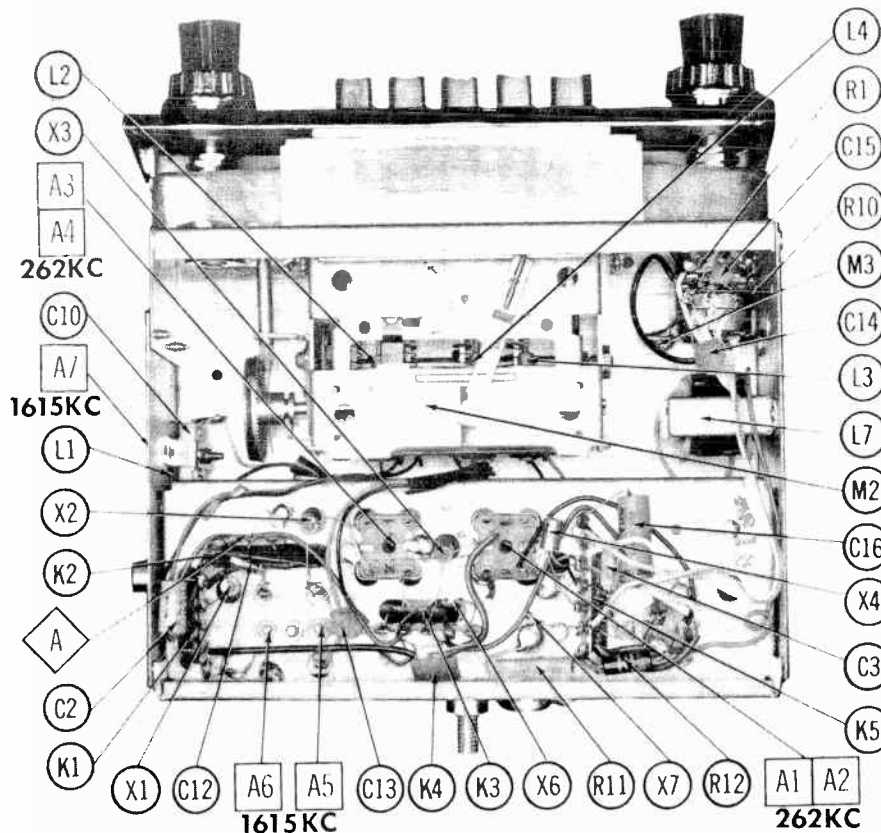
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Allstate PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2853	AFH3-00-94.5		XCS-48.1		FP300.83	TVLS-3026.1 <sup>#</sup>
B	300	18							
C	100	16							
C2	25	15	20-256	PTT69	NLW25-15	MT1-10	MLV25-15	TT13X25	TE-1157.1
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMenco PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10 C11A B		#28A1332							
C12	270		DL-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T25	
C13	100 N750		N750-DI100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10	
C14	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C15	.22			UK20-204	HCC25224Z			HY-325	
C16	.1 200V		BE2P1		WMF1P1	1DP-2-104	PVC101	2PS-P10	
C17	.05		TTD-05	CK-503	H5		TA150	TG-550	

# Allstate Part Number.



ALLSTATE MODEL 833.50202

# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				NOTES
			Allstate PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	
R1A	Tone Volume/Switch	10K 7500Ω Tap @ 5000Ω	80A22398 ①				
R1A	Tone Volume/Switch	10K 2500Ω Tap @ 5000Ω	80A25658C ②				
R1A	Tone Volume/Switch	10K 7500Ω Tap @ 5000Ω	80A3257 ③				
	Fader		80A1137 ④				

- ① Used in Models FAR-4054, FAL-4554.
- ② Used in Models FP-4056, F-4055, FA-4555, FAP4556, MAP-4561, MT-4061.
- ③ Used in Models MUS-4067, FN-4051, FNP-4052, FUP-4057, FAN-4551, FPA-4552, FPF-4557, CTP-4059, CT-4058, AC-4558, ACP-4559.
- ④ Used in Model MUS-4067.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Allstate PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (6.2uh)	14-6.2	BC-565	4610	RTC-8520	T859	① Part of M2.
L2	Ant.	①					
L3	RF	①					
L4	Osc.	①					
L5	Input IF	14-2654	BC-690	6570			
L6	Output IF	14-2655	BC-691	6571		TF606	

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	
L7	740ma	.5Ω	10MH	75A1269	C-4095	TC-2	TR-155	TY17XT

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	8:	1	75A2635			TR-184		

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	24Ω	Tap @ 8Ω	75A2636 ①			TR-189		① Alternate part #75A2693.

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Allstate PART No.	QUAM PART No.	
SP1	5" X 8" PM 8Ω	73B2786	58A15Z8	Models-FAL-4554, FAR-4054, FN-4051, FNP-4052, FUP-4057, FAN-4551, FPA-4552, FPF-4557, ACP-4539, CTP-4059, CT-4058, AC-4558. Models-FP-4056, F-4055, MT-4051, MAP-4561, FA-4555, FAP-4556 Model-MUS-4067.
	6" X 10" PM 8Ω	73B2724	610A1Z8	
	4" X 10" PM 8Ω	73B2737	410A2Z8	

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Allstate PART NO.	REPLACEMENT DATA
K1	RF Network	390Ω, 1000Ω, 82K, .05mfd, 1mfd	98A2582C	
K2	Converter Network	150Ω, 1000Ω, 4700Ω, 47K, .005mfd, .015mfd, .02mfd	89A2583	
K3	IF Network	560Ω, 5600Ω, 47K, .05mfd, .05mfd, .05mfd	89A2584	
K4	AVC Network	5600Ω, 180mfmf	89A2701	
K5	Audio Network	470Ω, 820Ω, 4700Ω, 12K, 27K, 27K, 270K, .002mfd	89A2585	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Allstate PART No.		LITTELFUSE PART No.			
			FUSE	HOLDER	FUSE	HOLDER		
M1	AGW	4A	108-400	In Fuse Block	303004		AGW4	

## MISCELLANEOUS

ITEM No.	PART NAME	Allstate PART No.	NOTES
M2	Tuner	78B2236	
M3	Spark Plate		

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Knob- Tuning or Volume	47-52B	Knob- Dummy	48A1522-1
Knob- Tone	48A1522	Pushbutton	55A2183

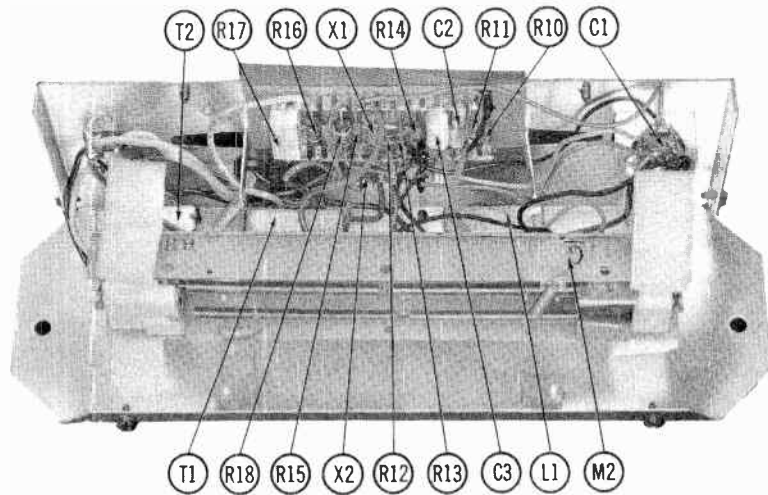
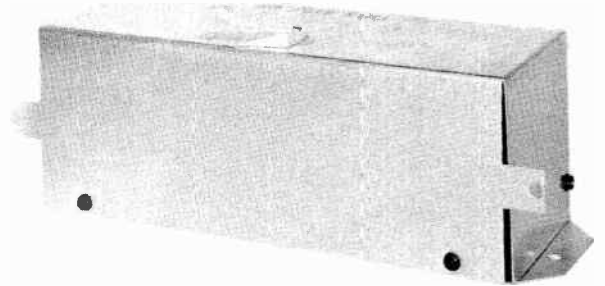
## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

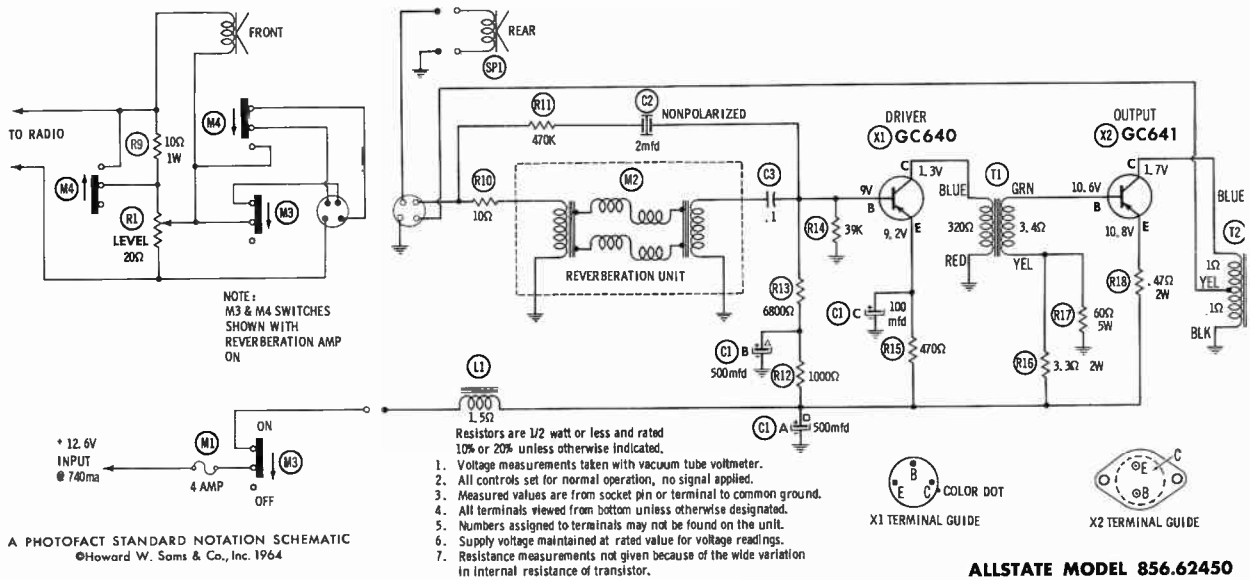


# PHOTOFACT<sup>®</sup>

**TRADE NAME :** Allstate Model 856. 62450  
**SUPPLIER :** For Current Address, See Master Index.  
**TYPE SET :** 2 Transistor Reverberation Unit  
**POWER SUPPLY :** 12 Volt Storage Battery  
**RATING :** .74 Amp. @ 12.6 Volts DC



ALLSTATE MODEL 856.62450



# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	GC640	Driver	DS-26	GE-2	2N591	PNP PNP *
X2	GC641	Output	DS-520	GE-3	2N301	

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Allstate PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
	CAP.	VOLT.							
C1A	500	15		AFH3-00-94, 5		XC3-48		FP-300, 83	TVL-3026, 8
B	500	15							
C	100	15							
C2	2	15NP		NP-PRS-7300				TCN502	TVANS-1202*

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.1 100V		P288N-1		WMFIFI	IDP-2-104	PVC-101	ZPS-P10

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Allstate PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1	Level (Reverb.)	20Ω					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000-)	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L1	740ma	1.5Ω	11MH						

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	15:	1						

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Allstate PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	12Ω Tap @	8Ω						

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Allstate PART No.	QUAM PART No.	
SP1	6" x 9" PM 8Ω	69A2Z8		

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Allstate PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	4			307004	155004	SFE 4	HMF

## MISCELLANEOUS

ITEM No.	PART NAME	Allstate PART No.	NOTES
M2	Reverb. Unit		
M3	Switch		
M4	(On-Off, Speaker) Switch (Reverb)		

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8870 (3/4 In.)



# PHOTOFACT<sup>®</sup>

TRADE NAME : ATR KARADIO

401	Universal	FD422	60-62 Ford
BKS410	61-62 Buick Special	LR424	62 Lancer
CT412	61-62 Chevrolet	MY426	62 Mercury
CR414	60-62 Corvair	OEF428	61-62 Oldsmobile F-85
COT416	60-62 Comet	PH430	62 Plymouth
DED418	62 Dodge Dart	PCT432	61-62 Pontiac Tempest
FAL420	60-62 Falcon	VT434	62 Valiant

SUPPLIER : For Current Address, See Master Index.

TYPE SET : 4 Tube 2 Transistor AM Receiver

POWER SUPPLY : 12 Volt Storage Battery

RATING : 1.3 Amp. @ 12.6 Volts DC



TUNING RANGE : BROADCAST 540-1615KC

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

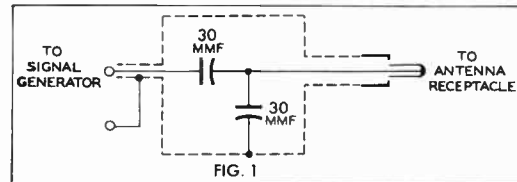
A1 thru A4  
A5, A6, A7

GENERAL CEMENT: 8606, 8606L, 8869  
GENERAL CEMENT: 8290, 8868, 9087

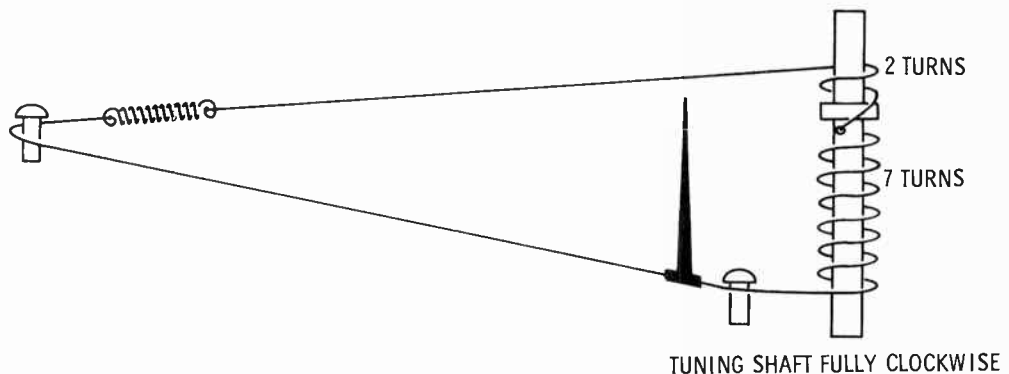
WALSCO: 2543, 2544, 2588  
WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point A, low side to ground.	262KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

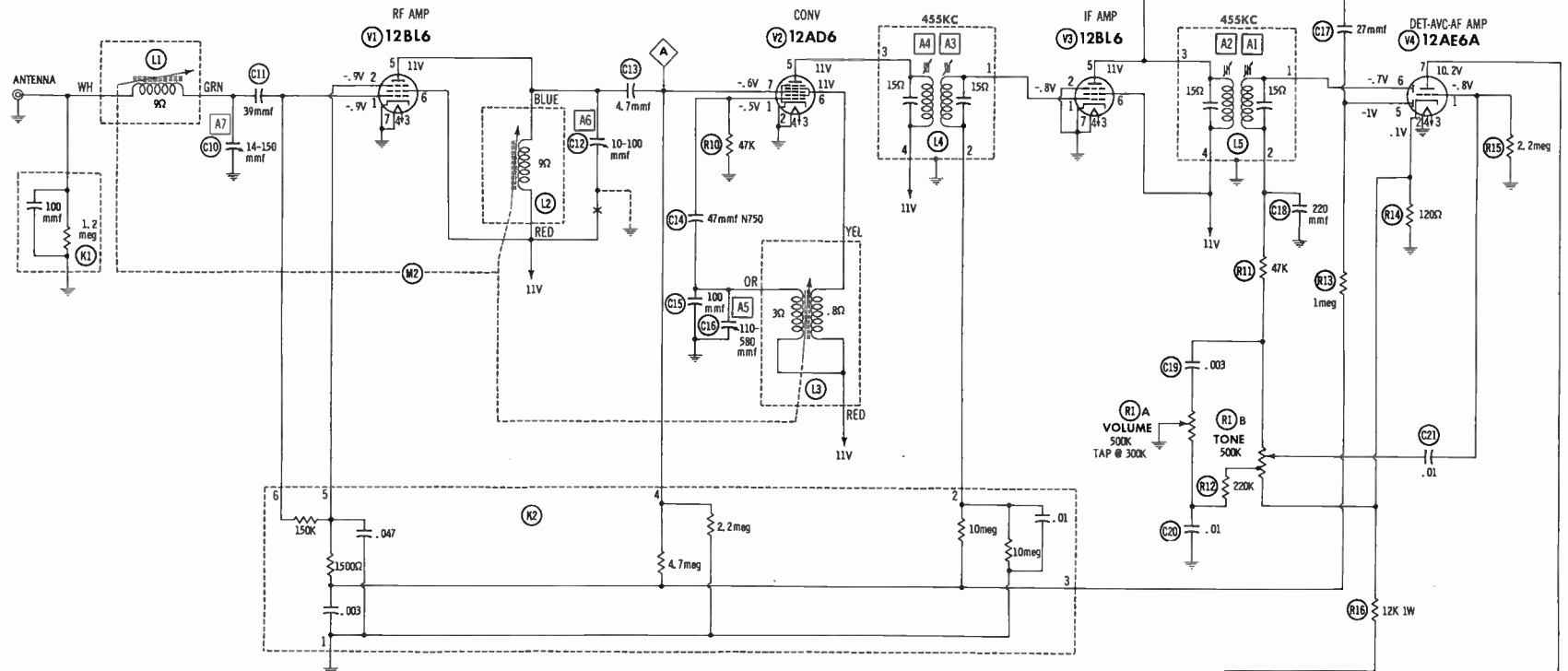


## DIAL CORD STRINGING



ATR KARADIO MODEL 400 SERIES

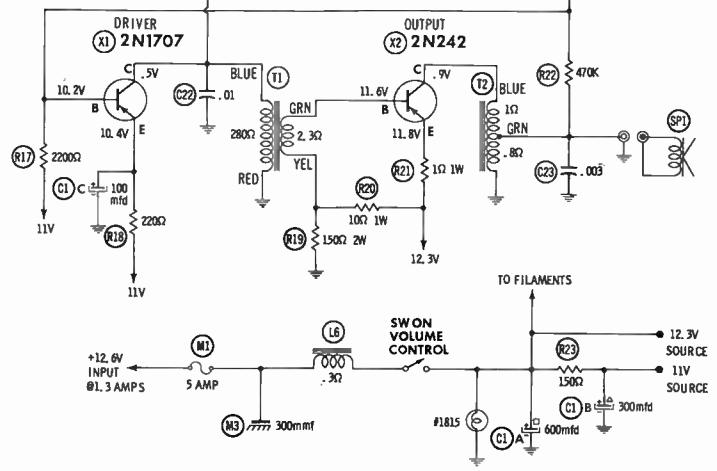
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



**RESISTANCE MEASUREMENTS**

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	5.5meg	5.5meg	FIL	FIL	†1.60Ω	†1.50Ω	0Ω
V2	12AD6	47K	0Ω	FIL	FIL	†1.65Ω	†1.50Ω	2meg
V3	12BL6	6.5meg	0Ω	FIL	FIL	†1.65Ω	†1.50Ω	0Ω
V4	12AE6A	2.2meg	120Ω	FIL	FIL	6.5meg	500K	†2200Ω
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7

† MEASURED FROM C1A.



RESISTANCE MEASUREMENTS FOR X1 & X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL RESISTANCE OF TRANSISTOR.

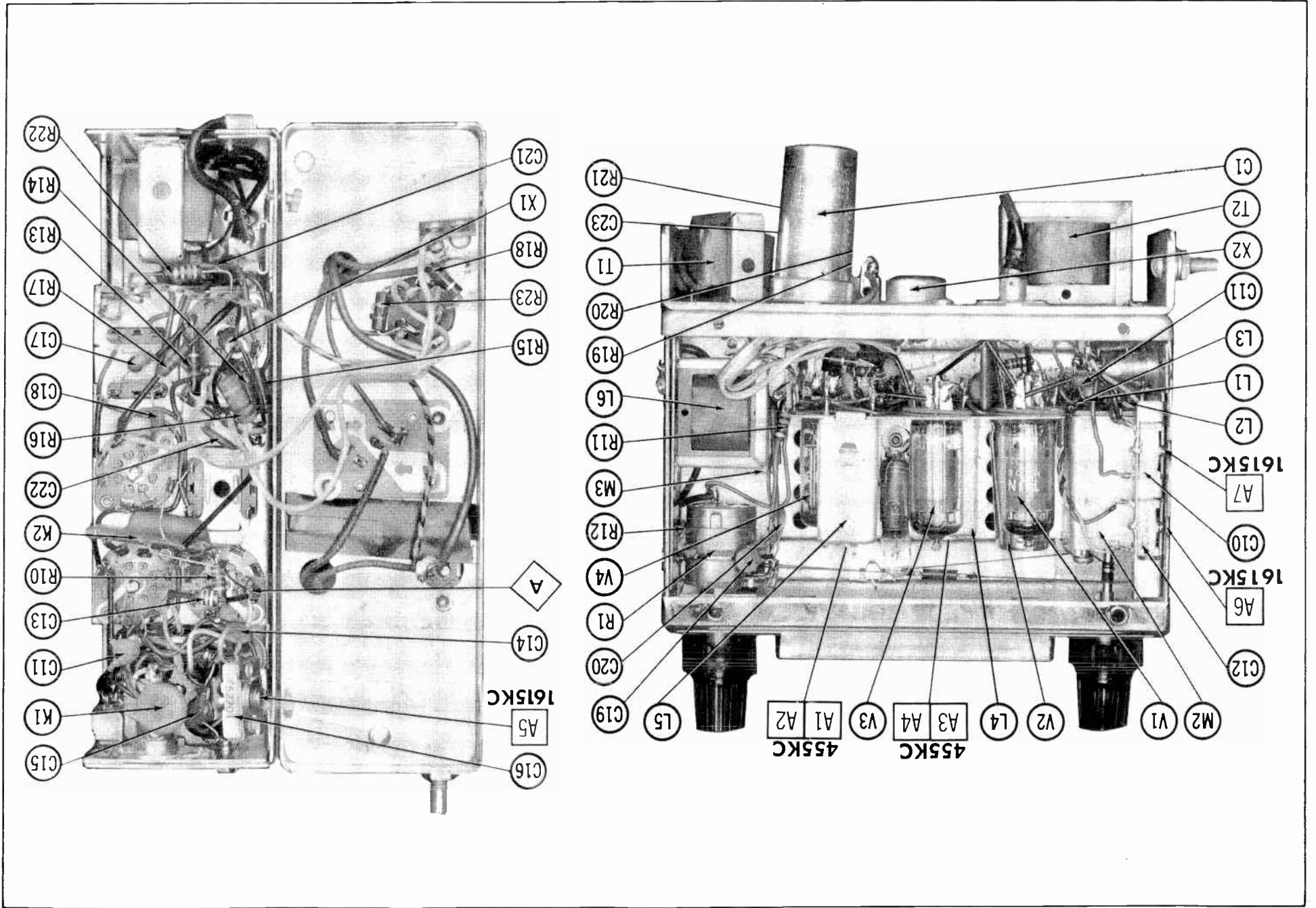
Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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**ATR KARADIO MODEL 400 SERIES**

ATR KARADIO MODEL 400 SERIES



# PARTS LIST AND DESCRIPTION

## WIRING DATA

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 in.) or 8670 (3/4 in.)

## TUBES

• AMPEREX •		GENERAL ELECTRIC		• RCA •		• SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE
V1	RF Amp.	12BL6	V3	IF Amp.	12BL6		
V2	Conv.	12AD6	V4	Det. - AVC - AF Amp.	12AE6A		

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1707	Driver	DS-26	GE-2	2N591	PNP
X2	2N242	Output	DS-520	GE-3	2N301	PNP

• When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ATR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	800	15		AFH3-00-95.4	CCOO12	XC3-48		WP300.85	TVLS-3026.7
B	300	15							
C	100	15							

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	14-150	#DP521033	DI-39	DD-390	LA10Q39-S3	CCD-390	GP439	5GA-Q39
C11	39	#DP521021	NPO-DI4.7	DTZ-4R7	C10V47C	CCTO-4R7	CN0547	10TCC-V47
C12	10-100		N750-DI47	DTN-47	C10Q47U	CCTN-470	CN7477	10TCU-Q47
C13	4.7		DI-100	DD-101	LA10T1-S3	CCD-101	GP310	5GA-T10
C14	47 N750	#T52700						
C15	100							
C16	110-580							
C17	27		DI-27	DD-270	LA10Q27-SL	CCD-270	GP427	5GA-Q27
C18	220		DI-220	DD-221	LA10T22-S3	CCD-221	GP322	10TS-T22
C19	.003		BPD-0033	DD-332	BYA10D33	CCD-332	B233	5HK-D33
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C21	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C23	.003		BPD-0033	DD-332	BYA10D33	CCD-332	B233	5HK-D33

# ATR part number.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			ATR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A	Tone Volume	500K 500K Tap @ 300K	(CD-597)	F1-500K, R16-500K, FFS102, RFS109 AK-31, KR-4		† QJ-1785A	

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-133, P17-105 (Panel)

"SNAPTROL" Equivalent: BU15, CF16, CR35 T, SF8, SR42, GC.

① Cut to required length.

B19-133, R9-115 (Rear)  
S-52 (Bushing)  
76-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ATR PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant						① Part of M2.
L2	RF						
L3	Osc.						
L4	Input IF	14-455X					
L5	Output IF	14-455X					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	ATR PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	
L6	1.3A	.3Ω	10MH	454C1	C-4095	TC-2	TR-152	TY17XT

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA					NOTES
		ATR PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	15: 1	454AT1			TR-187		

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ATR PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	20Ω Tap	@ 3-4Ω	454AT2			TR-170		

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		ATR PART No.	QUAM PART No.	
SP1	5" X 7" PM	3-4Ω	57A15	

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ATR PART NO.	REPLACEMENT DATA
K1 K2	Ant. Isol. Biasing	1.2meg, 100mfmf 1500Ω, 150K, 2.2meg, 4.7meg, 10meg, 10meg, .003mfd, .01mfd, .047mfd	103C47A2	Sprague PRC-9

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ATR PART No.	LITTELFUSE PART No.	BUSS PART No.			
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGC	5A			311005	155020	AGC5	HDJ

## MISCELLANEOUS

ITEM No.	PART NAME	ATR PART No.	NOTES
M2 M3	Tuner Spark Plate	830803	300mmf

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Dial Glass Knob	P-2010 WK-3	Dial Pointer	P-2012



# PHOTOFACT<sup>®</sup>

TRADE NAME : Automatic Models DEP-4154, DEP-4654,  
DUP-4151, DUP-4651, P-4152, P-4652,  
PS-4153, PS-4653

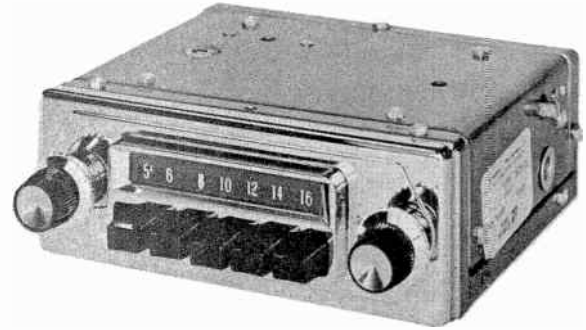
SUPPLIER : For Current Address, See Master Index.

TYPE SET : 5 Transistor AM Receiver

POWER SUPPLY : 6 or 12 Volt Storage Battery

RATING : .440 Amp. @ 6.3 Volts DC,  
.660 Amp. @ 12.6 Volts DC

TUNING RANGE: BROADCAST 540-1615KC



## ALIGNMENT INSTRUCTIONS

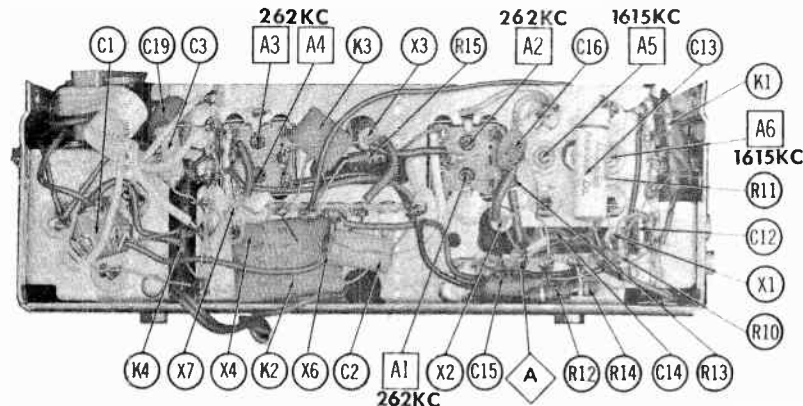
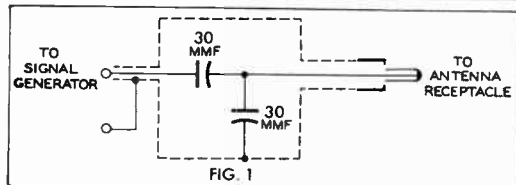
Check for specified source voltage.  
Use only enough generator output to provide a usable indication.  
Suggested Alignment Tools: A1 thru A7 GENERAL CEMENT: 9440 WALSCO: 2501

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	262KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

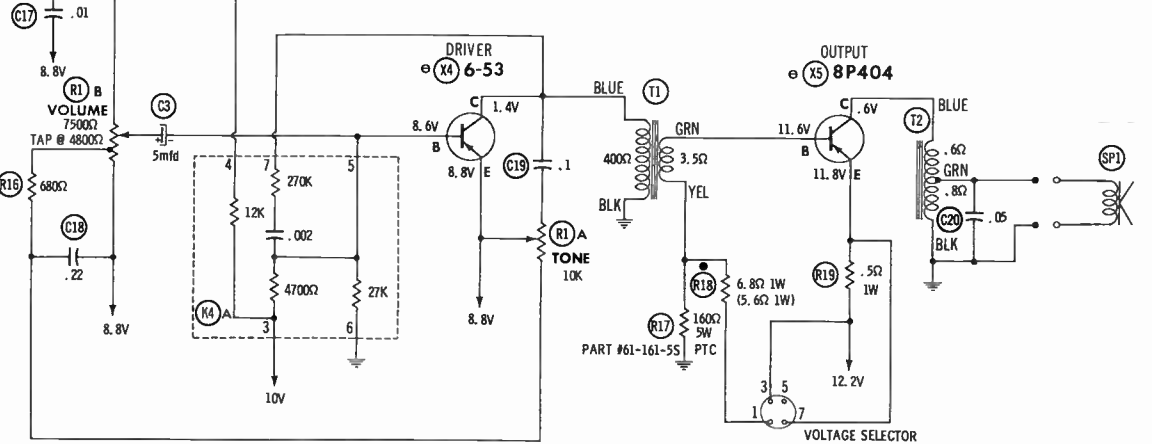
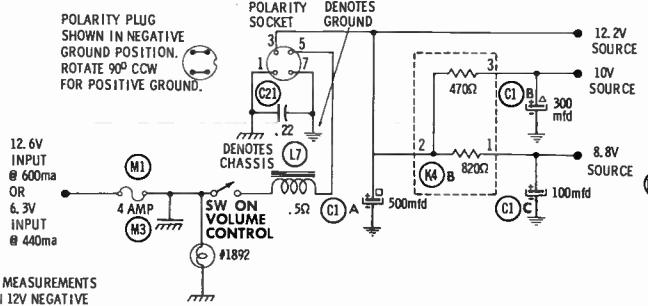
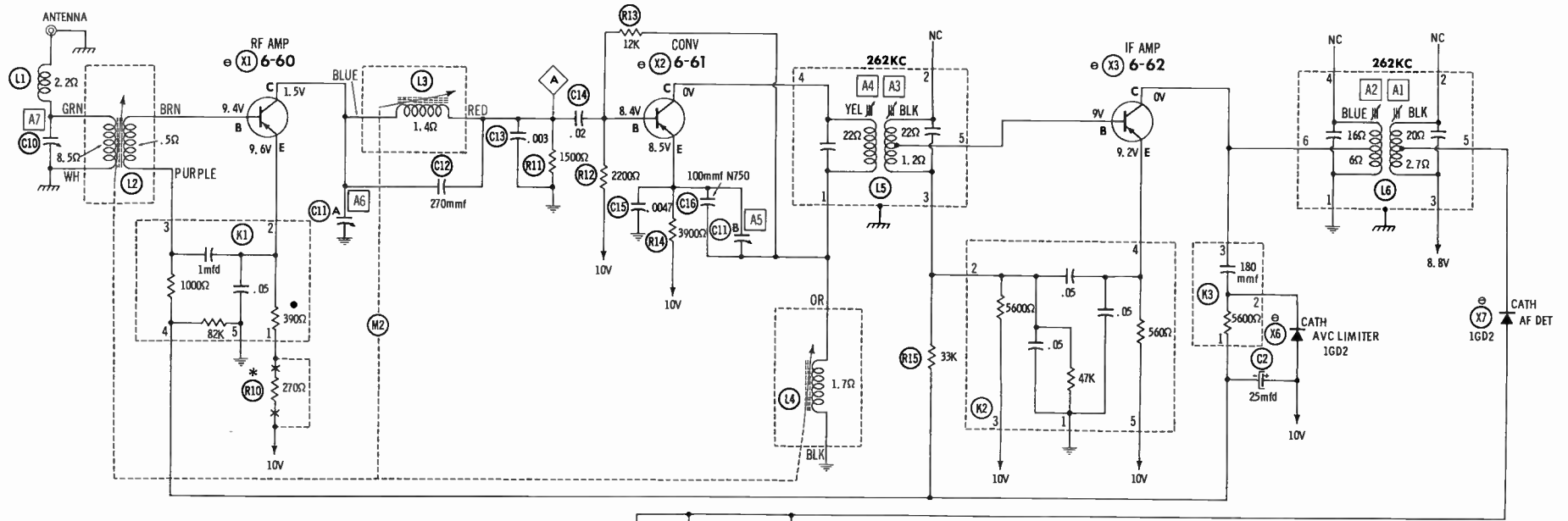
### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

AUTOMATIC 1964 UNIVERSAL SERIES

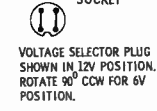


VOLTAGE MEASUREMENTS  
TAKEN IN 12V NEGATIVE  
GROUND POSITION.

\* NOT USED IN SOME VERSIONS  
● NOMINAL VALUE MAY VARY

Resistors are 1/2 watt or less and rated  
10% or 20% unless otherwise indicated.

- See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
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**AUTOMATIC MODEL 1964 UNIVERSAL SERIES**



## PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### TRANSISTORS

ITEM No.	ORIG TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-60 (2N640)†	RF Amp.	D6-25	GE-1	2N1637	PNP
X2	6-61 (2N642)†	Conv.	DS-25	GE-1	2N1639	PNP
X3	6-62 (2N641)†	IF Amp.	D6-25	GE-1	2N1638	PNP
X4	6-53 (2N591)†	Driver	D6-26	GE-2	2N591	PNP
X5	8P404 (2N176)†	Output	D8-520	GE-3	2N301	PNP <sup>Δ</sup>

† Alternate Type Number.

<sup>Δ</sup> When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

### POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X6		1GD2 (1N295)†					1N34AS
X7		1GD2 (1N295)†					1N34AS

† Alternate type number.

### ELECTROLYTIC CAPACITORS

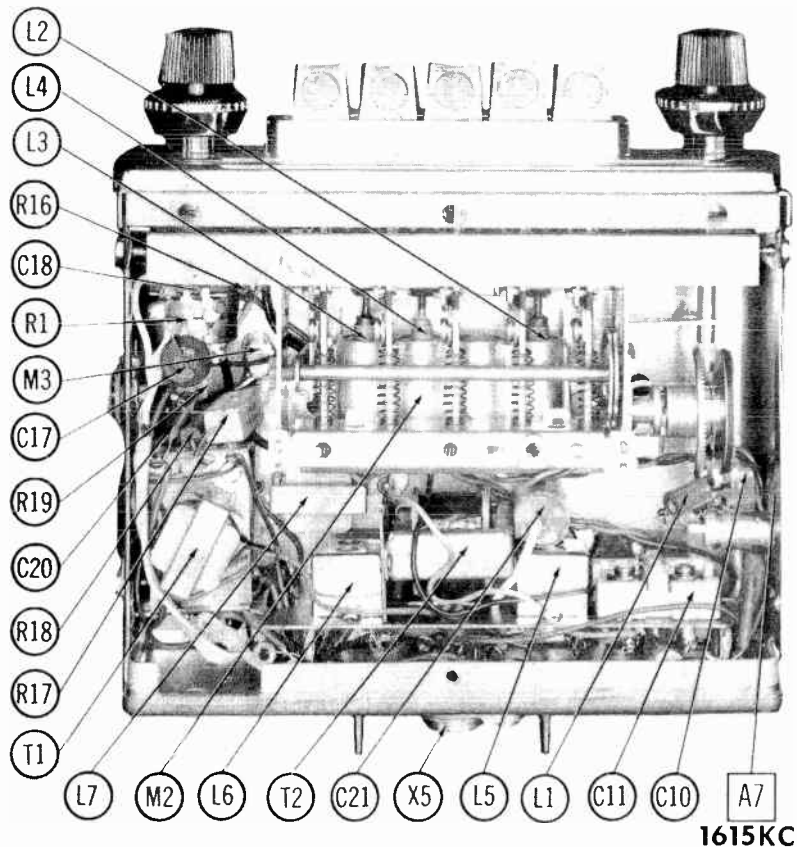
ITEM No.	RATING		Automatic PART No.	REPLACEMENT DATA					SPRAGUE PART No.
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	
C1A	500	16	20-2653	AFH3-00-04.5		XC3-48.1		FP300.83	TVLS-3026.14*
B	300	16							
C	100	16							
C1	25	15	20-256	PTT69	NLW25-15	MT1-10	MLV25-15	TT15X25	TE-1157.1
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

### FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10		#28-800-2L						
C11A		#28A1332						
C12	270		DI-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T270
C13	.003 200V		BE6D3	CPR-3000J	DPMS6D33	6DP-1-302	PVC423	6PS-D30
C14	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C15	.0047 200V		P288N-0047	CPR-4700J	WMF2D47	6DP-1-472	PVC4247	6PS-D47
C16	100 N750		N750-D1100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C18	.22 3V			UK20-204	HCC25224Z			HY-325
C19	.1 16V		TTD-1	CK-104	H6		TA010	TG-P10
C20	.05		TTD-05	CK-503	H5		TA150	TG-S50
C21	.22 200V		P288N-22		DPMS2P22	1DP-3-224	PVC1022	2PS-P22

\* Automatic Part Number.



1615KC

# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				NOTES
			PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	
R1A B	Tone Volume/Switch	10K 7500Ω Tap @ 4800Ω	80A3566			†QJ-1786A	

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-116, P17-112 (Panel)  
 "SNAPTROL" Equivalent: BU15, CF9, CR48T, SF10, SR9, GC. B21-115X, R-26-121 (Rear)  
 QCB5 (Bushing)  
 76-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Automatic PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (6.2uh)	14-6.2	BC-565	4610	RTC-8520	T859	① Part of M2.
L2	Ant.	①					
L3	RF	①					
L4	Osc.	①					
L5	Input IF	14-3233A					
L6	Output IF	14-3234A					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (D CURRENT 1000~)	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	600ma @ 12.6V 440ma @ 6.3V	.5Ω	10MH	75A3082	C-4095	TC-2	TR-155	TY17XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	8:	1	75A2635			TR-184		

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	24Ω Tap	@ 8Ω	75A2636			TR-169		

## SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			Automatic PART No.	QUAM PART No.	
SP1	5" X 7" PM 4" Round PM	8Ω 8Ω	73B2825 73B3553		

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Automatic PART No.	REPLACEMENT DATA
K1	RF Amp. Network	390Ω, 1000Ω, 82K, .05mfd, 1mfd	89A2582C	
K2	IF Amp. Network	560Ω, 5600Ω, 47K, .05mfd, .05mfd, .05mfd	89A2584	
K3	AVC	5600Ω, 180mmf	89A2701	
K4	Audio Network	470Ω, 820Ω, 4700Ω, 12K, 27K, 270K, .002mfd	89A2585	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Automatic PART No.	LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A			30S004	155009	AGW4	HDD

## MISCELLANEOUS

ITEM No.	PART NAME	Automatic PART No.	NOTES
M2	Tuner	78B3567	Pushbutton Manual
M3	Tuner Spark Plate	78B3591 43-216	

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

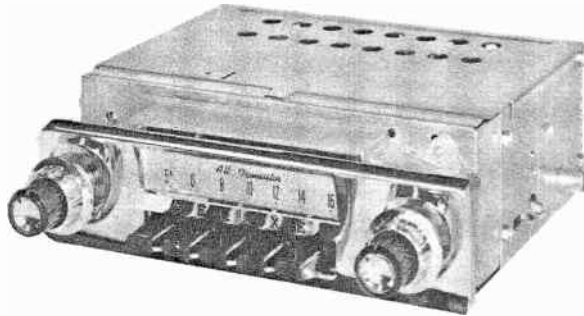
ITEM	PART No.	ITEM	PART No.
Escutcheon	54C2357	Knob-Dummy	40A393-1
Knob-Tuning or Volume	47-50BC	Knob-Spacer	47A1249
Knob-Tone	47B393	Pushbutton	55A1734

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



# PHOTOFACT<sup>®</sup>



## TRADE NAME : Automatic Models:

AC-4558	64 Comet	FN-4051	64 Falcon
ACP-4559	64 Comet	FNP-4052	64 Falcon
CT-4058	64 Comet	FP-4056	64 Ford
CTP-4059	64 Comet	FPA-4552	64 Falcon
F-4055	64 Ford	FPF-4557	64 Falcon
FA4555	64 Ford	FUP-4057	64 Falcon
FAL-4554	64 Fairlane	MAP-4561	64 Mercury
FAN-4551	64 Falcon	MT-4061-	64 Mercury
FAP-4556	64 Ford	MUS-4067	64 Mustang
FAR-4054	64 Fairlane		

SUPPLIER:	For Current Address, See Master Index.
TYPE SET:	5 Transistor AM Receiver
POWER SUPPLY:	12 Volt Storage Battery
RATING:	.740 Amp. @ 12.6 Volts DC
TUNING RANGE:	BROADCAST 540-1615KC

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
Use only enough generator output to provide a usable indication.  
Suggested Alignment Tools:

A1 thru A4  
A5, A6, A7

GENERAL CEMENT: 8606, 8606L, 8869  
GENERAL CEMENT: 8290, 8868, 9087

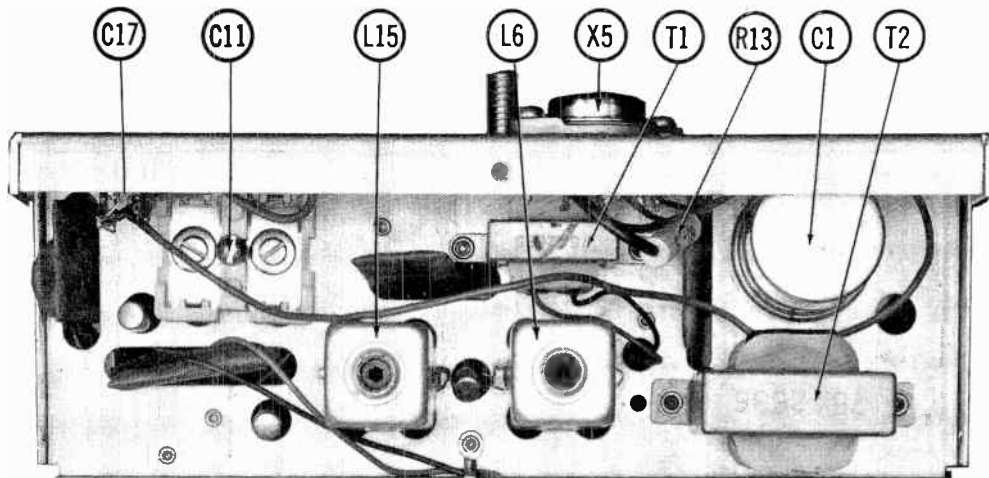
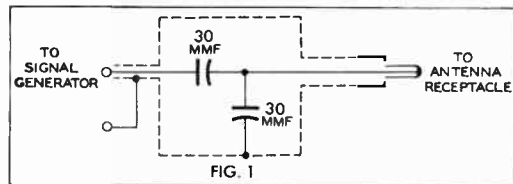
WALSCO: 2543, 2544, 2588  
WALSCO: 2525, 2528, 2587

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

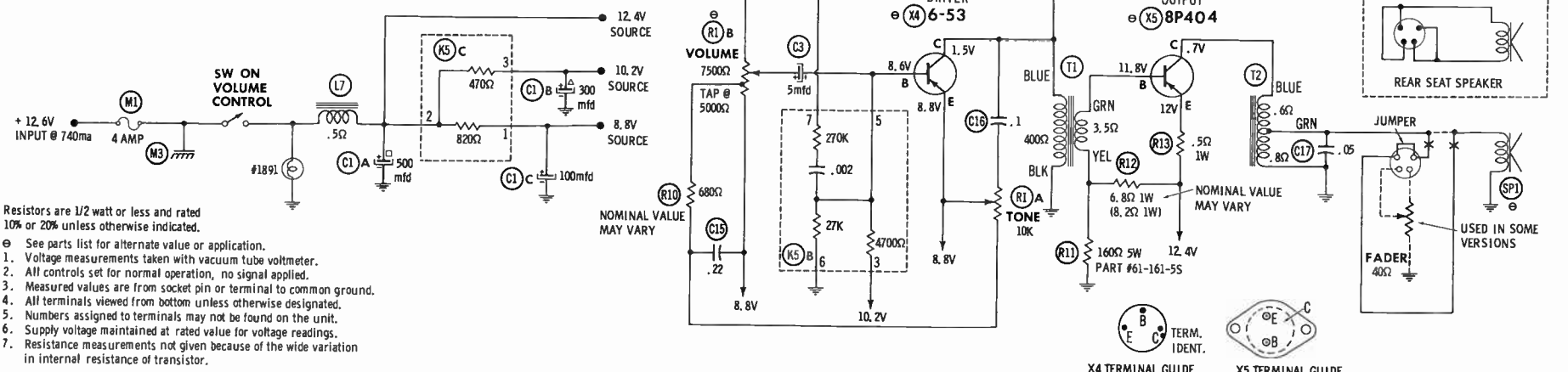
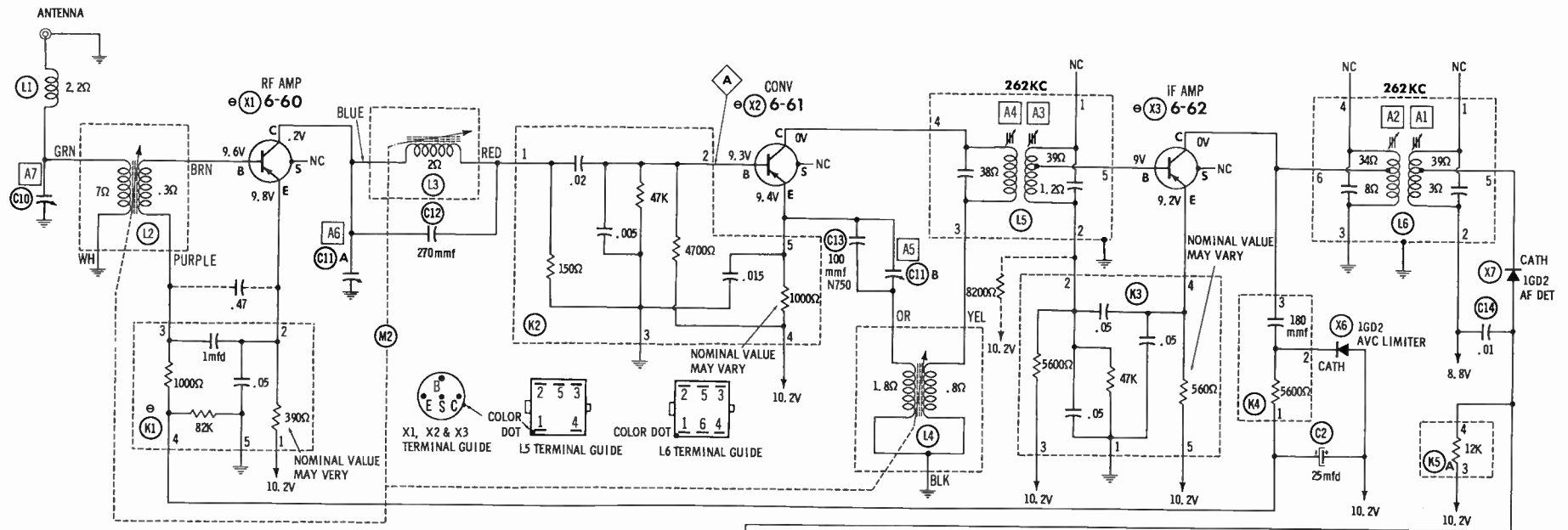
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- ⊖ See parts list for alternate value or application.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

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**AUTOMATIC MODEL 1964 CUSTOM SERIES**

## PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-80 (2N640)†	RF Amp.	DS-25	GE-1	2N1637	PNP
X2	6-81 (2N642)†	Conv.	DS-25	GE-1	2N1639	PNP
X3	6-82 (2N641)†	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	6-53	Driver	DS-26	GE-2	2N591	PNP
X5	(2N591)† 8P404 (2N176)†	Output	DS-520	GE-3	2N301	PNP <sup>Δ</sup>

† Alternate Type Number.

<sup>Δ</sup> When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

### POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X6		1GD2 (1N295)†					1N34AS
X7		1GD2 (1N295)†					1N34AS

† Alternate type number.

### ELECTROLYTIC CAPACITORS

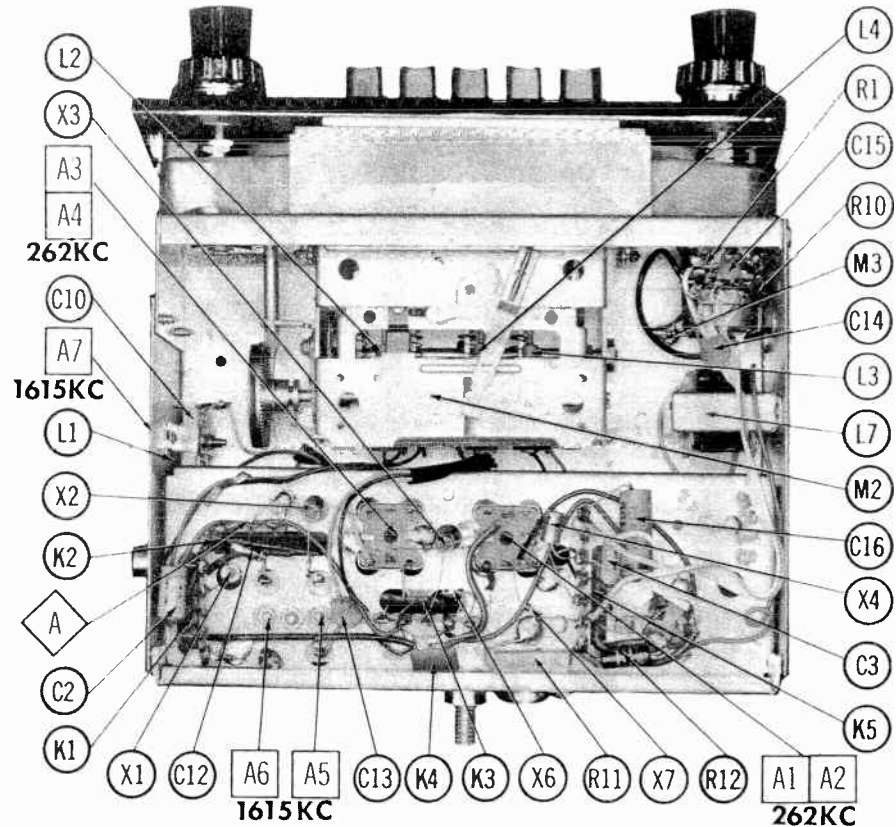
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Automatic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFH3-00-94.5		XC3-48.1		FP300.83	TVLS-3026.1 <sup>#</sup>
B	300	18							
C	100	18							
C2	25	15	20-256	PTT69	NLW25-15	MT1-10	MLV25-15	TT13X25	TE-1157.1
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

### FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMenco PART No.	MALLORY PART No.	SPRAGUE PART No.
C10		#28A1332						
C11A								
B								
C12	270		DI-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T25
C13	100 N750		N750-D1100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C14	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C15	.22			UK20-204	HCC25224Z			HY-325
C16	.1 200V	BE2P1		WMF1P1	IDP-2-104	PVC101	2PS-P10	
C17	.05	TTD-05	CK-503	H5		TA150	TG-S50	

# Automatic Part Number.



# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS® for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Automatic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLOYRY PART No.
RIA	Tone Volume/Switch	10K 7500Ω Tap @ 5000Ω	80A22398 ①				
RIA	Tone Volume/Switch	10K 2500Ω Tap @ 5000Ω	80A25658C ②				
RIA	Tone Volume/Switch	10K 7500Ω Tap @ 5000Ω	80A3257 ③				
	Fader		80A1137 ④				

- ① Used in Models FAR-4054, FAL-4554.
- ② Used in Models FP-4056, F-4055, FA-4555, FAP4556, MAP-4561, MT-4061.
- ③ Used in Models MUB-4067, FN-4051, FNP-4052, FUP-4057, FAN-4551, FPA-4552, FPF-4557, CTP-4059, CT-4058, AC-4558, ACP-4559.
- ④ Used in Model MUS-4067.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Automatic PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (6.2uh)	14-6.2	BC-565	4610	RTC-8520	T859	① Part of M2.
L2	Ant.	①					
L3	RF	①					
L4	Osc.	①					
L5	Input IF	14-2654	BC-690	6570			
L6	Output IF	14-2655	BC-691	6571		TF606	

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	740ma	.5Ω	10MH	75A1269	C-4065	TC-2	TR-155	TY1XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	T1	8:	1	75A2635			TR-184	

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Automatic PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	T2	240 Tap	-@ 8Ω	75A2636 ①			TR-169	

① Alternate part #75A2693.

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES	
		Automatic PART No.	QUAM PART No.		
SP1	5" X 8" PM	8Ω	73B2786	58A15Z8	Models-FAL-4554, FAR-4054, FN-4051, FNP-4052, FUP-4057, FAN-4551, FPA-4552, FPF-4557, ACP-4539, CTP-4059, CT-4058, AC-4558. Models-FP-4056, F-4055, MT-4051, MAP-4561, FA-4555, FAP-4556 Model-MUS-4067.
	6" X 10" PM	8Ω	73B2724	610A1Z8	
	4" X 10" PM	8Ω	73B2737	410A2Z8	

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Automatic PART NO.	REPLACEMENT DATA
K1	RF Network	390Ω, 1000Ω, 8 2K, .05mfd, 1mfd	98A2582C	
K2	Converter Network	150Ω, 1000Ω, 4700Ω, 47K, .005mfd, .015mfd, .02mfd	89A2583	
K3	IF Network	560Ω, 5600Ω, 47K, .05mfd, .05mfd, .05mfd	89A2584	
K4	AVC Network	5600Ω, 180mmf	89A2701	
K5	Audio Network	470Ω, 820Ω, 4700Ω, 12K, 27K, 27K, 270K, .002mfd	89A2585	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			Automatic PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	AGW	4A	108-400	In Fuse Block	308004			AGW4	

## MISCELLANEOUS

ITEM No.	PART NAME	Automatic PART No.	NOTES
M2	Tuner Spark Plate	78B2236	
M3			

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Knob- Tuning or Volume	47-52B	Knob- Dummy	48A1800-1
Knob- Tone	48A1522	Pushbutton	58A2180

## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Shielded Hook-up Wire	8524 (Stranded) Available in 12 Colors
Rear Seat Speaker Extension Cable	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

TRADE NAME: Automatic Model FM-3083A  
 SUPPLIER: For Current Address, See Master Index.  
 TYPE SET: 8 Transistor FM Converter  
 POWER SUPPLY: 12 Volt Storage Battery  
 RATING: .330 Amp. @ 12.6 Volts DC  
 TUNING RANGE: FREQ. MOD. 88-108MC



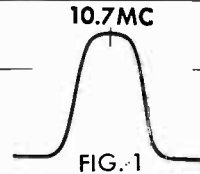
## ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
**CAUTION:** Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
 Suggested Alignment Tools:  
 A1 thru A13      GENERAL CEMENT: 5009, 8728A, 8987      WALSCO: 2531X, 2536

### FM ALIGNMENT USING AM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

High side to of generator thru .01mfd to point  $\diamond A$ , low side to ground for IF.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\diamond B$ ; common to ground.	A1 thru A8	Adjust for maximum.
"	"	DC probe to point $\diamond C$ ; common to	A9	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.



### FM IF ALIGNMENT USING FM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

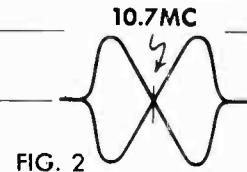
High side thru .01mfd to point  $\diamond A$ , low side to ground. Use 60v frequency modulated signal with 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\diamond B$ ; low side to ground.	A1 thru A8	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C3.
"	"	Vert. amp. to point $\diamond C$ ; low side to	A9	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator across antenna input with 120Ω carbon resistors in series with each lead.

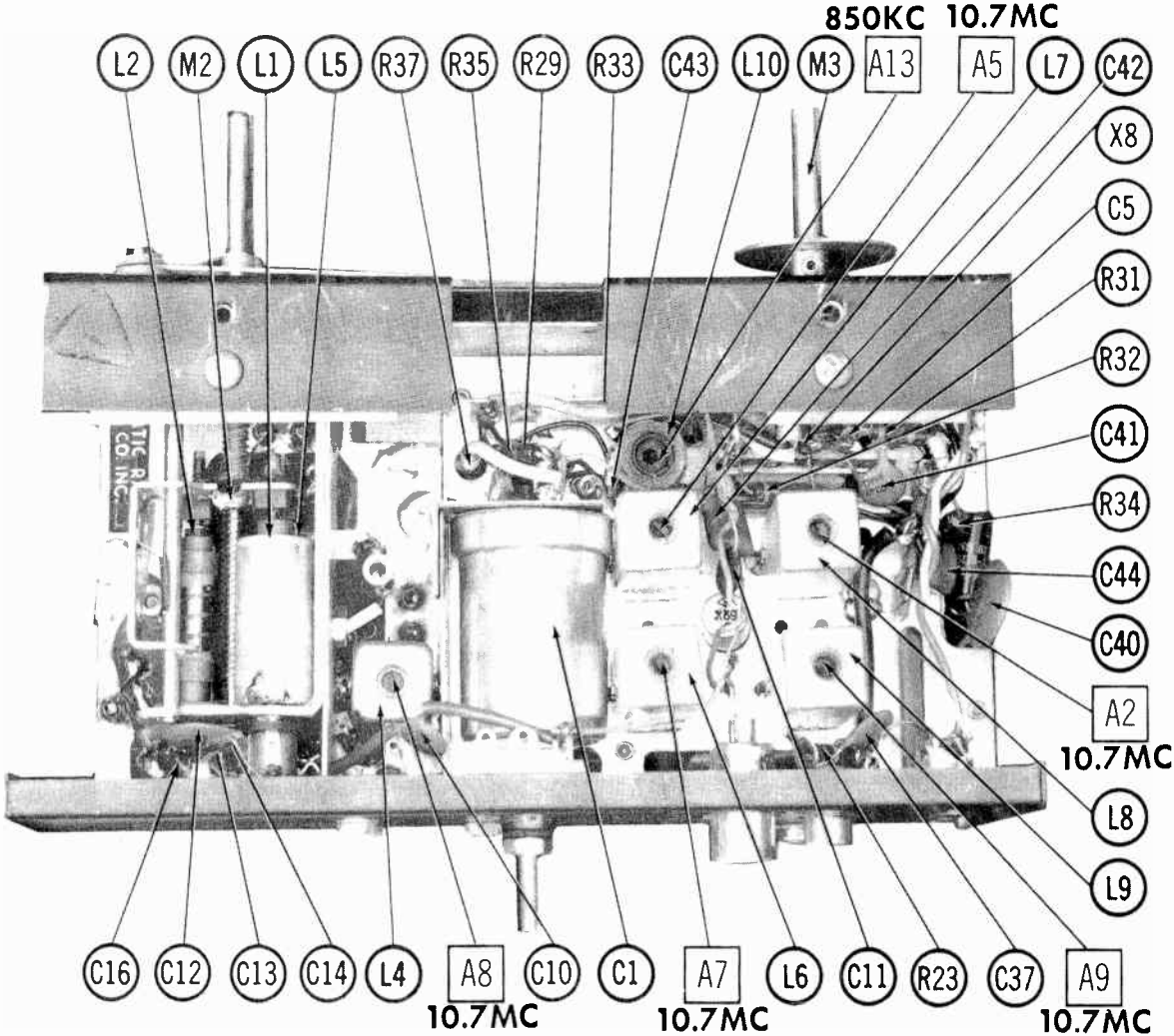
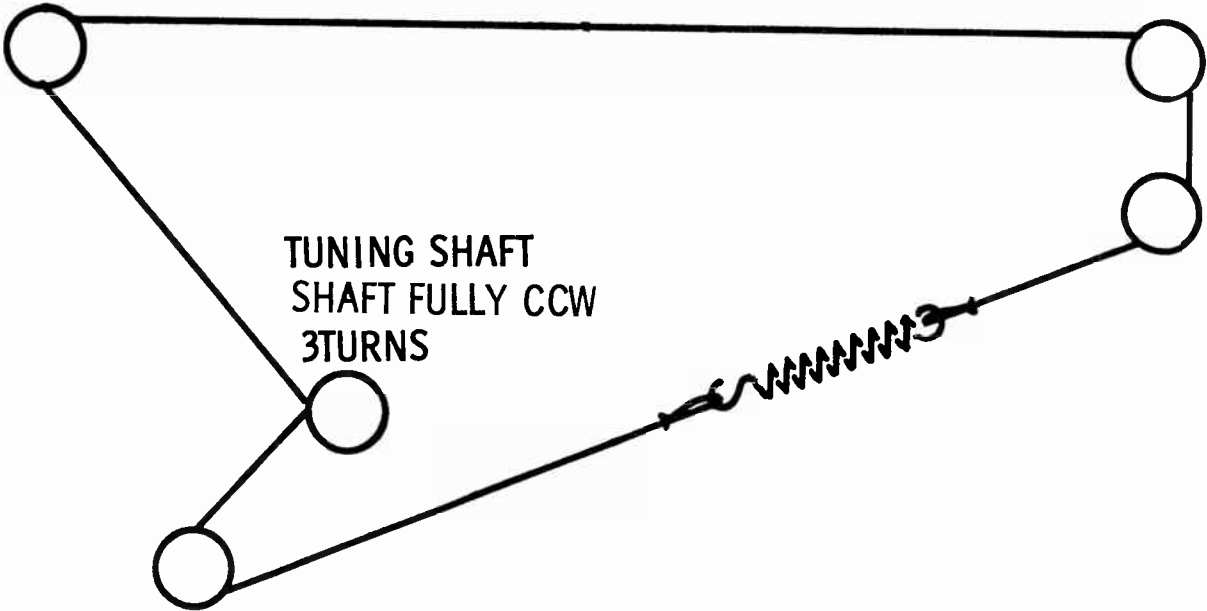
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MC	108MC	DC probe of VTVM to point $\diamond B$ ; common to ground.	A10, A11, A12	Adjust for maximum.



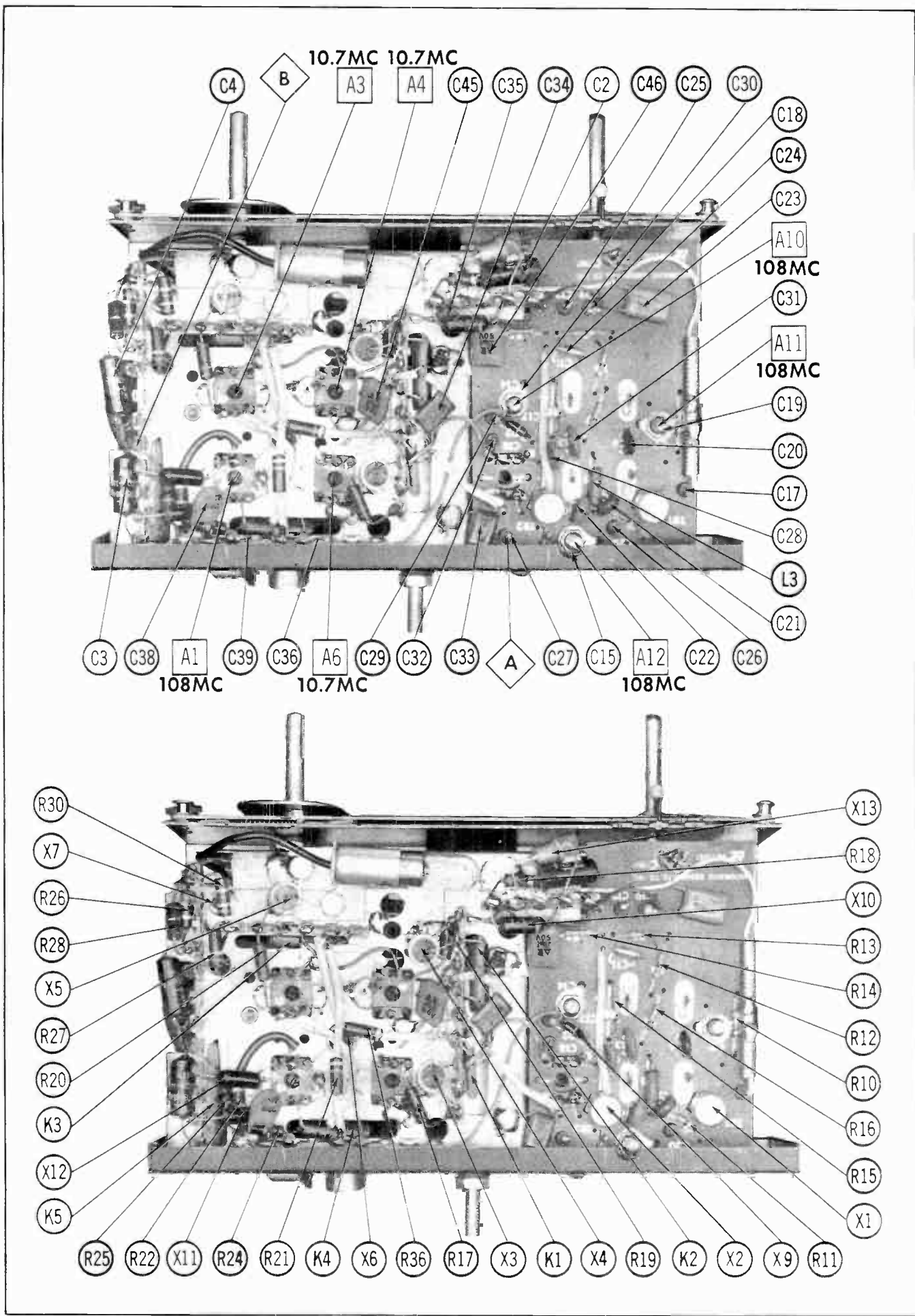
After unit is installed in car, tune in the AM receiver to a point of noninterference near 850KC. Tune in an FM signal and adjust A13 for maximum output.

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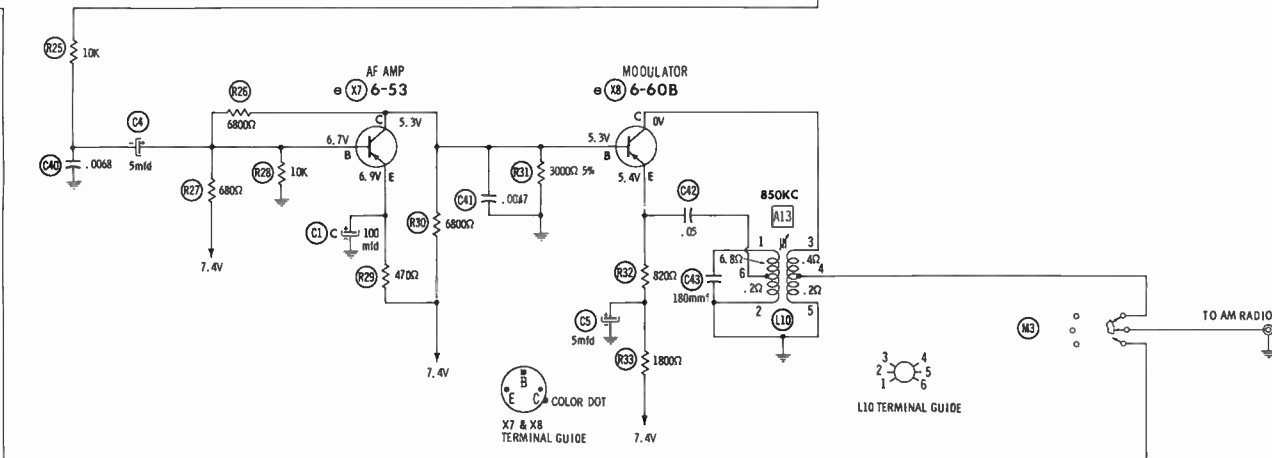
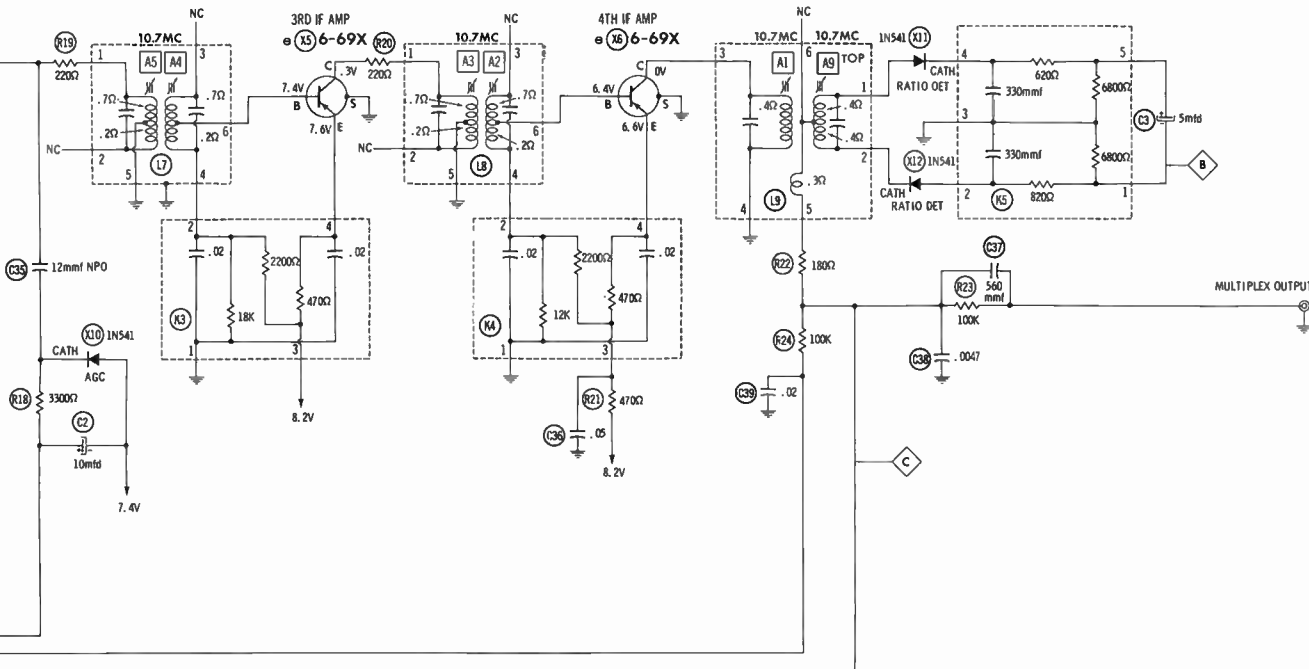
# DIAL CORD STRINGING









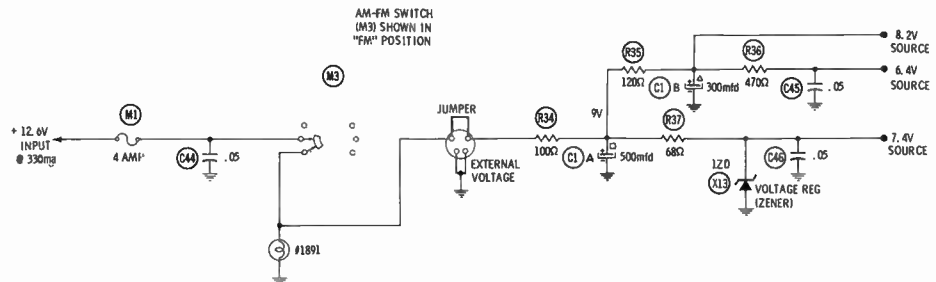


Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

- See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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AUTOMATIC MODEL FM-3083A

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.

Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement. **FIXED CAPACITORS**

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-89X (2N2089)	RF Amp.	DS-41		2N1177	PNP
X2	6-89X (2N2089)	Conv.	DS-42		2N1179	PNP
X3	6-69X (2N2091)	1st IF Amp.	DS-37		2N1180	PNP
X4	6-69X (2N2091)	2nd IF Amp.	DS-37		2N1180	PNP
X5	6-69X (2N2091)	3rd IF Amp.	DS-37		2N1180	PNP
X6	6-69X (2N2091)	4th IF Amp.	DS-37		2N1180	PNP
X7	6-53 (2N581)	AF Amp.	DS-26	GE-2	2N591	PNP
X8	6-60B (2N640)	Modulator	DS-25	GE-1	2N1639	PNP

† Alternate type number.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X9		1GD5X					1N34AS
X10		1N541					1N34AS
X11		1N541*					1N34AS
X12		1N541*					1N34AS
X13		1ZD8, 2V					1N34AS

\* Matched pair.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Automatic PART No.	REPLACEMENT DATA					SPRAGUE PART No.
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	
CLA	500	16	20-2653	AFH3-00-94.5	CC0012	XC3-48.1		FP300.83	TVL5-3026.14*
B	300	18							
C	100	16							
C2	10	15	20-106	CRE457A	NLW10-15	MT1-5	MLV10-15	TT15X10	TE-1155
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C4	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C5	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA						
	CAP.	VOLT.		AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	21	NPO	①	NPO-DI20	DTZ-20	C10Q2C	CC70-200	CNO420	10TCC-Q22	
C11	51	N750		N750-S150	TCN-51	C10Q51U			10TCU-Q50	
C12	47	NPO		NPO-DI47	DTZ-47	C10Q47C	CC70-470	CNO447	10TCU-Q47	
C13	3	NPO		NPO-DI3	DTZ-3R3	C10V33C	CC70-3R3	CNO533	10TCC-V30	
C14	17	NPO		NPO-DI20	TCZ-18	C10Q2C	CC70-180	CNO418	10TCC-Q18	
C15	1-6			#28-156						
C16	2.2	NPO		NPO-DI2.2	DTZ-2R2	C10V22C	CC70-2R2	CNO522	10TCC-V22	
C17	.0015			EF-001	MFT-1000		CCF-102	CT280A		
C18	.0015			EF-001	MFT-1000		CCF-102	CT280A		
C19	1-6			#28-156						
C20	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CC70-180	CNO418	10TCC-Q18		
C21	1.1	NPO	NPO-DI1	TCZ-1	C10V15C	CC70-V10	CNO510	10TCC-V10		
C22	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CC70-3R3	CNO533	10TCC-V30		
C23	.05		TTD-05	CK-503	H5	TA150	TA150	TG-850		
C24	270		NPO-SI270	TCZ-270	LA10T27-C4	CCD-271	CNO327	10TCC-T27		
C25	.0015		EF-001	MFT-1000		CCF-102	CT280A			
C26	.0015		EF-001	MFT-1000		CCF-102	CT280A			
C27	.0015		EF-001	MFT-1000		CCF-102	CT280A			

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C28	6.2	NPO	#15-6.2						
C29	.0015								
C30	1-6		#28-156	EF-001	MFT-1000		CCF-102	CT280A	
C31	15	N330			TCA-15				10TC8-Q15
C32	.0015			EF-001	MFT-1000		CCF-102	CT280A	
C33	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C34	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C35	12	NPO		SI-12	TCZ-12	LA10Q12-SL	CCTO-120	CNO410	10TCC-Q12
C36	.05			TTD-05	CK-503	H5	TA150	TG-850	
C37	560			DI-560	DD-561	LA10T56-C4	CCD-561	GP356	5HK-T56
C38	.0047			BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C39	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C40	.0068			DI-6800	DD-682	BYA10D68	CCD-682	GP268	10T8-D68
C41	.0047			BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C42	.05			TTD-05	CK-503	H5	TA150	TG-850	
C43	180			DI-180	DD-181	LA10T18-S3	CCD-181	GP318	5GA-T18
C44	.05			TTD-05	CK-503	H5	TA150	TG-850	
C45	.05			TTD-05	CK-503	H5	TA150	TG-850	
C46	.05			TTD-05	CK-503	H5	TA150	TG-850	

① Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	Automatic PART No.	REPLACEMENT DATA				NOTES
			MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.	①					① Part of M2.
L2	RF	①					
L3	RF Choke	14-.82	TV-182	4594			
L4	1st IF	14-2520				T804	
L5	Osc.	①					
L6	2nd IF	14-2933					
L7	3rd IF	14-2933					
L8	4th IF	14-2933					
L9	Ratio Detector	14-2522					
L10	Osc.	14A394					

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Automatic PART No.	REPLACEMENT DATA
K1	1st IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K2	2nd IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K3	3rd IF Network	470Ω, 2200Ω, 18K, .02mfd, .02mfd	89A2014	
K4	4th IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K5	Ratio Detector Network	680Ω, 820Ω, 6800Ω, 6800Ω, 330mfd, 330mfd	89A2538	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA			
			Automatic PART No.	LITTELFUSE PART No.	BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A				

## MISCELLANEOUS

ITEM No.	PART NAME	Automatic PART No.
M2	Tuner	78B2467
M3	Selector SW	94A3016

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.
Dial Glass	39-104
Knob-Tuning	48A1833
Excutechan	54C2107

## WIRING DATA

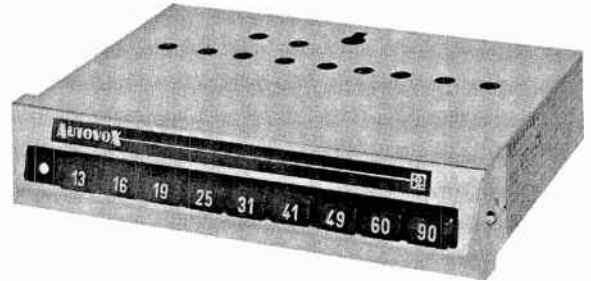
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Shielded Hook-up Wire	8524 (Stranded) Available in 12 Colors
Rear Seat Speaker Extension Cable	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

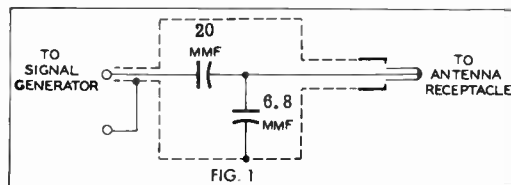
TRADE NAME : Autovox Model OC401  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : Short Wave Mobile Converter  
 POWER SUPPLY : 6 or 12 Volt Storage Battery  
 TUNING RANGE : 13 Meters (21.6MC) 41 Meters (7.2MC)  
                   16 " (17.8MC) 49 " (6.075MC)  
                   19 " (15.275MC) 60 " (4.905MC)  
                   25 " (11.837MC) 90 " (3.3MC)  
                   31 " (9.637MC)



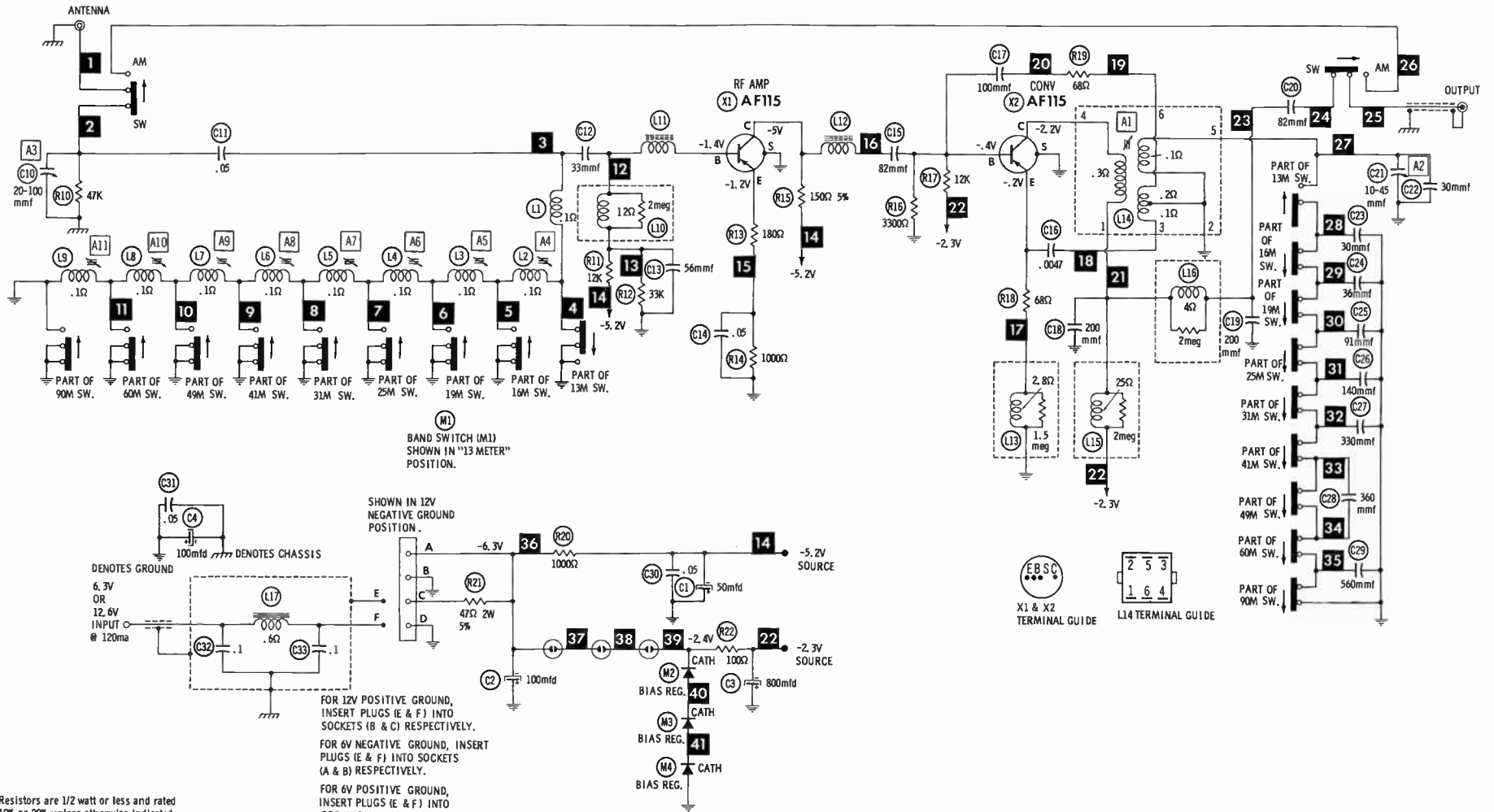
## ALIGNMENT INSTRUCTIONS

AUTOVOX MODEL OC-401

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT					
Connect Converter to Receiver for alignment and tune Receiver to 1200KC. Volume control at maximum output. Output of signal generator should be no higher than necessary to obtain an output reading. Suggested Alignment Tools: A1 thru A11      GENERAL CEMENT: 9440      WALSCO: 2501					
SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	DEPRESS PUSH-BUTTON	OUTPUT METER	ADJUST	REMARKS
1. Thru dummy(Fig.1) to Converter antenna receptacle.	3.3MC (300Ω Mod.)	90	Across voice coil	A1	Adjust for maximum.
2. " "	21.6MC	13	"	A2	"
3. " "	21.6MC	13	"	A3	"
4. " "	17.8MC	16	"	A4	"
5. " "	15.275MC	19	"	A5	"
6. " "	11.837MC	25	"	A6	"
7. " "	9.637MC	31	"	A7	"
8. " "	7.2MC	41	"	A8	"
9. " "	6.075MC	49	"	A9	"
10. " "	4.905MC	60	"	A10	"
11. " "	3.3MC	90	"	A11	"
12.	With radio & converter installed in car and antenna fully extended, tune in a station near 21.6MC and adjust A3 for maximum. (13 Button Depressed)				



**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



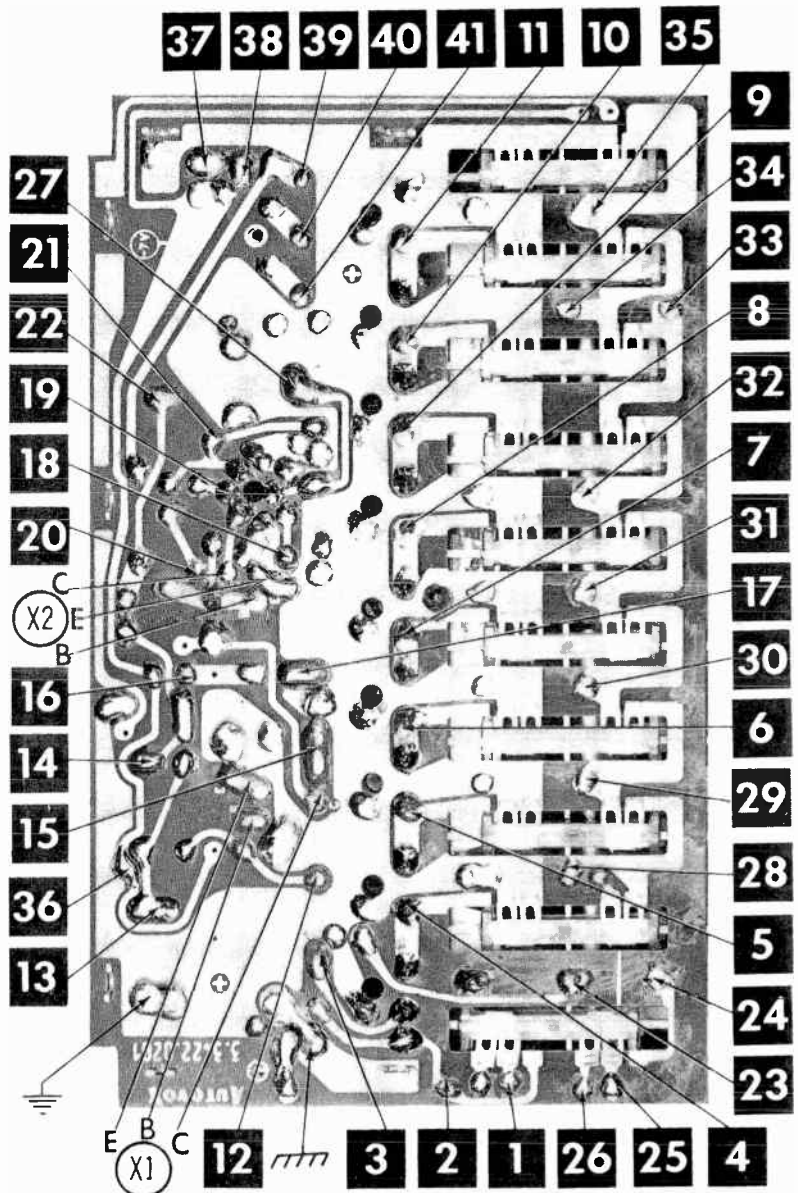
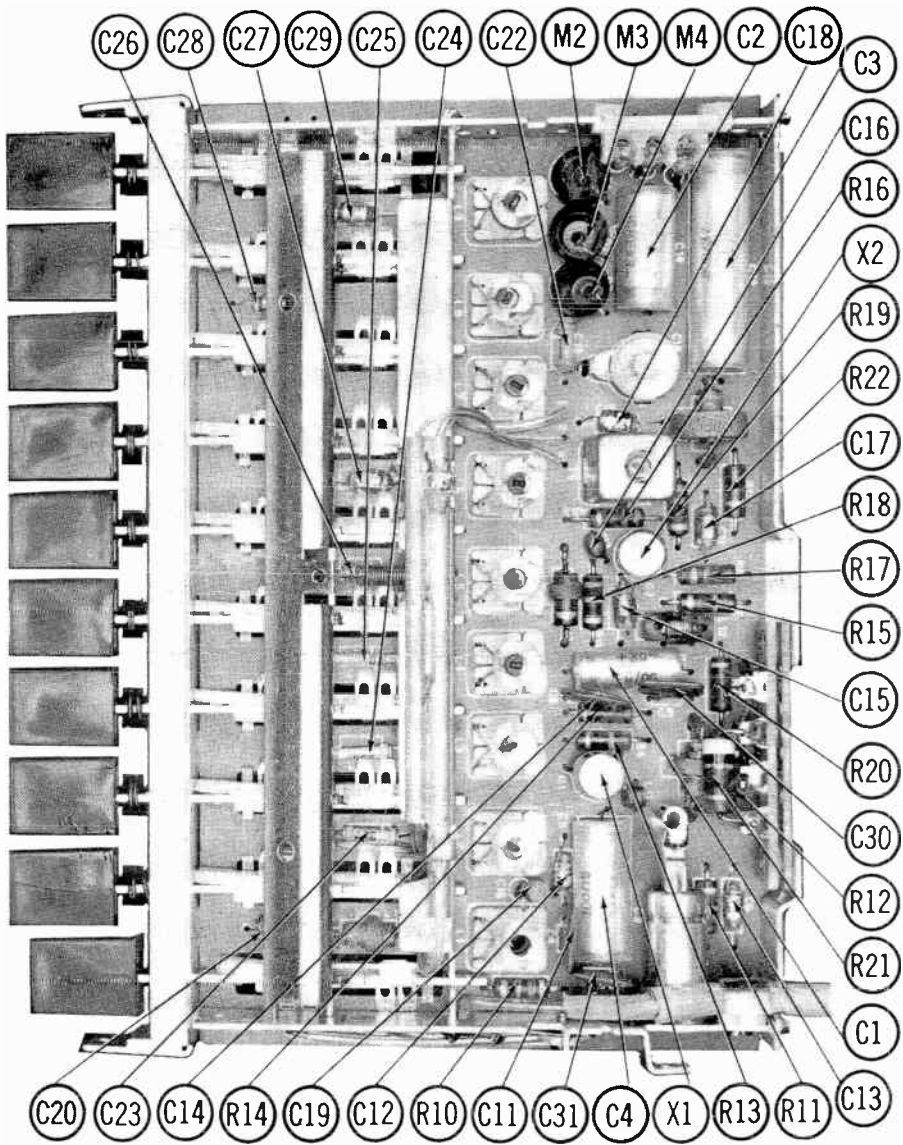
Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated. VOLTAGE MEASUREMENTS TAKEN IN 12V NEGATIVE GROUND POSITION

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.
7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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AUTOVOX MODEL OC-401



AUTOVOX MODEL OC-401

A Howard W. Sams CIRCUITRACE® Photo

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTERFACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF115	RF Amp.	DS-41		2N1177	PNP
X2	AF115	Conv.	DS-42		2N1179	PNP

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Autovox PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
	CAP.	VOLT.							
C1	50	6	0506, 2201	PTT29	MLW50-6	MT1-18	BL1520	TT6X520	TE-110
C2	100	12	0107, 3201	PTT60	NLW100-12	MT1-19	MLV100-12	TT12X100	TE-1135
C3	800	3	0807, 1202				BL2211		TES-1085*
C4	100	15	0107, 3203	PTT73	NLW100-15	MT1-19	MLV100-15	TT15X100	TE-1182

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	20-100		BPD-05	DD-503	H5	CCD-503	GP150	5GA-S50
C11	.05		NPO-DI33	CPR-33J	C10Q33C	CCTO-330	CNO433	10TCC-Q33
C12	33 125V		DI-56	CPR-56J	LA10Q56-S3	CCTO-560	CNO456	10TCC-Q56
C13	56 125V		BPD-05	DD-503	H5	CCD-503	GP150	5GA-S50
C14	.05		DI-82	CPR-82J	LA10Q82-S3	CCTO-820	CNO482	10TCC-Q82
C15	82 125V		DI-82	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C16	.0047		NPO-DI100	CPR-100J	C10T1C	CCTO-101	CNO310	10TCC-T10
C17	100 125V		N750-DI200	CPR-200J	C10T2U	CCTN-201	CNO320	10TCC-T20
C18	200 125V		N750-DI200	CPR-200J	C10T2U	CCTN-201	CNO320	10TCC-T20
C19	200 125V		DI-82	CPR-82J	LA10Q82-S3	CCTO-820	CNO482	10TCC-Q82
C20	82 125V							
C21	10-45	#4187, 0131						
C22	30		DI-30	TCZ-30	LA10Q3-SL	CCTO-300	GP430	10TCC-Q30
C23	30		DI-30	TCZ-30	LA10Q3-SL	CCTO-300	GP430	10TCC-Q30
C24	36		SI-36	TCZ-36		CCTO-360		
C25	91		SI-91	TCZ-91	LA10Q91-S3	CCD-910	GP491	5GA-Q91
C26	140		NPO-DI150	TCZ-150	C10T15C	CCTO-151	CNO315	10TCC-T15
C27	330		DI-330	CPR-330J	LA10T33-C4	CCD-331	GP333	10TS-T33
C28	360		N750-DI360	CPR-360J	LA10T36-C4		GP336	5GA-T36
C29	560		DI-560	CPR-560J	LA10T56-C4		GP358	5GA-T56
C30	.05		BPD-05	DD-503	H5	CCD-503	GP150	5GA-S50
C31	.05		BPD-05	DD-503	H5	CCD-503	GP150	5GA-S50
C32	.1			UK20-104	HO5P1		TA010	HY320
C33	.1			UK20-104	HO5P1		TA010	HY320

# Autovox Part Number.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Autovox PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	13M Ant.	2431, 0007					① Wound on 2meg resistor ② Wound on 2meg resistor † Shunt with 2meg resistor † Shunt with 1.5meg resistor.
L2	16M Ant.	2431, 0008					
L3	19M Ant.	2431, 0008					
L4	25M Ant.	2431, 0009					
L5	31M Ant.	2431, 0009					
L6	41M Ant.	2431, 0010					
L7	49M Ant.	2431, 0010					
L8	60M Ant.	2431, 0018					
L9	90M Ant.	2431, 0019					
L10	RF Choke (230uh)	2615, 0050 ①	BC-673A	72F224AP	RTC-8586A	T312A	
L11	RF Choke (9uh)	2615, 0044					
L12	RF Choke (1, 1uh)	2615, 0041	BC-561	4602	RTC-8515	T855	
L13	RF Choke (18uh)	2615, 0048 ②	TV-192†	72F185AP†	RTC-8584†	T300†	
L14	Osc	2641, 1143					
L15	RF Choke (1, 5MH)	2615, 0051 ①	BC-683A	4532A	RTC-9161A	T875A	
L16	RF Choke (36uh)	2615, 0049 ①	TV-180A	6176A	RTC-8593A	T301A	

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000~)	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L17	.120A	.6Ω	5MH	2615, 2011	C-4095	TC-2	TR-158	TY17XT	

## MISCELLANEOUS

ITEM No.	PART NAME	Autovox PART No.	NOTES
M1	Bandswitch		Slide Type.
M2	Bias Reg.		
M3	Bias Reg.		
M4	Bias Reg.		

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

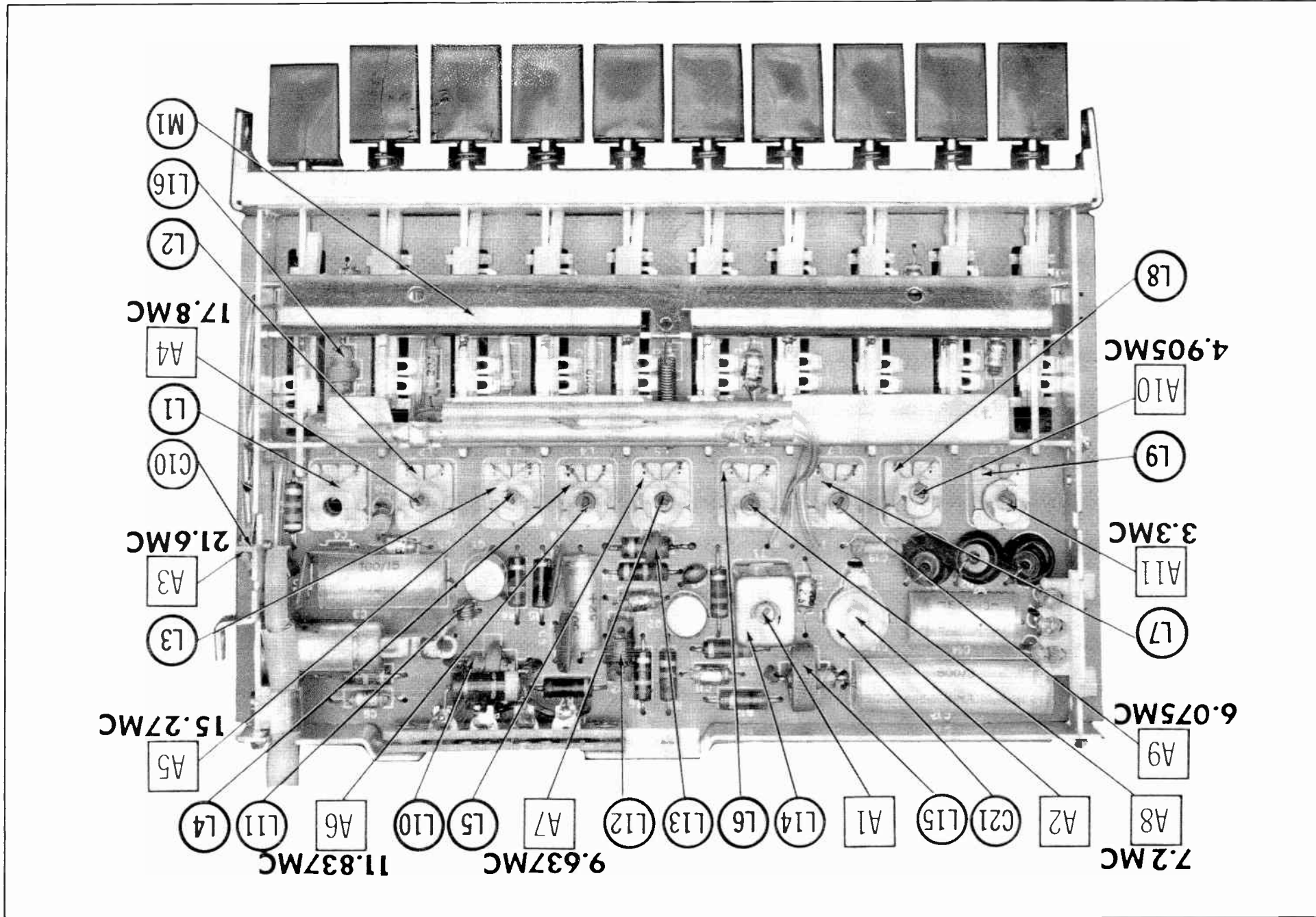
ITEM	PART No.	ITEM	PART No.
Pushbutton (90M)	2757, 0031	Pushbutton (25M)	2547, 0036
Pushbutton (60M)	2757, 0032	Pushbutton (19M)	2757, 0037
Pushbutton (49M)	2757, 0033	Pushbutton (16M)	2757, 0038
Pushbutton (41M)	2757, 0034	Pushbutton (13M)	2757, 0039
Pushbutton (31M)	2757, 0035	Pushbutton (MW)	2757, 0040

## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Shielded Hook-up Wire	8524 (Stranded) Available in 12 Colors
Rear Seat Speaker Extension Cable	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 6782 (Stranded) Coded Parallel Leads
	Use BELDEN No. 8661 (3/8 in.) or 8670 (3/4 in.)



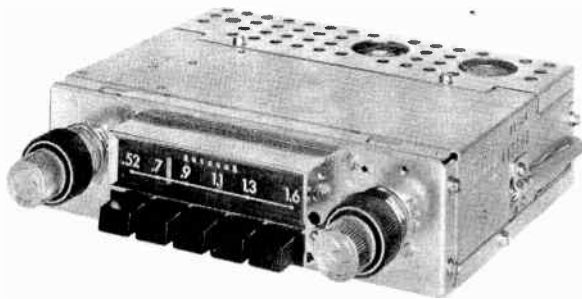
AUTOVOX MODEL OC-401





PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>



TRADE NAME : Autovox Model RA-164  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 7 Transistor AM Receiver  
 POWER SUPPLY : 6 or 12 Volt Storage Battery  
 RATING : .250 Amp. @ 6.3 or 12.6 Volts DC  
 TUNING RANGE: BROADCAST 540-1615KC

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools:

A1 thru A4  
 A5 thru A8

GENERAL CEMENT: 9440  
 GENERAL CEMENT: 8290, 8868, 9087

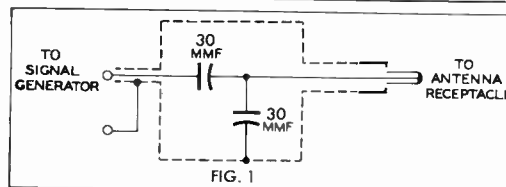
WALSCO: 2501  
 WALSCO: 2525, 2528, 2587

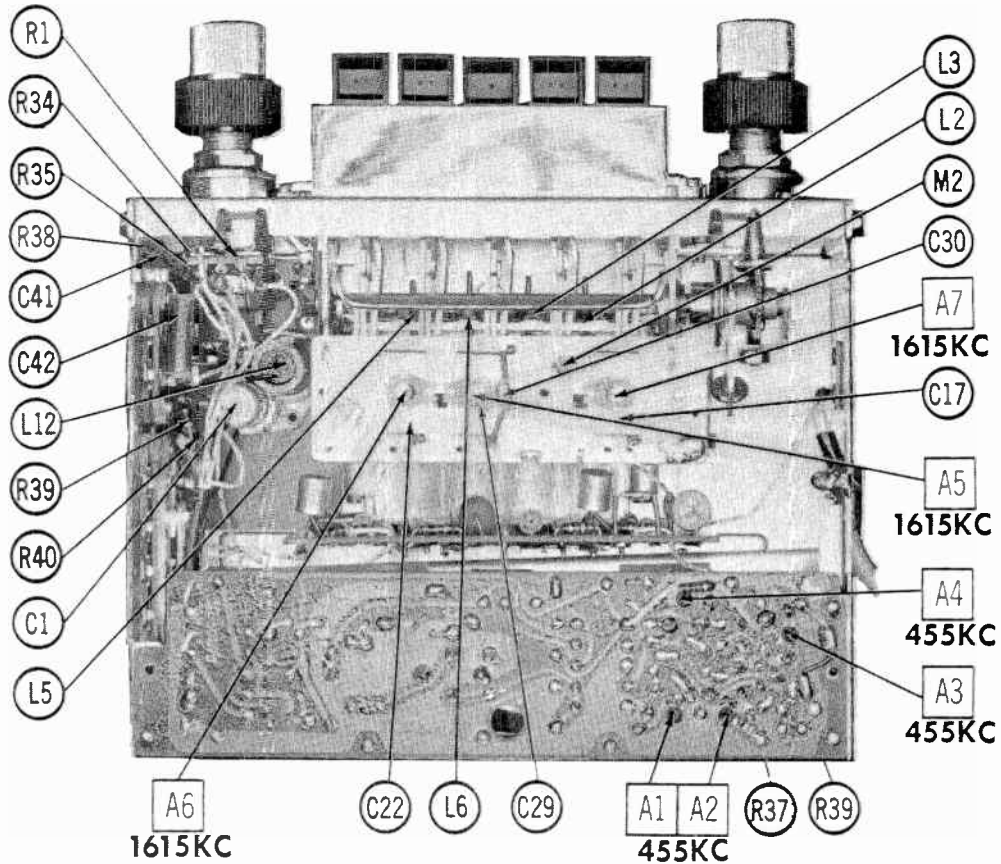
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	455KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7, A8	"

With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A8 for maximum output.

### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.





## PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

### TRANSISTORS

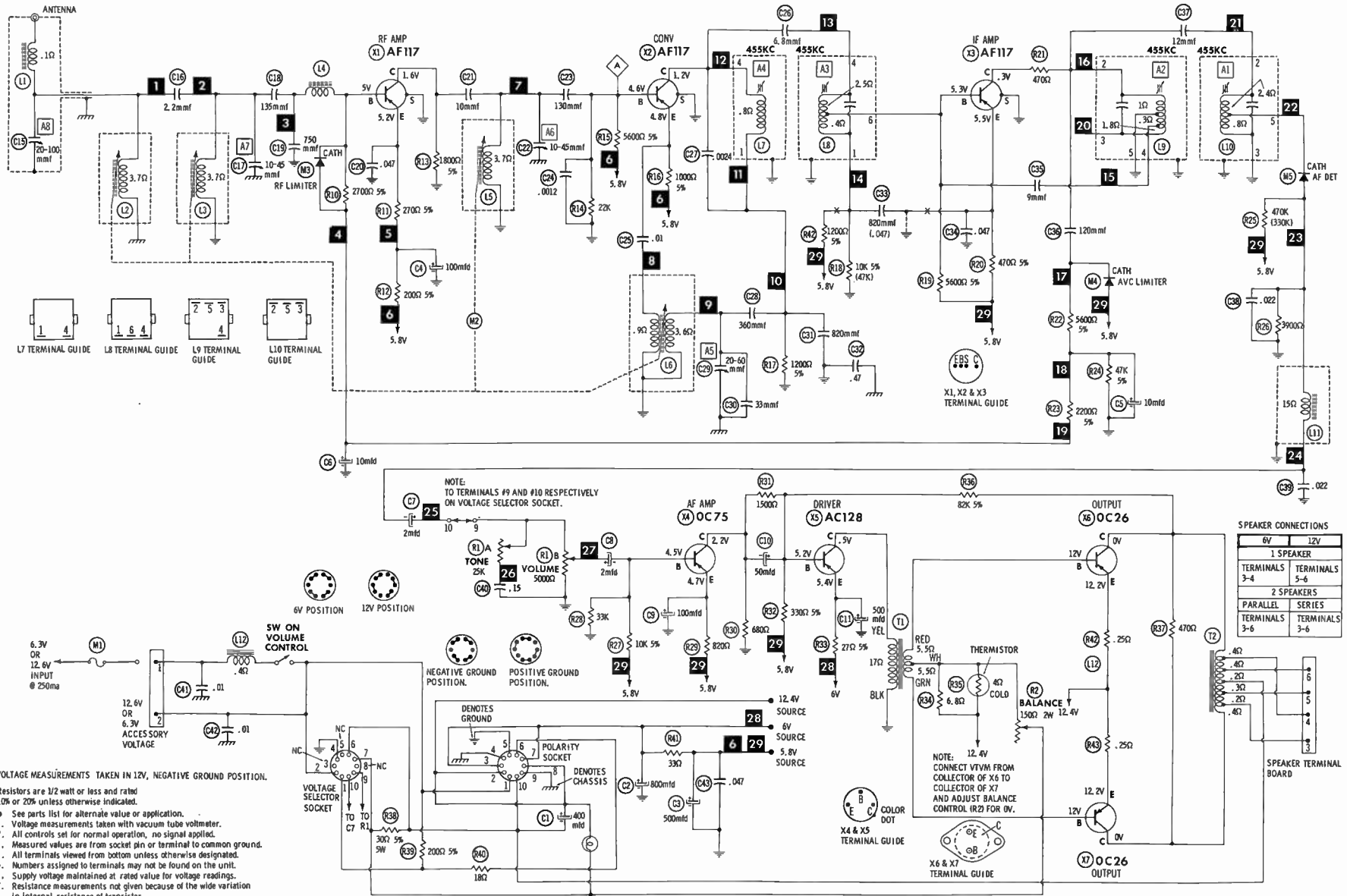
ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF117	RF Amp	DS-25	GE-1	2N1637	PNP
X2	AF117	Couv.	DS-25	GE-1	2N1639	PNP
X3	AF117	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	OC75	AF Amp.	DS-26	GE-2	2N581	PNP
X5	AC128	Driver	DS-26	GE-2	2N581	PNP
X6	OC26	Output	DS-520	GE-3	2N301	PNP*
X7	OC26	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

### ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Autovox PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLOY PART No.	SPRAGUE PART No.
C1	400	15		PRS1220	BR500-15	QT1-30	BL2340		TVAS-1161.5*
C2	800	6		PRS1130	BR1000-6		BL2321		TVAS-1103.8*
C3	500	6		PRS1120	BR500-6	QT1-30	BL2231	TC805	TVA-1132
C4	100	6		CRE323A	NLW100-12	MT1-21	BL1720	TT6X100	TE-1102
C5	10	6		PTT23	NLW10-6	MT1-5	BL1220	TT6X10	TE-1087
C6	10	6		PTT23	NLW10-6	MT1-5	BL1220	TT6X10	TE-1087
C7	2	6		PTT19	NLW2-50	MT1-1	BL1050	TT6X2	TE-1081
C8	2	6		PTT19	NLW2-50	MT1-1	BL1050	TT6X2	TE-1081
C9	100	6		CRE323A	NLW100-12	MT1-21	BL1720	TT6X100	TE-1102
C10	50	6		PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
C11	500	6		PRS1120	BR500-6	QT1-30	BL2231	TC805	TVA-1132

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.



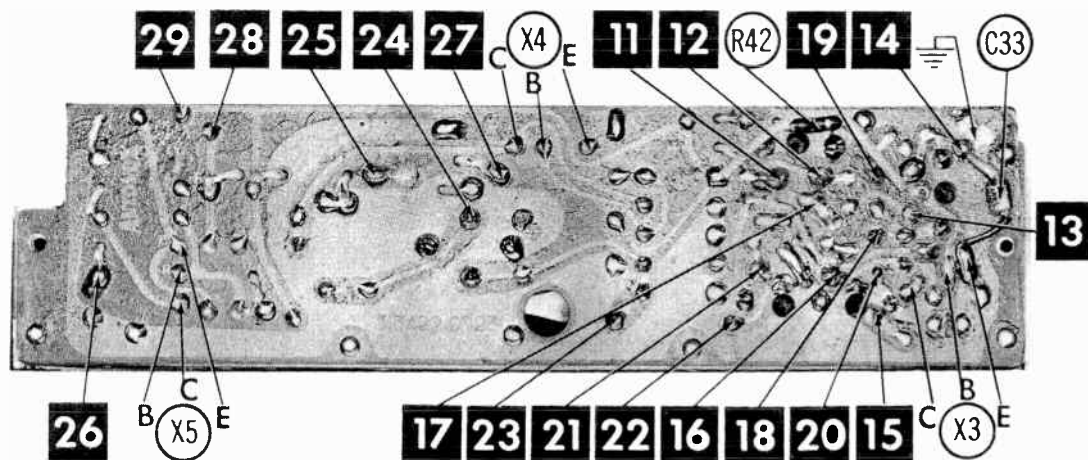
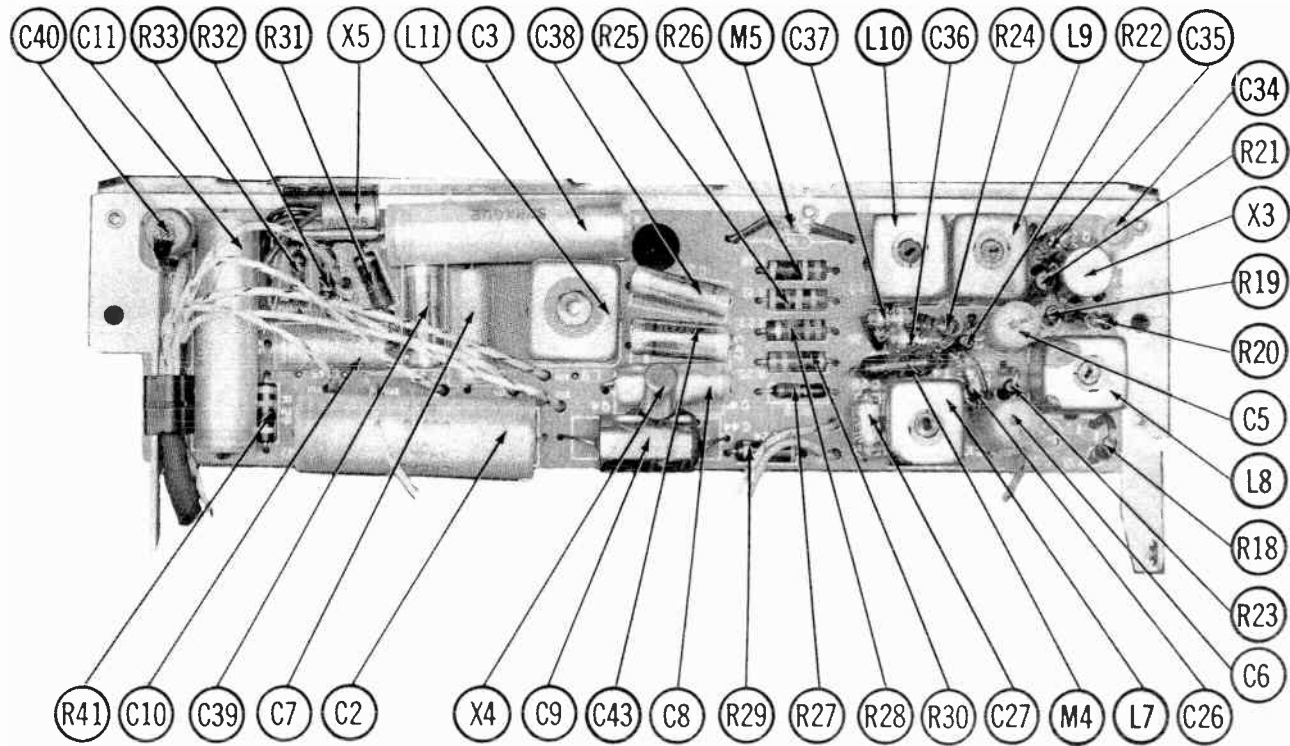
VOLTAGE MEASUREMENTS TAKEN IN 12V, NEGATIVE GROUND POSITION.  
 Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.  
 e See parts list for alternate value or application.  
 1. Voltage measurements taken with vacuum tube voltmeter.  
 2. All controls set for normal operation, no signal applied.  
 3. Measured values are from socket pin or terminal to common ground.  
 4. All terminals viewed from bottom unless otherwise designated.  
 5. Numbers assigned to terminals may not be found on the unit.  
 6. Supply voltage maintained at rated value for voltage readings.  
 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
 with **CIRCUITRACE**  
 ©Howard W. Sams & Co., Inc, 1964

SPEAKER CONNECTIONS

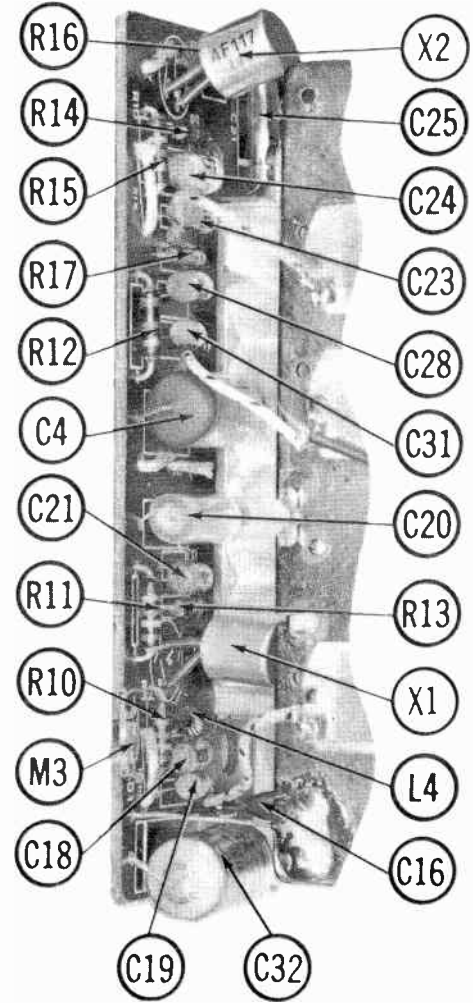
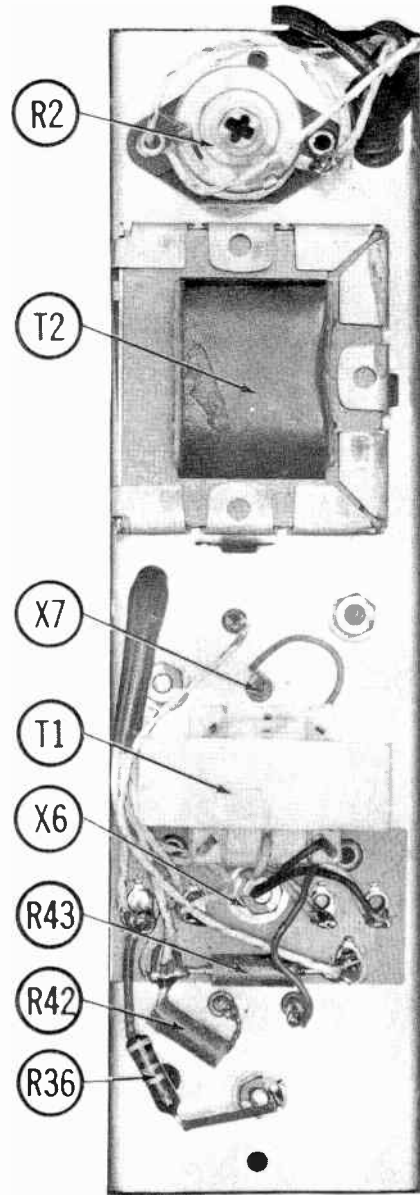
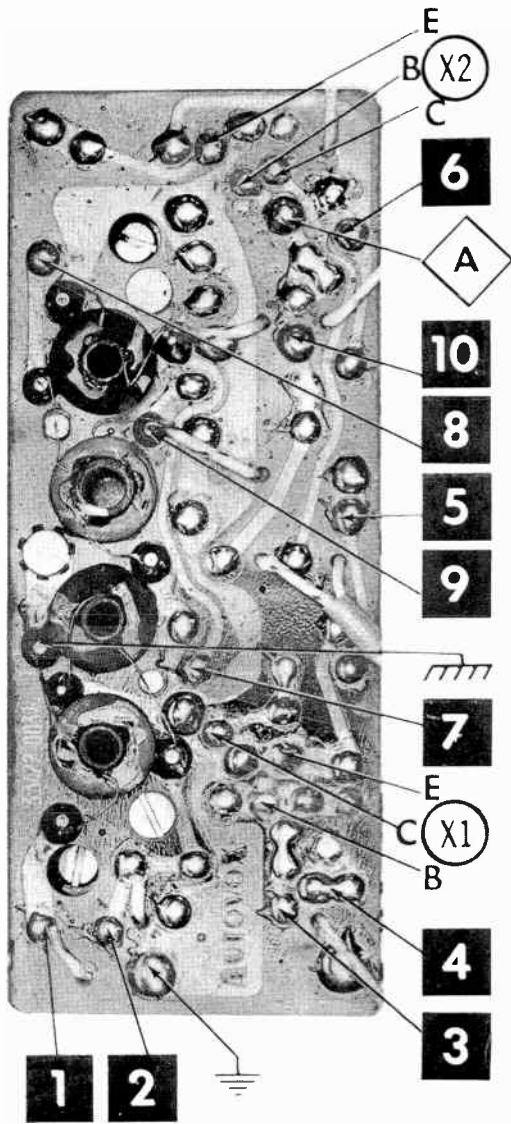
6V	12V
1 SPEAKER	
TERMINALS 3-4	TERMINALS 5-6
2 SPEAKERS	
PARALLEL	SERIES
TERMINALS 3-6	TERMINALS 3-6

**AUTOVOX MODEL RA-164**



AUTOVOX MODEL RA-164

A Howard W. Sams CIRCUITRACE® Photo



A Howard W. Sams **CIRCUITRACE** Photo

## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C15	20-100	( .047 ) †	NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22	
C16	2.2								
C17	10-45								
C18	135								
C19	750								
C20	.047		125V	P288N-047		WMF2S47	1DP-2-473	PVC1147	
C21	10			NPO-DI 10	DTZ-10	C10QIC	CCTO-100	CNO410	10TCC-Q10
C22	10-45								
C23	130								
C24	.0012								
C25	.01								
C26	8.8			NPO-DI6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO568	10TCC-V68
C27	.0024			BE6D25	CPR-2400J	WMF2D22	6DP-1-222	PVC6225	6PS-D25
C28	360			N750-DI360	DD-361	LA10T33-C4		GP336	5GA-T36
C29	20-60								
C30	33								
C31	820			NPO-DI33	CPR-33J	C10Q33C	CCTO-330	CNO433	10TCC-Q33
C32	.47		125V	DI-820	CPR-820J	LA10T82-C4	CCD-821	GP382	5GA-T82
C33	820			BE2P47		WMF1P47	1DP-4-474	PVC1047	2PS-P47
C34	.047			DI-820	CPR-820J	LA10T82-C4	CCD-821	GP382	6PS-S82
C35	9			P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C36	120			NPO-DI10	DTZ-10	C10QIC	CCTO-100	CNO410	10TCC-Q10
C37	12			NPO-DI120	CPR-120J	C10T12C	CCTO-121	CNO312	10TCC-T12
C38	.022			NPO-DI12	TCZ-12	LA10Q12-SL	CCTO-120	CNO412	10TCC-Q12
C39	.022			BE2S22		WMF2S22	4DP-2-223	PVC1122	2PS-S22
C40	.15		125V	BE2S22		WMF2S22	4DP-223	PVC1122	2PS-S22
C41	.01			BE2Q15		WMF2P15	2DP-3-154	PVC1015	2PS-P15
C42	.01			BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C43	.01			BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C44	.047			P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47

† Alternate Value

### CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Autovox PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A	Tone-Volume/Switch	25K 5000Ω		F2-25K,R2-5000, FFS102, RP113, KR-8 V-150		† QJ-1782A	
R2	Balance	150Ω			U39-150	110C150	

† "CONCENTRIKIT" Equivalent: K16 Kit with Base Elements and Shafts: B13-120, P17-105 (Panel)  
B13-114, R24 -127 (Rear)

### RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	REMARKS			IRC PART No.	WORKMAN PART No.	REMARKS
R38	30Ω 5W	PW5-30	5W-SQ-30						

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Autovox PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (4uh)			74F396AP			① Part of M2.
L2	1st Ant.	①					
L3	2nd Ant.	①					
L4	RF Choke (9uh)						
L5	RF	①					
L6	Osc.	①					
L7	1st IF Prim.						
L8	1st IF Sec.						
L9	2nd IF Prim.						
L10	2nd IF Sec.						
L11	Tone Choke (150MH)						

### FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L12	250ma	.4Ω	1.1MH						

### TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	14:	1						

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	12Ω	Taps @ 6.4Ω & 3.2Ω						

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			Autovox PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1									

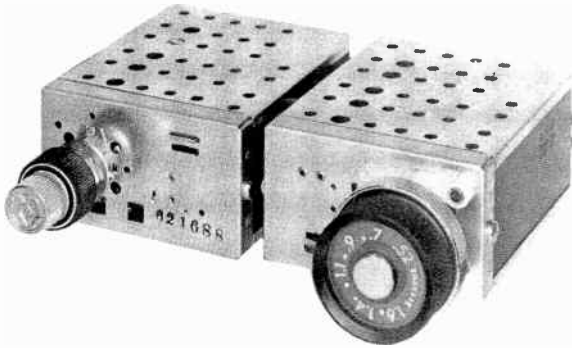
### MISCELLANEOUS

ITEM No.	PART NAME	Autovox PART No.	NOTES
M2	Tuner		
M3	RF Limiter		1G25 or OA91
M4	AVC Limiter		1G25 or OA91
M5	AF Det.		AA119 or SFD111



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>



TRADE NAME: Autovox Model RA-441  
 SUPPLIER: For Current Address, See Master Index.  
 TYPE SET: 6 Transistor AM Receiver  
 POWER SUPPLY: 12 Volt Storage Battery  
 TUNING RANGE: BROADCAST 540-1615KC

AUTOVOX MODEL RA-441

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4  
 A5 thru A8

GENERAL CEMENT: 9440

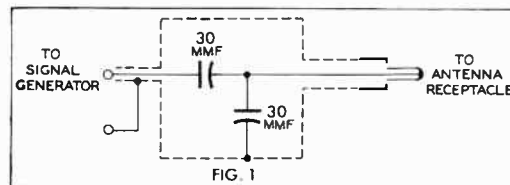
GENERAL CEMENT: 8290, 8868, 9087

WALSCO: 2501

WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	455KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7, A8	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A8 for maximum output.



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF117	RF Amp.	DS-25	GE-1	2N1180	PNP
X2	AF117	Conv.	DS-25	GE-1	2N1180	PNP
X3	AF117	IF Amp.	DS-25	GE-1	2N1180	PNP
X4	OC75	Emitter Follower	DS-26	GE-2	2N591	PNP
X5	AC128	Emitter Follower	DS-26	GE-2	2N591	PNP
X6	OC26	Output	DS-520	GE-3	2N301	PNP*

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				
			Autovox PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A B	Tone Volume/Switch	5000Ω 5000Ω		F2-5000, R2-5000, FFS102, RP113, KR-8 V-150		† QJ-1776A	
R2	Bias	150Ω 2W			U39-150	110C150	

† "CONCENTRIKIT" Equivalent: K16 Kit with Base Elements and Shafts: B13-114, P17-105 (Panel)  
B13-144, R24-127 (Rear)

## RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	Autovox Part No.			IRC PART No.	WORKMAN PART No.	Autovox Part No.
R32	3.9Ω 5W	PW5-4	5W-SQ-4	9399.7701	R35	39Ω 5W	PW5-40	5W-SQ-40	9390.7701

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Autovox PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	200	15		CRE481A	NLW200-15	MT1-25	BL2140	TT15X200	TE-1164
C2	200	12	0207.3203	BCD121150					TE-1139*
C3	10	6	0106.1203	PTT23	NLW10-6	MT1-5	BL1220	TT6X20	TE-1087
X4	50	6	0506.2202	PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
X5	50	6	0508.2202	PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
X6	50	6	0508.2202	PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
X7	800	3	0807.1202				BL2211		TES-1085*

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	20-100								
C11	2.2		NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522		10TCC-V22
C12	10-45								
C13	2.5		NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522		10TCC-V22
C14	750		DI-750	CPR-750J	LA10T75-C4	CCD-751	GP375		5GA-775
C15	.047 125V		P288N-047		WMF2S47	1DP-2-473	PVC1147		2PS-S47
C16	.047 125V		P288N-047		WMF2S47	1DP-2-473	PVC1147		2PS-S47
C17	.0022		P288N-0022	CPR-2200J	WMF1D22	6DP-1-222	PVC4222		6PS-D22
C18	10-45								
C19	130		DI-120	CPR-130J	LA10T13-S3	CCD-121	GP313		5GA-T13
C20	.0012 500V		DI-1200	CPR-1200J	DPMS8012	6DP-1-122	PVC6212		6DP-D12
C21	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211		4PS-S10
C22	10-45								
C23	33		NPO-DI33	CPR-33J	C10Q33C	CCTO-330	CNO433		10TCC-Q33
C24	390		DI-290	CPR-390J	LA10T39-C4	CCD-391	GP339		5GA-T39
C25	820		DI-820	CPR-820J1	LA10T82-C4	CCD-821	GP382		5GA-T82
C26	6.8		NPO-DI6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO568		10TCC-V68
C27	.047 125V		P288N-047		WMF2S47	1DP-2-473	PVC1147		2PS-S47
C28	.047 125V		P288N-047		WMF2S47	1DP-2-473	PVC1147		2PS-S47
C29	9 125V								
C30	120		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410		10TCC-Q10
C31	12 125V		NPO-DI120	CPR-120J	C10T12C	CCTO-121	CNO312		10TCC-T12
C32	.01 150V		NPO-DI12	TCZ-12	LA10Q12-SL	CCTO-120	CNO412		10TCC-Q12
C33	.082 125V		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211		4PS-S10
C34	.082 125V								
C35	1mfd 125V								
C36	.01		BE2S1	UK-105	HCC3105P	1DP-1-103	PVC211		HY-135
C37	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211		4PS-S10
C38	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211		4PS-S10
C39	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211		4PS-S10
C40	.47 125V		BE2P5		DPMS2P5	1DP-4-504	PVC105		2PS-P50

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Autovox PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (4uh)					74F396AP	① Part of M2. ② Alternate Part #2641.1142.
L2	1st Ant.	3528.5011 ①					
L3	2nd Ant.	3528.5011 ①					
L4	RF	3528.5011 ①					
L5	Osc.	2658.5001 ①					
L6	1st IF Pri.	2641.1140 ②					
L7	1st IF Sec.	2641.1141					
L8	2nd IF Pri.	2641.0311					
L9	2nd IF Sec.	2641.0312					
L10	Tone Choke	2615.0155					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L11	700ma	.4Ω	1.1MH	2615.1051					

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.		
T1	9Ω Tap @ 3.2Ω		2621.1177	A-4093 ①	TA-50 ①	TR-180 ①	TY-3XT ①	① Fabricate mounting.	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			Autovox PART No.	LITTELFUSE PART No.	BUSS PART No.	FUSE	HOLDER	FUSE	HOLDER
M1									

## MISCELLANEOUS

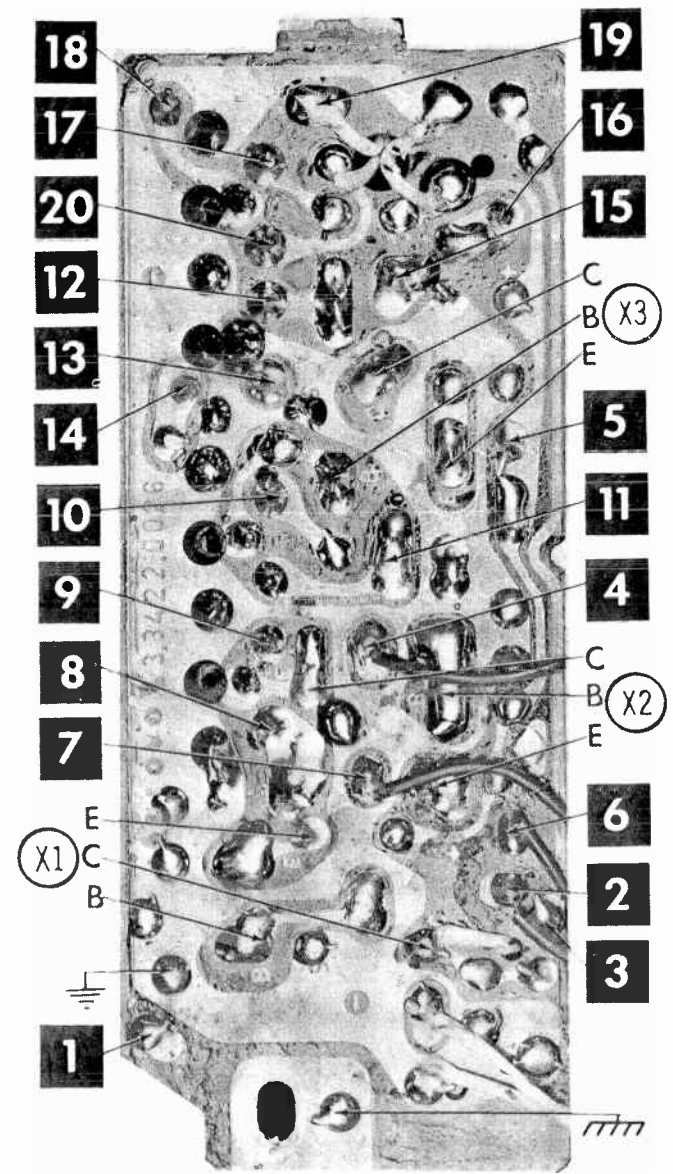
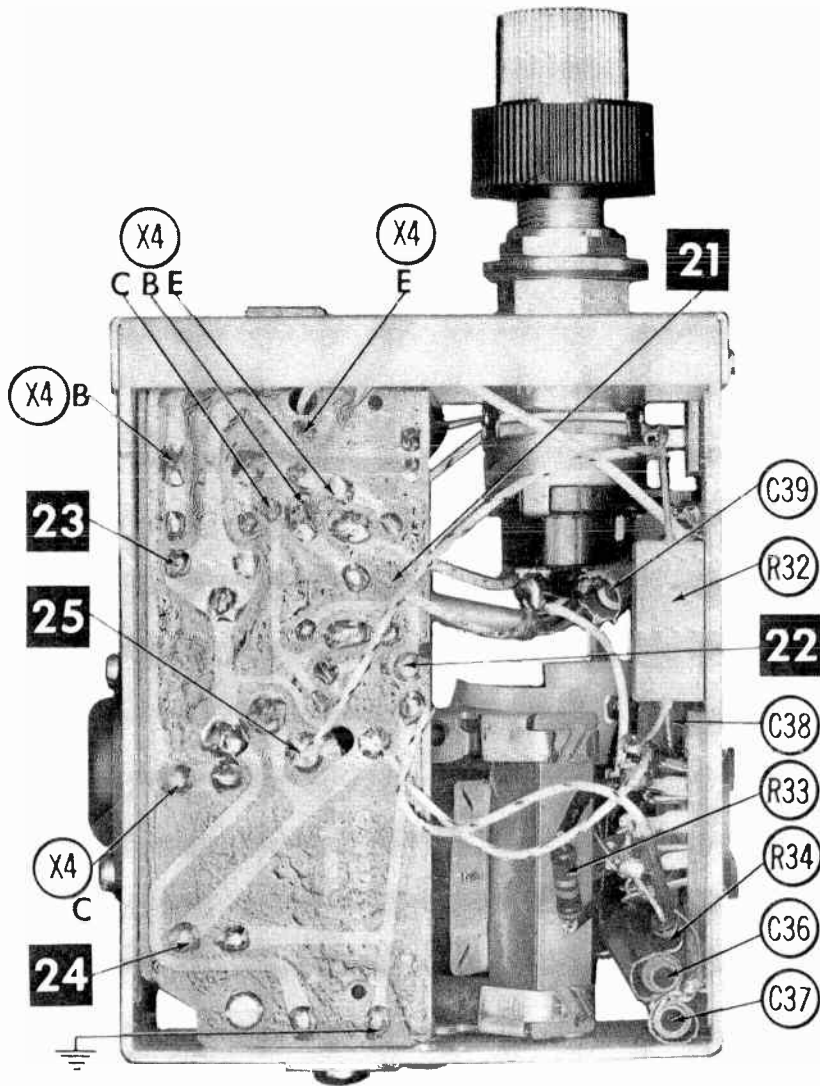
ITEM No.	PART NAME	Autovox PART No.	NOTES
M2	Tuner		
M3	Limitter (AVC)		1G25
M4	AF Det.		1G86

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

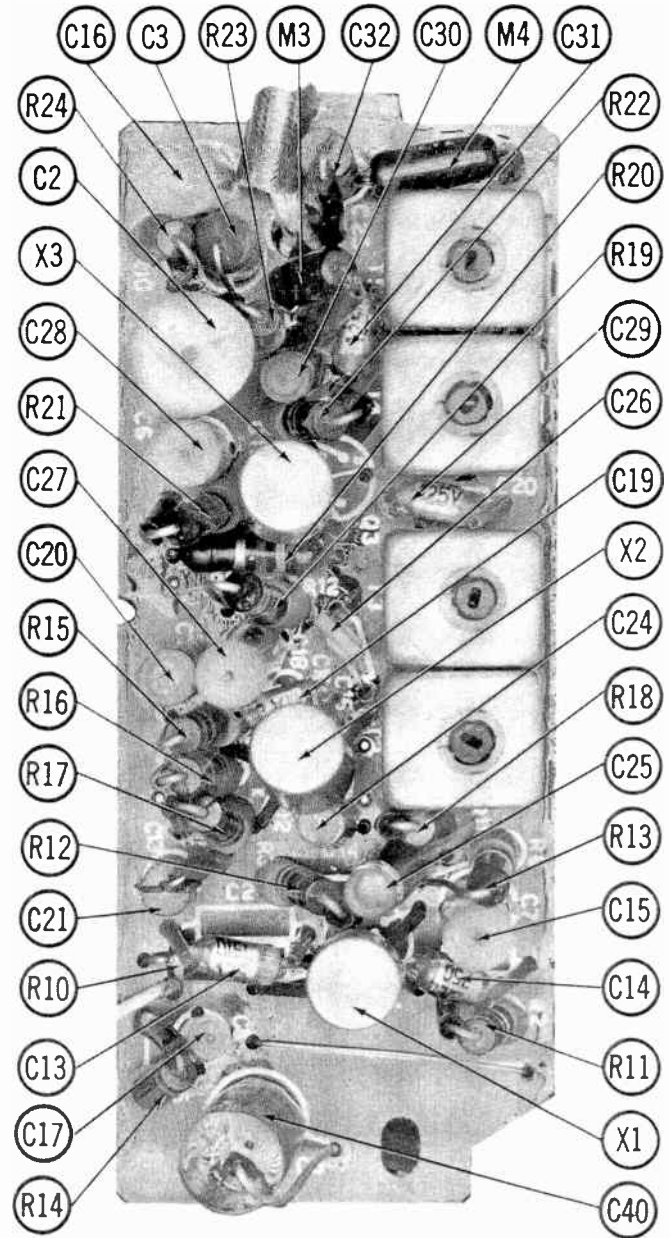
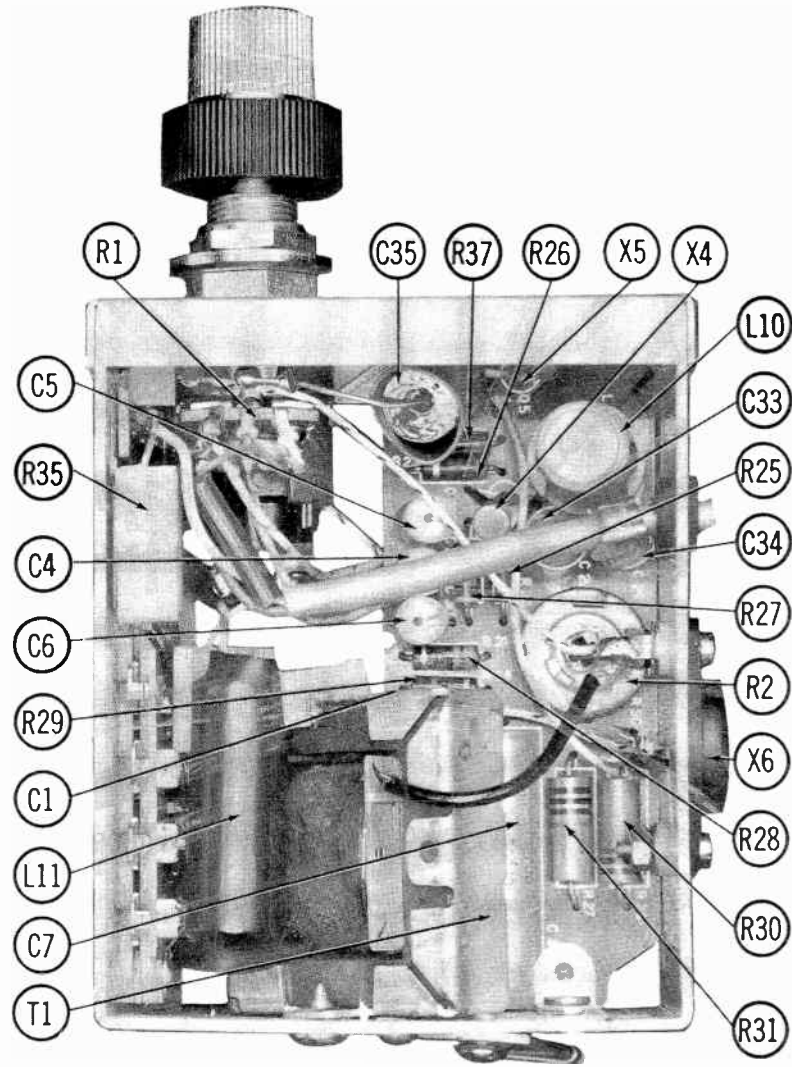
ITEM	PART No.
Tuning Knob	2331.0515
Volume Knob	2751.0151
Tone Knob	2751.0001

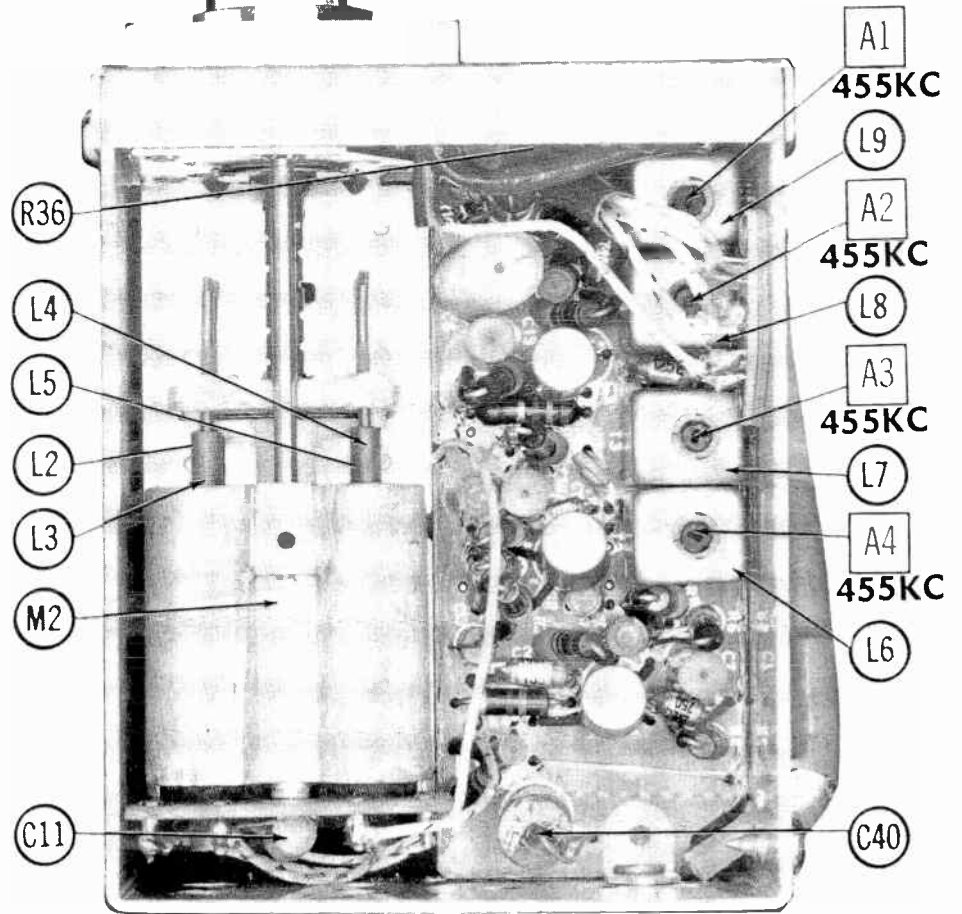
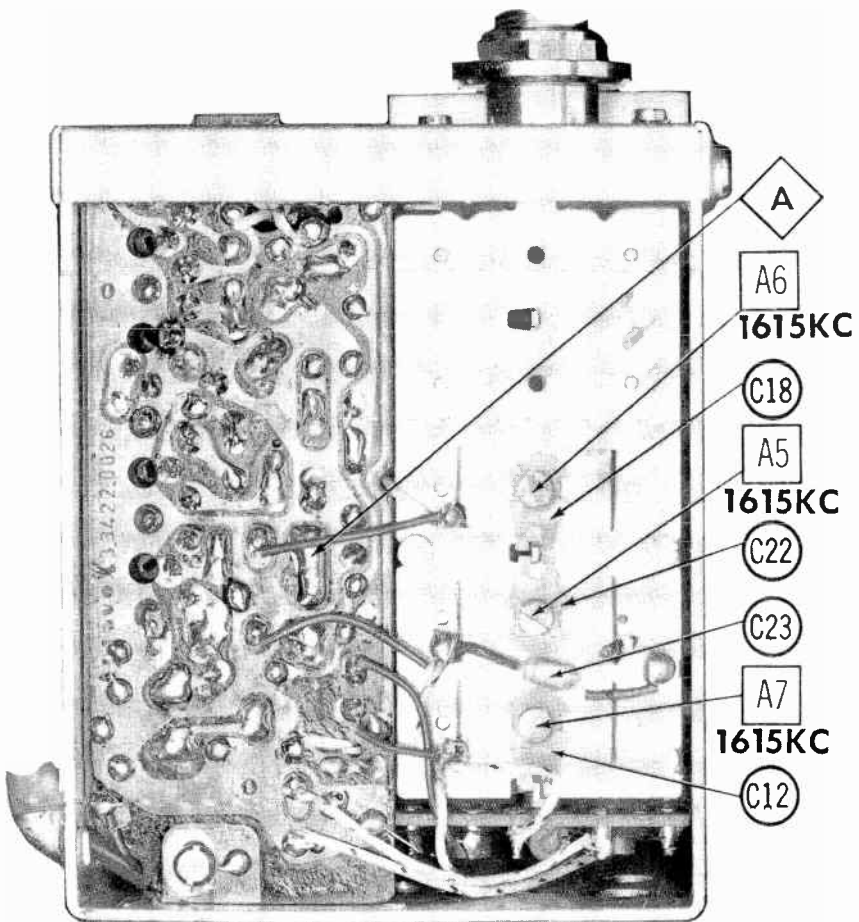




A Howard W. Sams **CIRCUITRACE** Photo

**AUTOVOX MODEL RA-441**

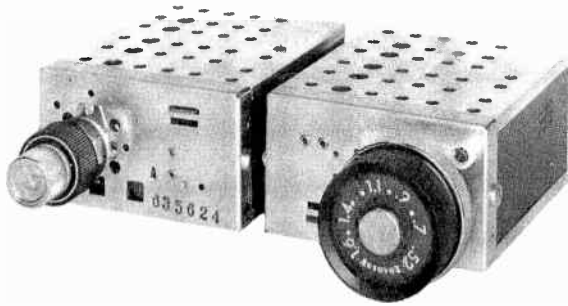






PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>



TRADE NAME : Autovox Model RA-443  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 6 Transistor AM Receiver  
 POWER SUPPLY : 6 Volt Storage Battery  
 RATING : .88 Amp. @ 6.3Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC

AUTOVOX MODEL RA-443

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4  
 A5 thru A8

GENERAL CEMENT: 9440

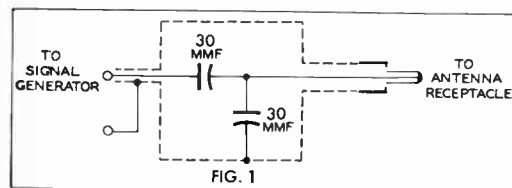
GENERAL CEMENT: 8290, 8868, 9087

WALSCO: 2501

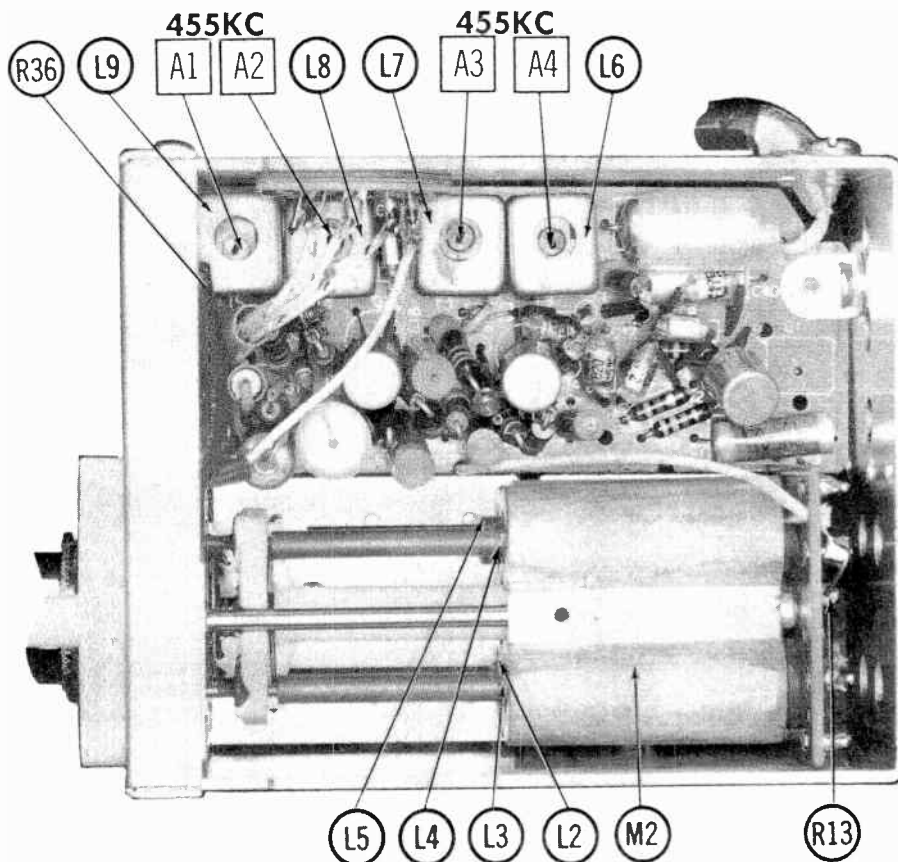
WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	455KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7, A8	"

With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A8 for maximum output.



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



## PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8870 (3/4 In.)

### TRANSISTORS

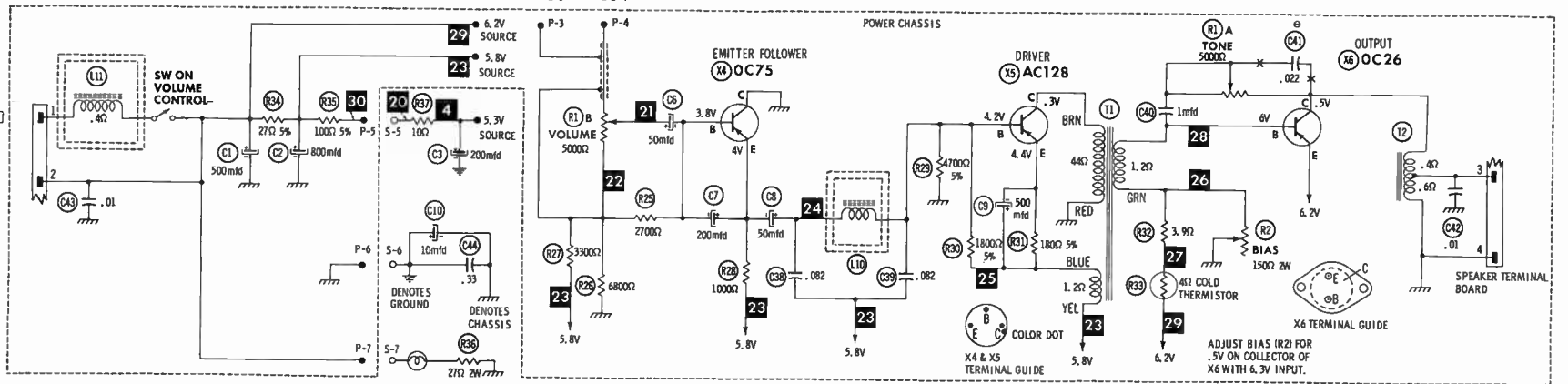
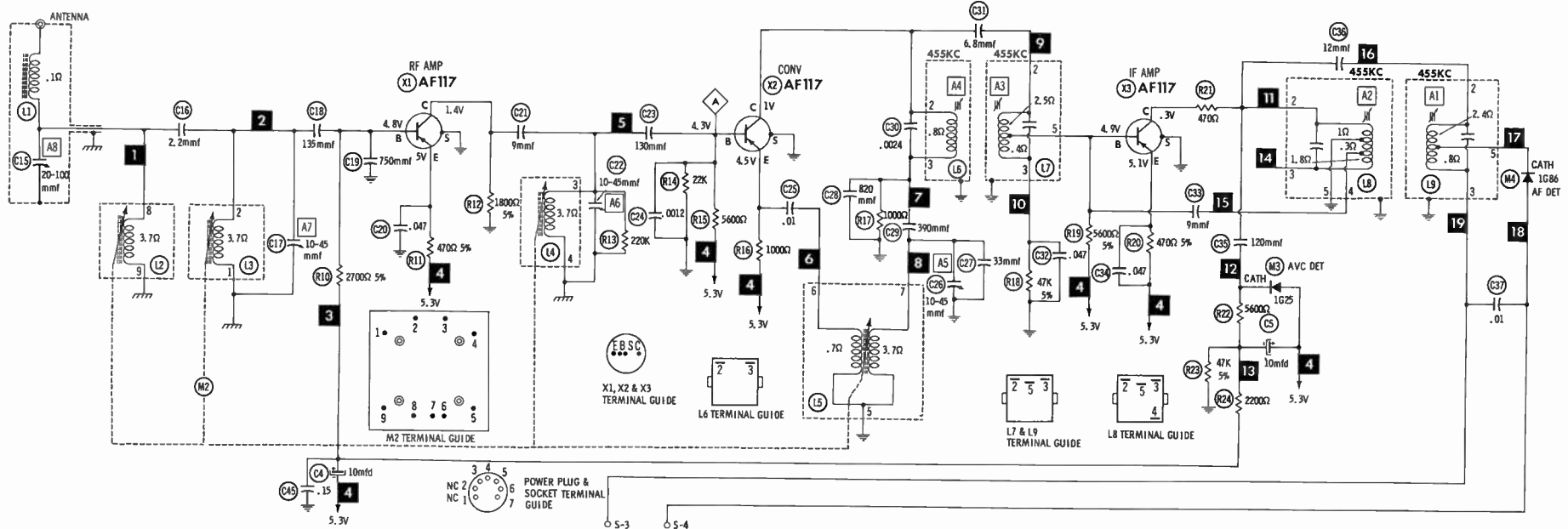
ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF117	RF Amp.	DS-25	GE-1	2N1637	PNP
X2	AF117	Conv.	DS-25	GE-1	2N1639	PNP
X3	AF117	IF Amp.	DS-25	GE-1	2N1637	PNP
X4	OC75	Emitter Follower	DS-26	GE-2	2N591	PNP
X5	AC128	Driver	DS-26	GE-2	2N591	PNP
X6	OC26	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

### ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	500	6	0507.2202	PRS1120	BR500-6	QT1-30	BL2221	TC605	TVA-1132
C2	800	3	0807.1202	PTT-138			BL2211		TES-1085*
C3	200	12	0207.3203	BCD12150					TL5-1139*
C4	10	6	0106.1203	PTT23	NLW10-6	MT1-5	BL1220	TT6X10	TE-1087
C5	10	6	0106.1203	PTT23	NLW10-6	MT1-5	BL1220	TT6X10	TE-1087
C6	50	6	0506.2202	PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
C7	200	3	0207.1202	CRE231A	NLW200-6	MT1-24	MLV200-3	TT6X200	TE-1064
C8	50	6	0506.2202	PTT29	NLW50-6	MT1-18	BL1520	TT6X50	TE-1100
C9	500	3		PTT17	BR500-6	MT1-26	BL2111	TC305	TE-1068
C10	10	12	0106.3201	PTT53	NLW10-15	MT1-5	BL1241	TT12X10	TE-1128

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.



- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- See parts list for alternate value or application.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

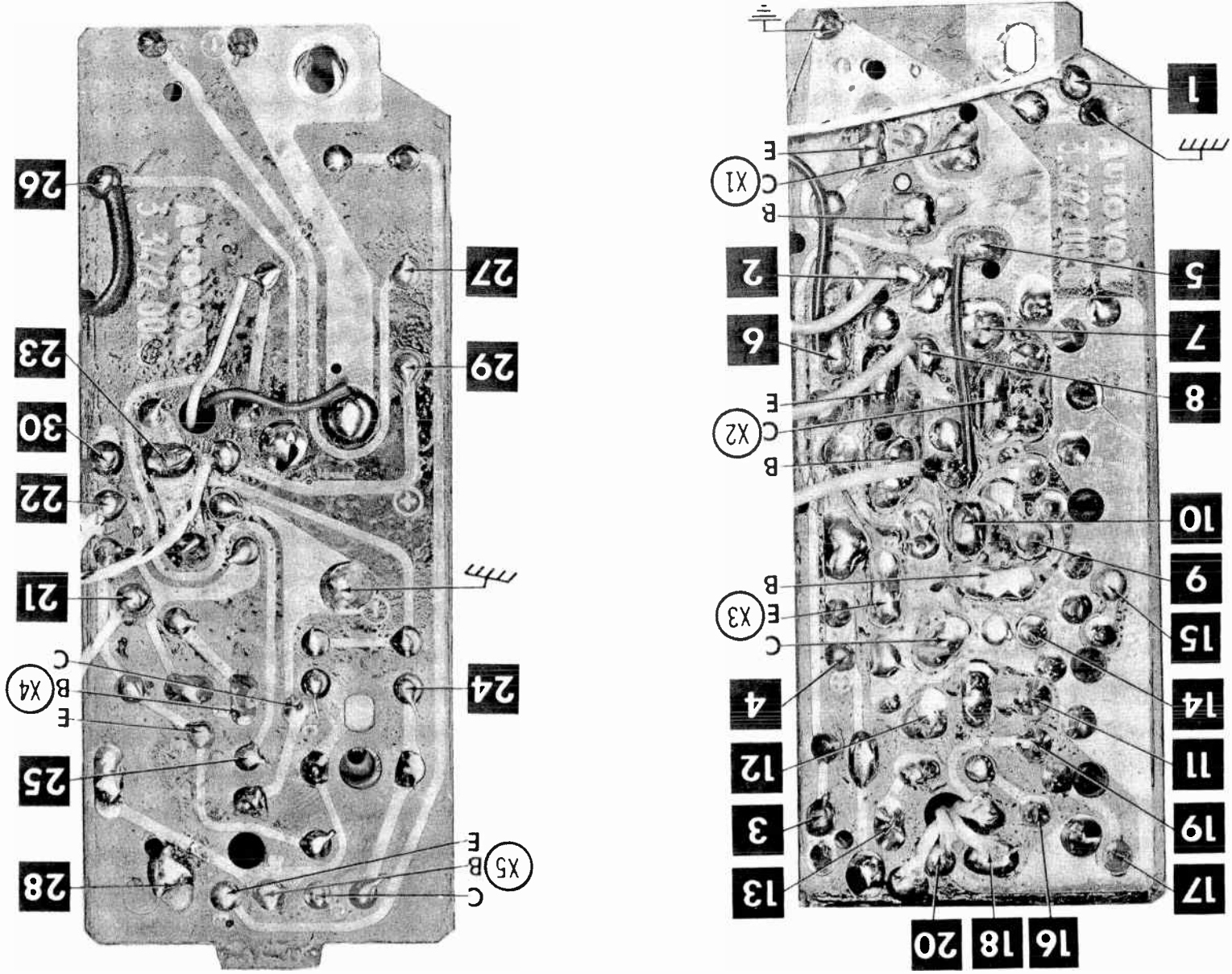
A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE  
 ©Howard W. Sams & Co., Inc, 1964

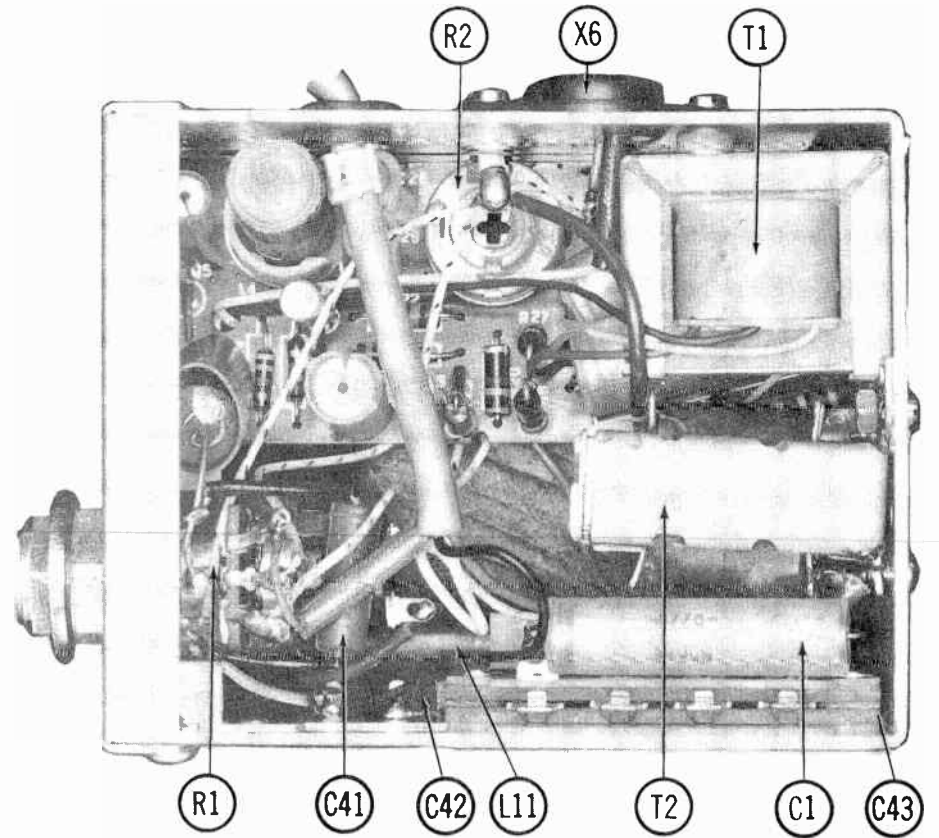
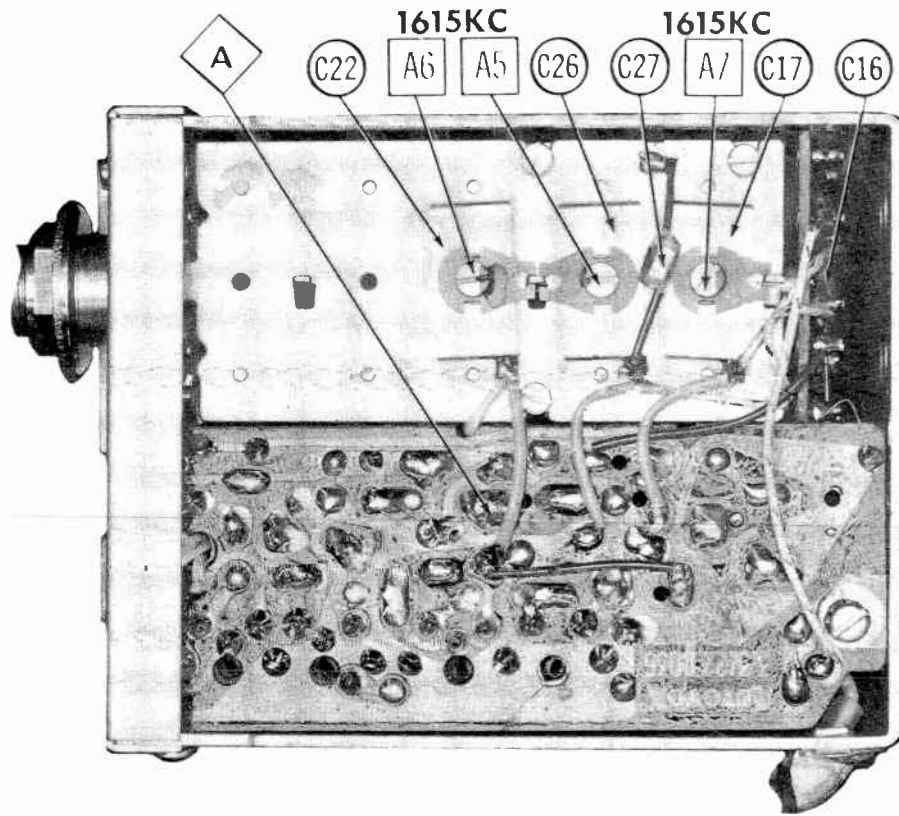
AUTOVOX MODEL RA-443



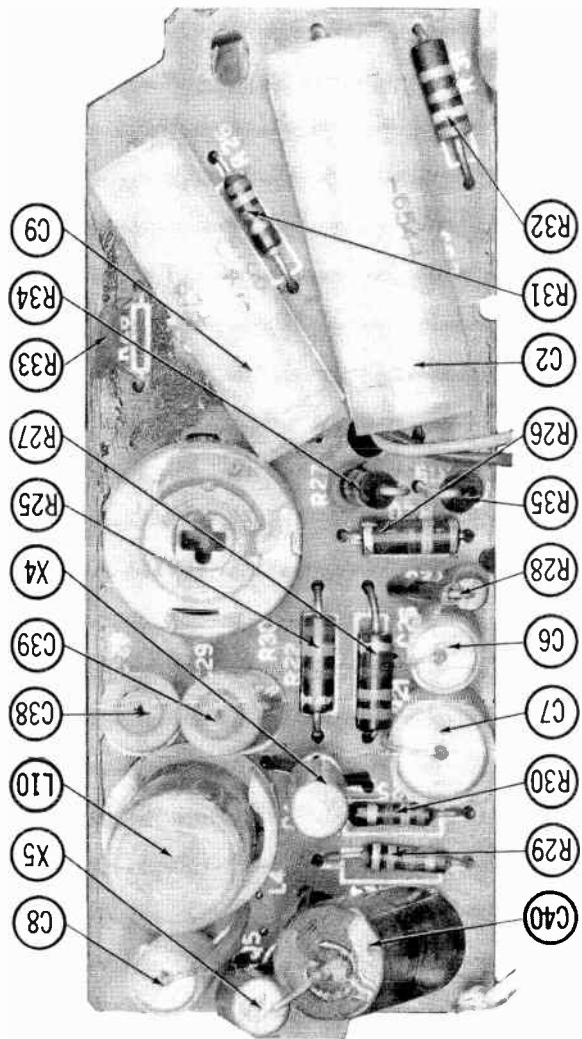
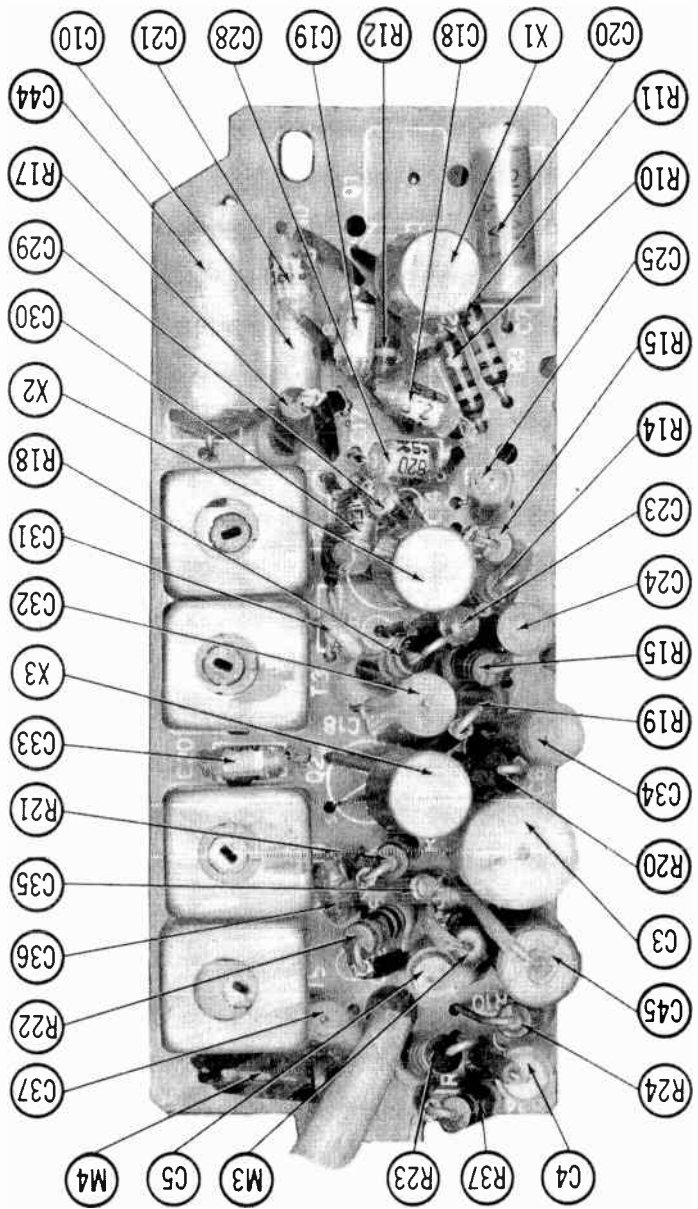
**AUTOVOX MODEL RA-443**

A Howard W. Sams **CIRCUITRACE** Photo





AUTOVOX MODEL RA-443



## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCOR PART No.	MALLORY PART No.	SPRAGUE PART No.
C15	20-100		NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22
C16	2.2							
C17	10-45							
C18	135		DI-120	CPR-130J	LA10T13-S3	CCD-121	GP313	5GA-T13
C19	750		DI-750	CPR-750J	LA10T75-C4	CCD-751	GP375	5GA-T75
C20	.047 125V		P288N-047		WMF2S47	4DP-3-473	PVC2147	2PS-S47
C21	9		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10
C22	10-45							
C23	130		DI-120	CPR-130J	LA10T13-S3	CCD-121	GP313	5GA-T13
C24	.0012 500V		DI-1200	CPR-1200J	DPMS6D12	6DP-1-122	PVC6212	6PS-D12
C25	.01 125V		BE2S1	CPR-1000J	WMF1S1	4DP-1-103	PVC211	4PS-S10
C26	10-45							
C27	33		NPO-DI33	CPR-33J	C10Q33C	CCTO-330	CNO433	10TCC-Q33
C28	820		DI-820	CPR-820J	LA10T82-C4	CCD-821	GP382	5GA-T82
C29	390		DI-390	CPR-390J	LA10T39-C4	CCD-391	GP339	5GA-T39
C30	.0024		BE6D25	CPR-2400J	WMF2D22	6DP-1-222	PVC6225	6PS-D25
C31	6.8		NPO-DI6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO568	10TCC-V68
C32	.047 125V		P288N-047		WMF2S47	4DP-3-473	PVC2147	2PS-S47
C33	9		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10
C34	.047 125V		P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C35	120		NPO-DI120	CPR-120J	C10T12C	CCTO-121	CNO312	10TCC-T12
C36	12		NPO-DI12	TCZ-12	LA10Q12-SL	CCTO-120	CNO412	10TCC-Q12
C37	.01 125V		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C38	.082				DPMS6S82	6DP-4-823	PVC6182	6PS-S82
C39	.082				DPMS6S82	6DP-4-823	PVC6182	6PS-S82
C40	1mfd 125V			UK-105	HCC3105P			HY-135
C41	.022 125V	①	BE2S22		WMF2S22	4DP-2-223	PVC2122	2PS-S22
C42	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C43	.01		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C44	.33 125V		BE2P33		WMF2P33	2DP-5-334	PVC2033	2PS-P33
C45	.15 125V		BE2P15		WMF2P15	2DP-3-154	PVC2015	2PS-P15

① Not used in some versions.

### CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Autovox PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A B	Tone Volume/Switch	5000Ω 5000Ω	4285.0118	F2-5000, R2-5000, FFS102,RP113, KR8		† QJ-1776A	
R2	Bias	150Ω 2W	4281.0521	V-150	U39-150	110C150	

† "CONCENTRIKIT" Equivalent: K16 Kit with Base Elements and Shafts: B13-114, P17-105 (Panel) B13-114, R24-127 (Rear)

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Autovox PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (4uh)			74F396AP			① Part of M2.
L2	1st Ant.	3526.5011 ①					
L3	2nd Ant.	3526.5011 ①					
L4	RF	3526.5011 ①					
L5	Osc.	2656.5001 ①					
L6	1st IF Pri	2641.1142					
L7	1st IF Sec.	2641.1141					
L8	2nd IF Pri	2641.0311					
L9	2nd IF Sec.	2641.0312					
L10	Tone Choke	2615.0155					

### FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	
L11	880ma	.4Ω	1.1 MH	2615.1051				

### TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA					NOTES
		Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
		PRI. 1	SEC. 1				
T1	7: 1 Pri. 2 Sec. 2 12: 1	2621.1182					

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Autovox PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	9Ω Tap @	3.2Ω	2621.1178	A-4093 ①	TA-50 ①	TR-160 ①	TY3XT ①	① Fabricate mounting.

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Autovox PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1								

### MISCELLANEOUS

ITEM No.	PART NAME	Autovox PART No.	NOTES
M2	Tuner		
M3	AVC		1G25
M4	AF Det.		1G86

### CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

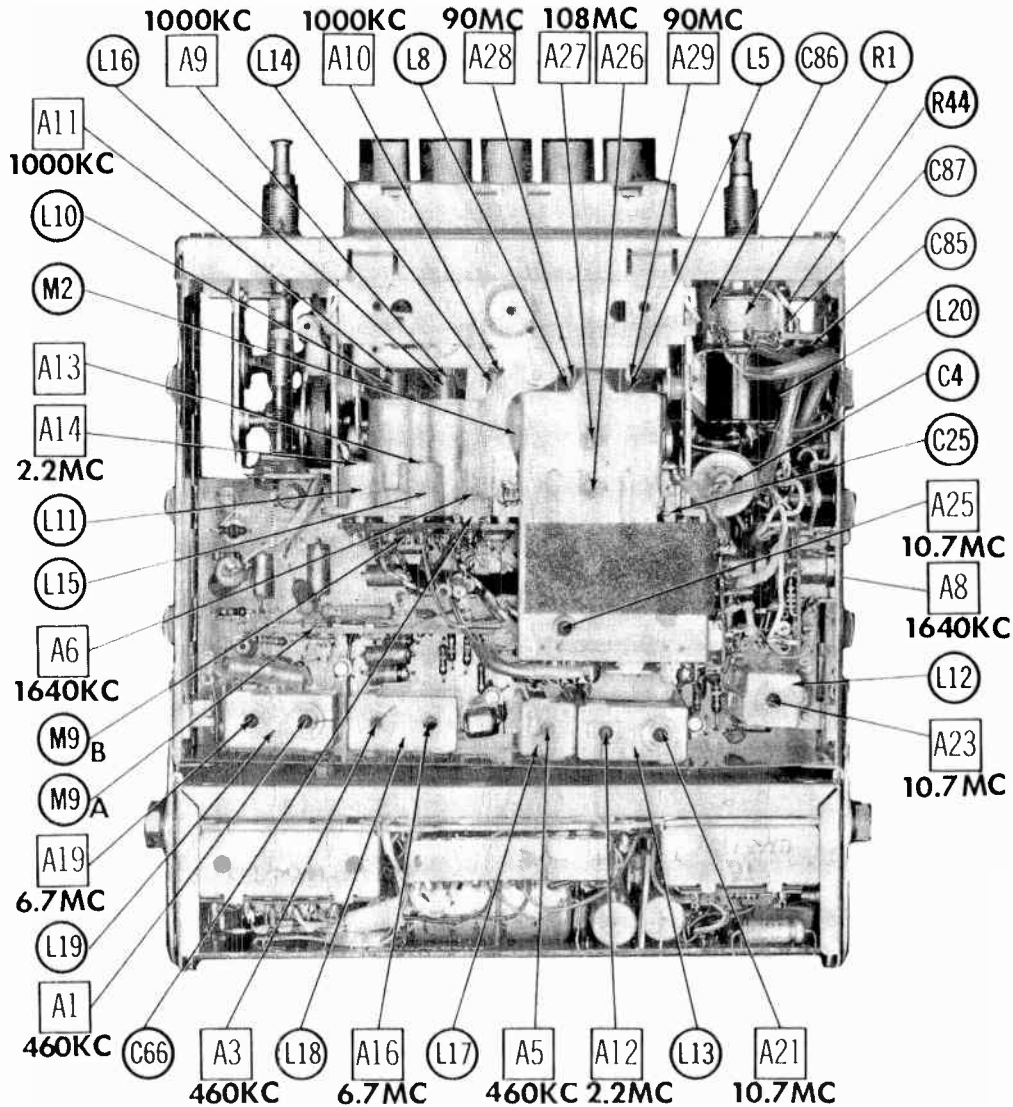
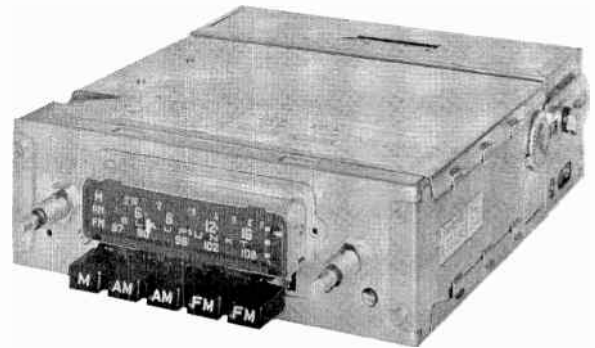
ITEM	PART No.	ITEM	PART No.
Knob, Tuning	2331.0515	Knob, Tone	2751.0001
Knob, Volume	2751.0151		



# PHOTOFACT<sup>®</sup> with

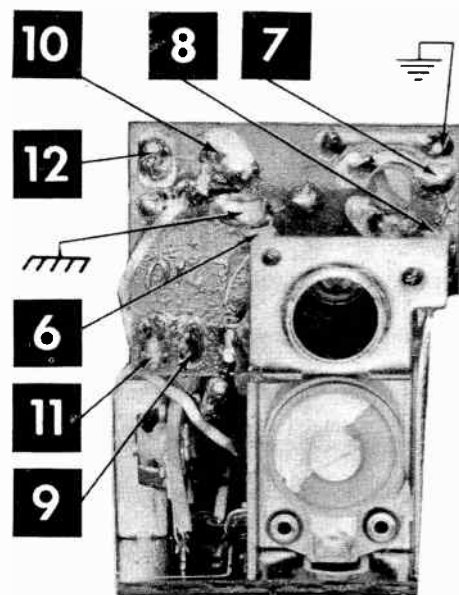
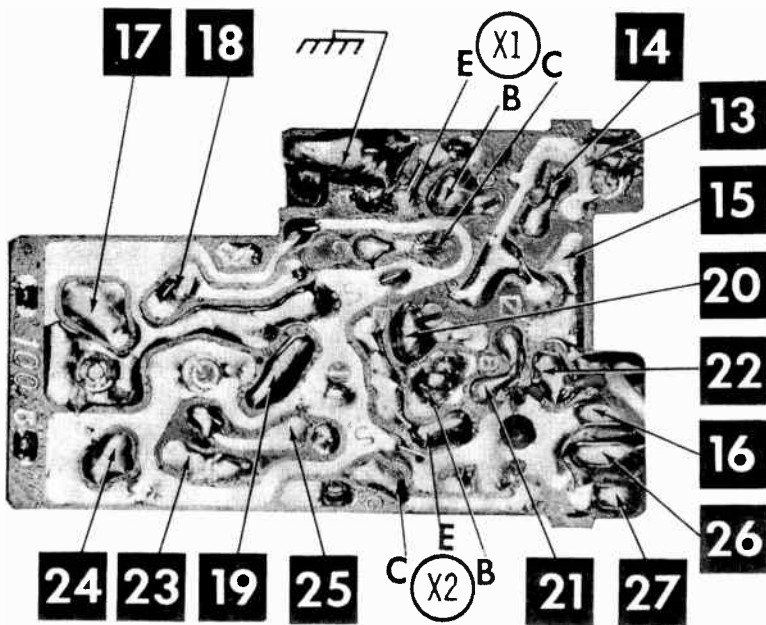
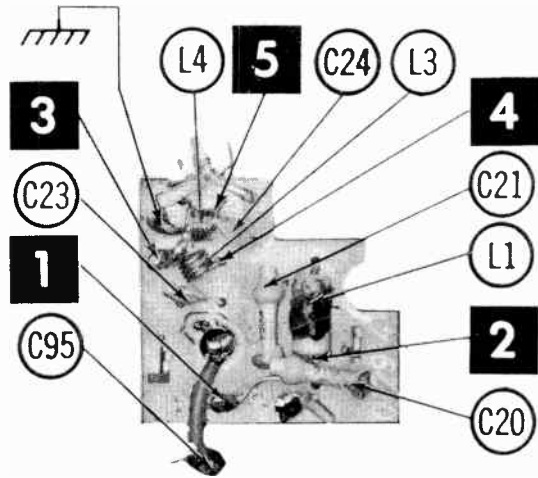
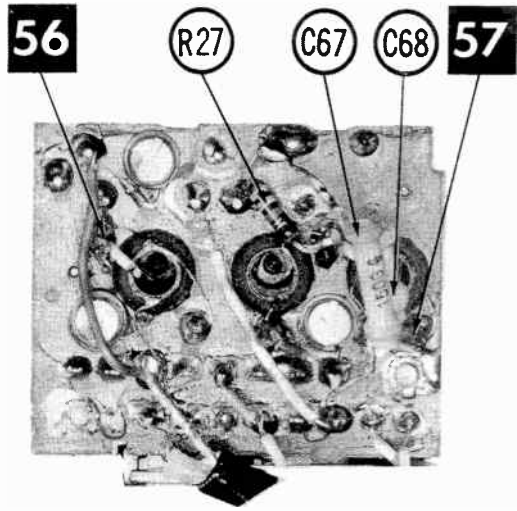
# CIRCUITRACE<sup>®</sup>

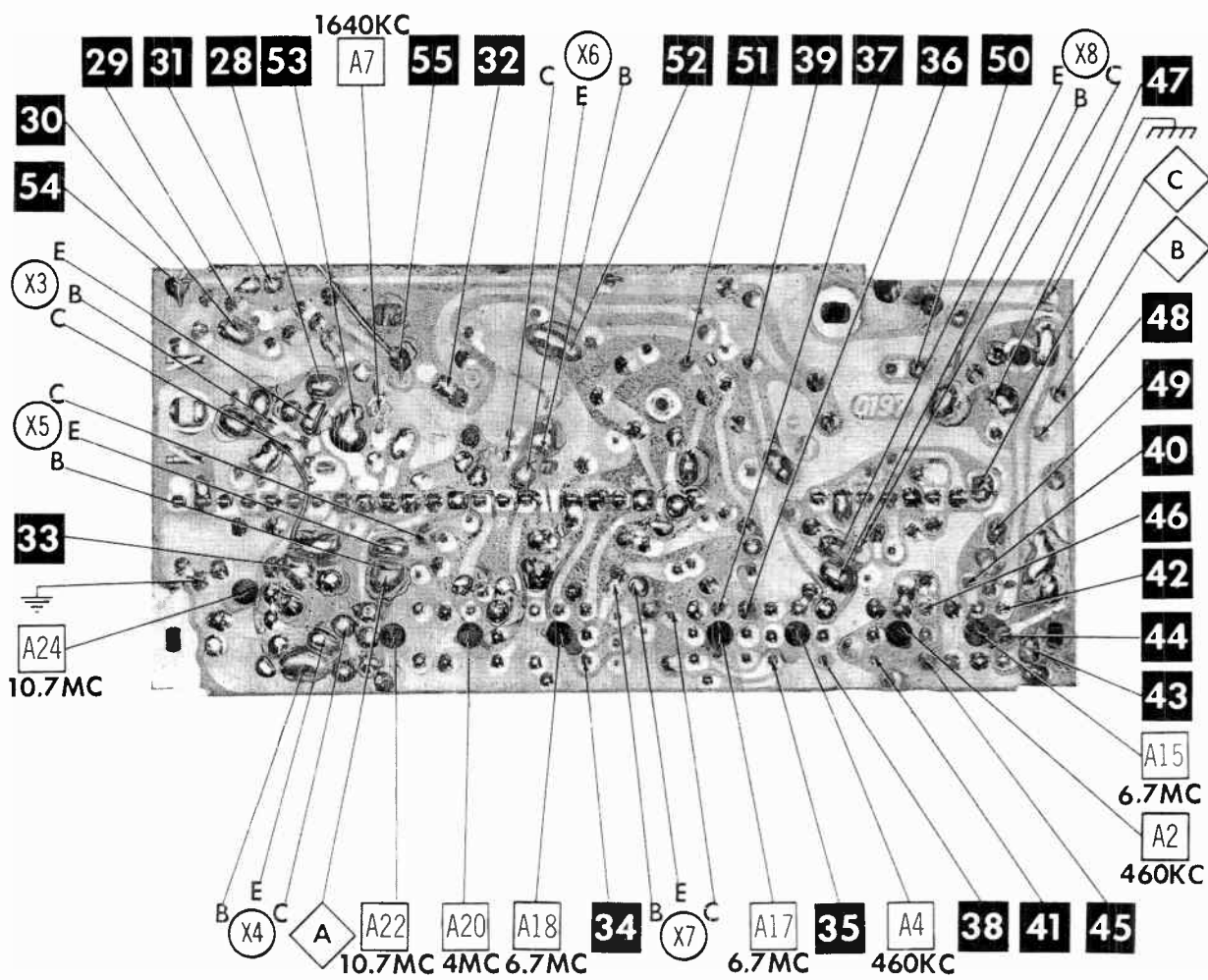
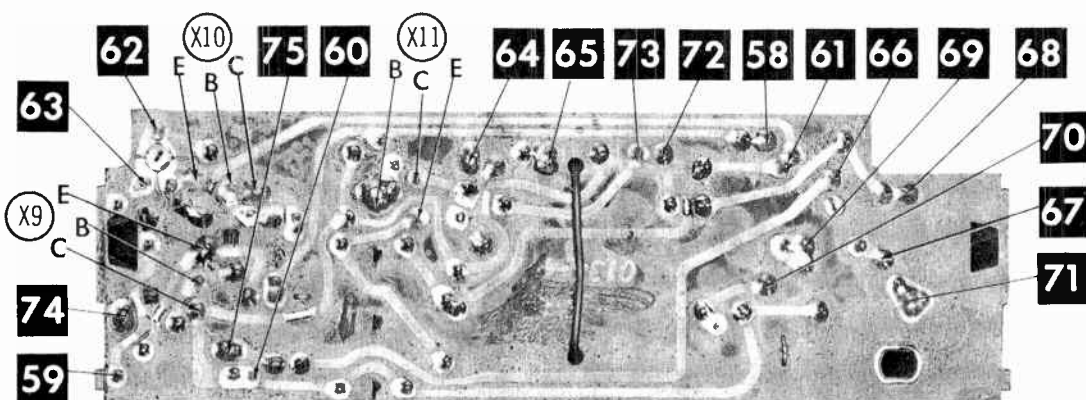
**TRADE NAME:** Blaupunkt Model Frankfurt US  
 (From Serial #V510001)  
**SUPPLIER:** For Current Address, See Master Index.  
**TYPE SET:** 13 Transistor AM-FM-SW Receiver  
**POWER SUPPLY:** 6 Volt or 12 Volt Storage Battery  
**RATING:** .3 Amp. @ 6 Volts DC or 12 Volts DC  
  
**TUNING RANGE:** BROADCAST 520-1640KC  
 MARINE BAND 2-2.5MC  
 FREQ. MOD. 86-108.5MC



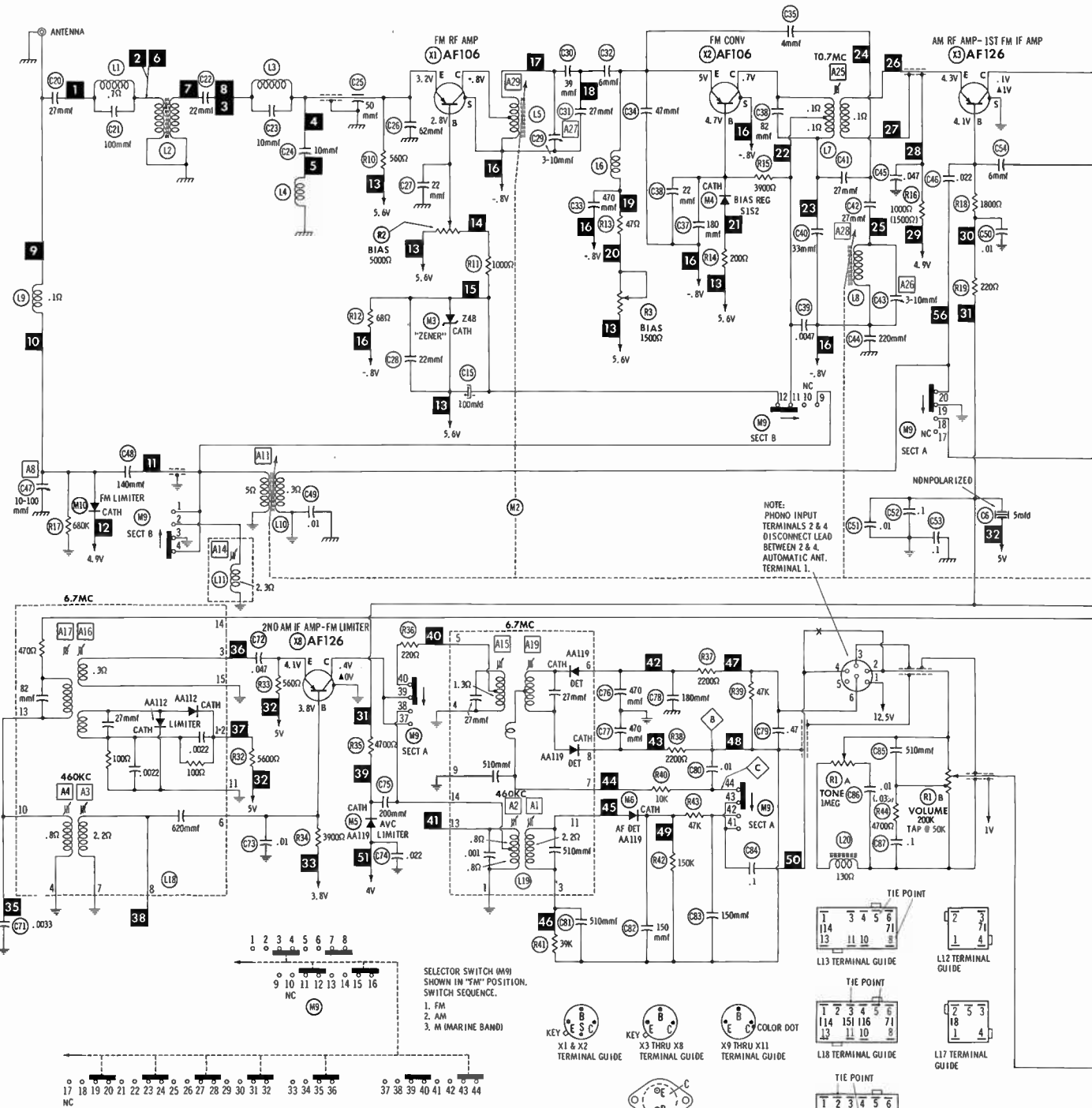
BLAUPUNKT MODEL FRANKFURT US (FROM SERIAL #V510001)

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana





A Howard W. Sams CIRCUITRACE® Photo



▽ DENOTES GROUND    *mm* DENOTES CHASSIS  
 ▲ VOLTAGE MEASUREMENTS TAKEN IN AM POSITION.  
 VOLTAGE MEASUREMENTS TAKEN IN FM, 12.6V, NEGATIVE GROUND POSITION.  
 RESISTORS ARE RATED 5% UNLESS OTHERWISE INDICATED.

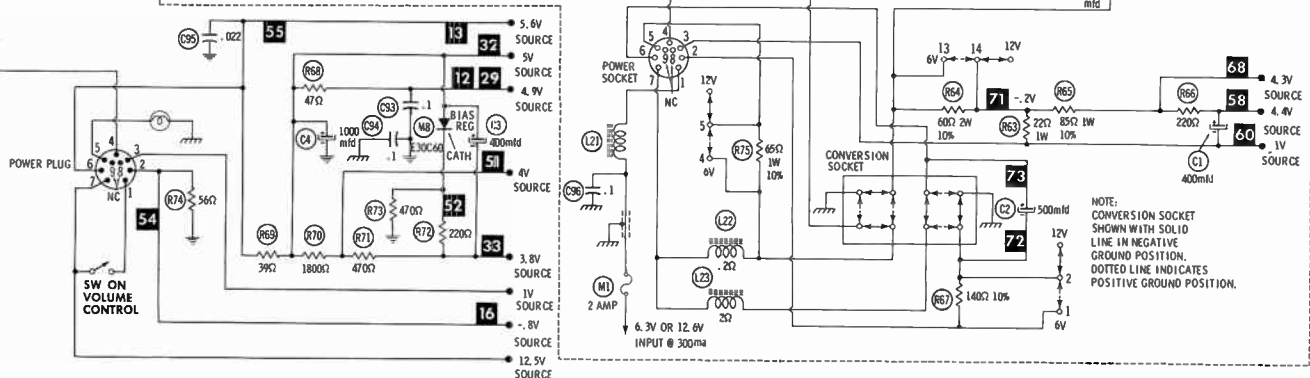
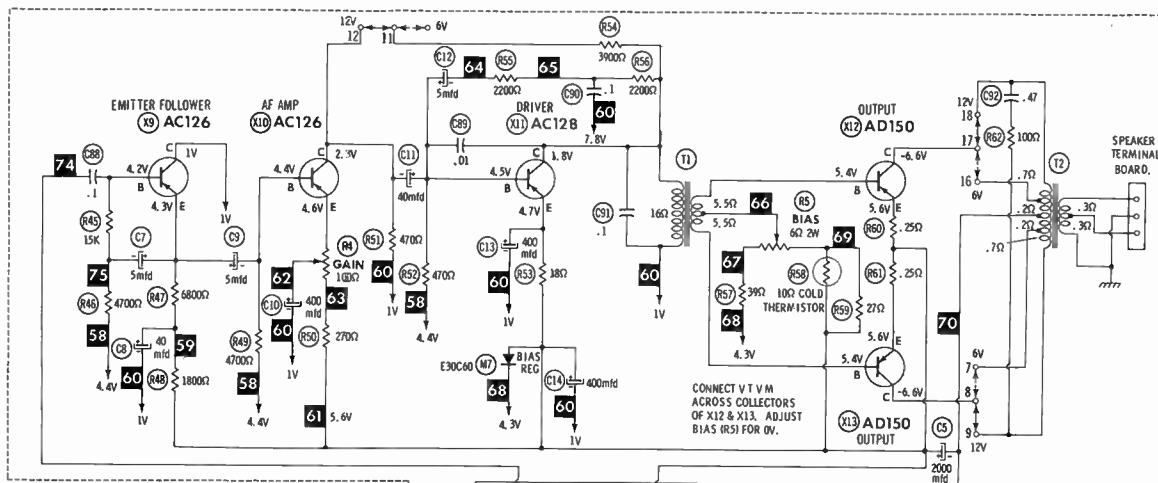
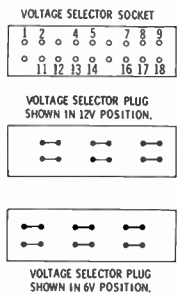
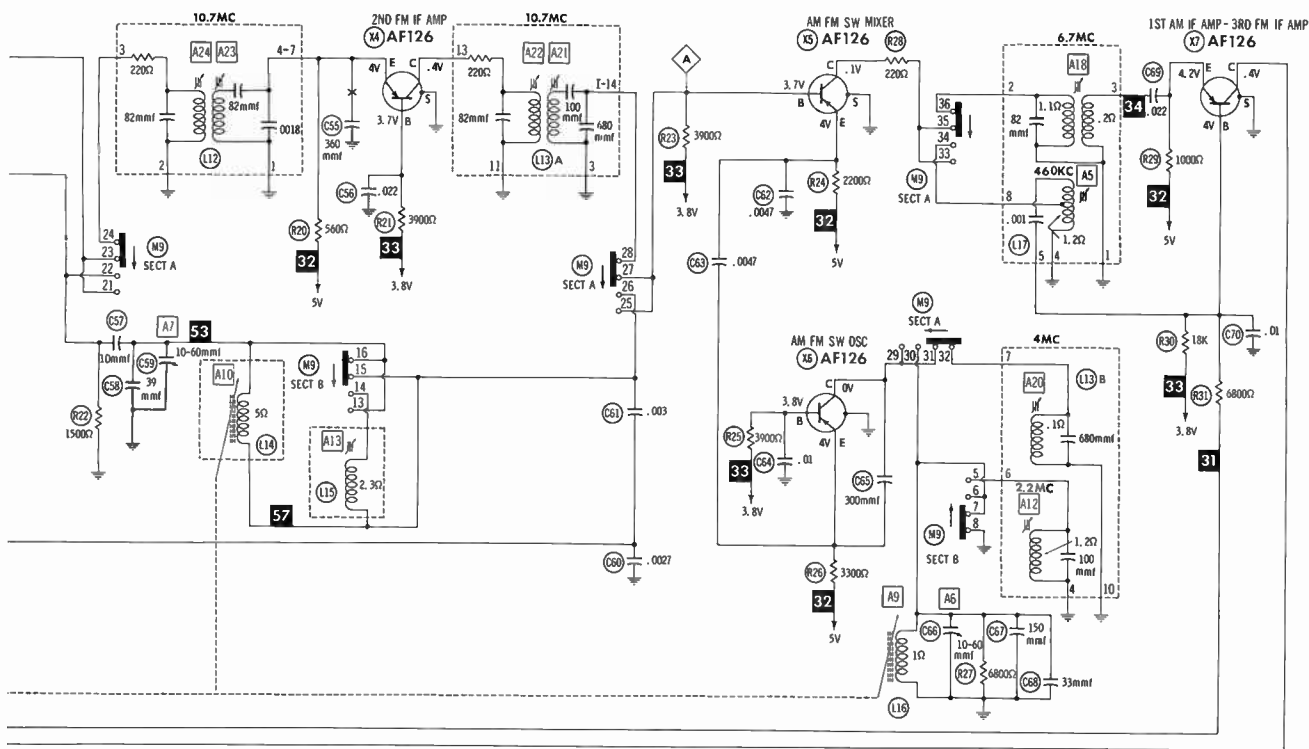
- See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
 with **CIRCUITRACE**  
 ©Howard W. Sams & Co., Inc., 1964

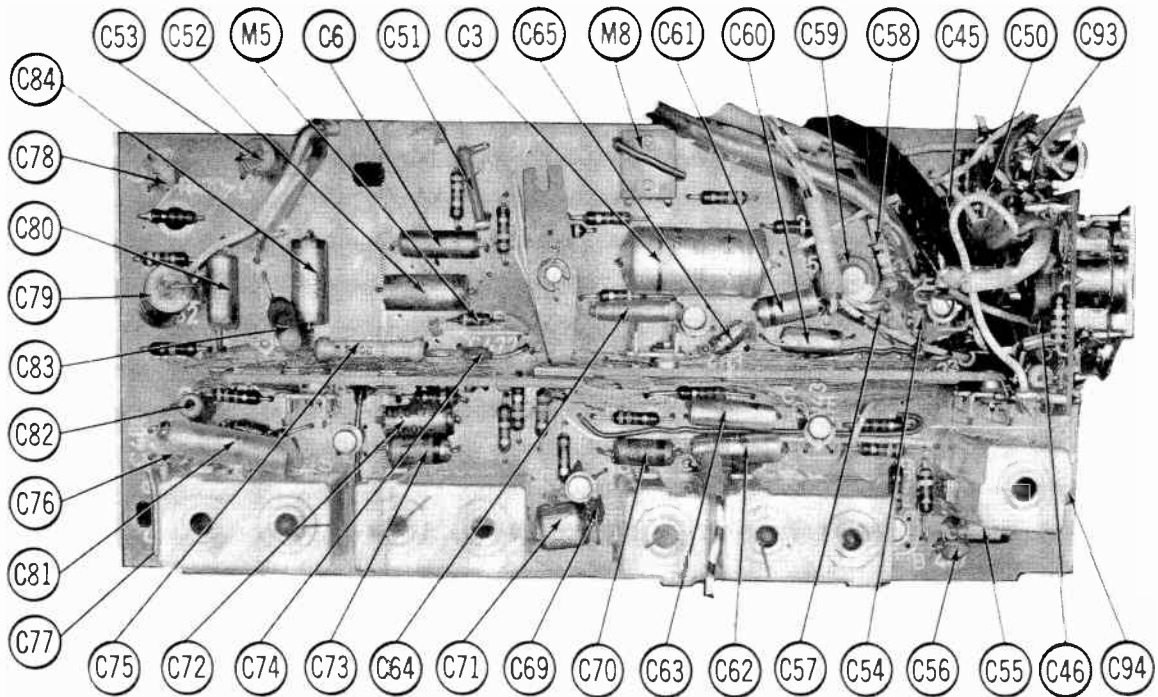
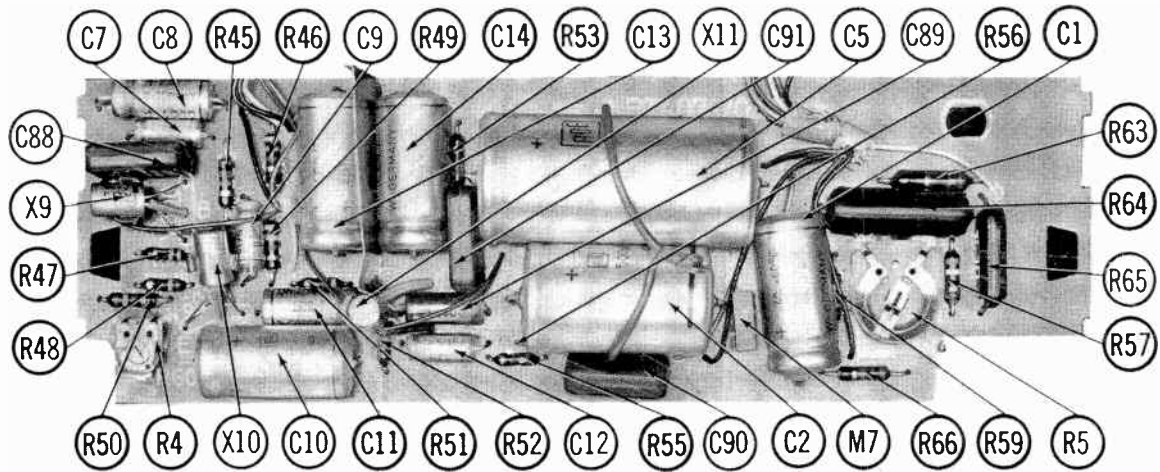
SELECTOR SWITCH (M9)  
 SHOWN IN "FM" POSITION.  
 SWITCH SEQUENCE.

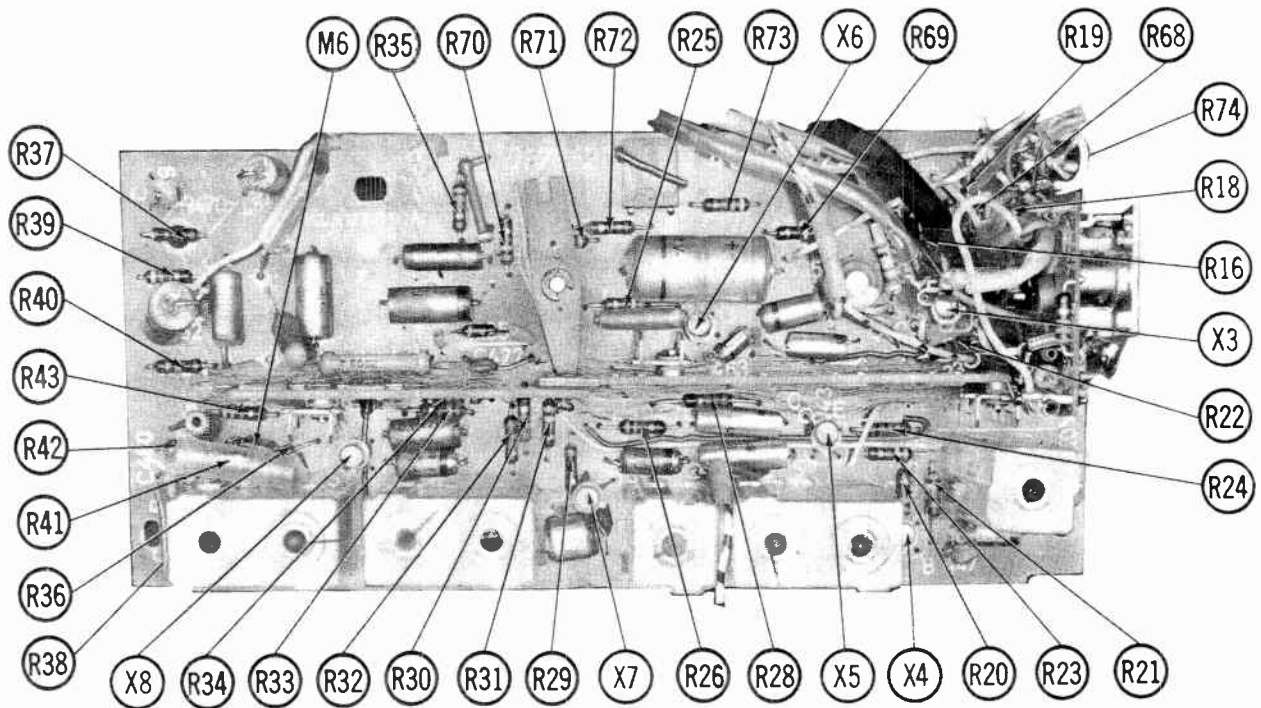
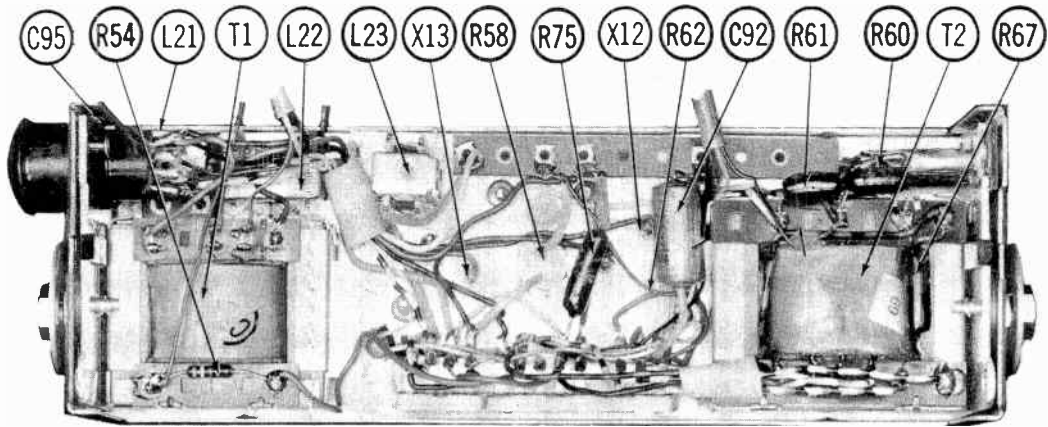






BLAUPUNKT MODEL FRANKFURT US (FROM SERIAL #V510001)





BLAUPUNKT MODEL FRANKFURT US (FROM SERIAL #V510001)

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.

## TRANSISTORS

Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## FIXED CAPACITORS (cont)

ITEM No.	ORIG TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF106	FM RF Amp.	DS-41		2N1177	PNP
X2	AF106	FM Conv.	DS-42		2N1179	PNP
X3	AF126	1st FM IF-AM RF Amp.	DS-34		2N1180	PNP
X4	AF126	2nd FM IF	DS-38		2N1180	PNP
X5	AF126	FM-AM-SW Mixer	DS-35		2N1180	PNP
X6	AF126	FM-AM-SW Osc.	DS-35		2N1180	PNP
X7	AF126	3rd FM-1st AM IF Amp.	DS-37		2N1180	PNP
X8	AF126	FM Limiter-2nd AM IF Amp.	DS-37		2N1180	PNP
X9	AC126	Emitter Follower	DS-26	GE-2	2N591	PNP
X10	AC126	AF Amp.	DS-26	GE-2	2N591	PNP
X11	AC126	Driver	DS-26	GE-2	2N591	PNP
X12	AD150	Output	DS-520	GE-3	2N301	PNP
X13	AD150	Output	DS-520	GE-3	2N301	PNP

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Blaupunkt PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	400	6		CRE337A	BR500-6	QT1-30	BL2121	TC605	TVA-1132
C2	500	15		PRS1220	BR500-15	QT1-30	BL2342	TC1505	TVA-1162
C3	400	6		CRE337A	BR500-6	QT1-30	BL2121	TC605	TVA-1132
C4	1000	6		PRS1130	BR1000-6	QT1-31	BL2321	TC610	TVA-1104
C5	2000	15							
C6	5	15NP							
C7	5	12		CRE404A	NLW5-15	MT1-3	BL1141	TT12X5	TE-1127
C8	40	10		CRE415A	NLW40-10	MT1-16	BL530	TT10X40	TE-1119
C9	5	12		CRE404A	NLW5-15	MT1-3	BL1141	TT12X5	TE-1127
C10	400	6		CRE337A	BR500-6	QT1-30	BL2121	TC605	TVA-1132
C11	40	16		CRE415A	NLW40-15	MT1-16	BL1530	TT10X40	TE-1119
C12	5	12		CRE404A	NLW5-15	MT1-3	BL1141	TT12X5	TE-1127
C13	400	6		CRE337A	BR500-6	QT1-30	BL2121	TC605	TVA-1132
C14	400	6		CRE337A	BR500-6	QT1-30	BL2121	TC605	TVA-1132
C15	100	6							

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C20	27			TCN-27		CN7427	10TCU-Q27	
C21	100		DI-100	DD-101	LA10T1-S3	CCD-101	GP310	5GA-T10
C22	22		NPO-DI22	DTZ-22	C10Q22C	CCTO-220	CNO422	10TCC-Q22
C23	10		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10
C24	10		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10
C25	50							
C26	62		NPO-DI68	TCZ-62	C10Q68C	CCTN-620	GP456	5GA-Q56
C27	22		NPO-DI22	DTZ-22	C10Q22C	CCTO-220	CNO422	10TCC-Q22
C28	22		NPO-DI22	DTZ-22	C10Q22C	CCTO-220	CNO422	10TCC-Q22
C29	3-10							
C30	39		NPO-DI39	TCZ-39	C10Q39C	CCTO-390	GP439	5GA-Q39
C31	27			TCN-27			CN7427	10TCU-Q27
C32	6							
C33	470		NPO-DI6.8	DTZ-6.8	C10V68C	CCTO-6R8	GP568	5GA-V60
C34	47		BPD-00047	CPR-470J	BYA10T47	CCD-471	B347	10TS-T47
C35	4		DI-47	DD-470	LA10Q47-S3	CCD-470	GP447	5GA-Q47
C36	22							
C37	180		NPO-DI22	DTZ-22	C10Q22C	CCTO-220	CNO422	10TCC-Q22
C38	82		DI-82	DD-820	LA10T82-S3	CCD-820	GP482	5GA-T18
C39	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C40	33		NPO-DI33	CPR-33J	C10Q33C	CCTO-330	CNO433	10TCC-Q33
C41	27			TCN-27			CN7427	10TCU-Q27
C42	27			TCN-27			CN7427	10TCU-Q27
C43	3-10							
C44	220		DI-220	DD-221	LA10T22-S3	CCD-221	GP322	10TS-T22

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C45	.047 160V		P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C46	.022		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C47	10-100							
C48	140		DI-150	DD-151	LA10T15-S3	CCD-151	GP315	5GA-T15
C49	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C50	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C51	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C52	.1 160V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C53	.1 160V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C54	6		NPO-DI6.8	DTZ-6.8	C10Q68C	CCTO-6R8	GP568	5GA-V60
C55	360		N750-DI360	CPR-360J	BYA10D47	CCD-391	GP336	5GA-T36
C56	.022		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C57	10		NPO-DI10	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10
C58	39		NPO-DI39	TCZ-39	C10Q39C	CCTO-390	GP439	5GA-Q39
C59	10-60							
C60	.0022		P288N-0022	CPR-2200J	WMF1D22	6DP-1-222	PVC4222	6PS-D22
C61	.003		DI-3000	CPR-3000J	LA10D3-C4	CCD-302	GP230	5GA-D30
C62	.0047		BPD-0047	CPR-4700J	BYA10D47	CCD-482	B247	5HK-D47
C63	.0047		BPD-0047	CPR-4700J	BYA10D47	CCD-482	B247	5HK-D47
C64	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C65	300		DI-300	DD-301	LA10T3-C4	CCD-301	GP330	5GA-T30
C66	10-60							
C67	150		DI-150	DD-151	LA10T15-S3	CCD-151	GP315	5GA-T15
C68	33		N750-DI33	DTN-33	C10Q33C	CCTN-330	CN7433	10TCU-Q33
C69	.022		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C70	.01		BPD-01	CPR-10000J	BYA10S1	CCD-103	B110	5HK-S10
C71	.0033		BPD-0033	CPR-3300J	BYA10D33	CCD-332	B233	5HK-D33
C72	.047 160V		P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C73	.01		BPD-01	CPR-10000J	BYA10S1	CCD-103	B110	5HK-S10
C74	.022		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C75	200		DI-200	DD-201	LA1T2-S3	CCD-201	GP320	5GA-T20
C76	470		BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47
C77	470		BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47
C78	180		DI-180	DD-181	LA10T18-S3	CCD-181	GP318	5GA-T18
C79	.47 160V		BE2P5		DPMS2P5	1DP-4-504	PVC105	2PS-P50
C80	.01 400V		BPD-01	CPR-10000J	BYA10S1	CCD-103	B110	5HK-S10
C81	510		DI-500	DD-511	LA10T5-C4	CCD-501	GP350	5GA-T50
C82	150		DI-150	DD-151	LA10T15-S3	CCD-151	GP315	5GA-T15
C83	150		DI-150	DD-151	LA10T15-S3	CCD-151	GP315	5GA-T15
C84	.1 160V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C85	510		DI-500	DD-511	LA10T5-C4	CCD-501	GP350	5GA-T50
C86	.01 400V		BPD-01	CPR-10000J	BYA10S1	CCD-103	B110	5HK-S10
C87	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C88	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C89	.01 125V		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C90	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C91	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C92	.47 125V		BE2P5		DPMS2P5	1DP-4-504	PVC105	2PS-P50
C93	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C94	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C95	.022		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C96	.1 125V		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10

† Not used in some versions.  
‡ Alternate Value.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA			
			Blaupunkt PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.
RIA	Tone	1meg				
B	Volume	200K Tap @ 50K				
R2	Bias	5000Ω				
R3	Bias	1500Ω				
R4	Gain	100Ω				
R5	Bias	6Ω				
		2W				

**PARTS LIST AND DESCRIPTION (CONTINUED)**

**COILS (RF-IF)**

ITEM No.	USE	REPLACEMENT DATA			
		Blaupunkt PART No.	MERIT PART No.	STANCOR PART No.	WORMAN PART No.
L1	RF Choke (1uh)	BC-561	4602	RTC-8515	T855
L2	FM Ant. Matching				
L3	RF Choke				
L4	RF Choke				
L5	FM HF				
L6	RF Choke				
L7	1st 10,7MC FM IF				
L8	1st FM Osc.				
L9	RF Choke (1.5uh)				
L10	BC Ant.				
L11	SW Ant.				
L12	2nd 10,7MC FM IF				
L13A	3rd 10,7MC FM IF				
L13B	2nd FM Osc.				
L14	BC RF				
L15	SW RF				
L16	AM Osc.				
L17A	1st 6,7MC FM IF				
L17B	1st AM IF				
L18A	FM Limiter & TMC				
L18B	2nd AM IF				
L19A	Ratio Detector				
L19B	3rd AM IF				
L20	Tone Choke				
L21	A. Lead Choke				
L22	B plus Choke				
L23	B plus Choke				

**TRANSFORMER (DRIVER)**

ITEM No.	TURNS RATIO	REPLACEMENT DATA			
		Blaupunkt PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON TRIAD PART No.
T1	7 PRI. 1 SEC.				

**TRANSFORMER (AUDIO OUTPUT)**

ITEM No.	IMPEDANCE	REPLACEMENT DATA			
		Blaupunkt PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON TRIAD PART No.
T2	12Ω PRI. 6Ω Tap @ 3Ω SEC.				

**FUSES**

ITEM No.	TYPE	RATING	REPLACEMENT DATA			
			Blaupunkt PART No.	LITTEL FUSE PART No.	FUSE HOLDER PART No.	FUSE HOLDER
M1	2A	250V				GMA2

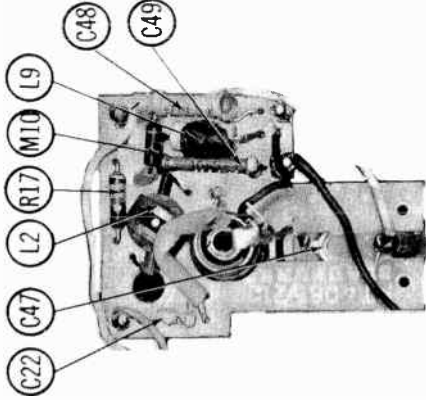
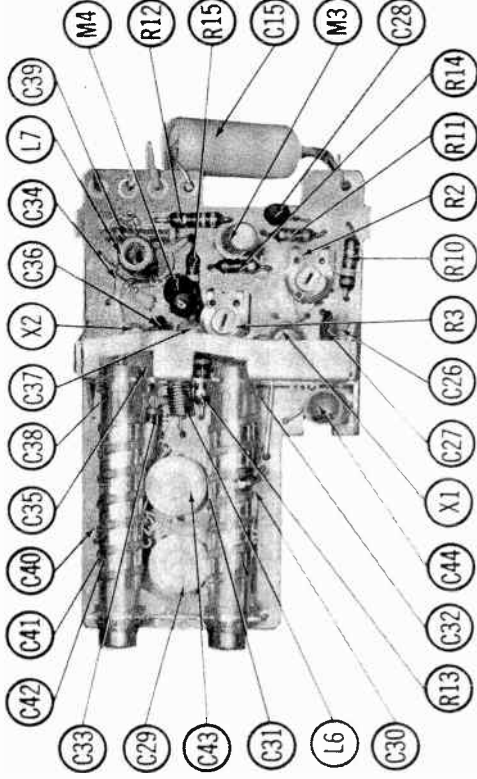
**MISCELLANEOUS**

ITEM No.	PART NAME	Blaupunkt PART No.	NOTES
M2	Tuner	Z4B	
M3	Zener	B1S2	
M4	Bias Reg.	AA119	
M5	AVC Limiter	AA119	
M6	AF Det.	E30C80	
M7	Bias Reg.	E30C80	
M8	Bias Reg.	E30C80	
M9	Selector Switch	BA100	
M10	FM Limiter		

**WIRING DATA**

8530 (Solid) Available in 12 Colors	Use BLIDEN No.
8524 (Stranded) Available in 12 Colors	Use BLIDEN No.
8885	Use BLIDEN No.
8782 (Stranded) Coded Parallel Leads	Use BLIDEN No.
8661 (3/8 in.) or 8670 (3/4 in.)	Use BLIDEN No.
Shielded Hook-up Wire	Use BLIDEN No.
Rear Seat Speaker Extension Cable	Use BLIDEN No.
Bonding Strap	Use BLIDEN No.

**BLAUPUNKT MODEL FRANKFURT US (FROM SERIAL #V510001)**



# ALIGNMENT INSTRUCTIONS

Check for specified source voltage. Use only enough generator output to provide a usable indication. Suggested Alignment Tools: A1 thru A29    GENERAL CEMENT: 9440 <span style="float: right;">WALSCO: 2501</span>					<b style="text-align: center;">PUSH-BUTTON ADJUSTMENT</b> 1. Pull button out. 2. Tune manually to desired station. 3. Press button in firmly. 4. Repeat for remaining buttons.
Selector in "AM" Position					
SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. High side thru .1mf to point $\text{A}$ , low side to ground.	460KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4, A5	Adjust for maximum.
2. Thru dummy (Fig. 1) to antenna receptacle.	1640KC	"	"	A6, A7, A8	"
Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. IF necessary, back tuning cores (A8, A9, A10) out of coils but not out of forms. Repeat step 2.					
3. Thru dummy (Fig. 1) to antenna receptacle.	1000KC	Tune to Signal.	Output Meter across voice coil.	A9, A10, A11	Adjust for maximum. Repeat steps 2 & 3 until no further improvement is noted.
4. Selector in "M" Position Thru dummy (Fig. 1) to antenna receptacle.	2.3MC	Tune To Signal	Output Meter across voice coil	A12, A13, A14	Adjust for maximum.

### FM ALIGNMENT USING AM SIGNAL GENERATOR - SELECTOR IN FM POSITION

High side thru .1mf to Point $\text{A}$ , low side to ground.				
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 6.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\text{B}$ ; common to ground.	A15, A16, A17, A18	Adjust for maximum.
6. "	"	DC probe to point $\text{C}$ ; common to	A19	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR - SELECTOR IN FM POSITION

High side to ungrounded shield over FM converter, low side to ground. Use only enough marker signal to obtain indication. Use 60% frequency modulated signal with 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.				
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 6.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\text{B}$ ; low side to ground.	A15, A16, A17, A18	Disconnect stabilizing capacitor C79. Adjust for maximum gain and symmetry of response similar to Fig. 2 with marker as shown. Reconnect C79.
6. "	"	Vert. amp. to point $\text{C}$ ; low side to	A19	Adjust A19 (Secondary) to place marker at center of crossover lines similar to Fig. 3. Adjust A15 (Primary) for maximum amplitude and straightness of crossover lines.

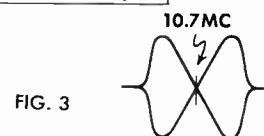
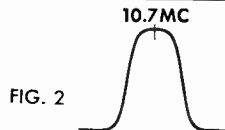
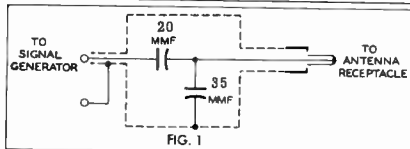
High side thru .1mf to point $\text{A}$ .				
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
7. 10.7MC (Unmod.)	Point of non-interference	DC probe of VTVM to point $\text{B}$ ; common to ground.	A20	Adjust for maximum.

### FM ALIGNMENT USING AM SIGNAL GENERATOR - SELECTOR IN FM POSITION

High side thru dummy Ant. Fig. 1 to Ant receptacle.				
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
8. 10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\text{B}$ ; common to ground.	A21, A22, A23, A24, A25	Adjust for maximum.

### FM RF ALIGNMENT

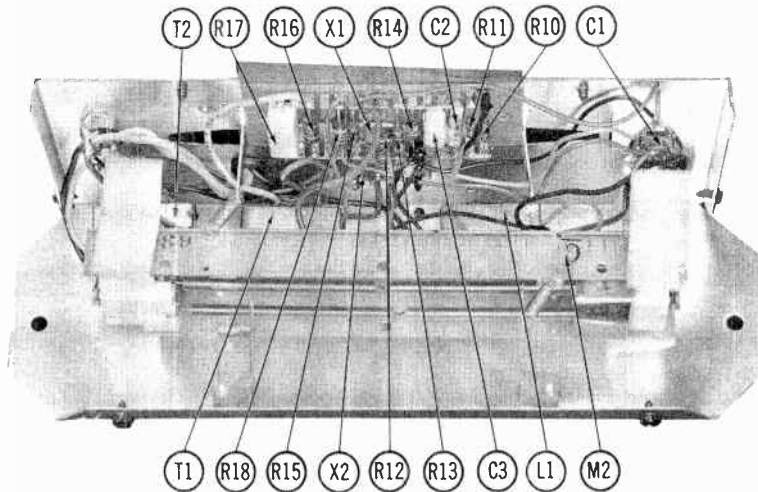
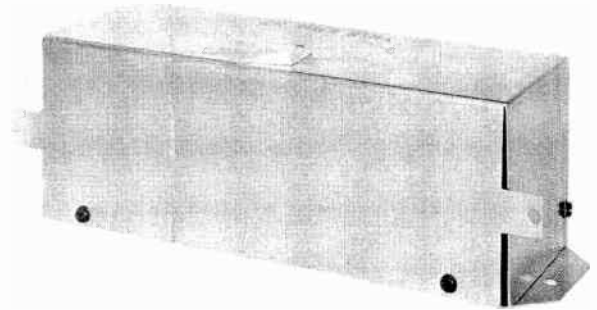
Thru dummy Ant. Fig. 1 to Ant. receptacle.				
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
9. 108MC	Set at high end.	DC probe of VTVM to point $\text{B}$ ; common to ground.	A26, A27	Adjust for maximum.
10. 90MC	Tune to signal.	"	A28, A29	Rock tuning and adjust for maximum. Repeat steps and until no further improvement can be made.
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A8 for maximum output.				



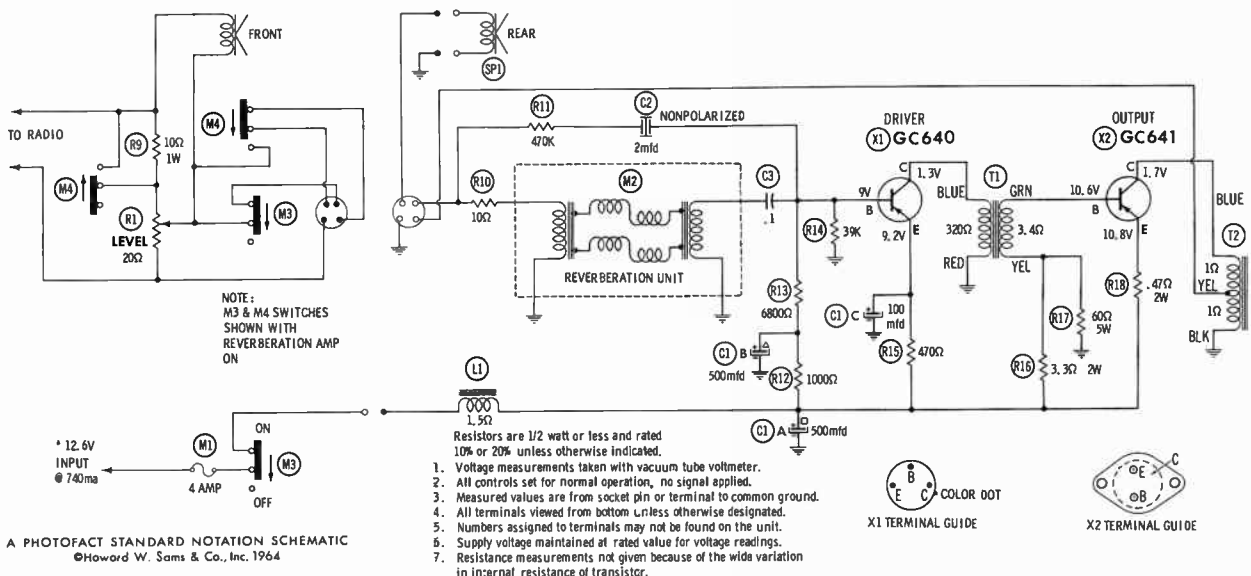


# PHOTOFACT<sup>®</sup>

TRADE NAME : Cletron Models RU-101, RU-104  
 SUPPLIER : For Current Address, See Master Index  
 TYPE SET : 2 Transistor Reverberation Unit  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .74 Amp. @ 12.6 Volts DC



CLETRON MODELS RU-101, RU-104



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
 ©Howard W. Sams & Co., Inc. 1964

CLETRON MODELS RU-101, RU-104

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	GC840	Driver	DS-26	GE-2	2N591	PNP
X2	GC841	Output	DS-520	GE-3	2N301	PNP *

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	15		AFH3-00-94.5		XC3-48		FP-300.83	TVL-3026.8
B	500	15							
C	100	15							
C2	2	15NP		NP-PRS-7300				TCN502	TVANS-1202*

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.1	100V		P288N-1		WMF1P1	IDP-2-104	PVC-101	2PS-P10

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1	Level (Reverb,)	20Ω					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L1	740ma	1.5Ω	11MH						

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	15:	1						

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	12Ω Tap@	8Ω						

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		PART No.	QUAM PART No.	
SP1	6" x 9" PM 8Ω	69A2Z8		

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	4			307004	155004	SFE 4	HMF

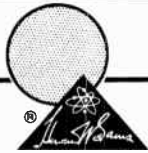
## MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Reverb. Unit		
M3	Switch		
M4	(On-Off, Speaker) Switch (Reverb)		

## WIRING DATA

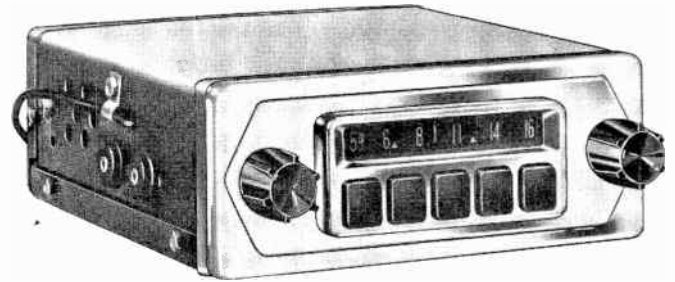
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8870 (3/4 In.)





# PHOTOFACT<sup>®</sup>

TRADE NAME : Firestone Model 3-D-6A  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 5 Transistor AM Receiver  
 POWER SUPPLY : 6 or 12 Volt Storage Battery  
 RATING : .440 Amp. @ 6.3 Volts DC  
 .660 Amp. @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC



## ALIGNMENT INSTRUCTIONS

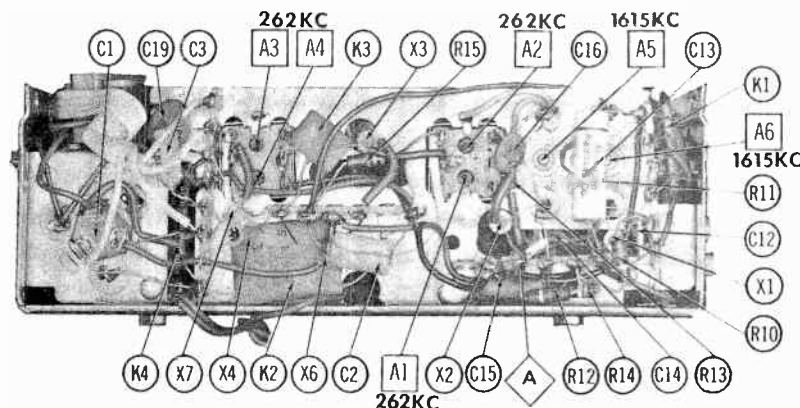
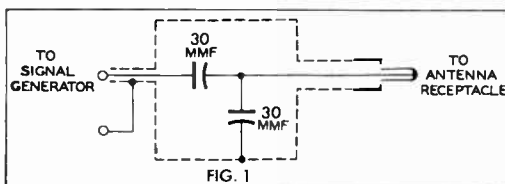
Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools: A1 thru A7    GENERAL CEMENT: 9440    WALSCO: 2501

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

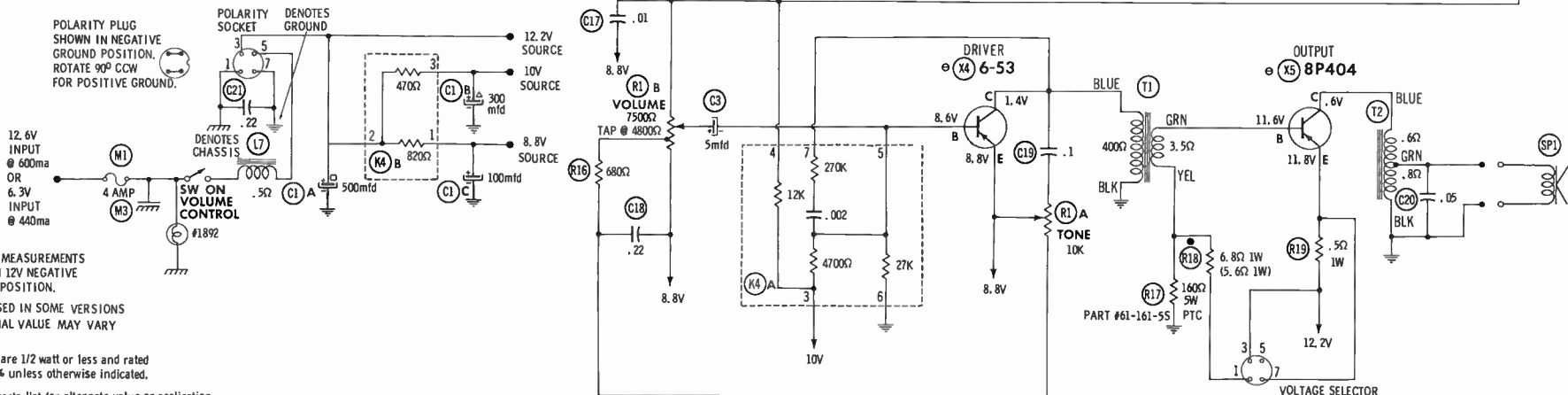
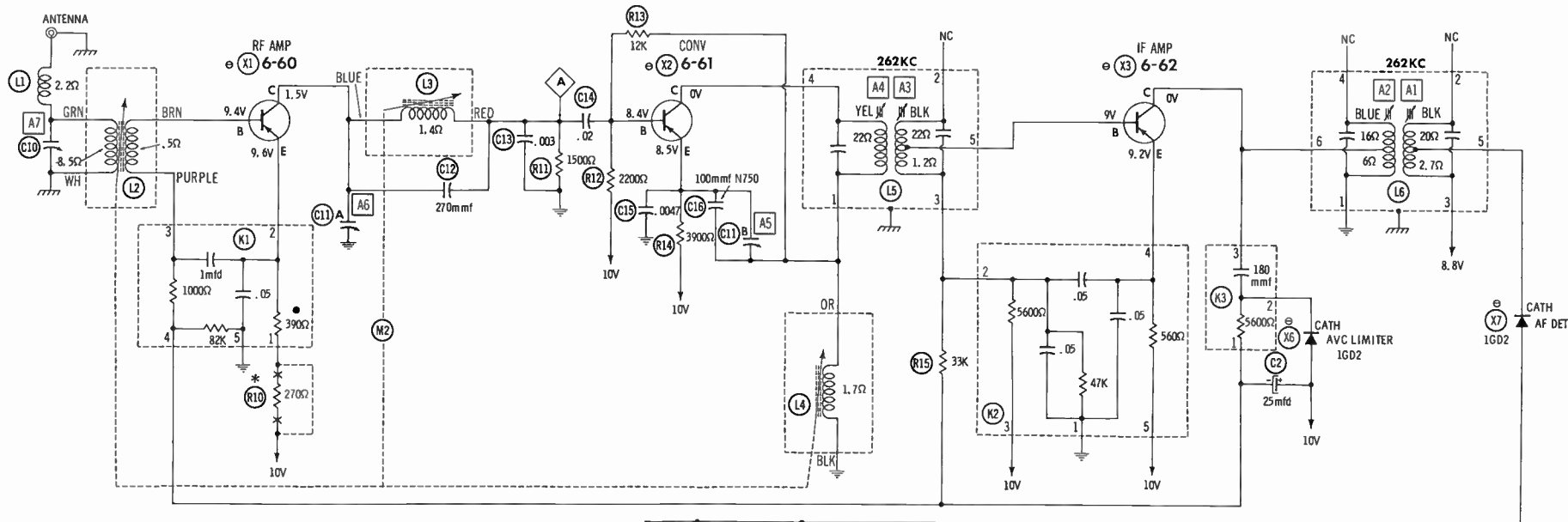
### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



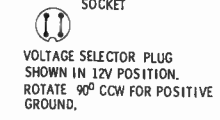
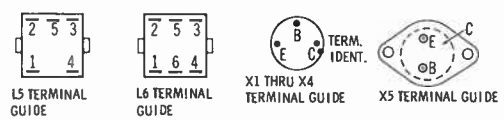
FIRESTONE MODEL 3-D-6A

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



VOLTAGE MEASUREMENTS TAKEN IN 12V NEGATIVE GROUND POSITION.  
 \* NOT USED IN SOME VERSIONS  
 • NOMINAL VALUE MAY VARY

- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- See parts list for alternate value or application.
  - Voltage measurements taken with vacuum tube voltmeter.
  - All controls set for normal operation, no signal applied.
  - Measured values are from socket pin or terminal to common ground.
  - All terminals viewed from bottom unless otherwise designated.
  - Numbers assigned to terminals may not be found on the unit.
  - Supply voltage maintained at rated value for voltage readings.
  - Resistance measurements not given because of the wide variation in internal resistance of transistor.



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
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**FIRESTONE MODEL 3-D6A**

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-80 (2N640)†	RF Amp.	DS-25	GE-1	2N1637	PNP
X2	6-61 (2N642)†	Conv.	DS-25	GE-1	2N1639	PNP
X3	6-62 (2N641)†	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	6-53 (2N591)†	Driver	DS-26	GE-2	2N591	PNP
X5	8P404 (2N176)†	Output	DS-520	GE-3	2N301	PNP*

† Alternate Type Number.

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X6		1GD2 (1N295)†					1N34AS
X7		1GD2 (1N295)†					1N34AS

† Alternate type number.

## ELECTROLYTIC CAPACITORS

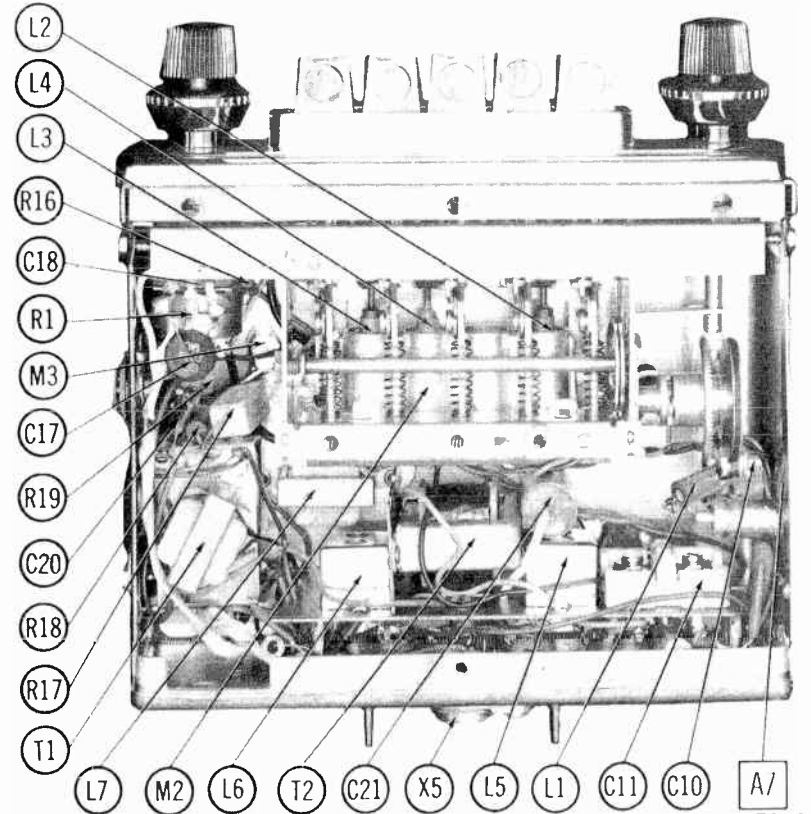
ITEM No.	RATING		PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFH3-00-04.5		XC3-48.1		FP300.53	TVLS-3026.1*
B	300	16							
C	100	16							
C2	25	15	20-256	PTT69	NLW25-15	MT1-10	MLV25-15	TT15X25	TE-1157.1
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10		#28-800-2L						
C11A		#28A1332						
B								
C12	270		DI-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T270
C13	.003 200V		BE8D3	CPR-3000J	DPMS6D33	6DP-1-302	PVC423	6PS-D30
C14	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C15	.0047 200V		P288N-0047	CPR-4700J	WMF2D47	6DP-1-472	PVC4247	6PS-D47
C16	100 N750		N750-DL100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-B10
C18	.22 3V			UK20-204	HCC25224Z			HY-325
C19	.1 16V		TTD-1	CK-104	H6		TA010	TG-P10
C20	.05		TTD-05	CK-503	H5		TA150	TG-S60
C21	.22 200V		P288N-22		DPMS2P22	1DP-3-224	PVC1022	2PB-P22

\* Part Number.



1615KC

FIRESTONE MODEL 3-D6A

## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				
			PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A B	Tone Volume/Switch	10K 7500Ω Tap @ 4800Ω	80A3566				†QJ-1786A

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-116, P17-112 (Panel)  
B21-115X, R-28-121 (Rear)  
"SNAPTROL" Equivalent: BU15, CF9, CR48T, SF10, SR9, GC.  
QCB5 (Bushing)  
76-1 (Switch)

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1 L2 L3 L4 L5 L6	RF Choke (6.2uh) Ant. RF Osc. Input IF Output IF	14-8.2 ① ① ① 14-8233A 14-3234A	BC-585	4610	RTC-8520	T859	① Part of M2.

### FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	
L7	600ma @ 12.0V 440ma @ 8.3V	.5Ω	10MH	75A3082	C-4095	TC-2	TR-155	T717KT

### TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	8:	1	75A2635				TR-184	

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	24Ω Tap	@ 8Ω	75A2638				TR-189	

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		PART No.	QUAM PART No.	
SP1	5" X 7" PM 4" Round PM	8Ω 8Ω	73B2825 73B3553	

### COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Automatic PART No.	REPLACEMENT DATA
K1 K2	RF Amp. Network IF Amp. Network	390Ω, 1000Ω, 82K, .05mfd, 1mfd 580Ω, 5800Ω, 47K, .05mfd, .05mfd, .05mfd	89A2582C 89A2584	
K3 K4	AVC Audio Network	5800Ω, 180mmf 470Ω, 820Ω, 4700Ω, 12K, 27K, 270K, .002mfd	89A2701 89A2585	

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A			303004	155009	AGW4	HDE

### MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Tuner	78B3587	Pushbutton Manual
M3	Spark Plate	78B3591 43-216	

### CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Escutcheon Knob-Tuning or Volume Knob-Tone	54C2357 47-50BC 47B393	Knob-Dummy Knob-Spacer Pushbutton	48A393-1 47A1249 55A1734

### WIRING DATA

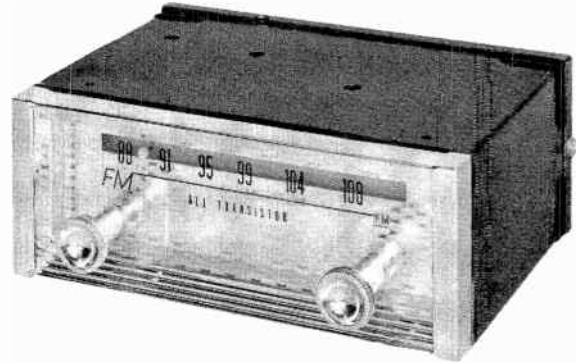
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8685
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 in.) or 8670 (3/4 in.)



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

TRADE NAME : Firestone Model 3-D-15  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 8 Transistor FM Converter  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .330 Amp. @ 12.6 Volts DC  
 TUNING RANGE : FREQ. MOD. 88-108MC



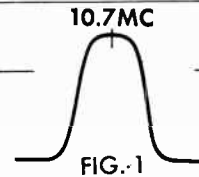
## ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
 CAUTION: Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
 Suggested Alignment Tools:  
 A1 thru A13      GENERAL CEMENT: 5009, 8728A, 8987      WALSCO: 2531X, 2536

### FM ALIGNMENT USING AM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

High side to of generator thru .01mfd to point  $\diamond A$ , low side to ground for IF.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\diamond B$ ; common to ground.	A1 thru A8	Adjust for maximum.
"	"	DC probe to point $\diamond C$ ; common to	A9	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.



### FM IF ALIGNMENT USING FM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

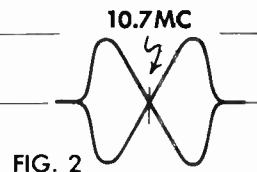
High side thru .01mfd to point  $\diamond A$ , low side to ground. Use 60v frequency modulated signal with 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\diamond B$ ; low side to ground.	A1 thru A8	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C3.
"	"	Vert. amp. to point $\diamond C$ ; low side to	A9	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator across antenna input with 120Ω carbon resistors in series with each lead.

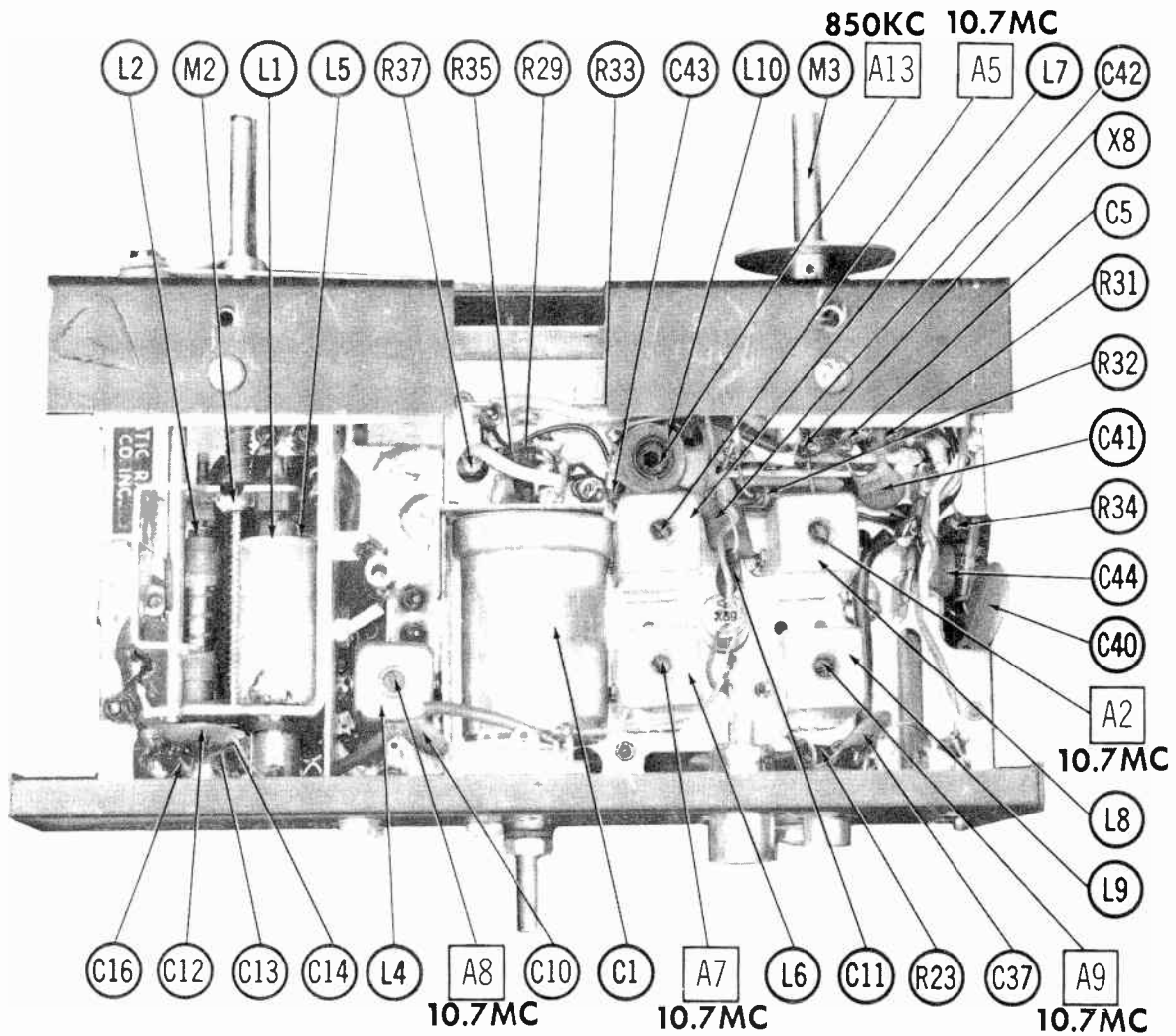
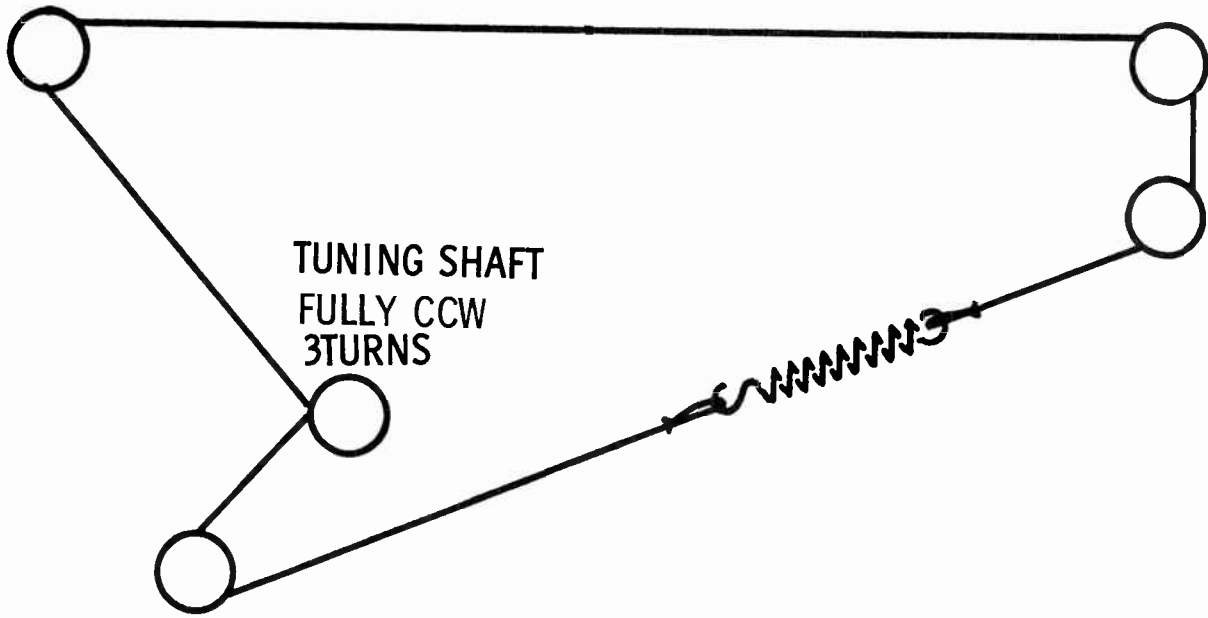
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MC	108MC	DC probe of VTVM to point $\diamond B$ ; common to ground.	A10, A11, A12	Adjust for maximum.

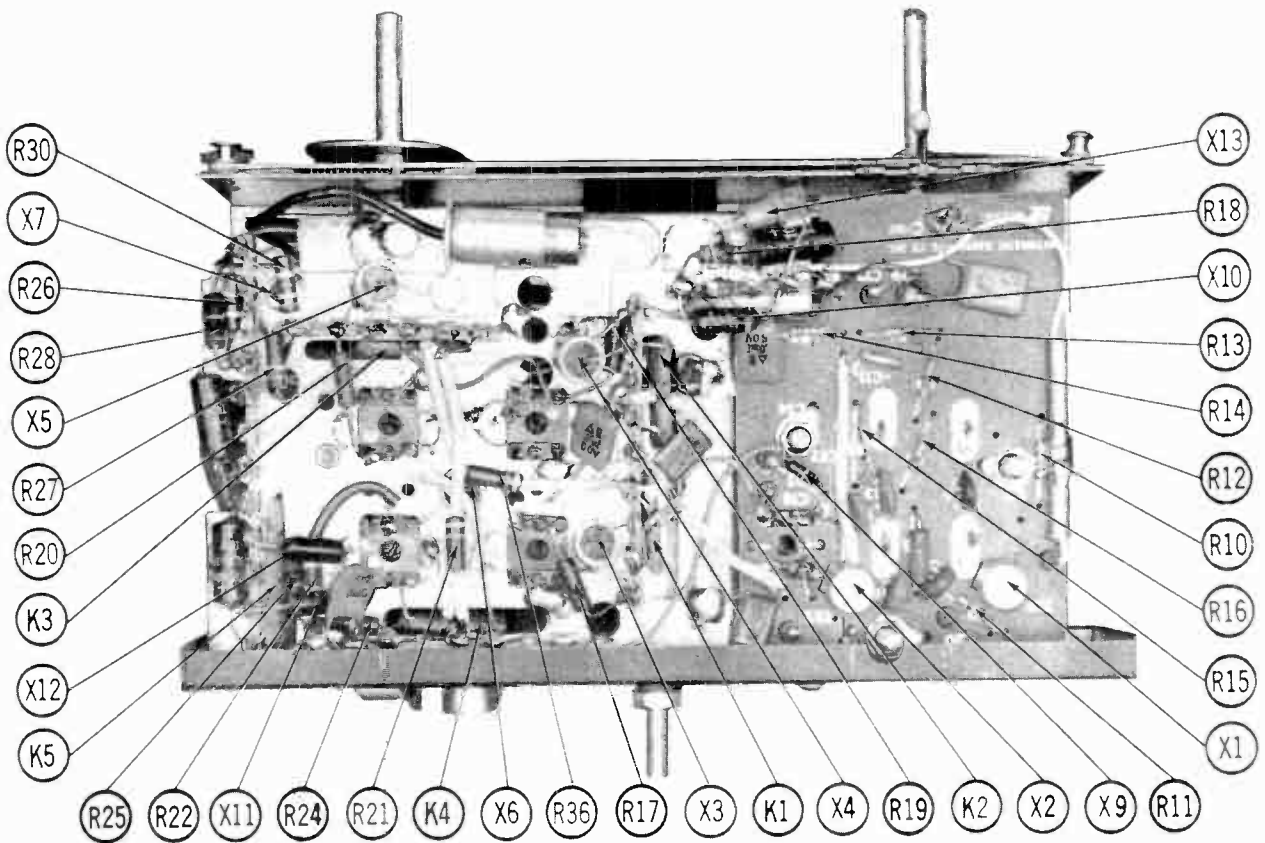
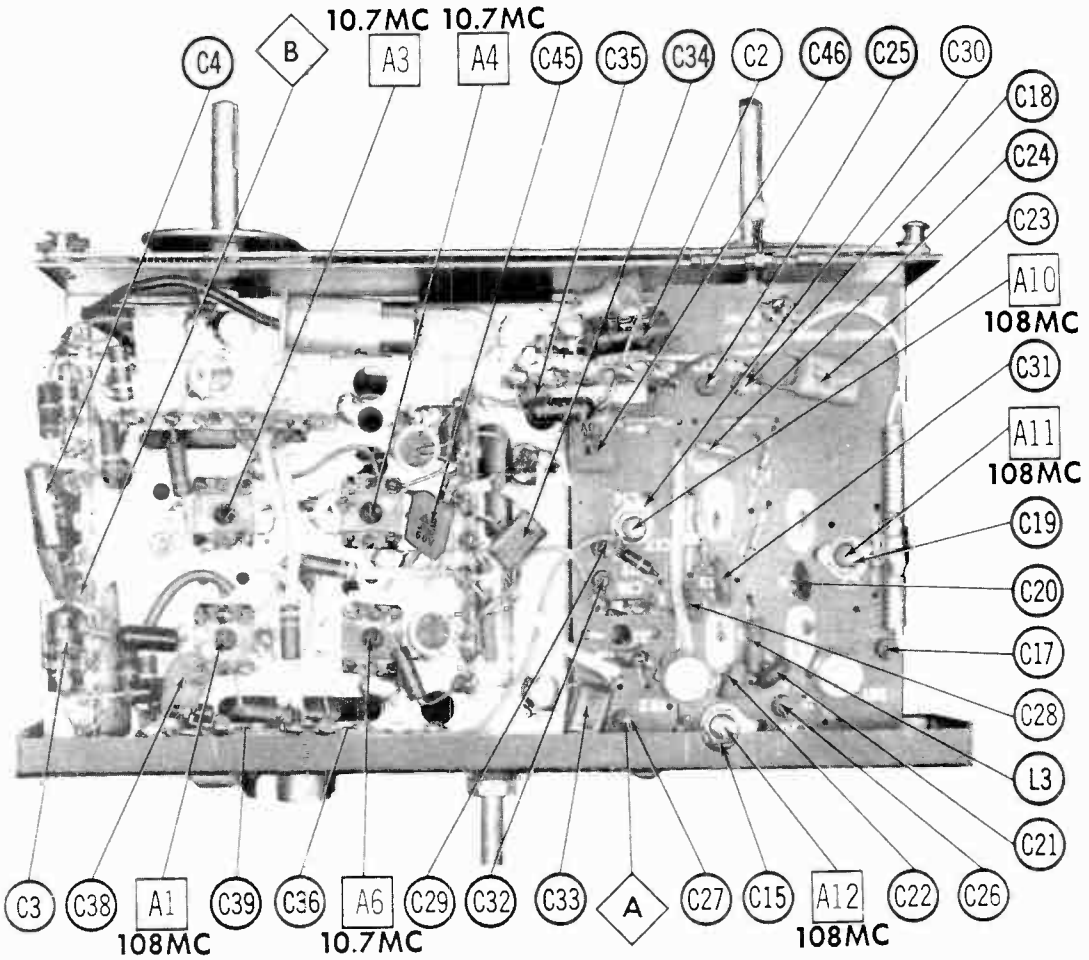


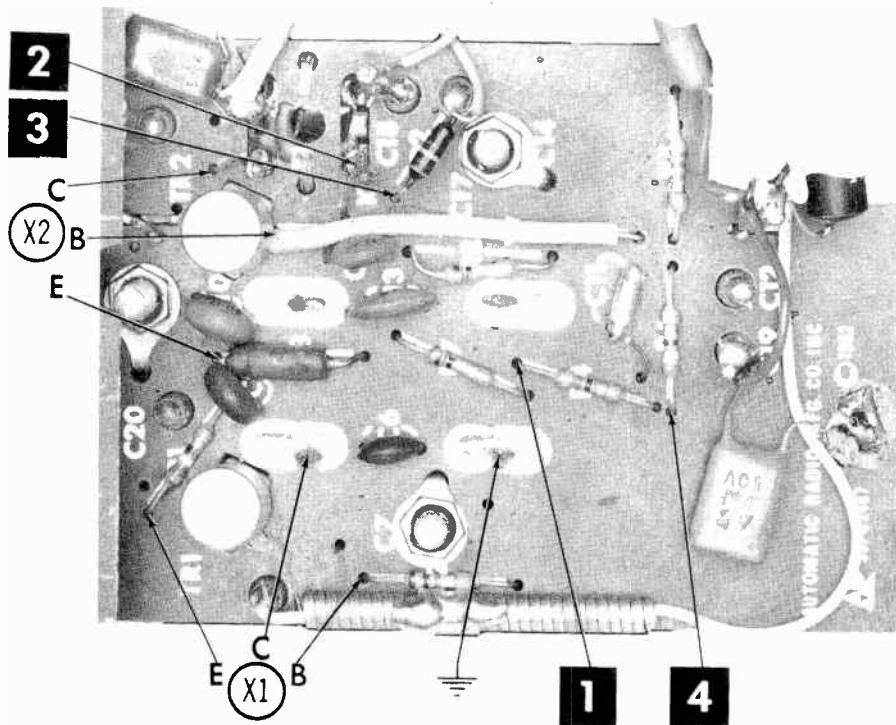
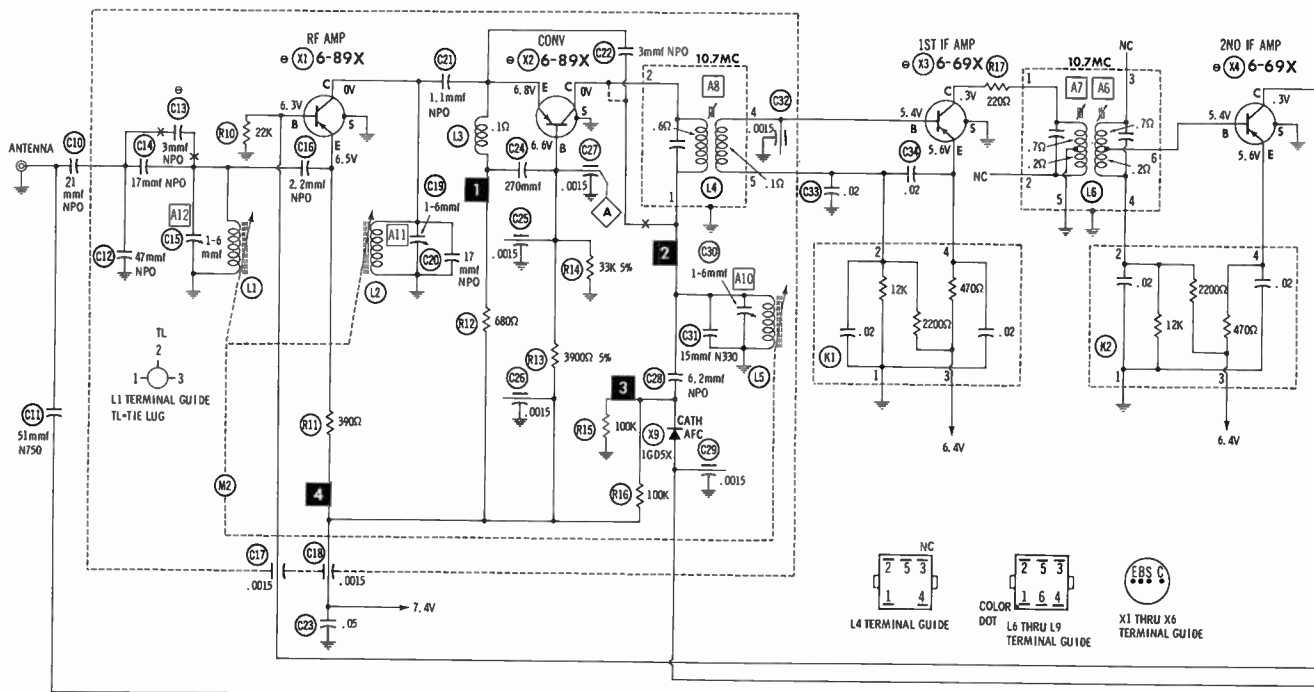
After unit is installed in car, tune in the AM receiver to a point of noninterference near 850KC. Tune in an FM signal and adjust A13 for maximum output.

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

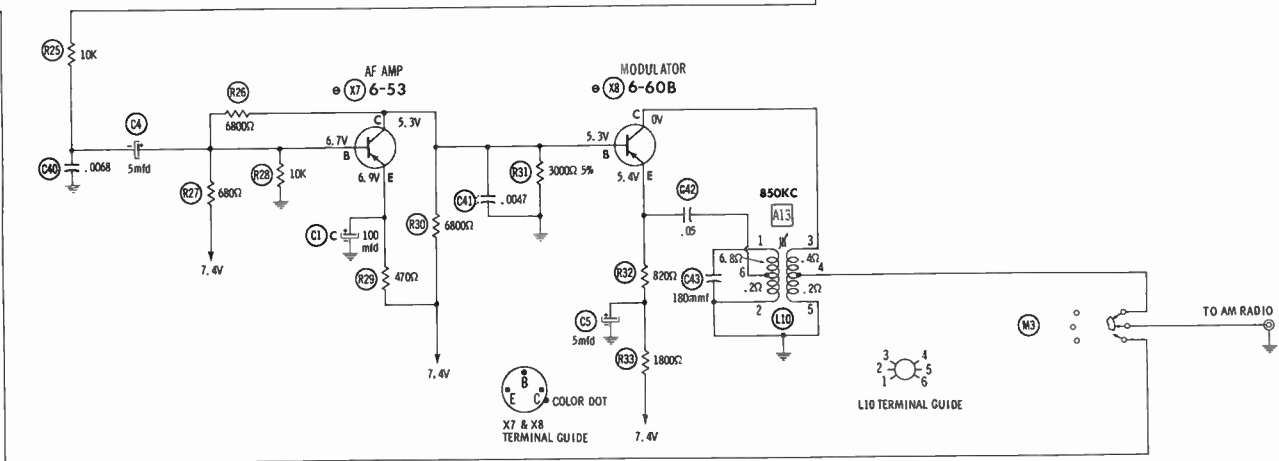
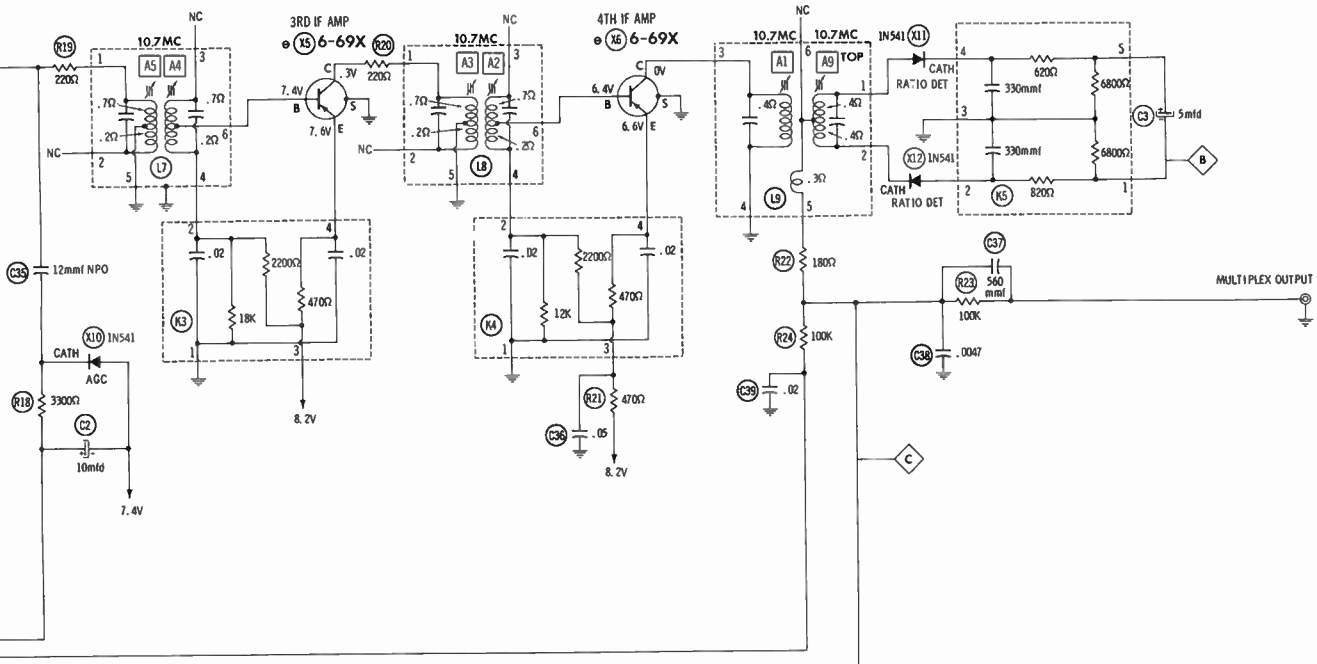
# DIAL CORD STRINGING









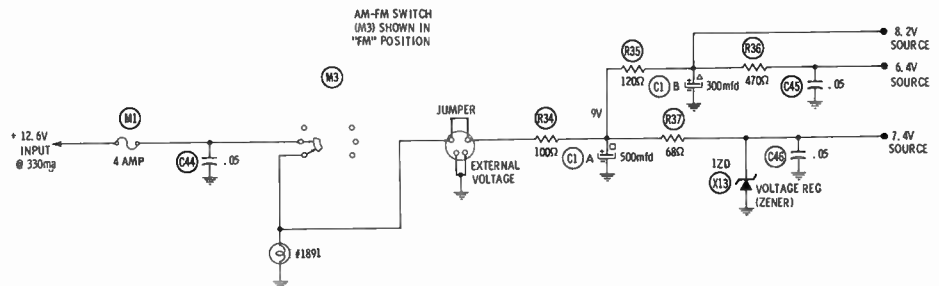


Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

1. See parts list for alternate value or application.
2. Voltage measurements taken with vacuum tube voltmeter.
3. All controls set for normal operation, no signal applied.
4. Measured values are from socket pin or terminal to common ground.
5. All terminals viewed from bottom unless otherwise designated.
6. Numbers assigned to terminals may not be found on the unit.
7. Supply voltage maintained at rated value for voltage readings.
8. Resistance measurements not given because of the wide variation in internal resistance of transistor.

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 with **CIRCUITRACE**

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FIRESTONE MODEL 3-D-15

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.

Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

## FIXED CAPACITORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-89X (2N2089)†	RF Amp.	DS-41		2N1177	PNP
X2	6-89X (2N2089)†	Conv.	DS-42		2N1179	PNP
X3	6-89X (2N209)†	1st IF Amp.	DS-37		2N1180	PNP
X4	6-89X (2N209)†	2nd IF Amp.	DS-37		2N1180	PNP
X5	6-89X (2N209)†	3rd IF Amp.	DS-37		2N1180	PNP
X6	6-89X (2N209)†	4th IF Amp.	DS-37		2N1180	PNP
X7	6-53 (2N591)†	AF Amp.	DS-26	GE-2	2N591	PNP
X8	6-80B (2N640)†	Modulator	DS-25	GE-1	2N1839	PNP

† Alternate type number.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X9		1GD5X					IN34AS
X10		IN541					IN34AS
X11		IN541*					IN34AS
X12		IN541*					IN34AS
X13		1ZD8. 2V					INB4AS

\* Matched pair.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFB3-00-94.5	CC0012	XC3-46.1		FP300.83	TVLS-3026.1*
B	300	16							
C	100	16							
C2	10	15	20-106	CRE457A	NLW10-15	MT1-5	MLV10-15	TT15X10	TE-1155
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C4	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C5	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	21	NPO	NPO-DI20	DTZ-20	C10Q2C	CCTO-200	CNO420	10TCC-Q22	
C11	51	N750	N750-SI50	TCN-51	C10Q51U			10TCC-Q50	
C12	47	NPO	NPO-DI47	DTZ-47	C10Q47C	CCTO-470	CNO447	10TCC-Q47	
C13	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30	
C14	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18	
C15	1-6								
C16	2.2	NPO	NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22	
C17	.0015		MFT-001	MFT-1000		CCF-102	CT280A		
C18	.0015		EF-001	MFT-1000		CCF-102	CT280A		
C19	1-6								
C20	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18	
C21	1.1	NPO	NPO-DI1	TCZ-1	C10V15C		CNO510	10TCC-V10	
C22	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30	
C23	.05		TTD-05	CK-503	H5		TA150	TG-850	
C24	270		NPO-SI270	TCZ-270	LA10T27-C4	CCD-271	CNO327	10TCC-T27	
C25	.0015		EF-001	MFT-1000		CCF-102	CT280A		
C26	.0015		EF-001	MFT-1000		CCF-102	CT280A		
C27	.0015		EF-001	MFT-1000		CCF-102	CT280A		

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C28	6.2	NPO	#15-6.2					
C29	.0015			EF-001	MFT-1000		CCF-102	CT280A
C30	1-8		#28-156					
C31	15	N330			TCA-15			10TCS-Q15
C32	.0015			EF-001	MFT-1000		CCF-102	CT280A
C33	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120
C34	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120
C35	12	NPO		SI-12	TCZ-12	LA10Q12-SL	CCTO-120	CNO410
C36	.05			TTD-05	CK-503	H5		TA150
C37	560			DI-560	DD-561	LA10T56-C4	CCD-561	GP356
C38	.0047			BPD-0047	DD-472	BYA10D47	CCD-472	B247
C39	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120
C40	.0068			DI-6800	DD-682	BYA10D68	CCD-682	GP268
C41	.0047			BPD-0047	DD-472	BYA10D47	CCD-472	B247
C42	.05			TTD-05	CK-503	H5		TA150
C43	180			DI-180	DD-181	LA10T18-S3	CCD-181	GP318
C44	.05			TTD-05	CK-503	H5		TA150
C45	.05			TTD-05	CK-503	H5		TA150
C46	.05			TTD-05	CK-503	H5		TA150

① Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	REMARKS	REPLACEMENT DATA					NOTES
			PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.							
L2	RF	①						① Part of M2.
L3	RF Choke	14-.82		TV-182	4594			
L4	1st IF	14-2520				T804		
L5	Osc.	①						
L6	2nd IF	14-2933						
L7	3rd IF	14-2933						
L8	4th IF	14-2933						
L9	Ratio Detector	14-2522						
L10	Osc.	14A3364						

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K1	1st IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K2	2nd IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K3	3rd IF Network	470Ω, 2200Ω, 18K, .02mfd, .02mfd	89A2014	
K4	4th IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K5	Ratio Detector Network	680Ω, 820Ω, 6800Ω, 6800Ω, 330mmf, 330mmf	89A2538	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A						

## MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Tuner	78B2467	
M3	Selector SW	94A3018	

## WIRING DATA

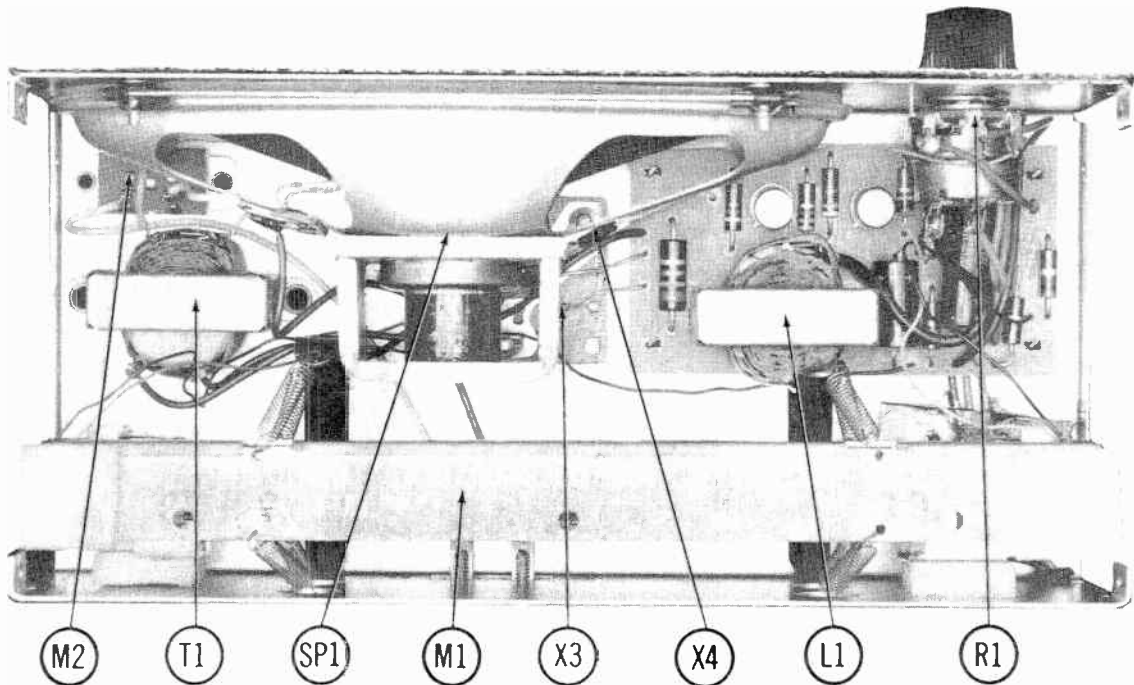
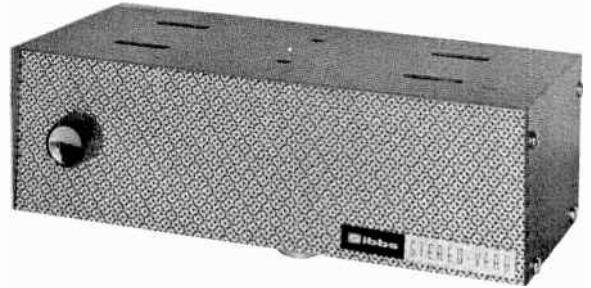
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Shielded Hook-up Wire	8524 (Stranded) Available in 12 Colors
Rear Seat Speaker Extension Cable	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
	Use BELDEN No. 8681 (3/8 In.) or 8670 (3/4 In.)



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

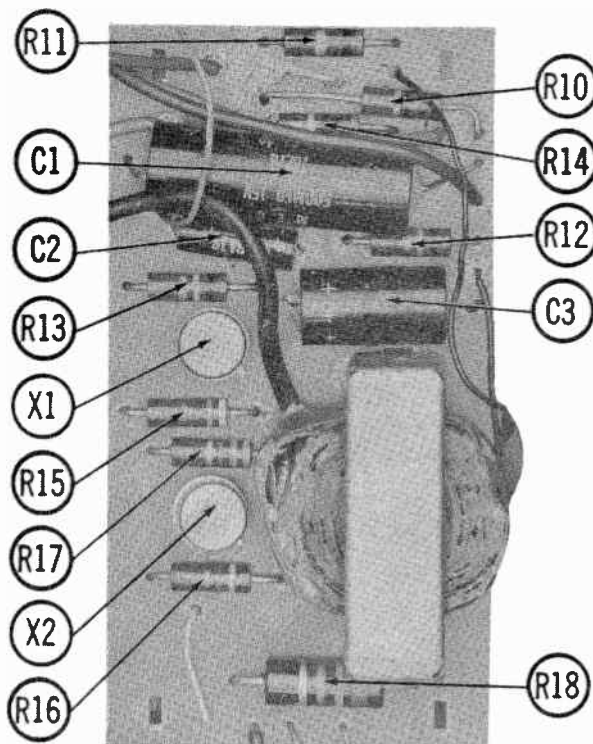
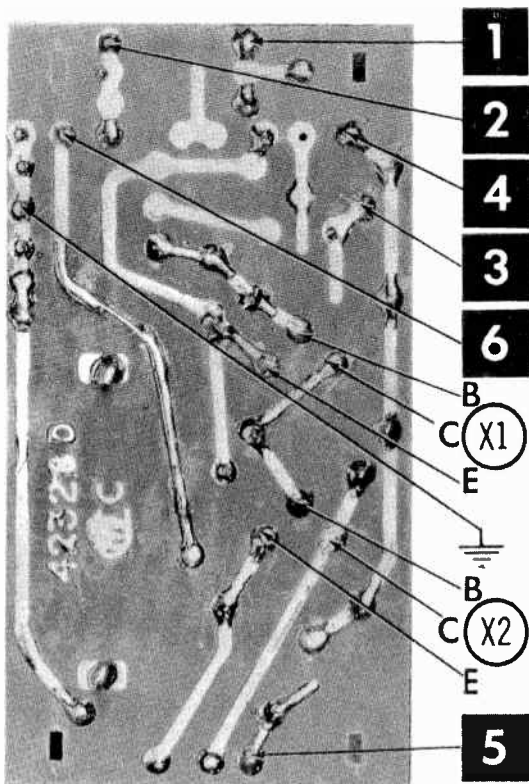
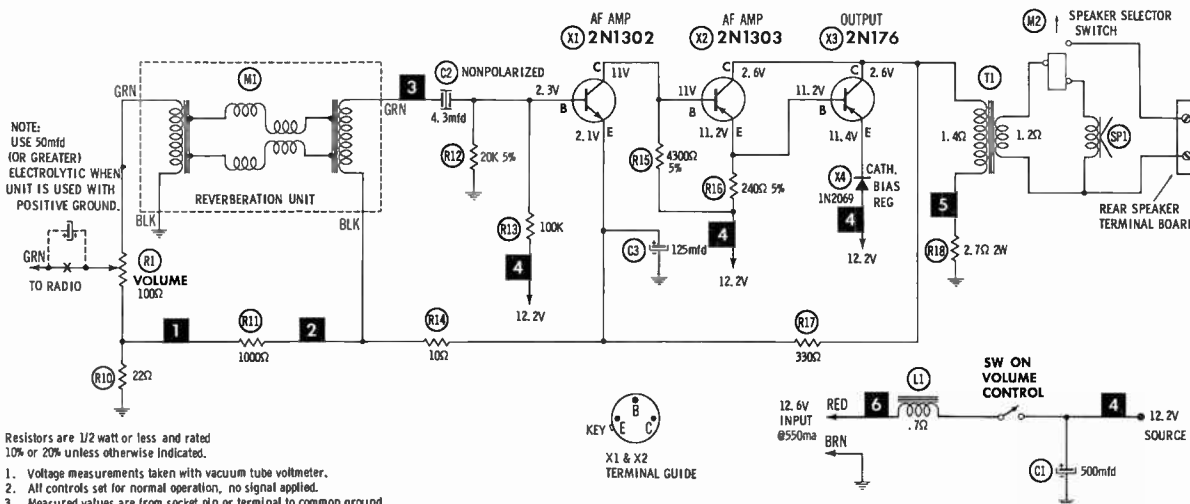
TRADE NAME : Gibbs Model 440, 441, 442  
SUPPLIER : For Current Address, See Master Index.  
TYPE SET : 3 Transistor Auto Reverberation Unit  
POWER SUPPLY : 12 Volt Storage Battery  
RATING : .55 Amp. @ 12.6 Volts DC



GIBBS MODEL 440

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1302	AF Amp.	DS-46	GE-10	2N849	NPN
X2	2N1303	AF Amp.	DS-26	GE-2	2N591	PNP
X3	2N176	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X4	Bias Reg.	1N2069					1N34AS

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GIBBS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	500	15	70278	PRS1220	BR500-15	QT1-30	BL2342	TC1505	TVA-1182
C2	4.3	10NP	70276	NP-PRS7405	BRNP5-400	NPQT-1		TCN105	TVANS-1110*
C3	125	10	70277	CRE426A	NLW125-15	MT1-23	BL1830	TT12X150	TE-1136

\* Not normally in distributor's stock.  
 Available thru distributor on order to manufacturer.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			GIBBS PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume/Switch	100Ω	70280-1	F1-100,SSK010, KR-4 or (B1, KR4)			B11-084, SK1, 76-1 or (BU1, CF1, SS1, GC)*	UA12L, SK1000, US41 or (RU12L, SL38, SK1000, US41) or (U1, US26)

\* "SNAPTROL"

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	GIBBS PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.		
L1	.550	.7Ω	11MH	70284	C-4095	TC-2	TR-154	TY17XT		

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	GIBBS PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	T1	16Ω	8Ω	70285				

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		GIBBS PART No.	QUAM PART No.	
SP1	2" X 6" PM 6" X 9" PM	8Ω 8Ω	70282 70356	26A07Z8 (Used in Model 440) (Used in Model 441)

## MISCELLANEOUS

ITEM No.	PART NAME	GIBBS PART No.	NOTES
M1 M2	Reverb Unit Speaker-Switch	AO-24600-7 70279	(Used in Model 440 Only)

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Knob	70324		

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

GIBBS MODEL 440



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>



TRADE NAME : Inland Model X100  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 7 Transistor AM Receiver  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .130 Amp. @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC

INLAND MODEL X100

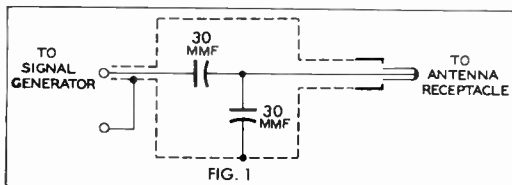
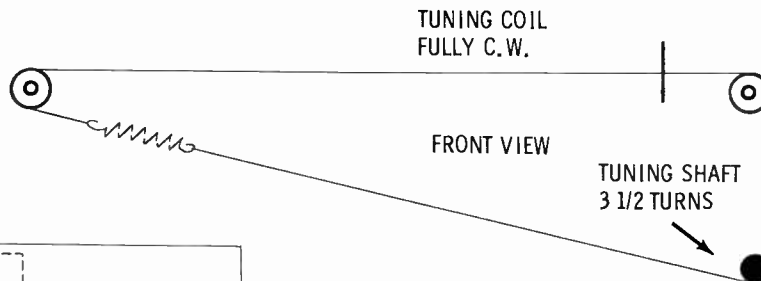
## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools:

A1 thru A8 GENERAL CEMENT: 9087 WALSCO: 2528

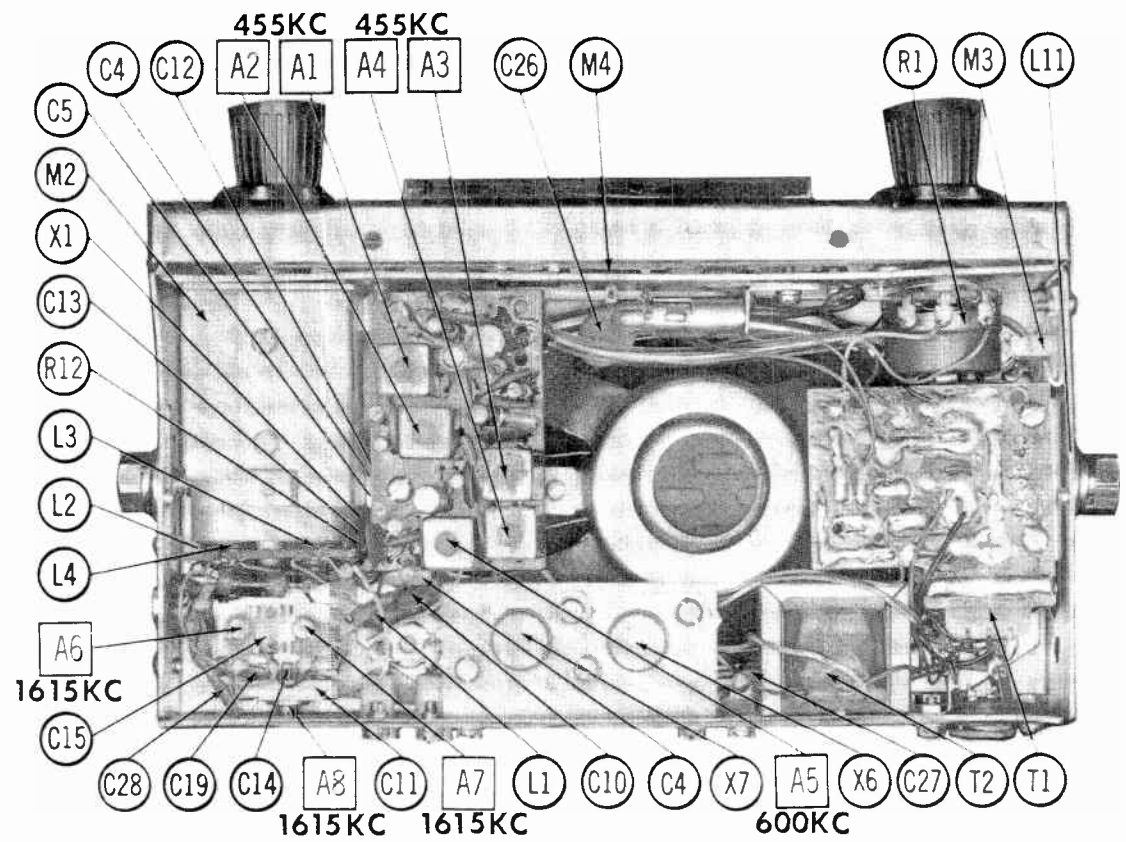
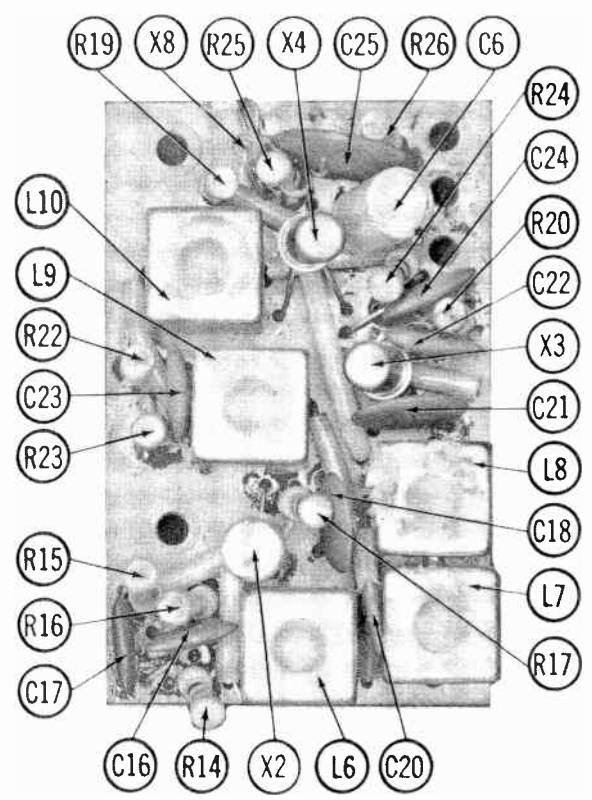
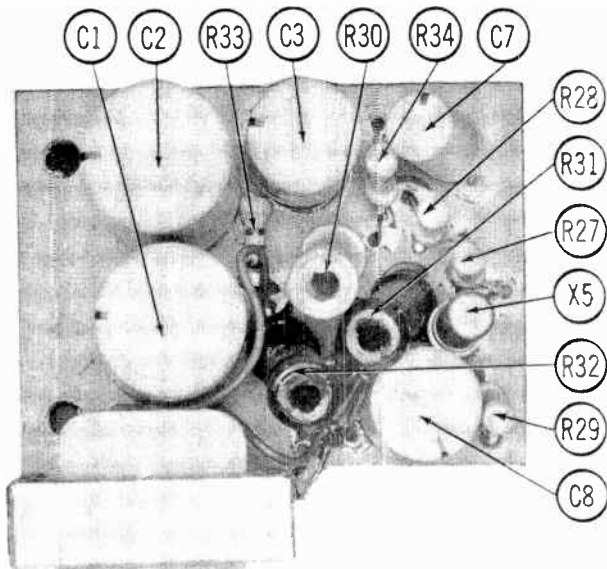
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	455KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	600KC	"	"	A5	"
Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. IF necessary, back tuning cores (A8, A9, A10) out of coils but not out of forms. Repeat step 2.						
3.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	Tune to Signal.	Output Meter across voice coil.	A6, A7, A8	Adjust for maximum. Repeat steps 2 & 3 until no further improvement is noted.

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A8 for maximum output.

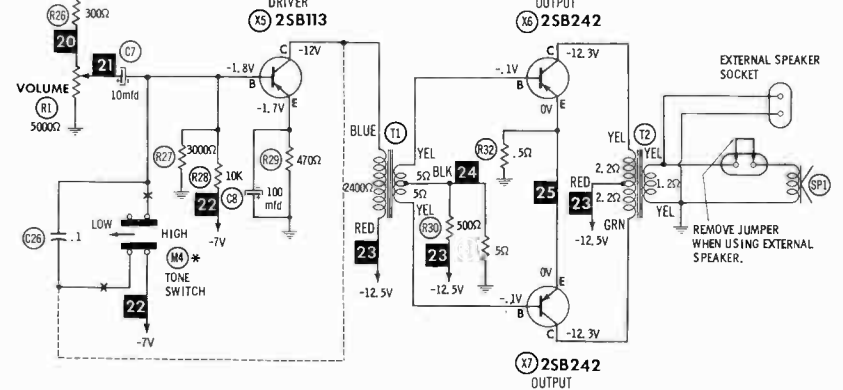
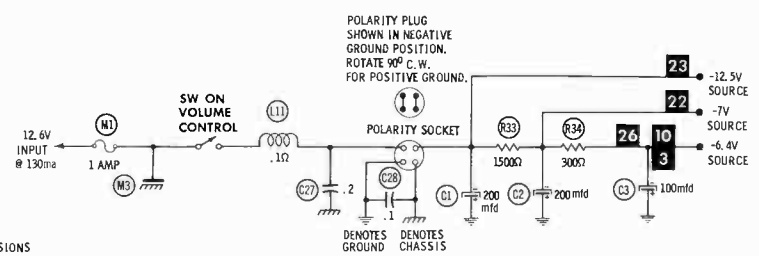
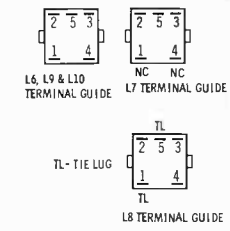
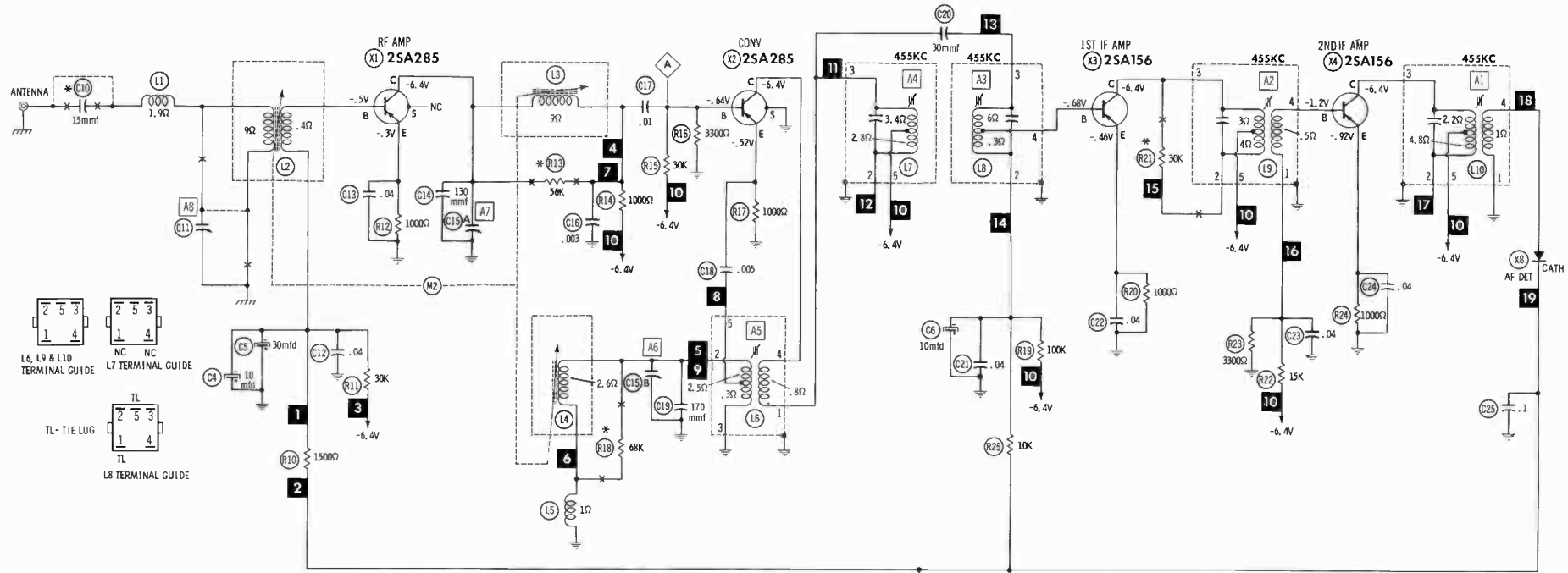


## DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



INLAND MODEL X100



\* NOT USED IN SOME VERSIONS  
 VOLTAGE MEASUREMENTS TAKEN IN NEGATIVE GROUND POSITION  
 Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

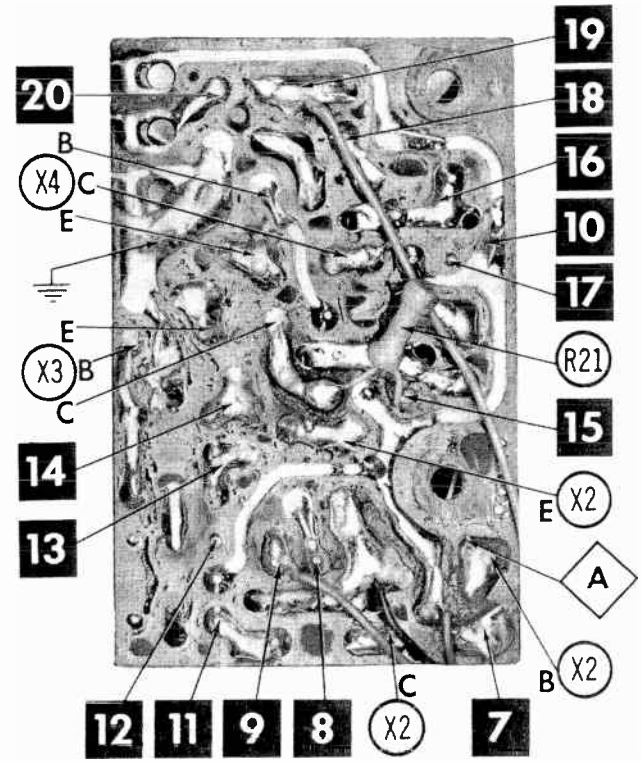
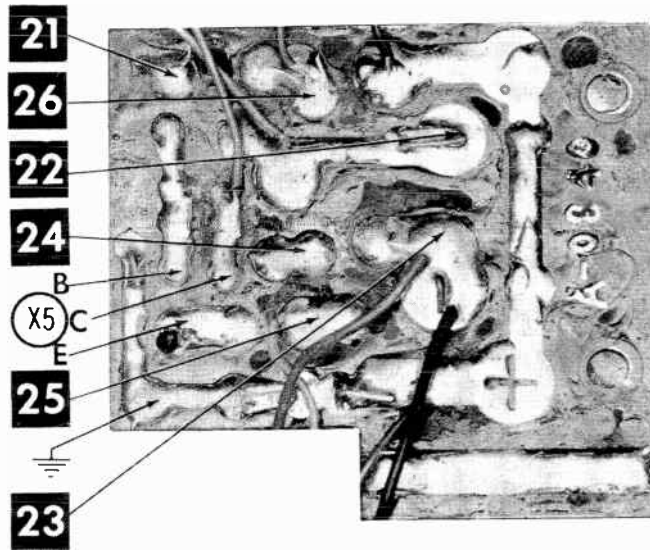
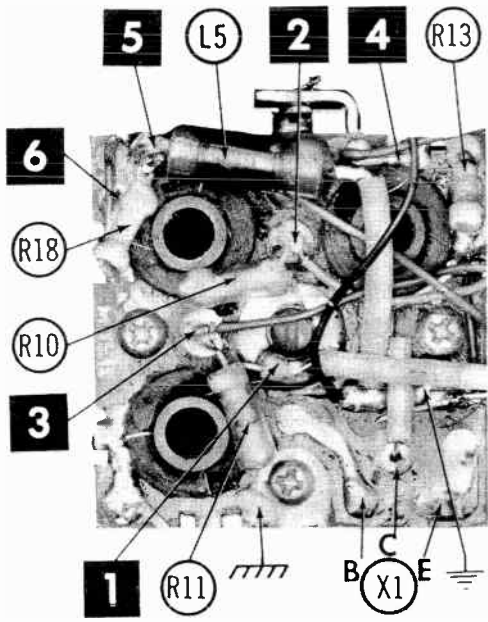
1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.
7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC with **CIRCUITRACE**  
 ©Howard W. Sams & Co., Inc. 1964



**INLAND MODEL X100**





A Howard W. Sams **CIRCUITRACE** Photo

**INLAND MODEL X100**

# PARTS LIST AND DESCRIPTION

## WIRING DATA

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS® for the most up-to-date replacement.

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2SA285	RF Amp.	DS-25	GE-9	2N1637	PNP
X2	2SA285	Conv.	DS-25	GE-9	2N1639	PNP
X3	2SA156	1st IF Amp.	DS-25	GE-9	2N1638	PNP
X4	2SA156	2nd IF Amp.	DS-25	GE-9	2N1638	PNP
X5	2SB113	Driver	DS-26	GE-2	2N591	PNP
X6	2SB242	Output			2N1183	PNP*
X7	2SB242	Output			2N1183	PNP*

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X8							1N34AS

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	INLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	200	15							
C2	200	15							
C3	100	10							
C4	10	6		BCD10100 BCD6010	NLW125-10 NLW10-8	MT1-19 MT1-6	BL1220	PET1400 PET1340	VL1140 VL1087
C5	30	6							
C6	10	6		BCD6010	NLW10-6	MT1-6	BL1220	PET1340	VL-1087
C7	10	6		BCD6010	NLW10-6	MT1-6	BL1220	PET1340	VL-1087
C8	100	6							

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	15								
C11									
C12	.04		TTD-05	CK-503	H5			TA150	TG-S50
C13	.04		TTD-05	CK-503	H5			TA150	TG-S50
C14	130		DI-120	DD-131	LA10T13-S3	CCD-121		GP313	5GA-T13
C15A									
C16	.003		DI-3000	DD-302	LA10D3-C4	CCD-302		GP230	10TS-D30
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103		B110	5HK-S10
C18	.0005		BPD-005	DD-502	BYA10D5	CCD-502		R250	5HK-D50
C19	170		DI-180	DD-181	LA10T18-S3	CCD-181		GP318	5GA-T18
C20	30		DI-30	DD-330	LA10Q3-SL	CCD-300		GP430	5GA-Q30
C21	.04		TTD-05	CK-503	H5			TA150	TG-S50
C22	.04		TTD-05	CK-503	H2			TA150	TG-S50
C23	.04		TTD-05	CK-503	H2			TA150	
C24	.04		TTD-05	CK-503	H2			TA150	TG-S50
C25	.1		TTD-1	CK-104	H6			TA010	TG-P10
C26	.1		TTD-1	CK-104	H6			TA010	TG-P10
C27	.2	150V	BE2P2		DPMS2P22	1DP-3-204		PVC1022	2PS-P20
C28	.1		TTD-1	CK-104	H6			TA010	TG-P10

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			INLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume-SW	5000Ω		F2-5000① SFS212, KR-2, or (AB11① AK-33, KC-2)			B13-144① SK9, 76-2 or (BU1①, CF60, SS4, WF)*	UA53A① SD3500, US42, or (RU53A, SL35, IS1125, US42 or (U12① DS37, US27)

\* "SNAPTROL"

① Enlarge mounting hole.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		INLAND PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (10uh)	① ① ①	BC-566	4612	RTC-8522	T860	
L2	Ant.						
L3	RF						
L4	Osc. Adj.						
L5	RF Choke (6.2uh)						
L6	Osc.						
L7	1st IF Pri.						
L8	1st IF Sec.						
L9	2nd IF						
L10	3rd IF						
L11	RF Choke (2.5uh)						

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
			INLAND PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.						
T1	18:	1						

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
			INLAND PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.						
T2	16Ω CT	8Ω						

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		INLAND PART No.	QUAM PART No.	
SP1	3" X 5" PM 8Ω		35A05	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			INLAND PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1A			312001	155020	AGC1	HDJ

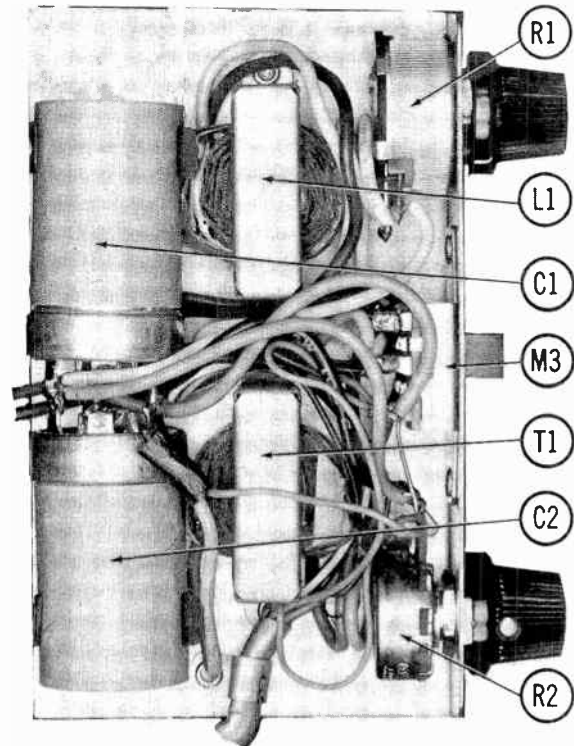
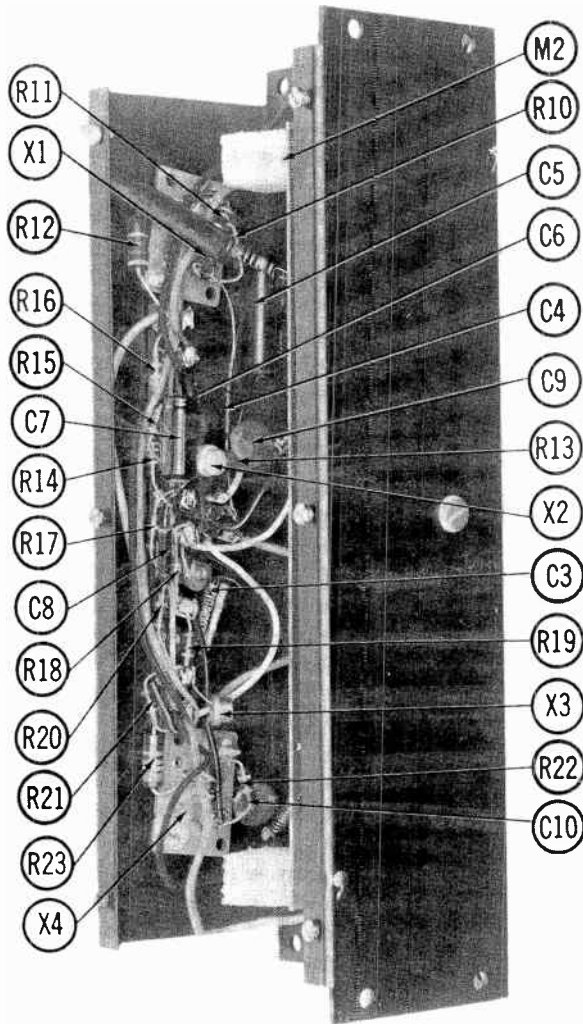
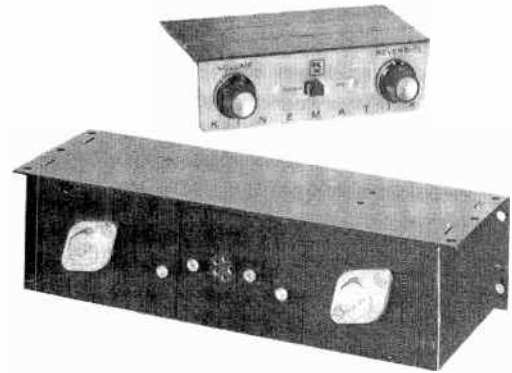
## MISCELLANEOUS

ITEM No.	PART NAME	INLAND PART No.	NOTES
M2	Tuner		
M3	Spark Plate		



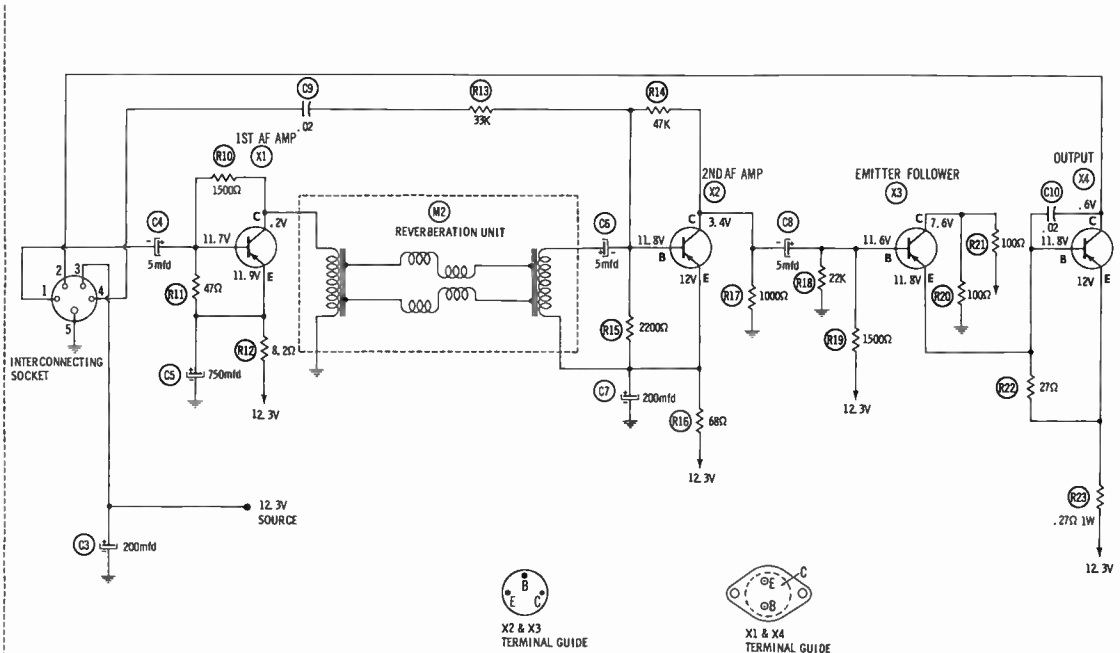
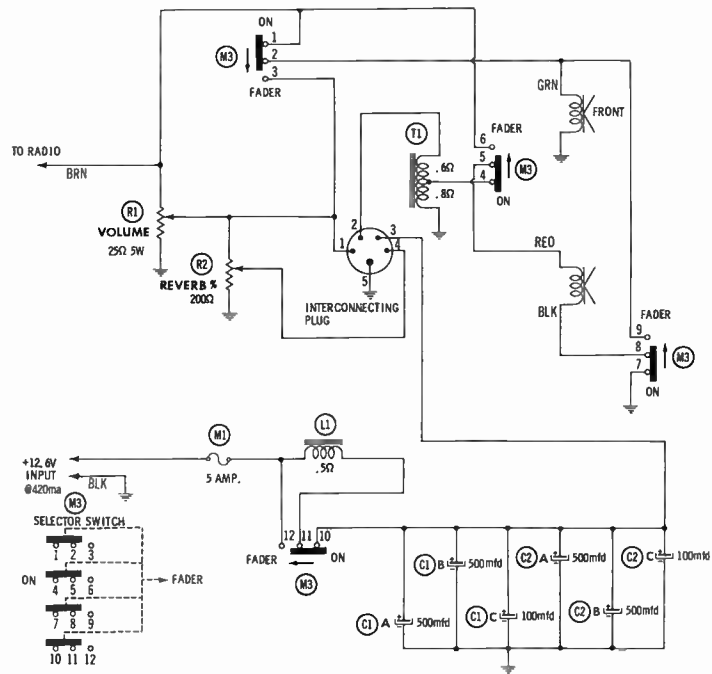
# PHOTOFACT<sup>®</sup>

TRADE NAME : Kinematix Model Verba-Matix  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 4 Transistor Reverberation Unit  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .420 Amp. @ 12.6 Volts DC



KINEMATIX MODEL VERBA-MATIX

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.
7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
©Howard W. Sams & Co., Inc. 1964

KINEMATIX MODEL VERBA-MATIX

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1		1st AF Amp. 2nd AF Amp. Emitter Follower Output	DS-520	GE-3	2N301	PNP <sup>a</sup>
X2			DS-26	GE-2	2N591	PNP
X3			DS-26	GE-2	2N591	PNP
X4			DS-520	GE-3	2N301	PNP <sup>a</sup>

<sup>a</sup> When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Kinematix PART No.	REPLACEMENT DATA					MALLORY PART No.	SPRAGUE PART No.
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	TT15X200		
C1A	500	16		PWH3-00-95	CC0012				PFP300, 85	PCLS-3026, 11*
B	500	16								
C	100	16								
C2A	500	16		PWH3-0075	CC0012				PFP300, 18	PCLS-3026, 11*
B	500	16								
C	100	16								
C3	200	12		CRE431A	NLW200-12	MT1-25	BL2140	TT15X200	TE-1137	
C4	5	10		CRE404A	NLW5-15	MT1-3	BL1130	TT12X5	TE-1127	
C5	750	12		PRS1180	BR1000-12	QT1-32	TD-1000-15	TC1501	TVA-1133	
C6	5	10		CRE404A	NLW5-15	MT1-3	BL1130	TT12X5	TE-1127	
C7	200	12		CRE431A	NLW200-12	MT1-25	BL2140	TT15X200	TE-1137	
C8	5	10		CRE404A	NLW5-15	MT1-3	BL1130	TT12X5	TE-1127	

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C10	.02		BPD-02	DD-203	BYAS2	CCD-203	B120	5HK-S20

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Kinematix PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1	Volume	25Ω 5W		WN-250 or (WW-250)	A58-25, FKS $\frac{1}{2}$	WPS25 or (BU1, WF17, SS3)*	VW25 or (M25PK)
R2	Reverb %	200Ω		F1-200, SK010, or (B-2)		Q11-201 or (BU1, CF2, SSI, DC1)*	RU22L, SL38, SK750

\*\*"SNAPTROL"

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Kinematix PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L1	420ma	.5Ω	8MH		C-4095	TC-2	TR-155	TY17XT	

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Kinematix PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	16Ω Tap	@ 8Ω						

## SPEAKER

ITEM No.	TYPE	RATING	REPLACEMENT DATA		NOTES
			Kinematix PART No.	QUAM PART No.	
SP1	6" X 9" PM	8Ω		89CX6	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Kinematix PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGA	5A			301005	15504	AGA5	HAF

## MISCELLANEOUS

ITEM No.	PART NAME	Kinematix PART No.	NOTES
M2 M3	Reverb Unit Selector Switch (Fader - On)		

## WIRING DATA

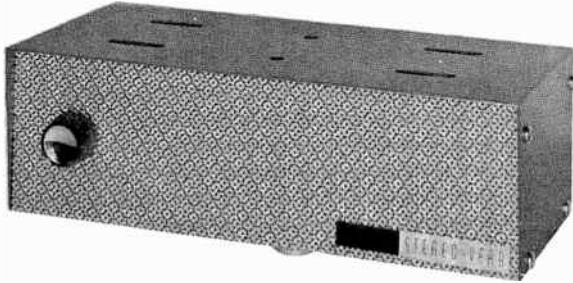
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

KINEMATIX MODEL VERBA-MATIX



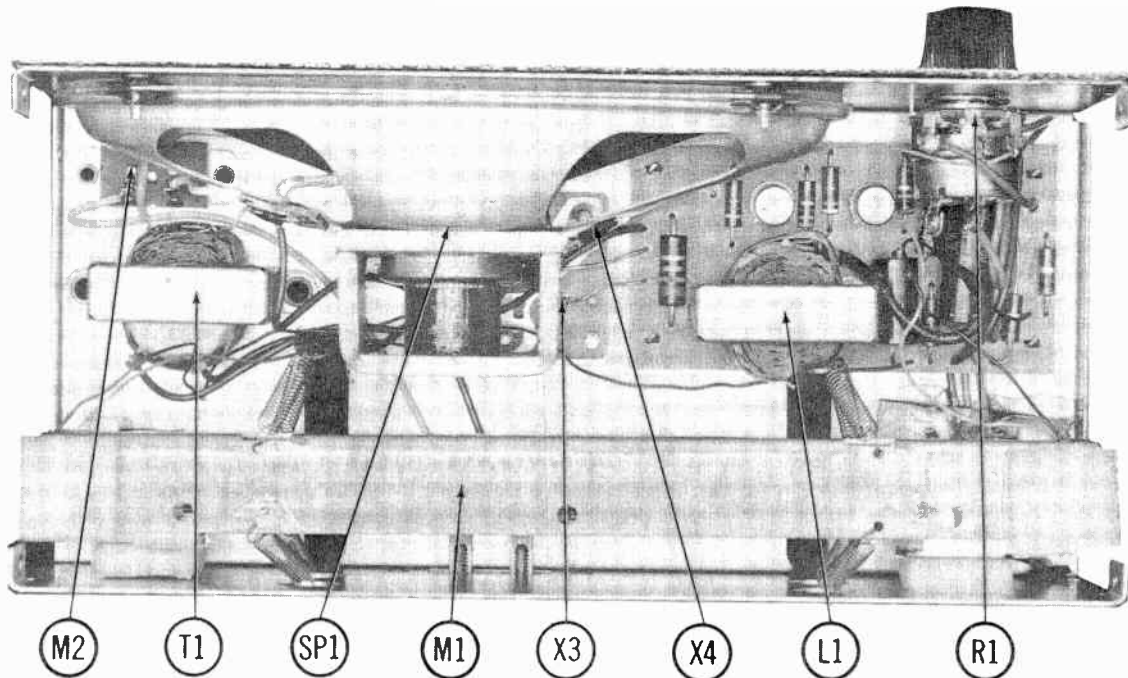
PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

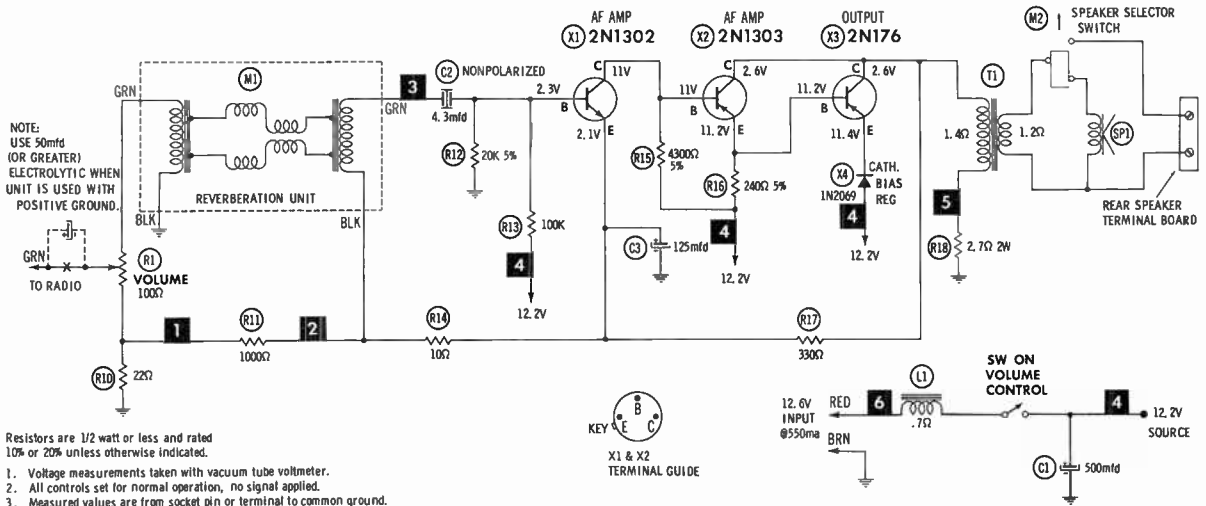


TRADE NAME : Riverside Model FGJ-16511A  
SUPPLIER : For Current Address, See Master Index  
TYPE SET : 3 Transistor Auto Reverberation Unit  
POWER SUPPLY : 12 Volt Storage Battery  
RATING : .55 Amp. @ 12.6 Volts DC

RIVERSIDE MODEL FGJ-16511A



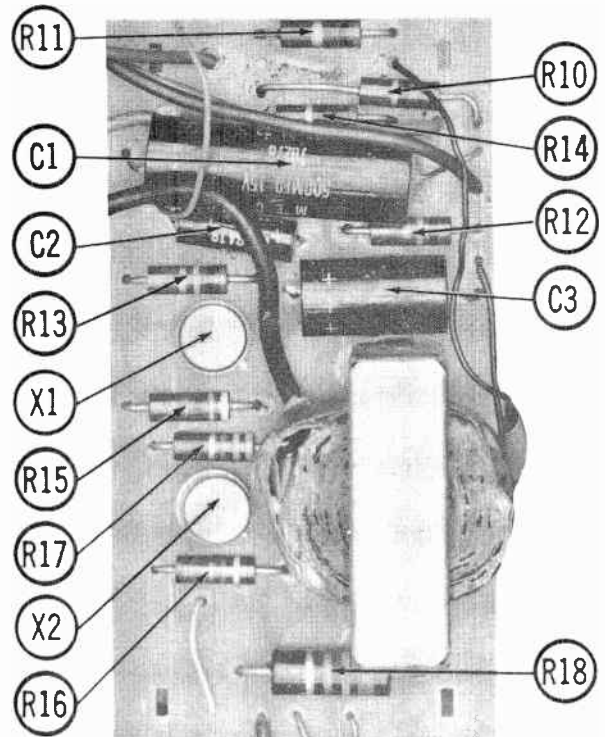
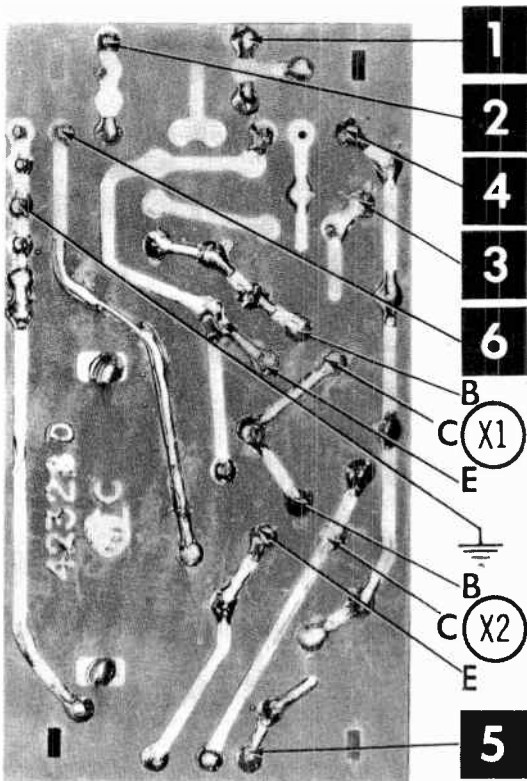
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



- NOTE:  
USE 50mfd  
OR GREATER  
ELECTROLYTIC WHEN  
UNIT IS USED WITH  
POSITIVE GROUND.
- Resistors are 1/2 watt or less and rated  
10% or 20% unless otherwise indicated.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
with **CIRCUITRACE**  
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**RIVERSIDE MODEL FGJ-16511A**



A Howard W. Sams **CIRCUITRACE** Photo

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1302	AF Amp.	DS-46	GE-10	2N649	NPN
X2	2N1303	AF Amp.	DS-26	GE-2	2N591	PNP
X3	2N176	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X4	Bias Reg.	1N2069					1N34AS

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Riverside PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	500	15	70278	PRS1220	BR500-15	QT1-30	BL2342	TC1505	TVA-1162
C2	4.3	10N <sup>P</sup>	70276	NP-PRS7405	BRNP5-400	NPQT-1		TCN105	TVANS-1110*
C3	125	10	70277	CRE426A	NLW125-15	MT1-23	BL1830	TT12X150	TE-1138

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			Riverside PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume/Switch	100Ω	70280-1	F1-100,SSK010, KR-4 or (B1, KR4)			BL1-084, SK1, 76-1 or (BU1, CF1, SS1, GC) *	UA12L, SK1000, US41 or (RU12L, SL38, SK1000, US41) or (U1, US26)

\* "SNAPTROL"

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Riverside PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L1	.550	.7Ω	11MH	70284	C-4095	TC-2	TR-154	TY17XT	

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRL	SEC.	Riverside PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	16Ω	8Ω	70285					

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Riverside PART No.	QUAM PART No.	
SP1	2" X 6" PM	8Ω	70282	(Used in Model 440)
	6" X 9" PM	8Ω	70356	

## MISCELLANEOUS

ITEM No.	PART NAME	Riverside PART No.	NOTES
M1	Reverb Unit	AO-24600-7	
M2	Speaker-Switch	70279	(Used in Model 440 Only)

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Knob	70324		

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 in.) or 8670 (3/4 in.)





PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

TRADE NAME : Riverside Model FJB-6551B  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 8 Transistor FM Converter  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .330 Amp. @ 12.6 Volts DC  
 TUNING RANGE: FREQ. MOD. 88-108MC



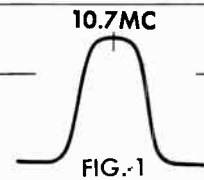
## ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
**CAUTION:** Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
 Suggested Alignment Tools:  
 A1 thru A13      GENERAL CEMENT: 5009, 8728A, 8987      WALSCO: 2531X, 2536

### FM ALIGNMENT USING AM SIGNAL GENERATOR — SELECTOR IN FM POSITION

High side to of generator thru .01mfd to point  $\diamond A$ , low side to ground for IF.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\diamond B$ ; common to ground.	A1 thru A8	Adjust for maximum.
"	"	DC probe to point $\diamond C$ ; common to	A9	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.



### FM IF ALIGNMENT USING FM SIGNAL GENERATOR — SELECTOR IN FM POSITION

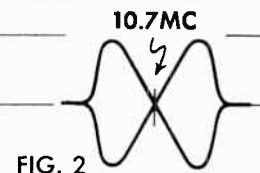
High side thru .01mfd to point  $\diamond A$ , low side to ground. Use 60% frequency modulated signal with 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\diamond B$ ; low side to ground.	A1 thru A8	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C3.
"	"	Vert. amp. to point $\diamond C$ ; low side to	A9	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator across antenna input with 120Ω carbon resistors in series with each lead.

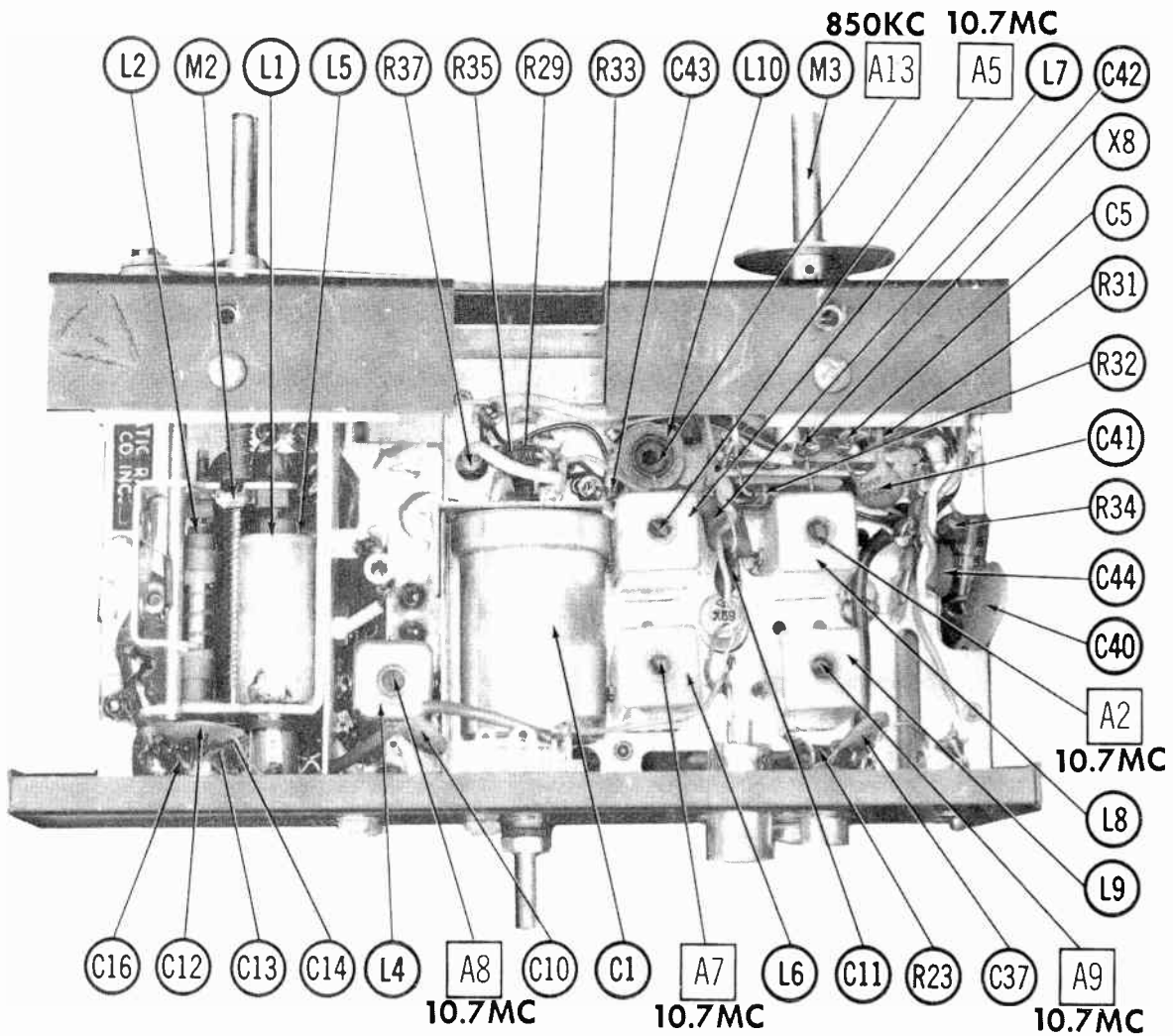
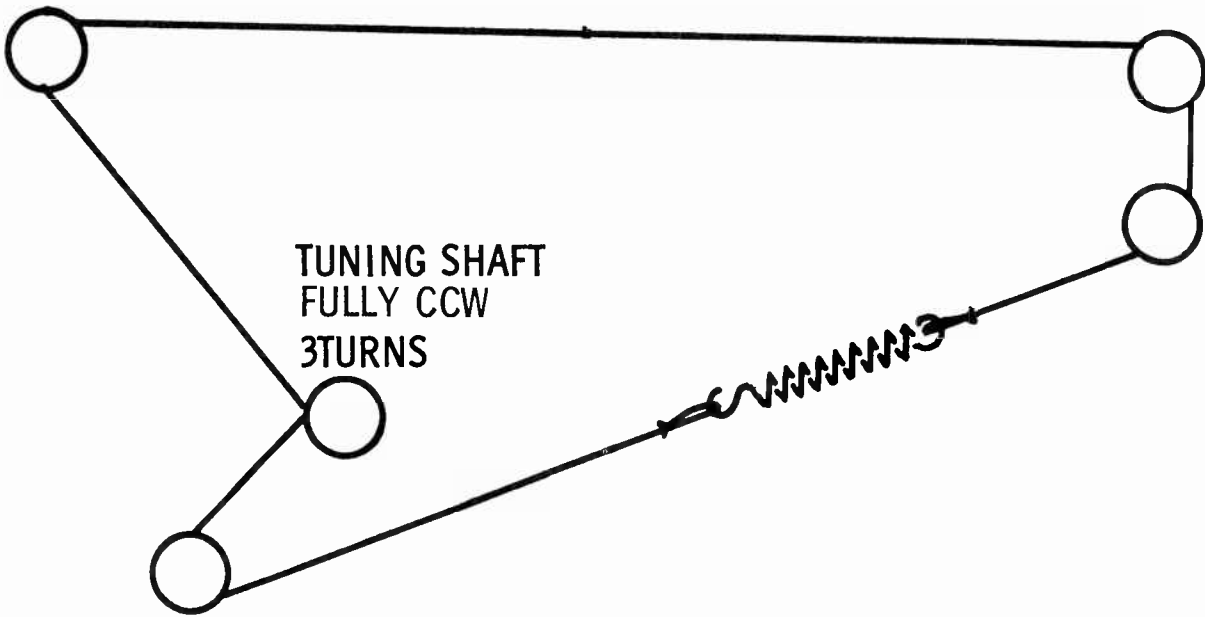
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MC	108MC	DC probe of VTVM to point $\diamond B$ ; common to ground.	A10, A11, A12	Adjust for maximum.

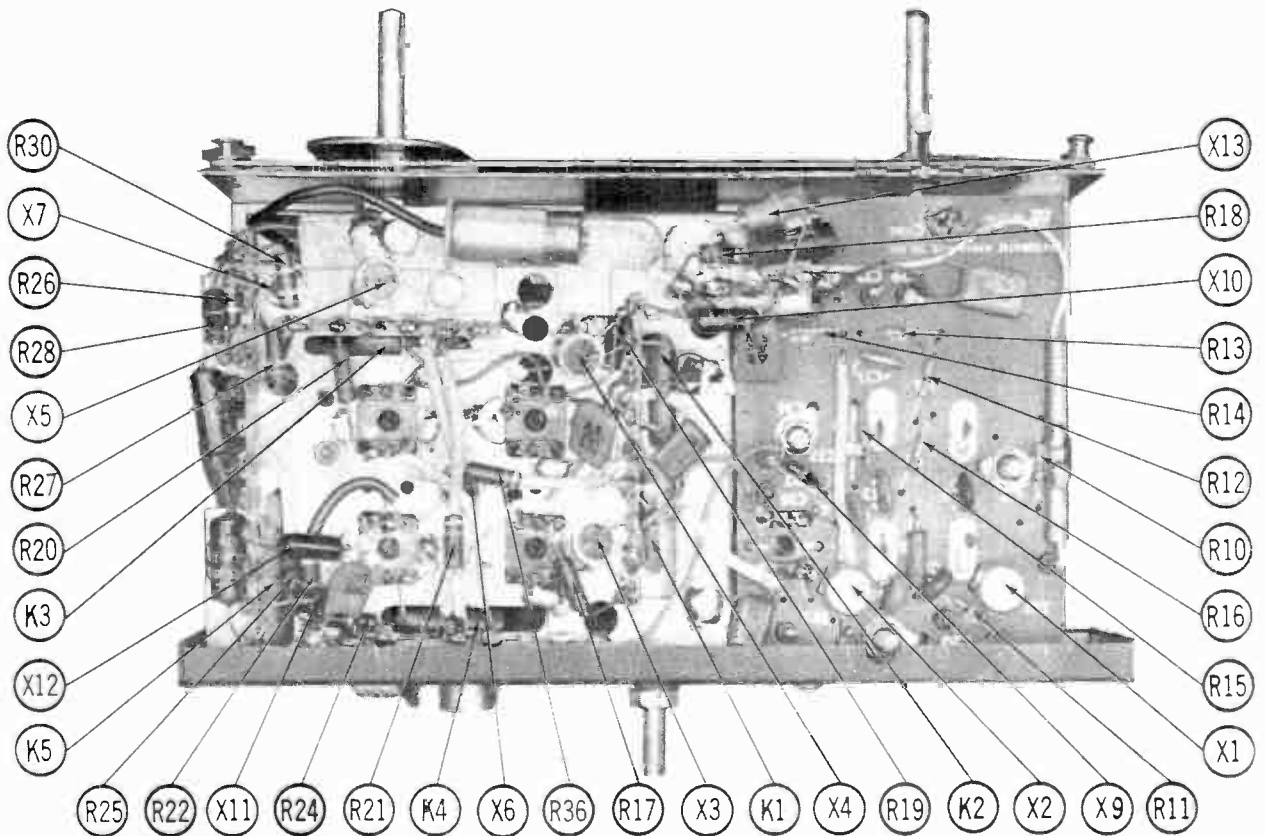
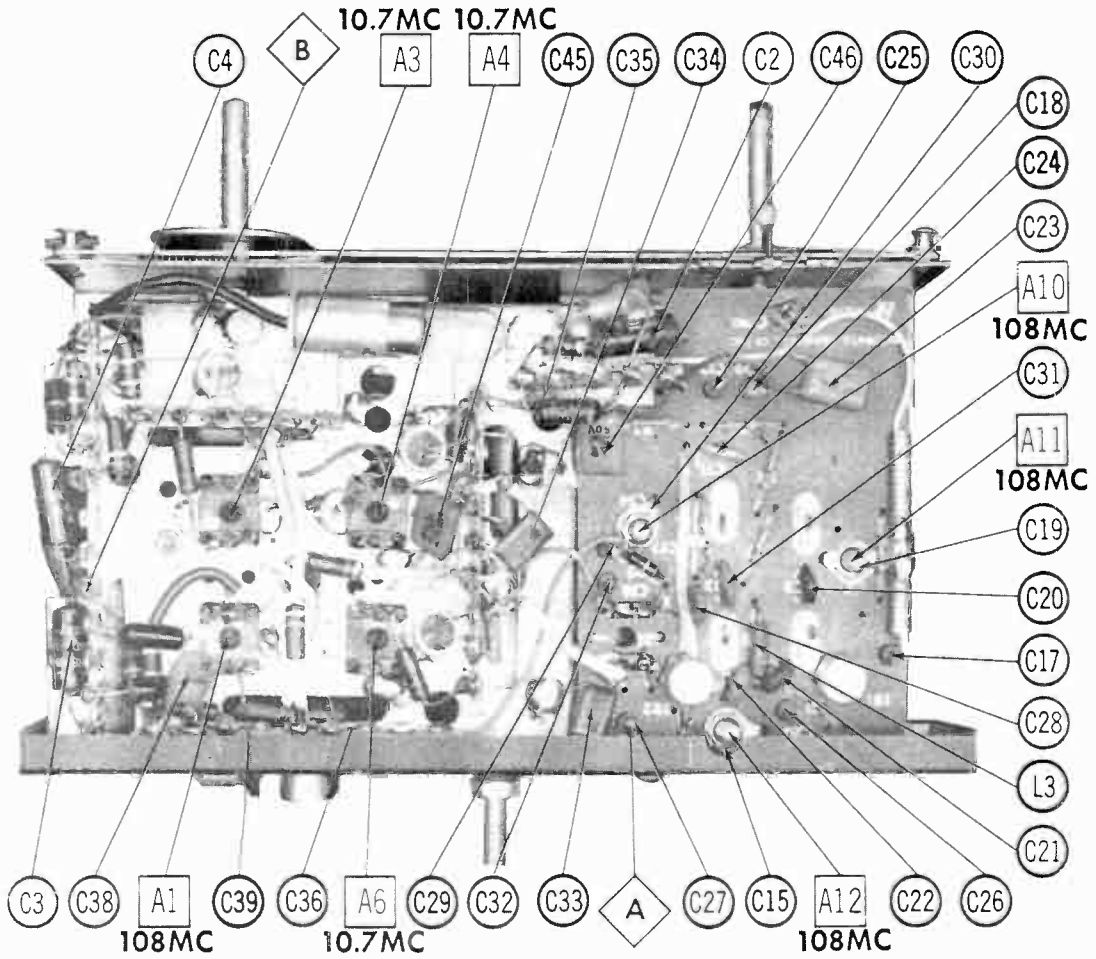


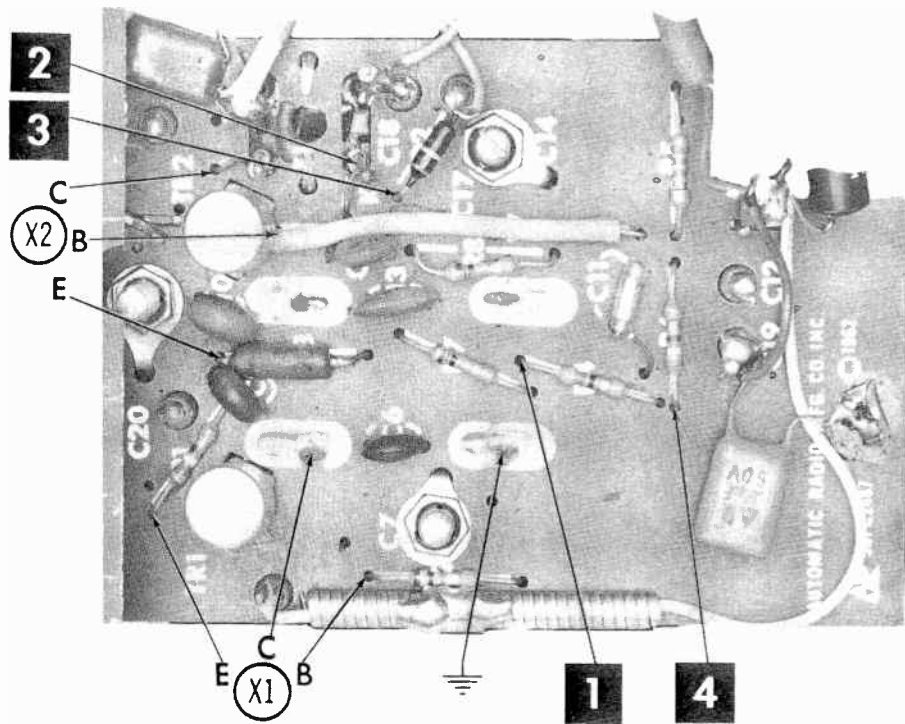
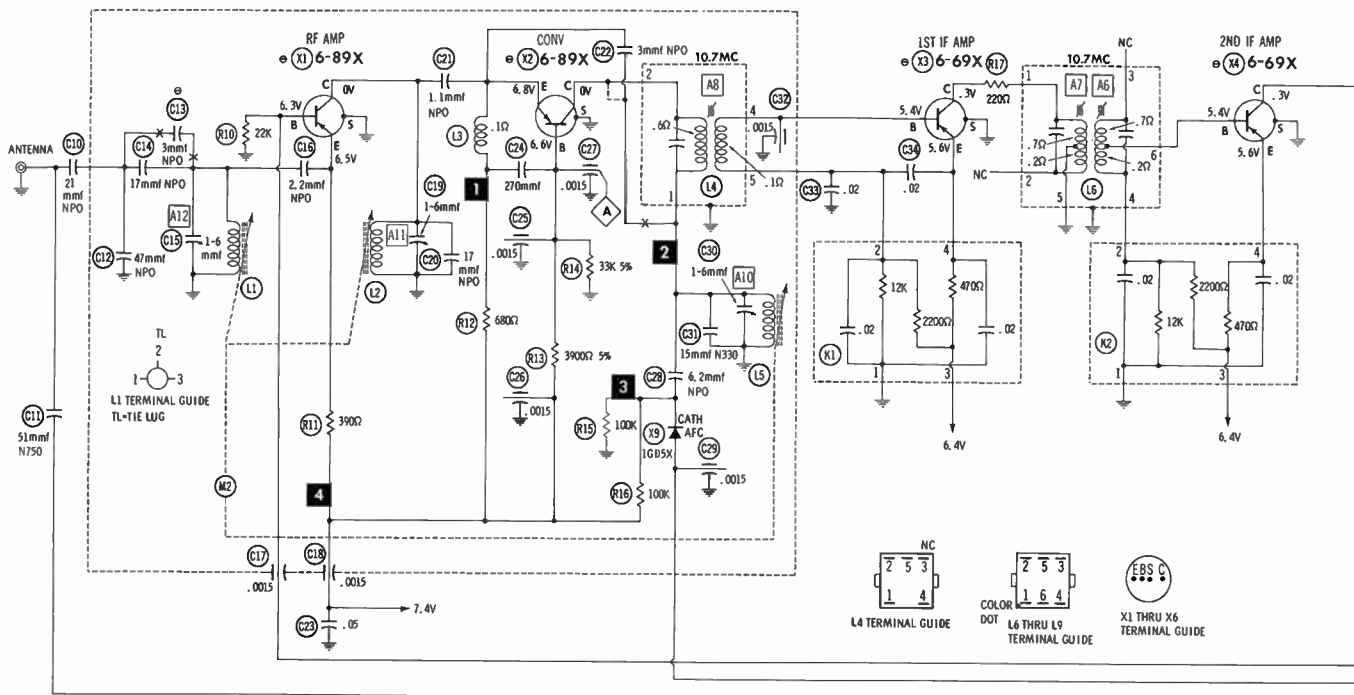
After unit is installed in car, tune in the AM receiver to a point of noninterference near 850KC. Tune in an FM signal and adjust A13 for maximum output

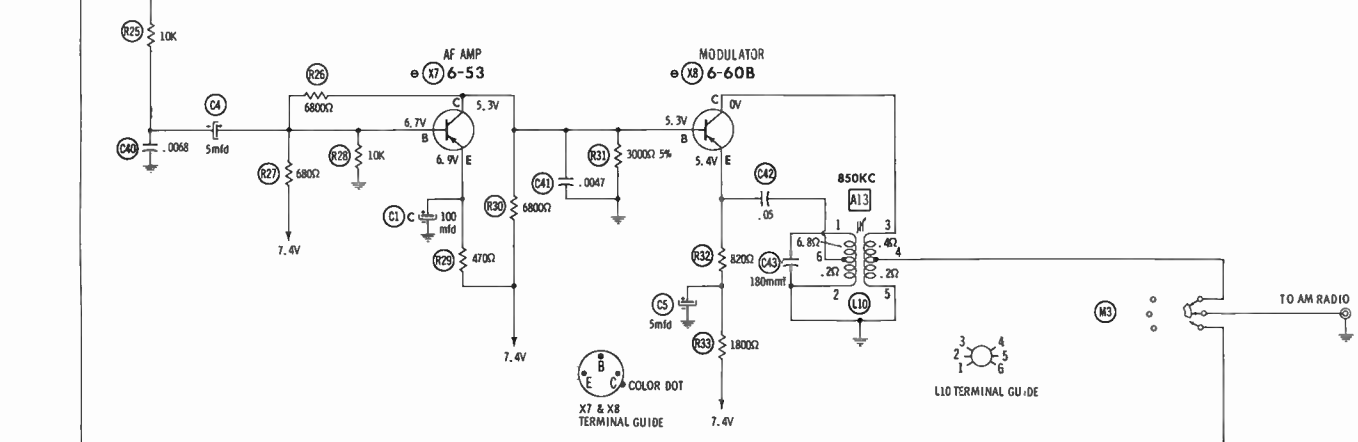
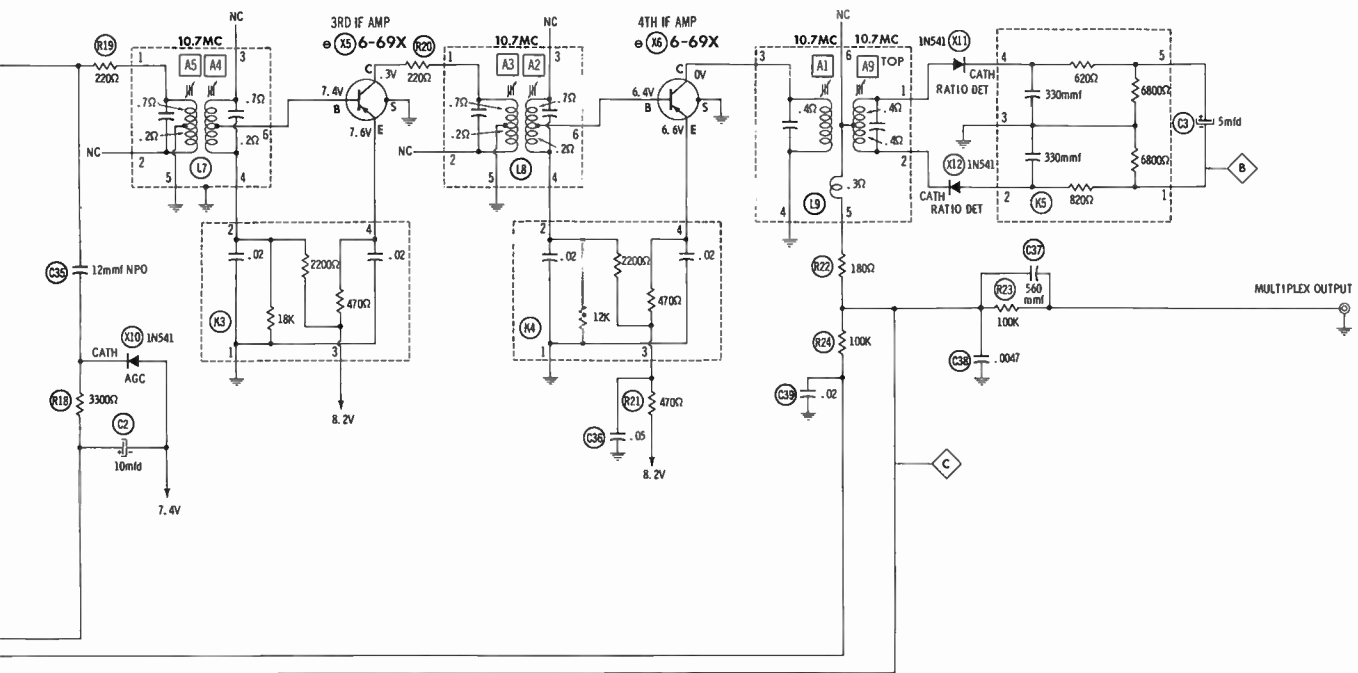
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

# DIAL CORD STRINGING



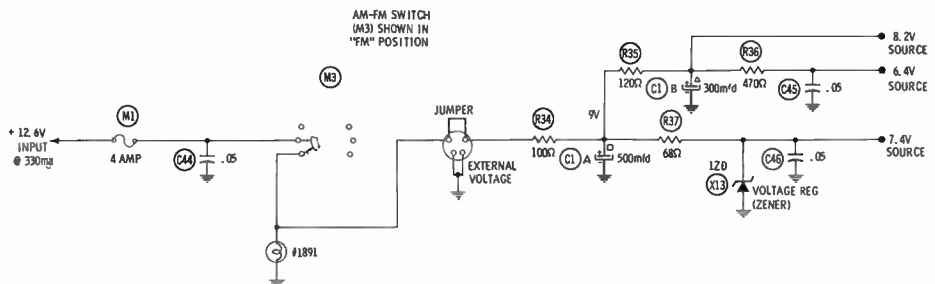






- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- ⊖ See part lists for alternate value or application.
  - 1. Voltage measurements taken with vacuum tube voltmeter.
  - 2. All controls set for normal operation, no signal applied.
  - 3. Measured values are from socket pin or terminal to common ground.
  - 4. All terminals viewed from bottom unless otherwise designated.
  - 5. Numbers ass gnad to terminals may not be found on the unit.
  - 6. Supply voltage maintained at rated value for voltage readings.
  - 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
with **CIRCUITRACE**  
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RIVERSIDE MODEL FJB-6551B

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

## FIXED CAPACITORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-89X (2N2089)	RF Amp.	DS-41		2N1177	PNP
X2	6-89X (2N2089)	Conv.	DS-42		2N1179	PNP
X3	6-69X (2N209)	1st IF Amp.	DS-37		2N1180	PNP
X4	6-69X (2N209)	2nd IF Amp.	DS-37		2N1180	PNP
X5	6-69X (2N209)	3rd IF Amp.	DS-37		2N1180	PNP
X6	6-69X (2N209)	4th IF Amp.	DS-37		2N1180	PNP
X7	6-53 (2N591)	AF Amp.	DS-26	GE-2	2N591	PNP
X8	6-60B (2N640)	Modulator	DS-25	GE-1	2N1839	PNP

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C28	6.2 NPO	#15-6.2	EF-001	MFT-1000			CCF-102	CT280A	
C29	.0015								
C30	1-6	#28-156							
C31	15 N330			TCA-15					10TCC-Q15
C32	.0015		EF-001	MFT-1000			CCF-102	CT280A	
C33	.02		BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-820
C34	.02		BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-820
C35	12 NPO		SI-12	TCZ-12	LA10Q12-SL		CCTO-120	CNO410	10TCC-Q12
C36	.05		TTD-05	CK-503	H5			TA150	TC-850
C37	560		DI-560	DD-561	LA10T56-C4		CCD-561	GP956	5HK-T56
C38	.0047		BPD-0047	DD-472	BYA10D47		CCD-472	B247	5HK-D47
C39	.02		BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-820
C40	.0068		DI-6800	DD-682	BYA10D68		CCD-682	GP268	10T8-D68
C41	.0047		BPD-0047	DD-472	BYA10D47		CCD-472	B247	5HK-D47
C42	.05		TTD-05	CK-503	H5			TA150	TC-850
C43	180		DI-180	DD-181	LA10T18-S3		CCD-181	GP318	5CA-T18
C44	.05		TTD-05	CK-503	H5			TA150	TC-850
C45	.05		TTD-05	CK-503	H5			TA150	TC-850
C46	.05		TTD-05	CK-503	H5			TA150	TC-850

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X9		1GD5X					1N34AS
X10		1N541					1N34AS
X11		1N541*					1N34AS
X12		1N541*					1N34AS
X13		1ZD8. 2V					1N84AS

\* Matched pair.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFH3-00-94.5	CC0012	XC3-48.1		FP300.83	TVLS-3026.14*
B	300	16							
C	100	16							
C2	10	15	20-106	CRE457A	NLW10-15	MT1-5	MLV10-15	TT15X10	TE-1155
C3	5	15	20-506	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C4	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C5	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	31 NPO		NPO-D120	DTZ-20	C10Q2C	CCTO-200	CNO420	10TCC-Q22
C11	51 N750		N750-SI50	TCN-51	C10Q51U			10TCU-Q50
C12	47 NPO		NPO-D147	DTZ-47	C10Q47C	CCTO-470	CNO447	10TCU-Q47
C13	3 NPO	Ⓢ	NPO-D13	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C14	17 NPO		NPO-D120	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C15	1-6	#28-156						
C16	2.2 NPO		NPO-D12.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22
C17	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C18	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C19	1-6	#28-156						
C20	17 NPO		NPO-D120	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C21	1.1 NPO		NPO-D11	TCZ-1	C10V15C		CNO510	10TCC-V10
C22	3 NPO		NPO-D13	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C23	.05		TTD-05	CK-503	H5		TA150	TC-850
C24	270		NPO-S1270	TCZ-270	LA10T27-C4	CCD-271	CNO327	10TCC-T27
C25	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C26	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C27	.0015		EF-001	MFT-1000		CCF-102	CT280A	

Ⓢ Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	REMARKS	REPLACEMENT DATA				NOTES
			PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	
L1	Ant.	Ⓢ					Ⓢ Part of M2.
L2	RF	Ⓢ					
L3	RF Choke	14-.82		TV-182	4594	T804	
L4	1st IF	14-2520					
L5	Osc.	Ⓢ					
L6	2nd IF	14-2933					
L7	3rd IF	14-2933					
L8	4th IF	14-2933					
L9	Ratio Detector	14-2522					
L10	Osc.	14A3364					

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K1	1st IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K2	2nd IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K3	3rd IF Network	470Ω, 2200Ω, 18K, .02mfd, .02mfd	89A2014	
K4	4th IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K5	Ratio Detector Network	680Ω, 820Ω, 6800Ω, 6800Ω, 330mmf, 330mmf	89A2538	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	AGW	4A							

## MISCELLANEOUS

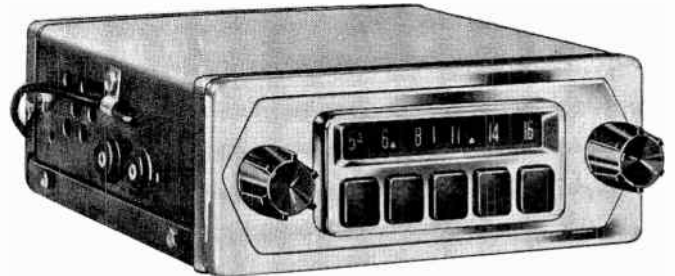
ITEM No.	PART NAME	PART No.	NOTES
M2	Tuner	78B2467	
M3	Selector SW	94A3016	

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in 12 Colors  
8524 (Stranded) Available in 12 Colors  
Shielded Hook-up Wire ..... Use BELDEN No. 8885  
Rear Seat Speaker Extension Cable ..... Use BELDEN No. 8782 (Stranded) Coded Parallel Leads  
Bonding Strap ..... Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



TRADE NAME : Riverside Models FJB-6615A, FJB-6540C  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 5 Transistor AM Receiver  
 POWER SUPPLY : 6 or 12 Volt Storage Battery  
 RATING : .440 Amp. @ 6.3 Volts DC  
 .660 Amp. @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC



## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools: A1 thru A7 GENERAL CEMENT: 0440

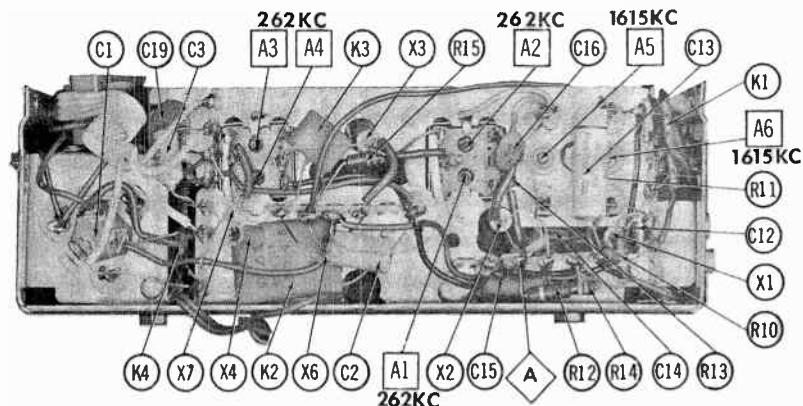
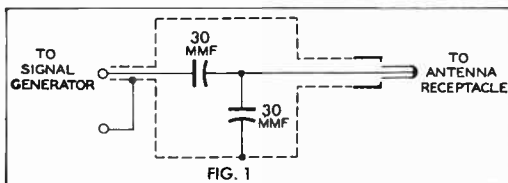
WALSCO: 2501

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

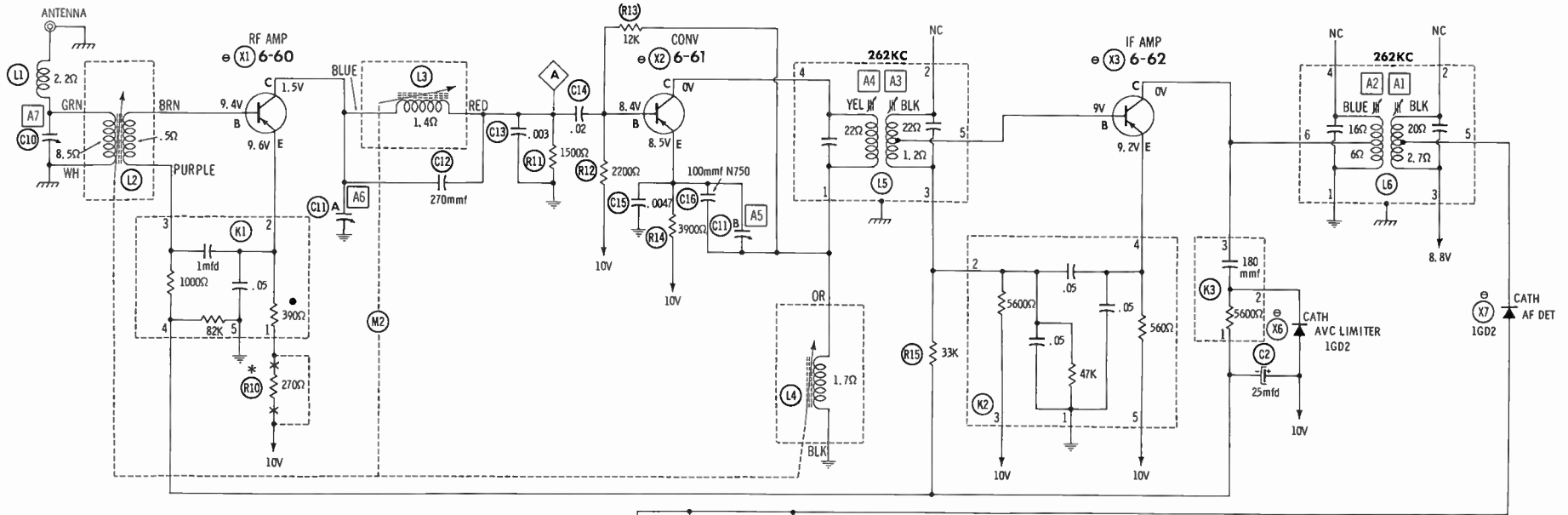
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



RIVERSIDE MODELS FJB-6615A, FJB-6540C



POLARITY PLUG SHOWN IN NEGATIVE GROUND POSITION. ROTATE 90° CCW FOR POSITIVE GROUND.

12.6V INPUT @ 600ma  
OR  
6.3V INPUT @ 440ma

SW ON VOLUME CONTROL #1892

VOLTAGE MEASUREMENTS TAKEN IN 12V NEGATIVE GROUND POSITION.

\* NOT USED IN SOME VERSIONS  
● NOMINAL VALUE MAY VARY

Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

- See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.



VOLTAGE SELECTOR SOCKET

VOLTAGE SELECTOR PLUG SHOWN IN 12V POSITION. ROTATE 90° CCW FOR 6V POSITION.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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RIVERSIDE MODELS FJB-6615A, FJB-6540C



## PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

### TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-60 (2N640)†	RF Amp.	DS-25	GE-1	2N1637	PNP
X2	6-61 (2N642)†	Conv.	DS-25	GE-1	2N1639	PNP
X3	6-62 (2N641)†	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	6-53 (2N591)†	Driver	DS-26	GE-2	2N591	PNP
X5	8P404 (2N176)†	Output	DS-520	GE-3	2N301	PNP

† Alternate Type Number.

▲ When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

### POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X6		1GD2 (1N295)†					1N34AS
X7		1GD2 (1N295)†					1N34AS

† Alternate type number.

### ELECTROLYTIC CAPACITORS

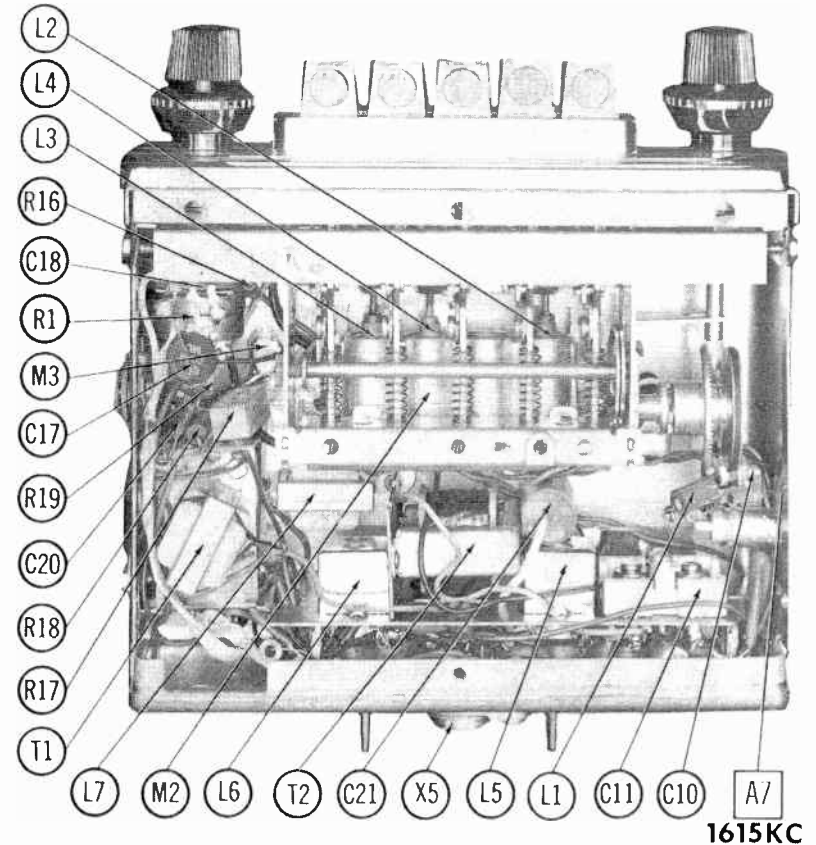
ITEM No.	RATING		PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFH3-00-94.5		KC3-48.1		FP300.83	TVLS-3026.1*
B	300	16							
C	100	18							
C2	25	15	20-256	PTT69	NLW25-15	MT1-10	MLV25-15	TT15X25	TE-1157.1
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

### FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10		#28-800-2L							
C11A		#28A1332							
C12	270		DL-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T270	
C13	.003 200V		BE6D3	CPR-3000J	DPMS6D33	6DP-1-302	PVC423	6PS-D30	
C14	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-820	
C15	.0047 200V		P288N-0047	CPR-4700J	WMF2D47	6DP-1-472	PVC4247	6PS-D47	
C16	100 N750		N750-DI100	DTN-100	C10TIU	CCTN-101	CN7310	10TCU-T10	
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-810	
C18	.22 3V			UK20-204	HCC25224Z			HY-325	
C19	.1 16V		TTD-1	CK-104	H6		TA010	TG-P10	
C20	.05		TTD-05	CK-503	H5		TA150	TG-S50	
C21	.22 200V		P288N-22		DPMS2P22	1DP-3-224	PVC1022	2PS-P22	

# Part Number.



# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				NOTES
			PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	
R1A B	Tone Volume/Switch	10K 7500Ω Tap @ 4800Ω	80A3588			†QJ-1786A	

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-116, P17-112 (Panel)  
 B21-115X, R-28-121 (Rear)  
 "SNAPTROL" Equivalent: BU15, CF9, CR48T, SF10, SR9, GC.  
 QCB5 (Bushing)  
 76-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (8, 2uh)	14-6, 2	BC-585	4810	RTC-8520	T859	① Part of M2.
L2	Ant.	①					
L3	RF	①					
L4	Osc.	①					
L5	Input IF	14-3233A					
L8	Output IF	14-3234A					

## FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	600ma @ 12.6V 440ma @ 6.3V	.5Ω	10MH	75A3082	C-4095	TC-2	TR-155	TY17XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	8:	1	75A2635			TR-184		

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	24Ω Tap	@ 8Ω	75A2638			TR-189		

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		PART No.	QUAM PART No.	
SP1	5" X 7" PM 4" Round PM	8Ω 8Ω	73B2825 73B3553	

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Automatic PART No.	REPLACEMENT DATA
K1	RF Amp. Network	390Ω, 1000Ω, 82K, .05mfd, 1mfd	89A2582C	
K2	IF Amp. Network	580Ω, 5800Ω, 47K, .05mfd, .05mfd	89A2584	
K3	AVC	.05mfd		
K4	Audio Network	5800Ω, 180mmf 470Ω, 820Ω, 4700Ω, 12K, 27K, 270K, .002mfd	89A2701 89A2585	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			LITTELFUSE		BUSS			
			PART No.	PART No.	FUSE	HOLDER		
M1	AGW	4A			303004	155009	AGW4	HDE

## MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Tuner	78B3587	Pushbutton Manual
M3	Tuner Spark Plate	78B3591 43-218	

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color).

ITEM	PART No.	ITEM	PART No.
Escutcheon	54C2357	Knob-Dummy	48A393-1
Knob-Tuning or Volume	47-50BC	Knob-Spacer	47A1249
Knob-Tone	47B393	Pushbutton	56A1734

## WIRING DATA

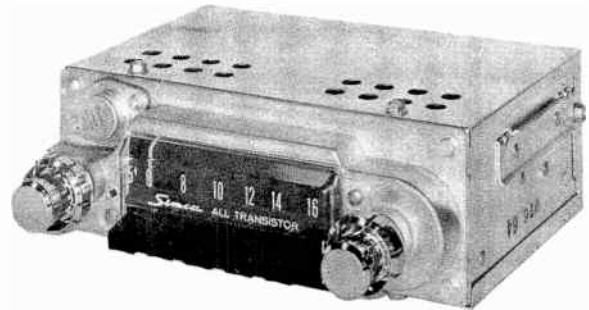
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8881 (3/8 In.) or 8870 (3/4 In.)



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

TRADE NAME : Simca Model 4TBJ (1000) 1964  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 6 Transistor AM Receiver  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .7 Amp @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1605KC



SIMCA MODEL 4TBJ

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4  
 A5, A6, A7

GENERAL CEMENT: 8806, 8606L, 8869  
 GENERAL CEMENT: 8290, 8868, 9087

WALSCO: 2543, 2544, 2588  
 WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	262.5KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1605KC	"	"	A5, A6, A7	"
Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. IF necessary, back tuning cores (A8, A9, A10) out of coils but not out of forms. Repeat step 2.						
3.	Thru dummy (Fig. 1) to antenna receptacle.	1000KC	Tune to Signal.	Output Meter across voice coil.	A8, A9, A10	Adjust for maximum. Repeat steps 2 & 3 until no further improvement is noted.
With radio installed in car and antenna fully extended, tune in a weak station near 1600KC and adjust A7 for maximum output.						

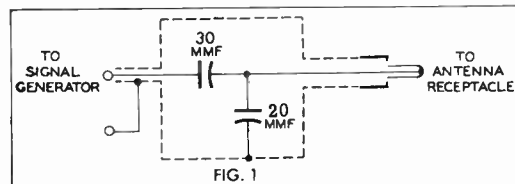
## REMOVAL INSTRUCTIONS

### RADIO REMOVAL

1. Pull off knobs.
2. Use 11/16" wrench and remove nuts from control bushing.
3. Remove trim plate.
4. Disconnect Ant., "A" and Speaker leads.
5. Use 7/16" wrench and remove nut from rear brace.
6. Remove radio from under instrument panel.

### SPEAKER

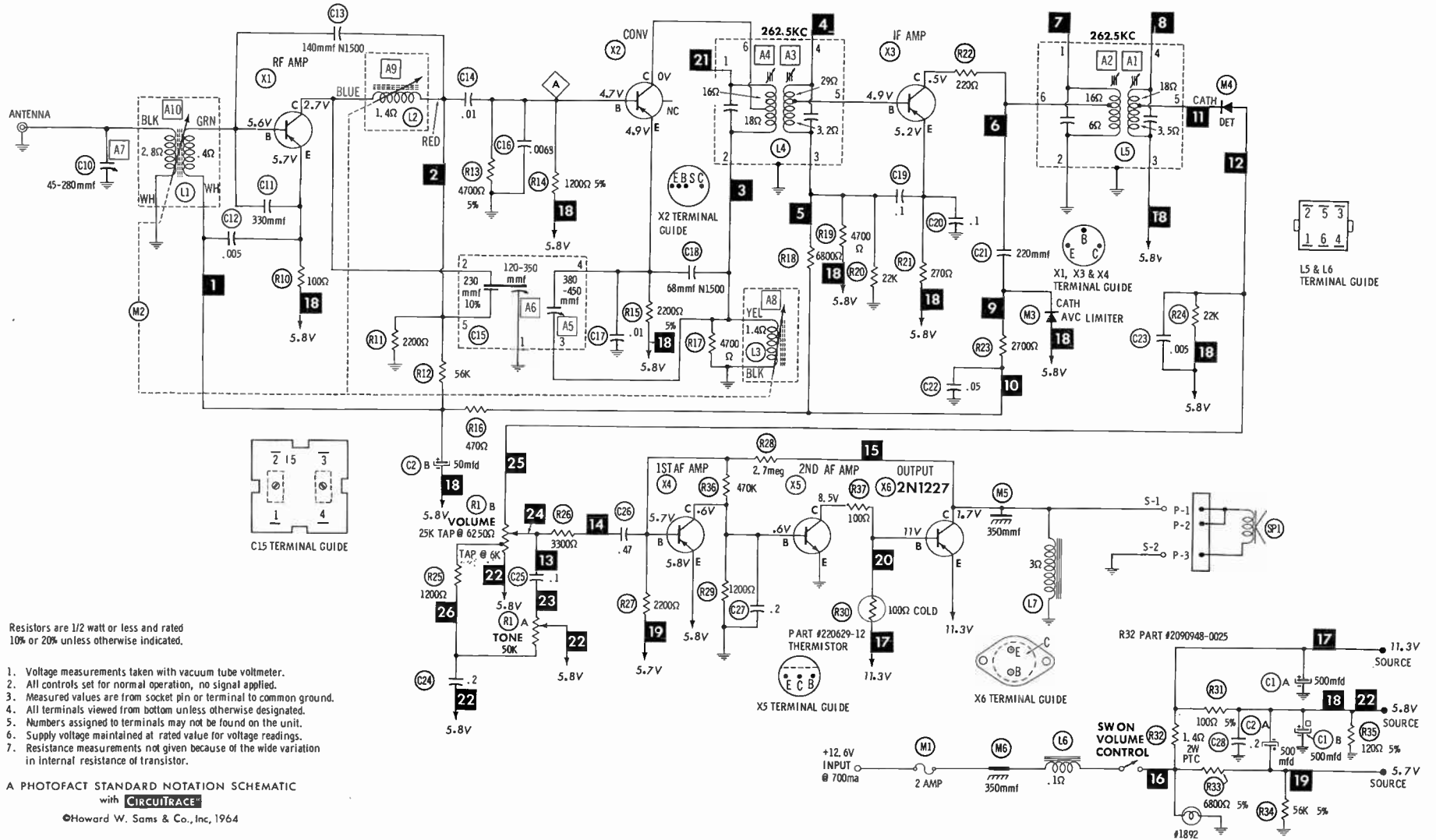
1. Use 5/16" wrench and remove 4 metal screws from speaker mounting.
2. Remove speaker from under instrument panel.



### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.
7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

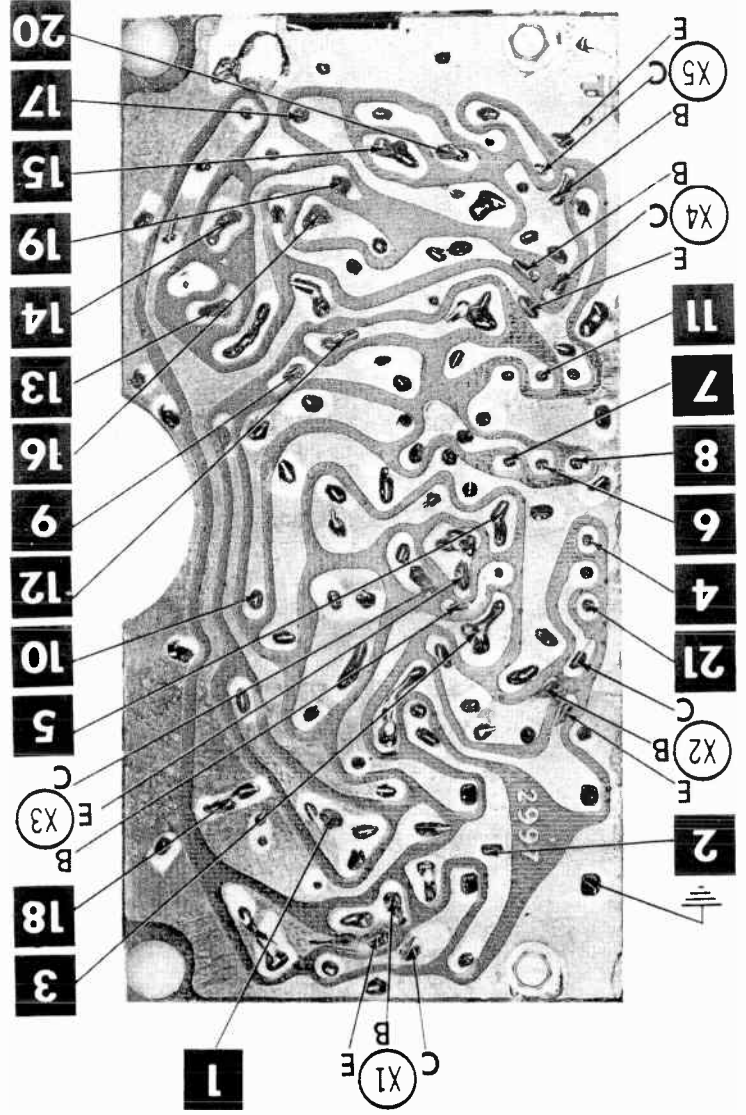
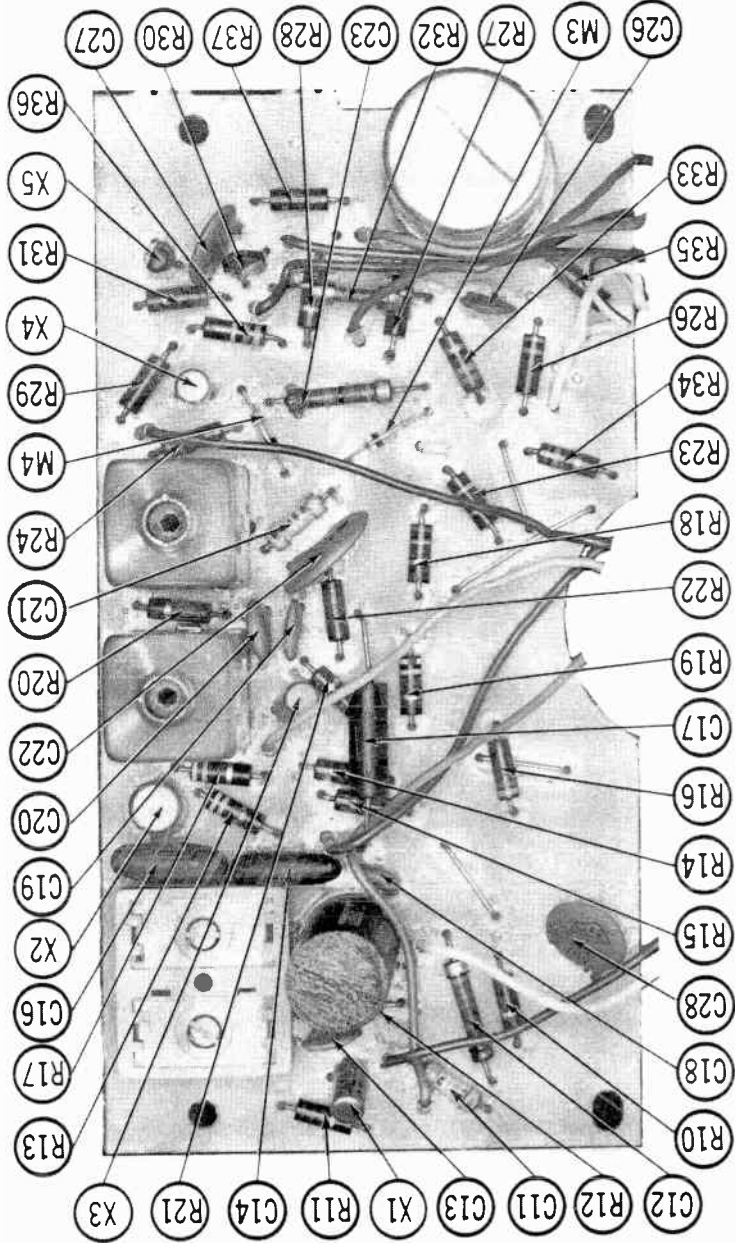
A PHOTOFAC STANDARD NOTATION SCHEMATIC with **CIRCUITRACE**

©Howard W. Sams & Co., Inc, 1964

**SIMCA MODEL 4TBJ**

SIMCA MODEL 4TBJ

A Howard W. Sams CIRCUITRACE® Photo



# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES	BENDIX Part No.
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.		
X1		RF Amp.	DS-25	GE-1	2N1837	PNP	2091241-0015
X2		Conv.	DS-25	GE-1	2N1839	PNP	2091241-0013
X3		IF Amp.	DS-25	GE-1	2N1838	PNP	2091241-0014
X4		1st AF Amp.	DS-26	GE-2	2N591	PNP	2090924-0008
X5		2nd AF Amp.	DS-46	GE-10	2N649	NPN	2092609-0002
X6	2N1227	Output	DS-520	GE-3	2N301	PNP*	2091859-0713

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	220353-30	PWH2-02-40				PFP200.65	PCLS-2161.5*
B	500	8							
C2A	500	3	2092246-0001	BCD3X50050				PET290	VLS-2116*
B	50	3							

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	45-280	#2091221-0008	DI-330	DD-331	LA10T33-C4	CCD-331	GP333	10TS-T33
C11	330		BPD-005	DD-502	BYA10D5	CCD-502	B250	9FK-D50
C12	.005							
C13	140 N1500	#2093030-0037						
C14	.01 100V		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C15A	120-350	#219092-23						
B	230							
C	380-450							
C16	.0068 100V		BE8D68	CPR-6800J	WMF1D68	1DP-1-682	PVC4268	6PS-D68
C17	.01 100V		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10
C18	68 N1500	#2093030-0034		TCL-68				
C19	.01 10V		TTD-1	CK-104	H6		TA010	TG-P10
C20	.1 10V		TTD-1	CK-104	H8		TA010	TG-P10
C21	220		DI-220	DD-221	LA10T22-S3	CCD-221	GP322	10TS-T22
C22	.05		TTD-05	DDA-503	H0585		TA150	TH-S50
C23	.005		BPD-005	DD-502	BYA10D5	CCD-502	B250	5HK-D50
C24	.2 10V			UK20-204	HCC25224Z			HY-325
C25	.1 10V		TTD-1	CK-104	H6		TA010	TG-P10
C26	.47 3V			UK10-404	HCC10474Z			HY-330
C27	.2 10V			UK20-204	HCC25224Z			HY-325
C28	.2 10V			UK20-204	HCC25224Z			HY-325

# Bendix Part Number.

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Tone	50K	2091258-0004	F1-50K ①			† QJ-1752A	FA14L ①
B	Volume/Switch	25K Tap @ 8250Ω		R14-25K, FFS111, RFS203, KR4				RU253T53, OS1687, IS2187, US41

① Use original Tab Mounting Plate.

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-123, P17-123 (Panel)

"SNAP-TROL" Equivalent: BU7, CF12, CR50T, SF13, SR49, GC. B19-119X, R9-202 (Rear)

76-1 (Switch)  
R5 (Retainer)

## COILS (RF-IF)

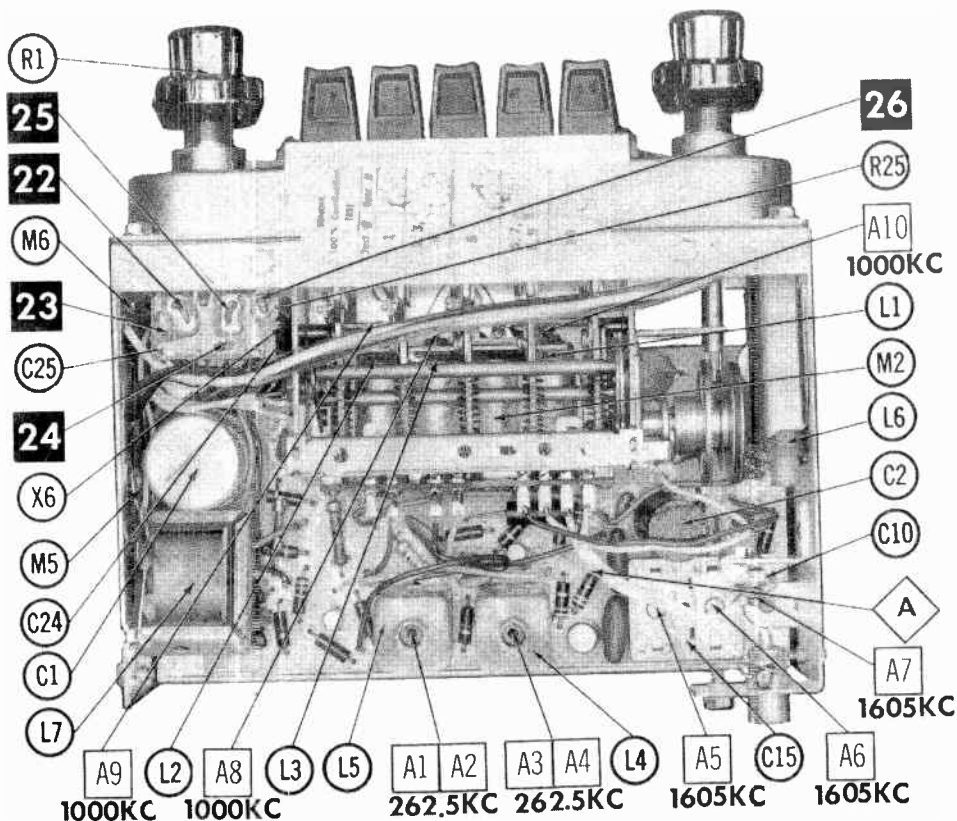
ITEM No.	USE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.	①					① Part of M2.
L2	RF	①					
L3	Osc.	①					
L4	Input IF	2093001-0701		6520			
L5	Output IF	2093002-0701		6521			

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L6	.7 Amp.	.1Ω	240uh	2092050-0014					

## CHOKE (AUDIO OUTPUT)

ITEM No.	INDUCTANCE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	50MH	2092245-0005					



## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		BENDIX PART No.	QUAM PART No.	
SP1	5" X 7" PM 20Ω	2092481-0001	57A1Z20	

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				BUSS PART No.	
			BENDIX PART No.		LITTELFUSE PART No.		FUSE	HOLDER
			FUSE	HOLDER	FUSE	HOLDER		
M1	1AG	2A 32V	2091811-0007	2090932-0509	301002	15500	AGA2	HAF

### MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Tuner Coil Assembly	2092544-0707	
M3	AVC Limiter	2090131-0072	
M4	AF Det.	2092055-0001	
M5	Spark Plate	2092055-0001	(350mmf)
M6	Spark Plate	2093050-0001	(350mmf)

### CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Escutcheon Assembly	2092709-0502	Knob, Tone, Dummy	2092235-0001
Dial Glass	2092474-0005	Pushbutton	2092224-0002
Knob, Tuning, Volume	2091420-0001	Pointer Arm Assembly	2090129-0033

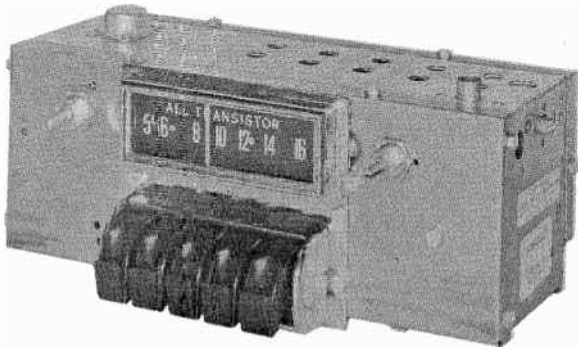
### WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>



TRADE NAME: Soundex Model RAP-364T  
 SUPPLIER: For Current Address, See Master Index.  
 TYPE SET: 5 Transistor AM Receiver  
 POWER SUPPLY: 12 Volt Storage Battery  
 RATING: .680 Amp. @ 12.6 Volts DC  
 TUNING RANGE: BROADCAST 540-1615KC

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.

Use only enough generator output to provide a usable indication.

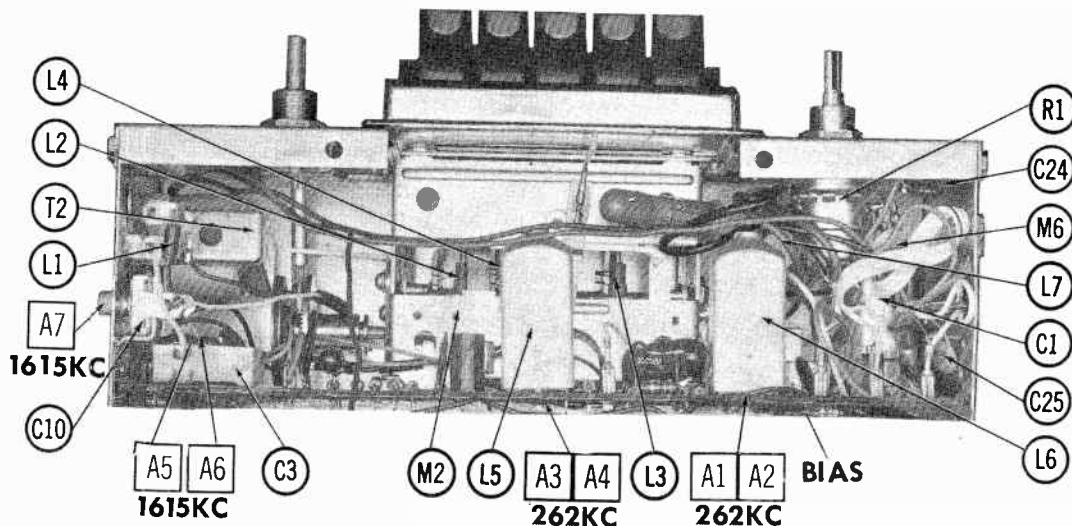
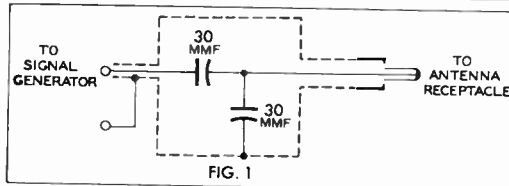
Suggested Alignment Tools: A1 thru A4 GENERAL CEMENT: 8606, 8606L, 8869 WALSCO: 2543, 2544, 2588  
 A5, A6, A7 GENERAL CEMENT: 8290, 8868, 9087 WALSCO: 2525, 2528, 2587

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400 $\nu$ Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2. Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.

### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1637	RF Amp	DS-25	GE-1	2N1837	PNP
X2	2N1639	Converter	DS-25	GE-1	2N1839	PNP
X3	2N1638	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	2N591	Driver	DS-28	GE-2	2N591	PNP
X5	2N301	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Soundex PART No.	REPLACEMENT DATA					SPRAGUE PART No.
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	
C1A	▲300	18	C-88	PWH3-00-95		XC3-48		PPF300.18	PCIS-302R 12*
B	■500	18							
C	100	18							
C2	25	15	C-53	BCD15025	NLP25-15	MT1-14	BL1441	PET1570	VL-1170
C3	5	15	C-54	BCD15005	NLP5-15	MT1-3	BL1141	PET1535	VL-1164

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMenco PART No.	MALLORY PART No.	SPRAGUE PART No.
C10		#TR-5A	BPD-0033	DD-332	BYA10D33	CCD-332	B233	5HK-D33
C11	.003		P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C12	.047	100V						
C13A		#TR-14						
B								
C14	270		DI-270	DD-271	LA10T27-04	CCD-271	GP327	5GA-T27
C15	.02		BPD-02	DD-203	BYA8S2	CCD-203	B120	5HK-S20
C18	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C17	.015		P288N-015		WMF2S15	4DP-1-153	PVC2115	4PS-S15
C18	100	100V	N750-DI100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C19	.05	100V	P288N-05		DPMS2S5	1DP-2-503	PVC215	2PS-S50
C20	.1	100V	P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C21	180		DI-180	DD-181	LA10T18-63	CCD-181	GP318	5GA-T18
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C23	330		DI-330	DD-331	LA10T33-4	CCD-331	GP333	10TS-T33
C24	.1	200V	P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C25	.003	(.05) †	BPD-0033	DD-332	BYA10D33	CCD-332	B233	5HK-D33

# Soundex Part Number.  
† Alternate Value.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			Soundex PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Tone	25K	VC15T	F1-25K, R2-10K, FFS011, RFS102, AK28, KR4		† QJ1783A		AUE4523-S
B	Volume, Switch	10K						
R2	Bias	500Ω 2W	PT1	U39-500		110-800		PFL800

① Alter Bushing to meet requirements.

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-120, P22-021 (Panel)

"SNAPTROL" Equivalent: BU10, CF11, CR49T, SF3, SR39, GC.

▲ "STA-LOC" Equivalent: FE253L, RU14A, OS750A, IS1187, US41

S37 (Bushing)

78-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Soundex PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (8.5uh)	TF-14	BC-565	74F888AP	RTC-8520	T859	① Part of M2
L2	Ant.	①					
L3	RF	②					
L4	Osc.	③					
L5	Input IF	TF-31					
L8	Output IF	TF-30					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	
L7	880MA	.8Ω	15MH	TF-4C	C-4095	TC-2	TR-152	TY17XT

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA					NOTES
		Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	13:1	TF-34					

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	25Ω Tap @	3-4Ω	TF-15E				TR-188	

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA	NOTES
SP1	6" X 10" PM	3-4Ω SK-23W 810A1	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				
			Soundex PART No.	LITTELFUSE PART No.	BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	7½A 32V			31107.5	155020	AGC7½ HDJ

## MISCELLANEOUS

ITEM No.	PART NAME	Soundex PART No.	NOTES
M2	Tuner	TUN-36T	
M3	RF Limiter		1N295
M4	AVC Limiter		1N295
M5	AF Det.		1N295
M6	Spark Plate	SPK-P-2	

## WIRING DATA

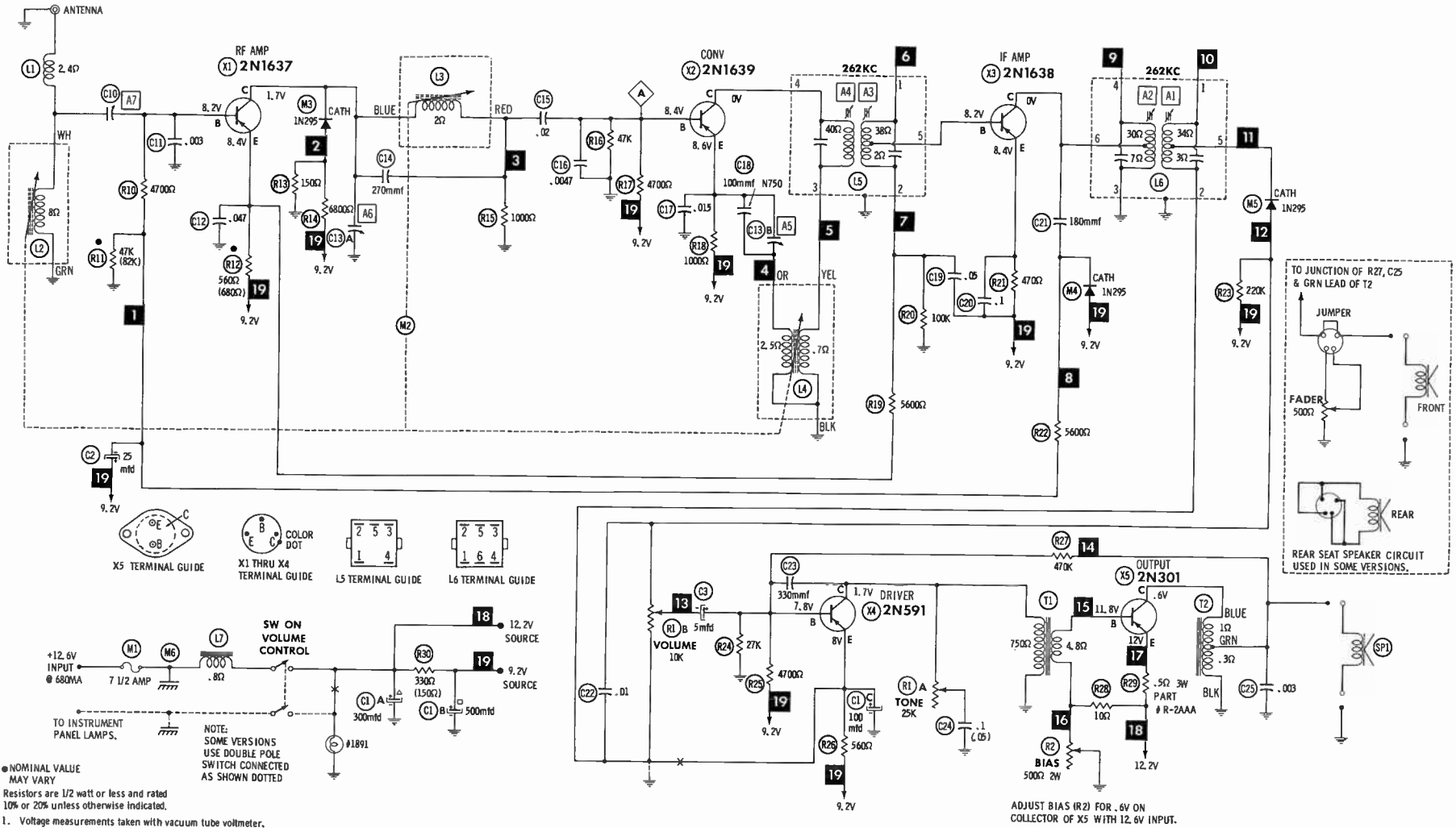
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in 12 Colors  
8524 (Stranded) Available in 12 Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Rear Seat Speaker Extension Cable ..... Use BELDEN No. 8782 (Stranded) Coded Parallel Leads

Bonding Strap ..... Use BELDEN No. 8681 (3/8 In.) or 8670 (3/4 In.)

SOUNDEX MODEL RAP-364T



SOUNDEX MODEL RAP-364T

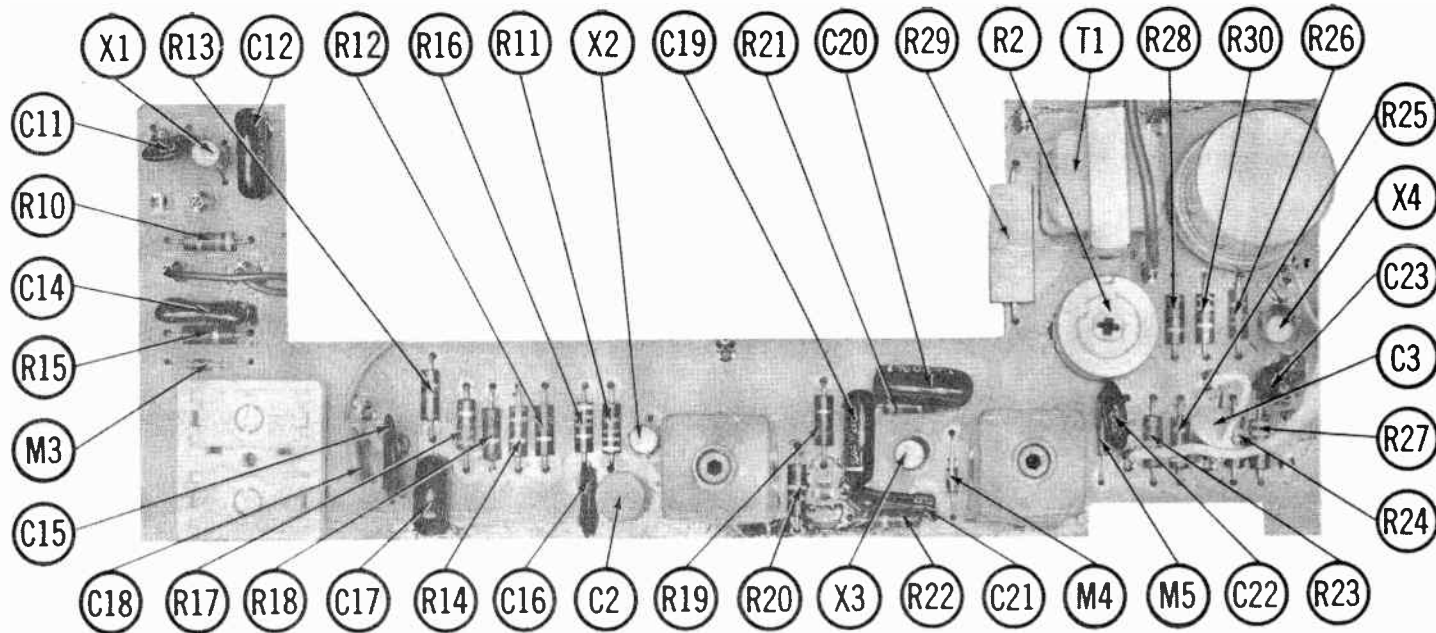
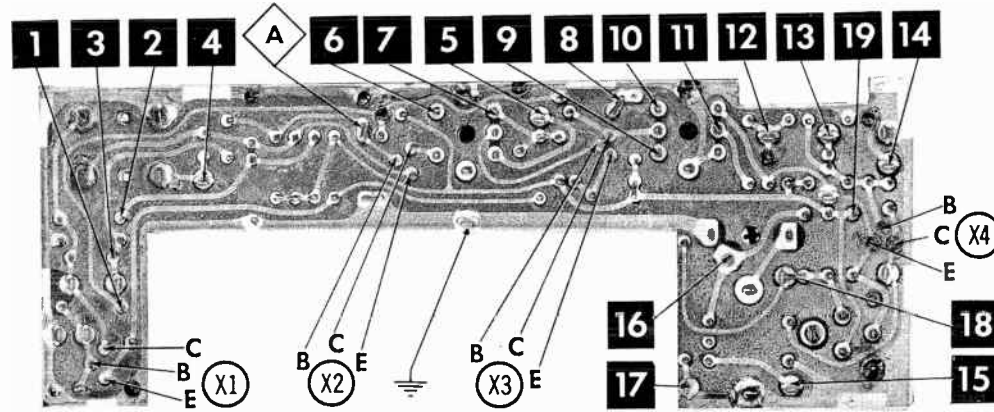
• NOMINAL VALUE MAY VARY

Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation, no signal applied.
3. Measured values are from socket pin or terminal to common ground.
4. All terminals viewed from bottom unless otherwise designated.
5. Numbers assigned to terminals may not be found on the unit.
6. Supply voltage maintained at rated value for voltage readings.
7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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**SOUNDEX MODEL RAP-364T**



# PHOTOFACT®



**TRADE NAME :** Soundex Model SM-130RPE  
**SUPPLIER :** For Current Address, See Master Index.  
**TYPE SET :** 3 Tube 2 Transistor AM Receiver  
**POWER SUPPLY :** 12 Volt Storage Battery  
**RATING :** 1.2 Amp. @ 12.6 Volts DC  
  
**TUNING RANGE :** BROADCAST 540-1615KC

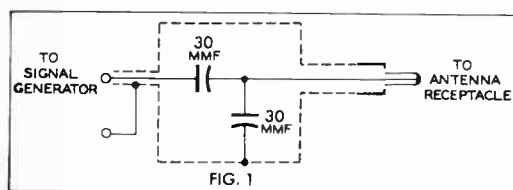
SOUNDEX MODEL SM-130RPE

## ALIGNMENT INSTRUCTIONS

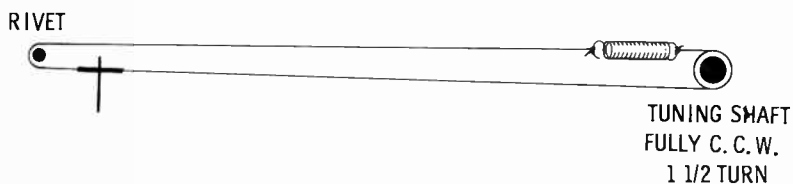
Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools: A1 thru A4 GENERAL CEMENT: 8606, 8606L, 8869 WALSCO: 2543, 2544, 2588  
 A5, A6, A7 GENERAL CEMENT: 8290, 8868, 9087 WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mfd to point $\Delta$ , low side to ground.	262KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coll.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.



## DIAL CORD STRINGING



REAR VIEW

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

# PARTS LIST AND DESCRIPTION

## WIRING DATA

Replacement parts shown may be superseded by the availability of newly introduced replacements. Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 in.) or 8670 (3/4 in.)

## TUBES

AMPEREX		GENERAL ELECTRIC		RCA		SYLVANIA	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V1	Converter IF Amp.	12AD6		V3	Det. -AVC-AF Amp.	12AE6A	
V2		12BL6					

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N591	Driver	DS-26	GE-2	2N591	PNP
X2	2N301	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Soundex PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
CLA	800	16	C-46	AFH3-00-95.4		XC3-48	WP300.85v	WP300.85	PC1S-8026.10*
B	300	16							
C	100	16							

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	27		#TR-5A		TCN-27			CN7427	10TCU-Q27
C11									
C12	100	N750		N750-DI100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C13	.003			DI-3000	DD-302	LA10D3-C4	CCD-302	GP230	5GA-D30
C14A									
B									
C15	.047								HY-310
C16	200	N750	N750-DI200	DTN-200	C10T2U	CCTN-201	CN7320	10TCU-T20	
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C18	27			TCN-27			CN7427	10TCU-Q27	
C19	.002		BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C21	.003		DI-3000	DD-302	LA10D3-C4	CCD-302	GP230	5GA-D30	
C22	.5	100V	BE2P5	DD-302	LA10D3-C4	CCD-302	GP230	5GA-D30	
				DD-302	DPM52P5	IDP-4-504	PVC105	2PS-750	

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			Soundex PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
RIA	Tone	2meg	VC-2B	F1-2meg,			† QJ-1811A	▲UE4524-S
B	Volume, Switch	1meg Tap @ 220K		R14-1meg, FFS015, RFS107, AK31, KR4				

† "CONCENTRIKIT" Equivalent: K7 Kit with Base Elements and Shafts: B11-139, P21-029 (Panel)  
 "SNAPTROL" Equivalent: BU8, CF19, CR32T, SF40, SR6, GC. B13-137X, R26-112 (Rear)  
 ▲ "STA-LOC" Equivalent: FR26L, RU18T224, O8937, 1S1437, US41 76-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	Soundex PART No.	REPLACEMENT DATA				NOTES
			MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	1st Ant.	①					① Part of M2
L2	2nd Ant.	①					
L3	Osc.	①					
L4	Input IF	TF-8 (2624S)					
L5	Output IF	TF-9 (2626S)					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L6	1.2Amp.	.3Ω	3MH	TF-6C	C-4095	TC-1	TR-156	TY16XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA					NOTES
		Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	14:4:1	TF-1C					

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	20Ω	3-4Ω	TF-20C			TR-187		

## SPEAKER

ITEM No.	TYPE	RATING	REPLACEMENT DATA		NOTES
			Soundex PART No.	QUAM PART No.	
SP1	5" PM	3-4Ω	SK-5	5A07R	

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Soundex PART No.	REPLACEMENT DATA
K1	Osc. Coupling	47K, 40mmf, 51mmf.	RC-3	
K2	Audio Coupling	470K, 2.2meg, .01mfd, .01mfd.	RC-4A	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Soundex PART No.	LITTELFUSE PART No.		BUSS PART No.		
				FUSE	HOLDER	FUSE	HOLDER	FUSE
M1	3AG	7½/32V			31107.5	155020	AGC7½	HDJ

## MISCELLANEOUS

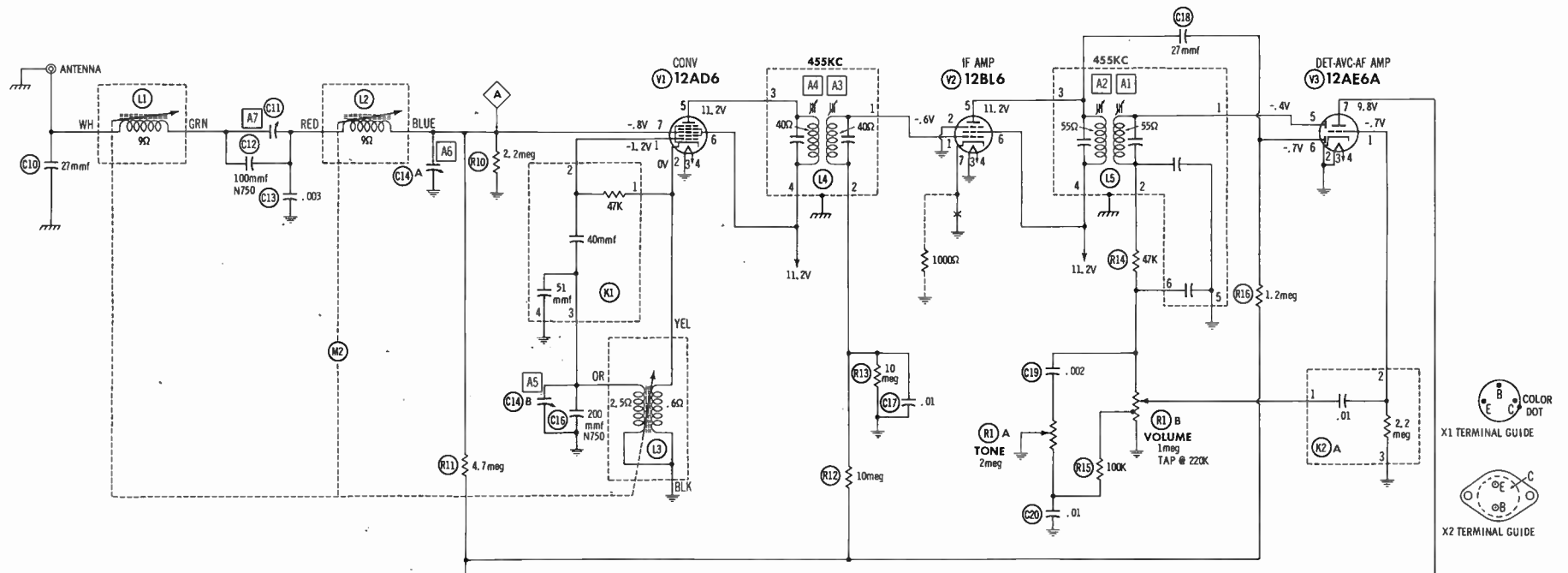
ITEM No.	PART NAME	Soundex PART No.	NOTES
M2	Tuner	TUN-17M	
M3	Spark Plate	SPK-P-2	

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Escutcheon	BE-12		

REVERSE SIDE OF PARTS LIST



**RESISTANCE MEASUREMENTS**

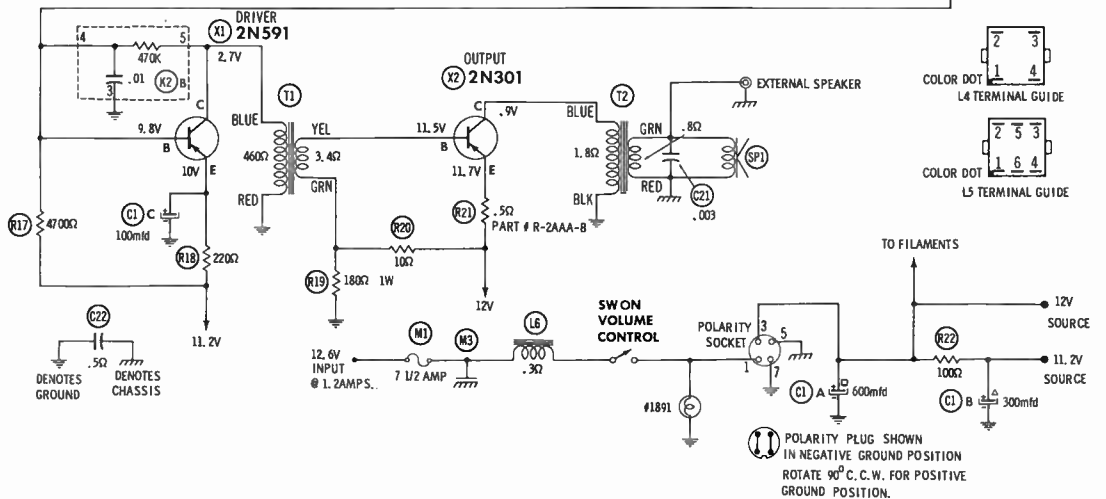
ITEM	TUBE	PIn 1	PIn 2	PIn 3	PIn 4	PIn 5	PIn 6	PIn 7
V1	12AD6	47K	.6Ω	FIL	FIL	†140Ω	†1100Ω	2meg
V2	12BL6	7meg	0Ω	FIL	FIL	†155Ω	†1100Ω	0Ω
V3	12AE6A	2.2meg	0Ω	FIL	FIL	400K	7meg	14700Ω

† MEASURED FROM CIA.

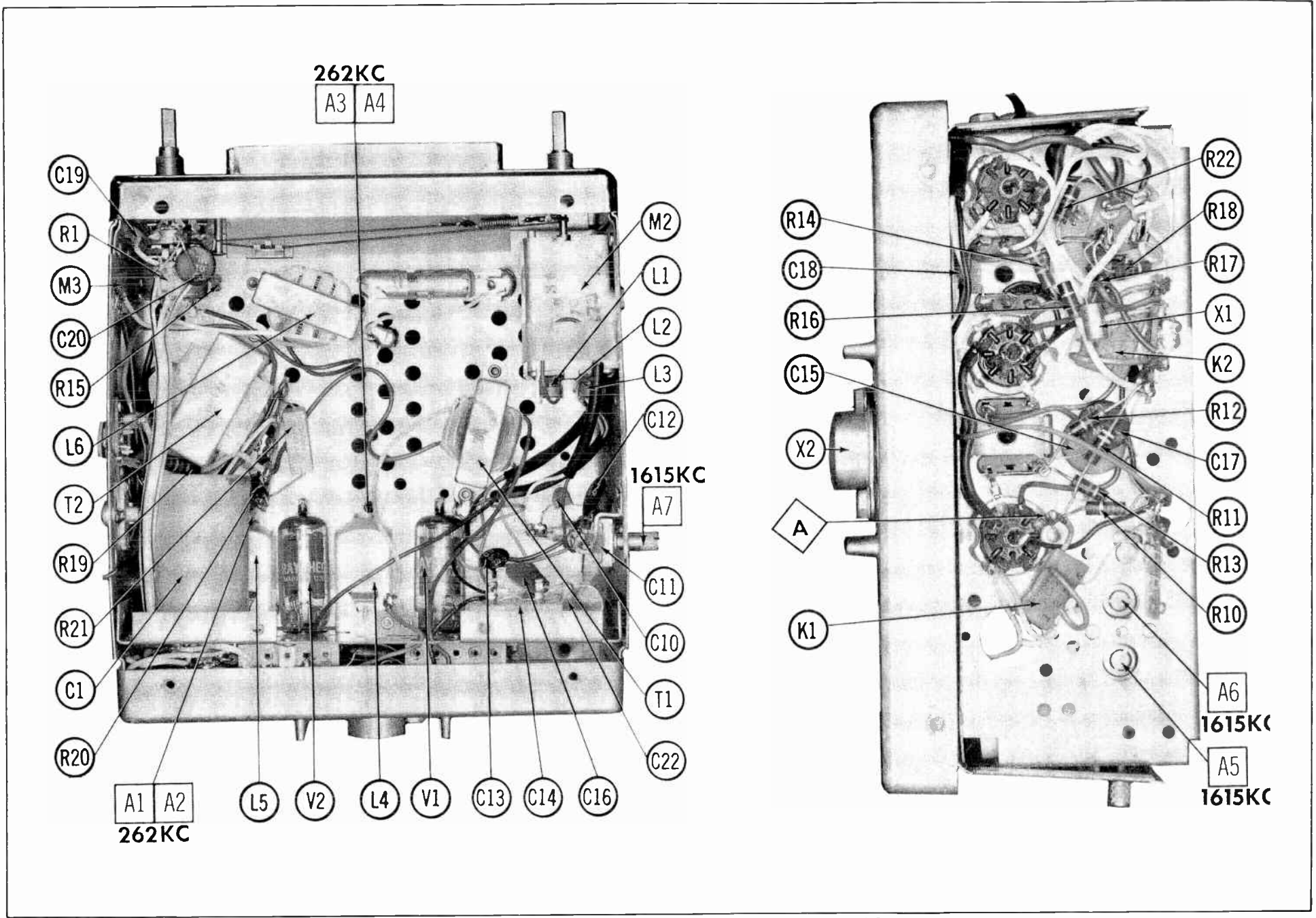
RESISTANCE MEASUREMENTS NOT GIVEN FOR X1 & X2 BECAUSE OF THE WIDE VARIATION IN INTERNAL RESISTANCE OF TRANSISTOR. VOLTAGES TAKEN IN NEGATIVE GROUND POSITION.

1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

**SOUNDEX MODEL SM-13ORPE**



A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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SUNDUX MODEL SM-130RPE



# PHOTOFACT®



TRADE NAME : Soundex Model UP-220RPT  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 5 Transistor AM Receiver  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .65 Amp. @ 12.6 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC

SOUNDEX MODEL UP-220RPT

## ALIGNMENT INSTRUCTIONS

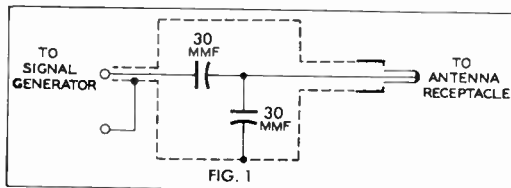
Check for specified source voltage.

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools: A1 thru A4 GENERAL CEMENT: 8606, 8806L, 8869 WALSCO: 2543, 2544, 2588  
 A5, A6, A7 GENERAL CEMENT: 8290, 8868, 9087 WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	262KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.



### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1837	RF Amp.	DS-25	GE-1	2N1837	PNP
X2	2N1839	Converter	DS-25	GE-1	2N1839	PNP
X3	2N1838	IF Amp.	DS-25	GE-1	2N1838	PNP
X4	2N591	AF Amp.	DS-28	GE-2	2N591	PNP
X5	2N301	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicone grease to both sides of insulator. Tighten Mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Soundex PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	
C1A	▲300	18	C-48	AFH3-00-954		XC3-48		WP300.85	TVLS-3028.7*
B	■800	18							
C	100	18							
C2	25	18	C-35	PTT82	NLW25-25	MTI-14	BL1550	TT25X25	TL-1157.1
C3	5	18	C-36	PTT77	NLW6-25	MTI-3	BL1250	TT25X25	TL-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	FLMenco PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	.003	#TR5A-1	DI-3000	DD-302	LA10D3-C4	CCD-302	GP230	5GA-D30
C11	.047							HY-310
C12		#TR-3						
C13A								
B								
C14	270		DI-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T27
C15	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20
C16	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47
C17	.015	100V	P288N-015		WMF2S15	4DP-1-153	PVC2115	4PS-S15
C18	100	N750	N750-DI100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C19	180		DI-180	DD-181	LA10T18-S8	CCD-181	GP318	5GA-T18
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C21	330		DI-330	DD-331	LA10T33-C4	CCD-331	GP333	10TS-T33
C22	.1	100V	P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C23	.003		DI-3000	DD-302	LA10D3-C4	CCD-302	GP230	5GA-D30
C24	.47	100V	BE2P5		DPMS2P5	1DP-4-504	PVC105	2PS-P50

# Soundex Part Number \* Not normally in distributor's stock. Available thru distributor on order to manufacturer.  
† Alternate Value

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA					
			Soundex PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Tone	250K	VC2BT	F2-250K,				
B	Volume	10K		R2-10K,				
				FFS014,				
				RFS108,				
				AK-31	KR-4			
							† QJ-1761A	

① Alter Bushing to meet requirements. ② Disregard Tap.  
† "CONCENTRIKIT" Equivalent: K8 Kit with base Elements and Shafts: B13-130, P21-029 (Panel)  
"SNAPTROL" Equivalent: BU8, CF23, CR49T, SF5, SR8, GC.  
B13-116, R9-110 (Rear)  
S45 (Bushling)  
76-1 (Switch)

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Soundex PART NO.	REPLACEMENT DATA
K1	Biasing	470Ω, 5800Ω, 100K, .05mfd, .1mfd.	RC7B	

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Soundex PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (6.8uh)	TF-14	BC-565	74F886AP	RTC-8520	T859	① Part of M2. ② Some versions may use Part #TF-27T. ③ Some versions may use Part #TF-28T.
L2	Ant.	①					
L3	RF	②					
L4	Osc.	③					
L5	Input IF	TF-20 ②		6570			
L6	Output IF	TF-21 ③		6571			

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	650MA	.3Ω	3MH	TF-8C	C-4095	TC-1	TR-158	TY18XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	14.4:	1	TF-1C					

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES	
		Soundex PART No.	QUAM PART No.		
SP1	5" X 7" PM 5" PM	3-4Ω 3-4Ω	SK-11 SK-5	57A1 5A07R	Ait.

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Soundex PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	4A 32V			311004	155020	AGC4	HDJ

## MISCELLANEOUS

ITEM No.	PART NAME	Soundex PART No.	NOTES
M2	Tuner	TUN-37T	
M3	RF Limiter		(1N295)
M4	AVC Limiter		(1N295)
M5	AF Det.		(1N295)
M6	Spark Plate	SPK-P-2	

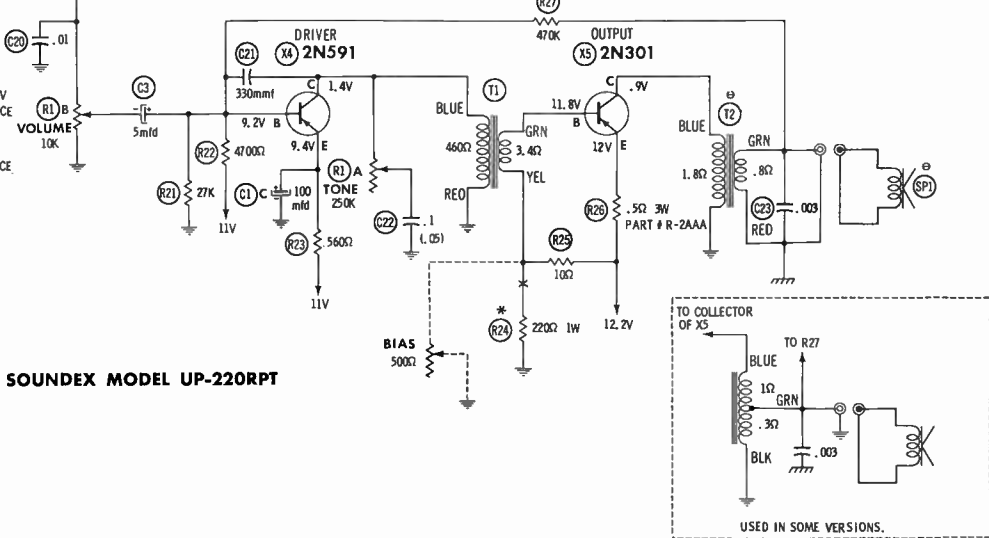
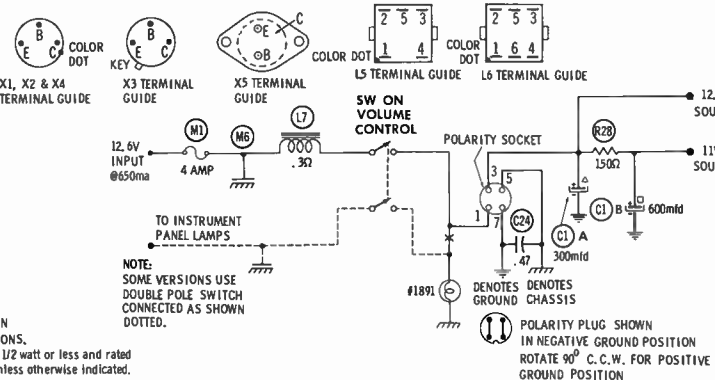
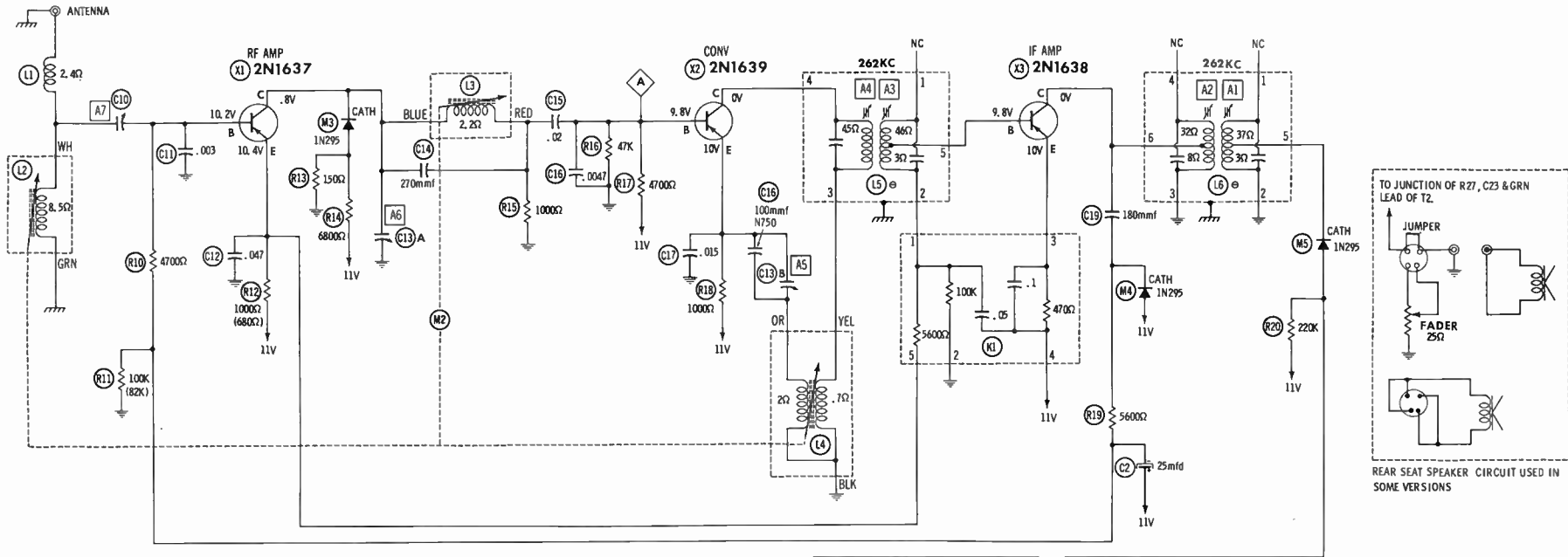
## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Bezel	BE-27		

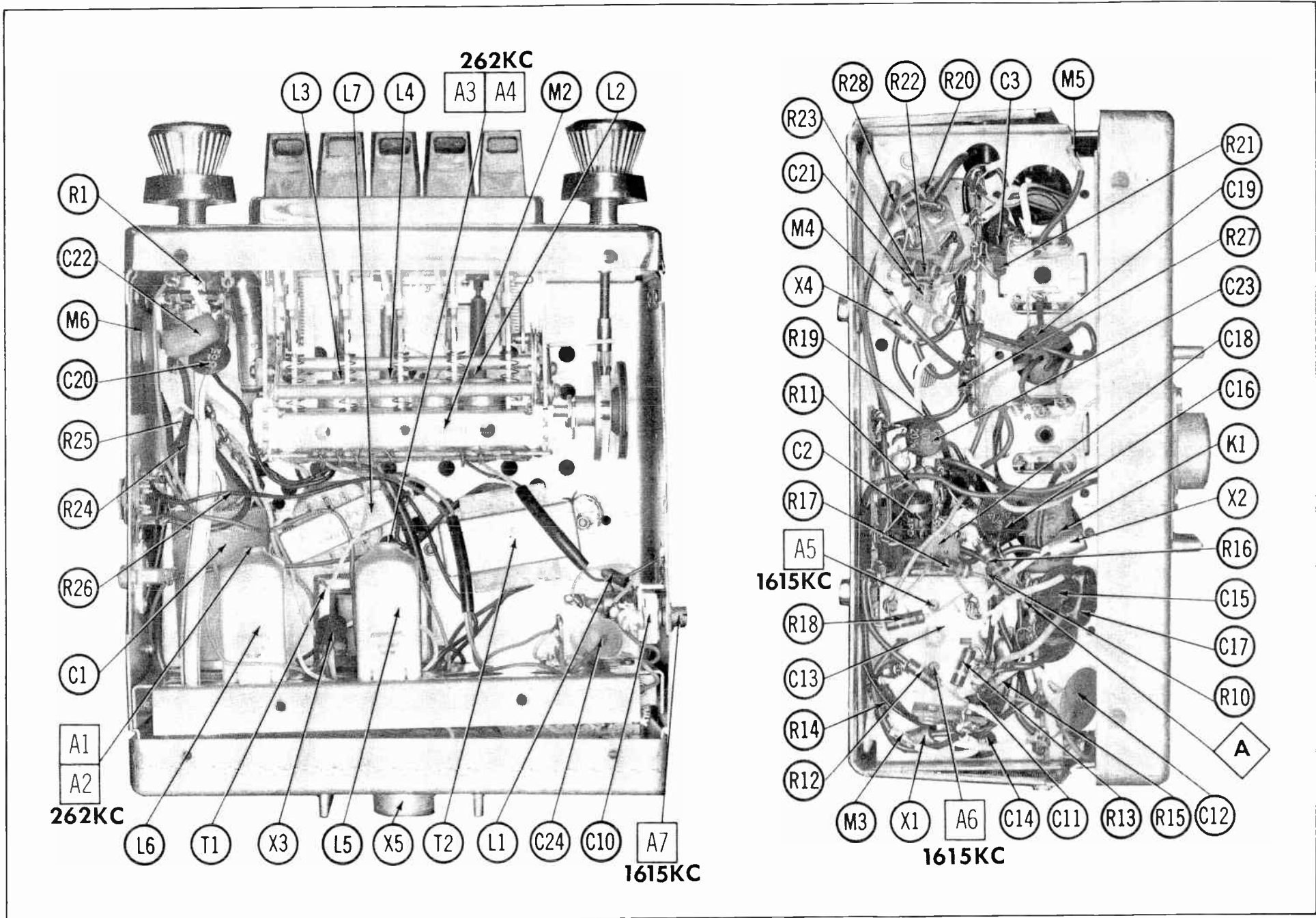
## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



- \* NOT USED IN SOME VERSIONS.  
 Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- ⊖ See parts list for alternate value or application.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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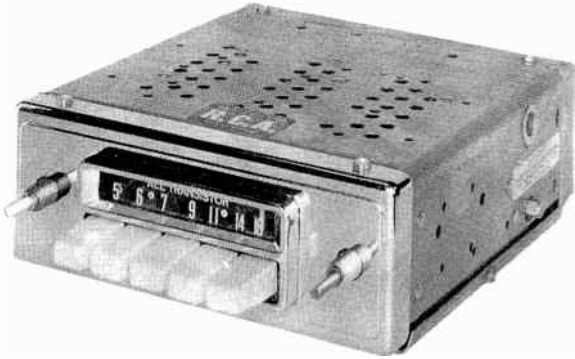


SOUNDEX MODEL UP-220RPT



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>



TRADE NAME : Soundex Model VWP-19T  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 5 Transistor AM Receiver  
 POWER SUPPLY : 6 Volt Storage Battery  
 RATING : .750 Amp. @ 6.3 Volts DC  
 TUNING RANGE : BROADCAST 540-1615KC

SOUNDEX MODEL VWP-19T

## ALIGNMENT INSTRUCTIONS

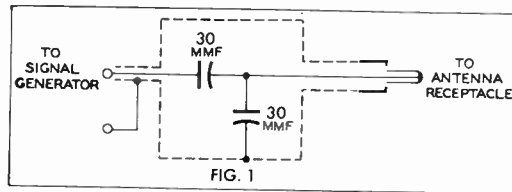
Check for specified source voltage.

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools: A1 thru A4 GENERAL CEMENT: 8606, 8606L, 8869 WALSCO: 2543, 2544, 2588  
 A5, A6, A7 GENERAL CEMENT: 8290, 8868, 9087 WALSCO: 2525, 2528, 2587

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	262KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	"	"	A5, A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.



### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1637	RF Amp.	DS-25	GE-1	2N1637	PNP
X2	2N1639	Converter	DS-25	GE-1	2N1639	PNP
X3	2N2872	IF Amp.	DS-25	GE-1	2N1638	PNP
X4	2N591	Driver	DS-26	GE-2	2N591	PNP
X5	2N301	Output	DS-520	GE-3	2N301	PNP*

\* When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Soundex PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	4300	16	C-66	PWH3-00-95	CCOO12	XC3-48		PFP300.18	PCIS-3026.12*
B	500	16							
C	100	16							
C2	25	15	C-53	BCD15025	NLP25-15	MT1-14	BL1441	PET1570	VL-1170
C3	5	15	C-54	BCD15005	NLP5-15	MT1-3	BL1141	PET1535	VL-1184
C4	750	3	C-22	PRS1130	BR1000-6	Q71-32	BL2211	PETA190	TVA-1097
C5	900	10	①	PRS1180	BR1000-12	Q71-32	BL2430	TC1501	TVA-1133

① May not be used in some versions.  
\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA								
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.			
C10	820 .047	100V	#TR-5A-1	DI-820	DD-821	LA10T82-C4	CCD-821	B382	10TS-T82		
C11				P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47		
C12											
C13A	200V N750 100V 100V 100V 100V 100V 100V 100V 100V 100V 100V 100V 100V 100V	#TR-14	#TR-14	DI-270	DD-271	LA10T27-C4	CCD-271	GP327	5GA-T27		
C14				BPD-02	DD-203	BYA8S2	CCD-203	B120	5HK-S20		
C15				BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47		
C16				P288N-015		WMF2S15	ADP-1-153	PVC2115	4PS-S15		
C17				P288N-015		N750-D1100	DTN-100	C10T1U	CCTN-101	CN7310	10TCU-T10
C18				P288N-047		P288N-047		WMF2S47	1DP-2-473	PVC1147	2PS-S47
C19				.1		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C20				180		DI-180	DD-181	LA10T18-S3	CCD-181	GP318	5GA-T18
C21				.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10
C22				330		DI-330	DD-331	LA10T33-C4	CCD-331	GP333	10TS-T33
C23				.1		P288N-1		WMF1P1	1DP-2-104	PVC101	2PS-P10
C24				.003		BPD-0033	DD-332	BYA10D33	CCD-332	B233	5HK-D33

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA			
			Soundex PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.
R1A	Tone Volume, Switch	250K 10K	VC2BT	F2-250K, R2-10K, FFS014, RFS106, AK-31 KR4		† QJ-1761A
B						

① Alter Bushing to meet requirements.  
† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B13-130, P21-029 (Panel)  
B13-116, R9-110 (Rear)  
S45 (Bushing)  
76-1 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Soundex PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	RF Choke (6.8uh)	TF-14	BC-565	74F686AP	RTC-8520	T859	① Part of M2.
L2	Ant.	①					
L3	RF	①					
L4	Osc.	①					
L5	Input IF	TF-31					
L6	Output IF	TF-30					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	750MA	.5Ω	1.5MH	TF-17C	C-4095	TC-1	TR-159	TY16XT	

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	T1	14.4:	1	TF-1C				

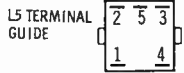
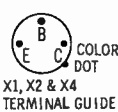
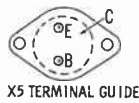
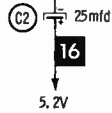
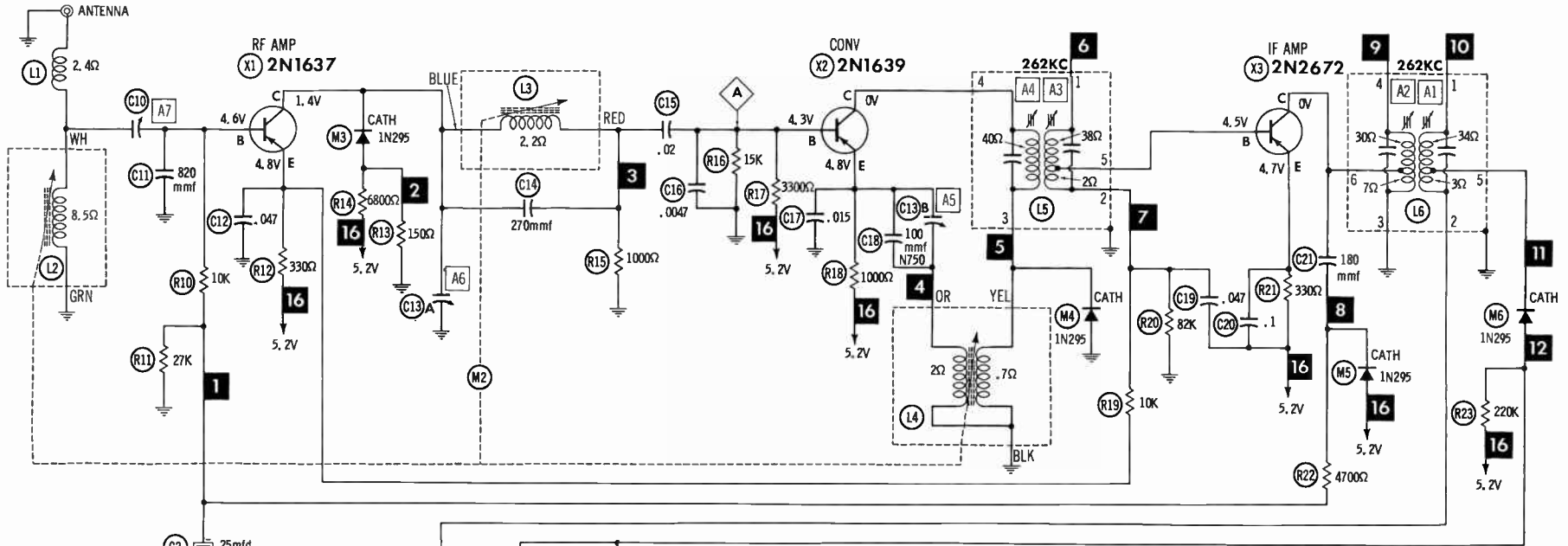
## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Soundex PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	T2	15MH	TF22					

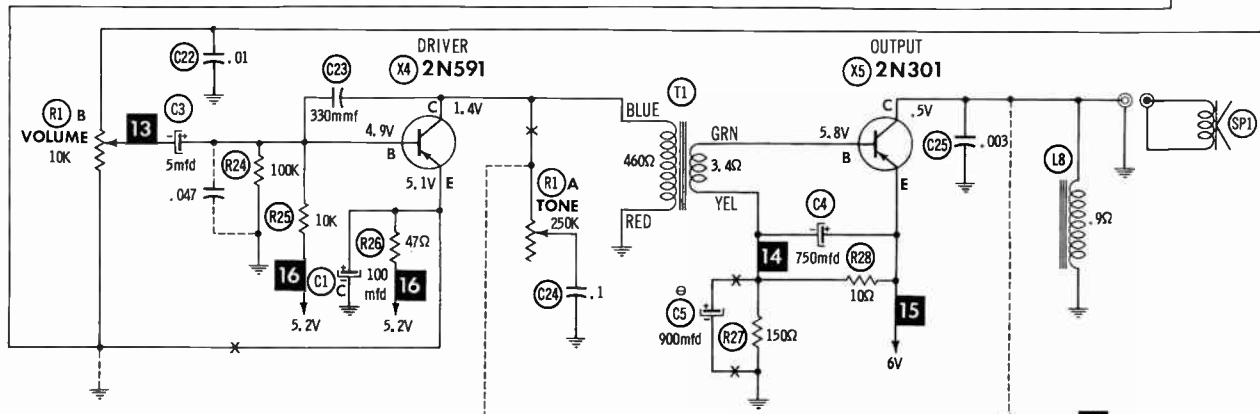
## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Soundex PART No.	QUAM PART No.	
SP1	5" PM 8Ω	SK-5A	5A07Z8	

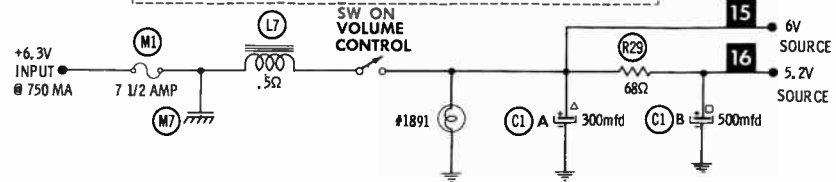
SOUNDEX MODEL WMP-191



- ⊖ See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.



Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.



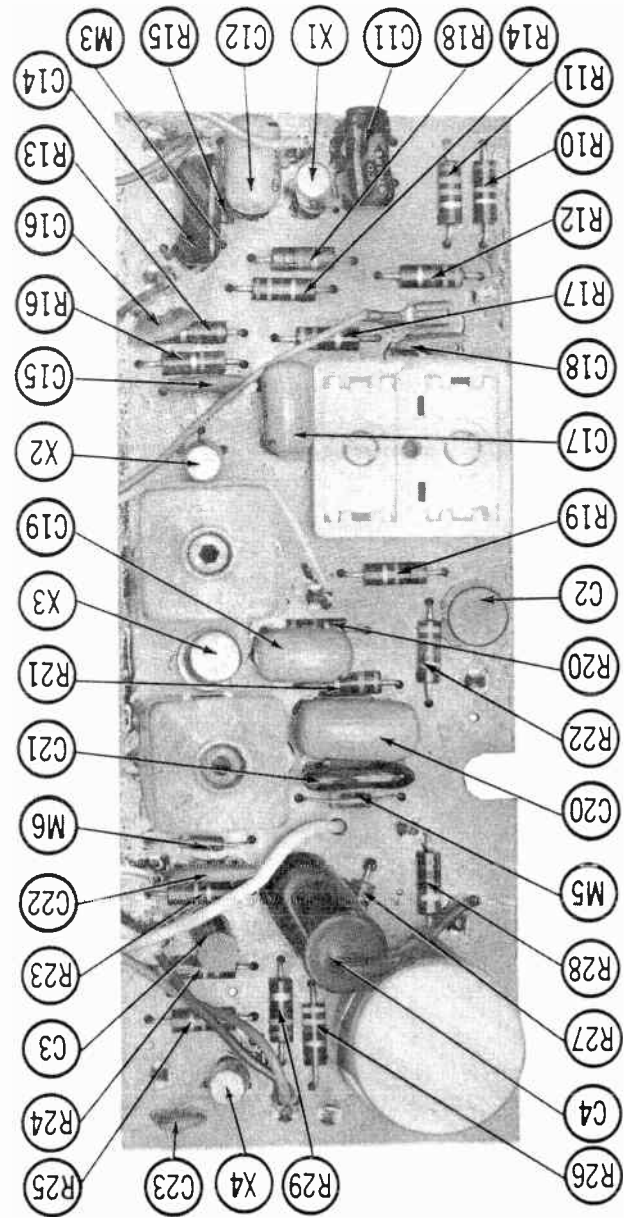
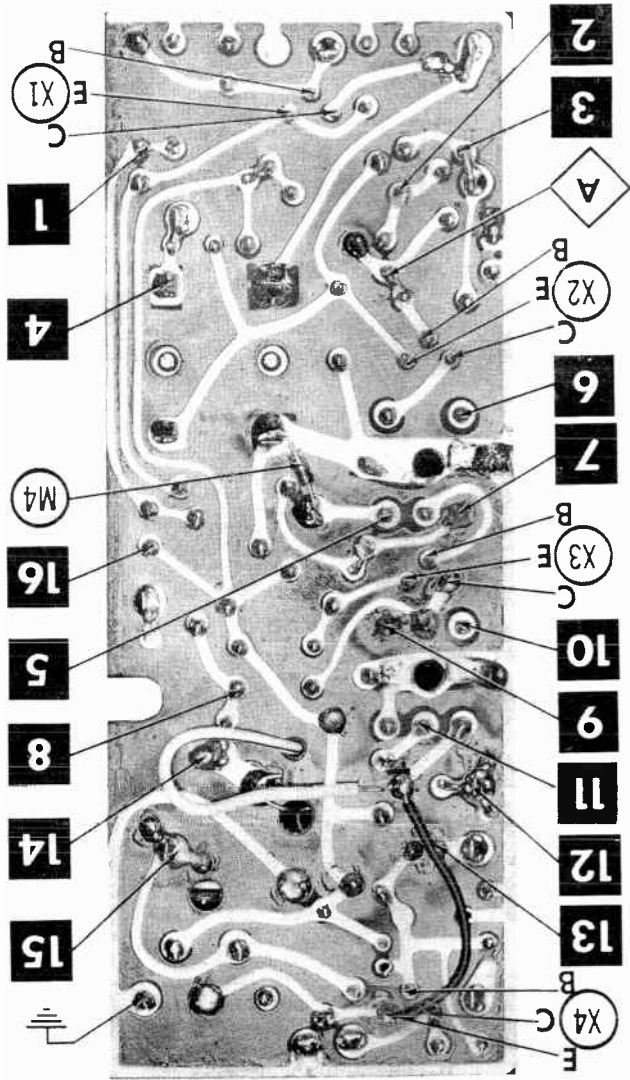
A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE

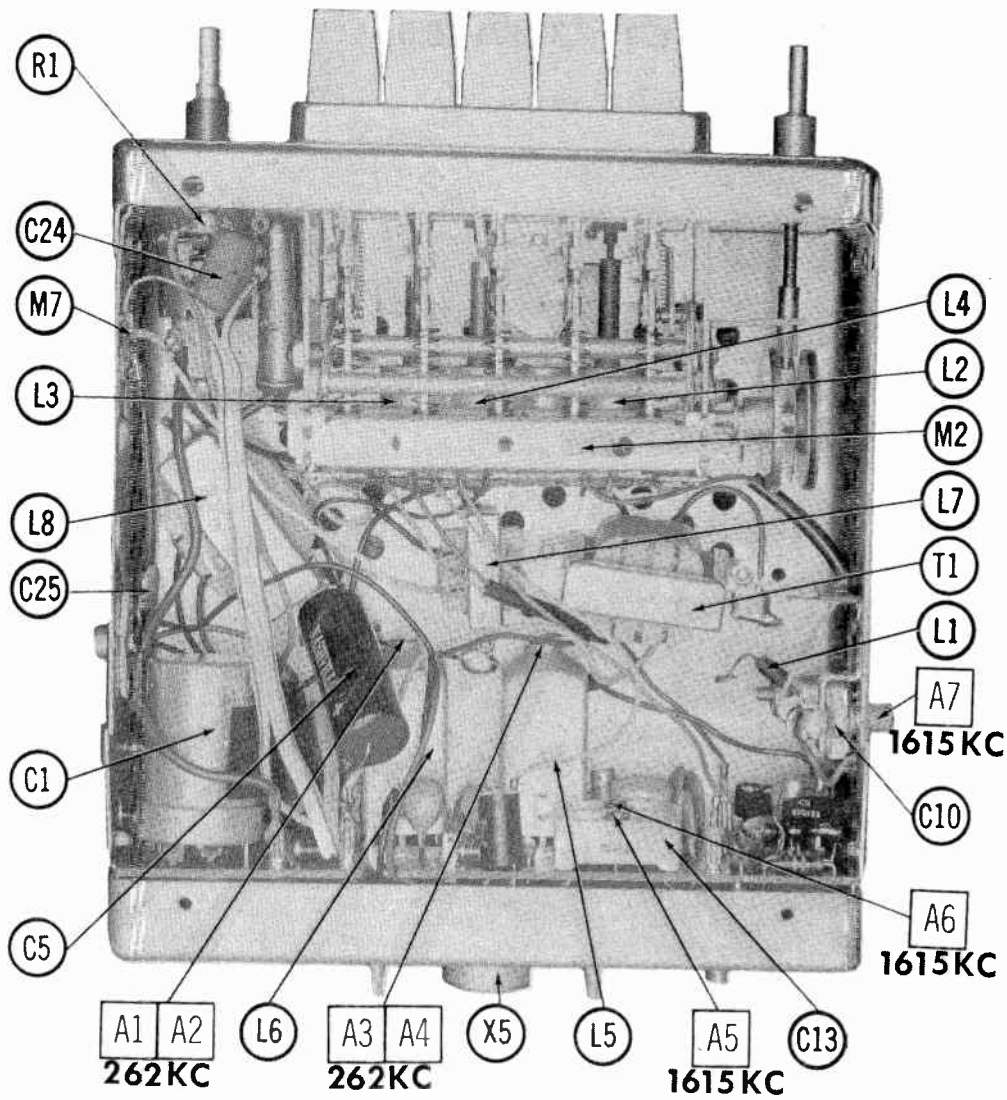
**SOUNDEX MODEL VWP-19T**

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SOUNDEX MODEL VWP-19T

A Howard W. Sams CIRCUITRACE® Photo





## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Soundex PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	7½ A 32V			31107.5	155020	AGC7½	HDJ

### MISCELLANEOUS

ITEM No.	PART NAME	Soundex PART No.	NOTES
M2	Tuner	TUN-34-T	1N295
M3	RF Limiter		
M4	IF Limiter		
M5	AVC Limiter		
M6	AF Det.		
M7	Spark Plate	SPK-P-2	1N295

### CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Bezel	BE-13	Dial Scale	DS-24T





PHOTOFACT<sup>®</sup> with

CIRCUTRACE<sup>®</sup>

TRADE NAME : Titan Model FMC-4  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 8 Transistor FM Converter  
 POWER SUPPLY : 12 Volt Storage Battery  
 RATING : .330 Amp. @ 12.6 Volts DC  
 TUNING RANGE: FREQ. MOD. 88-108MC



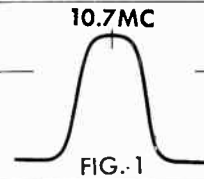
## ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
**CAUTION:** Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
 Suggested Alignment Tools:  
 A1 thru A13      GENERAL CEMENT: 5009, 8728A, 8987      WALSCO: 2531X, 2536

### FM ALIGNMENT USING AM SIGNAL GENERATOR — SELECTOR IN FM POSITION

High side to of generator thru .01mfd to point  $\diamond A$ , low side to ground for IF.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\diamond B$ ; common to ground.	A1 thru A8	Adjust for maximum.
"	"	DC probe to point $\diamond C$ ; common to	A9	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.



### FM IF ALIGNMENT USING FM SIGNAL GENERATOR — SELECTOR IN FM POSITION

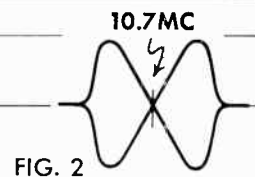
High side thru .01mfd to point  $\diamond A$ , low side to ground. Use 60% frequency modulated signal with 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\diamond B$ ; low side to ground.	A1 thru A8	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C3.
"	"	Vert. amp. to point $\diamond C$ ; low side to	A9	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator across antenna input with 120Ω carbon resistors in series with each lead.

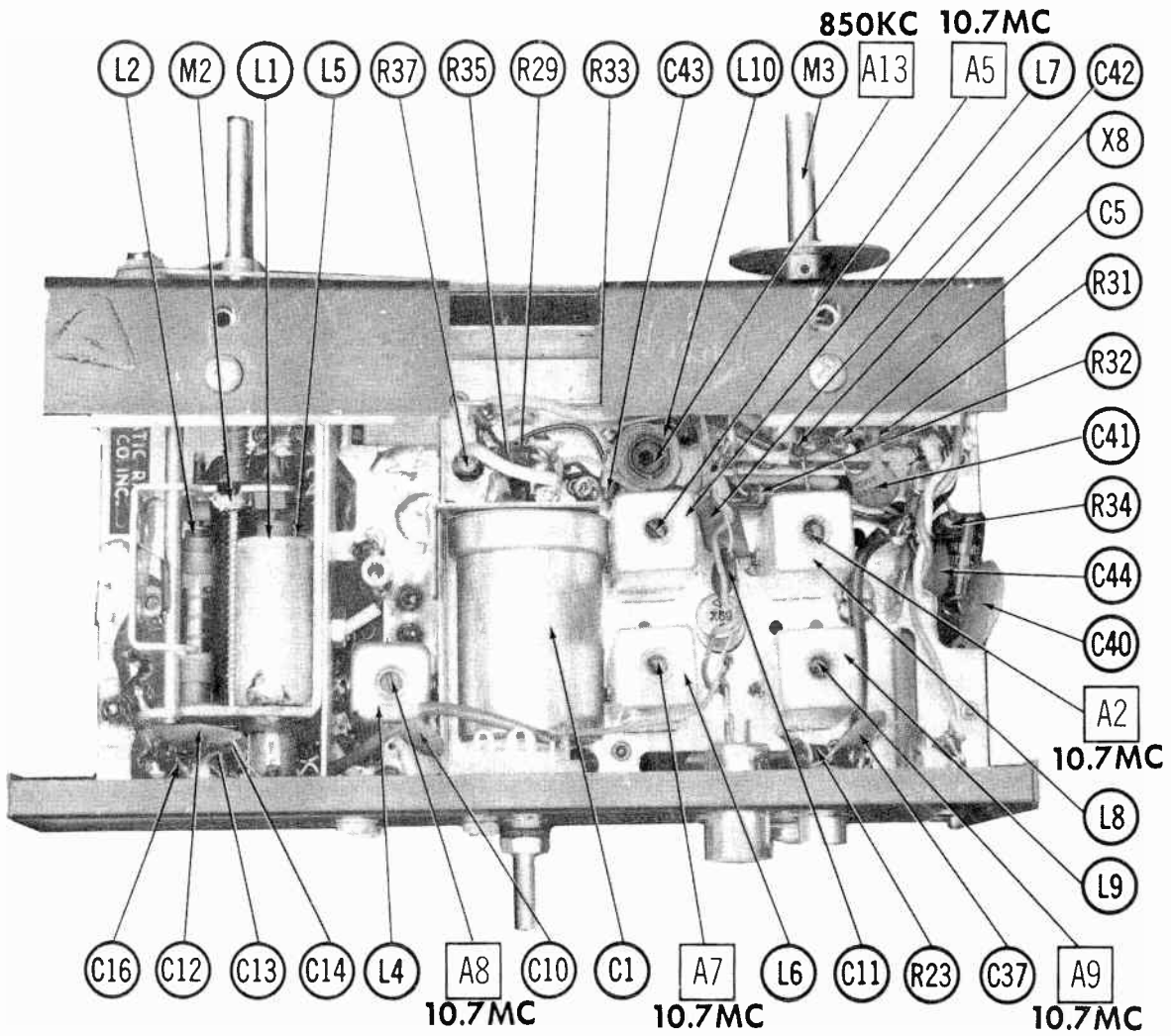
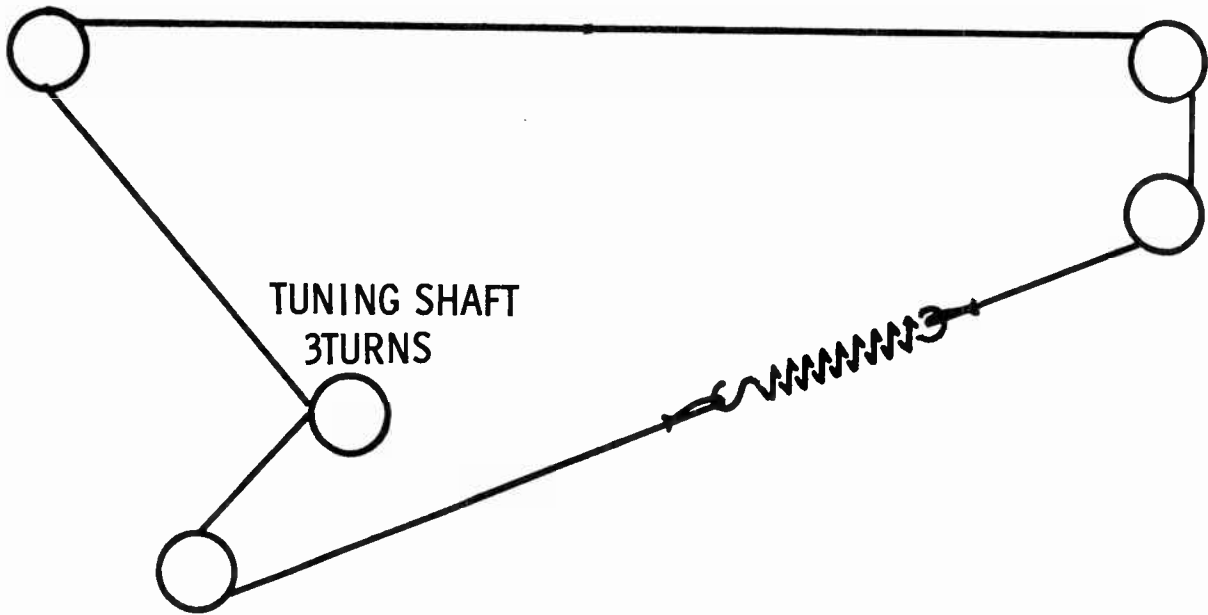
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MC	108MC	DC probe of VTVM to point $\diamond B$ ; common to ground.	A10, A11, A12	Adjust for maximum.

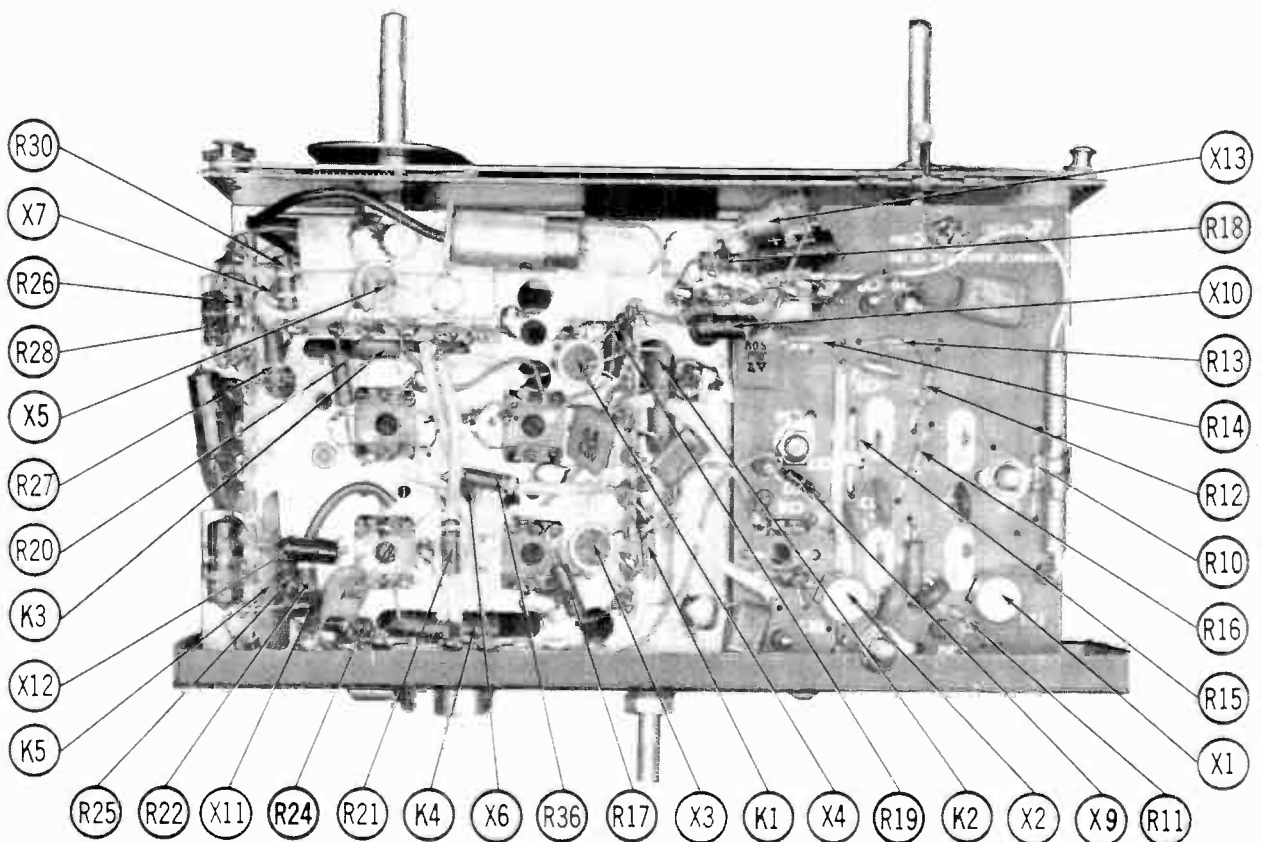
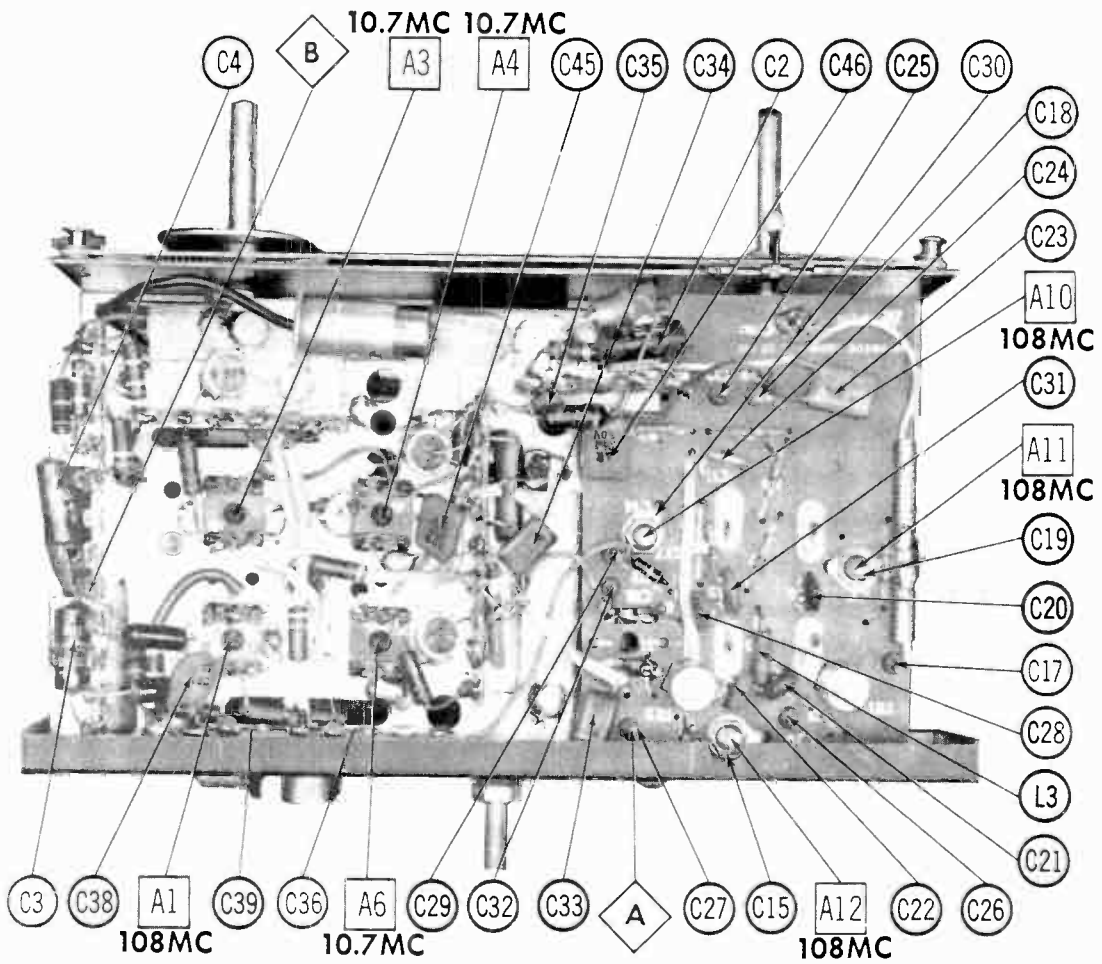


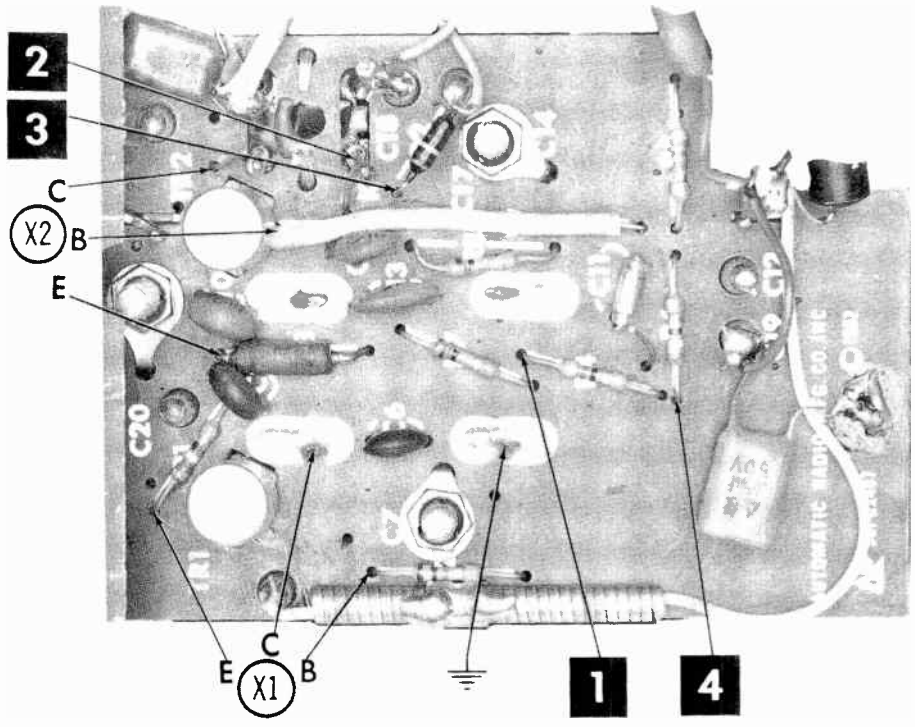
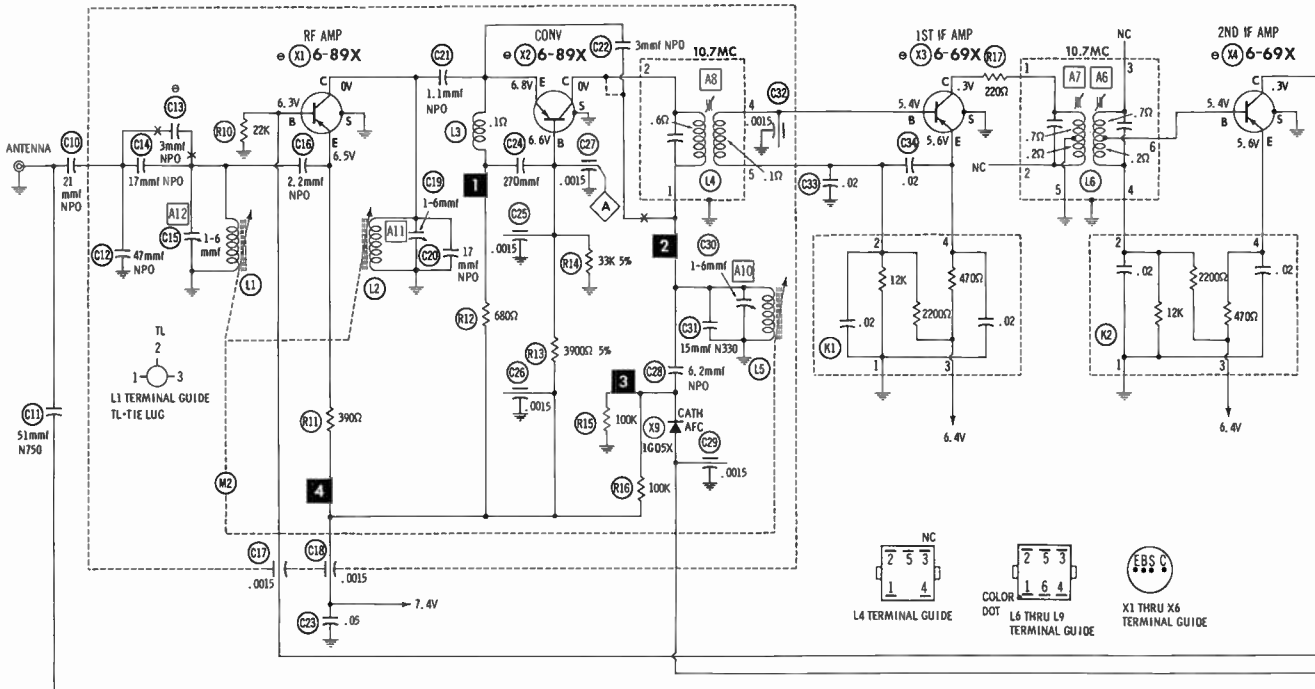
After unit is installed in car, tune in the AM receiver to a point of noninterference near 850KC. Tune in an FM signal and adjust A13 for maximum output.

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

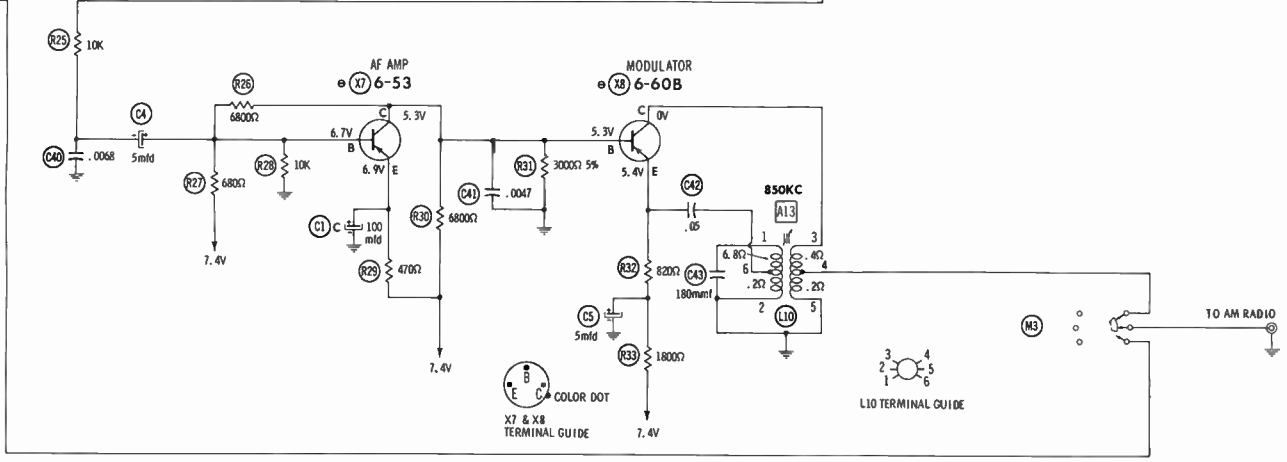
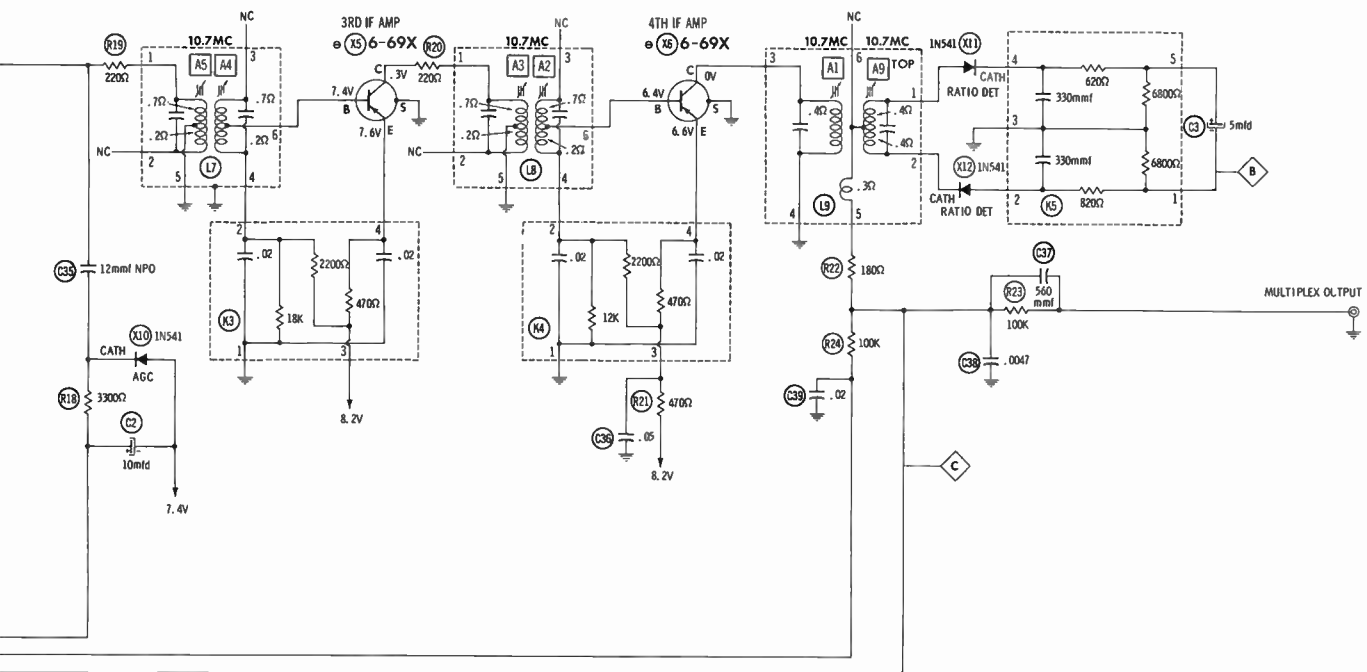
# DIAL CORD STRINGING





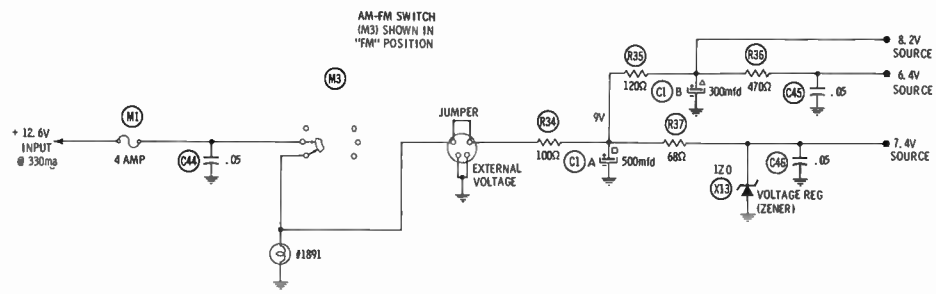


A Howard W. Sams **CIRCUITRACE** Photo



- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
- ⊖ See parts list for alternate value or application.
  - 1. Voltage measurements taken with vacuum tube voltmeter.
  - 2. All controls set for normal operation, no signal applied.
  - 3. Measured values are from socket pin or terminal to common ground.
  - 4. All terminals viewed from bottom unless otherwise designated.
  - 5. Numbers assigned to terminals may not be found on the unit.
  - 6. Supply voltage maintained at rated value for voltage readings.
  - 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE  
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TITAN MODEL FMC-4

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.

Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

## FIXED CAPACITORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	6-89X (2N2089)†	RF Amp.	DS-41		2N1177	PNP
X2	6-89X (2N2089)†	Conv.	DS-42		2N1179	PNP
X3	6-69X (2N2091)†	1st IF Amp.	DS-37		2N1180	PNP
X4	6-69X (2N2091)†	2nd IF Amp.	DS-37		2N1180	PNP
X5	6-69X (2N2091)†	3rd IF Amp.	DS-37		2N1180	PNP
X6	6-69X (2N2091)†	4th IF Amp.	DS-37		2N1180	PNP
X7	6-53 (2N591)†	AF Amp.	DS-26	GE-2	2N591	PNP
X8	6-60B (2N640)†	Modulator	DS-25	GE-1	2N1639	PNP

ITEM No.	RATING	REMARKS	REPLACEMENT DATA							
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.		
C28	6.2	NPO	#15-6.2	EF-001	MFT-1000			CCF-102	CT280A	
C29	.0015									
C30	1-6		#28-156							
C31	15	N330			TCA-15					10TCS-Q15
C32	.0015			EF-001	MFT-1000			CCF-102	CT280A	
C33	.02			BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-S20
C34	.02			BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-S20
C35	12	NPO		SI-12	TCZ-12	LAI0Q12-SL		CCTO-120	CNO410	10TCC-Q12
C36	.05			TTD-05	CK-503	H5			TA150	TG-S50
C37	580			DI-580	DD-561	LAI0T56-C4		CCD-561	GP356	5HK-T56
C38	.0047			BPD-0047	DD-472	BYA10D47		CCD-472	B247	5HK-D47
C39	.02			BPD-02	DD-203	BYA6S2		CCD-203	B120	5HK-S20
C40	.0068			DI-6800	DD-682	BYA10D68		CCD-682	GP268	10TDS-D68
C41	.0047			BPD-0047	DD-472	BYA10D47		CCD-472	B247	5HK-D47
C42	.05			TTD-05	CK-503	H5			TA150	TG-S50
C43	180			DI-180	DD-181	LAI0T18-S3		CCD-181	GP318	5GA-T18
C44	.05			TTD-05	CK-503	H5			TA150	TG-S50
C45	.05			TTD-05	CK-503	H5			TA150	TG-S50
C46	.05			TTD-05	CK-503	H5			TA150	TG-S50

## POWER RECTIFIERS & SIGNAL DIODES

† Alternate type number.

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X9		1GD5X					1N34AS
X10		1N541					1N34AS
X11		1N541*					1N34AS
X12		1N541*					1N34AS
X13		1ZD8. 2V					

\* Matched pair.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Titan PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	500	16	20-2653	AFH3-00-94.5	CC0012	XC3-48.1		FP300. 83	TVLS-3026.14*
B	300	16							
C	100	16							
C2	10	15	20-106	CRE457A	NLW10-15	MT1-5	MLV10-15	TT15X10	TE-1155
C3	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C4	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152
C5	5	15	20-505	CRE454A	NLW5-15	MT1-3	MLV5-15	TT25X5	TE-1152

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	21	NPO	NPO-DI20	DTZ-20	C10Q2C	CCTO-200	CNO420	10TCC-Q22
C11	51	N750	N750-S150	TCN-51	C10Q51U			10TCU-Q50
C12	47	NPO	NPO-DI47	DTZ-47	C10Q47C	CCTO-470	CNO447	10TCU-Q47
C13	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C14	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C15	1-6							
C16	2.2	NPO	NPO-DI2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22
C17	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C18	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C19	1-6							
C20	17	NPO	NPO-DI20	TCZ-18	C10Q2C	CCTO-180	CNO418	10TCC-Q18
C21	1.1	NPO	NPO-DI1	TCZ-1	C10V15C	CCTO-150	CNO510	10TCC-V10
C22	3	NPO	NPO-DI3	DTZ-3R3	C10V33C	CCTO-3R3	CNO533	10TCC-V30
C23	.05		TTD-05	CK-503	H5		TA150	TG-S50
C24	270		NPO-SI270	TCZ-270		CCD-271	CNO327	10TCC-T27
C25	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C26	.0015		EF-001	MFT-1000		CCF-102	CT280A	
C27	.0015		EF-001	MFT-1000		CCF-102	CT280A	

① Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Titan PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.						① Part of M2.
L2	RF						
L3	RF Choke	14-. 82	TV-182	4594		T804	
L4	1st IF	14-2520					
L5	Osc.						
L6	2nd IF	14-2933					
L7	3rd IF	14-2933					
L8	4th IF	14-2933					
L9	Ratio Detector	14-2522					
L10	Osc.	14A3364					

## COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Titan PART No.	REPLACEMENT DATA
K1	1st IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K2	2nd IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K3	3rd IF Network	470Ω, 2200Ω, 18K, .02mfd, .02mfd	89A2014	
K4	4th IF Network	470Ω, 2200Ω, 12K, .02mfd, .02mfd	89A3353	
K5	Ratio Detector Network	680Ω, 820Ω, 6800Ω, 6800Ω, 330mmf, 330mmf	89A2538	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA			
			Titan PART No.		LITTELFUSE PART No.	
			FUSE	HOLDER	FUSE	HOLDER
M1	AGW	4A				

## MISCELLANEOUS

ITEM No.	PART NAME	Titan PART No.	NOTES
M2	Tuner	78B2467	
M3	Selector SW	94A3016	

## WIRING DATA

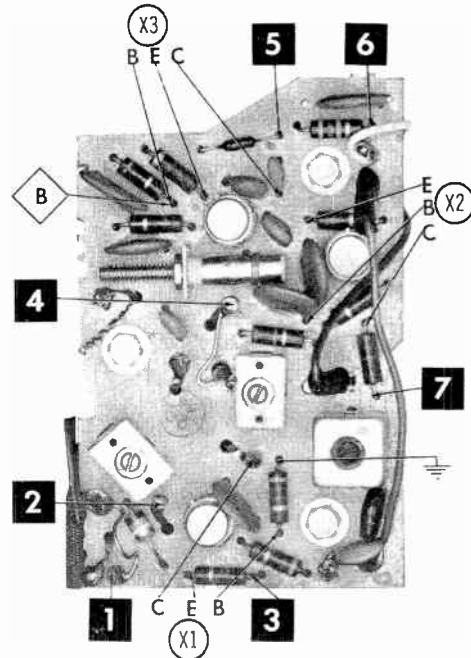
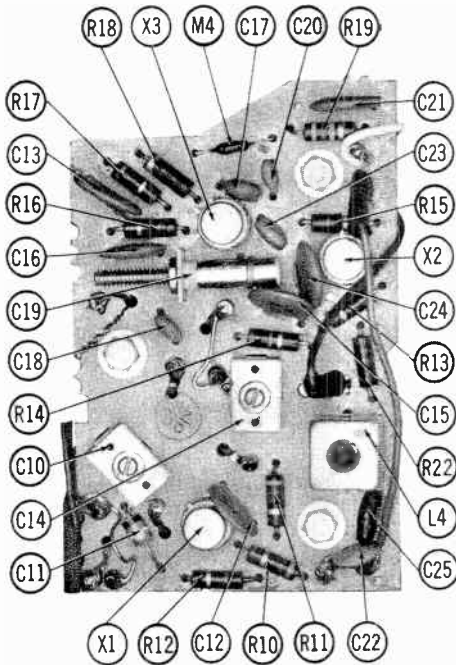
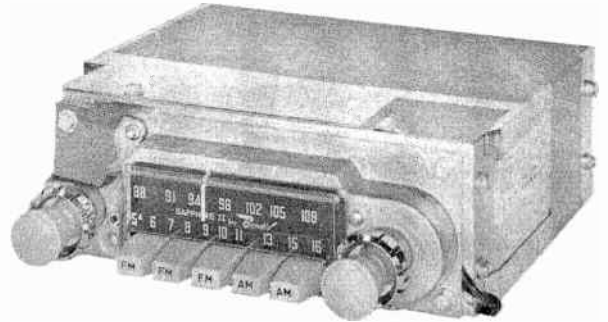
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in 12 Colors  
 8524 (Stranded) Available in 12 Colors  
 Shielded Hook-up Wire ..... Use BELDEN No. 8885  
 Rear Seat Speaker Extension Cable ..... Use BELDEN No. 8782 (Stranded) Coded Parallel Leads  
 Bonding Strap ..... Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

TRADE NAME : Volkswagen (Sapphire II) Models  
4FMBG Karmann Ghia, 4FMBT Transporter, 4FMBV Sedan  
SUPPLIER : For Current Address, See Master Index.  
TYPE SET : 11 Transistor AM-FM Receiver  
POWER SUPPLY : 6 Volt Storage Battery.  
RATING : .95 Amp. @ 6.3 Volts DC  
TUNING RANGE: BROADCAST 540-1605KC  
FREQ. MOD. 88-108.5MC



VOLKSWAGEN &  
KARMAN GHIA

## REMOVAL INSTRUCTIONS

TRANSPORTER

### RADIO REMOVAL

1. Pull off knobs.
2. Use 11/16" wrench and remove nuts from control bushings.
3. Remove trim plate.
4. Thru trunk opening, use 7/16" wrench and remove nut from rear brace.
5. Disconnect Ant., "A" and Speaker leads.
6. Remove radio thru trunk opening.

### SPEAKER

1. Use 5/16" wrench and remove 4 metal screws from speaker mounting.
2. Remove speaker thru trunk opening.

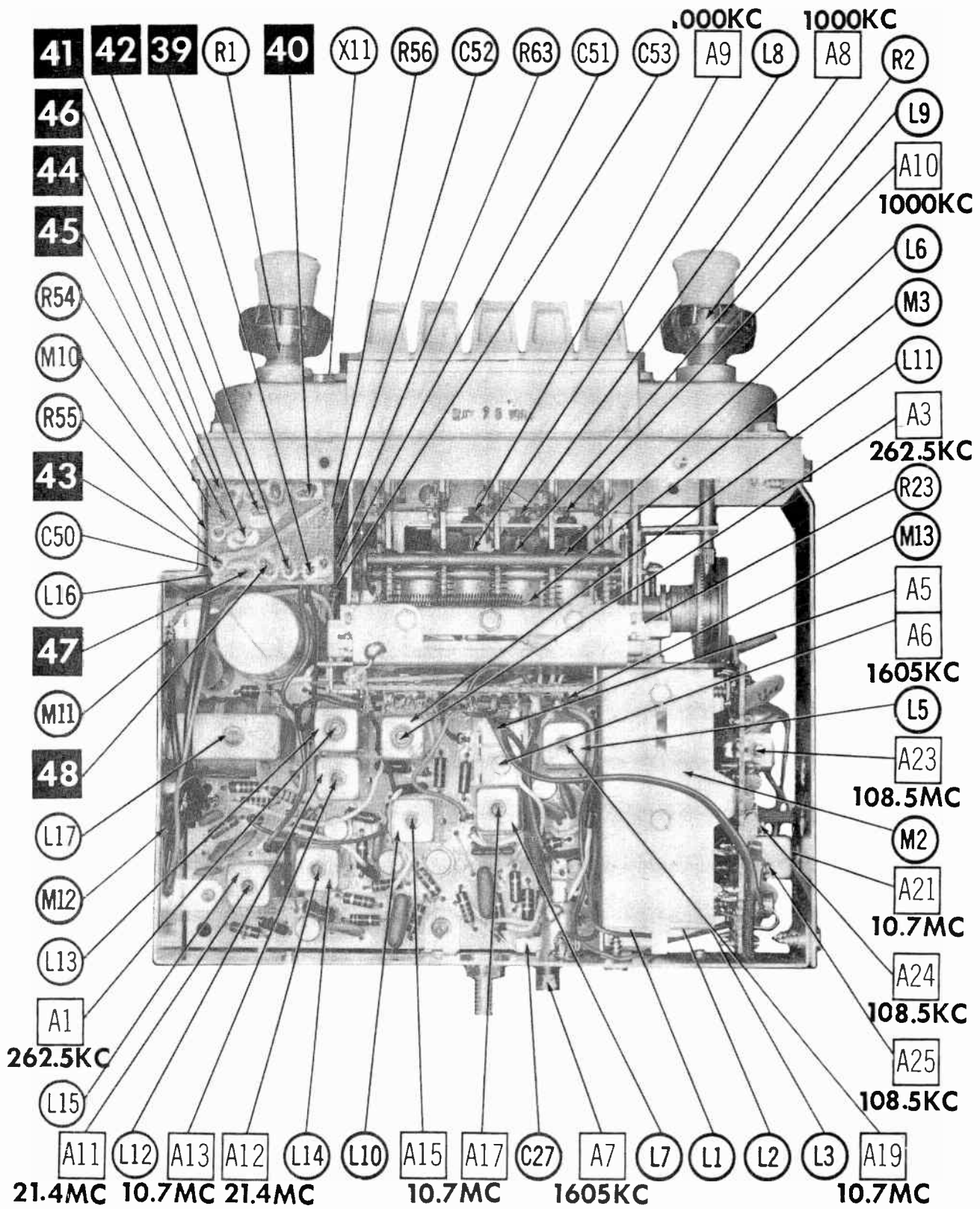
### RADIO REMOVAL

1. Pull off knobs.
2. Use 11/16" wrench and remove nuts from control bushing.
3. Remove trim plate.
4. Disconnect Ant., "A" and Speaker leads.
5. Use 7/16" wrench and remove nut from rear brace.
6. Remove radio from under instrument panel.

### SPEAKER

1. Use 5/16" wrench and remove 4 metal screws from speaker mounting.
2. Remove speaker from under instrument panel.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



A Howard W. Sams **CIRCUITRACE** Photo



# ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools:  
 A1 thru A25    GENERAL CEMENT: 8290, 8868, 9087    WALSCO: 2525, 2528, 2587

**PUSH-BUTTON ADJUSTMENT**  
 1. Pull button out.  
 2. Tune manually to desired station.  
 3. Press button in firmly.  
 4. Repeat for remaining buttons.

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. High side thru .1mfd to point $\text{A}$ , low side to ground.	262.5KC (400% Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2. Thru dummy (Fig. 1) to antenna receptacle.	1605KC	"	"	A5, A6, A7	"
Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. IF necessary, back tuning cores (A8, A9, A10) out of coils but not out of forms. Repeat step 2.					
3. Thru dummy (Fig. 1) to antenna receptacle.	1000KC	Tune to Signal.	Output Meter across voice coil.	A8, A9, A10	Adjust for maximum. Repeat steps 2 & 3 until no further improvement is noted.
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

### FM ALIGNMENT USING AM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

High side thru .1mfd to Point  $\text{B}$ , low side to ground.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
4. 10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point $\text{C}$ ; common to ground.	A11, A thru A21	Adjust for maximum.
5. "	"	DC probe to point $\text{D}$ ; common to	A22	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR -- SELECTOR IN FM POSITION

High side thru .1mfd to Point  $\text{B}$ , low side to ground. Use only enough marker signal to obtain indication. Use 60% frequency modulated signal with 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
4. 10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point $\text{C}$ ; low side to ground.	A11 thru A21	Adjust for maximum gain and symmetry of response similar to Fig. 3 with marker as shown.
5. "	"	Vert. amp. to point $\text{D}$ ; low side to	A22	Adjust A 22 (Secondary) to place marker at center of crossover lines similar to Fig. 4. Adjust A 11 (Primary) for maximum amplitude and straightness of crossover lines.

### FM RF ALIGNMENT

Connect generator thru dummy Ant. Fig. 2.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
6. 108.5MC	Set at high end.	DC probe of VTVM to point $\text{C}$ ; common to ground.	A23, A24, A25	Adjust for maximum.

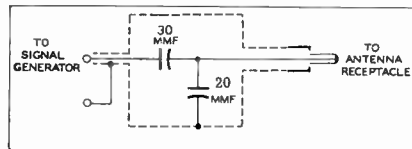


FIG. 1

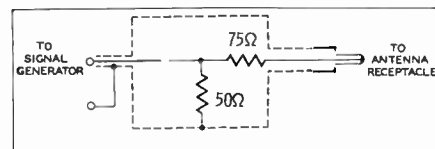


FIG. 2

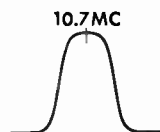


FIG. 3

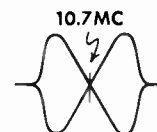
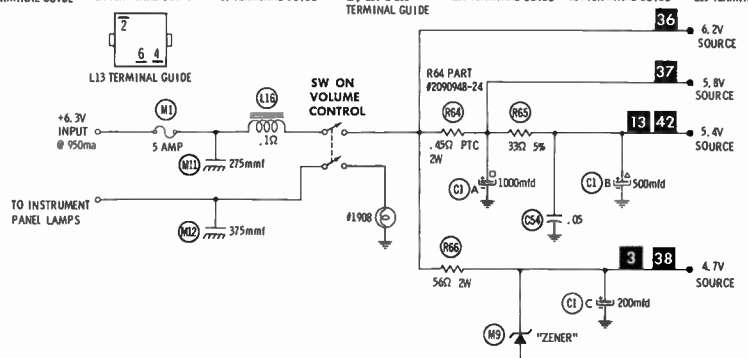
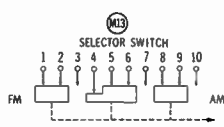
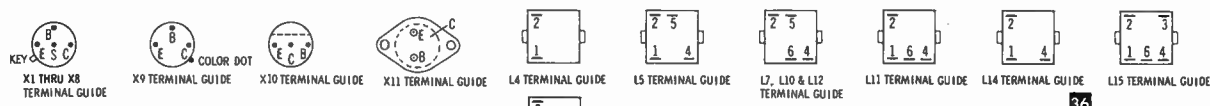
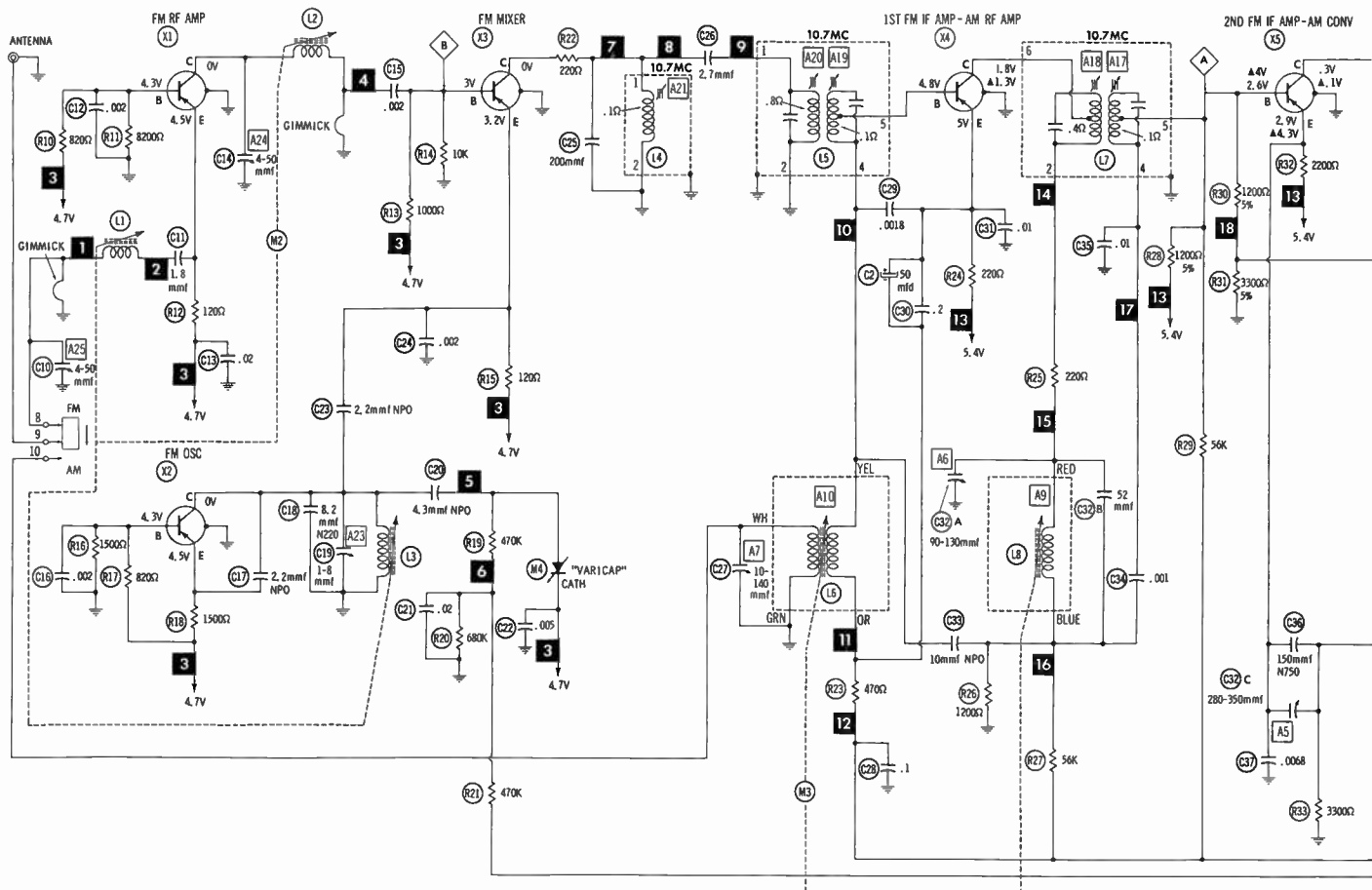


FIG. 4

VOLKSWAGEN MODELS 4FM8G, 4FM8T, 4FM8V



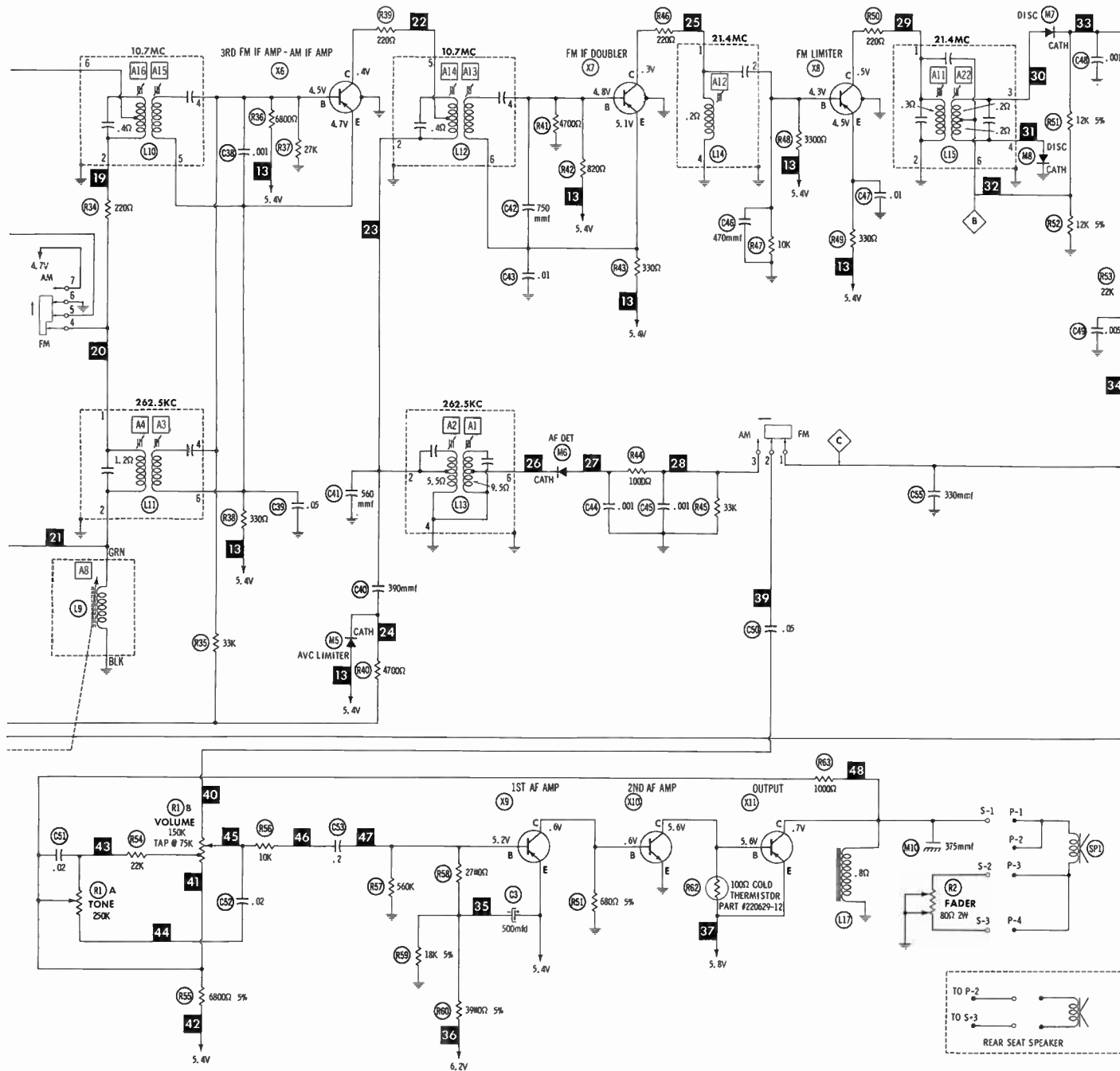
VOLTAGE MEASUREMENTS  
TAKEN IN FM POSITION  
UNLESS OTHERWISE INDICATED.  
TAKEN IN AM POSITION.

Resistors are 1/2 watt or less and rated  
10% or 20% unless otherwise indicated.

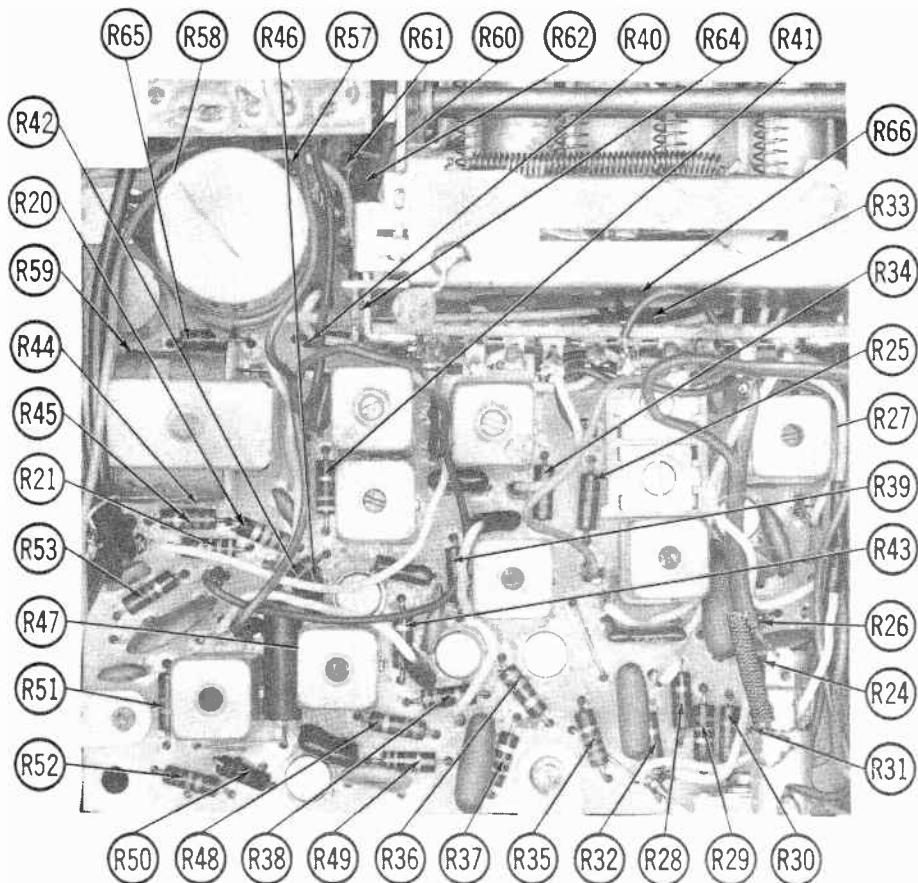
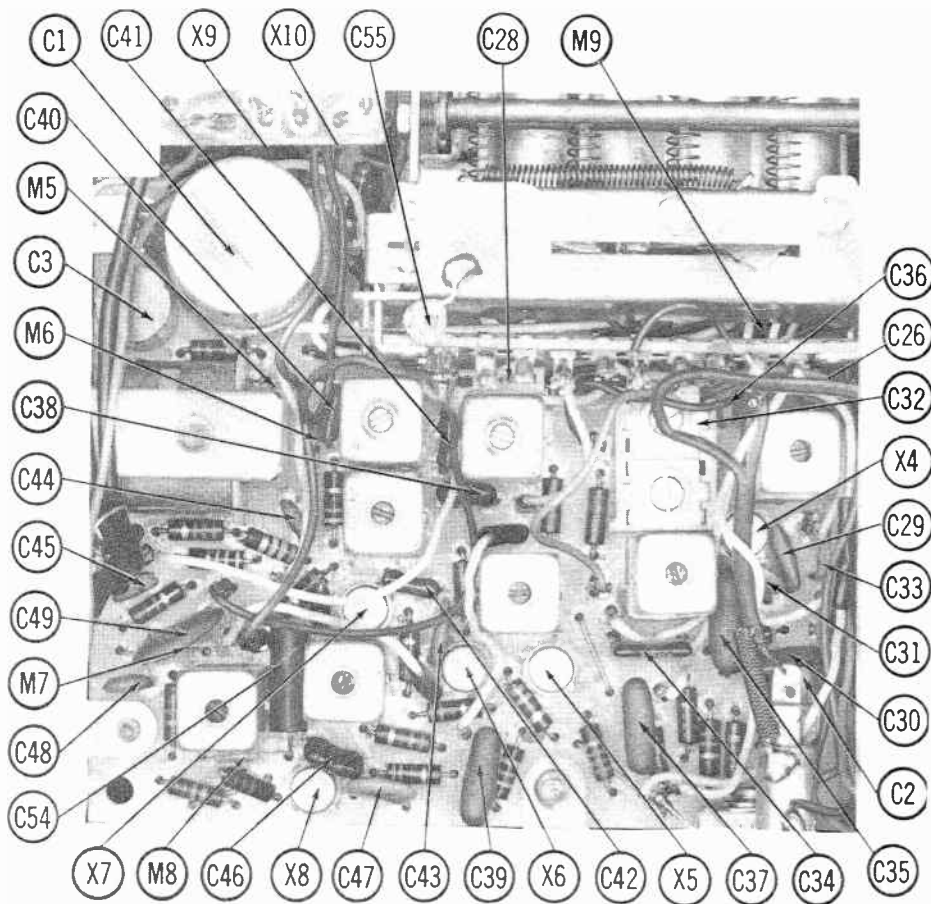
- ① See parts list for alternate value or application.
- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All controls set for normal operation, no signal applied.
- 3. Measured values are from socket pin or terminal to common ground.
- 4. All terminals viewed from bottom unless otherwise designated.
- 5. Numbers assigned to terminals may not be found on the unit.
- 6. Supply voltage maintained at rated value for voltage readings.
- 7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

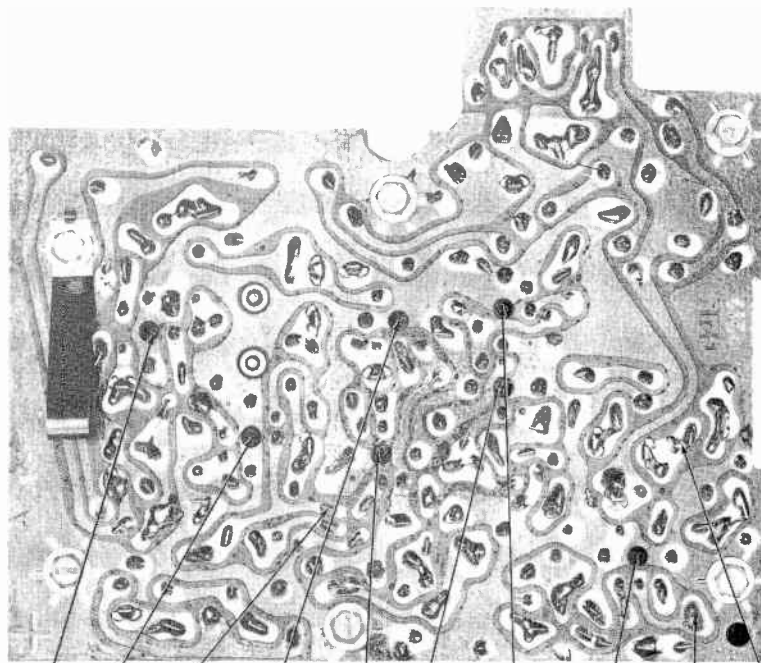
A PHOTOFAC STANDARD NOTATION SCHEMATIC  
with CIRCUITRACE

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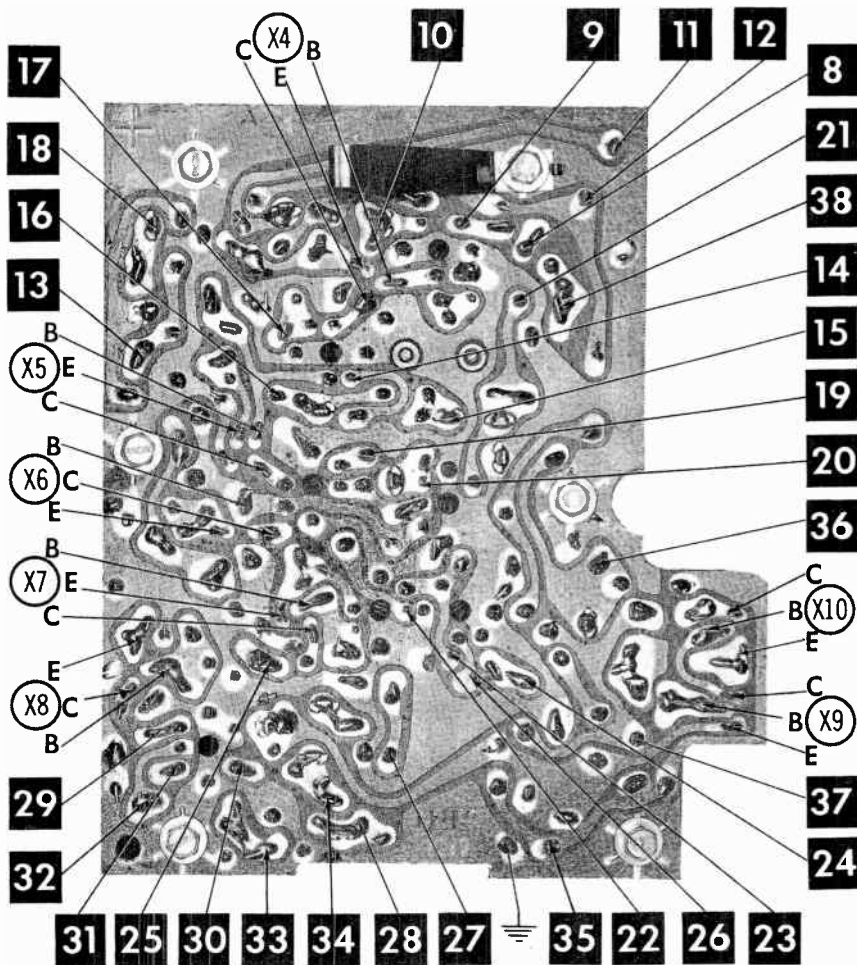


VOLKSWAGEN MODELS 4FMBG, 4FMBT, 4FMBV





- A20  
10.7MC
- A18
- A
- A4  
262.5KC
- A16  
10.7MC
- A14
- A2  
262.5KC
- A22  
21.4MC
- C
- D



A Howard W. Sams CIRCUITRACE® Photo

# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.		
X1		FM RF Amp.	DS-41		2N1177	PNP	2092417-0707
X2		FM Osc.	DS-42		2N1179	PNP	2092418-0711
X3		FM Mixer	DS-41		2N1177	PNP	2092417-0708
X4		1st FM IF-AM RF Amp.	DS-42		2N1180	PNP	2092418-0711
X5		2nd FM IF Amp.-AM Conv.	DS-42		2N1180	PNP	2092418-0711
X6		3rd FM IF-AM IF Amp.	DS-42		2N1180	PNP	2092418-0711
X7		FM IF Doubler	DS-42		2N1180	PNP	2092418-0711
X8		FM Limiter	DS-42		2N1180	PNP	2092418-0711
X9		1st AF Amp.	DS-26	GE-2	2N591	PNP	2090924-0008
X10		2nd AF Amp.	DS-46	GE-10	2N649	NPN	2092609-1
X11		Output	DS-520	GE-3	2N301	PNP*	2091859-4

\* When replacing, apply silicon grease to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Volkswagen PART No.	REPLACEMENT DATA					SPRAGUE PART No.
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	
C1A	m1000	8	220353-37						PCLS-3016.*
B	500	8							
C	200	6							
C2	50	3	2093386-0702	BCD3050	NLW50-3	MT1-18	BL1410	PET1575	VL-1045
C3	500	3	2093386-0701	BCD12500	NLW450-3	MT1-26	BL2111	PET290	TE-1088

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	4-50	2093115-0702							
C11	1.8		NPO-D12.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22	
C12	.002		BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C13	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C14	4-50	2093115-0702							
C15	.002		BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C16	.002		BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C17	2.2 NPO		NPO-D12.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22	
C18	8.2 N220							10TCR-V82	
C19	1-8	2093105-0001							
C20	4.3 NPO	2093135-0706							
C21	.02		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C22	.005		BPD-005	DD-502	BYA10D5	CCD-502	B250	5HK-D50	
C23	2.2 NPO		NPO-D12.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO522	10TCC-V22	
C24	.002		BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C25	200			DM-201					
C26	2.7								10TCC-V27
C27	10-140	219083-7							
C28	.1 100V		BE2P1		WMF1P1	1DP-2-104	PVC101	2PS-P10	
C29	.0018		DI-1800	DD-182	JB6D18		GP218	10TS-D18	
C30	.2 10V			UK20-204	HCC25224Z			HY-325	
C31	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C32A	90-130	2092422-0706							
B	52								
C	280-350								
C33	10 NPO		NPO-D110	DTZ-10	C10Q1C	CCTO-100	CNO410	10TCC-Q10	
C34	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C35	.01 100V		BE2S1	CPR-10000J	WMF1S1	1DP-1-103	PVC211	4PS-S10	
C36	150 N750		N750-D1150	DTN-150	C10T15U	CCTN-151	CN7315	10TCU-T15	
C37	.0068 100V		BE6D68	CPR-6800J	WMF1D68	6DP-1-682	PVC4268	6PS-D68	
C38	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C39	.05 100V		P288N-05		DPMS2S5	1DP-2-503	PVC215	2PS-S50	
C40	390		DI-390	DD-391	LA10T39-C4	CCD-391	GP339	5GA-T36	
C41	560		DI-560	DD-561	LA10T56-C4	CCD-561	GP356	5GA-T56	
C42	750		DI-750	DD-751	LA10T75-C4	CCD-751	GP375	5GA-T75	
C43	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C44	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C45	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C46	470		BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47	
C47	.01		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C48	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C49	.005		BPD-005	DD-502	BYA10D5	CCD-502	B250	5HK-D50	
C50	.05		TTD-05	CK-503	H5		TA150	TG-S50	
C51	.02		TTD-02	CK-203	H3		TA120	TG-S20	
C52	.02		TTD-02	CK-203	H3		TA120	TG-S20	
C53	.2 10V			UK20-204	HCC25224Z			HY-325	
C54	.05 100V		P288N-05		DPMS2S5	1DP-2-503	PVC215	2PS-S50	
C55	330		DI-330	DD-331	LA10T33-C4	CCD-331	GP333	10TS-T33	

# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				
			BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLYORY PART No.
R1A B	Tone Volume/Switch	250K 150K Tap @ 75K	2091258-0003	F1-250K, R16-250K, F5S115,RFS207, AK-38, KR-7		† QJ-1788A	■ UE4454-S
R2	Fader	80Ω 2W	2092415-0001				

† "CONCENTRIKIT" Equivalent: K8 Kit with Base Elements and Shafts: B11-128, P22-121 (Panel)  
"SNAPTROL" Equivalent: BU7, CF15, CR34T, SF13, SR49, WF. B13-130X, R-16-205 (Rear)  
"STA-LOC" Equivalent: FA254L①, RU154T653, OS1687, IS2187, US42. 76-2 (Switch)  
① Use Orlo 7AB mounting plate.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	FM Ant.	①					① Part of M2. ② Part of M3.
L2	FM RF	①					
L3	FM Osc.	①					
L4	1st FM IF	2093149-0706					
L5	2nd FM IF	2093149-0701					
L6	AM Ant.	②					
L7	3rd FM IF	2093149-0702					
L8	AM RF	②					
L9	AM Osc.	②					
L10	4th FM IF	2093149-0703					
L11	1st AM IF	2092419-0709					
L12	5th FM IF	2093149-0704					
L13	2nd AM IF	2092419-0710					
L14	FM IF Doubler	2093149-0705					
L15	Discriminator	2093216-0701					

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L16	950ma	.1Ω	1MH	2092424-0001					

## CHOKE (AUDIO OUTPUT)

ITEM No.	INDUCTANCE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L17	14MH	2092138-0711	C-4095	TC-2	TR-152	TY17XT	

## SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		BENDIX PART No.	QUAM PART No.	
SP1	6" PM 8Ω	2091246-0004	6A21Z8	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	1AG	5A 32V	2091811-0009	2091699-0001	301005	155004	AGA5	HAF

## MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	FM Tuner	2093394-0703	
M3	AM Tuner	2092711-0501	
M4	Vari-Cap.	2092055-3	
M5	AVC Limiter	2092055-1	
M6	AF Det.	2092055-1	
M7	Discriminator	2092055-7	Matched Pair
M8	Discriminator	2092055-7	
M9	Voltage Reg. Zener	2092055-4	
M10	Spark Plate	2093050-0703	375mmf
M11	Spark Plate	2093050-0002	275mmf
M12	Spark Plate	2093050-0703	375mmf
M13	Selector Switch	2092702-0005	

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

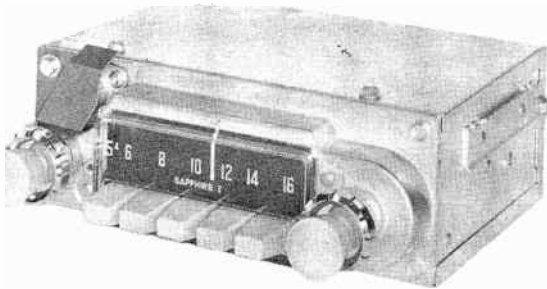
ITEM	PART No.	ITEM	PART No.
Escutcheon	2092167-0502	Pushbutton (FM)	2092397-0003
Dial Glass	2092404-0003	Pushbutton (AM)	2092397-0004
Knob, Volume or Tuning	2091244-0503	Pointer Assembly	2090129-0037
Knob, Tone or Fader	2092235-0001		

VOLKSWAGEN MODELS 4FMBG, 4FMBT, 4FMBV



# PHOTOFACT<sup>®</sup> with

# CIRCUTRACE<sup>®</sup>



TRADE NAME : Volkswagen (Sapphire I) Models 4TBV (Sedan), 4TBVG (Karmann Ghia), 4TBVT (Transporter)

SUPPLIER : For Current Address, See Master Index.

TYPE SET : 6 Transistor AM Receiver

POWER SUPPLY : 6 Volt Storage Battery

RATING : .88 Amp. @ 6.3 Volts DC

TUNING RANGE: BROADCAST 540-1605KC

## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4  
A5, A6, A7

GENERAL CEMENT: 8606, 8606L, 8869  
GENERAL CEMENT: 8290, 8868, 9087

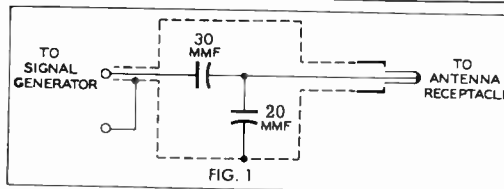
WALSCO: 2543, 2544, 2588  
WALSCO: 2525, 2528, 2587

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. High side thru .1mf to point $\Delta$ , low side to ground.	262.5KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2. Thru dummy (Fig. 1) to antenna receptacle.	1605KC	"	"	A5, A6, A7	"
Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. IF necessary, back tuning cores (A8, A9, A10) out of coils but not out of forms. Repeat step 2.					
3. Thru dummy (Fig. 1) to antenna receptacle.	1000KC	Tune to Signal.	Output Meter across voice coil.	A8, A9, A10	Adjust for maximum. Repeat steps 2 & 3 until no further improvement is noted.

With radio installed in car and antenna fully extended, tune in a weak station near 1600KC and adjust A7 for maximum output.

### PUSH-BUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.



VOLKSWAGEN & KARMAN GHIA

## REMOVAL INSTRUCTIONS

TRANSPORTER

### RADIO REMOVAL

1. Pull off knobs.
2. Use 11/16" wrench and remove nuts from control bushings.
3. Remove trim plate.
4. Thru trunk opening, use 7/16" wrench and remove nut from rear brace.
5. Disconnect Ant., "A" and Speaker leads.
6. Remove radio thru trunk opening.

### SPEAKER

1. Use 5/16" wrench and remove 4 metal screws from speaker mounting.
2. Remove speaker thru trunk opening.

### RADIO REMOVAL

1. Pull off knobs.
2. Use 11/16" wrench and remove nuts from control bushing.
3. Remove trim plate.
4. Disconnect Ant., "A" and Speaker leads.
5. Use 7/16" wrench and remove nut from rear brace.
6. Remove radio from under instrument panel.

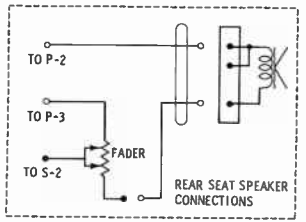
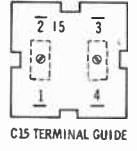
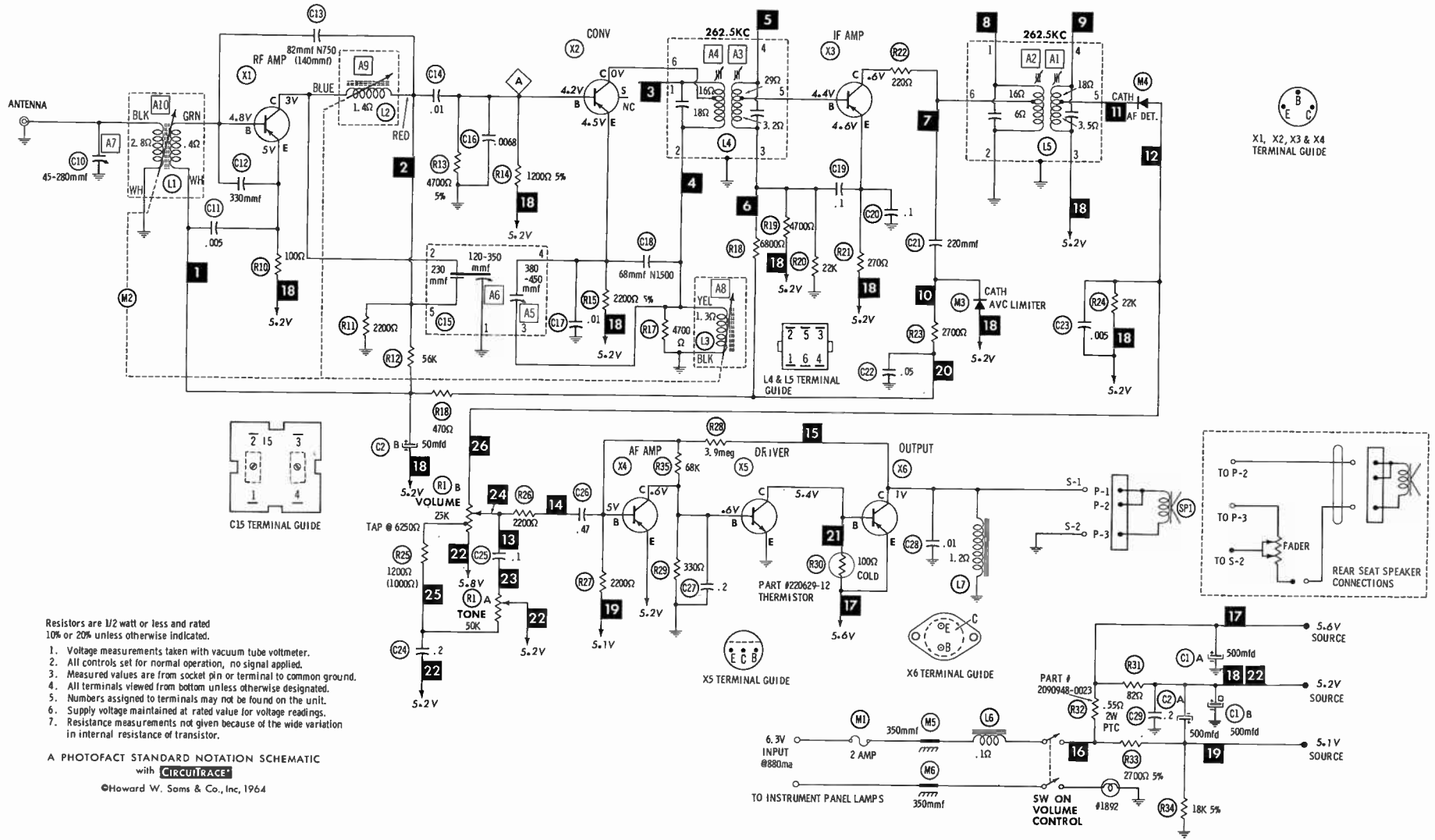
### SPEAKER

1. Use 5/16" wrench and remove 4 metal screws from speaker mounting.
2. Remove speaker from under instrument panel.

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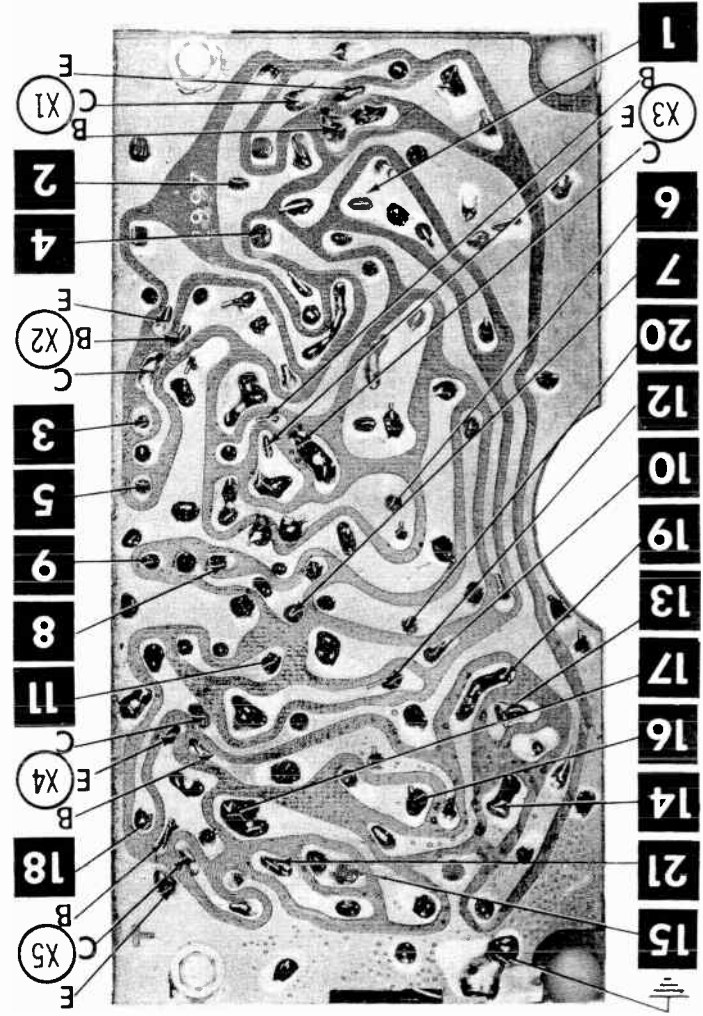
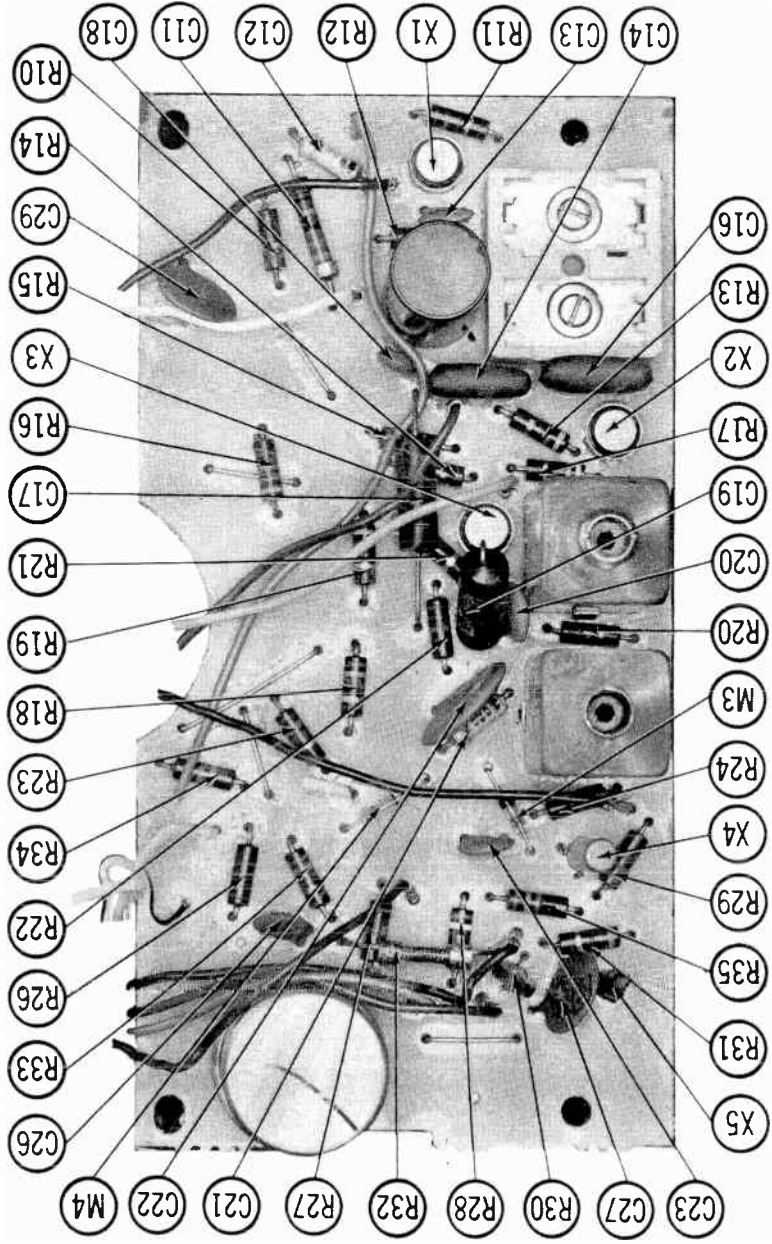




- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
with **CIRCUITRACE**  
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**VOLKSWAGEN MODELS 4TBV,  
4TBVG, 4TBVT**



# PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
 Have your local distributor check Sams COUNTER FACTS<sup>®</sup> for the most up-to-date replacement.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST- ANCE	REPLACEMENT DATA				
			BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
RIA B	Tone Volume	50K 25K Tap @ 6250Ω	2091258- 0002	F1-50K <sup>①</sup> R14-25K,FFS111 RFS203, KR-7		† QJ-1777A	FA54L <sup>①</sup> RU253T53, OS1687, IS2187, US42

① Use original spring mounting clips.  
 † "CONCENTRIKIT" Equivalent: K8<sup>①</sup> Kit with Base Elements and Shafts: B11-123, P13-122 (Panel)  
 B19-119X, R26-206 (Rear)  
 78-2 (Switch)

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Ant.	①					① Part of M2.
L2	RF	①					
L3	Osc.	①					
L4	Input IF	2093001-0701		6520			
L5	Output IF	2093002-0701		6521			

## FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L6	.880 Amp.	.1Ω	240uh	2092050-0014					

## CHOKE (AUDIO OUTPUT)

ITEM No.	INDUCTANCE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	19MH	2092245-0004					

## SPEAKER

ITEM No.	TYPE	RATING	REPLACEMENT DATA		NOTES
			BENDIX PART No.	QUAM PART No.	
SP1	5" PM	6Ω	2093455-0701	5A15Z6	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	1AG	2A 32V	2091811-0007	2091699-0001	301002	155004	AGA2	HAF

## MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Tuner	2092544-0703	
	Coil Assembly	2090131-0072	
M3	AVC Limiter	2092055-0001	
M4	AF Det.	2092055-0001	
M5	Spark Plate	2093050-0001	(350mmf)
M6	Spark Plate	2093050-0001	(350mmf)

## CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	PART No.	ITEM	PART No.
Escutcheon Assembly	2092709-0503	Knob, Tone, Dummy	2092235-0001
Dial Glass	2092225-0004	Pushbutton	2092224-0004
Knob, Tuning, Volume	2091244-0503	Pointer Arm Assembly	2090128-0003

## WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap	Use BELDEN No. 8661 (3/8 In.) or 8670 (3/4 In.)



PHOTOFACT<sup>®</sup> with

CIRCUITRACE<sup>®</sup>

TRADE NAME : Voxmobil Model TR241 (Mark IV, V)  
 SUPPLIER : For Current Address, See Master Index.  
 TYPE SET : 7 Transistor Portable-Auto Receiver  
 POWER SUPPLY : 6 or 12 Volt Storage Battery (Auto)  
 6 Volts DC (Portable)  
 RATING : .17 Amp. @ 12.6 Volts DC (Auto)  
 27ma @ 6 Volts DC (Portable)  
 TUNING RANGE: BROADCAST 540-1615KC



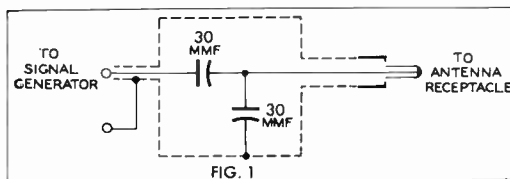
## ALIGNMENT INSTRUCTIONS

Check for specified source voltage.  
 Use only enough generator output to provide a usable indication.  
 Suggested Alignment Tools:

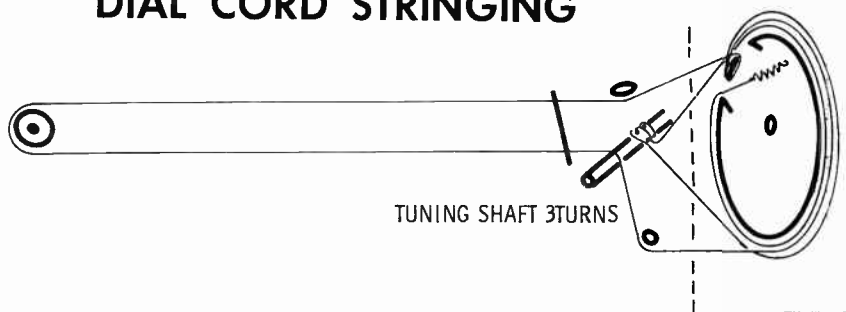
A1, A2, A3, A4, A7, A8. . . . . GENERAL CEMENT #8606  
 A5, A6, A9, A10. . . . . GENERAL CEMENT #5000, 5066, 8290  
 WALSCO #2525

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	High side thru .1mf to point $\Delta$ , low side to ground.	262KC (400v Mod.)	High Freq. End Stop.	Output Meter across voice coil.	A1, A2, A3, A4	Adjust for maximum.
2.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1615KC	"	"	A5, A6	Adjust for maximum.
3.	"	600KC	600KC Signal.	"	A7, A8	Adjust for maximum. Repeat step 2.
4.	Thru dummy (Fig. 1) to antenna receptacle.	1615KC	High Freq. End Stop.	"	A9	Adjust for maximum.

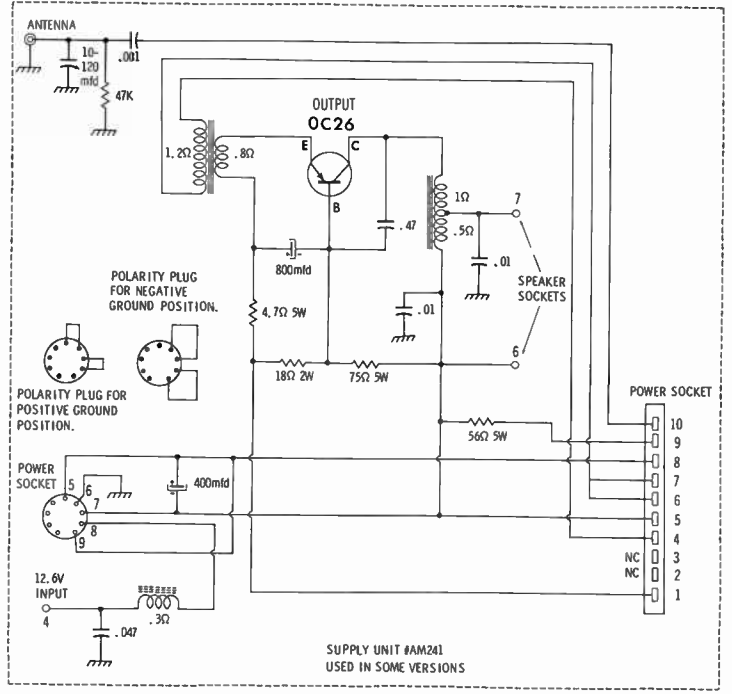
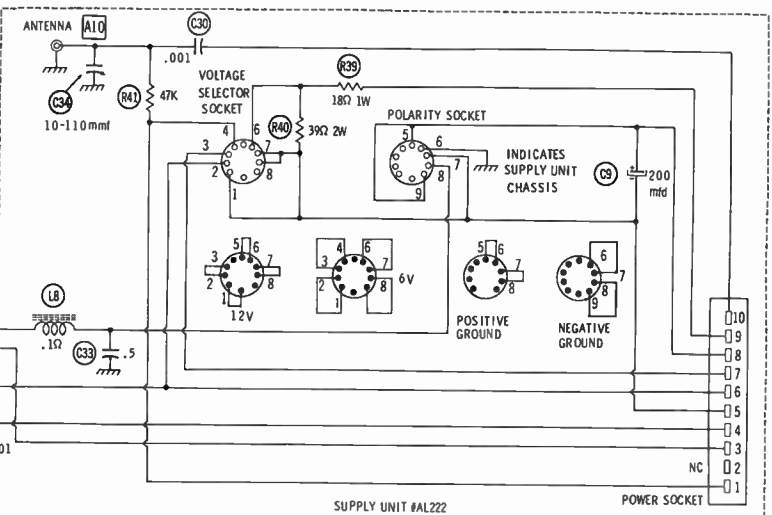
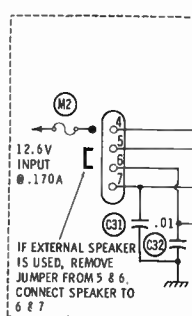
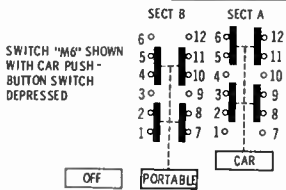
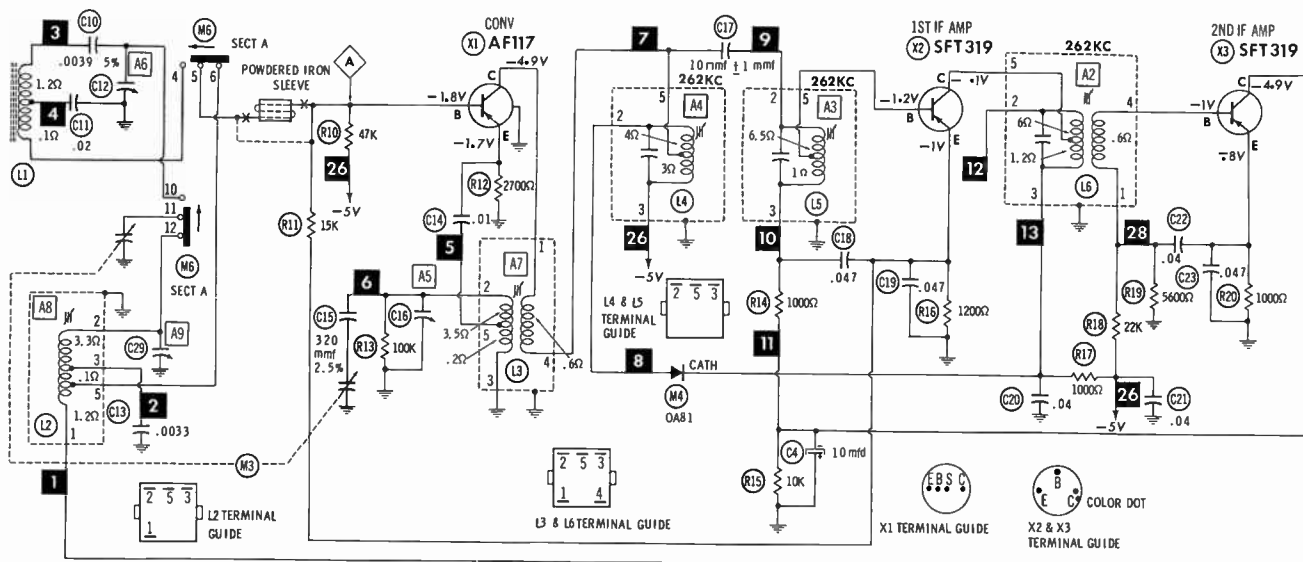
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A10 for maximum output.

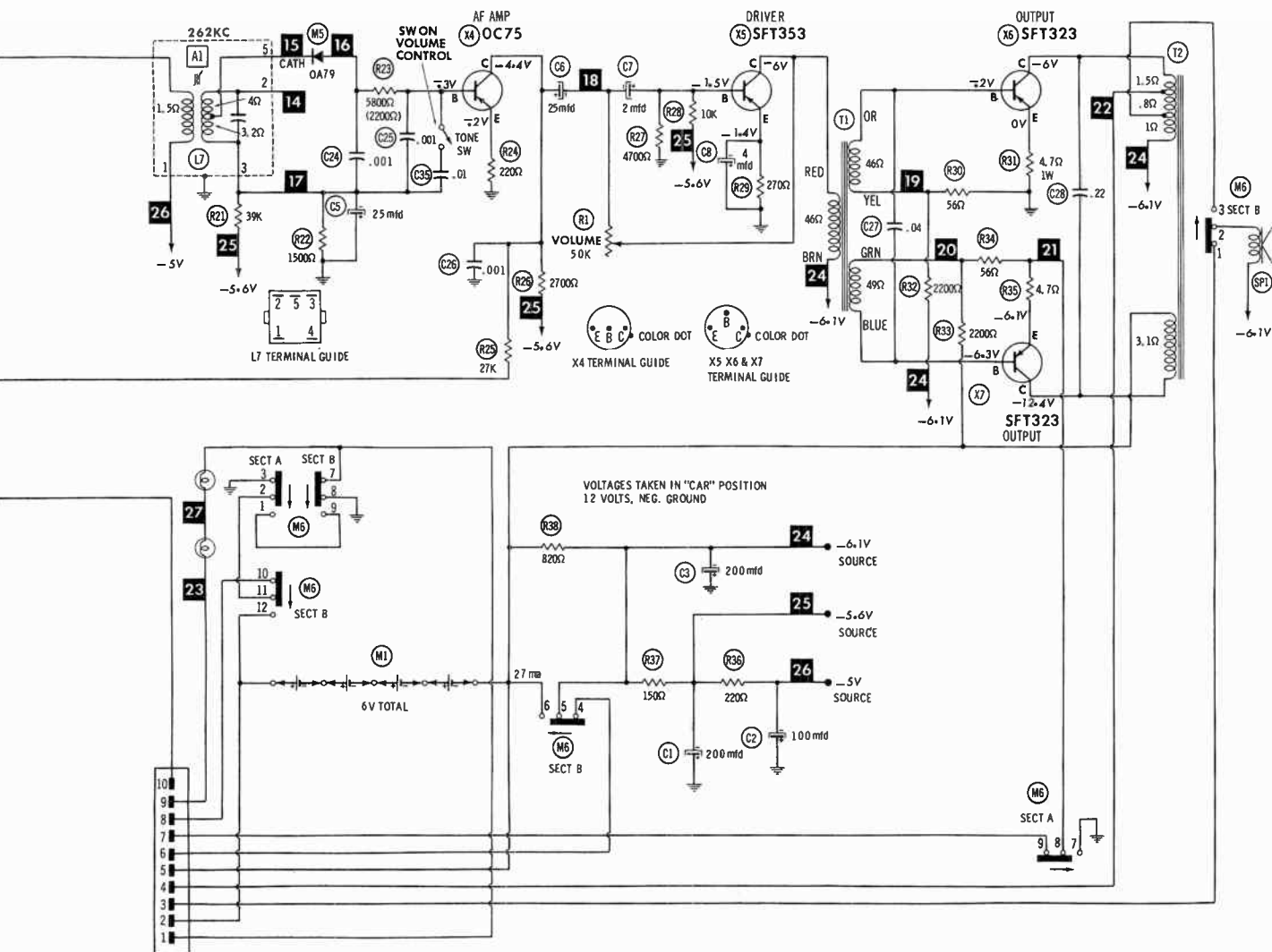


## DIAL CORD STRINGING



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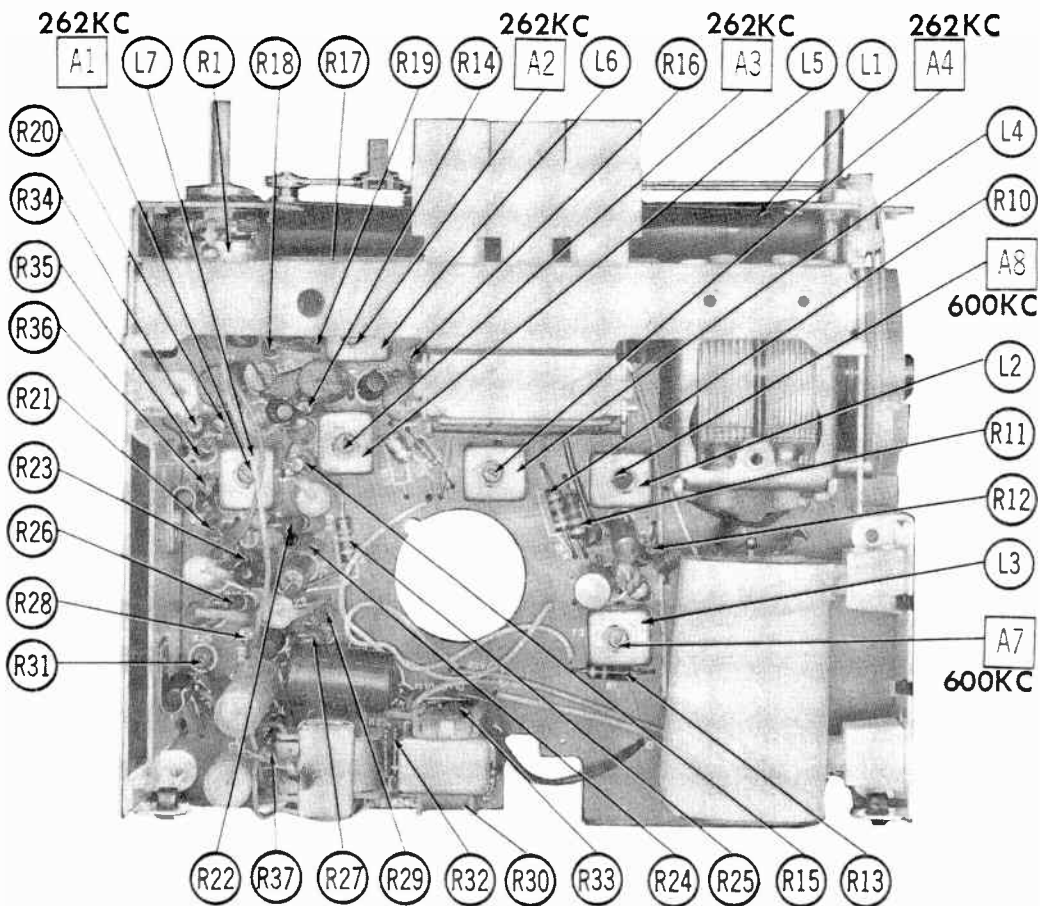
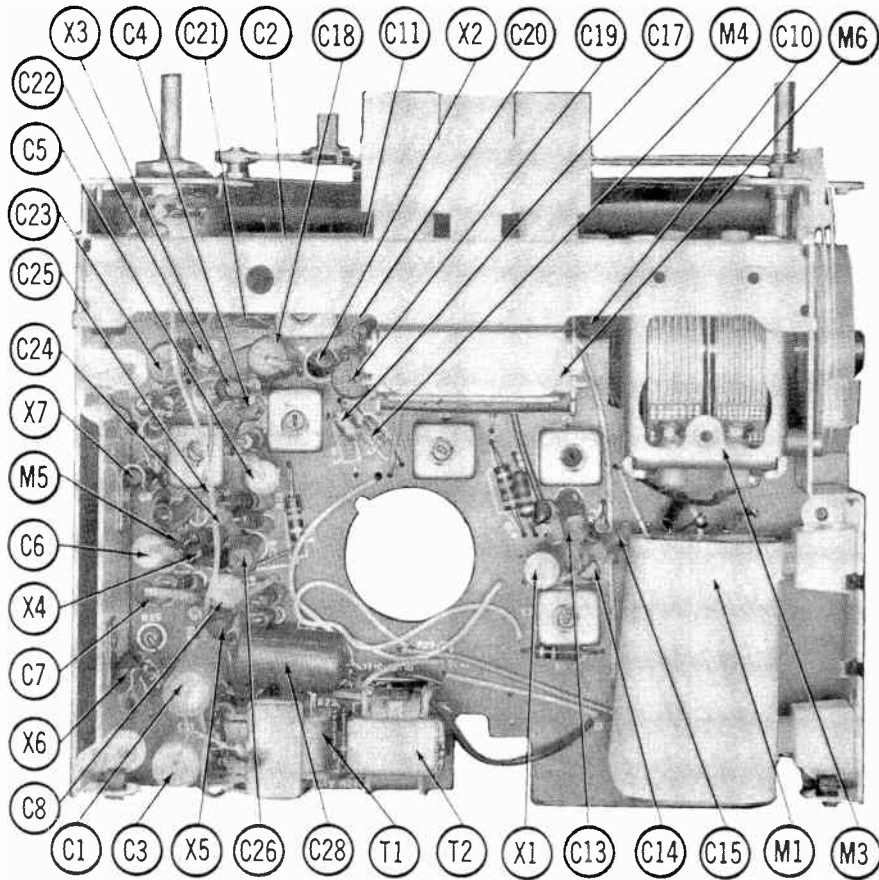




- Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFAC STANDARD NOTATION SCHEMATIC with **CIRCUITRACE**  
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VOXMOBILE MODEL TR-241 (MARK IV, V)







# PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	AF117	Conv.	DS-25	GE-1	2N163-9	PNP
X2	SFT319	1st IF Amp.	DS-25	GE-1	2N1638	PNP
X3	SFT319	2nd IF Amp.	DS-25	GE-1	2N1638	PNP
X4	OC75	AF Amp.	DS-26	GE-2	2N406	PNP
X5	SFT353	Driver	DS-26	GE-2	2N406	PNP
X6	SFT323	Output	DS-26	GE-2	2N408	PNP
X7	SFT323	Output	DS-26	GE-2	2N408	PNP

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Voxmobil PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	200	12		CRE431	NLW200-12	MT1-25	MLV200-12	TT15X200	TE-1137
C2	100	6		CRE323	NLW100-12	MT1-21	MLV100-10	TT6X100	TE-1102
C3	200	12		CRE431	NLW200-12	MT1-25	MLV200-12	TT15X200	TE-1137
C4	10	3		CRE207	NLW10-3	MT1-5	MLV10-3	TT3X10	TE-1053
C5	25	6		CRE312	NLW25-10	MT1-13	MLV25-10	TT6X25	TE-1091
C6	25	6		CRE312	NLW25-10	MT1-13	MLV25-10	TT6X25	TE-1091
C7	2	12		CRE401	NLW2-50	MT1-1	MLV2-50	TT12X2	TE-1121
C8	4	3		CRE203	NLW4-15	MT1-3	MLV5-3	TT6X4	TE-1052.1
C9	200	15		CRE481	NLW200-15	MT1-23	BL2140	TT15X200	TE-1164

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	.0039 5%		1464-0039	CPR-3900J	IR5D39	CM-20B-392J	MCJ462.5	MS-239
C11	.02		TTD-02	CK-203	H05S2		TA-120	TG-S20
C12								
C13	.0033		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C14	.01		TTD-01	CK-103	H05S1		TA-110	TG-S10
C15	320 2.5%							
C16								
C17	10 + 1mmf		NPO-S110	DTZ-10	C10Q1C	CC TO-100	CNO-410	10TCC-Q10
C18	.047		TTD-005	CK-502	H05D5		TA-250	TG-D50
C19	.047		TTD-005	CK-502	H05D5		TA-250	TG-D50
C20	.04		TTD-05	CK-503	H05S5		TA-150	TG-S50
C21	.04		TTD-05	CK-503	H05S5		TA-150	TG-S50
C22	.04		TTD-05	CK-503	H05S5		TA-150	TG-S50
C23	.047		TTD-005	CK-502	H05D5		TA-250	TG-D50
C24	.001			DM-102	H05D1			
C25	.001			DM-102	H05D1			
C26	.001			DM-102	H05D1			
C27	.04		TTD-05	CK-503	H05S5		TA-150	TG-S50
C28	.22			UK20-204	HCC25224Z			HY-325
C29								
C30	.001			DM-102	H05D1			
C31	.01		TTD-01	CK-103	H05S1		TA-110	TG-S10
C32	.01		TTD-01	CK-103	H05S1		TA-110	TG-S10
C33	.5		BE2P5		DOMS2P5	IDP-4-504	PVC-105	2PS-P50
C34	10-110							
C35	.01		BE2S1	CPR-10000J	WMF1S1	IDP-1-103	PVC-211	4PS-S10

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			Voxmobil PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume/Tone-SW	50K		F3-50K SP212, KR-8			B17-123, SK8 or (BU2, CF12, SS11, K)*	

\* "SNAPTROL"

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Voxmobil PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Loopstick						
L2	Ant. Matching						
L3	Oscillator						
L4	1st IF						
L5	2nd IF						
L6	3rd IF						
L7	4th IF						
L8	"A" Lead Choke						

## PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

### TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
			Voxmobl PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	1.6:	1						
		SEC. 2						
		1						

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
			Voxmobl PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2								

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Voxmobl PART No.	QUAM PART No.	
SP1	3 1/2" PM 3-4Ω		3A05	

### BATTERIES

ITEM No.	VOLTAGE	Voxmobl PART No.	REPLACEMENT DATA			NOTES
			BURGESS	EVEREADY	MALLORY	
M1	6		930 (or AL9, Hg9)	1015 (or E91, E9)	M-15R (or MN1500, ZM-9)	4 Required

### FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA							
			Voxmobl PART No.		LITTELFUSE PART No.		BUSS PART No.			
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER		
M2										

### MISCELLANEOUS

ITEM No.	PART NAME	Voxmobl PART No.	NOTES
M3	Tuning Gang		
M4	AVC Det.	OA81	
M5	AF Det.	OA79	
M6	Selector SW		

### WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Hook-up Wire .....	Use BELDEN No. 8885
Rear Seat Speaker Extension Cable .....	Use BELDEN No. 8782 (Stranded) Coded Parallel Leads
Bonding Strap .....	Use BELDEN No. 8861 (3/8 In.) or 8670 (3/4 In.)

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