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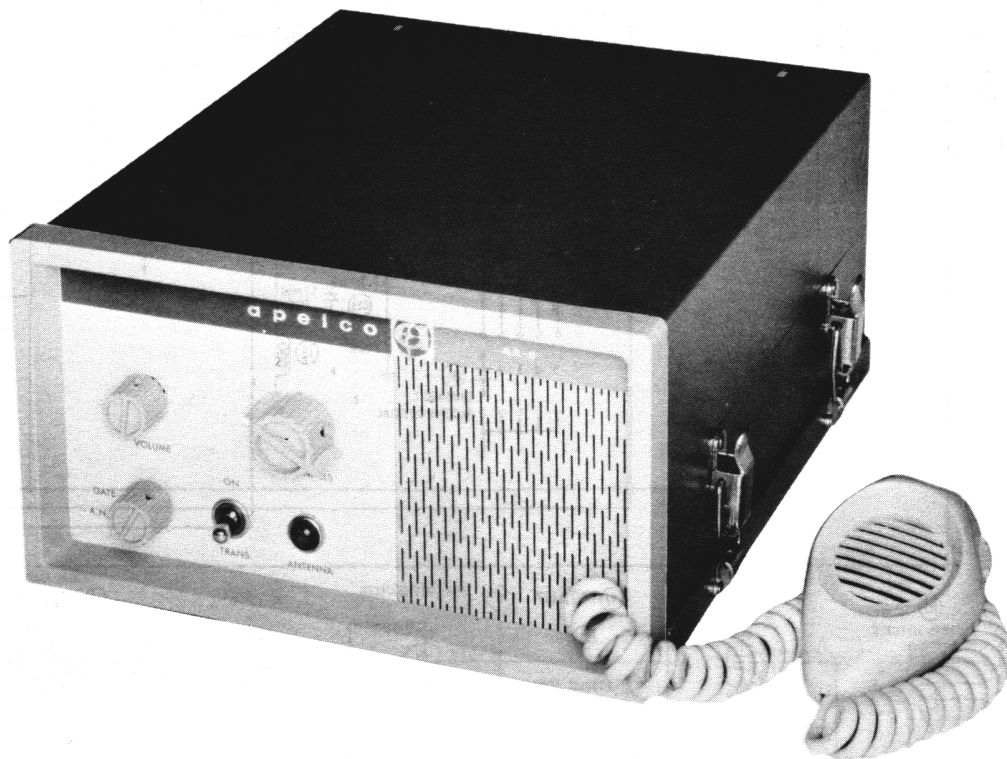
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PHOTOFACT® Folder



**APELCO  
MODEL AR-9**



**APELCO  
MODEL AR-9**

TRADE NAME	Apelco Model AR-9
MANUFACTURER	Apelco Co., 213 E. Grand Ave., South San Francisco, California
TYPE SET	Battery Operated 9 Tube Crystal Controlled Citizens Band Transmitter-Receiver (Some versions operate on AC)
POWER SUPPLY	12 Volt Storage Battery      RATING 4.5 Amp @ 12.6 Volts DC
TUNING RANGE	Any 5 of Citizens Band Channels 1 thru 22

**NOTICE**

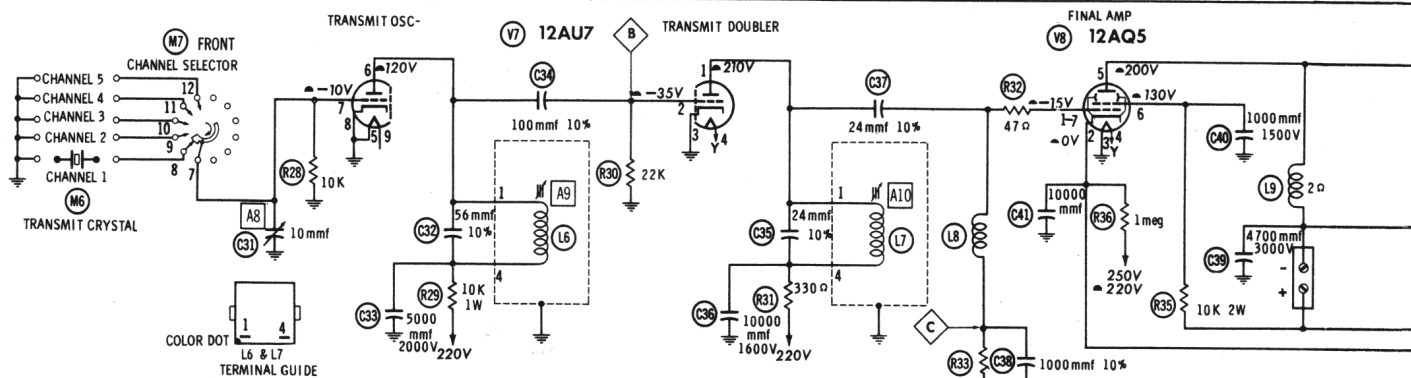
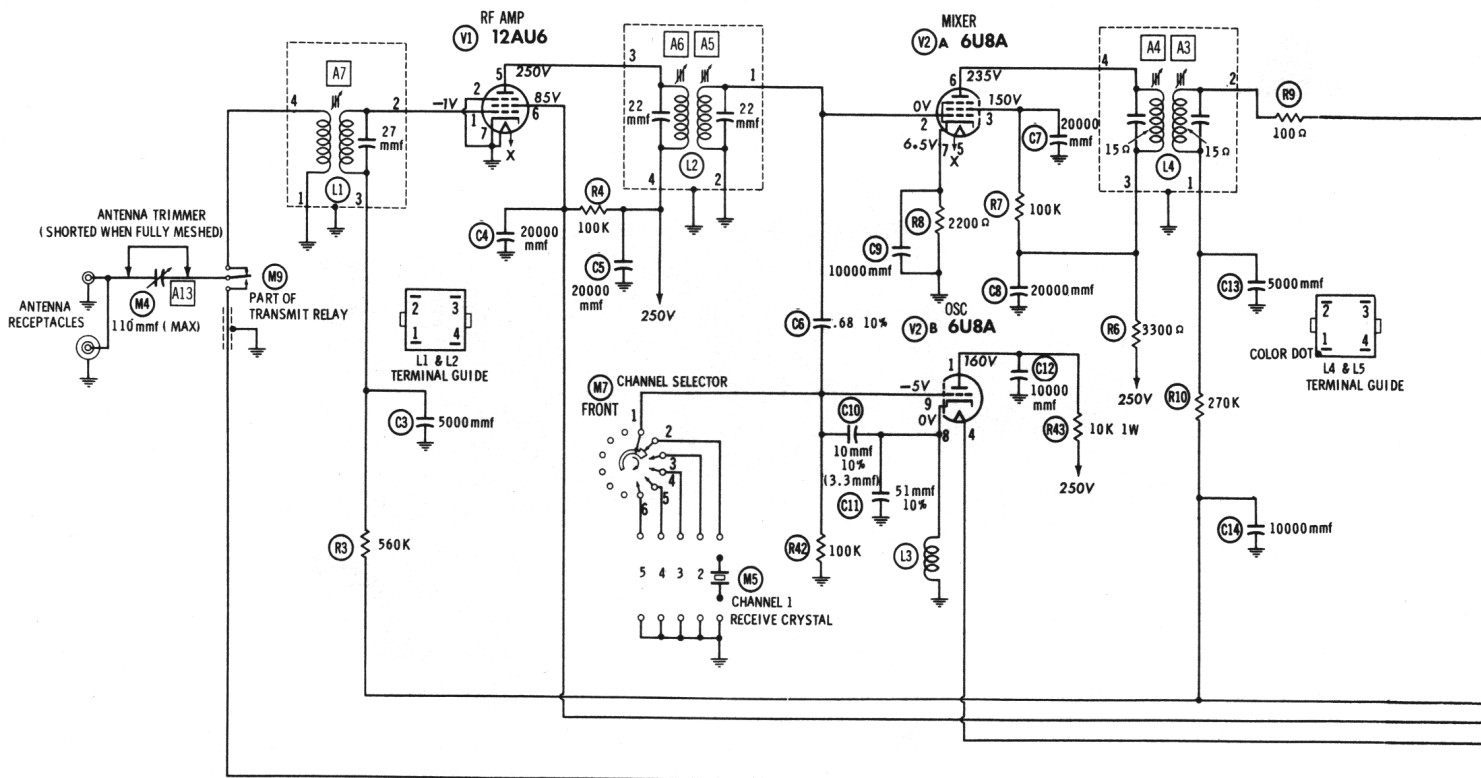
ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO MAKE CRYSTAL SUBSTITUTION OR EFFECT REPAIRS ON THE TRANSMITTER PORTION OF THIS UNIT.

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



The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KZ430

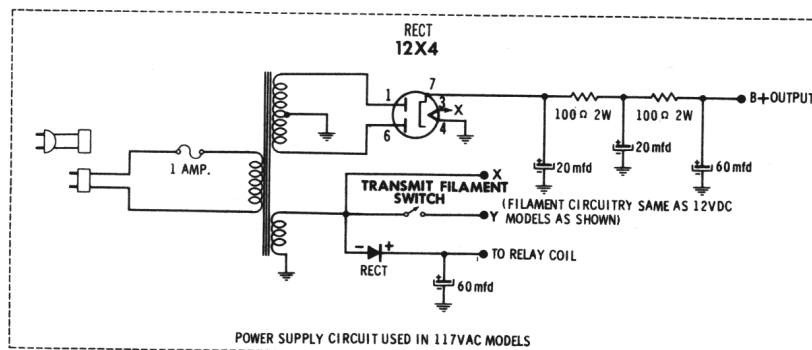
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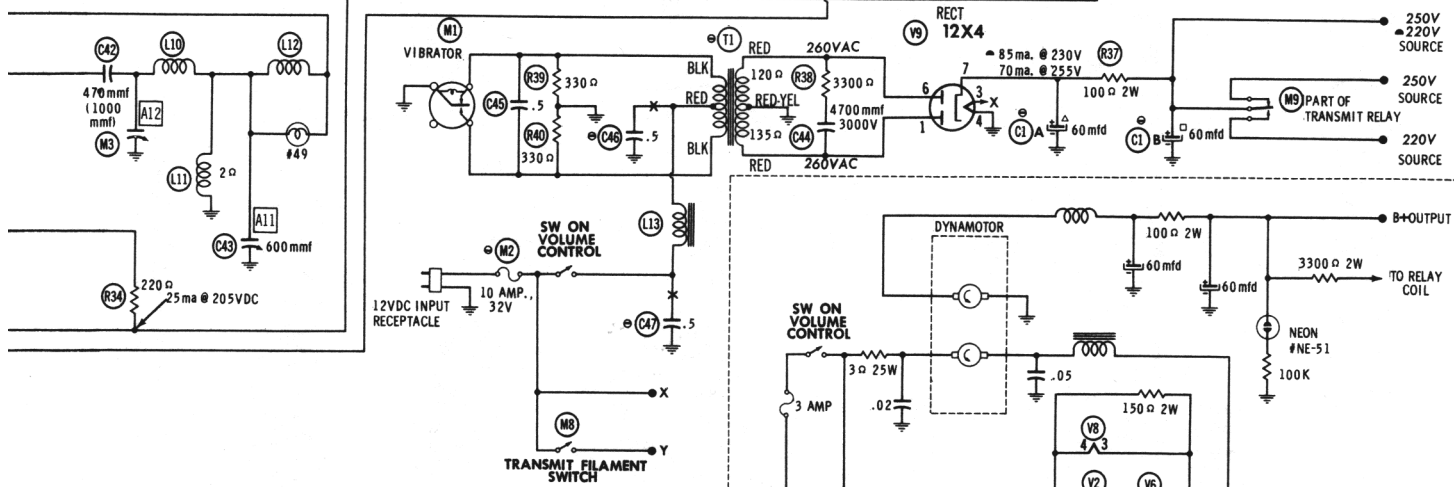
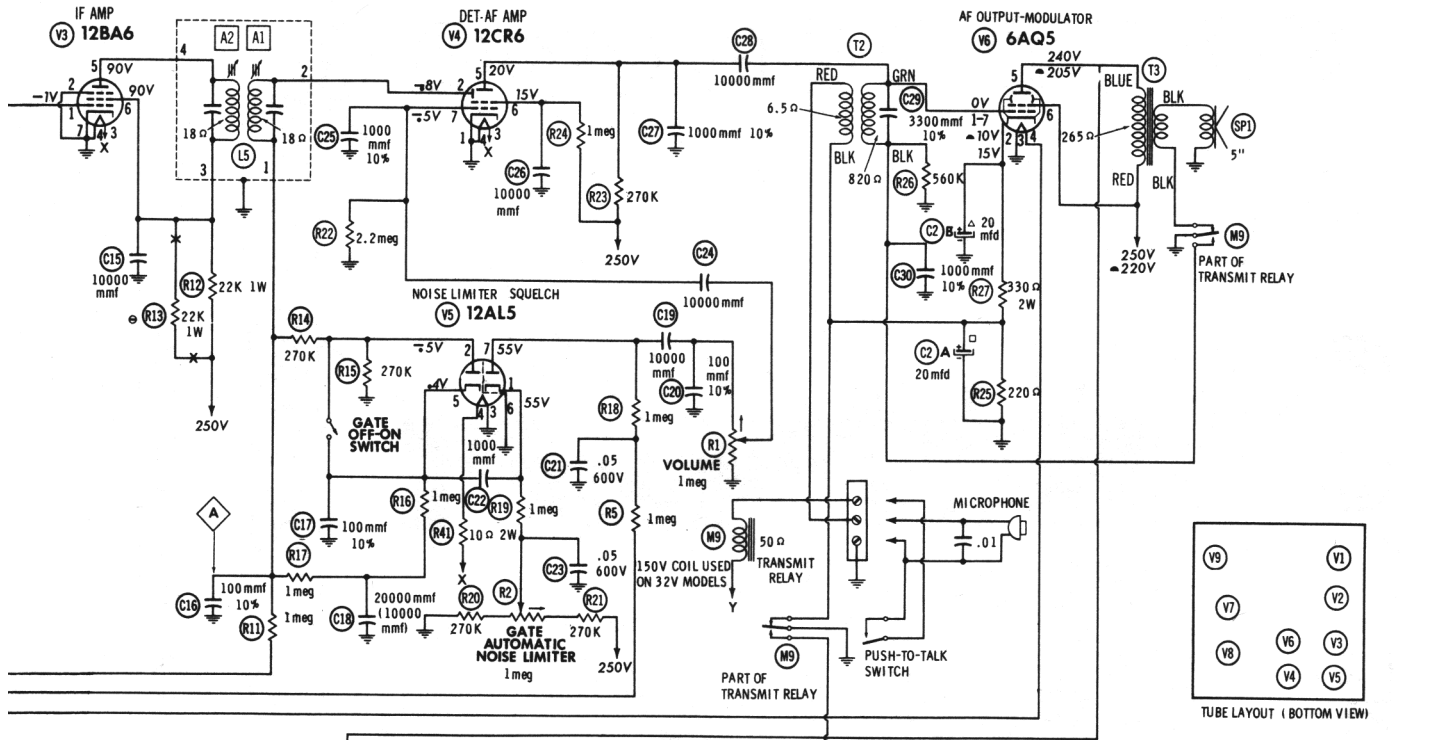
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of  $\pm 15\%$  in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
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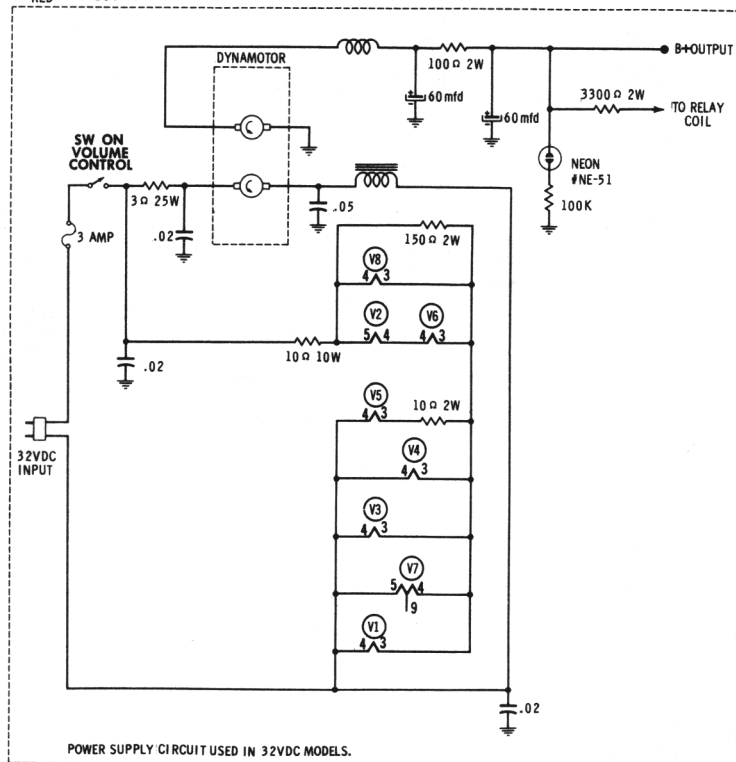
- SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
- DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
- ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



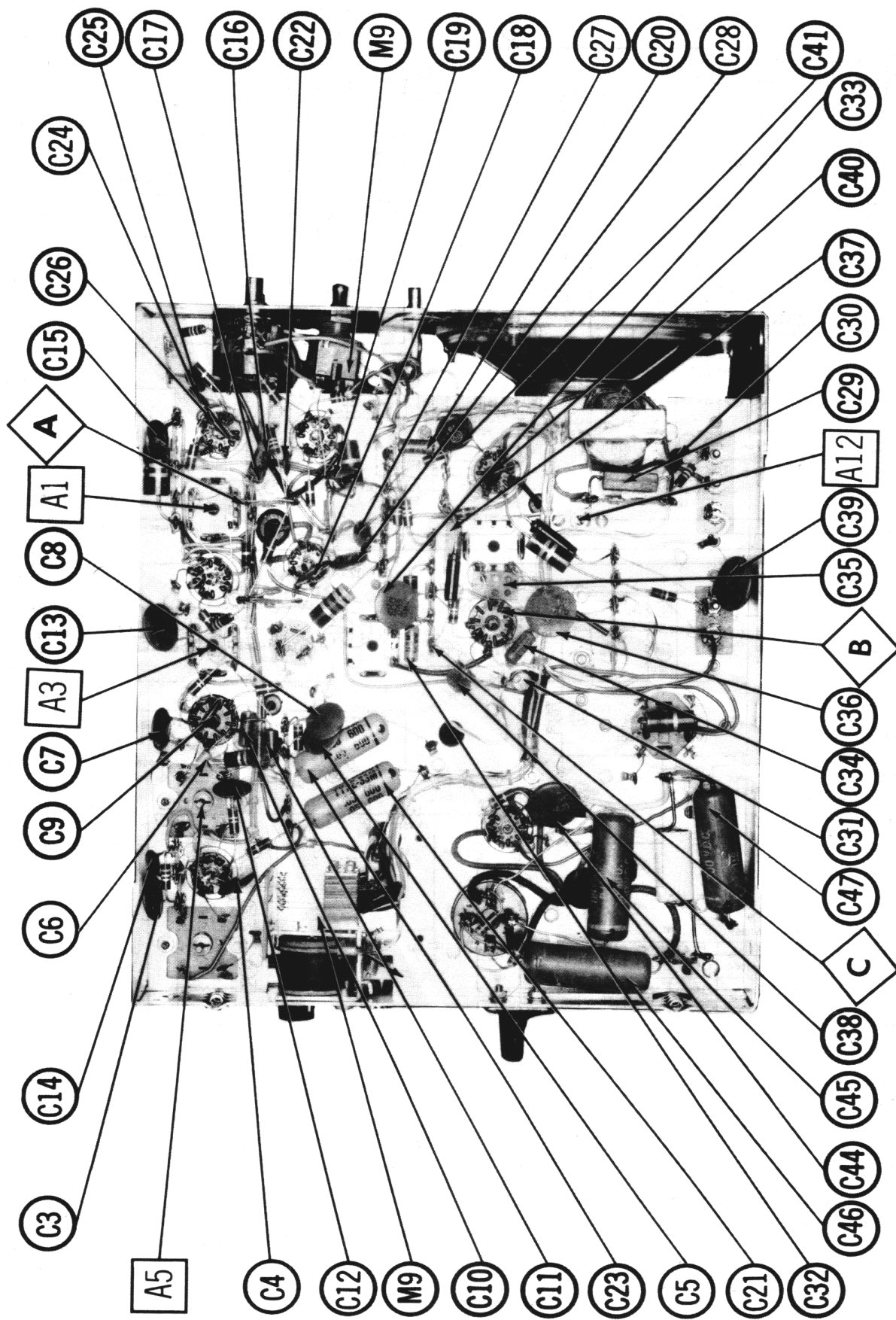
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU6	2 meg	0 Ω	0 Ω	2 Ω	†100 Ω	†100K	0 Ω		
V2	6U8A	†10K	0 Ω	†100K	2 Ω	3 Ω	†3400 Ω	2200 Ω	0 Ω	100K
V3	12BA6	1.8 meg	0 Ω	0 Ω	2 Ω	†11K	†11K	0 Ω		
V4	12CR6	0 Ω	520K	2 Ω	0 Ω	†270K	†1 meg	2.2 meg		
V5	12AL5	†1.2 meg	270K	0 Ω	4 Ω	2.5 meg	0 Ω	† 2.1 meg		
V6	6AQ5	560K -820 Ω	330 Ω -550 Ω	0 Ω	3 Ω	†365 Ω	†100 Ω	560K -820 Ω		
V7	12AU7	†430 Ω	22K	0 Ω	0 Ω	2 Ω	†10K	10K	0 Ω	NC
V8	12AQ5	NC	-0 Ω	2 Ω	0 Ω	†585 Ω	†10K	10K		
V9	12X4	135 Ω	TP	0 Ω	2 Ω	NC	120 Ω	†		

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION UNLESS OTHERWISE DESIGNATED.  
 † MEASURED IN "TRANSMIT" POSITION.  
 NC NO CONNECTION  
 † THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.  
 † MEASURED FROM PIN 7 OF V9.  
 TP TIE POINT



POWER SUPPLY CIRCUIT USED IN 32VDC MODELS.



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.





# ALIGNMENT INSTRUCTIONS

## RECEIVER

Turn Gate Control (R2) to off.

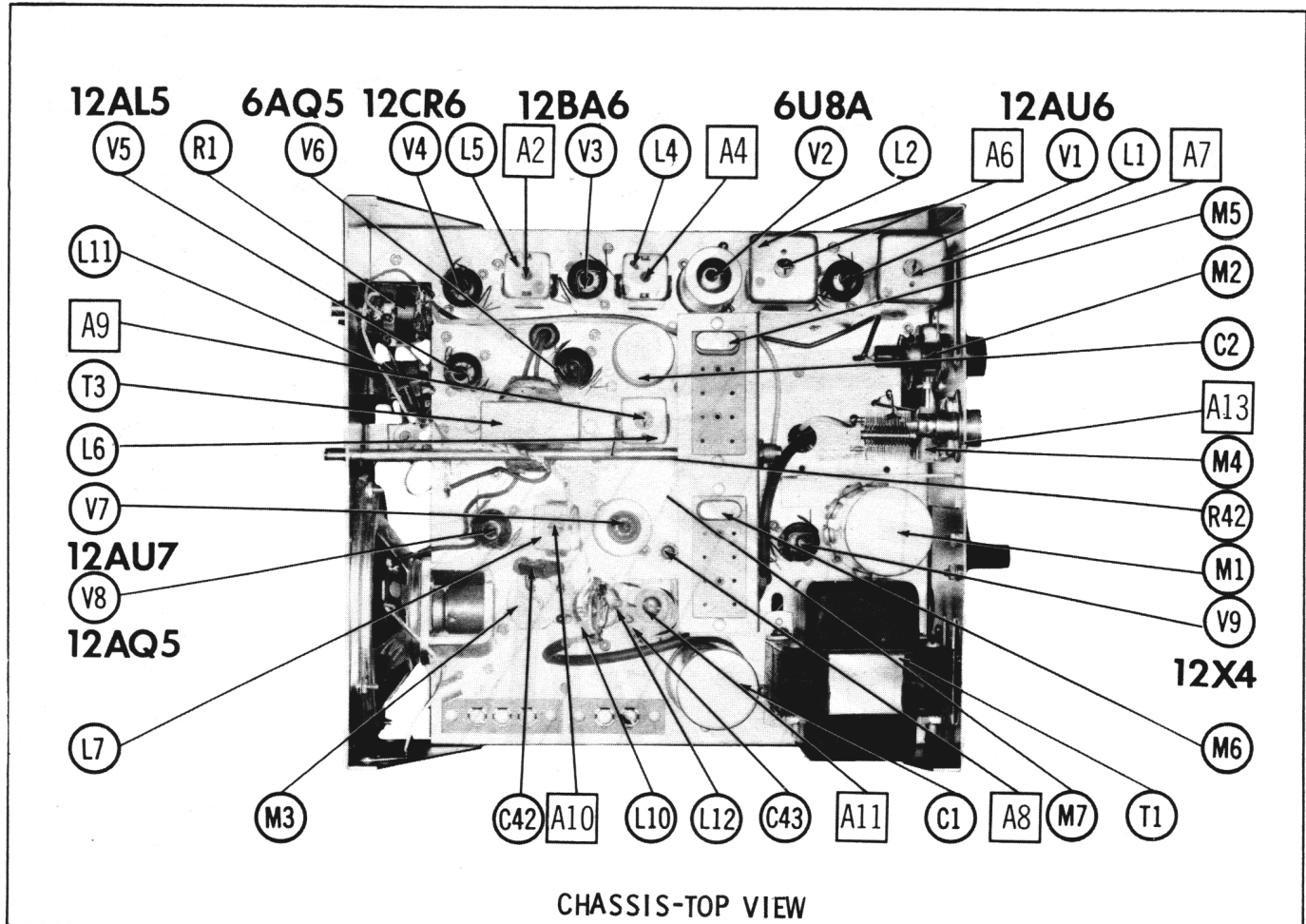
1. Connect a signal generator tuned to 455KC (400 $\mu$  Mod.) thru .1mfid to pin 2 of V2A (Mixer), common to chassis. Connect a DC VTVM to point  $\text{A}$ . Adjust A1, A2, A3, and A4 for maximum deflection.

2. Change connection of signal generator to the antenna socket and retune generator to 27.085KC (Channel 11). Adjust A5, A6 and A7 for maximum deflection.

## TRANSMITTER

1. Connect a 52 $\Omega$  dummy load to antenna socket. Using a Frequency Meter, adjust A8 to frequency indicated on osc. crystal for zero beat, (within 100 cps.)
2. Connect DC probe of VTVM to point  $\text{B}$ , common to chassis. Adjust A9 on channel 11 for maximum deflection of VTVM and then back off about 10% on the long slope. (When the crystal oscillator is tuned in one direction the output will increase slowly -- long slope -- then suddenly fall off).
3. Connect DC probe of VTVM to point  $\text{C}$ , common to chassis. Adjust A10 for maximum deflection (approximately 30 volts).

4. Connect DC milliammeter to two screw terminal strip and adjust A11 and A12 alternately until the meter reads 25ma. Care should be taken not to exceed this current, otherwise the maximum legal plate input of 5 watts will be exceeded.
5. Adjustment A13 is intended to cancel out the internal wiring inductance between the pi section load capacitor and the antenna coaxial feed. The output of the transmitter is designed to match from 25 to 75 ohms. This adjustment (A13) may also be used to compensate for a standing wave ratio appearing on the coaxial cable feed to the antenna. An antenna may be off frequency by several inches and yet be loaded efficiently by the adjustment of A13. A12 is shorted out of the circuit when fully meshed.



# PARTS LIST AND DESCRIPTIONS

## TUBES

GENERAL ELECTRIC		RAYTHEON		SYLVANIA	
ITEM No.	USE	ITEM No.	USE	ITEM No.	TYPE
V1	RF Amplifier	12A06			
V2	Mixer-Osc.	6UBA			6AQ5
V3	IF Amplifier	12BA6			12AU7
V4	Det.-AF Amp.	12CR6			12AQ5
V5	Noise Limiter-Squeich	12AL5			12X4

## FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				MALLORY PART No.	SPRAGUE PART No.
			AERVOX PART No.	CENTRALAB PART No.	CORNELL-DUBIERL PART No.	ELMENCO PART No.		
C46	.5 200V	Note 1	P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C47	.5 200V	Note 1	P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50

Note 1. Not used in some versions.  
† Alternate Value.

## CONTROLS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				MALLORY PART No.	INSTALLATION NOTES
			APELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.		
R1A	Imeg Shaft		CM-16686	B-69	A47-Imeg-S	U54	Volume	
R1B	Imeg Switch		CM-16686	Not Req.	RS-2	Not Req.	Power Off-On	
R1C	Imeg Switch		CM-16686	B-69	SW-20	US-27	Gate A. N. L.	
R2A	Imeg Shaft		CM-18888	B-69	A47-Imeg-S	U54	Volume	
R2B	Imeg Switch		CM-18888	Not Req.	RS-2	Not Req.	Power Off-On	
R2C	Imeg Switch		CM-18888	KR-1	SWE-12	US-26	Gate Off-On	

## RESISTORS

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

ITEM No.	RATING	REMARKS	REPLACEMENT DATA		RATING	ITEM No.	REMARKS	REPLACEMENT DATA	
			WORKMAN TV PART No.	IRC PART No.				WORKMAN TV PART No.	IRC PART No.
R24	560K				Imeg	R24			
R25	100K				220Ω	R25			
R26	Imeg				560K	R26			
R27	3300Ω				2W	R27			
R28	10K					R28			
R29	10K				1W	R29			
R30	20K					R30			
R31	330Ω					R31			
R32	41Ω					R32			
R33	0K					R33			
R34	10K 2W					R34			
R35	10K 2W					R35			
R36	Imeg					R36			
R37	100Ω 2W					R37			
R38	3300Ω					R38			
R39	330Ω					R39			
R40	330Ω					R40			
R41	10Ω 2W					R41			
R42	100K					R42			
R43	10K 1W					R43			

Note 1. Not used in some versions.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				Stancor PART No.	Workman TV PART No.	NOTES
		APELCO PART No.	Merit PART No.	Miller PART No.	Workman TV PART No.			
L1	Ant.	TL-61						
L2	RF Choke (1.5uh)	TL-62						
L3	RF Choke (1.5uh)	3029ITK	BC-562	4604			T856	
L4	Output IF	302225K	BC-352	12-C1			T807	
L5	Osc. Plate	TL-65	BC-352	12-C2			T808	
L6	Doubler Plate	TL-64						
L7	RF Choke (2uh)	TL-63	BC-563	4606			T857	
L8	RF Choke (15uh)	TL-63	BC-563	4624			T862	
L9	RF Choke (15uh)	TL-63	BC-563	4624			T862	
L10	RF Choke (15uh)	TL-63	BC-563	4624			T862	
L11	Hash Choke (10uh)	T105-118T	BC-537	7825-8			T862	
L12	Hash Choke (10uh)	T105-118T	BC-537	7825-8			T862	
L13	Hash Choke (10uh)	T105-118T	BC-537	7825-8			T862	

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING	CAP.	VOL.	REPLACEMENT DATA				SPRAGUE PART No.	NOTES
				APELCO PART No.	AERVOX PART No.	CORNELL-DUBIERL PART No.	MALLORY PART No.		
C1A	450	450			AFH2-59	FPI48	TMS-1790	TVL-1730	Note 1
C2A	450	450			AFH2-08	BR6045	A0500	TVL-1714	Note 1
C2B	100	100				FP208	TMD-2075	TVL-2415	
C2C	100	100							

Note 1. AC versions use 20-20mfd in this application.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				MALLORY PART No.	SPRAGUE PART No.
			AERVOX PART No.	CENTRALAB PART No.	CORNELL-DUBIERL PART No.	ELMENCO PART No.		
C3	5000		BPD-005	DD-502	BYA1005	CCD-502	5HK-D50	
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	5HK-S20	
C5	20000		NPO-SI .68	TCZ-R68		CCD-203	5HK-S20	
C6	68 10%		BPD-02	DD-203	BYB6S2	CCD-203		
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203		
C8	20000		BPD-02	DD-103	BYA10S1	CCD-100		
C9	10000		NPO-SI 10	DD-100	LI0Q1	CCD-100		
C10	10 10%	(3, 3) †	NPO-SI 51	DD-500	LI0Q51	CCD-500		
C11	31 10%		BPD-01	DD-103	BYA10S1	CCD-103		
C12	10000		BPD-01	DD-502	BYA10S1	CCD-502		
C13	5000		BPD-01	DD-103	BYA10S1	CCD-103		
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103		
C15	10000		NPO-SI 100	DD-101	LI0T1	CCD-101		
C16	100 10%		NPO-SI 100	DD-101	LI0T1	CCD-101		
C17	100 10%		BPD-02	DD-203	BYB6S2	CCD-203		
C18	20000		BPD-01	DD-103	BYA10S1	CCD-103		
C19	10000		NPO-SI 100	DD-101	LI0T1	CCD-101		
C20	100 10%	(10000) †	P688N-05	DD-503	CUB6S5	CCD-503		
C21	.05 600V		BPD-001	DD-102	BYA10D1	CCD-102		
C22	1000		P688N-05	DD-503	CUB6S5	CCD-503		
C23	.05 600V		BPD-01	DD-102	BYA10S1	CCD-102		
C24	10000		BPD-01	DD-102	BYA10S1	CCD-102		
C25	1000 10%		BPD-01	DD-103	BYA10S1	CCD-103		
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103		
C27	1000 10%		BPD-01	DD-102	BYA10S1	CCD-102		
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103		
C29	3300 10%		BPD-01	DD-103	BYA10S1	CCD-103		
C30	1000 10%		D1-1000	DD-102	IR5D33	CCD-102		
C31	10 max.		D1-1000	DD-102	5R5D1	CCD-102		
C32	56 10%		NPO-SI 56	DD-560	LI0Q56	CCD-560		
C33	5000 2000V			DD30-502	HVC20D5	CCD-502		
C34	100 10%		NPO-SI 100	DD-101	LI0T1	CCD-101		
C35	24 10%		1469-000024	TCZ-24		CCD-24		
C36	10000 1600V		DAC-27	DD16-103	HVE16S1	CCD-103		
C37	24 10%		1469-000024	TCZ-24		CCD-24		
C38	1000 10%		D1-1000	DD-102	5R5D1	CCD-102		
C39	4700 3000V		DAC-2	DD30-472	HVB20D1	CCD-472		
C40	1000 1500V		BPD-01	DD30-102	BYB10D1	CCD-102		
C41	10000		1468-00047	DD-103	5W5T47	CCD-103		
C42	470			DD30-472		CCD-472		
C43	600 max.			DD30-502		CCD-502		
C44	4700 3000V			2DP-5-504		CCD-504		
C45	.5 200V		P288N-5	DD30-472		CCD-472		

Note 1. AC versions use 20-20mfd in this application.



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	APELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T1	12VCT ② 2.7A	520VCT ③ .085A	ST-86 ①				① Part #ST-89 used for AC Operation.

## TRANSFORMER MIC

ITEM No.	TURNS RATIO		REPLACEMENT DATA				NOTES
	PRI.	SEC.	APELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T2	1	14	ST-88				

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	APELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T3	500Ω	3-4Ω	ST-19				

## SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
	SIZE	FIELD	APELCO PART No.	QUAM PART No.	
SP1	5"	PM	220006	5A07	

## VIBRATOR

ITEM No.	TYPE	INPUT VOLTS/FREQUENCY	REPLACEMENT DATA			NOTES
			APELCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	
M1	Interrupter	12.6 115v	G-8301	6301	G1601	6301

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				
			APELCO PART No.	LITTELFUSE PART No.	BIUSS PART No.	HOLDER	
M2	3AG	10A ① 32V		313010 (3AG 10A 32V)	342001	AGC 10	HKP

① AC versions use 1A in this application.

## MISCELLANEOUS

ITEM No.	PART NAME	APELCO PART No.	NOTES
M3	Trimmer Cap		Final Amp. Tank 110mm Max. Antenna Series Receiver (Order Freq. Desired) Transmit (Order Freq. Desired) Channel Selector (Rotary Type) Transmitter Filamentis (Toggle Type) Transmit
M4	Trimmer Cap		
M5	Crystal		
M6	Crystal		
M7	Switch		
M8	Switch		
M9	Relay	579	

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors  
 Shielded Hook-up Wire ..... Use BELDEN No. 8524 (Stranded) Available in Ten Colors  
 Bonding Strap ..... Use BELDEN No. 8885  
 ..... Use BELDEN No. 8661