

MOTOROLA
MODELS 396, 396-12

TRADE NAME Motorola Models 396, 396-12
MANUFACTURER Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET Battery Operated Universal Type AM Superheterodyne Automobile Receiver
TUBES (51x) Types 12BD6 RF Amplifier, 12BE6 Converter, 12BD6 IF Amplifier, 12CR6 Det.-AVC-AF Amp., 12AB5 Output, 12X4 Rectifier (6 volt equivalents used in Model 396)

POWER SUPPLY 12 Volt Storage Battery (Model 396-12) RATING 2.6 Amp. @ 12.6 Volts DC (Model 396-12)
TUNING RANGE—BROADCAST 540KC - 1600KC 5.2 Amp. @ 6.3 Volts DC (Model 396)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

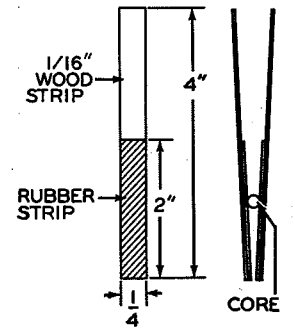
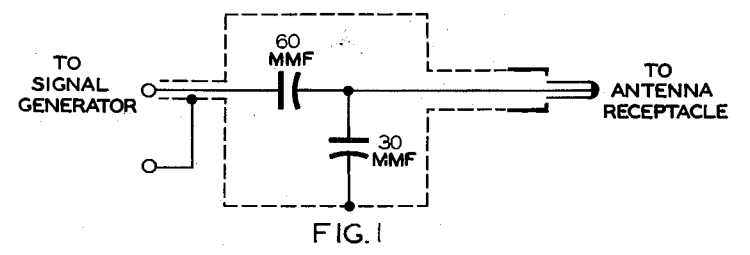
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1. 1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400% Mod)	High freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2. Fig. 1	Thru dummy to antenna receptacle	1610KC	"	"	A5, A6, A7	"
* 3. "	"	"	"	"	"	Using alignment tool (Fig. 2) back A8, A9 and A10 (tuning cores) out of coils, but not out of coil forms. Adjust A5, A6 and A7 for maximum output.
* 4. "	"	1400KC	Adjust 13/64" from high freq. end stop.	"	A8, A9, A10	Using alignment tool (Fig. 2) adjust A8, A9 and A10 for maximum output.
* 5. "	"	1610KC	High freq. end stop.	"	A5, A6, A7	Retouch for maximum output.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC, adjust A7 for maximum volume.					

POINTER ADJUSTMENT

Set tuner to extreme low end of dial and set pointer to calibration mark on top left end of dial back plate.

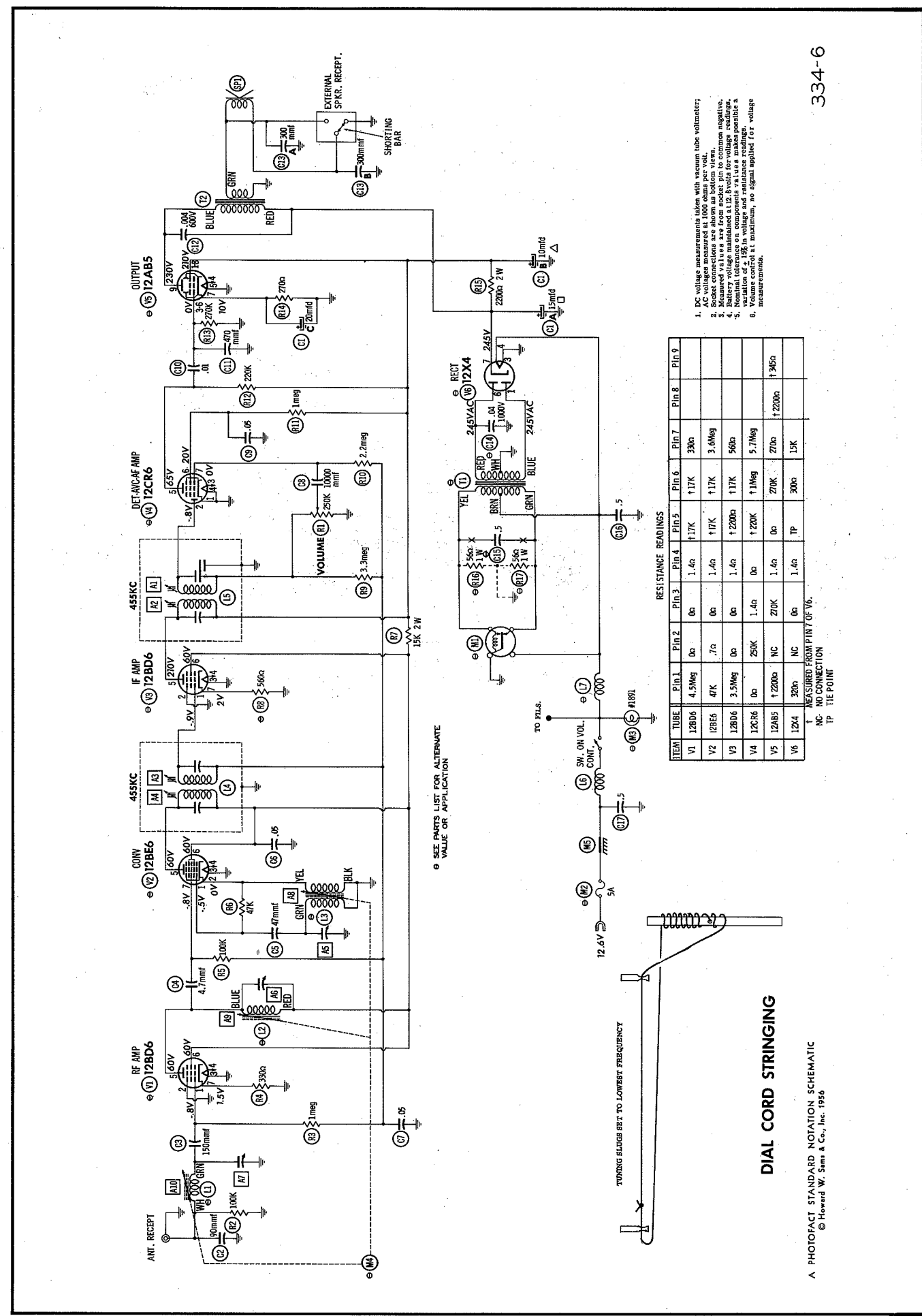
* Not necessary, except in case of tampering or replacement of tuning cores or components.



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RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BD6	4.5Meg	0a	0a	1.4a	1.7K	39a			
V2	12BE6	47K	.7a	0a	1.4a	1.7K	3.6Meg			
V3	12BD6	3.5Meg	0a	0a	1.4a	1.7K	56a			
V4	12BE6	0a	250K	1.4a	0a	1.7K	5.7Meg			
V5	12AB5	1.20a	NC	270K	1.4a	0a	270K	27a	1.20a	1.35a
V6	12X4	30a	NC	0a	1.4a	TP	30a	15K		

1. MEASURED FROM PIN 7 OF V6.
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter;
2. AC voltage measurements taken with vacuum tube voltmeter;
3. Model components are as shown in schematic;
4. Battery voltage maintained at 12.6 volts for voltage readings;
5. Nominal tolerance of components is as shown in schematic;
6. Volume control at maximum, no signal applied for voltage measurements.

PARTS LIST AND DESCRIPTIONS
 TUBES (GENERAL ELECTRIC, SYLVANIA)

MOTOROLA
 MODEL 396

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BD6	Note 1
V2	Converter	12BE6	Note 1
V3	IF Amplifier	12BD6	Note 1

Note 1. 6 Volt equivalent type used in Model 396.

Note 2. 6A3S used in 6 volt model.

ITEM No.	USE	TYPE	NOTES
V4	Det.-AVC-AF Amplifier	12CR6	Note 1
V5	Output	12AB5	Note 2
V6	Rectifier	12X4	Note 1

ELECTROLYTIC CAPACITORS

RATING				REPLACEMENT DATA			
ITEM No.	CAP.	VOLT.		MOTOROLA PART No.	CORNELL-DUBILIER PART No.	ARVOX PART No.	
C1A	15	350		23A465877	AFR3-104	C077	
C1B	10	350					
C1C	20	25					

FIXED CAPACITORS

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

RATING				REPLACEMENT DATA				NOTES
ITEM No.	CAP.	VOLT.		MOTOROLA PART No.	ARVOX PART No.	CORNELL-DUBILIER PART No.	CENTRALAB PART No.	
C2	90			21A501682			DD-151	
C3	150			21R410112			G046	
C4	4.7			21R115955			TCZ-4R7	
C5	47			21R115953			TCN-47	
C6	.05	400		21R121567			BPD-05	
C7	.05	200		21R121005			DF-503	
C8	10000			21R482726			BPD-01	
C9	.05	400		8R121567			DF-503	
C10	.01	400		8R121002			DF-503	
C11	470			21R14554			BPD-01	
C12	.004	600		8R121000			DD-471	
C13A	300			21A520233			S14000	
C14	.04	1000		8R121549			P1068N-.04	
C15	.5	100		8K122076			VHC36	
C16	.5	100		8K122076			VHC36	
C17	.5	100		8K122076			VHC36	

Note 1. Model 396 uses .02MFD in this application (part #8R121004).

Note 2. Not used in Model 396.

CONTROLS

RATING				REPLACEMENT DATA				INSTALLATION NOTES
ITEM No.	RESISTANCE	WATTS		MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	
R1A	250K			18B531560	AB-50	A47-250K-S	Q11-130	
R1B	Switch			Not Req.	AK-9	SWR-13	Not Req.	
R1C	Switch			Not Req.	KB-1	SWR-13	70-1	Volume Attach to R1A

RESISTORS

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

RATING				REPLACEMENT DATA				NOTES
ITEM No.	OHMS	WATT		MOTOROLA PART No.	IRC PART No.	NOTES		
R2	100K			6R6075	BTS-100K		R10	
R3	1Meg			6R6004	BTS-1Meg		R11	
R4	330Ω			6R6022	BTS-330		R12	
R5	100K			6R6075	BTS-100K		R13	
R6	47K			6R6056	BTS-47K		R14	
R7	15K			6R5732	BTS-15K		R15	
R8	500Ω			6R6281	BTS-500		R16	
R9	3.3Meg			6R2118	BTS-3.3Meg		R17	

Note 1. 6 volt models use 470Ω in this application (part #6R6090).

Note 2. Used in 6 volt models only.

PARTS LIST AND DESCRIPTIONS (Continued)
 TRANSFORMER (VIBRATOR)

RATING				REPLACEMENT DATA			
ITEM No.	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Holderson PART No.	Merit PART No.	Tied PART No.
T1	12.6V @ 1.4A	470VCT @ .05A	SEC. 3	26C521841	Q	26C538445	22R79

Q Used in Model 396-12.

Q Used in Model 396.

TRANSFORMER (AUDIO OUTPUT)

RATING				REPLACEMENT DATA			
ITEM No.	IMPEDANCE	MOTOROLA PART No.	Holderson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Notes
T2	5-2KΩ 3-4Ω	55B701T1	Z1107	A-2980	A-3977	24851	S-3X

SPEAKER

RATINGS				REPLACEMENT DATA			
ITEM No.	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	5 1/4"	PM	3-4Ω	90C534239	92A1	21751	

COILS (RF-IF)

USE				REPLACEMENT DATA			
ITEM No.	DC RES.	PRI.	SEC.	MOTOROLA PART No.	MESSNER PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	18Ω					Note 2 (Part of M4)
L2	Ant. Coil	70					Note 2 (Part of M4)
L3	Ant. Coil	18Ω					Note 2 (Part of M4)
L4	Input IF	18Ω		24C485533	18-8758	12-C1	
L5	Output IF	18Ω		24C485534	18-8770	12-C8	
L6	Vib. Choke	0Ω		24C580708			
L7	Vib. Choke	.1Ω		24A589447			Note 1

Note 1. Part #24A532093 used in Model 396.

Note 2. Ant. Coil part #24B502472 used in tuner #77D532189 (MT-127).

RF Coil part #24B502473 used in tuner #77D532189 (MT-127).

Ant. Coil part #24B537760 used in tuner #77D537759 (MT-187).

RF Coil part #24B502473 used in tuner #77D537759 (MT-188).

Osc. Coil part #24B502474 used in tuner #77D537759 (MT-189).

Ant. Coil part #24B537770 used in tuner #77D537768 (MT-187).

RF Coil part #24K536596 used in tuner #77K537768 (MT-187).

Osc. Coil part #24K536596 used in tuner #77K537768 (MT-187).

VIBRATOR

REPLACEMENT DATA				REPLACEMENT DATA			
ITEM No.	TYPE	INPUT VOLTS/FREQUENCY		MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	NOTES
M1	Interrupter	12.6V	115%	48B52200Q	6301	G859	Q Used in Model 396-12
M2	Interrupter	8V	115%	48B3335	Q	5342	Q Used in Model 396

FUSES

RATING				REPLACEMENT DATA			
ITEM No.	TYPE	FUSE		MOTOROLA PART No.	LITTELFUSE PART No.	BUSS PART No.	
M2	LAG	5A		65R12245	9C536545	301005	
M2	LAG	32V		65R10248	9	5342	

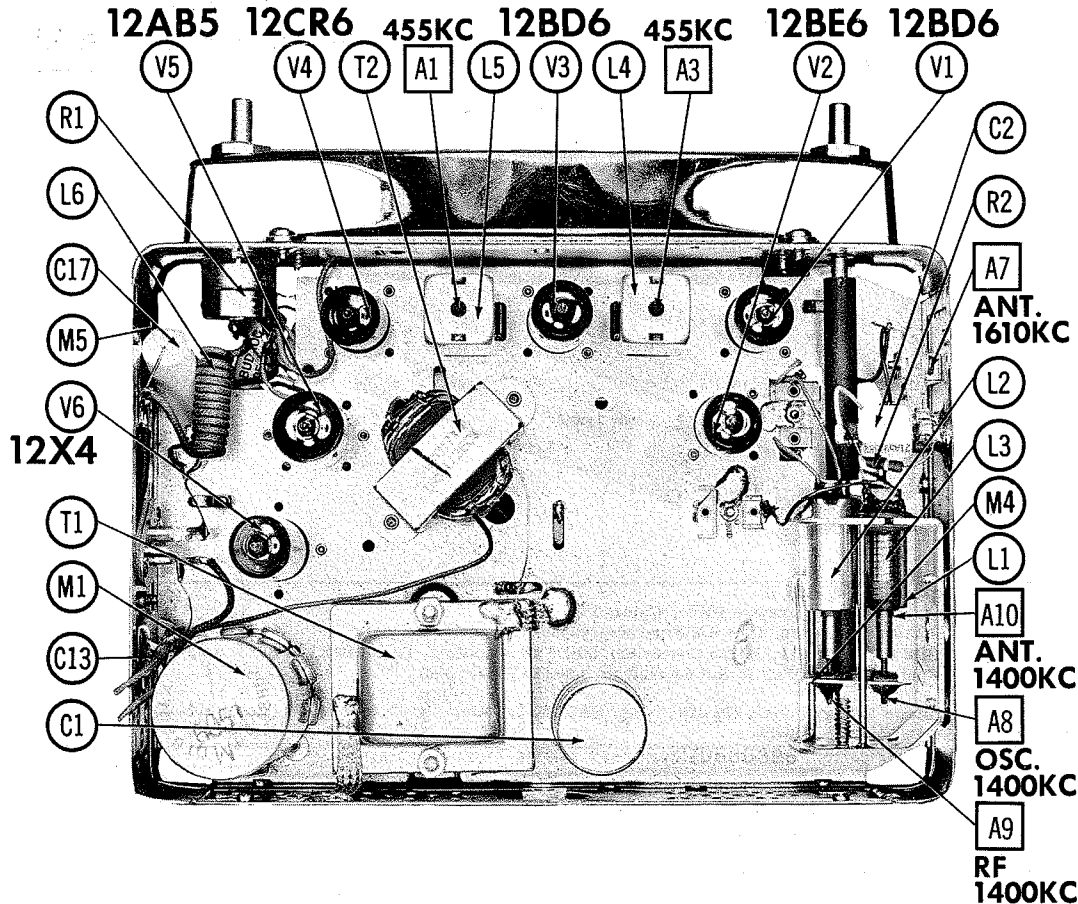
* Used in Model 396.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65T333821	#1891 Model 396-12
M4	Tuner	65X10887	#44 Model 396
M5	Sparks Plate	77D532163	(MT-127) Permeability (complete) Includes L1, L2, L3
A5	Trimmer Cap.	64K532087	Osc. (955-470MMF)
A6	Trimmer Cap.	20A485708	RF (20-180MMF)
A7	Knob	20K538723	On-off-volume & tuning
A8	Knob	38B536544	On-off-volume & tuning
A9	Dial Scale	34B536618	

* Alternate part nos. 77D537759 (MT-186), 77K537768 (MT-187).

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW

