SANYO

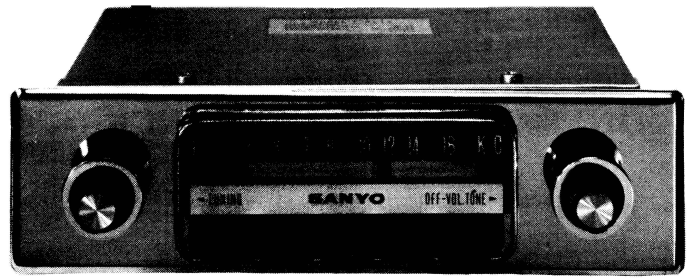
Solid State AM Car Radio

MODEL F-8214

SERVICE MANUAL

SANYO ELECTRIC CO., LTD.

INTERNATIONAL DIVISION : SANYO ELECTRIC TRADING CO., LTD.
OSAKA, JAPAN

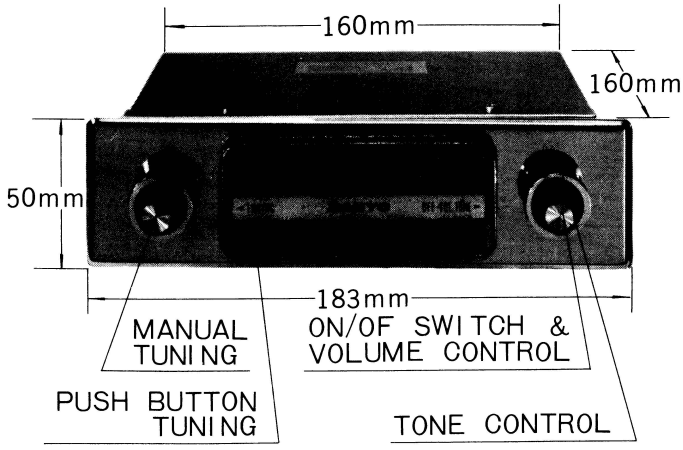


SPECIFICATIONS

Circuit System.....7transistor plus 2 diodes super-heterodyne with an RF amplifier and manual & push button tuning
Frequency Range.....530—1605 KC
Intermediate Frequency.....455 KC
Sensitivity (for 500mw output)...10μV (12V)
Signal to Noise Ratio.....28dB (at 56μV signal input)
Selectivity.....20dB (at 10KC off-tuning from 1000KC)
Output Power.....Undistorted 1.7W (12V) 1.0W (6V)
Maximum 2.8W (12V) 1.5W (6V)
Power Supply.....12V/6V (Reversable ground polarity)
Current Drain.....No signal 130mA (12V) 100mA (6V)
Maximum 400mA (12V) 500mA (6V)

Transistors.....2SA322 RF Amplifier
2SA322 Converter
2SA322 IF Amplifier
2SB186×2 Audio Amplifiers
2SB405R×2 Power Amplifier
Diodes.....1S188 Detector
1S188 AGC
Speaker Unit.....5″ permanent dynamic type 8 ohm voice coil impedence
Shaft Space.....130mm (Distance between both control shafts)
Dimensions.....Radio Unit Width 160mm (6½″)
Hight 50mm (2″)
Depth 160mm (6½″)
Weight.....Radio Unit 1.8 kg (4 lbs.)
Speaker Unit 1 kg (2.5 lbs.)

CONSTRUCTION



STANDARD ACCESSORIES

PART NO.	DESCRIPTION	Q'TY
R-32738B	Speaker Box —enclosure only	1
R-S0721	Speaker 5″ 8 ohms	1
R-112809a	Mounting Metal —speaker box mtg	1
	Hex Hd Machine Screw 6×30	2
	Hex Nut type 6ϕ	2
	Spring Washer 6ϕ	2
	Washer 6ϕ	2
R-111685	Perforated Mounting Metal	1
R-111663a	Mounting Angle	2
	Hex Hd Machine Screw 6×30	3
	Hex Nut type-1 6ϕ	3
	Spring Washer 6ϕ	3
	Washer 6ϕ	3
	Hex Hd Machine Screw 5×8	3
	Spring Washer 5ϕ	3
	Washer 5ϕ	3
R-112338a	Trim Plate	1
R-C4005	Noise Suppressor Capacitor	1
R-R7006	Noise Suppressor Resistor	1
R-S1044	Fuse 1.2A	1

PARTS LIST

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
HOUSING		
	R-117157	Main Housing
	R-112335b	Front Housing
	R-112334b	Top Housing
	R-477166	Specification Sheet
	R-A112924b	Nose Panel Assembly
	R-112924b	Nose Panel
	R-267153	Metal Marking
	R-38146	Dial Scale
	R-112346a	Back Screen —behind Dial Scale
	R-32568	Clear Plastic —for Pilot Lamp
	R-S81333	Knob —on/off & volume control
	R-S81334	Knob —tone control
	R-S81558	Knob —tuning control
	R-21031	Heat Sink
	R-24523	Hex Nut —volume & tuning shaft
	R-113232	Washer
	R-24950	Hex Nut —nose panel mtg
CONTROLS		
L2 L3 L4 L5	R-S81301a	Tuner Assembly
R16 R17	R-R124137a	Variable Resistor (Double)
R10	R-R11018	Semi-fixed Resistor 250K
CT1	R-C0047a	Trimmer 65pF
CT2	R-C0029d	Trimmer 65pF
CT3	R-C0028d	Trimmer 50pF
	R-S4363	Slide Switch
COILS & TRANSFORMERS		
L1	R-W1015b	Choke Coil 6μH
L6	R-W1064	Choke Coil 5μH
T1	R-W8210	Oscillator Coil
T2	R-W5T218	IF Transformer
T3	R-W5T219	IF Transformer
T4	R-W5T220	IF Transformer
T5	R-W5T221	IF Transformer
T6	R-W6335	Input Transformer
T7	R-W6251a 1	Output Transformer
L7	R-W6195	Choke Coil
MISCELLANEOUS		
	R-C4005	Noise Suppressor Capacitor
	R-R7006	Noise Suppressor Resistor
C27 C29	R-C7003	Spark Plate Capacitor
	R-S1044	Fuse 1.2A
	R-S1286	Fuse Holder
	R-S2155	Antenna Receptacle Jack
	R-S1165a	Pilot Lamp
	R-S2140a	Pilot Socket
	R-S1102	Polarity Reverse Plug
	R-S2164	Polarity Reverse Socket
	R-S3138a	Speaker Leads (Female) —on radio unit
	R-S3139b	Speaker Leads (Male) —on speaker box

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
SEMICONDUCTORS		
Tr1 Tr3	2SA322	Transistor (black mark)
Tr2	2SA322	Transistor (no mark)
Tr4 Tr5	2SB186B	Transistor
Tr6 Tr7	2SB405R	Transistor (OTL)
D1 D2	1S188	Diode
Th	SDT-02	Thermistor
ELECTROLYTIC CAPACITORS		
C16	R-C9126	0.1μF 10V
C18	R-C9078 or R-C9131	5μF 6V
C19 C21	R-C9170 or R-C9060	10μF 10V
C20 C22	R-C9172 or R-C9145	100μF 10V
C25 C26	R-C9127a	500μF 15V
C32	R-C9171 or R-C9146	200μF 10V
FIXED VALUE RESISTORS		
R1 R14 R18	R-R103K	10K ohms
R2	R-R561K	560 ohms
R3 R8 R19	R-R393K	39K ohms
R4 R7 R11	R-R102K	1K ohms
R5	R-R273K	27K ohms
R6	R-R272K	2.7K ohms
R9	R-R123K	12K ohms
R12 R23	R-R682K	6.8K ohms
R13	R-R331K	330 ohms
R15	R-R271K	270 ohms
R20	R-R821K	820 ohms
R21	R-R222K	2.2K ohms
R22	R-R152K	1.5K ohms
R24	R-R151K	150 ohms
R25	R-R200J	20 ohms ±5%
R26	R-R821J	820 ohms ±5%
R27 R29	R-R102J	1K ohms ±5%
R28	R-R104K	100K ohms
R30 R35	R-R101J	100 ohms ±5%
R31 R32	R-R6N8J	6.8 ohms ±5%
R33	R-R010K	1 ohms ½W
R36	R-R220K	22 ohms
FIXED VALUE CAPACITORS		
C1 C4 C15	R-CQS103Y	0.01μF +30% Mylar
C2 C10 C11 C17	R-CQS403Y	0.04μF +30% Mylar
C3 C7	R-CKD121K	120pF ±10% Ceramic, Insulated
C5	R-CQS502Y	0.005μF +30% Mylar
C6	R-CQS102Y	0.001μF +30% Mylar
C8	R-CQT101K	100pF ±10% Styrol
C9	R-CKD050K	5pF ±0.5pF Ceramic
C12	R-CKD1N5K	1.5pF ±0.5pF Ceramic
C13	R-CKD101K	100pF ±10% Ceramic
C14	R-CKD070K	7pF ±0.5pF Ceramic
C23 C24	R-CQS203Y	0.02μF +30% Mylar
C30	R-CMT504M	0.5μF ±20% Metalized Paper
C31	R-CKD201K	200pF ±10% Ceramic
C33	R-CKD403Z	0.04μF +80% Ceramic

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POLARITY REVERSE

The polarity reversing plug must be positioned correctly before installing your radio or making any electrical connections to the radio.

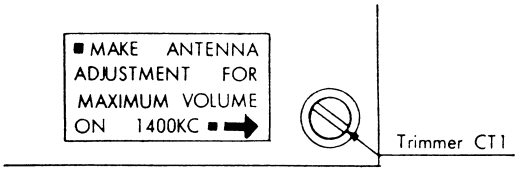
Set the polarity plug to the positive position if the positive terminal of the battery is grounded to the car.

Set the polarity plug to the negative position if the negative terminal is grounded to the car.

Damage to the radio may result if polarity plug is not positioned correctly before operating.

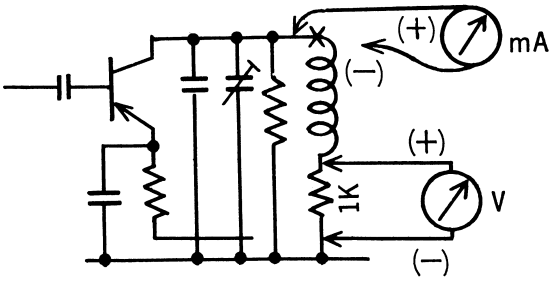
ANTENNA TRIMMER ADJUSTMENT

With radio installed in car and antenna fully extended, tune in weak station near 1400 Kc and adjust CT1 for maximum output.



COLLECTOR CURRENT ADJUSTMENT

With power supply voltage (13.2V) and load (8 ohms) applied, operate the unit without connection of car antenna.
Insert a miliammeter or connect a volt-meter as shown and adjust Semi-fixed Resistor (R10 250K) for 600 micro-ampere current circulation thru the collector of Tr1 (2SA322).



ALIGNMENT PROCEDURES

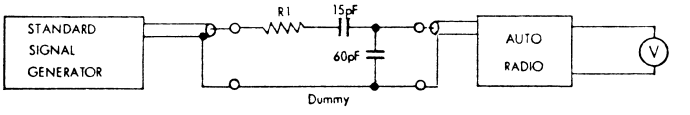
Check power supply voltage (13.2V) and ground polarity.
Volume control should be at maximum position.

Signal generator output:	Modulation frequency 400 cps Percentage modulation 30% Signal level just high enough to provide meter deflection.
Signal supply inlet:	Antenna receptacle through the dummy.
Output meter connection:	Through extension outlet

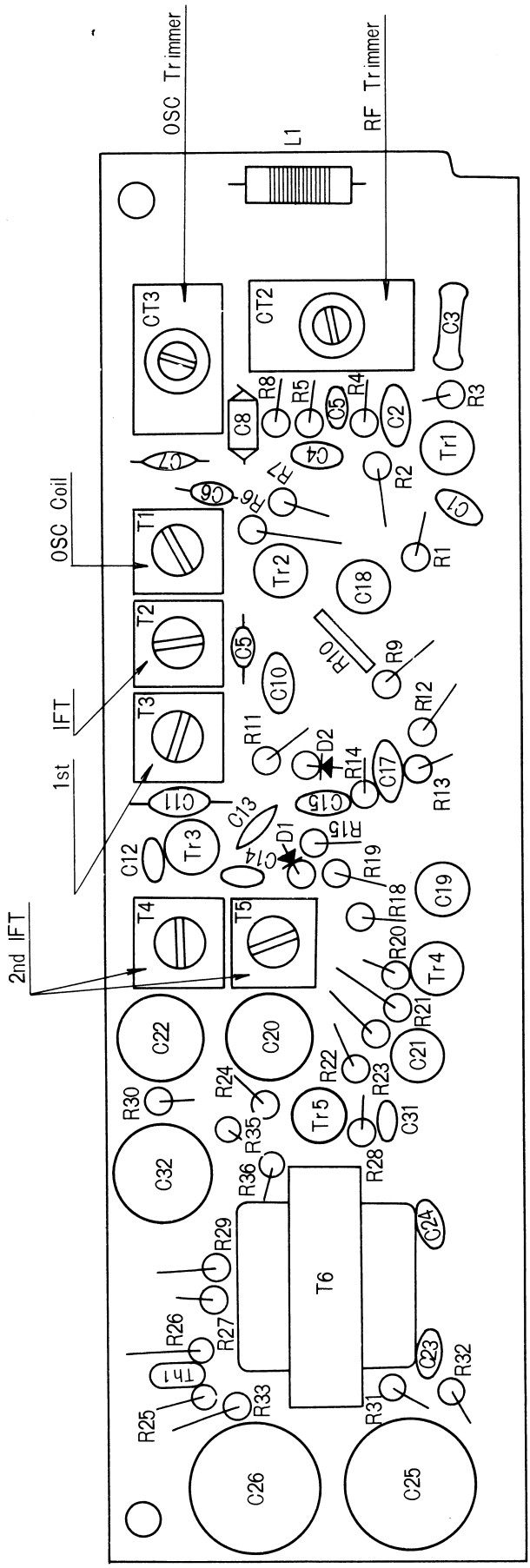
STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST FOR MAXIMUM OUTPUT
IF Alignment				
1.	Thru dummy to antenna receptacle.	455 Kc	Low frequency end stop	IF transformer T2, T3, T4, T5,
RF Alignment				
2.	Thru dummy to antenna receptacle.	600 Kc	600 Kc	Oscillator coil T1
3.		1400 Kc	1400 Kc	Oscillator trimmer CT3
4.		1400 Kc	1400 Kc	RF trimmer CT2 Antenna trimmer CT1

*Repeat steps 2, 3 and 4.

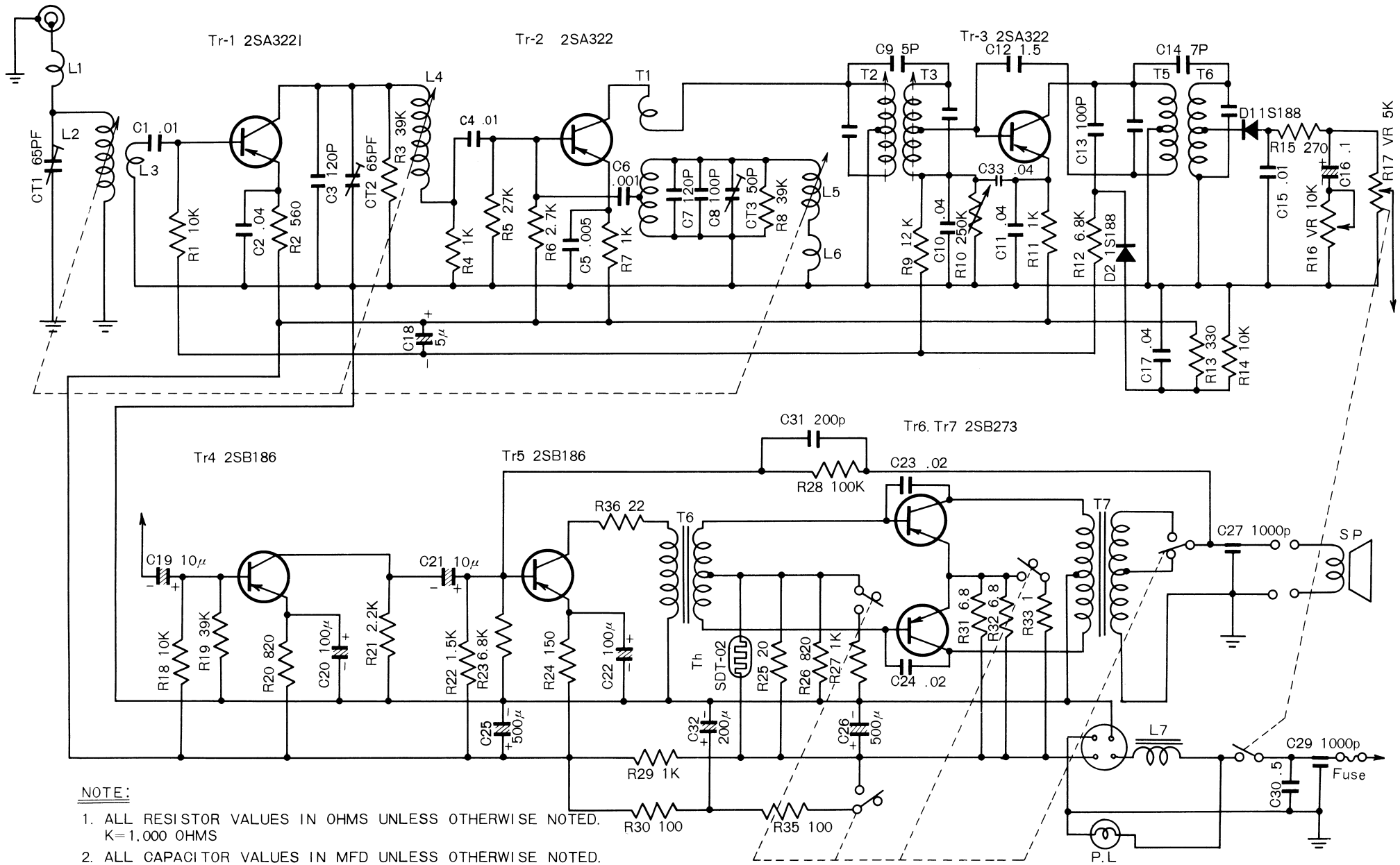
NOTE:
1. It is unnecessary to adjust tuner assembly at the points of 600 Kc and 1400 Kc because the assembly is completely line-uped.
2. Alignment is usually to be taken at points of 600 Kc and 1400 Kc, but it may be possible to obtain 530 Kc to 1605 Kc tuning range by adjusting at both lower and upper end of receiving band.



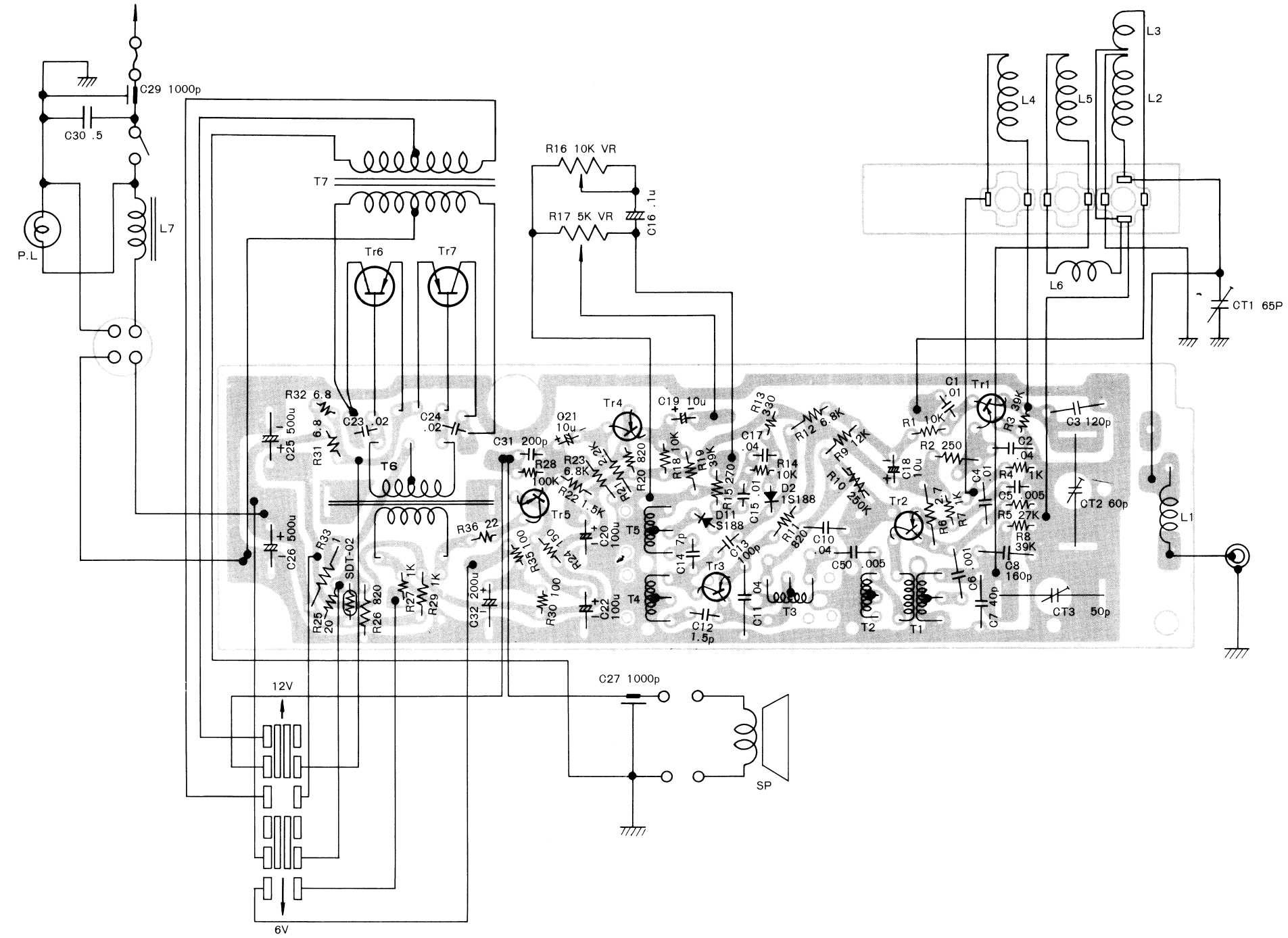
ELECTRIC PARTS IDENTIFICATION



SCHEMATIC DIAGRAMS



NOTE:

1. ALL RESISTOR VALUES IN OHMS UNLESS OTHERWISE NOTED. K=1,000 OHMS
2. ALL CAPACITOR VALUES IN MFD UNLESS OTHERWISE NOTED. P=MICRO MICRO FARAD
3. ALL RESISTORS $\frac{1}{4}$ WATT EXCEPT R33. R33=$\frac{1}{2}$ WATT

INTER-PARTS WIRING