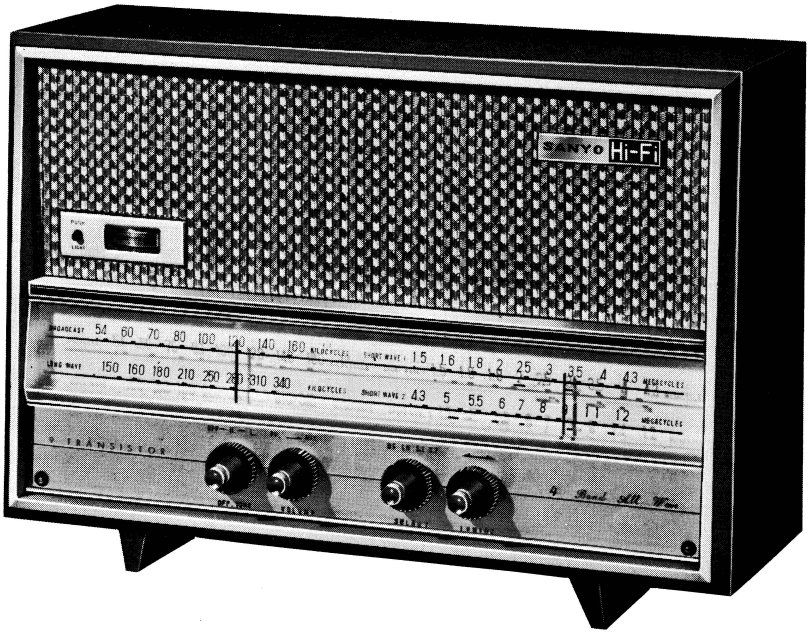
SANYO

MODEL
9X-200L

Battery Operated All-transistor 4-Band Radio

Service Manual



SPECIFICATIONS

FREQUENCY RANCE

BC	535 – 1605 kc
LW	150 – 350 kc
SW 1	1.5 – 4.3 mc
SW 2	4.3 – 12 mc

INTERMEDIATE FREQUENCY
455 kc

TRANSISTORS

(1) 2SA222	Frequency converter
(2) 2SA203	Local oscillator
(3) 2SA202	1 st IF amplifier
(4) 2SA203	2nd IF amplifier
(5) 2SB188 or 2SB24	Audio amplifier
(6) 2SB185	Driver
(7) 2SB272×2	Power amplifier (Pushpull)
(8) 2SB185	Audio pre-amplifier

GERMANIUN DIODES & THERMISTOR

(1) 1S188	Diode : Oscillation limiter
(2) 1S188	Diode : AGC
(3) 1N60	Diode : Detector & AGC
(4) SDT-06	Thermistor : Compensator

OUTPUT POWER

Undistorted	0.9 W
Maximum	1.5 W

SENSITIVITY

BC	50 μV/m
LW	140 μV/m
SW1	60 μV/m
SW2	9 μV

SIGNAL TO NOISE RATIO
56 μV/m (at 1000kc, 1mV/m signal input)

CURRENT DRAIN

No signal	18 mA
Maximum	220 mA

BATTERY
DC 9 volts. 6 standard flashlight batteries

LOUD SPEAKER
6½″ (16cm) permanent dynamic speaker

DIMENSIONS
Wooden cabinet
18″ wide × 6½″ deep × 13″ high

WEIGHT
8.4 lbs (3.8 kg)

SANYO ELECTRIC CO., LTD.

FIXED CAPACITORS

PART NO.	STOCK NO.	DESCRIPTION
C 1		0.01 μF +30,−20% 50WV Mylar Square
C 2		0.02 μF +30,−20% 50WV Mylar Square
C 3		30 pF ±10% 500WV Ceramic Disc
C 4		0.01 μF +80,−20% 25WV Ceramic Disc
C 5		0.005 μF +30,−20% 50WV Mylar Square
C 6		0.04 μF +80,−20% 25WV Ceramic Disc
C 7		110 pF ±10% 150WV Ceramic Non-insulated tubular
C 9		460 pF ±3.5% 500WV Ceramic Non-insulated tubular
C 10		1200 pF ±10% 250WV Styrol Tubular
C 11		3600 pF ±10% 1000WV Styrol Tubular
C 14		13 pF ±10% 25WV Ceramic Square
C 19		7 pF ±0.5pF 25WV Ceramic Square
C 25		0.1 μF +30−20% 50WV Mylar Tubular
C 29		0.004 μF +30−20% 50WV Mylar Square
C 30		0.004 μF +30−20% 50WV Mylar Square
C 31		0.04 μF +30−20% 50WV Mylar Square
C 36		13 pF ±10% 25WV Ceramic Square
C 37		0.04 μF +80−20% 25WV Ceramic Square
C 38		0.002 μF +30−20% 50WV Mylar Square
C 39		220 pF ±10% 125WV Styrol Tubular
C 40		0.005 μF +30−20% 50WV Mylar Tubular

ELECTROLYTIC CAPACITORS

PART NO.	STOCK NO.	DESCRIPTION
C 8	R-C9023	30μF+150−10% 6WV Vertical
C 12	R-C9077	200μF+150−10% 6WV 〃
C 13	R-C9023	30μF 6WV 〃
C 16	R-C9023	30μF 6WV 〃
C 22	R-C9084	5μF+200−10% 6WV Axial
C 23	R-C9084	5μF 6WV 〃
C 24	R-C9023	30μF 6WV Vertical
C 26	R-C9023	30μF 6WV 〃
C 27	R-C9023	30μF 6WV 〃
C 28	R-C9091	120μF+150−10% 10WV Vertical
C 32	R-C9091	120μF 10WV 〃
C 33	R-C9082	100μF+150−10% 6WV Vertical
C 34	R-C9023	30μF 6WV 〃
C 35	R-C9023	30μF 6WV 〃

FIXED RESISTORS

PART NO.	STOCK NO.	DESCRIPTION
R 1		30K ohm ±5% ¼W Carbon film
R 2		4.7K 〃 〃 〃 〃
R 3		1.5K 〃 ±10% ½W Mold
R 4		33 〃 ± 5% ¼W Carbon film
R 5		22K 〃 ±10% ½W Mold
R 6		4.7K 〃 〃 〃 〃
R 7		1.2K 〃 〃 〃 〃
R 8		100 〃 〃 ¼W Carbon film
R 9		150 〃 〃 ½W Mold
R 10		56K 〃 〃 〃 〃
R 12		68K 〃 〃 〃 〃
R 14		2.2K 〃 〃 〃 〃
R 15		36K 〃 ± 5% ¼W Carbon film
R 18		5.6K 〃 ±10% ½W Mold
R 21		33K 〃 〃 〃 〃
R 22		10K 〃 〃 〃 〃
R 23		820 〃 〃 〃 〃
R 24		1.5K 〃 〃 〃 〃
R 25		22K 〃 〃 〃 〃
R 26		8.2K 〃 〃 〃 〃
R 27		820 〃 〃 〃 〃
R 28		10 〃 〃 〃 〃
R 29		390 〃 〃 〃 〃
R 30		2.7K 〃 〃 〃 〃
R 31		68 〃 〃 〃 〃
R 32		2.2 〃 ± 5% ¼W Carbon film
R 33		680 〃 ±10% ½W Mold
R 34		220 〃 ±20% 〃 〃
R 35		680 〃 ±10% 〃 〃
R 36		1M 〃 〃 〃 〃
R 37		270K 〃 ±20% 〃 〃
R 38		6.8K 〃 ±10% 〃 〃
R 40		560 〃 〃 〃 〃
R 41		10 〃 ±10% ½W Mold
R 42		22 〃 〃 〃 〃

CABINET

	R-46283b	Cabinet
	R-46284a	Baffle plate
	———	Net covering baffle plate
	R-26457	Back screen alminium
	R-31506	Dial panel −plastic
	R-26455	Metal strip
	R-23544	Badge "SANYO Hi-Fi"
	R-44163	Badge cushion rubber
	R-44005	V-groove rubber
	R-423016	Back cover
	R-S8341.	Knob
	———	Knob felt
	R-47276	Battery instruction sheet
	R-26525	Check meter frame

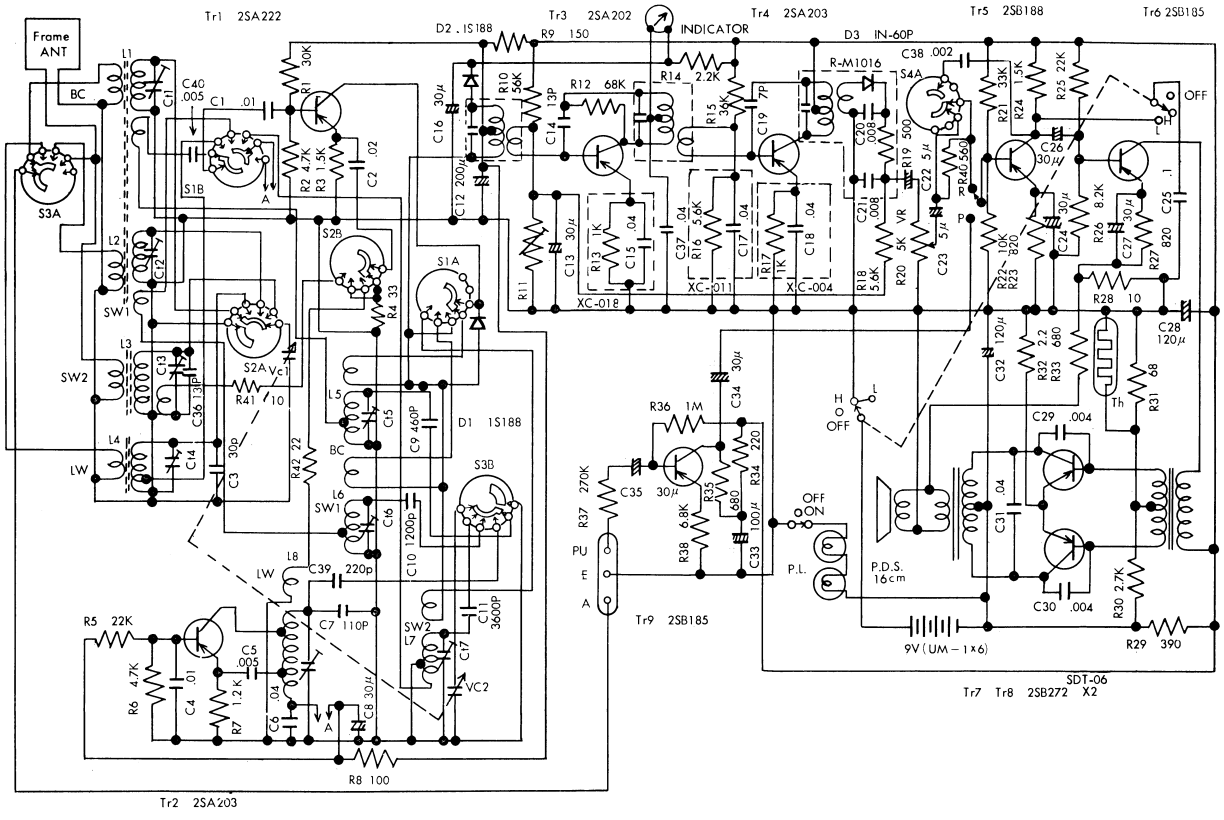
MISCELLANEOUS

	R-S8296	+terminal case
	R-S8041	−terminal case
	R-35174	Battery inserting tube
	R-S8342	Pointer assembly
	R-15039	Dial tension spring
	R-26573	Eyelet for dial cord stringing
	R-44007	Rubber grommet −chassis mtg.
	R-44004	Rubber grommet −tuning gang
	R-32130	Polystyrol bushing −trimmer mtg.
	R-S8300	Extension antenna lead
	R-S3099	Pick-up terminal board
	R-265111	Metal frame antenna
	R-S3007	Terminal lug strip −4 terminal
	R-S2042	Pilot lamp socket
	R-S5044	Pilot lamp
	R-S5509	Check meter
		Dial cord tetron 0.5 1100mm
	R-S8025	Drum

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Printed in Japan

CIRCUIT DIAGRAM

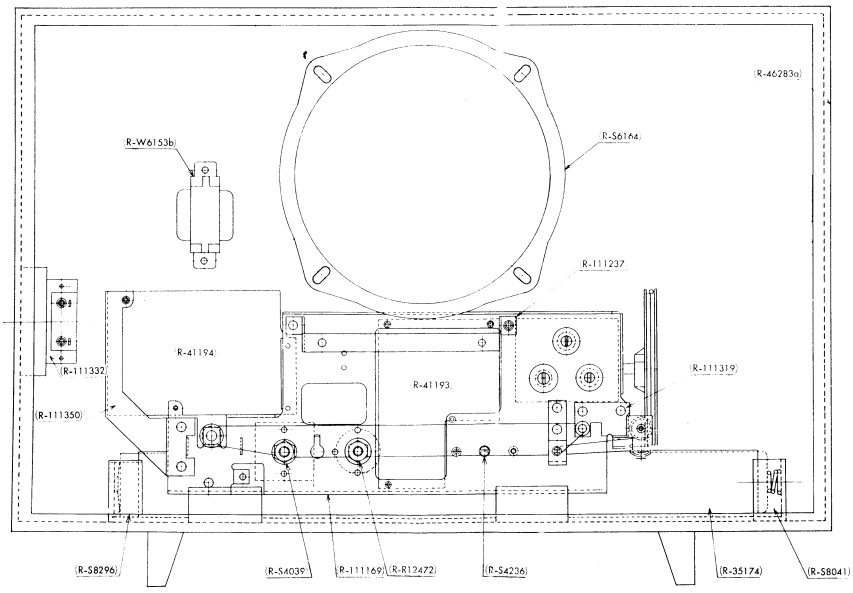


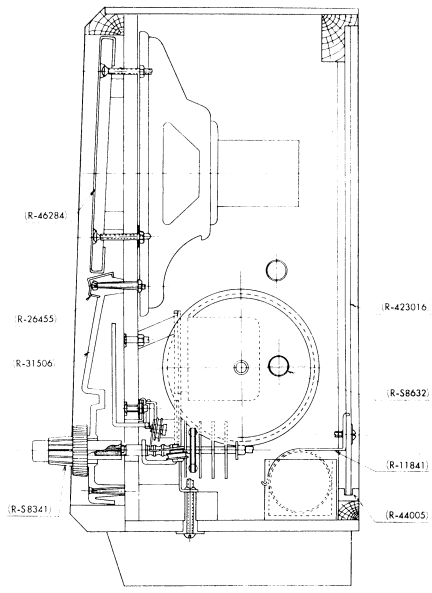
ALIGNMENT PROCEDURES

Apply volt-meter across the voice coil. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain output reading in order to avoid AGC function.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST FOR MAXIMUM OUTPUT
IF ALIGNMENT				
1	Radiate signal through the loop antenna, which connected with signal generator output cable.	455 kc	left end	DFT module T3 IFT T2 IFT T1
BROADCAST RF ALIGNMENT				
2	Radiate signal through the loop antenna, which connected with signal generator output cable.	520 kc	left end	BC Osc. coil L5
3		1650 kc	right end	BC Osc. trim Ct5
4		Repeat steps 2 and 3.		
5		600 kc	600 kc	BC Ant. coil L1
6		1400 kc	1400 kc	BC Ant. trim Ct1
7		Repeat steps 5 and 6.		
SHORTWAVE 1 RF ALIGNMENT				
14	Radiate signal through the loop antenna, which connected with signal generetor output cable.	1.4 mc	left end	SW1 Osc coil L6
15		4.5 mc	right end	SW1 Osc trim Ct6
16		Repeat steps 14 and 15.		
17		1.6 mc	1.6 mc	SW1 Ant coil L2
18		4.0 mc	4.0 mc	SW1 Ant trim Ct2
19		Repeat steps 17 and 18.		
SHORTWAVE 2 RF ALIGNMENT				
20	Radiate signal through the loop antenna, which connected with signal generator output cable.	3.9 mc	left end	SW2 Osc coil L7
21		13.0 mc	right end	SW2 Osc trim Ct7
22		Repeat steps 20 and 21.		
23		4.5 mc	4.5 mc	SW2 Ant coil L3
24		11.0 mc	11.0 mc	SW2 Ant trim Ct3
25				
LONG WAVE RF ALIGNMENT				※ (or 182 kc) for Turkey
8	Radiate signal through the loop antenna, which connected with signal generator output cable.	138 kc	left end	LW Osc coil L8
8′		138 kc	left end	LW Ant coil L4
9		360 kc	right end	LW Osc trim Ct8
9′		360 kc	right end	LW Ant trim Ct4
10		Repeat steps 8 and 9′.		
11		※ 160 kc	※ 160 kc	LW Osc coil L8
12		※ 340 kc	※ 340 kc	LW Ant trim Ct4
13		Repeat steps 11 and 12.		

CONSTRUCTIONS





TRANSISTORS

PART NO.	STOCK NO.	DESCRIPTION
Tr 1	2SA222	Frequency converter
Tr 2	2SA203	Local oscillator
Tr 3	2SA202	1st IF amplifier
Tr 4	2SA203	2nd IF amplifier
Tr 5	2SB188 2SB 24	Audio amplifier
Tr 6	2SB185	Driver
Tr 7 Tr 8	2SB272 2SB272	Power amplifier (Class B pushpull)
Tr 9	2SB185	Audio Pre-amplifier

DIODE AND THERMISTOR

PART NO.	STOCK NO.	DESCRIPTION
D 1	1S188	Oscillation limiter
D 2	1S188	AGC
Th	SDT-06	Temperature compensator

PACKED RESISTOR & CAPACITOR

PART NO.	STOCK NO.	DESCRIPTION
R13+C15	R-CXC018a	(1K ohms 5%) + (0.04 μF +80-20% 25WV)
R16+C17	R-CXC011	(5.6K 10%) + (0.04 μF +80-20% 25WV)
R17+C18	R-CXC004	(1K ohms 10%) + (0.04 μF +80-20% 25WV)

COILS

PART NO.	STOCK NO.	DESCRIPTION
L1, L2	R- S 8369	Antenna coil BC, & SW1
L3	R-W2115	Antenna coil SW2
L4	R- S 8632	Antenna coil LW
L5	R-W8041	Oscillator coil BC
L6	R-W8056	Oscillator coil SW1
L7	R-W8057	Oscillator coil SW2
L8	R-W8104	Oscillator coil LW

TRANSFORMERS

PART NO.	STOCK NO.	DESCRIPTION
T 1	R-W5T008	1st IF transformer 6038A
T 2	R-W5T009	2nd IF transformer 6029A
T 3	R-M1016	IF transformer with det. circuit
T 4	R-W6134(1)	Input transformer 3.5K : 1.5K
T 5	R-W6153b	Output transformer 150 : 8 ohms

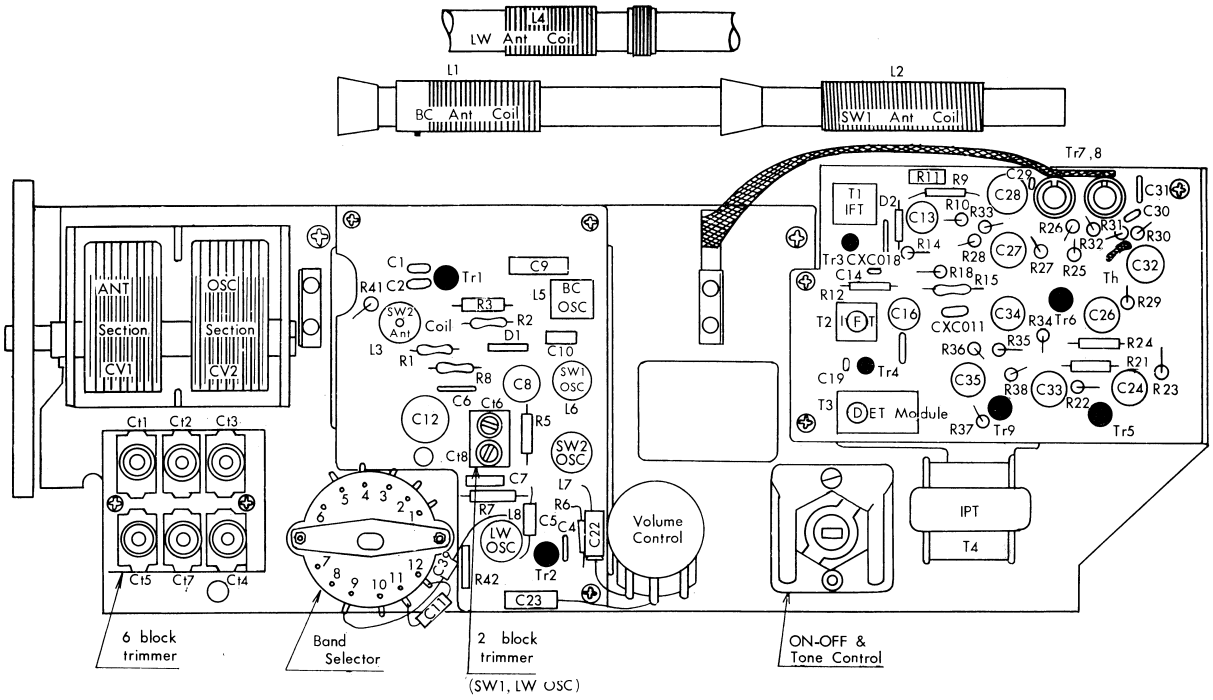
CONTROLS

PART NO.	STOCK NO.	DESCRIPTION
	R-S 4236	Band selector switch 4 wafers
	R-S 4039	Tone selector switch
	R-C1051	Tuning capacitor air
	R-C0009	6-block trimmer
Ct6, Ct8	R-C0013	2-block trimmer
VR R20	R-R 12472	Volume control with switch 5K
R 11	R-R 11006	Semi-fixed resistor 50K
	R-S 4169	Pilot light switch

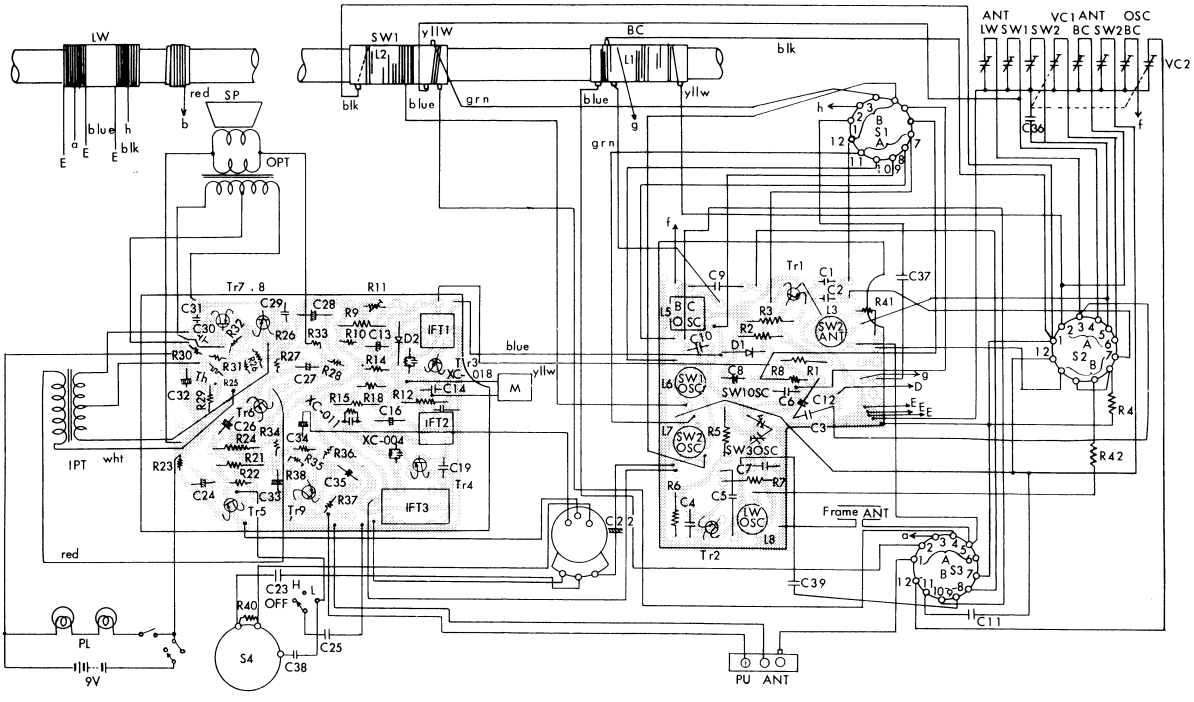
LOUD SPEAKER

PART NO.	STOCK NO.	DESCRIPTION
	R-S6164	6½″ permanent dymanic

MAIN PARTS LAYOUT

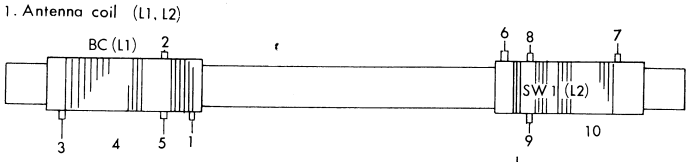


INTER PARTS CONNECTION

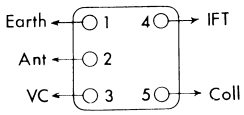


MAIN PARTS CONNECTION

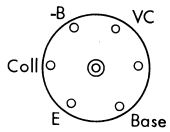
1. Antenna coil (L1, L2)

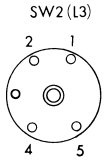


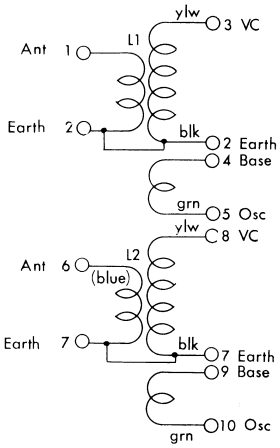
OSC coil
BC OSC coil

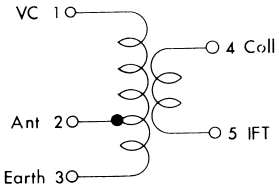


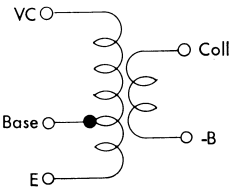
SW1 OSC coil

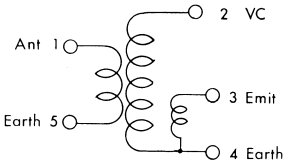




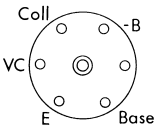


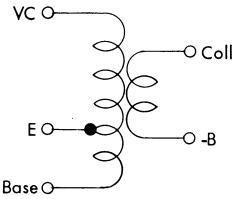


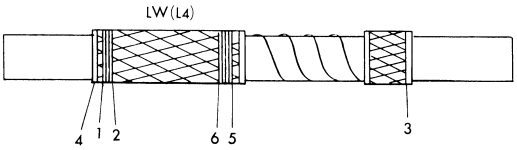


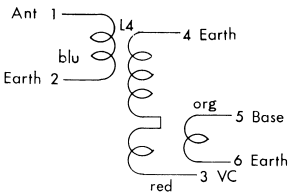


SW2 OSC coil

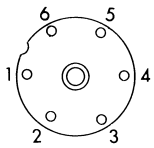




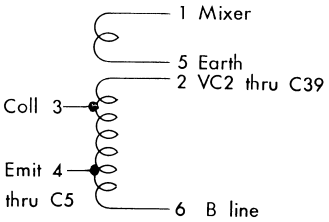




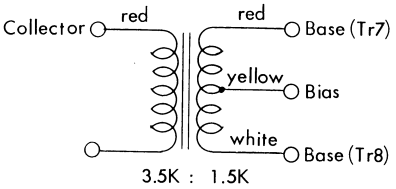
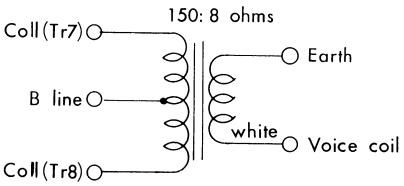
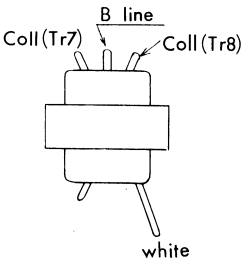
Oscillator coil



LW (L8)



Input transformer (T4)



Output transformer