SANYO

MODEL
8X-P24

All-transistor Radio
Service Manual

SPECIFICATIONS

FREQUENCY RANGE

BC	530 - 1605 Kc/s
SW1	2 - 6 Mc/s
SW2	6 - 16 Mc/s
SW3	16 - 26 Mc/s

INTERMEDIATE FREQUENCY
455 Kc/s

TRANSISTORS

2SA223	Local oscillator
2SA222	Mixer
2SA322	1st IF amplifier
2SA203	2nd IF amplifier
2SB186	AF amplifier
2SB186	Driver
2SB272 × 2	Power amplifier (B class pushpull)

GERMANIUM DIODE & THERMISTOR

1S188	Diode ; Detector & AGC
SDT-06	Thermistor ; Temperature compensator

RADIATION SENSITIVITY

BC	average	30 μV/m at 10 mW
SW1	average	35 μV/m at 10 mW
SW2	average	40 μV/m at 10 mW
SW3	average	4 μV at 10 mW

POWER OUTPUT

Undistorted	700 mW
Maximum	1100 mW

POWER SOURCE
6V (4 C Size Standard flashlight batteries)

CURRENT DRAIN

No signal	20 mA
Maximum	315 mA

SPEAKER
10 × 15 cm Permanent dynamic speaker

DIMENSIONS
250(W) × 154(H) × 64(D) (mm)

WEIGHT
1700 grams

ANTENNA
Ferrite bar antenna for BC, SW1 & SW2
External antenna terminal for SW3.

SELECTIVITY
28 db (at 10 kc off-tuning from 1000 kc)

SIGNAL TO NOISE RATIO
30 db (at 1 mV/m input on BC band)

ACCESSARIES
Earphone, phono input plug, external antenna lead

SANYO ELECTRIC CO., LTD.

PART NO.	STOCK NO.	DESCRIPTION

MISCELLANEOUS (Continued)

	R-33355	Push button SW1
	R-33356	Push button SW2
	R-33357	Push button SW3
	R-S8551	Tone control (high and low)
	R-24570	Stud nut A 6φ×26
	R-24571	Stud nut B 6φ×17
	R-24233	Stud nut C 5φ×7
	R-24572	Stud nut D 6φ×27.5
	R-S1170	Plug -for earphone jack
	R-S6210	Earphone
	R-S1163a	Telescopic rod antenna
	R-S2025b	Antenna jack
	R-S8265	Antenna lead with plug and cup
	R-S2081a	Dual earphone jack

FIXED CAPACITORS

C 1		180 pF ±10% 125WV Ceramic Tubular
C 2		5 pF ±10% 50WV Ceramic
C 3		8 pF ±10% 50WV Ceramic
C 4		0.01 μF ±20% 50WV Ceramic Disc
C 5		0.05 μF +80–20% 10WV Disc
C 7		0.05 μF +80–20% 10WV Disc
C 8		0.05 μF +80–20% 10WV Disc
C 10		3 pF ±10% 50WV Ceramic
C 11		0.05 μF +80–10% 10WV Disc
C 12		16 pF ±10% 50WV Ceramic
C 14		0.01 μF +30–20% 50WV Mylar Square
C 15		0.01 μF +30–20% 50WV Mylar Square
C 21		0.01 μF +30–20% 50WV Mylar Square
C 22		0.005 μF +30–20% 50WV Mylar Square
C 23		0.04 μF +30–20% 50WV Mylar Square
C 26		0.001 μF +30–20% 50WV Mylar Square
C 27		0.001 μF ±30–20% 50WV Mylar Square
C 30		0.05 μF +80–20% 10WV Disc
C 31		0.01 μF +80–20% 50WV Ceramic Disc
C 32		0.005 μF +30–20% 50WV Mylar Square
C 33		0.005 μF +30–20% 50WV Mylar Tubular

PART NO.	STOCK NO.	DESCRIPTION

FIXED CAPACITORS (Continued)

C 34		0.0015 μF +30–20% 50WV Mylar Square
C 35		0.002 μF ±20% 50WV Ceramic Disc
C 36		0.002 μF ±20% 50WV Disc
C 37		500 pF ±10% 35WV Styrol Tubular
C 38		0.01 μF +80–20% 50WV Ceramic Disc
C 39		250 pF ±10% 35WV Styrol Tubular
C 40		310 pF ±10% 35WV Styrol Tubular
C 41		1000 pF ±10% 35WV Styrol Tubular
C 42		3100 pF ±10% 35WV Styrol Tubular
C 43		0.02 μF +80–20% 50WV Ceramic Disc
C 44		150 pF ±10% 125WV Ceramic Tubular
C 45		0.04 μF +80–20% 50WV Ceramic Disc

FIXED RESISTORS

R 1	Carbon film		56K	ohms	±10%	¼W
R 2	〃		1.5K	〃	〃	〃
R 3	〃		33K	〃	〃	〃
R 4	〃	*	15K	〃	〃	〃
R 5	〃	*	1K	〃	〃	〃
R 6	〃	*	12K	〃	〃	〃
R 7	〃	*	39K	〃	〃	〃
R 8	〃	*	1K	〃	〃	〃
R 9	〃		200	〃	〃	〃
R 10	〃		5.6K	〃	〃	〃
R 11	〃		100	〃	〃	〃
R 12	〃	*	12K	〃	〃	〃
R 13	〃	*	56K	〃	〃	〃
R 14	〃	*	820	〃	〃	〃
R 15	〃	*	10K	〃	〃	〃
R 16	〃	*	2.2K	〃	〃	〃
R 17	〃	*	1K	〃	〃	〃
R 18	〃	*	27K	〃	〃	〃
R 19	〃	*	15K	〃	〃	〃
R 20	〃		470	〃	〃	〃
R 21	〃		4.7	〃	〃	〃
R 22	〃		1.2K	〃	〃	〃
R 23	〃	*	56	〃	〃	〃
R 24	〃		100	〃	〃	〃
R 25	〃		330	〃	〃	〃
R 26	Solid		2.2	〃	〃	½W
R 27	Carbon film*		100	〃	〃	¼W
R 28	〃		10K	〃	〃	〃
R 29	〃		4.7K	〃	〃	〃
R 30	〃		1.2K	〃	〃	〃
R 31	〃	*	120	〃	〃	〃
R 32	〃		3.9K	〃	〃	〃

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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ALIGNMENT PROCEDURES

Apply volt-meter across the voice coil.

The volume control should be set to maximum.

Output of signal generator be kept low only enough to obtain output indication.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST FOR MAXIMUM OUTPUT
IF ALIGNMENT (Band select in BC position)				
1	Radiate signal through the loop coil, which connected with signal generator output cable.	455 kc	530 kc	IF trans T 3 IF trans T 2 IF trans T 1
BROADCAST RF ALIGNMENT				
2	Radiate signal through the loop coil, which connected with signal generator output cable.	530 kc	left end	BC osc coil L5
3		1650 kc	right end	BC osc trim Ct5
4		Repeat step 2 and 3.		
5		600 kc	600 kc	BC ant coil L1
6		1400 kc	1400 kc	BC ant trim Ct1
7		Repeat step 5 and 6.		
SHORTWAVE 1 RF ALIGNMENT				
8	Radiate signal through the loop coil that connected with signal generator output cable.	1.96 mc	left end	SW1 osc coil L6
9		6.2 mc	right end	SW1 osc trim Ct6
10		Repeat step 8 and 9.		
11		2.5 mc	8.5 mc	SW1 ant coil L2
12		5.5 mc	5.5 mc	SW1 ant trim Ct2
13		Repeat step 11 and 12.		
SHORTWAVE 2 RF ALIGNMENT				
14	Connect high-side of signal generator cable through dummy antenna to antenna terminal. Low side to chassis.	5.8 mc	left end	SW2 osc coil L7
15		16.5 mc	right end	SW2 osc trim Ct7
16		Repeat Step 14 and 15.		
17		6.5 mc	6.5 mc	SW2 ant coil L3
18		15.5 mc	15.5 mc	SW2 ant trim Ct3
19		Repeat Step 17 and 18.		
SHORTWAVE 3 RF ALIGNMENT				
20	Connect high-side of signal generator cable through dummy antenna to antenna terminal. Low side to chassis.	15.5 mc	left end	SW3 osc coil L8
21		26.9 mc	right end	SW3 osc trim Ct8
22		Repeat Step 20 and 21.		
23		16.5 mc	16.5 mc	SW3 ant coil L4
24		25.5 mc	25.5 mc	SW3 ant trim Ct4
25		Repeat Step 23 and 24.		

PART NO.	STOCK NO.	DESCRIPTION

TRANSISTORS

Tr 1	2SA223	Local oscillator
Tr 2	2SA222	Mixer
Tr 3	2SA322	1st IF amplifier
Tr 4	2SA203B3	2nd IF amplifier
Tr 5	2SB186	1st AF amplifier
Tr 6	2SB186	2nd AF amplifier
Tr 7, 8	2SB272	Push-pull power amplifier

DIODE AND THERMISTOR

D	1S188	Detector & AGC
T h	SDT-06	Temperature compensator

COILS

L1, L2	R-S8579	Antenna coil BC, SW1 ferrite bar L1 340 μH, L2 23 μH
L 3	R-S8580	Antenna coil SW2 ferrite bar 2.3 μH
L 4	R-W2159	Antenna coil SW3 0.25 μH
L 5	R-W8109	Oscillator coil BC red 155 μH
L 6	R-W8092	Oscillator coil SW1 red 17.7 μH
L 7	R-W8093a	Oscillator coil SW2 no cover 2.2 μH
L 8	R-W8094	Oscillator coil SW3 no cover 0.24 μH

TRANSFORMERS

T 1	R-W5T008	1st IF transformer yellow 50k : 400
T 2	R-W5T039	2nd IF transformer white 50k : 300
T 3	R-W5T060	3rd IF transformer black 40k : 5k
T 4	R-W6187	Input transformer 1k : 1k
T 5	R-W6213	Output transformer 60Ω : 4Ω

CONTROLS

Vc 1,2	R-C1085	Tuning gang 5pF 274.3pF
Vc 3	R-C1093	Fine tuning capacitor less than 1pF 1.8±0.5pF
C t 1	R-C0030	Dual trimmer min. 3pF var. range 7pF
Ct4, 8	R-C0037	Trimmer min. 3pF var. range 7pF
V R - 2	R-R11625	Volume control 10k T curve with switch
V R - 1	R-R11011	Semi-variable resistor 100k
	R-S4224	Push switch band select (4 button)
	R-S4200	Slide switch tone select

SPEAKER

	R-S6212	10×15 cm permanent dynamic speaker 4 ohms 1.5W

PART NO.	STOCK NO.	DESCRIPTION

ELECTROLYTIC CAPACITORS

C 6	R-C9080	30 μF	3WV	Vertical
C 9	R-C9080	30 μF	3WV	〃
C 16	R-C9082	100 μF	6WV	〃
C 17	R-C9080	30 μF	3WV	〃
C 18	R-C9080	30 μF	3WV	〃
C 19	R-C9080	30 μF	3WV	〃
C 20	R-C9103	0.1 μF		Titanium
C 24	R-C9082	100 μF	6WV	Vertical
C 25	R-C9077	200 μF	6WV	〃
C 28	R-C9082	100 μF	6WV	〃
C 29	R-C9082	100 μF	6WV	〃

OTHERS

	R-S1187	Ceramic filter f_0 455±2kc B. W. 8±2kc

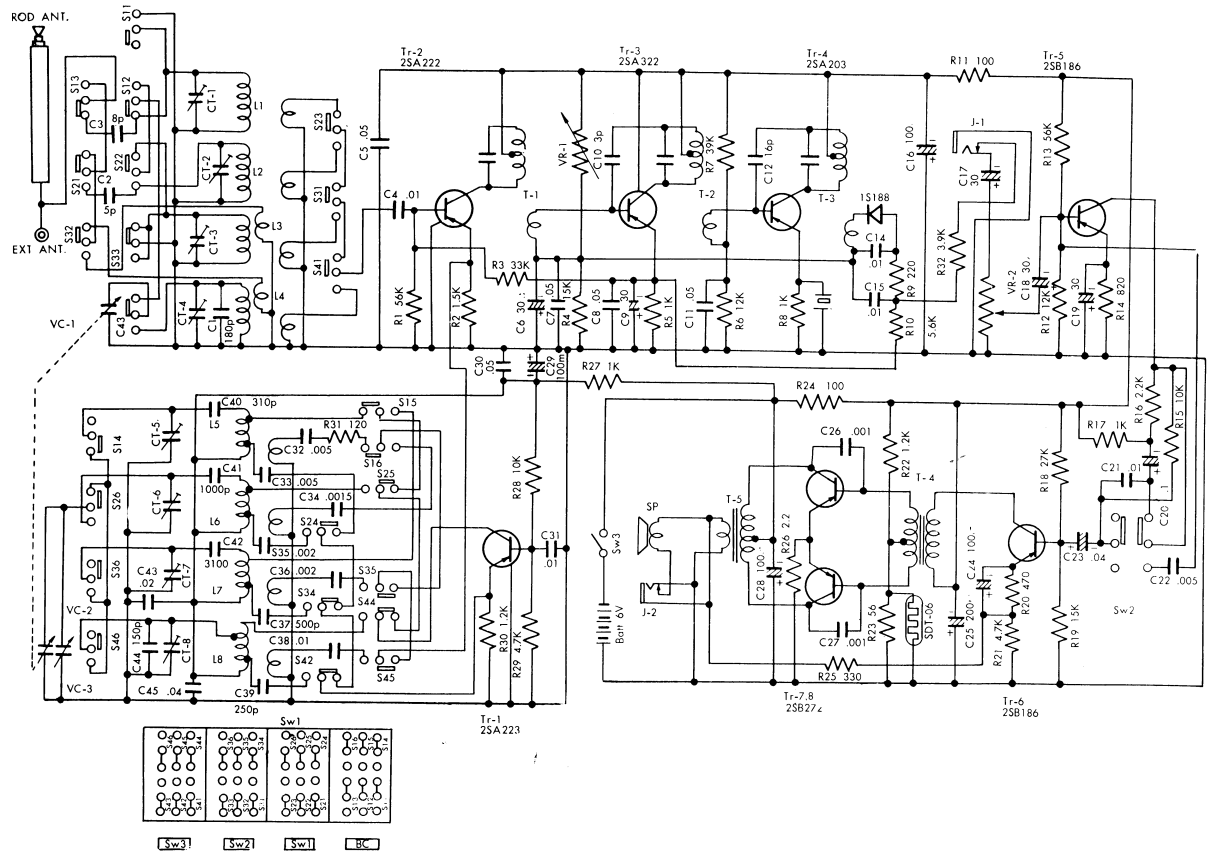
CABINET

	R-31527a	Cabinet -polystyrol
	R-26746	Metal strip " 8 TRANSISTOR "
	R-32313	Dial panel -polystyrol
	R-26636	Badge " Transworld " attached on dial panel
	R-26539	Metal strip -L section
	R-26764a	Punching metal
	R-22028	" SANYO " badge
	R-28064	Oval ring
	R-26538	Metal strip -U section
	R-24567	Handle fixing nut
	R-24568	Handle fixing washer
	R-31473	Back cover -polystyrol
	R-32291	Battery compartment lid
	R-26637	Specification metal sheet
	R-24569	Lid fixing metal
	R-12112	Tongue metal
	R-S8550	Pointer
	R-S8656a	Handle complete

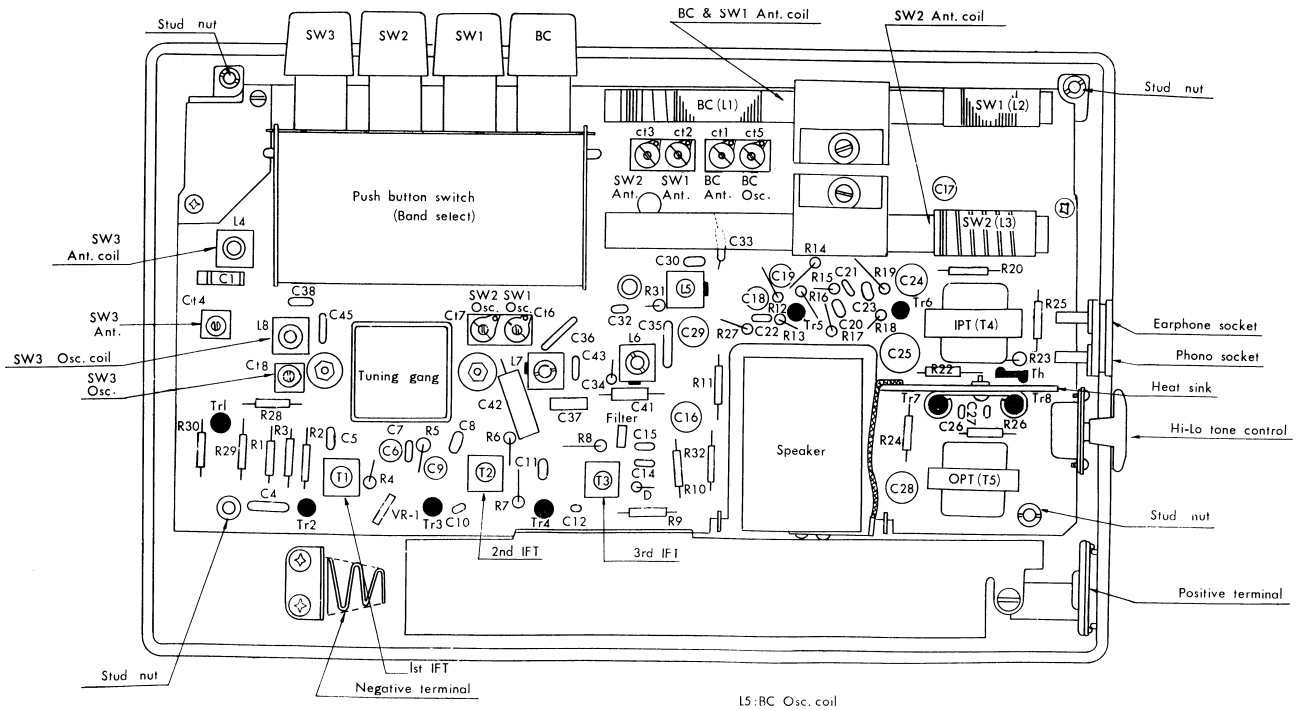
MISCELLANEOUS (Continue to reverse)

	R-32315	Drum -polystyrol
	R-111460	Back screen metal
	R-33325a	Tuning knob
	R-24483	Pulley shaft
	R-24482	Pulley
	R-33326	Volume control knob
	R-23667	Heat sink plate
	R-15039	Coil spring -for dial cord string
		Dial cord -0.7φ tetron
	R-39092	Fine tuning knob
	R-33349	Push button BC

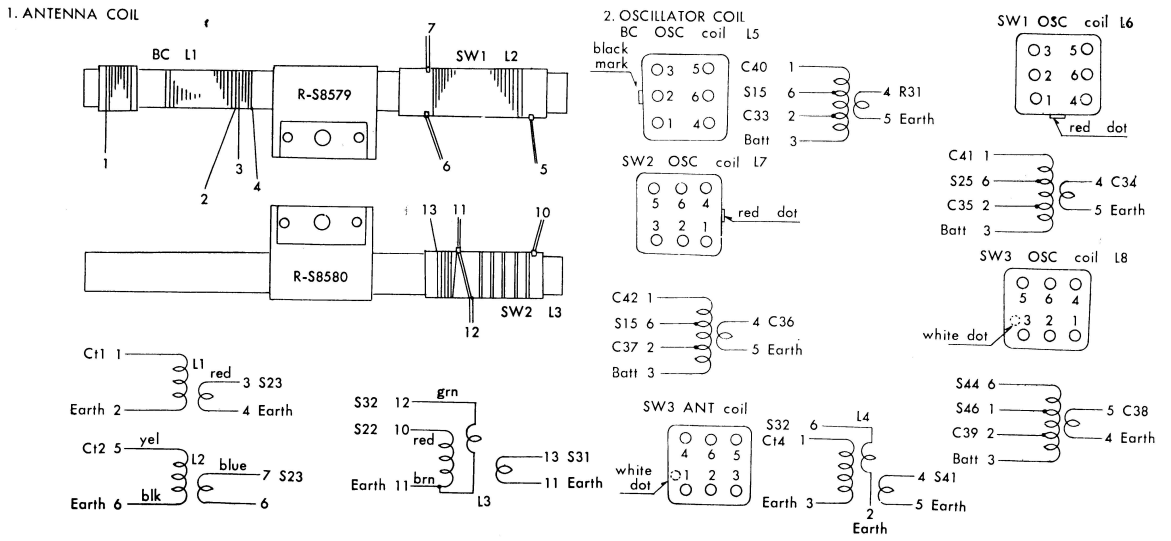
CIRCUIT DIAGRAM



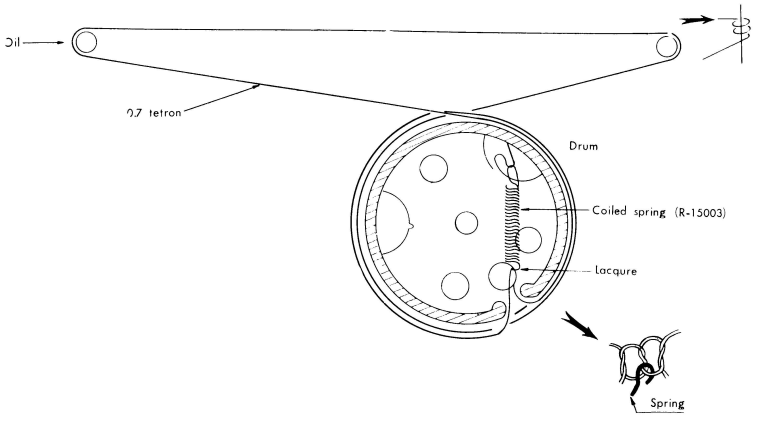
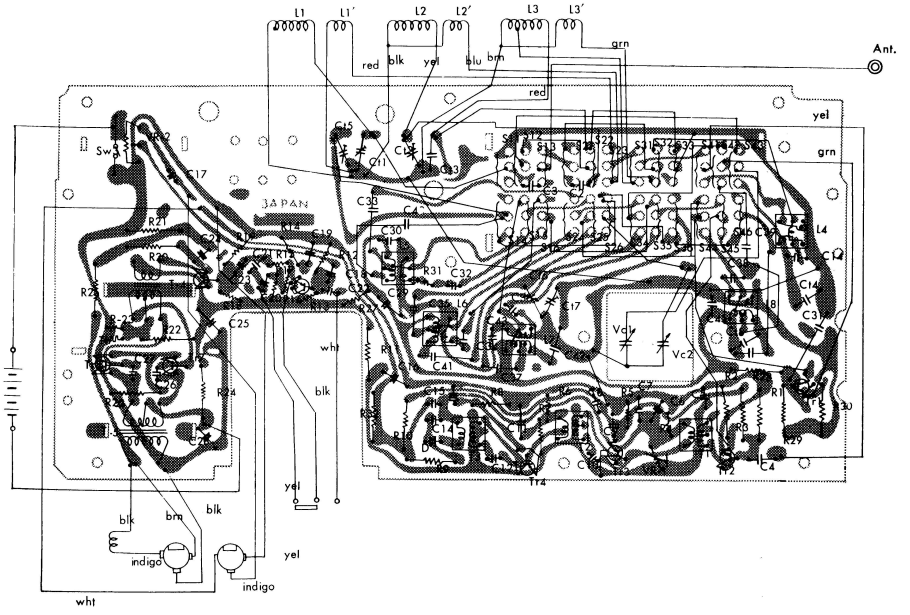
PARTS LAYOUT



MAIN PARTS TERMINAL IDENTIFICATIONS



DIAL CORD STRIGING



INTER-PARTS WIRING ILLUSTRATIONS