



# SANYO

## ALL-TRANSISTOR RADIO MODEL 10U-P28 SERVICE MANUAL

### SPECIFICATIONS

#### FREQUENCY RANGE

BC	530 - 1,605 kc
SW1	2.3 - 7.3 mc
SW2	8 - 22 mc

#### INTERMEDIATE FREQUENCY

455 kc

#### TRANSISTORS

(1) 2SA222	Local oscillator
(2) 2SA222	Frequency changer
(3) 2SA322	1st IF amplifier
(4) 2SA203	2nd IF amplifier
(5) 2SB 185	AGC amplifier
(6) 2SB 185	1st AF amplifier
(7) 2SB 185	2nd AF amplifier
(8) 2SB 187	Driver
(9) 2SB 272 × 2	Power amplifier

#### DIODE & THERMISTOR

(1) 1S188 diode	: Detector
(2) SDT - 09 thermistor	: Temperature compensator

#### OUTPUT POWER

Undistorted	300 mw
Maximum	500 mw

#### SENSITIVITY

BC	50 $\mu\text{v}/\text{m}$ (Average for 50 mw output)
SW1	30 $\mu\text{v}/\text{m}$ (Average for 50 mw output)
SW2	7 $\mu\text{v}$ (Average for 50 mw output)

#### CURRENT DRAIN

No signal	19 mA
Maximum	200 mA

#### POWER SUPPLY

DC 4.5 volt : 3 × D-size flashlight batteries

#### LOUDSPEAKER

4" × 6" oval permanent dynamic speaker 4 ohm

#### DIMENSIONS

9 $\frac{3}{4}$ " wide × 6 $\frac{3}{4}$ " high × 2 $\frac{3}{4}$ " deep

#### WEIGHT

3 $\frac{3}{4}$  lbs

### ALIGNMENT PROCEDURES

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

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	MAXIMUM OUTPUT
<b>IF ALIGNMENT</b> (Band select in BC, DX-Local select in DX position)				
1	Radiate signal through the loop antenna coil, which connected with signal generator output cable.	455 kc	530 kc	T3 T2 T1
<b>BROADCAST RF ALIGNMENT</b> (Band select in BC, DX-Local select in DX)				
2	Radiate signal through the loop antenna, which connected with signal generator output cable.	515 kc	left end	L4 BC osc coil
3		1650 kc	right end	Ct4 BC osc trimmer
4		Repeat steps 2 and 3.		
5		600 kc	600 kc	L1 BC ant coil
6		1400 kc	1400 kc	Ct1 BC ant trimmer
7		Repeat steps 5 and 6.		

# PARTS LIST

SYMBOL	STOCK NO.	DESCRIPTION	
	R-31533b	Cabinet	
	R-26827	Back screen	
	R-39167	Dial panel	
	R-26825	Window metal -for indicator	
	R-26829	Metal grille -perforated	
	R-26828	Control disc panel	
	R-26882	Emblem "SANYO"	
	R-28066	Metal frame	
	R-111948	Special washer	
	R-31534	Back cover	
	R-32365	Battery compartment lid	
	R-28069	Slide knob -on compartment lid	
	R-12183d	Mtg. spring	
	R-32371	Pilot switch button	
	R-23594	Contact metal } make pilot switch	
	R-25150	Spring metal }	
	R-S8709	Handle assembly	
	R-15096a	Coil spring	
		Dial cord tetron 0.5φ 750mm long	
	R-15168	Tension spring -dial stringing	
	R-S3018	Eyelet lug	
	R-S4259	Band select -mounted on P. W. board	
S	2	R-S4249	DX-Local switch
S	3	R-S4209	Tone switch
	R-S2081a	Earphone jack	
	R-S1198a	Telescopic antenna	
	R-23638	Transistor sleeve -heat sink	
	R-S8764	Positive terminal	
	R-S8354a	Negative terminal	
	R-S1202	Pilot lamp	
	R-S5523	Indicator	
	R-S6210	Earphone	
	R-24372	Connection tip	
		Cushion 9φ×3φ×1.5t -speaker mtg.	
	R-24571	Stud nut A 6φ×17	
	R-24700	Stud nut B 6φ×19 -speaker mtg.	

SYMBOL	STOCK NO.	DESCRIPTION
	R-24736	Stud nut C 6φ×30
	R-S8766	Volume control knob
	R-28068a	Band select knob
	R-S8767	Tuning knob
	R-S8790	Fine tuning knob
	R-111943	Battery shelf
	R-24635	Pulley
	R-24483	Pulley shaft
	R-26826b	Pointer slide screen
	R-S8760	Pointer assembly
	R-S8772	Gear assembly
	R-39125	Drum
	R-33414	DX-LOCAL knob
	R-S4257a	Band select switch

**SANYO ELECTRIC CO., LTD.**

OSAKA JAPAN

INTERNATIONAL DIVISION ;  
SANYO ELECTRIC TRADING CO., LTD.

**SHORTWAVE 1 RF ALIGNMENT** (Band select in SW1, DX-Local select in DX)

8		2.25 mc	left end	L5 SW1 osc coil
9	Radiate signal through the loop antenna, which connected with signal generator output cable.	7.5 mc	right end	Ct5 SW1 osc trimmer
10		Repeat steps 8 and 9.		
11		2.5 mc	2.5 mc	L2 SW1 ant coil
12		6.5 mc	6.5 mc	Ct2 SW1 ant trimmer
13	Repeat steps 11 and 12.			

**SHORTWAVE 2 RF ALIGNMNET** (Band select in SW2, DX-Local select in DX)

14		7.75 mc	left end	L6 SW2 osc coil
15	Inject signal through the dummy antenna, which connected with signal generator output cable.	22.67 mc	right end	Ct6 SW2 osc trimmer
16		Repeat steps 14 and 15.		
17		8.0 mc	8.0 mc	L3 SW2 ant coil
18		21.0 mc	21.0 mc	Ct3 SW2 ant trimmer
19	Repeat steps 17 and 18.			

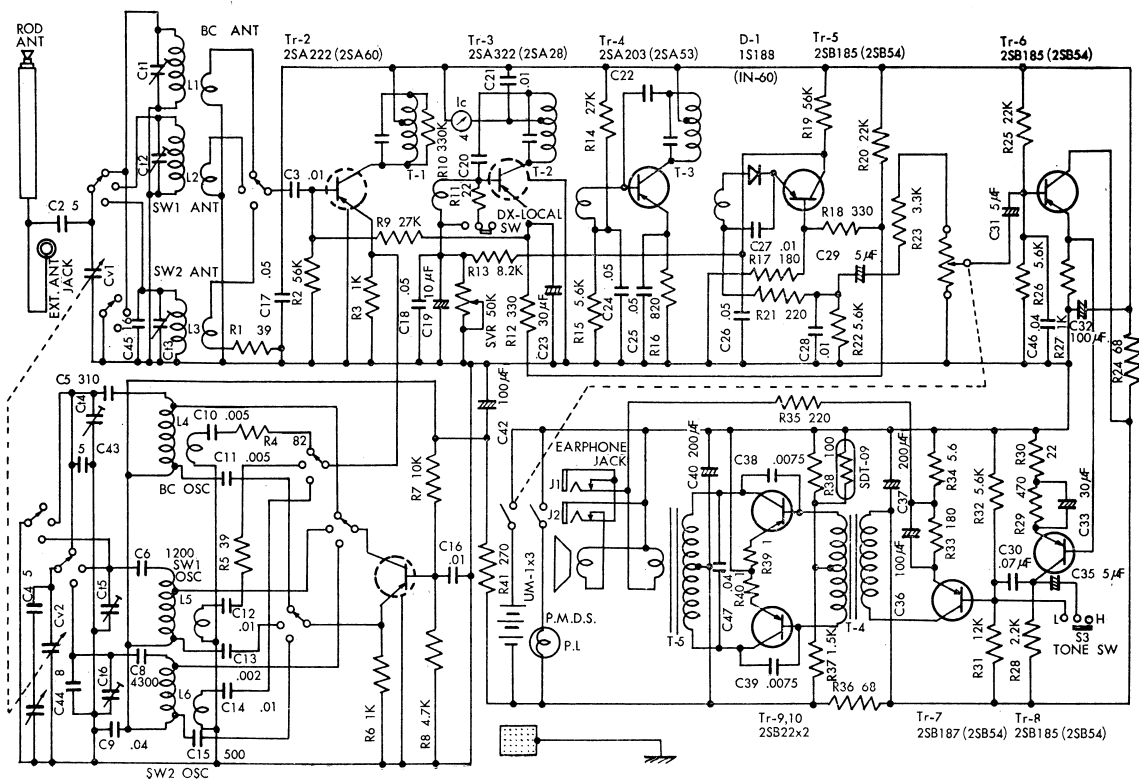
**ADJUSTMENT OF SEMI-FIXED RESISTOR (SVR 50 kohms)**

Set the value of SVR at maximum and make a receiver tune in no signal (station).

Apply 4.5 volts to the receiver as power source. Connect an ammeter (range : 1 mA) between two points P and N as illustrated.

Adjust the value of SVR in order to obtain such meter reading as 400 $\mu$ A (tolerance  $\pm 10\%$ ).

**CIRCUIT DIAGRAM**



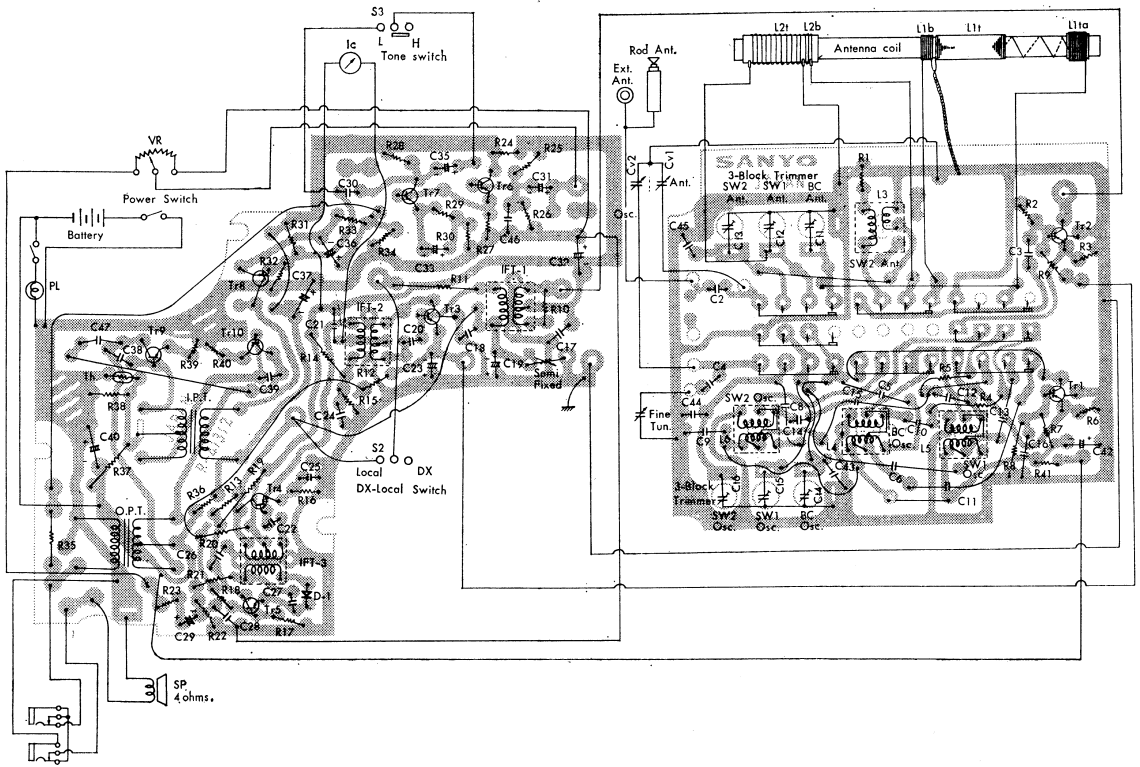
PART NO.	STOCK NO.	DESCRIPTION
<b>ELECTROLYTIC CAPACITORS</b>		
C 19	R-C9079	10 $\mu$ F 3WV Vertical
C 23	R-C9124	30 $\mu$ F // //
C 32	R-C9082	100 $\mu$ F 6WV //
C 33	R-C9124	30 $\mu$ F 3WV //
C 36	R-C9082	100 $\mu$ F 6WV //
C 37	R-C9077a	200 $\mu$ F 6WV //
C 40	R-C9123	200 $\mu$ F // //
C 42	R-C9122	100 $\mu$ F // //

PART NO.	STOCK NO.	DESCRIPTION
R 26		5.6K // // //
R 27		1K // // //
R 28		2.2K // // //
R 29		470 // // //
R 30		22 // // //
R 31		12K // // //
R 32		5.6K // // //
R 33		180 // // //
R 34		5.6 // // //
R 35		220 // // //
R 36		68 // // //
R 37		1.5K // $\pm 5\%$ //
R 38		100 // // //
R 39		1 // // //
R 40		1 // // //
R 41		270 // $\pm 10\%$ //

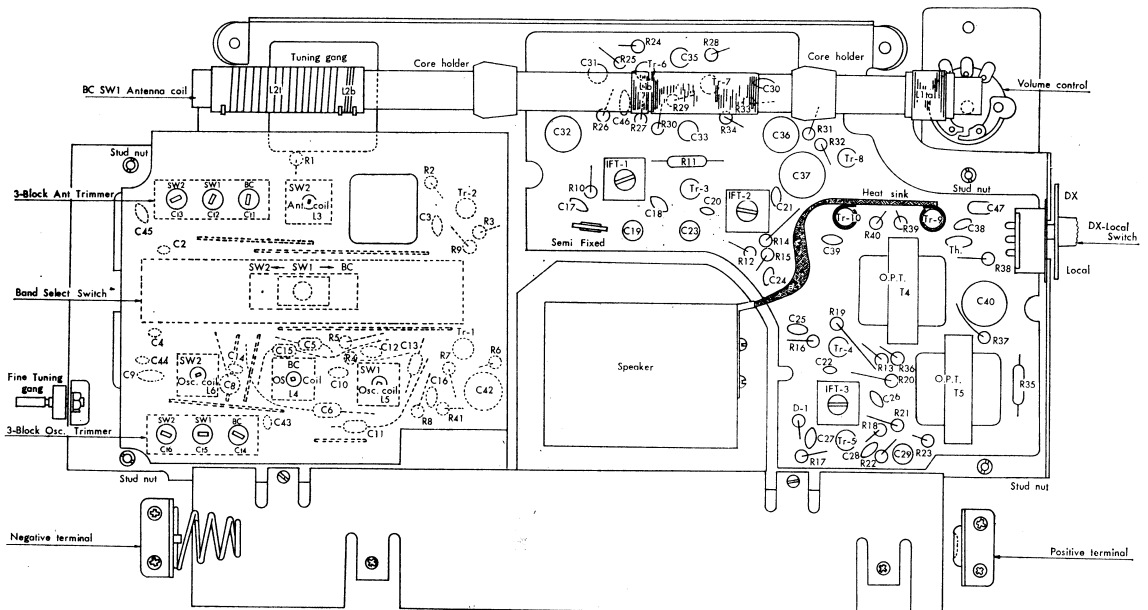
## P A R T S L I S T

PART NO.	STOCK NO.	DESCRIPTION
<b>RESISTORS</b>		
R 1	Carbon P	39 ohm $\pm 10\%$ $\frac{1}{4}$ W
R 2	//	56K // // //
R 3	//	1K // // //
R 4	//	82 // // //
R 5	//	39 // // //
R 6	//	1K // // //
R 7	//	10K // // //
R 8	//	4.7K // // //
R 9	//	27K // // //
R 10	//	330K // // //
R 11	//	22 // // //
R 12	//	330 // // //
R 13	//	8.2K // // //
R 14	//	27K // // //
R 15		5.6K // // $\frac{1}{2}$ W or $\frac{1}{4}$ W
R 16	Carbon P	820 // // $\frac{1}{4}$ W
R 17		180 // // $\frac{1}{2}$ W or $\frac{1}{4}$ W
R 18	Carbon P	330 // // $\frac{1}{4}$ W
R 19		56K // // $\frac{1}{2}$ W or $\frac{1}{4}$ W
R 20		22K // // //
R 21		220 // // //
R 22		5.6K // // //
R 23		3.3K // // //
R 24		68 // // //
R 25		22K // // //


# CHASSIS LAYOUT, WIRING SIDE



# CHASSIS LAYOUT, COMPONENT SIDE



## PARTS LIST

PART NO.	STOCK NO.	DESCRIPTION
<b>TRANSISTORS</b>		
Tr 1	2SA222	Local oscillator
Tr 2	2SA222	Frequency changer
Tr 3	2SA322	1st IF amplifier
Tr 4	2SA203	2nd IF amplifier
Tr 5	2SB185	AGC amplifier
Tr 6	2SB185	1st AF amplifier
Tr 7	2SB185	2nd AF amplifier
Tr 8	2SB187	Driver
Tr 9	2SB22	Power amplifier
Tr 10	2SB22	Power amplifier
<b>GERMANIUM DIODE &amp; THERMISTOR</b>		
D1	1S188 SDT-09	Detector Temperature compensator
<b>COILS</b>		
	R-S8770	(Ferrite core) antenna coil with holder
	R-W2185	Antenna coil only
	R-35077b	Core holder
	R-W2186	Antenna coil SW2
	R-W8118a	Oscillator coil BC
	R-W8119	Oscillator coil SW1
R-W8120	Oscillator coil SW2	
<b>TRANSFORMERS</b>		
T 1	R-W5T038	1st IF yellow
T 2	R-W5T054	2nd IF white
T 3	R-W5T060	3rd IF black
T 4	R-W6187a	Input 1K : 1K
T 5	R-W6221	Output 80Ω : 4Ω
<b>CONTROLS</b>		
	R-C1025	Tuning capacitor
	R-C0040	Triple trimmer
	R-C1093	Fine tuning capacitor
	R-R11625	Volume control with switch
	R-R11010	Semi-fixed resistor
<b>LOUDSPEAKER</b>		
	R-S6260	4½" × 4" permanent dynamic speaker

## PARTS LIST

PART NO.	STOCK NO.	DESCRIPTION
<b>CAPACITORS</b>		
Mylar-0.01 μF, +30-20%, 50V Ceramic-5 pF, ±0.5 pF, 25V (Sample)		
C 2	5	pF ±0.5pF 25WV
C 3	0.01	μF +30-20% 50WV
C 4	5	pF ±0.5pF 25WV
C 5	310	pF ±10% 125WV
C 6	1200	pF // //
C 8	4300	pF // //
C 9	0.04	μF +30-20% 50WV
C 10	0.005	μF // //
C 11	0.005	μF // //
C 12	0.01	μF // //
C 13	0.002	μF // //
C 14	0.01	μF // //
C 15	500	pF // //
C 16	0.01	μF // //
C 17	0.05	μF +80-20% 10WV
C 18	0.05	μF // //
C 20	4	pF ±0.5pF 25WV
C 21	0.01	μF +30-20% 50WV
C 22	13	pF ±10% 25WV
C 22	12	pF // //
C 24	0.05	μF +80-20% 10WV
C 25	0.05	μF // //
C 26	0.05	μF // //
C 27	0.01	μF +30-20% 50WV
C 28	0.01	μF // //
C 30	}	0.05 μF +80-20% 10WV
		0.02 μF +30-20% 50WV
C 38	0.0075	μF +30-20% 50WV
C 39	0.0075	μF // //
C 43	5	pF ±0.5pF 25WV
C 44	8	pF ±10% //
C 45	16	pF ±10% //
C 46	0.04	μF +30-20% 50WV
C 47	0.04	μF // //