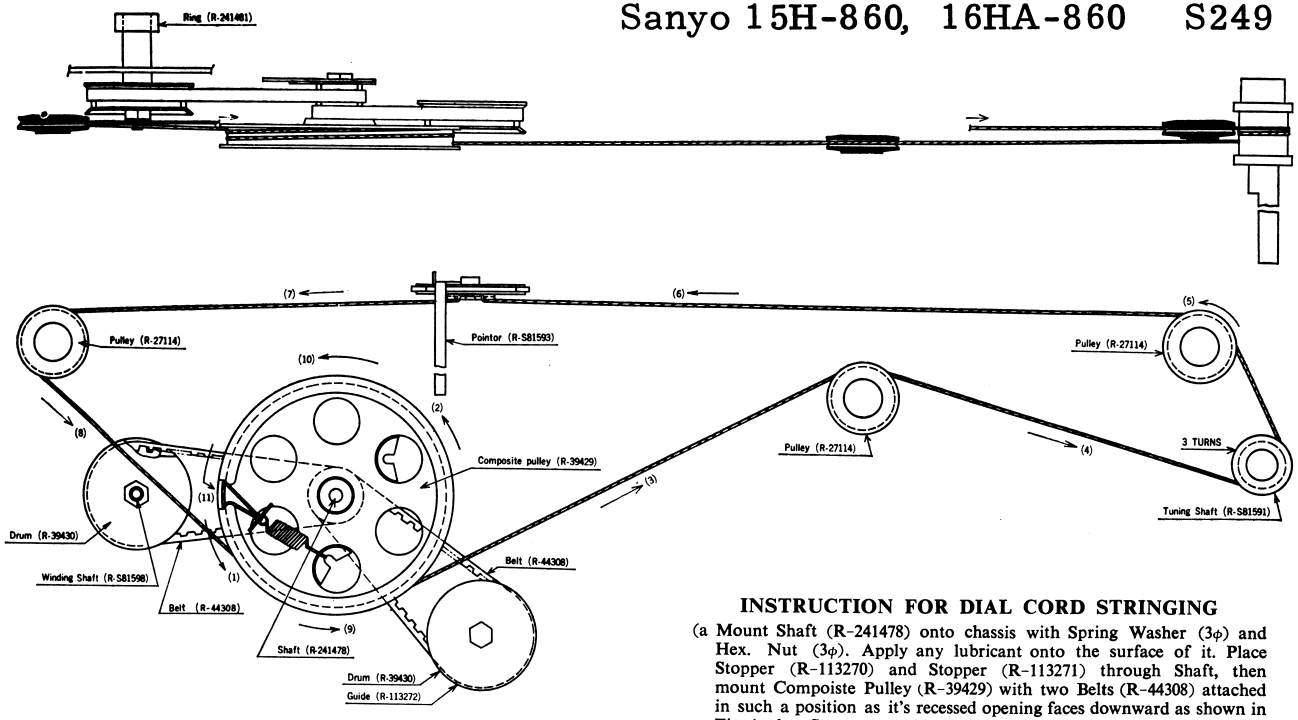


INSTRUCTION FOR DIAL CORD STRINGING

(a Mount Shaft (R-241478) onto chassis with Spring Washer (3ϕ) and Hex. Nut (3ϕ). Apply any lubricant onto the surface of it. Place Stopper (R-113270) and Stopper (R-113271) through Shaft, then mount Compoiste Pulley (R-39429) with two Belts (R-44308) attached in such a position as it's recessed opening faces downward as shown in Fig. 1 when Stoppers are hindered from swinging further by a projection on chassis.

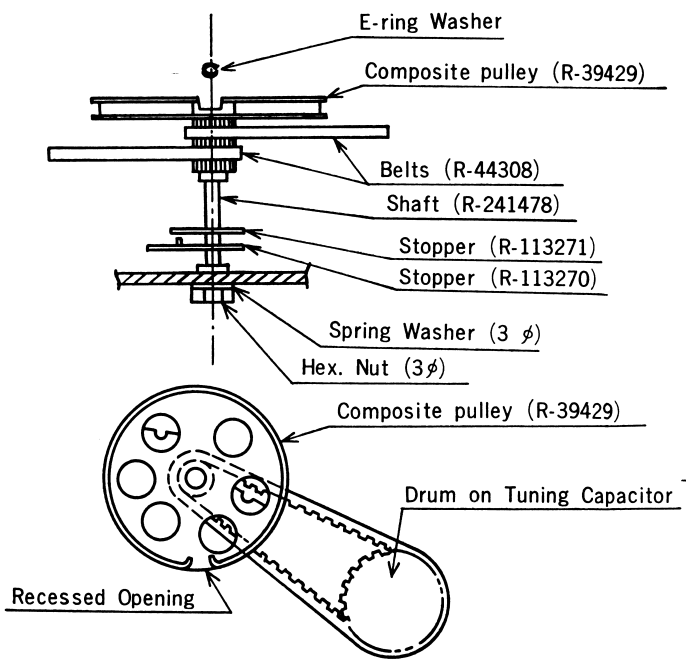
b) Mount two Drums (R-39430) temporarily onto Winding Shaft (R-S81598) and Tuning Capacitor respectively.

c) One Belt is conjugated with Drum on Tuning Capacitor in the state in which Tuning Capacitor has the minimum capacitances (been fully rotated clockwise). The other Belt is connected with Drum on Winding Shaft ordinally without any special consideration.
Then rotate Composite Pulley a full turn and check if Stopper works well without any play or not, as well as whether belt looping is correctly made with appropriate tension or not.

d) Mount two Guides (R-113272) onto respective Drums with the specified screws. Be careful not to apply any notable forces onto Tuning Capacitor when fastening.

e) String Dial Cord following the above illustration and locate, Pointor (R-S81593) on Cord temporarily. Then place the unit into Housing and check the location of Pointor. If correctly located, fix Pointor with lacquer.

f) COUPLIGN BETWEEN FM TUNER AND WINDING SHAFT
Set Pointor to 106MC on dial scale of FM band (Pointor Just behind the "O" letter of 106). Pull out the slug-shifting cord (for "mu" variation of coils) from FM Tuner (FM-100) fully.
Mark the point on the cord which is of 37 $\pm$2 milimeters distance measured from the metal casing. And make a knot on the marked point. (Fig. 2)
Insert the cord through hole of Ring (R-241481) and tighten Screw (R-S7085) slightly.
Apply FM signal of 106MC into input terminals (1 and 4) of FM-100 and adjust location of Ring on Winding Shaft in order to receive the signal loudest. Then fasten Ring with Screw tightened. (Fig. 3)



TOP VIEW (FIG. 1)

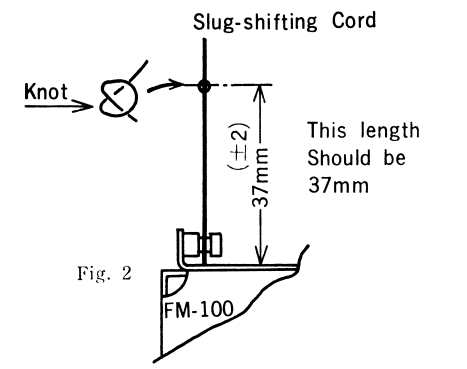


Fig. 2

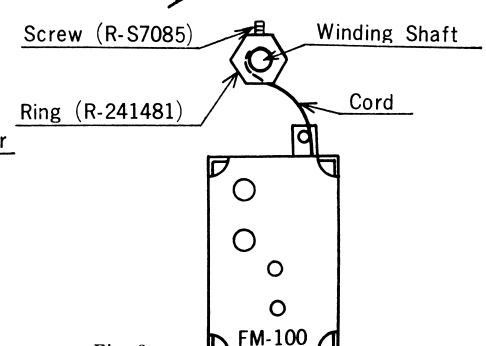
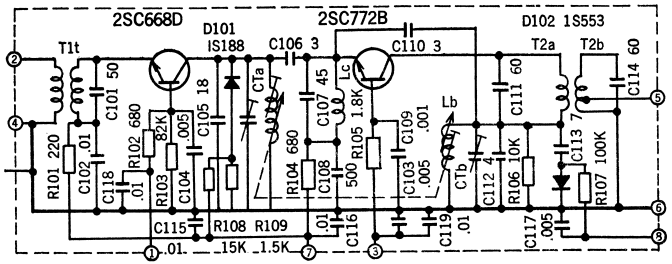
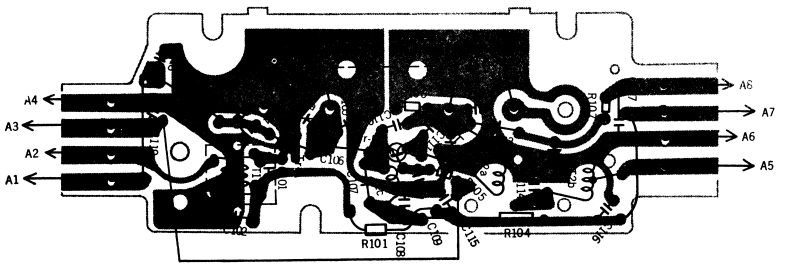


Fig. 3

FM TUNER (FM-100)
SCHEMATIC DIAGRAM



INTER-PARTS WIRING ILLUSTRATION



SANYO

Solid State FM/AM 7 Band Portable Radio Companetta

MODEL 15H-860

MODEL 16HA-860

SERVICE MANUAL

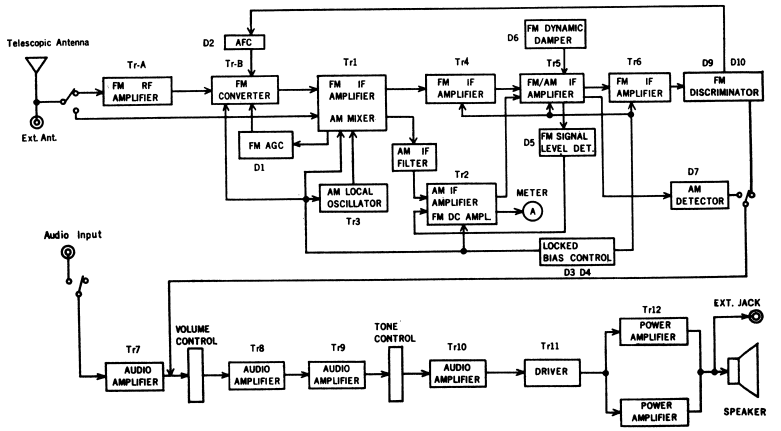
SANYO ELECTRIC CO., LTD.
INTERNATIONAL DIVISION: SANYO ELECTRIC TRADING CO., LTD.
OSAKA, JAPAN

SPECIFICATIONS

FREQUENSY RANGE	FM	87 – 108	MC
	LW	150 – 350	KC
	MW	515 – 1620	KC
	SW1	2.3 – 5.2	MC
	SW2	5.95 – 7.3	MC
	SW3	9.5 – 12.5	MC
	SW4	14.5 – 18	MC
INTERMEDIATE FREQUENCY	FM	10.7	MC
	AM	455	KC
SENSITIVITY (for 50mW output)			
FM (30dB S/N)		5	μV
LW		50	μV/m
MW		25	μV/m
SW1		30	μV/m
SW2		20	μV/m
SW3		20	μV/m
SW4		3.2	μV

OUTPUT POWER	Undistorted 1400 mW Maximum 2000 mW
POWER SUPPLY	DC 9V (six "D-size" standard flashlight batteries) AC house current (110V/220V) available for 16HA-860 without AC adaptor and for 15H-860 with optional AC adaptor
CURRENT DRAIN	No signal 40 mA Maximum 380 mA
SPEAKER	4″×6″ permanent dynamic type 4 ohm voice coil impedance
OUTLET	Output jack for earphone Connector Jack for record and playback
DIMENSIONS	14½″ wide×8″ high×4¾″ deep
NET WEIGHT	7½ lbs.

BLOCK DIAGRAM



ALIGNMENT PROCEDURES

Band Coverage & Tracking Alignment

Procedures	Position of Band Switch	Signal Input	Frequency of Signal Gen.	Dial Setting of Radio	Components to be Adjusted	
FM IF STAGE	FM	Dummy Ant	10.7 MC	87 MC	FM IF Transformers T4, T3, T2, T1, T2a & T2b	
FM DISCRIM.	FM	Dummy Ant	10.7 MC	87 MC	FM IF Transformer T5	
FM BAND COVERAGE	FM	Dummy Ant	89 MC	89 MC	Oscillator Trimmer	Ctb
	FM	Dummy Ant	106 MC	106 MC	FM Oscillator Coil	Lb
FM TRACKING	FM	Dummy Ant	98 MC	98 MC	FM RF Trimmer	Cta
AM IF STAGE	SW1	Thru 0.1μF	455 KC	Lowest End	AM IF Transformer T8 T7 & T6	
MW BAND COVERAGE	MW	IRE Loop	505 KC	Lowest End	MW Oscillator Coil	T12
	MW	IRE Loop	1650 KC	Highest End	MW Oscillator Trimmer	Ct13
MW TRACKING	MW	IRE Loop	600 KC	600 KC	MW Antenna Coil	L9 L10
	MW	IRE Loop	1400 KC	1400 KC	MW Antenna Trimmer	Ct6
LW BAND COVERAGE	LW	IRE Loop	145 KC	Lowest End	LW Oscillator Coil	T13
	LW	IRE Loop	365 KC	Highest End	LW Oscillator Trimmer	Ct14
LW TRACKING	LW	IRE Loop	160 KC	160 KC	LW Antenna Coil	L11 L12
	LW	IRE Loop	340 KC	340 KC	LW Antenna Trimmer	Ct7
SW1 BAND COVERAGE	SW1	IRE Loop	2.23 MC	Lowest End	SW1 Oscillator Coil	T11
	SW1	IRE Loop	5.2 MC	Highest End	SW1 Oscillator Trimmer	Ct12
SW1 TRACKING	SW1	IRE Loop	2.4 MC	2.4 MC	SW1 Antenna Coil	L7 L8
	SW1	IRE Loop	4.7 MC	4.7 MC	SW1 Antenna Trimmer	Ct5
SW2 BAND COVERAGE	SW2	IRE Loop	5.95 MC	5.95 MC	SW2 Oscillator Trimmer	Ct10
	SW2	IRE Loop	7.0 MC	7.0 MC	SW2 Oscillator Trimmer	Ct11
SW2 TRACKING	SW2	IRE Loop	5.95 MC	5.95 MC	SW2 Antenna Trimmer	Ct3
	SW2	IRE Loop	7.0 MC	7.0 MC	SW2 Antenna Trimmer	Ct4
SW3 BAND COVERAGE	SW3	IRE Loop	9.30 MC	Lowest End	SW3 Oscillator Coil	T10
	SW3	IRE Loop	12.4 MC	Highest End	SW3 Oscillator Trimmer	Ct9
SW3 TRACKING	SW3	IRE Loop	9.7 MC	9.7 MC	SW3 Antenna Coil	L5 L6
	SW3	IRE Loop	11.7 MC	11.7 MC	SW3 Antenna Trimmer	Ct2
SW4 BAND COVERAGE	SW4	Dummy Ant	14.9 MC	Lowest End	SW4 Oscillator Coil	T9
	SW4	Dummy Ant	18.2 MC	Highest End	SW4 Oscillator Trimmer	Ct8
SW4 TRACKING	SW4	Dummy Ant	15.5 MC	15.5 MC	SW4 Antenna Coil	L3 L4
	SW4	Dummy Ant	17.7 MC	17.7 MC	SW4 Antenna Trimmer	Ct1

ADJUSTMENT OF COLLECTOR CURRENTS

a) Adjust the semi-fixed resistor (R9 50K) in order to make 1500μA current circulation thru the collector of transistor (Tr2 2SC772E). An ammeter should be applied with a series resistor of more than 1K ohm value for measurement.

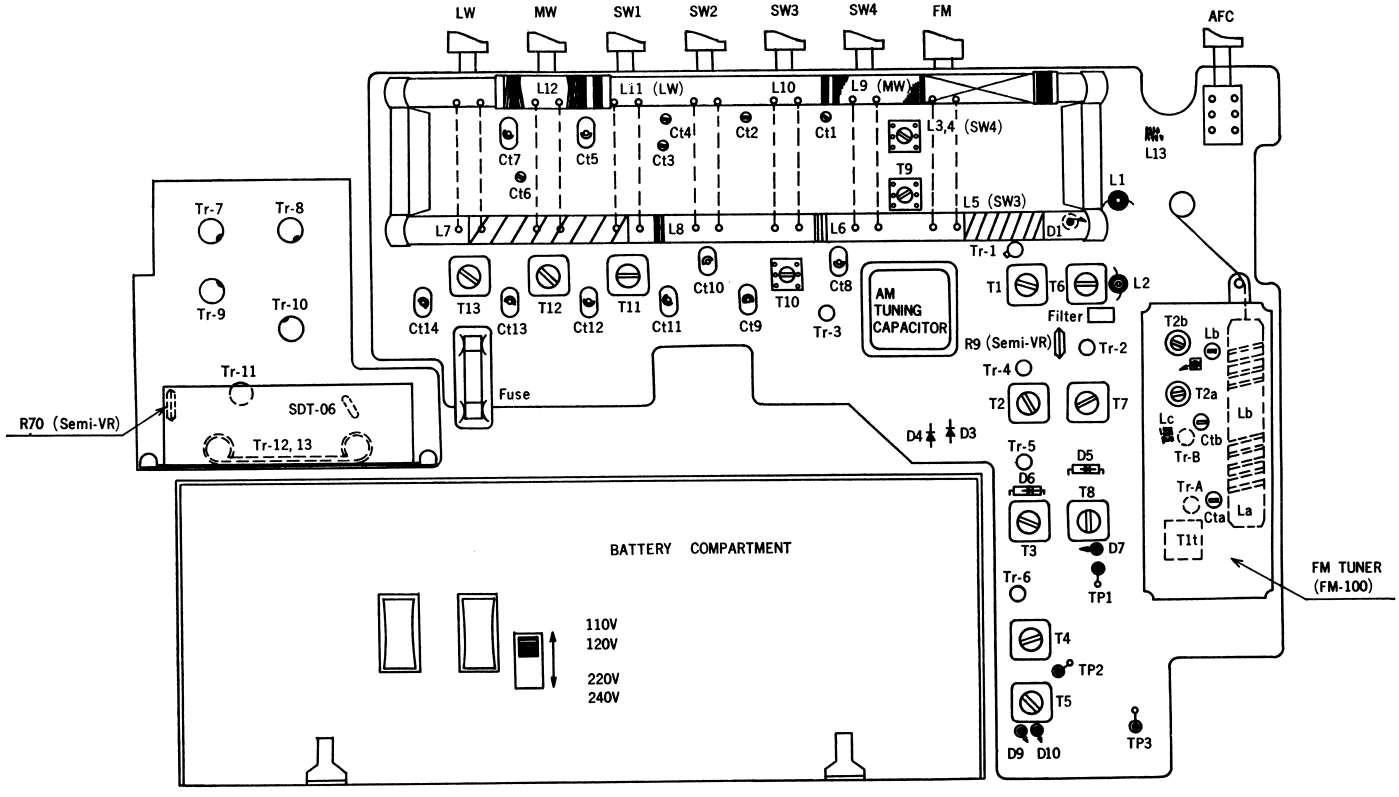
REMARKS ON REPAIR, ADJUSTMENT AND MEASUREMENT

a) Please be careful not to short-circuit the base of Tr2 (2SC772E) to common ground (positive line of battery supply) and the base of Trll (2N3638) to common line (negative line of battery supply). As there is no resistor incorporated between their emitters and common ground, it may lead to heavy damage on the transistors when careless shortcircuit made by a screw driver and other test equipmemt.
In addition, the semi-fixed resistors (R9 50K and R70 50K) should be set to around their medium value points respectively before the radio is turned on, when they are replaced by repair, and they should not be set down to any point below 10K ohms when some adjustment is made on them.

b) On FM Tracking Alignmnet adjustment for tracking on low frequencies is made by trimmer capacitors and tracking on high frequencies by a screw of FM oscillator coil as shown above, because this radio employes a tuning system of variable μ type.

c) On AM IF Response Curve double-peak characteristic curve is displayed when IF sweep marker generator and oscilloscope are used for this alignment.
(1) Each peak, P1 and P2, is determined by a ceramic filter. A center marker (455KC) may not always locate on the center of the curve, but efforts, to locate it on the center may not be required necessarily. (Fig. 4)
(2) Adjustment should be made for aiming to elevate the gap of the curve as high as possible (in other words, to have the maximum response curve in whole).
(3) Either peak P1 or P2 is made to change its relative hight when a screwed slug of AM IFT, T6 or T7, is turned in either direction. Proportionate double-peak response curve should be obtained by repetition of above arrangements.

MAIN PARTS IDENTIFICATION



NOTE: AC select switch and fuse are not on 15H-860

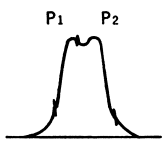
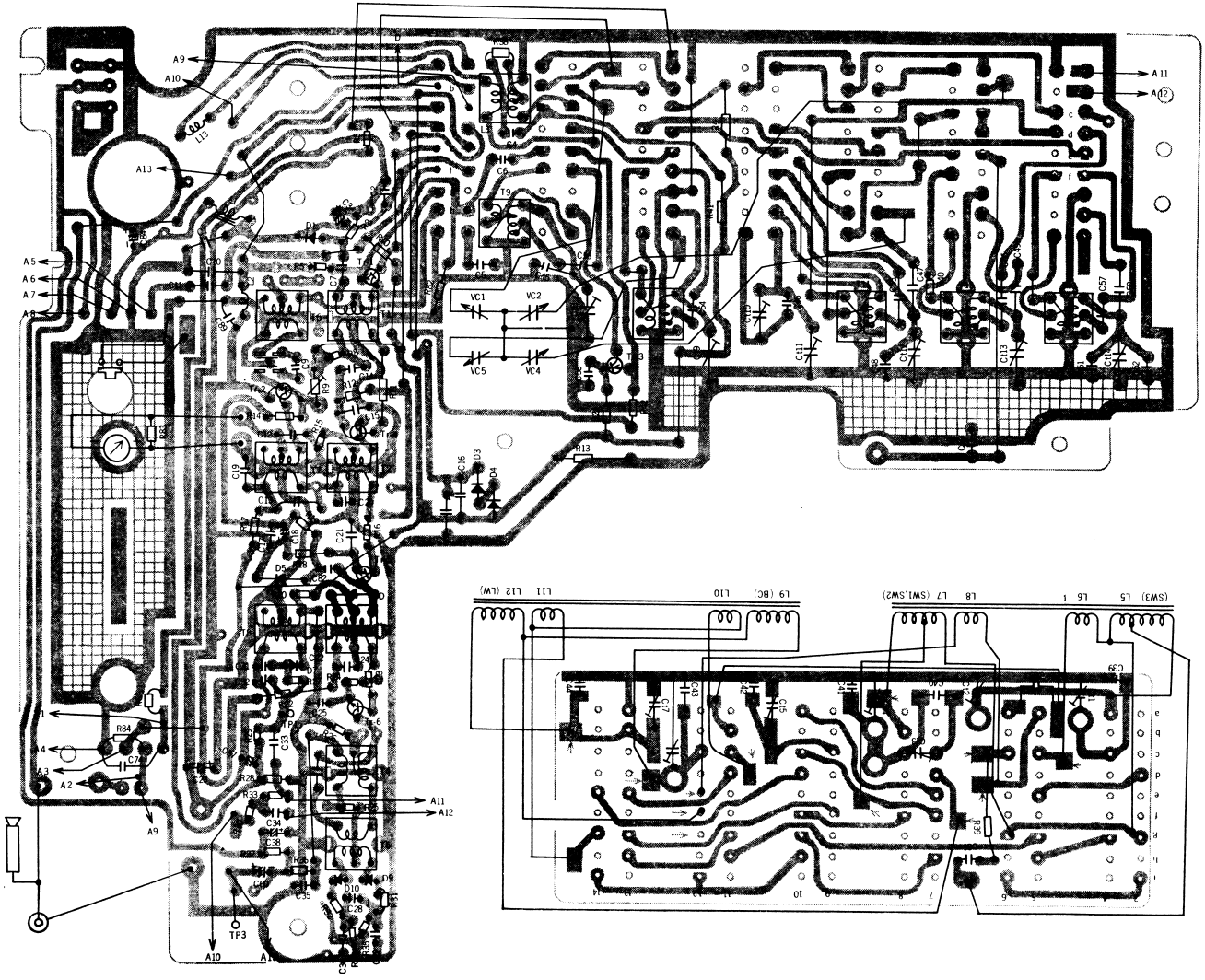


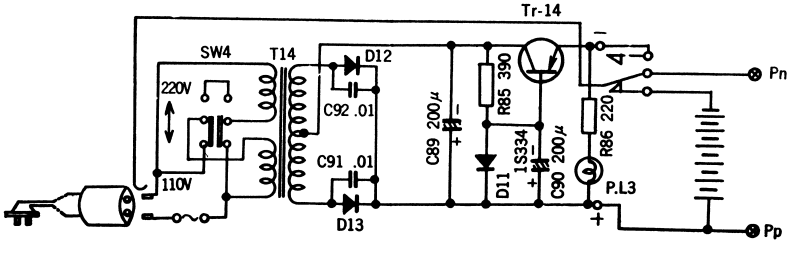
FiG. 4 RESPONCE CURVE OF AM IF STAGE

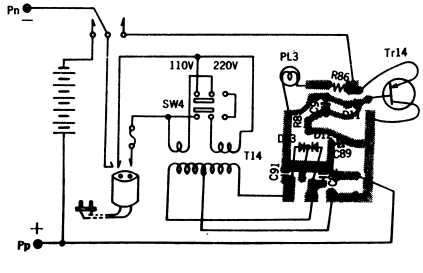
Fig. 4

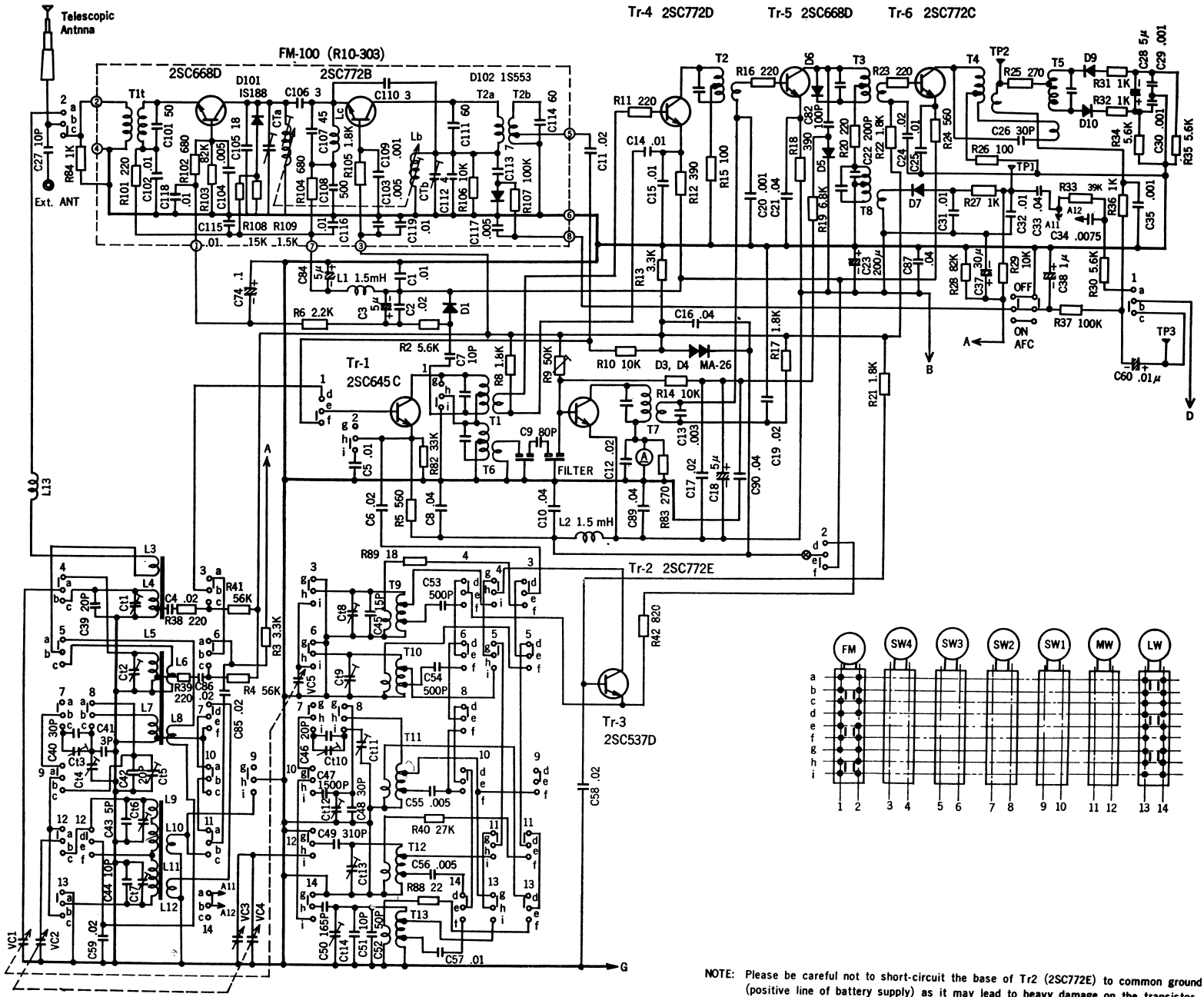
INTER-PARTS WIRING ILLUSTRATION



AC CONVERTER (16HA-860)







NOTE: Please be careful not to short-circuit the base of Tr2 (2SC772E) to common ground (positive line of battery supply) as it may lead to heavy damage on the transistor when careless shortcircuit made by a screw driver and other test equipments.