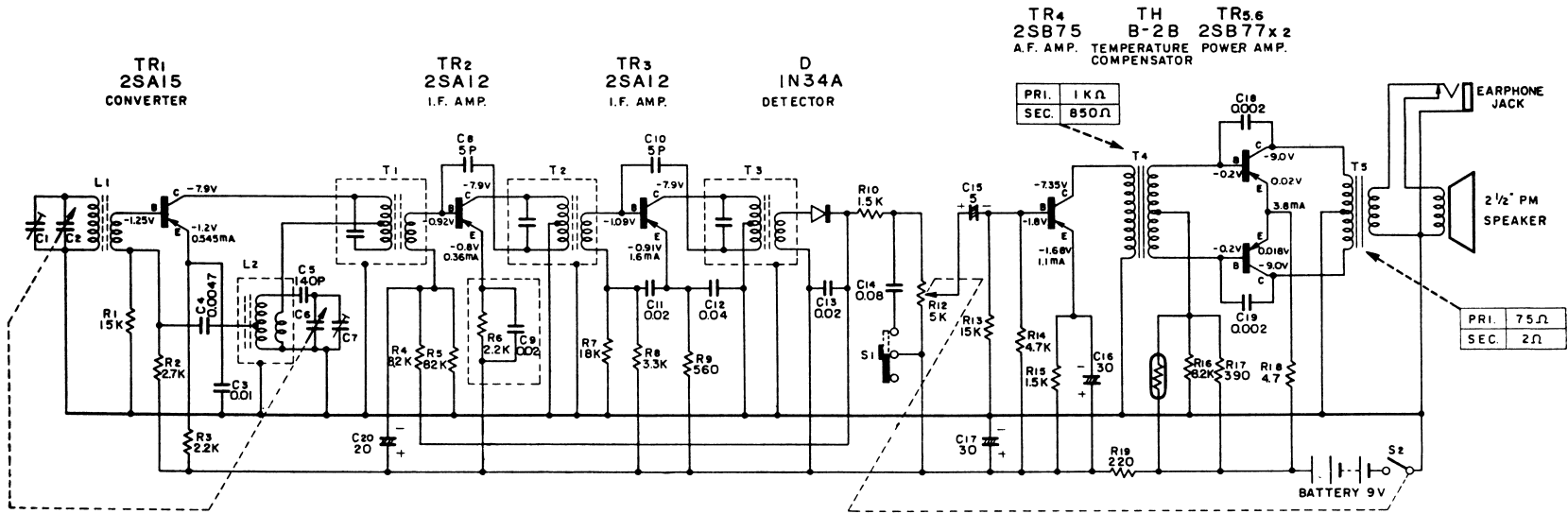


HITACHI TH-648

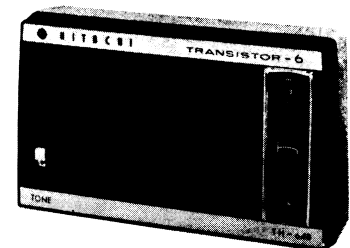


NOTES: 1. Resistance unit is  $\Omega$ ; unit of capacity is either  $\mu\text{F}$  or F.

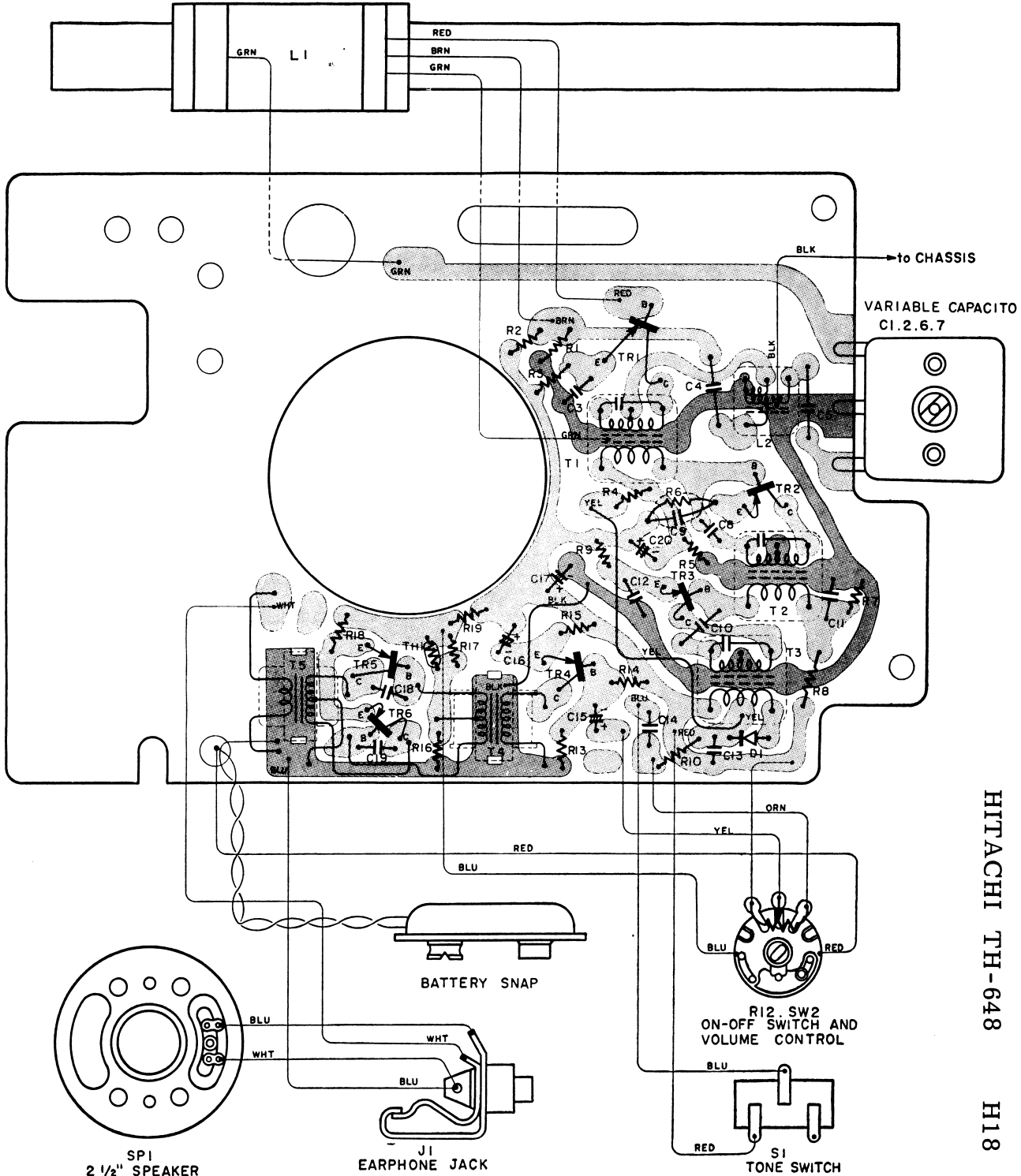
SPECIFICATIONS

CIRCUIT SYSTEM .....	6 transistor superheterodyne
TUNING RANGE.....	535~1,605 kc
INTERMEDIATE FREQUENCY .....	455 kc
TRANSISTOR COMPONENTS	
2 SA 15 .....	Converter
2 SA 12 .....	I.F. Amp.
2 SA 12 .....	I.F. Amp.
2 SB 75 .....	A.F. Amp.
2 SB 77x2 .....	Class-B Push-pull Power Amp.

GERMANIUM DIODE	
1N34A .....	Detector & A.G.C.
THERMISTOR .....	Temperature Compensator
POWER OUTPUT .....	180 mW (Maximum)
LOUDSPEAKER .....	2 1/2" P.M.
POWER SOURCE .....	9 Volts
EARPHONE JACK.....	One. Accessory Hitachi earphone EL-216 is recommended.
DIMENSIONS .....	3 1/8" High, 5 1/8" Wide, 1 3/8" Deep.
WEIGHT .....	Approx. 0.6 lbs. including batteries



FERRITE ANTENNA



HITACHI TH-648

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## DISASSEMBLY INSTRUCTION

After removing the battery, referring to Fig. 1,

1. remove the circuit board assembly by removing four screws.

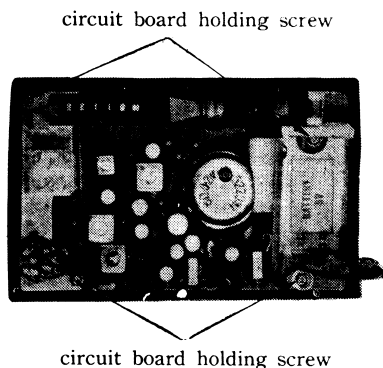


Fig. 1.

## ALIGNMENT PROCEDURE

- (1) Use a battery having the specified voltage. Voltage, when turning on the receiver (with no signal), must not be less than 8.5 volts.
- (2) Rotate the volume control fully downwards (maximum).
- (3) Connect the output of the oscillator (modulated to 1,000 c/s) to a loop antenna (looped 2~3 rounds and 4 inch in diameter) and bring the loop antenna close to the ferrite-core antenna  $L_1$ .
- (4) Connect the vacuum-tube voltmeter (with an AC 3V or less scale) to the earphone jack. Make the following adjustments to gain maximum on voltmeter.
- (5) In alignment keep the oscillator output less than 1 volt to avoid AVC action.
- (6) When adjustments are over, fix  $T_3$ ,  $T_2$ ,  $T_1$  and  $L_2$  with white lacquer, and  $L_1$  with wax and mark  $C_7$  and  $C_1$  with red pencil.

### Intermediate Frequency Adjustment

Step	Signal Generator Output	Dial Pointer Setting	Adjust for Max. Output
Ⓐ	455 kc	Quiet point at high frequency end	$T_3$ 3rd I.F.
Ⓑ			$T_2$ 2nd I.F.
Ⓒ			$T_1$ 1st I.F.
Ⓓ	Repeat Steps Ⓐ, Ⓑ and Ⓒ		

### Radio Frequency Adjustment

Step	Signal Generator Output	Dial Pointer Setting	Adjust for Max. Output
Ⓔ	520 kc	Low frequency end	Oscillator coil $L_2$
Ⓕ	1,650 kc	High frequency end	Oscillator trimmer $C_7$
Ⓖ	Repeat Steps Ⓔ and Ⓕ		
Ⓗ	600 kc	600 kc signal	Antenna coil $L_1$
Ⓙ	1,400 kc	1,400 kc signal	Antenna trimmer $C_1$
Ⓚ	Repeat Steps Ⓗ and Ⓙ		

## SERVICE HINTS

1. To check for a circuit defect which would cause excessive battery drain, an overall current measurement and supplementary voltage measurements should be made. Because continuity measurements may be misleading for reasons explained below.

2. Signal tracing by injection of a signal from a signal generator is recommended as test procedure. The signal generator should be connected in series with a capacitor to avoid shorting out bias voltages. Of the transistors used in this receiver, the BASE is the signal input terminal (corresponding to signal grid of tubes), the COLLECTOR is the signal output terminal (corresponding to plate of tubes), and the EMITTER is the common terminal (corresponding to cathode of tubes).

3. The output circuit in this receiver is of "Class-B" type. In "Class-B" output, the battery current increases greatly with increased signal input to the "Class-B" transistors.

4. Extreme care should be taken to avoid accidental

shorting of transistor elements to circuit ground. This is especially true of the output transistors; if either BASE terminal is accidentally grounded for a few seconds, the output transistors will be permanently damaged.

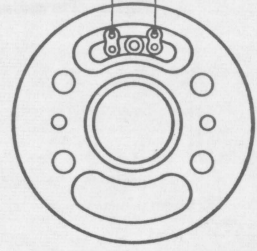
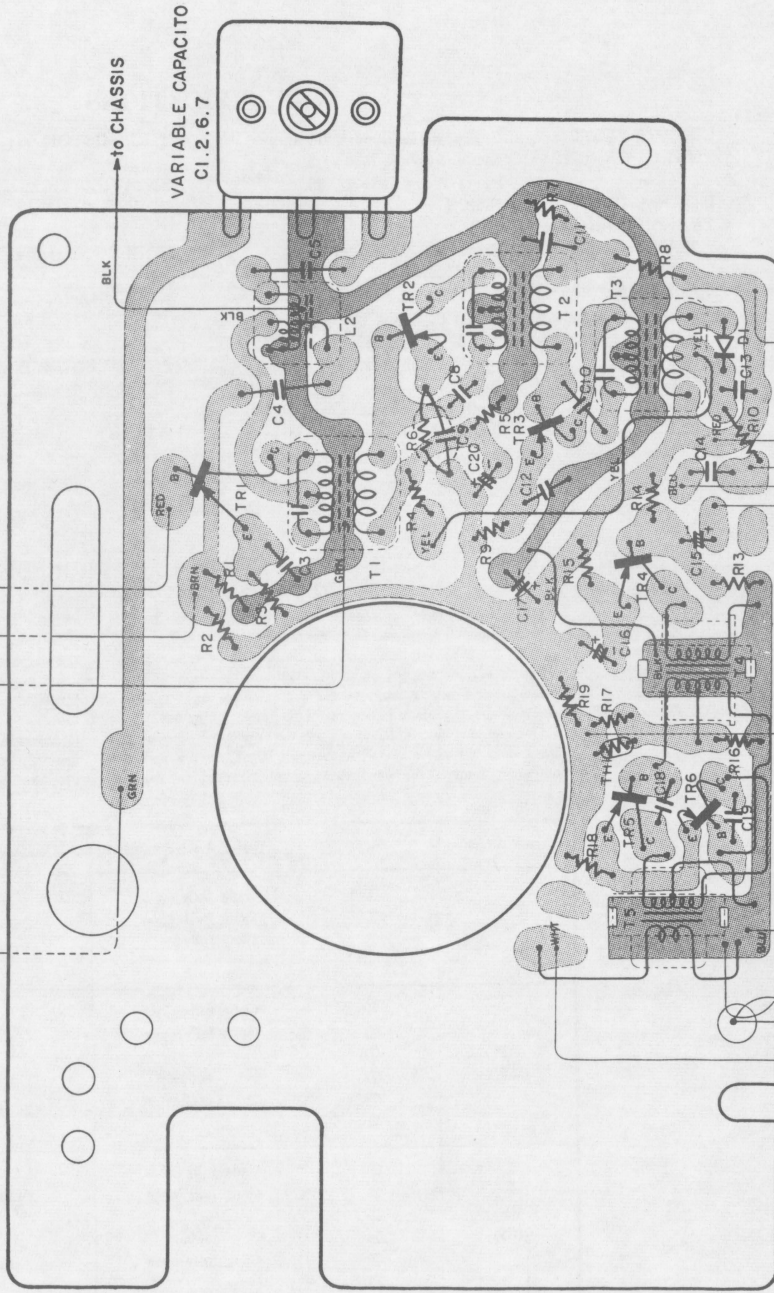
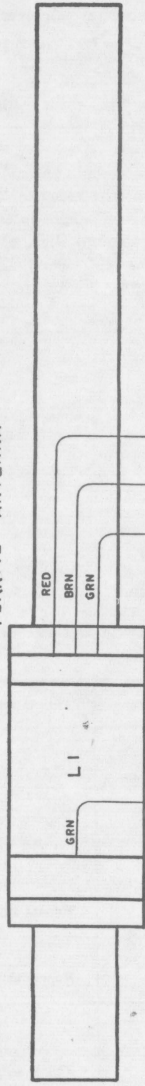
5. Transistor(s) and the printed circuit board may be damaged by too much heat. Whenever soldering is necessary on the board, use a soldering iron hot and clean. This reduces the amount of heat radiated from the soldering position.

6. Voltage measurements should be made only with a sensitive voltmeter such as vacuum-tube voltmeter.

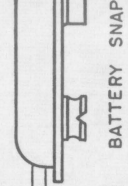
7. If transistors in the i.f. stage are interchanged, their realignment may be necessary.

8. It may be possible to damage a transistor when testing circuit continuity. Since a transistor needs only low voltage applied to its terminals for conduction testing of continuity of a circuit including a transistor is apt to mislead continuity indications. To avoid transistor damage and misleading continuity indications, remove the transistor before making continuity test of its circuits.

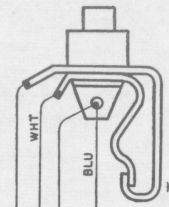
FERRITE ANTENNA



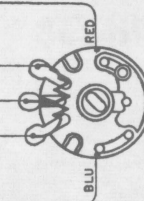
SPI  
2 1/2" SPEAKER



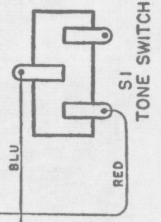
BATTERY SNAP



J1  
EARPHONE JACK



R12, SW2  
ON-OFF SWITCH AND  
VOLUME CONTROL



S1  
TONE SWITCH