

GENERAL ELECTRIC SERVICE INFORMATION

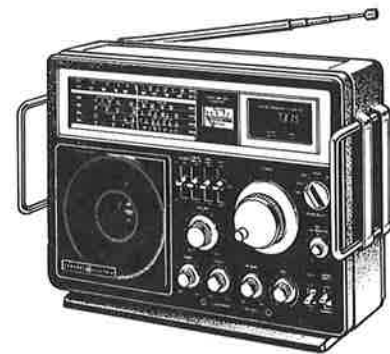
MODEL
7-2990A
6 BAND
PORTABLE RADIO w/
DIGITAL COUNTER

FILE TAB 7

CAUTION: THIS MANUAL IS DESIGNED FOR USE BY QUALIFIED ELECTRONIC TECHNICIANS ONLY. CONSUMER USERS ARE URGED TO CONTACT QUALIFIED FACTORY AUTHORIZED SERVICE FACILITIES FOR REPAIRS.

FEATURES

- Delux, high performance, six band portable, FM/AM plus four International Short Wave bands ● Extended Short Wave ● Extended short wave frequency range [3.5-31MHz] allows reception of additional amateur and ham bands as well as international short wave and CB broadcasts. ● Monitors Citizen's Band frequencies including single sideband ● BFO (Beat Frequency Oscillator) for reception of single side band and continuous wave signals on short wave BFO switch and BFO pitch control included ● Digital frequency display (vacuum fluorescent) for all bands ● Slide-rule dial scale ● High ratio (23:1) vernier tuning with fast/slow knob ● Narrow/wide bandwidth switch for AM and short wave. (Use narrow for greater selectivity) ● SW Calibrator Control precisely tunes radio to incoming signal shown on digital display ● RF gain control for AM and short wave allows adjustment for varying power of incoming signals ● Switchable AFC (Automatic Frequency Control) on FM ● Lighted tuning/battery strength meter ● Double superheterodyne system ● 52" swivel antenna for FM and SW, plus built-in ferrite rod antenna for AM ● External screw-type antenna terminals: SW/FM/ground ● Large 5" dynamic speaker
- Separate bass and treble controls to adjust for personal listening preference ● 800 mw RMS audio output ● Battery saving momentary switches for dial lights and digital display ● Battery/signal strength meter ● Separate on/off power switch ● Rack-type handles protect controls ● 2-way power: operates on 6 "D" batteries (not included) or AC ● AC cord storage compartment
- 120/220 volt AC operation. 220-volt AC plug adaptor included ● Jacks: 3.5mm jack for optional earphone or optional headset 3.5mm jack for tape recorder output ● World time zone map on cabinet top ● Optional accessories: Headset 5-1847, Earphone 5-1082



SERVICE SPECIFICATIONS

| | | | |
|-------------------|---|---|--|
| Electrical | 120 Volts AC, 60Hz Switchable to 220 Volts AC, 50Hz 9 Volts DC Battery | Sensitivity | AM Better than 350uv/M for 20 db quieting FM Better than 15uv for 30 db quieting SW Better than 50uv for 20 db quieting |
| Batteries | (6) "D" Cells | Power Output @ 10% Distortion | 800 MW Minimum |
| Tuning Range | AM 535 to 1605KHz FM 88 to 108MHz SW1 3.5 to 10MHz SW2 10 to 19MHz SW3 19 to 25MHz SW4 25 to 31MHz | Minimum Volume Hum - All Bands | 4uw |
| IF Frequencies | AM/SW 455KHz FM 10.7MHz | Current Drain @ Idle Current Without Display On | AM 55MA FM 55MA SW 55MA |
| Speaker Impedance | 8 ohm | | |

AUDIO ELECTRONICS TECHNICAL SERVICES • UTICA, NEW YORK

ALIGNMENT PROCEDURE

AM ALIGNMENT - Band switch in AM position, Bass and Treble controls at max, Volume Control at max, RF gain control at max, Bandwidth switch to Wide, Display and Dial Light switches at OFF, BFO switch at OFF, AFC at OFF.

| AM GENERATOR - RF Radiated Signal Modulated 30% at 400Hz | | | | |
|--|--------------------|--|---------------------------|--|
| GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
| 1. 455 KHz | Low End | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | T4, T5 | Adjust for maximum. Repeat until no further improvement is noted. |
| 2. 1630 KHz | High End | | TC8 | Adjust for maximum. |
| 3. 510 KHz | Low End | | L15 | Adjust for maximum. Repeat Steps 2 and 3 for Band End alignment. |
| 4. 1400 KHz | Tune to Signal | | TC7 | High end RF adjustment. Adjust for maximum. |
| 5. 600 KHz | Tune to Signal | | L301 AM Antenna Tank Coil | Low end RF adjustment. Slide tank coil along core to obtain maximum output. Repeat Steps 4 & 5 until no further improvement is noted. Wax or cement tank coil to core. |

FM ALIGNMENT - Band switch in FM position, Bass and Treble controls at center, Volume Control at min., RF gain control at min., Bandwidth switch to Wide, Display and Dial Light at OFF, BFO switch at OFF, AFC at OFF.

| FM GENERATOR - High Side of FM Sweep Generator thru a 15pf capacitor in series with a 68Ω resistor to Pin 3 of IC 1. Use only enough Marker Signal for Indication. | | | | |
|--|--------------------|--|--------|---|
| GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
| 1. 10.7 MHz | Low End | Scope at TP3 thru Pad (Fig. 1) | T2 | Adjust for maximum gain and symmetry. |
| 2. 10.7 MHz | Low End | Scope at TP3 thru Pad (Fig. 1) | T1 | Decrease input gain and adjust for best waveform. |
| FM Generator - Modulated RF Radiated Signal | | | | |
| 3. 109.0 MHz | High End | Output Meter Across Speaker or 8Ω Load In place of Speaker Via Earphone Jack | TC2 | Adjust for maximum. |
| 4. 87.5 MHz | Low End | | L2 | Adjust for maximum. Repeat Steps 3 and 4 for Band End alignment. |
| 5. 108.0 MHz | Tune to Signal | | TC1 | Adjust for maximum. |
| 6. 88 MHz | Tune to Signal | | L1 | Adjust for maximum to obtain optimum alignment. Repeat Steps 5 & 6. |

ALIGNMENT PROCEDURE

SHORT WAVE ALIGNMENT - Bass and Treble controls at max, Volume Control at max, RF gain control at max., Bandwidth switch to Wide, Display and Dial Light switches at OFF, BFO switch at OFF, AFC switch at OFF, SW Calibrator Control at center.

| SW GENERATOR - RF Signal Modulated 30% at 400 Hz to TP1 thru Pad (Fig. 2). | | | | |
|--|----------------------|--|---------|--|
| BAND SWITCH AT SW1 POSITION | | | | |
| GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
| 1. 3.0 MHz ± 50 Hz | At Mechanical Center | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | L16, T3 | Adjust for maximum. Repeat until no further improvement is noted. |
| 2. 3.45 MHz | Low End | | L12 | Adjust for maximum. |
| 3. 10.5 MHz | High End | | TC10 | Adjust for maximum. Repeat Steps 2 and 3 for Band End Alignment. |
| 4. 9.3 MHz | Tune to Signal | | TC6 | High end RF adjustment. Adjust for maximum. |
| 5. 3.9 MHz | Tune to Signal | | L7 | Low end RF adjustment. Adjust for Maximum. Repeat Steps 4 & 5 until no further improvement is noted. |

BAND SWITCH AT SW2 POSITION

| GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
|---------------------|--------------------|--|--------|--|
| 1. 9.7 MHz | Low End | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | L13 | Adjust for maximum. |
| 2. 19.5 MHz | High End | | TC11 | Adjust for maximum. Repeat Steps 1 & 2 for Band End alignment. |
| 3. 18.5 MHz | Tune to Signal | | TC5 | High end RF adjustment. Adjust for maximum. |
| 4. 10.5 MHz | Tune to Signal | | L6 | Low end RF adjustment. Adjust for Maximum. Repeat Steps 3 & 4 until no further improvement is noted. |

BAND SWITCH AT SW 3 POSITION

| GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
|---------------------|--------------------|--|--------|--|
| 1. 18.6 MHz | Low End | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | L14 | Adjust for maximum. |
| 2. 25.5 MHz | High End | | TC12 | Adjust for maximum. Repeat Steps 1 & 2 for Band End alignment. |
| 3. 25.0 MHz | Tune to Signal | | TC4 | High end RF adjustment. Adjust for maximum. |
| 4. 19.0 MHz | Tune to Signal | | L5 | Low end RF adjustment. Adjust for maximum. Repeat Steps 3 & 4 until no further improvement is noted. |

ALIGNMENT PROCEDURE

BAND SWITCH AT SW4 POSITION

| | GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
|----|---------------------|--------------------|---|--------|---|
| 1. | 31.0 MHz | Tune to Signal | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | TC 3 | Adjust for maximum. |
| 2. | 25.0 MHz | Tune to Signal | | L4 | Adjust for maximum. Repeat Steps 1 and 2 for optimum alignment. |

BFO ALIGNMENT - BFO switch at ON, Bandswitch at SW1.

| | GENERATOR FREQUENCY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
|----|---------------------|--------------------|---|--------|-----------------------|
| 1. | 6.5 MHz | Tune to Signal | Output Meter Across Speaker or 8Ω Load in Place of Speaker via Earphone Jack | T6 | Adjust for null beat. |

TUNING/BATTERY METER - Bandswitch at FM, Volume Control at min., RF gain control at min., BFO switch at OFF, AFC switch at OFF

| | DC POWER SUPPLY | RADIO DIAL SETTING | INDICATOR | ADJUST | REMARKS |
|----|-----------------|--------------------|--|--------|--|
| 1. | 9.5 Volts | Low End | "0" Point on Meter Scale | VR3 | Adjust for "0" Reading. |
| 2. | 6.0 Volts | Low End | Pointer between "White and Blue" bar area on Meter scale | VR3 | Repeat Steps 1 and 2 for the best calibration between both readings. |

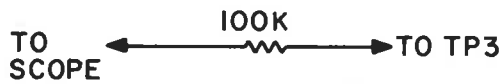


FIGURE 1

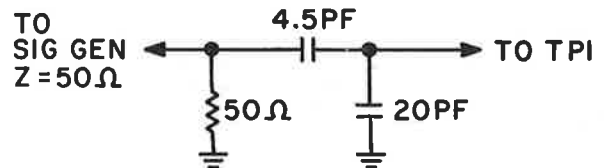
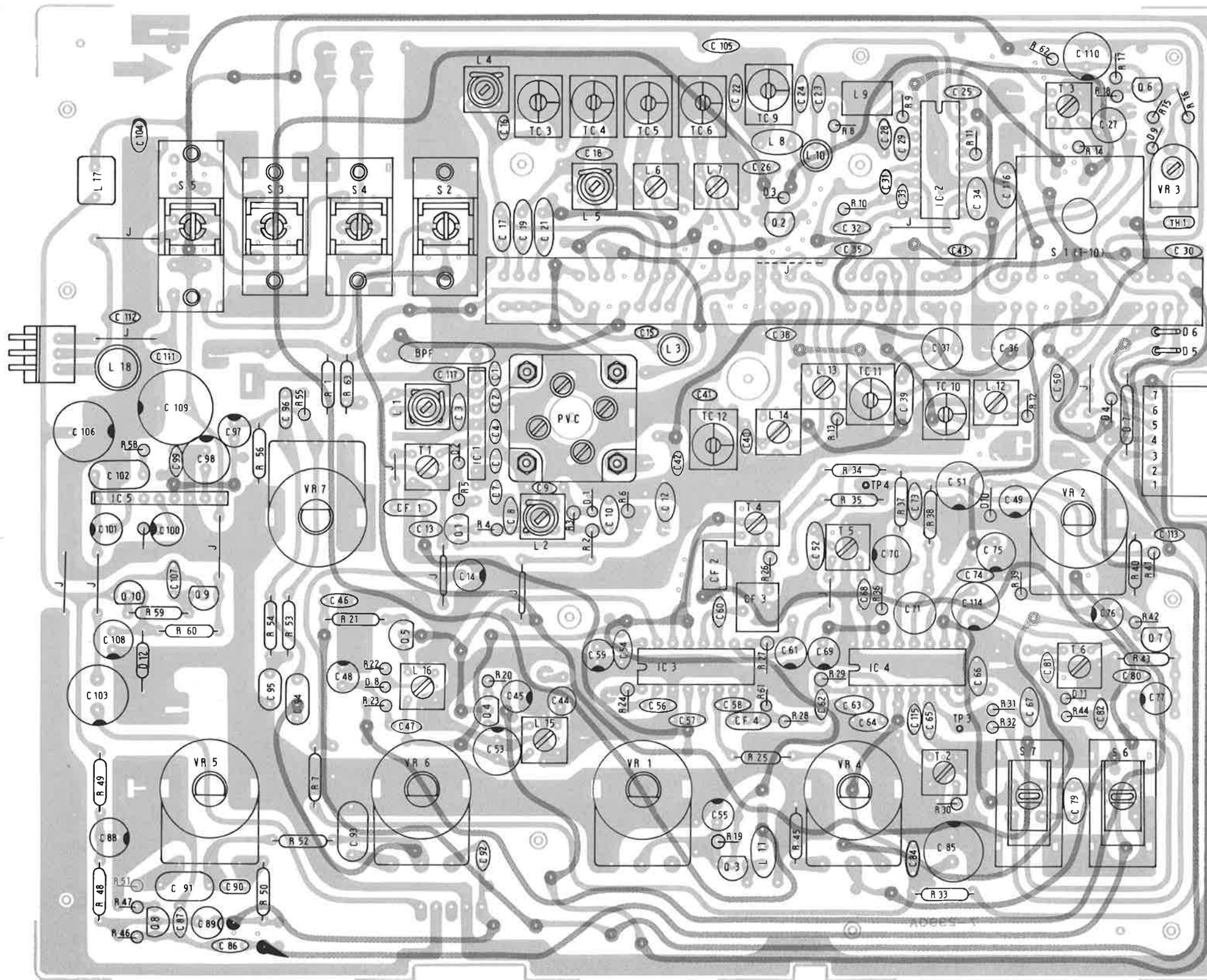
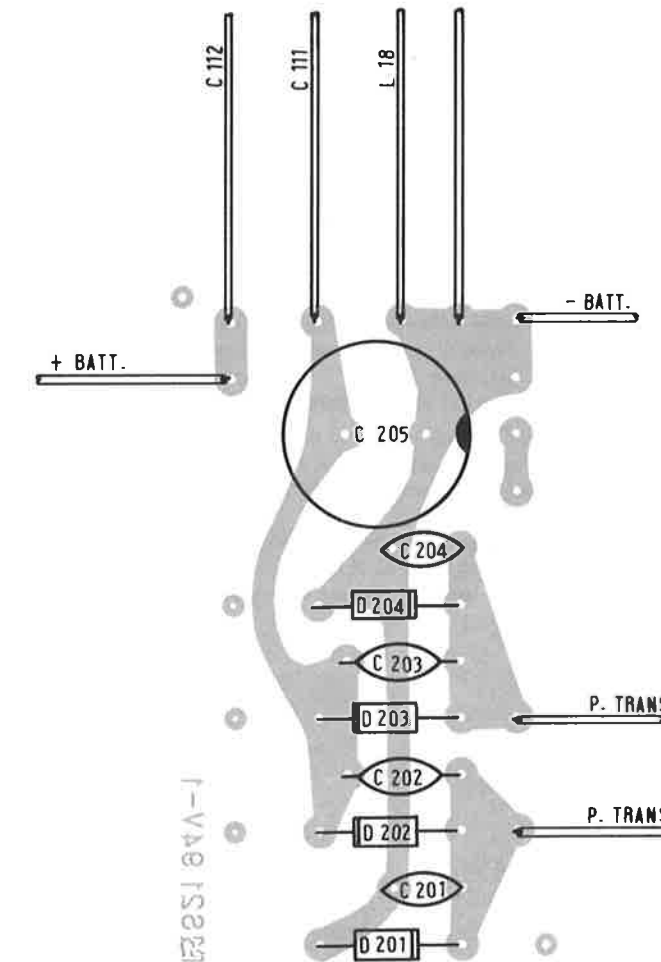


FIGURE 2



COMPONENT LAYOUT (TOP VIEW) MAIN BOARD



COMPONENT LAYOUT
POWER SUPPLY BOARD

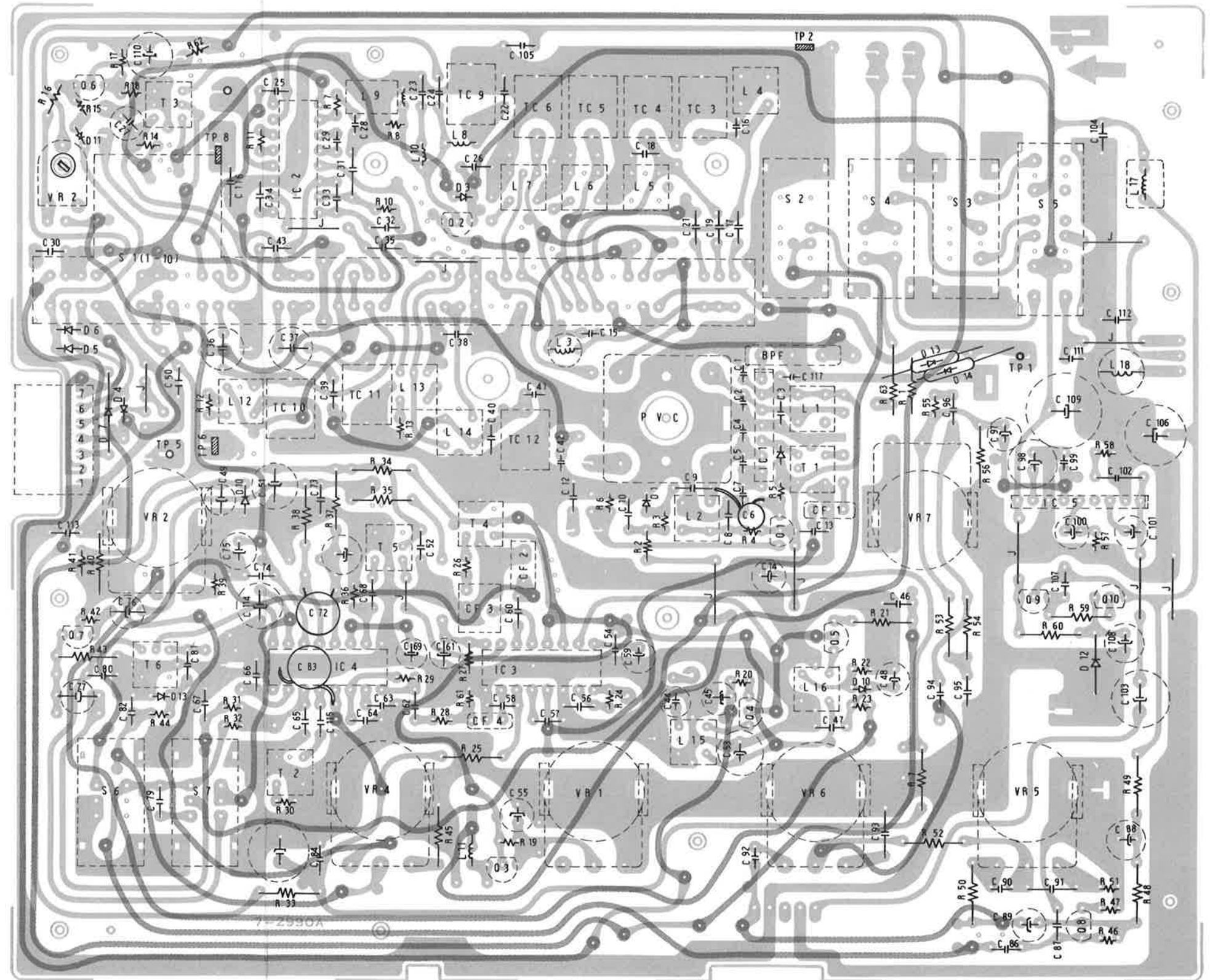
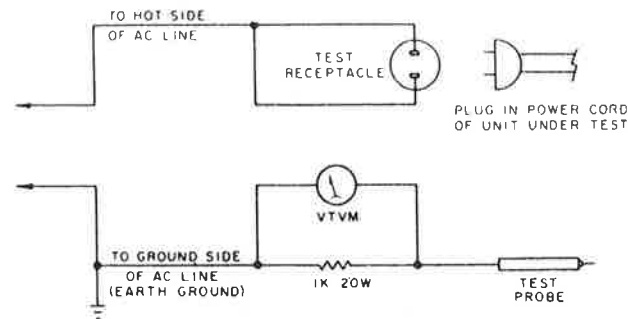
IMPORTANT

PERFORM THE FOLLOWING SAFETY CHECKS AFTER SERVICING THIS UNIT:

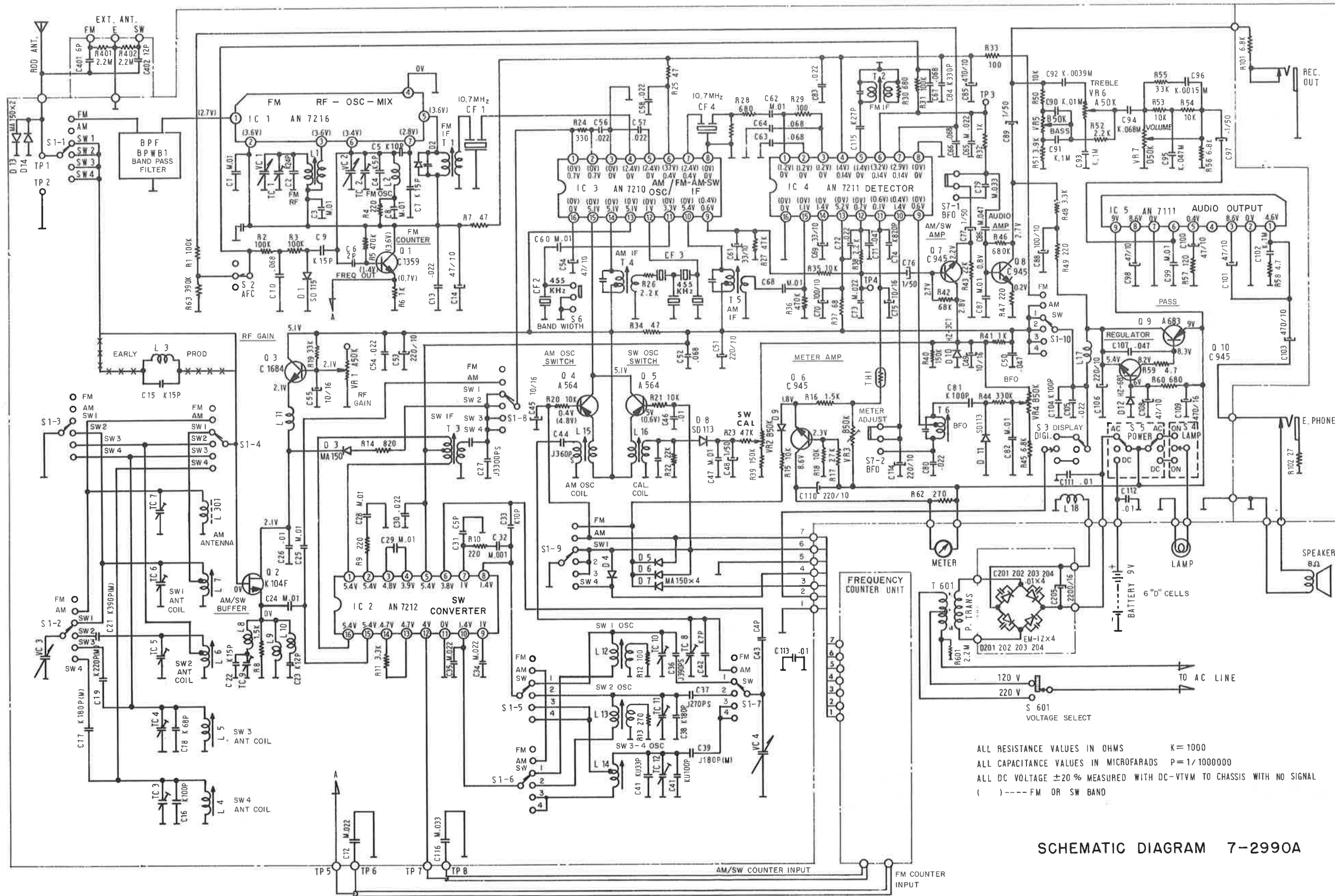
1. Remove all externally connected test equipment and wires before safety testing this unit.
2. Use RT6440 Safety Test Box or construct circuit as shown.
3. Plug power cord of unit to be tested into Test Receptacle.
4. Switch unit being tested to ON position. Voltage select switch must be in 120 volt position.
5. Connect VTVM across 1K resistor in test circuit. Set meter on high (150V AC) scale to avoid meter damage and touch the following points with Test Probe.
 - a) Three (3) external ant. terminals
 - b) Earphone Jack
 - c) One (1) screw in cord compartment near power cord.

If meter reading indicates less than 3 volts on all test points, set meter to low (3V AC) scale and repeat test.

6. Any reading greater than two tenths (.2) volt indicates a potential shock hazard. If this occurs, determine the cause of the leakage, correct the problem, and repeat safety test.

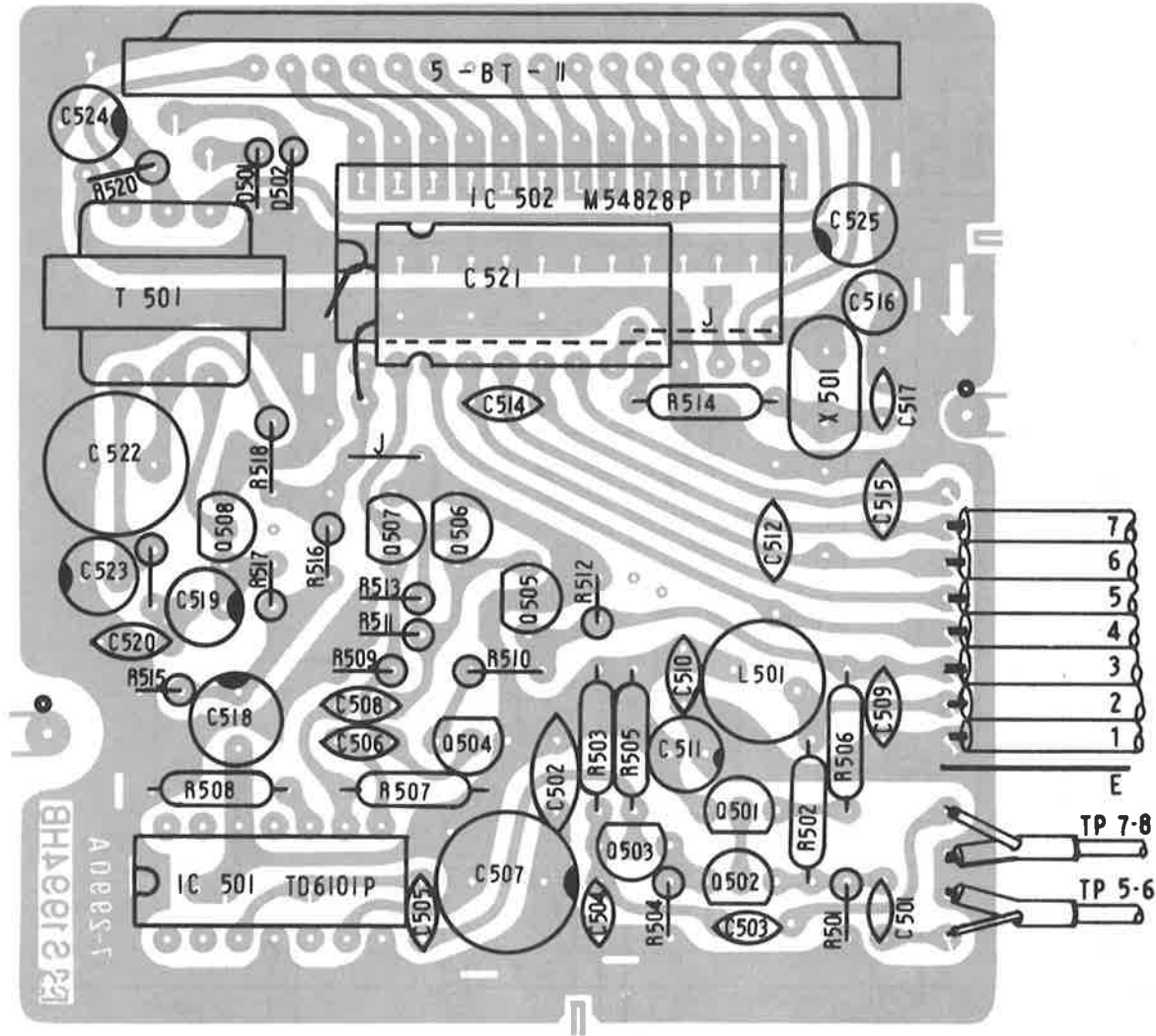


COMPONENT LAYOUT (BOTTOM VIEW) MAIN BOARD

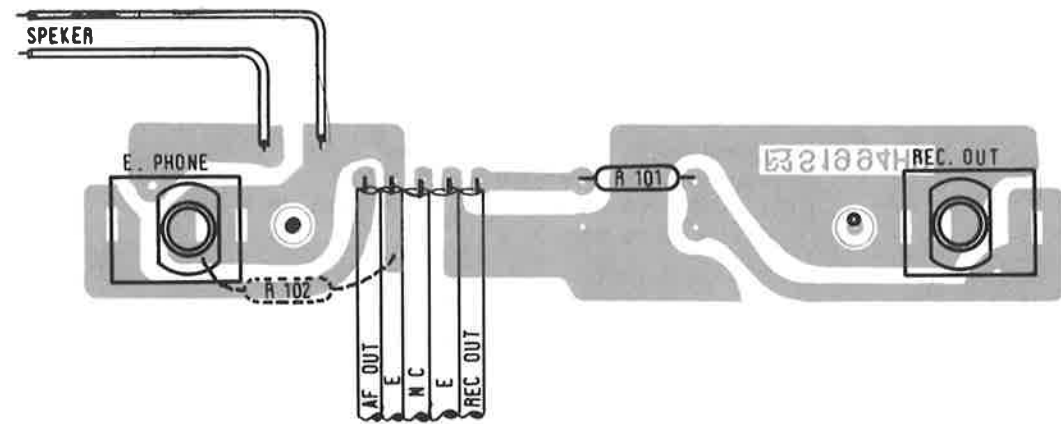


ALL RESISTANCE VALUES IN OHMS K=1000
 ALL CAPACITANCE VALUES IN MICROFARADS P=1/1000000
 ALL DC VOLTAGE ±20% MEASURED WITH DC-VTVM TO CHASSIS WITH NO SIGNAL
 () ---- FM OR SW BAND

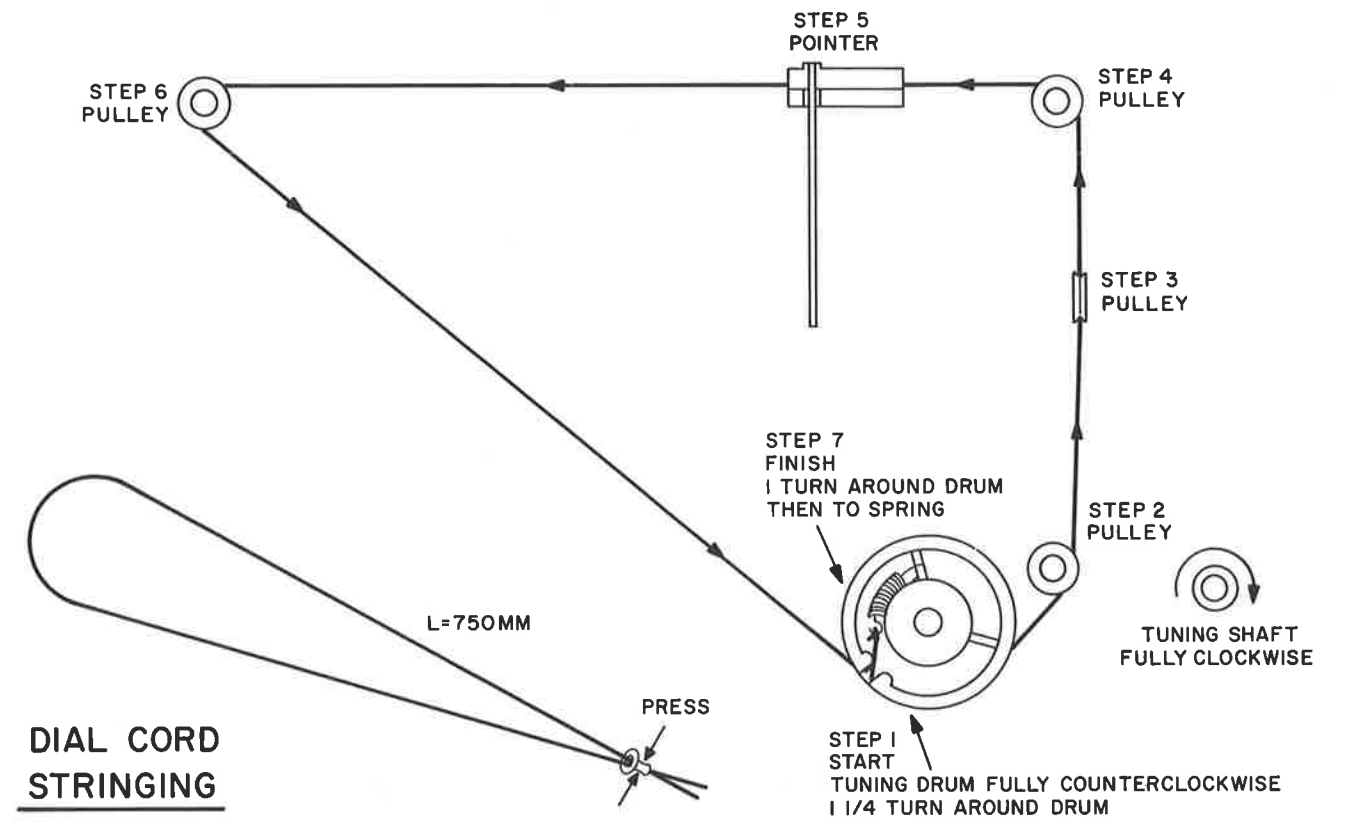
SCHEMATIC DIAGRAM 7-2990A



DIGITAL COUNTER MODULE



JACK BOARD

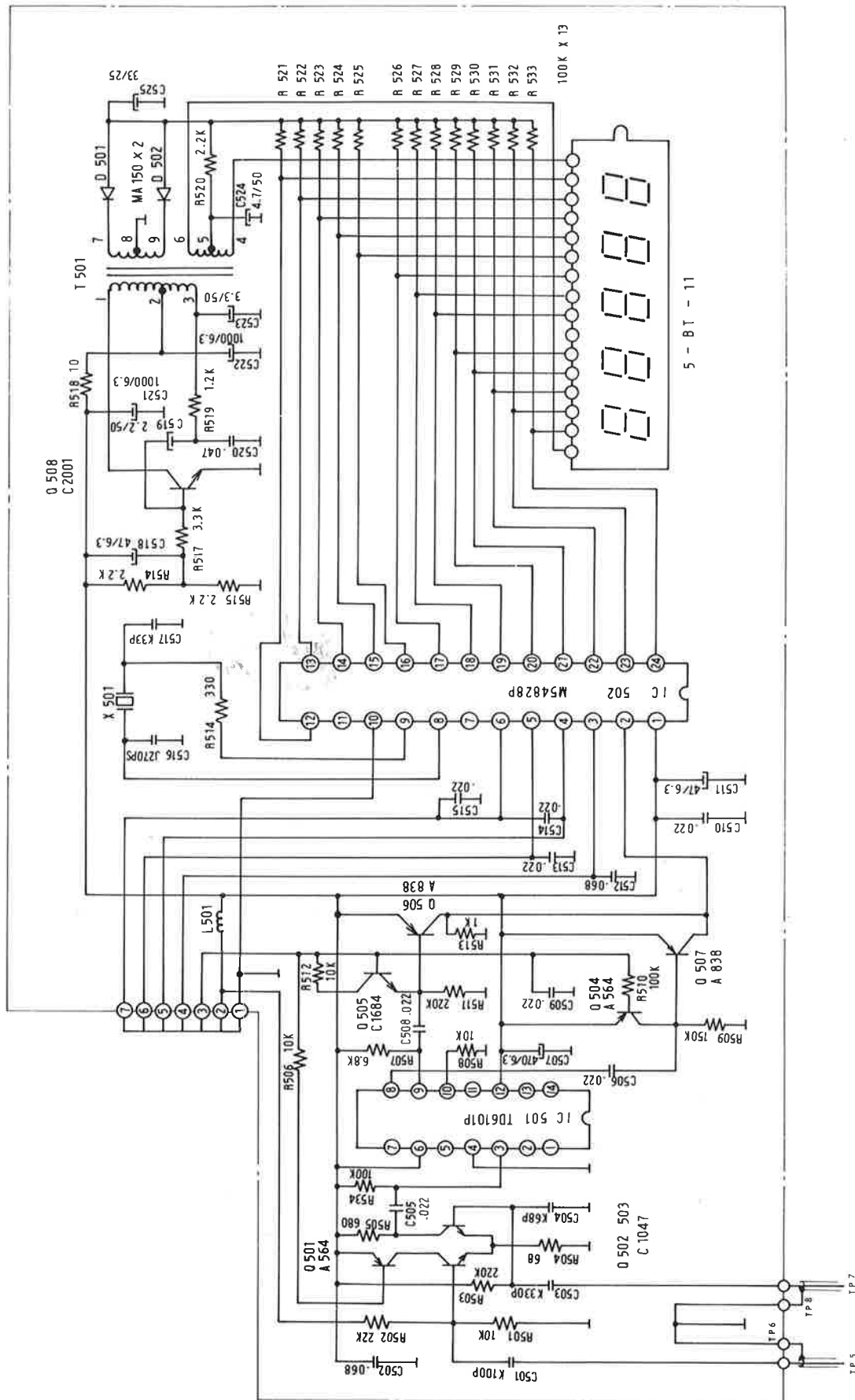


DIAL CORD STRINGING

REPLACEMENT PARTS LIST - MODEL 7-2990A

| CAT. NO. | SYMBOL | DESCRIPTION | CAT. NO. | SYMBOL | DESCRIPTION |
|--|------------|-------------------|---------------------------------------|----------------|-----------------------|
| TRANSISTORS & INTEGRATED CIRCUITS | | | DIODES & RECTIFIERS | | |
| EA15X251 | Q1 | 2SC1359C | EA16X470 | D1 | SD115 |
| EA15X521 | Q2 | 2SK104F | EA16X146 | D2,3,4,5,6,7,9 | MA150 |
| EA15X520 | Q3 | 2SC828S | EA16X498 | D8,11 | SD113 |
| EA15X466 | Q4,5 | 2SA564K | EA16X499 | D10 | HZ-3C1 |
| EA15X335 | Q6,7,8,10 | 2SC945P | EA16X500 | D12 | HZ-6B1 |
| EA15X396 | Q9 | 2SA683 | EA16X501 | D13,14 | IS1555 |
| EA33X8712 | IC1 | AN7213 | EA16X502 | D15 | TD5-A900 |
| EA33X8715 | IC2 | AN7212 | EA57X14 | D201-D204 | EM-1Z |
| EA33X8713 | IC3 | AN7210 | | | |
| EA33X8714 | IC4 | AN7211 | | | |
| EA33X8716 | IC5 | AN7111 | | | |
| CAPACITORS | | | POTENTIOMETERS & TRIM POTS | | |
| EA30X99 | TC3,4,5 | Trimmer Capacitor | EA49X693 | VR1 | RF Gain Control, 50K |
| | 10, 11, 12 | | EA49X694 | VR2 | SW Calibrator, 50K |
| EA30X100 | TC13 | Trimmer Capacitor | EA49X696 | VR3 | Trim Pot f/Meter, 50K |
| | | | EA49X694 | VR4 | BFO Control, 50K |
| | | | EA49X694 | VR5 | Bass Control, 50K |
| | | | EA49X693 | VR6 | Treble Control, 50K |
| | | | EA49X695 | VR7 | Volume Control, 50K |

Replacement Parts List Continued on Back Cover



DIGITAL COUNTER SCHEMATIC

GENERAL ELECTRIC

REPLACEMENT PARTS LIST CONT'D - MODEL 7-2990A

| CAT. NO. | SYMBOL | DESCRIPTION | CAT. NO. | SYMBOL | DESCRIPTION |
|---------------------|--------|--|--|--------|------------------------|
| <u>MICELLANEOUS</u> | | | <u>COILS & TRANSFORMERS</u> | | |
| EA36X666 | BPF | Band Pass Filter | EA36X672 | L1 | FM RF Coil |
| EA36X667 | CF1,4 | Ceramic Filter, 10.7 MHz | EA36X673 | L2 | FM OSC Coil |
| EA36X669 | CF2 | Ceramic Filter, 455 KHz | EA36X670 | L3,10 | Choke Coil |
| EA36X668 | CF3 | Ceramic Filter, 455 KHz | EA36X684 | L4 | SW 4 Ant. Coil |
| EA93X400 | MS-1 | Digital Counter Module Complete w/Components | EA36X682 | L5 | SW 3 Ant. Coil |
| EA62X315 | MS-2 | Meter, Tuning/Batt | EA36X680 | L6 | SW 2 Ant. Coil |
| EA41X349 | MS-3 | Dial Lamp, Long Leads | EA36X678 | L7 | SW 1 Ant. Coil |
| EA41X350 | MS-4 | Dial Lamp, Short Leads | EA36X674 | L8,11 | Choke Coil |
| EA41X351 | MS-5 | Earphone Jack | EA36X677 | L9 | Choke Coil |
| EA41X351 | MS-6 | Record Jack | EA36X679 | L12 | SW 1 OSC Coil |
| EA82X88 | MS-7 | Whip Antenna | EA36X681 | L13 | SW 2 OSC Coil |
| EA66X56 | MS-8 | Power Cord | EA36X683 | L14 | SW 3 OSC Coil |
| EA95X196 | MS-9 | Speaker, 8 Ω | EA36X676 | L15 | AM OSC Coil |
| EA2X1438 | MS-10 | External Ant. Term. | EA36X685 | L16 | Calibration Coil |
| EA2X1439 | MS-11 | Battery Contact, Positive | EA36X675 | L17 | Choke Coil |
| EA2X1440 | MS-12 | Battery Spring, Pos/Neg | EA36X671 | L18 | Choke Coil |
| EA2X1441 | MS-13 | Battery Spring, Negative | EA83X184 | L301 | AM Antenna |
| EA5X521 | MS-14 | Planetary Gear Asm. | EA61X383 | T1 | 1st FM IF |
| EA98X857 | MS-15 | Cabinet Front Complete w/Sub. Asm. Less Handles | EA61X384 | T2 | 2nd FM IF |
| EA98X856 | MS-16 | Cabinet Back Asm. w/Batt Contacts and Ant. Term. | EA61X385 | T3 | SW IF |
| EA9X611 | MS-17 | Battery/Cord Comp. Door Handle | EA61X386 | T4 | 1st AM IF |
| EA78X135 | MS-18 | Dial Crystal w/Escutcheon | EA61X387 | T5 | 2nd AM IF |
| EA90X309 | MS-19 | Time Zone Escutcheon | EA35X211 | T6 | BFO |
| EA4X883 | MS-20 | GE Logo | EA88X286 | T601 | Power Transformer |
| EA4X882 | MS-21 | Speaker Grill w/Logo | <u>SWITCHES</u> | | |
| EA89X294 | MS-22 | Tuning Knob | EA41X348 | S1 | Band Select Switch |
| EA43X1478 | MS-23 | Volume Knob | EA39X479 | S2 | AFC Switch |
| EA43X1479 | MS-24 | SW Calibrator Knob | EA39X480 | S3 | Digital Display Switch |
| EA43X1480 | MS-25 | Bass Knob | EA39X480 | S4 | Dial Light Switch |
| EA43X1481 | MS-26 | Treble Knob | EA39X481 | S5 | Power Switch |
| EA43X1481 | MS-27 | RF Gain Knob | EA39X482 | S6 | Band Width Switch |
| EA43X1481 | MS-28 | BFO Knob | EA39X482 | S7 | BFO Switch |
| EA43X1482 | MS-29 | Band Select Knob | EA39X483 | S601 | Voltage Select Switch |
| EA43X1476 | MS-30 | BFO Off/On Knob | NOTE: MS Reference is for factory use only. Capacitors and items not listed are non-stocked items. | | |
| EA43X1476 | MS-31 | Band Width Knob | Replacement parts may be ordered from: General Electric Company, National Parts Distribution, P.O. Box 7025, Charlotte, N.C. 28217 or in CANADA - Canadian General Electric, 80 Bradford St., P.O. Box 1060, Barrie, Ontario L4M5E1. | | |
| EA43X1477 | MS-32 | Power Knob | | | |
| EA43X1477 | MS-33 | Display Knob | | | |
| EA43X1477 | MS-34 | Dial Light Knob | | | |
| EA43X1477 | MS-35 | AFC Knob | | | |
| 5-1827 | MS-36 | AC Plug Adaptor f/220V | | | |
| 5-1847 | MS-37 | Headset | | | |
| 5-1082 | MS-38 | Earphone | | | |