Kenwood TS450S AT KC3YFZ Ed Dec 6 2025

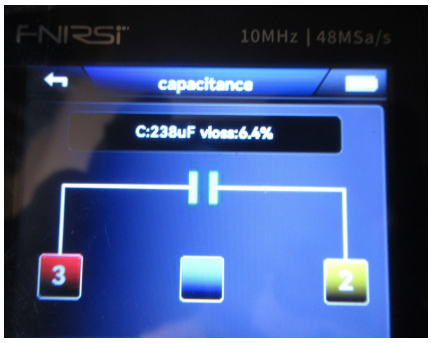
C104 Capacitor **<u>if volumn is low on speaker out & replace Lithium Coin battery</u>**
Common repair 470uF at 25volts. Original was 10 Volts and will get spiked at 14 volts.
25 volts adds room. The leak will be on bottom. Clean well.

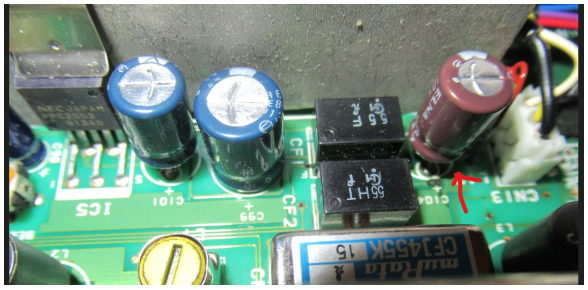
TEST of old came in avg of 267uF it is a 10V cap original. Cap was leaking at bottom.

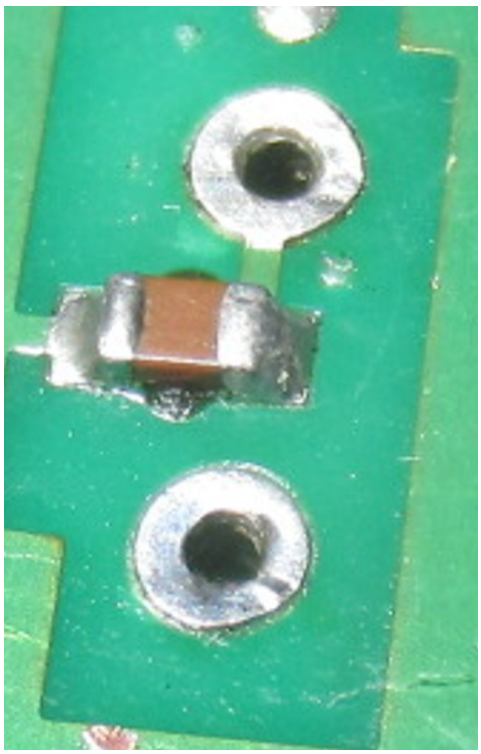
Which brand? On an audio circuit: The audio engineers say Panasonic may be best for voice application.
https://youtu.be/DU2hhbreb0g?si=dudqtYumgEtLsUKL
https://youtu.be/s9ggr0DQgQY?si=RSaoNVrgx4-sb4DJ

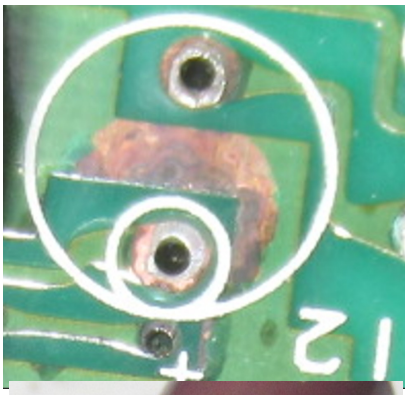
Kenwood TS-450S IF unit board are as follows: Fails due to 13.9 V spikes. Replae with 25 V.

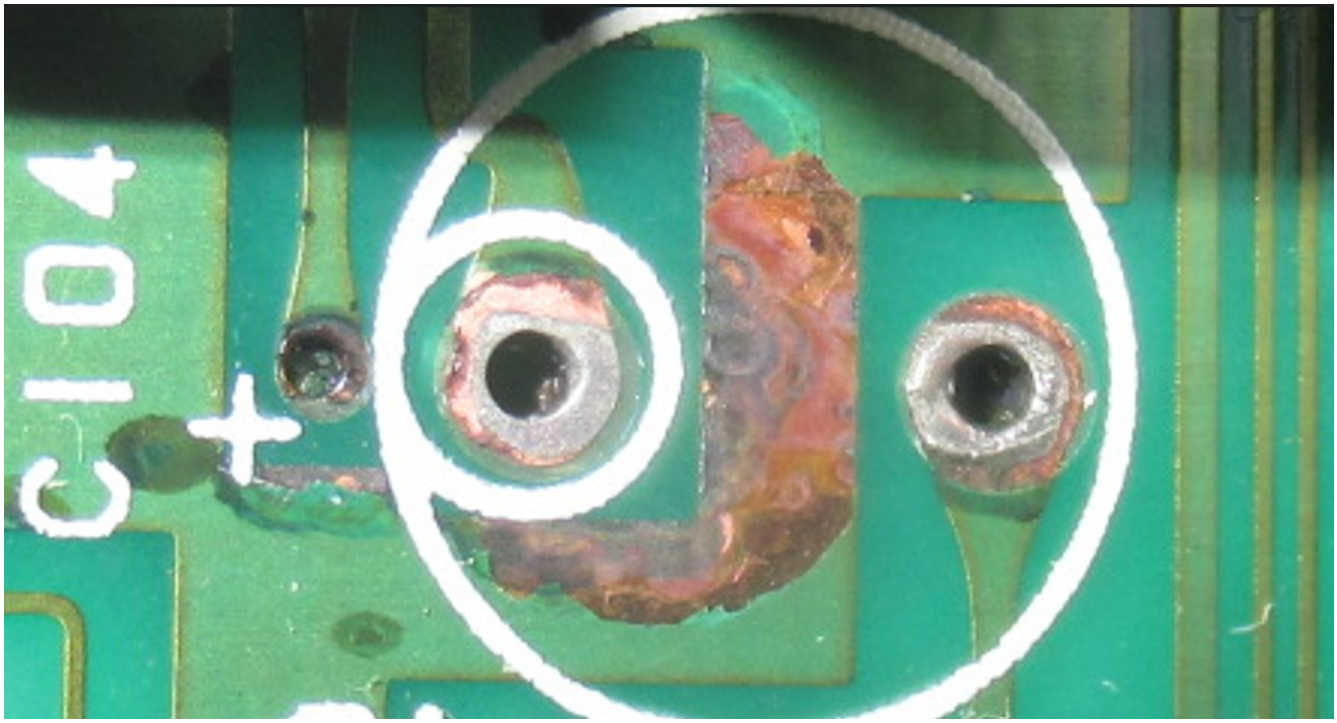
•**C101:** 470µF at 6.3V not tested no leaks **C99:** 330µF at 25V (tested as 331 uF vLoss 1.9% esr 0.11) **C104:** 470µF at 10V (tested as below 275uF, vLoss 5.8 leaking)











Replacement Recommendation

It is highly recommended to replace these original capacitors with new ones that have a higher voltage rating, such as **470µF at 25V**. This is because the original 10V capacitors are considered to be underrated for the circuit's operating voltage, which is around 14V, leading to their common failure over time.

C 99 Test

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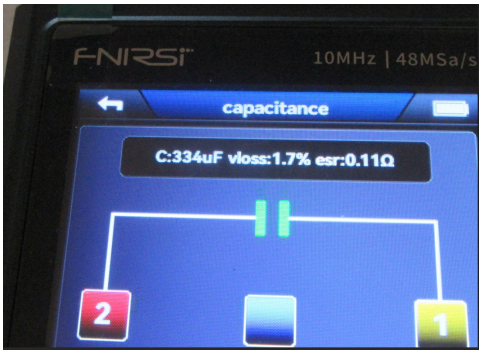
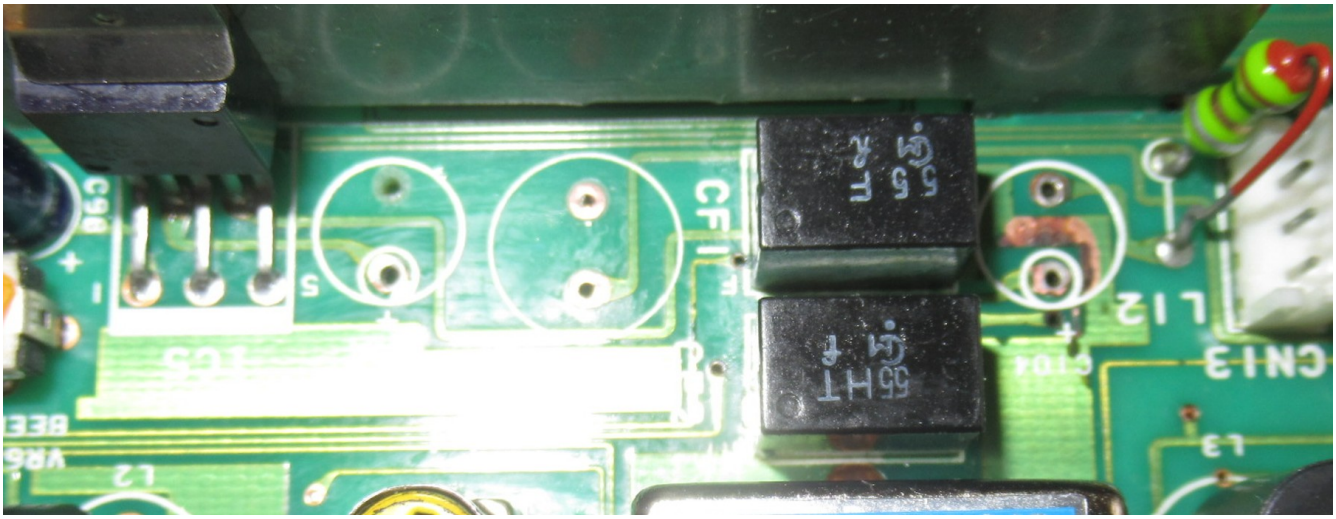
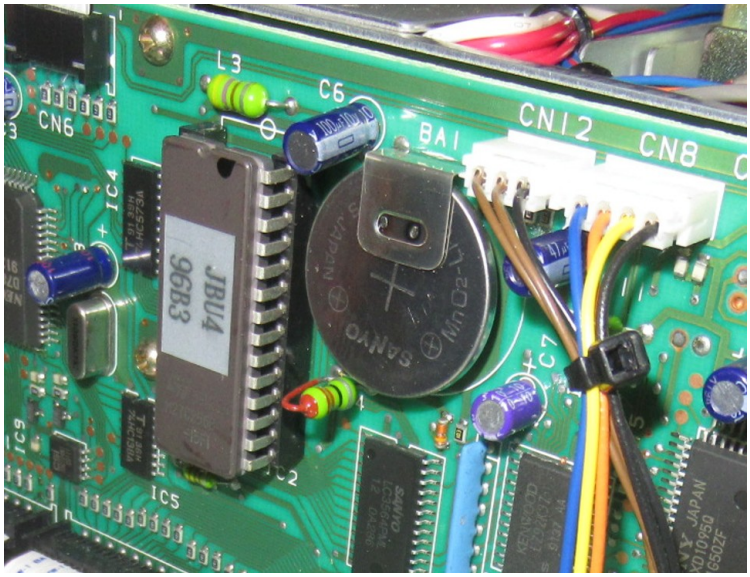


All 3 caps removed no leaks on C 99 or C 101



Battery No Leaks



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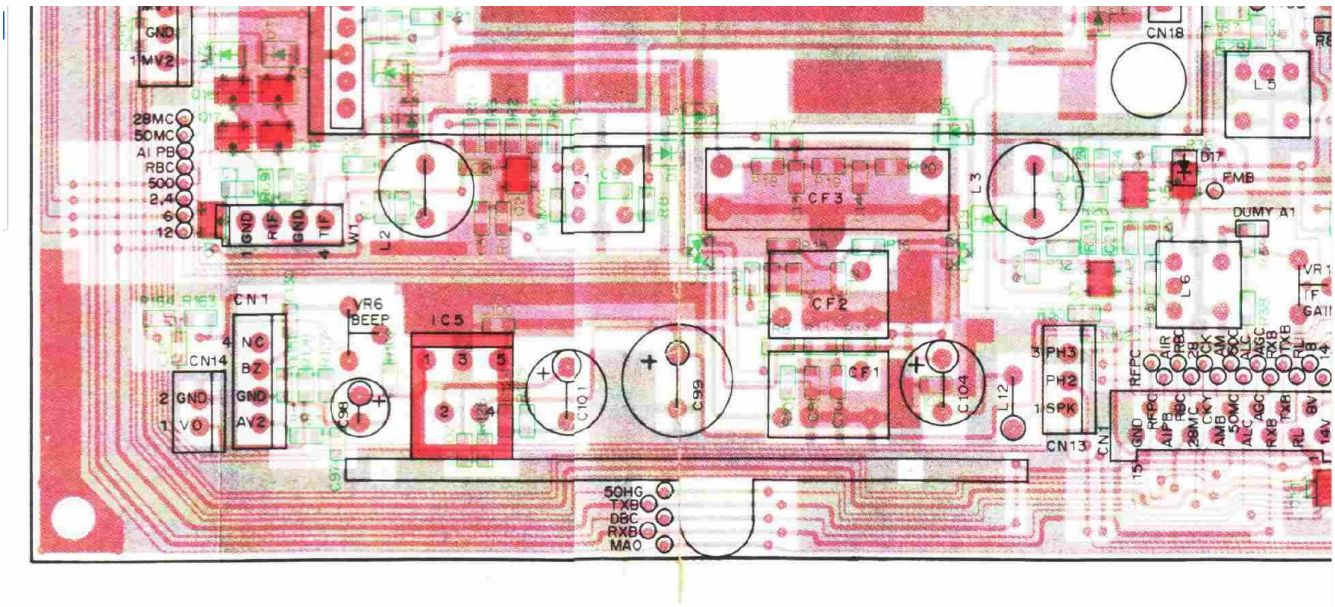

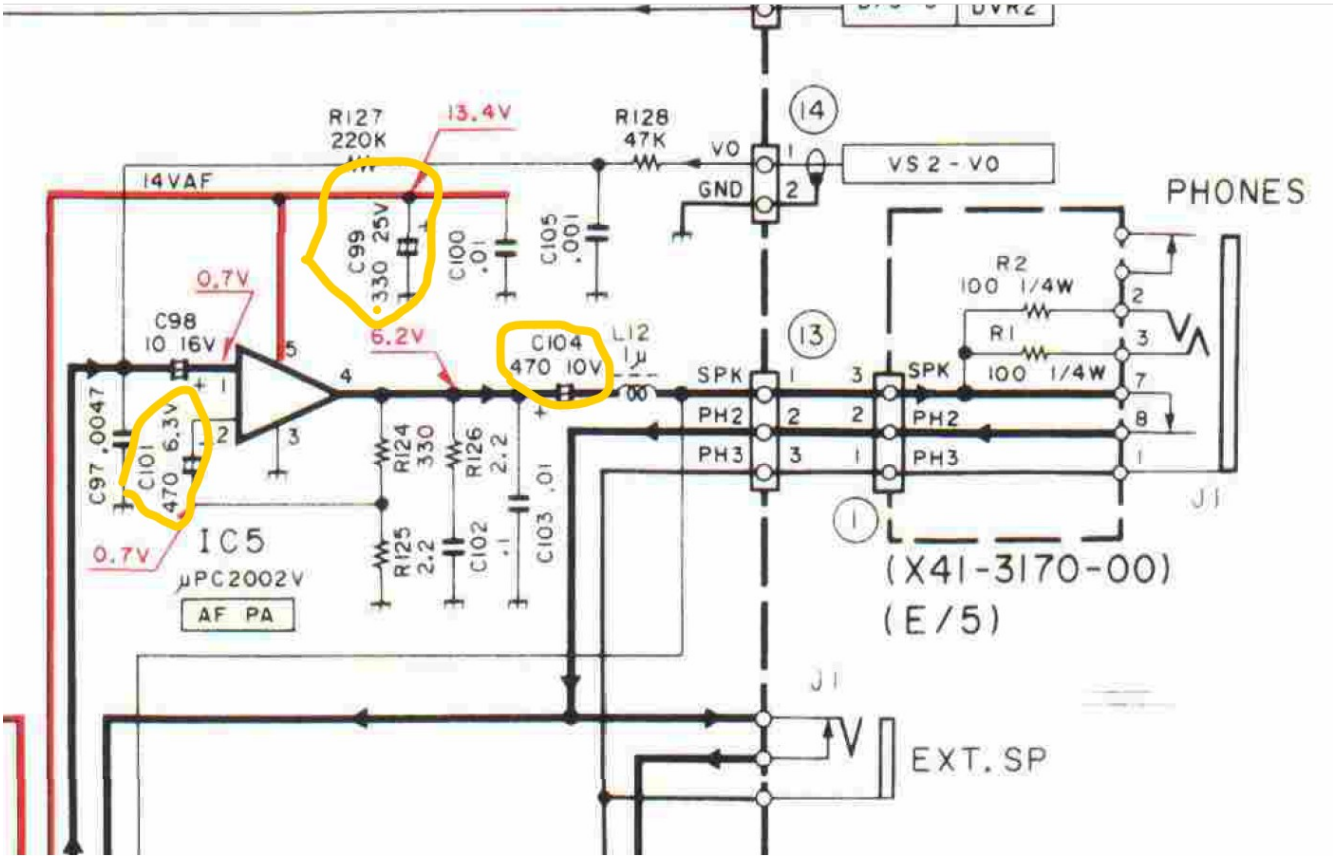

Modern, high-quality replacements from manufacturers like Rubycon, Nichicon, or Panasonic are generally advised for reliability.

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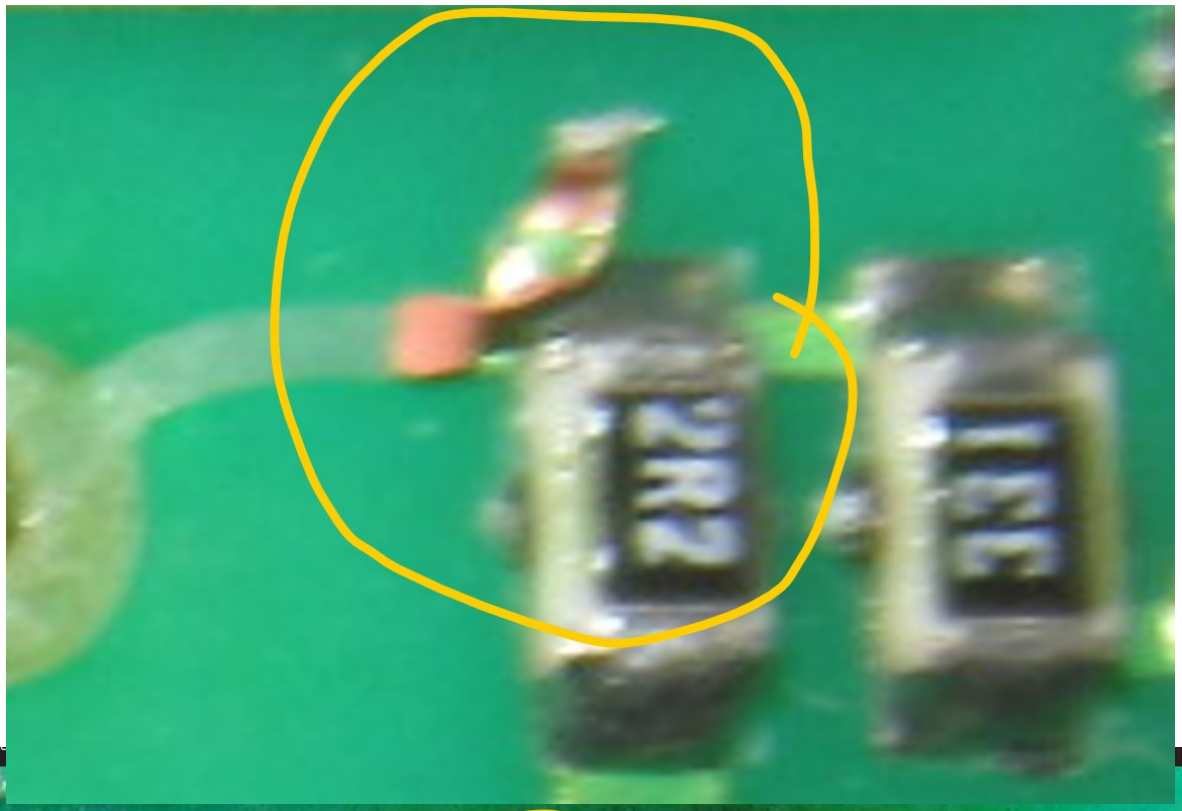
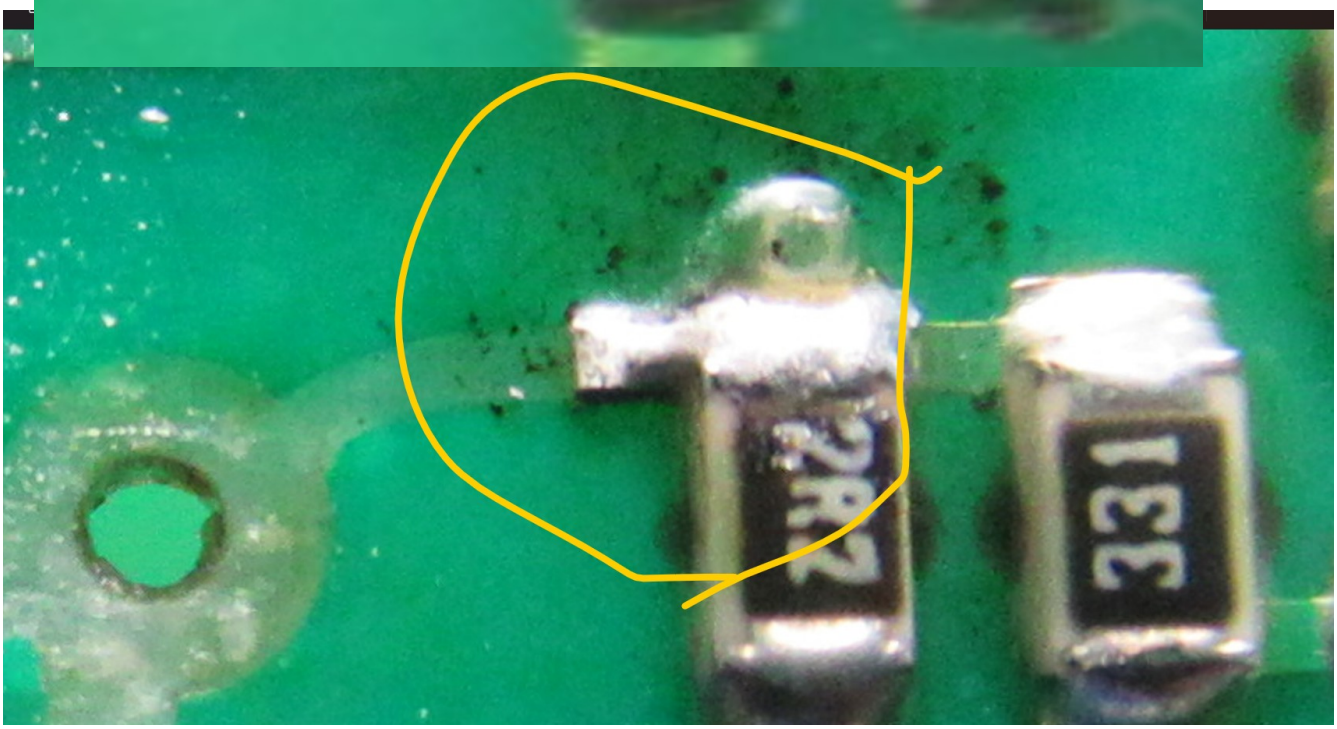
OOPS – being a real beginner, I noticed I must have pulled a trace from a SMT Resistor.

The value of macro zoom on a camera. Naked eye cannot not see it.





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NORMAL FAILURES

Gemini AI :

Based on common service logs and repair kits, here are the top failures for the Kenwood TS-450S (and the AT tuner model), the necessary repairs, and the estimated parts cost.

Quick Summary: Total Cost in Parts

- **Standard Repair (Audio/Leakage Fix): ~$45 – $60 USD**
- *Includes:* Full electrolytic capacitor kit, memory battery, cleaning supplies. 2032 batt + holder
- **Major Repair (DDS/PLL Failure): $100 – $150+ USD (High Risk)**
- *Includes:* Replacement DDS chips (obsolete/used market only), trimmer capacitors. *Note: If DDS chips fail, the radio is often considered "beyond economical repair" due to part scarcity.*

Top Failures & Repair List

1. Leaking Electrolytic Capacitors (The #1 Killer)

- **Symptoms:** No audio, distorted audio, low volume, or erratic display behavior. The electrolyte leaks onto the circuit board and eats through the copper traces.
- **The Fix:** Replace the specific leaking capacitors and thoroughly clean the board with isopropyl alcohol to neutralize the acid. You often need to repair damaged circuit traces with jumper wires.
- **Critical Parts to Replace: Also Replace battery.**
- **C104 (470µF 16V):** Located on the IF Unit. This is the most notorious failure point.
- **C99, C101:** Often replaced preventatively while working on the IF board.
- **C20:** Located on the AT (Antenna Tuner) unit (sandwiched between motor drive ICs).

2. PLL Unlock (Dots on Display)

- **Symptoms:** The display shows a series of dots or the radio refuses to transmit/receive.
- **The Fix:**
- **Option A (Common):** Replace **TC1** (Trimmer Capacitor) in the VCO2 sub-unit. The original ceramic trimmers become brittle and crack.
- **Option B (Serious):** Failure of the **DDS Chips (YM6631)**. These run hot and eventually fail.
- **Critical Parts:**
- Ceramic Trimmer Capacitor (20pF or similar, check service manual).
- Heat sinks (often added by owners to the DDS chips to prevent future failure).

3. Solder Joint Fatigue (Dry Joints)

- **Symptoms:** Intermittent power, PA (Power Amplifier) failure, or relay issues.
- **The Fix:** Reflow solder joints on the LPF (Low Pass Filter) relay and the main DC power connectors.

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- **Critical Parts:** Solder and flux (Labor intensive, low parts cost).

Detailed Parts List & Cost Breakdown
If you are performing a full refurbishment to "future-proof" the rig, here is the shopping list.

Component / Kit	Purpose	Est. Price	Source
Electrolytic Capacitor Kit	Replaces all aging caps (approx. 100+ caps). Includes the critical C104.	**$38 – $50**	eBay Kit Example or Jahnke Electronics
CR2032 Battery + Holder	Memory retention (often dead or leaking).	**$5**	Electronics Supplier
Trimmer Capacitor (TC1)	Fixes PLL unlock issues (usually red or white plastic/ceramic).	**$2 – $5**	DigiKey / Mouser
DeoxIT D5 Spray	Cleaning "scratchy" volume/squelch pots and ribbon cables.	**$15**	Amazon / Hardware Store
Isopropyl Alcohol (99%)	Cleaning leaked electrolyte acid from the board.	**$5**	Pharmacy
TOTAL (Standard)		**~$63 – $80**	

** Note on DDS Chips:** If your radio has the "DDS Failure" (unrepairable via capacitors/trimmers), you will need to hunt for "pulled" parts or organ donor radios. There is no steady supply of new YM6631 chips.

Next Steps
Would you like me to find the **Service Manual PDF** for you so you can locate **C104** on the board layout before you order parts?

To replace the memory backup battery on a Kenwood TS-450SAT with a CR2032 battery holder, you must open the unit, desolder the original battery or leads, and solder the new holder to the circuit board.

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Required Materials

•**CR2032 battery holder**: A PCB-mount or wire-lead holder for a single CR2032 coin cell (available from electronics suppliers or online retailers like Amazon.com or eBay).

•**CR2032 battery**: A new 3V lithium coin cell battery.

•**Soldering iron and solder**: Use minimal heat to avoid damaging the circuit board.

•**Screwdrivers**: Both Phillips and flathead are needed for disassembly.

•**Wire clippers/nippers** (optional, for removing the old battery).

Step-by-Step Procedure

1.**Remove Power**: Ensure the unit is completely powered off and disconnected from all power sources and cables.

2.**Disassemble the Unit**:

•Remove all screws securing the top and bottom covers of the TS-450SAT.

•Remove the top right and left flathead screws holding the front panel.

•Loosen the two bottom left and right screws of the front cover and drop it down to access the main circuit board.

3.**Locate and Remove the Old Battery**:

•Identify the original memory backup battery location on the circuit card assembly. The original battery may be a soldered-in type or have welded tabs.

•Gently heat the old battery's connection points with the soldering iron and pull the assembly away from the circuit card. Alternatively, you can use nippers to cut the old battery off and then desolder the remaining tabs.

4.**Prepare the New Holder**: If using a battery holder with wire leads, attach the wires to the holder and use heat-shrink tubing for insulation if necessary.

5.**Install the New Battery Holder**:

•Carefully solder the new battery holder to the solder points where the old battery was connected.

•**Pay close attention to the polarity**: Ensure the positive (+) and negative (-) terminals of the new holder align with the correct pads on the circuit board.

6.**Insert the Battery**: Insert a new CR2032 battery into the holder, observing the correct polarity (typically positive side up).

7.**Reassemble the Unit**: Reverse the disassembly steps to put the covers and front panel back in place, ensuring all screws are fastened securely. Future battery replacements will now be easy to perform by simply popping the old battery out and inserting a new one into the holder.