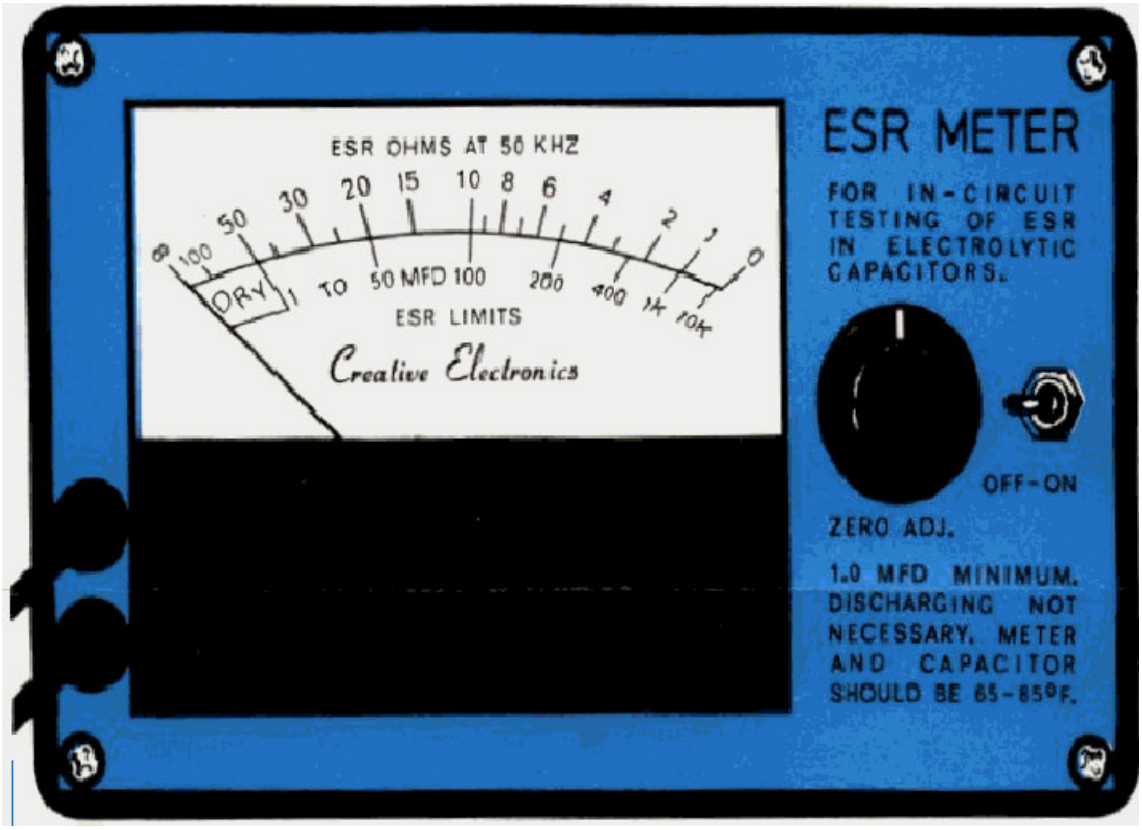
This is from the sales literature from the late Creative Electronics



Actual Size

NEW! AN IN-CIRCUIT ELECTROLYTIC CAPACITOR TESTER THAT REALLY WORKS!

THE Creative Electronics ESR METER!

Checks capacitors from 1 to 10,000 MFD in-circuit.

Shows up intermittent opens. Measures dryness of the electrolyte.

Our research on field failures of electrolytics reveals that almost all of them fail because of high ESR (equivalent series resistance). The high internal resistance reduces the capacitor's rate of charge and discharge, effectively making it an "open" capacitor.

High ESR usually results from dehydration of the electrolyte due to equipment heat, old age, poor sealing, or internal heat from ESR and high ripple currents (why input filters fail most).

Another common reason for high ESR is defective terminations due to broken welds, loose crimps or rivets, and/or corrosion. These problems cause variable ESR or intermittent opens and can usually be detected by monitoring ESR while wiggling the capacitor leads.

We have yet to find an electrolytic capacitor with normal ESR whose circuit failure was due to capacitance change alone. This helps to explain why traditional capacitance meters have never been popular with the service industry. THE REAL PROBLEM WITH ELECTROLYTICS ISN'T CAPACITANCE CHANGE, IT'S ESR CHANGE!

Only about 1% of todays electrolytic failures are leaky or shorted. Both types cause obvious circuit voltage changes or burned parts

The other 99% can be located instantly with the ESR Meter!

The ESR meter can be used in-circuit because circuit resistances are large compared to normal ESR values. By testing at only 25 mV rms , semiconductor circuit components are not activated. Test lead polarity is unnecessary because the test voltage is AC (50KHZ).

Discharging not necessary! A small internal capacitor couples ESR but blocks DC up to 6OOV. Can frequently be used on live circuits.

Note: ESR, being electrochemical in nature, is influenced by temperature. By testing in the 65-850F range (room temperature), corrections for temperature are unnecessary, especially since you're looking for ESR changes of 10 to 100 times above normal.

The meter's upper scale shows the capacitor's present ESR condition -and the lower scale shows you the ESR working limit for that size capacitor in MFD. Capacitors over SO ohms are dry and unreliable.

Most of the time you don't even need to know the capacitor s value because the reading is obvious, usually very high or very low. The DC voltage rating doesn't matter because ESR is independent of it.

Safely tests the electrolytics with the power off. Avoids current surges that temporarily "heal" the bad connection in electrolytics. No mQre ',blown" semiconductors from paralleling live capacitors.

From Customers. "Saves me an average of half an hour a day." "Works fantastic on the miniature electrolytics ." Tells me right away what my problem is or isn't."

Satisfaction guaranteed! Return within 60 days for prompt refund if not impressed with its performance.

Compact, portable, operates from 2 ordinary "C" cells for about -200 hours. With batteries and instructions.

QUICKLY PAYS FOR ITSELF IN TIME SAVED AND RECALLS PREVENTED!

Dear Sir:

Times change. In the days of tube-type electronics, excessive leakage current in electrolytic capacitors was a popular problem -due to the high voltages used.

In today's solid-state low-voltage circuits, less than 1% of all electrolytic failures are from excessive leakage current, or are shorted. About 90% of today's failures are "open" due to dried out electrolyte between the capacitor plates. Another 9% have intermittent terminations. Both types can be located in-circuit with our ESR Meter for a total effectiveness of 99%!

-(ESR is the standard abbreviation for Equivalent Series Resistance)

Lab-tested by Electronic Technician/Dealer - May 1979: "It works!"
Lab-tested by Electronic Servicing magazine - June 1979: ..."a profitable addition to most service shops."

Equipment Report by Radio-Electronics magazine - November 1981: "Once you discover this little device, it is sure to become one of the most useful instruments on your workshop or service bench."

It's invaluable when more than one electrolytic is causing the same circuit problem. It can check all the set's electrolytics in just a few minutes to assure electrolytic quality, prevent recalls, and save you hours of trouble-shooting.

It won't just sit on your shelf like the other capacitor testers. After a couple weeks of use, users keep it right next to their bench VOM because it's so fast & effective! As one of our users recently said: "It's a lot faster than using a scope."

The ESR Meter saves you time, improves your service quality, and quickly pays for itself.

Shouldn't you try it? We guarantee your satisfaction for 60 days.

$ 149 **Postpaid in USA & CAN.**

December 1983

Dear Customer:

The operating frequency of our ESR Meter has been changed from 100 khz to 50 khz. The reason for this change is that the slew-rate of the IC we use has been reduced industry-wide to improve stability.

The new slew-rate makes it impossible for us to operate our ESR Meter at 100 kHz, and a practical substitute **IC** does not exist.

Fortunately ESR is generally independent of frequency and can be checked jus~ as well at 50 kHz over the range of 1 to 10 000 **MFD.** The error due to capacitive reactance at 1 MFD, at its Limit of 50 ohms, is an additional 0.5 ohm, which is almost imperceptible.

Return to the ESR meter index
Return to the main page