

## Re: Old Zenith safety caps.

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- *From:* "Michael A. Terrell" <[mike.terrell@xxxxxxxxxxxxxx](mailto:mike.terrell@xxxxxxxxxxxxxx)>
  - *Date:* Fri, 28 Sep 2007 10:45:06 -0400
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"captainvideo462002@xxxxxxxxxx" wrote:

On Sep 25, 2:50 pm, Edd Whatley <[Edd.Whatley.13f1...@xxxxxxxxxxxxxx](mailto:Edd.Whatley.13f1...@xxxxxxxxxxxxxx)> wrote:

If you have ever torn down a paper / mylar / poly capacitor to view its internal infrastructure, you would see the offsetting of the dielectric foil upon the dielectric separator and the clustering of the mass at both ends . That then needs to be collectively interfaced to the two wire connector leads. That is usually accomplished by a pressure compression of lots of surface contacting area or a enclosed crimping action and the other means being via a large molten solder "blob" which will properly meld with the tinnable copper wire lead and be dependent upon the other contact aspect to be the extensive area of foil that has solder interspersed within it.

Now getting to your special feature of the "safety capacitor". You will be finding it placed in the collector / to / flyback primary winding where it is resonating along with the primary of that transformer, as that transformer action certainly is more efficient operating as handling a pseudo-sine wave versus a positive polarity sawtooth waveform. With that resonance established between the two components of that tuned circuit , there will be quite a degree of flywheel energy present and an actual lowered degree of required power required as compared to a circuit with out that aspect being present.

Now lets look at that repetitive 15,734 ~ signal that is continually hitting that current loop in the hoz output stage, much in the order of an instantaneous power impact effect of a jackhammer. If all is well in the hoz circuit, fine, no problems will be had.....but lets move back to the described capacitors internal structuring , if those high current pulse might find a weak / marginal contact area within that cap, expect it to arc over, vaporize metal and open a portion of a previously contacting area. That then leaves progressively less area to be carrying and sharing the current requirement.

Re: Old Zenith safety caps.

A daisy chain or domino effect is then possible with the eventual loss of all contact area made to the foil and either arc over or loss of internal contact completely and the loss of connection and capacitance transfer.

Now IF that cap is effectively out of the circuit, by virtue of that opened internal connection.

Expect that previous effect of drawing less current while being in coincident or close to resonance state to the frequency that the hoz power circuitry was operating at, to no longer be valid.

The power consumption...i.e. current passing through that loop should increase, along with a shooting up of the high voltage level being produced at the fly /IHVT output by virtue of being hit by the sharp peak of a sawtooth waveform now.

That would be limit taxing on the HV components as well as possibly getting up into the X-ray level from picture tubes, or even up to the ultimate threshold of actually breaking the kine via a circular ring fracture about the yoke mounting area.

That is where the safety aspect of the mentioned capacitor comes into play.

In examining the circuitry, you will find that the caps dual leads are dependent upon completing specific interconnections.

That being in the closed loop from the B+ supply to the collector circuit of the Hoz output transistor. Within those capacitors, there are internal fusible links between adjunct leads, such that when operated beyond their current passage design center, an opening will occur internally, opening their circuit, such that the sweep circuit then becomes disabled.

Therefore being dubbed "safety capacitors", so that extreme condition never occurs, or merely rising upon that threshold for an instant.

Regards..... Edd

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Edd Whatley

That is really an interesting discussion of how these things work. But it begs the question of why didn't they simply put some type of fuse or fusible link in the circuit? Lenny

Have you ever seen the original three lead safety capacitor Zenith used? When they failed, a high DC current flowed in the yoke, which caused the neck of the CRT to crack. Plastic Capacitor Corp. made the defective three lead parts, and went out of business. I was working for a shop that sold Zenith, and went to the factory school on those sets. As soon as the problem surfaced, a mad rush was on to find every Zenith TV with the defective caps, and modify them to the new design, and apply the modification sticker to the back of the cabinet. They showed a 16

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mm film of a CRT self destructing.

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Service to my country? Been there, Done that, and I've got my DD214 to prove it.

Member of DAV #85.

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