

Technical Bulletin

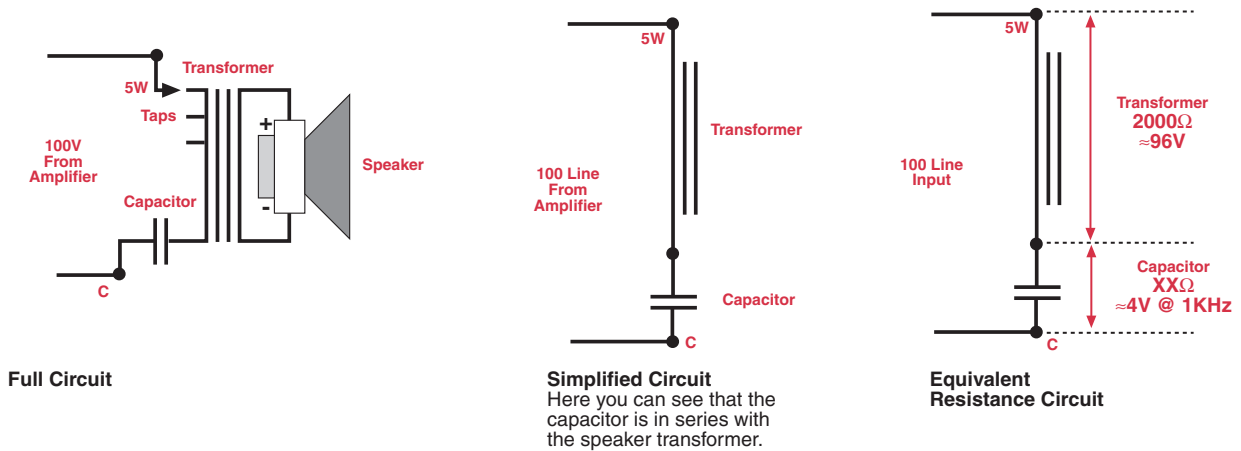
Line Monitoring Supervising Capacitors For EWIS Loudspeakers

There is an apparent lack of understanding of the rating of the capacitor used for line monitoring in emergency warning systems.

Firstly the capacitor is employed to “block” the “DC” signal which is commonly used in monitoring the integrity of speaker circuits, whilst passing the “AC” audio signal.

As the vast majority (if not all) EWIS systems in Australia use a 100V line output, many people are of the opinion that the supervising capacitor must therefore be rated at 100V.

However this is not correct, the capacitor is in series with the transformer, it has very little voltage across it. Below is a schematic diagram of the capacitor in circuit:



In reality both the transformer and capacitor have an internal resistance. We know that the transformer on the 5W tap as used in a 100V system has an impedance or AC resistance of 2000Ω or 2kΩ. Most of the 100V drop occurs here. The ESR (equivalent series resistance) of the capacitor changes with frequency.

To keep it simple, the following table shows the actual voltage measured across the capacitor at the following frequencies when the circuit is fed with a 100V signal from the amplifier:

From the above you will instantly see that the 50V rating which is widely used is far above what is actually measured across the capacitor in service.

Frequency	Voltage Across Capacitor
100Hz	3.4V
500Hz	0.73V
1KHz	0.36V
5KHz	0.13V
10KHz	0.10V

Therefore it is well within specifications to utilise a 50V rated or 100V rated capacitor.

Apart from this, the capacitor must have a high enough rating to handle the current flowing through it.

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