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Summit Media

TRANSMISSION TALK TUESDAY

Episode #69

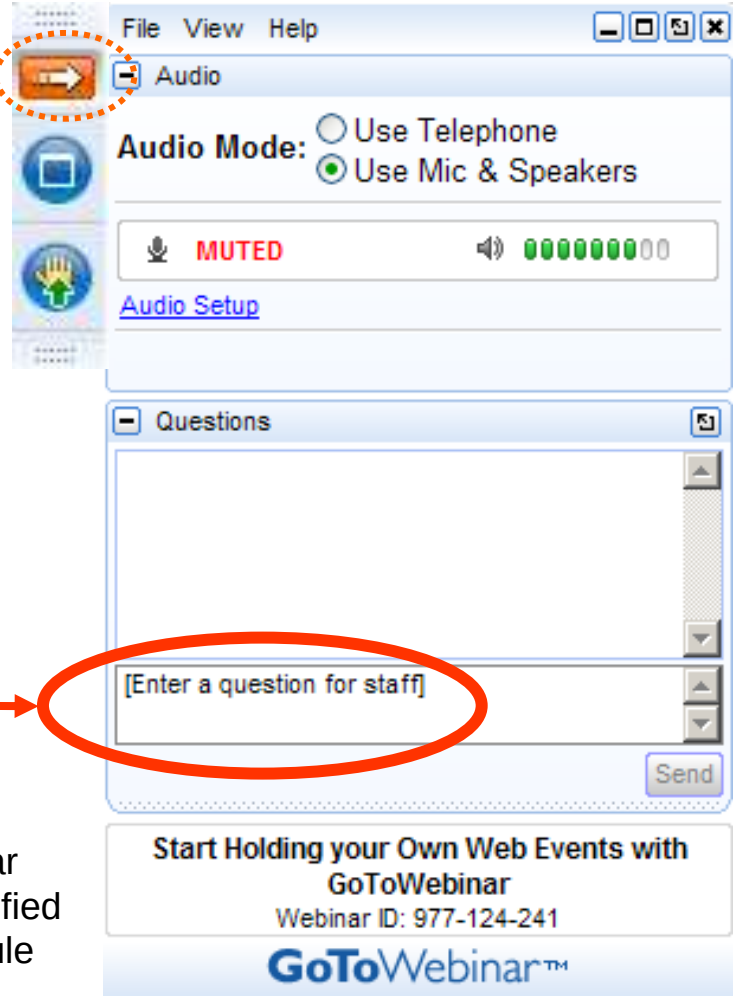
AC Power
How to Talk with Your Electrician

nautel
AM/FM Radio Transmitters

Your questions please?

(if you don't see the control panel, click on the orange arrow icon to expand it)

Please enter your questions in the text box of the webinar control panel (remember to press send)



Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.

Advance Questions

Which are the more critical electric points on your new generation transmitters FOR AM AND FM

What kinds of AC panel surge protectors are good? Protect the one transmitter circuit or protect the whole service entrance?

Seeking information about latest technologies in Power surge protection for Broacast transmitter sites and recording studios.

Explain to the electrician that an adjacent fused disconnect box is needed for equipment maintenance not just a circuit breaker

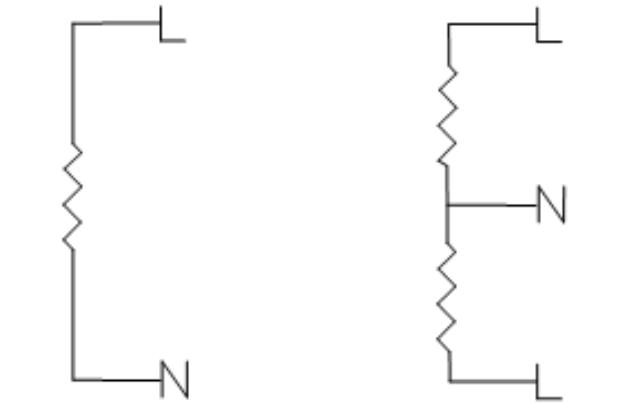
Single Phase Power

7. AC Power Supply

Single-Phase (1-Phase) Operation:

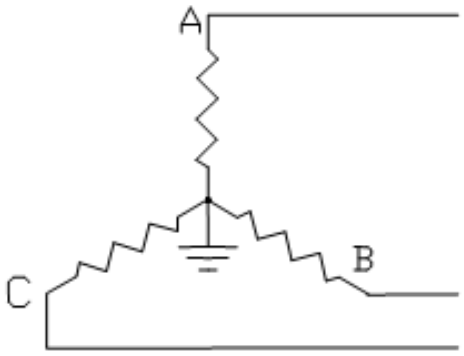
Nominal Value of AC Power Service to Transmitter	_____ Volts	_____ Hz
Measured Voltages	Line-Line _____ Volts	Line-Neutral _____ Volts

Configuration of AC Power Service to Transmitter: (circle one below)

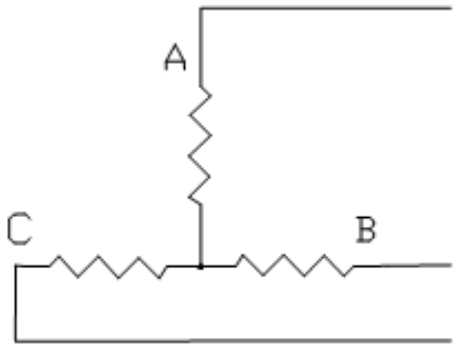


Three Phase Power

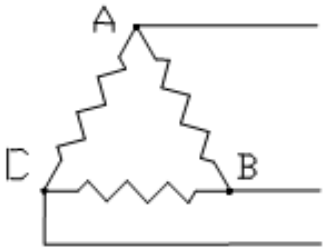
Configuration of AC Power Service to Transmitter: (circle one below)
Note: Wye configuration is preferred



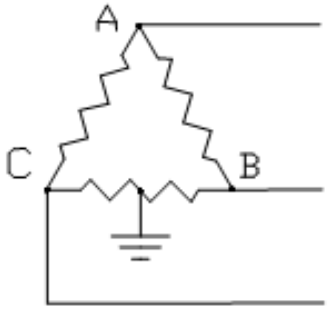
WYE

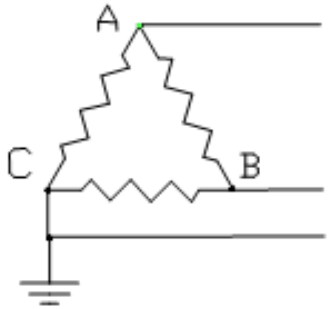


SCOTT CONNECTION

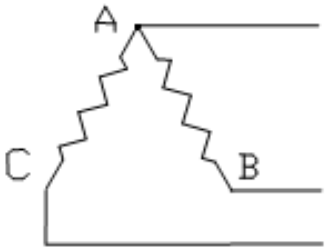


DELTA



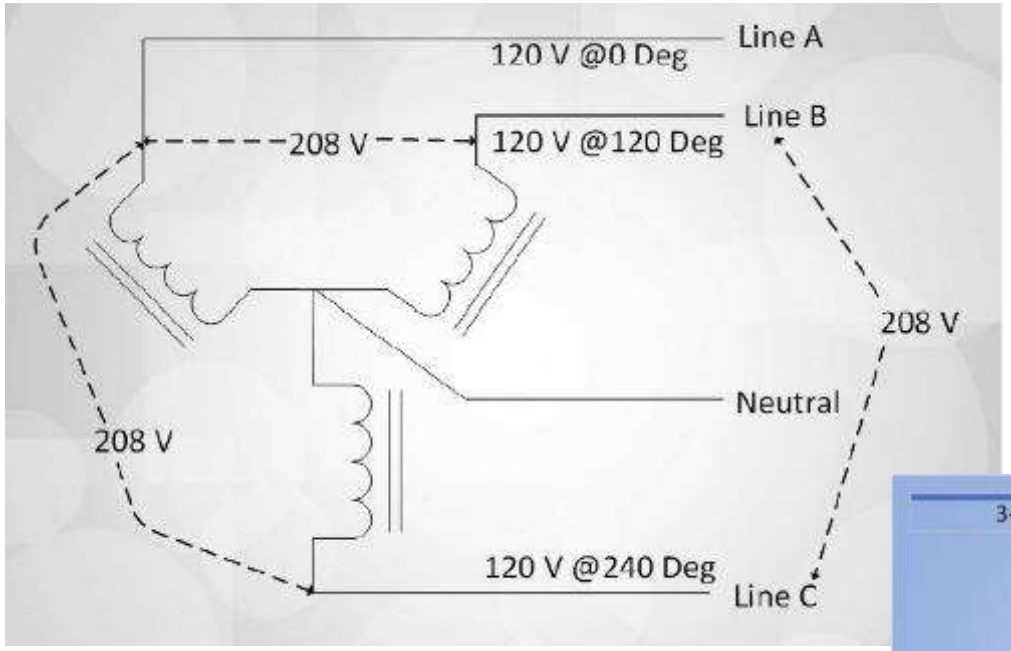


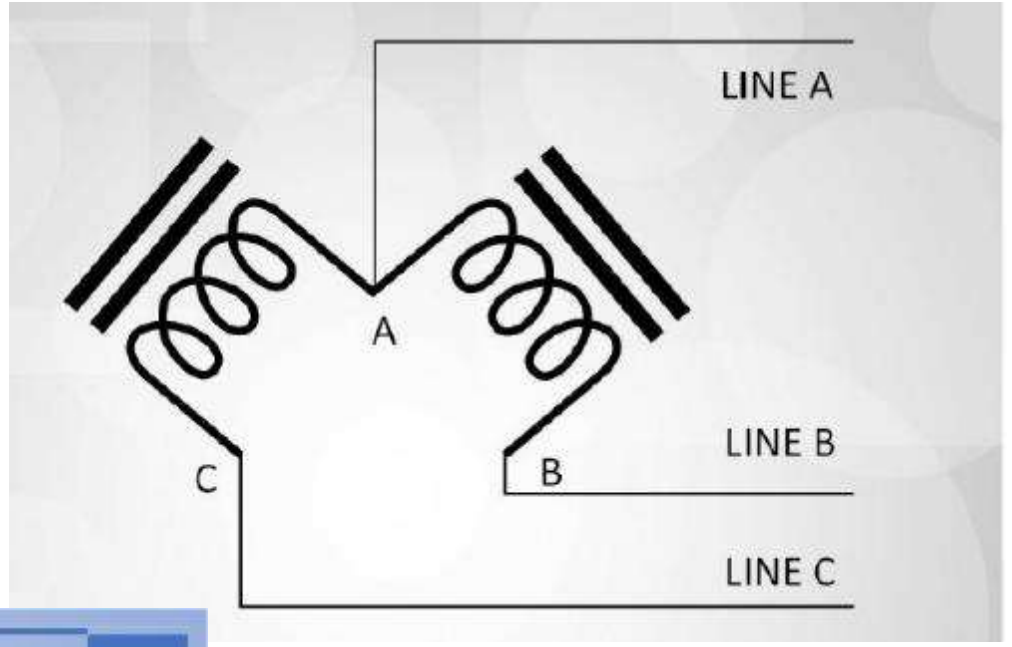
UNBALANCED DELTA

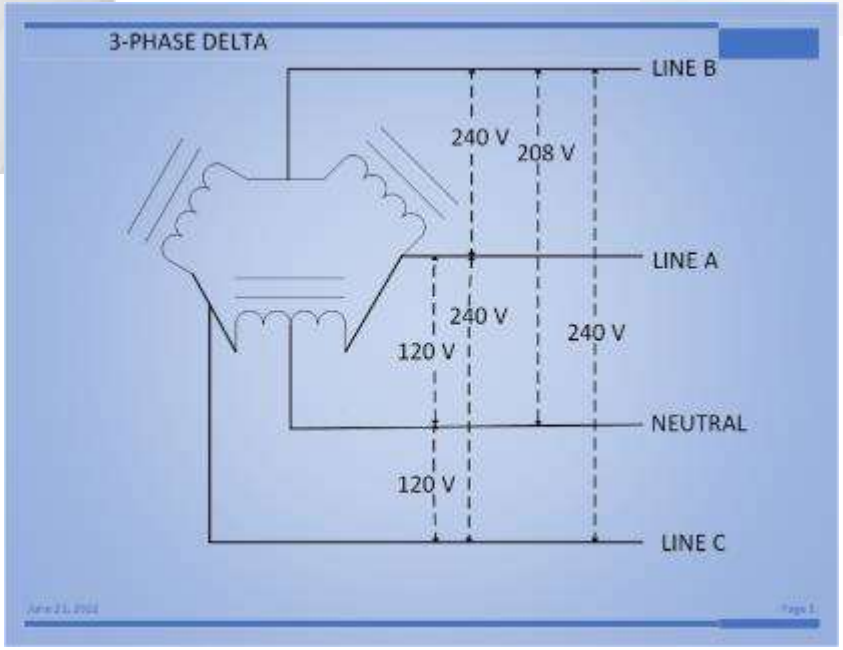


OPEN DELTA

Three Phase Power







https://www.radioworld.com/tech-and-gear/tech-tips/a-three-phase-power-tutorial-part-1

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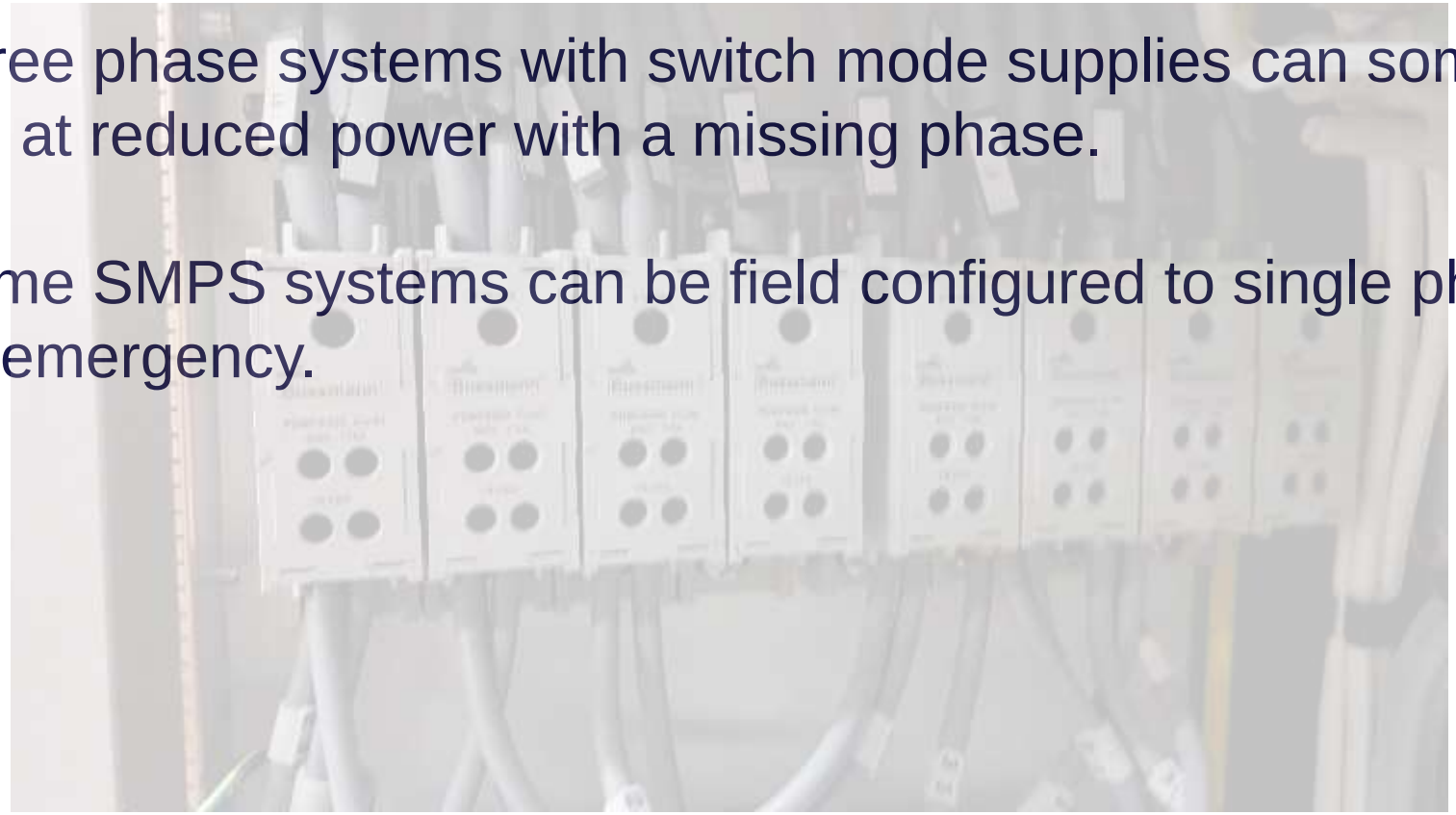
Three Phase Power

- Points to consider:
  - A lot of transformer based power supplies can autotransform a missing phase – this could be good or bad!
  - Three phase systems with switch mode supplies can sometimes run at reduced power with a missing phase.
  - Some SMPS systems can be field configured to single phase in an emergency.



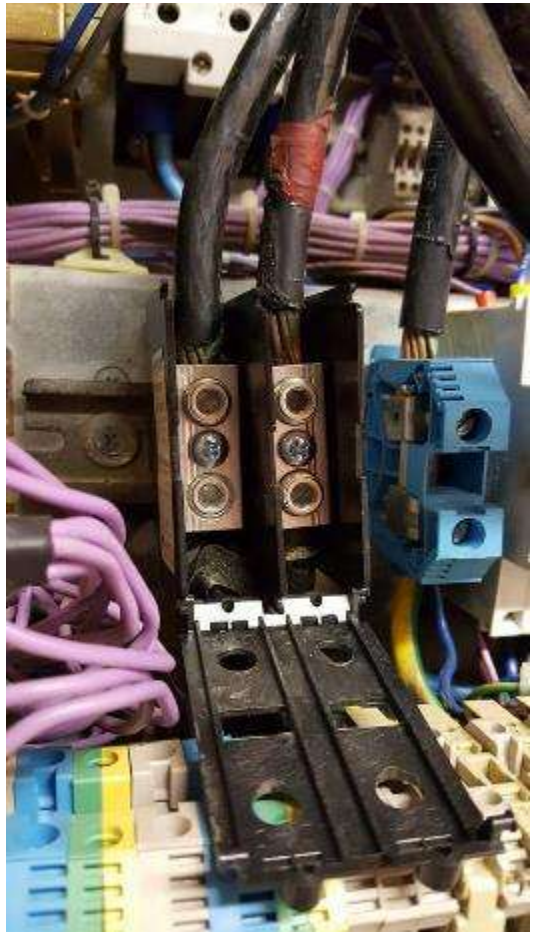
Calculating breaker requirements

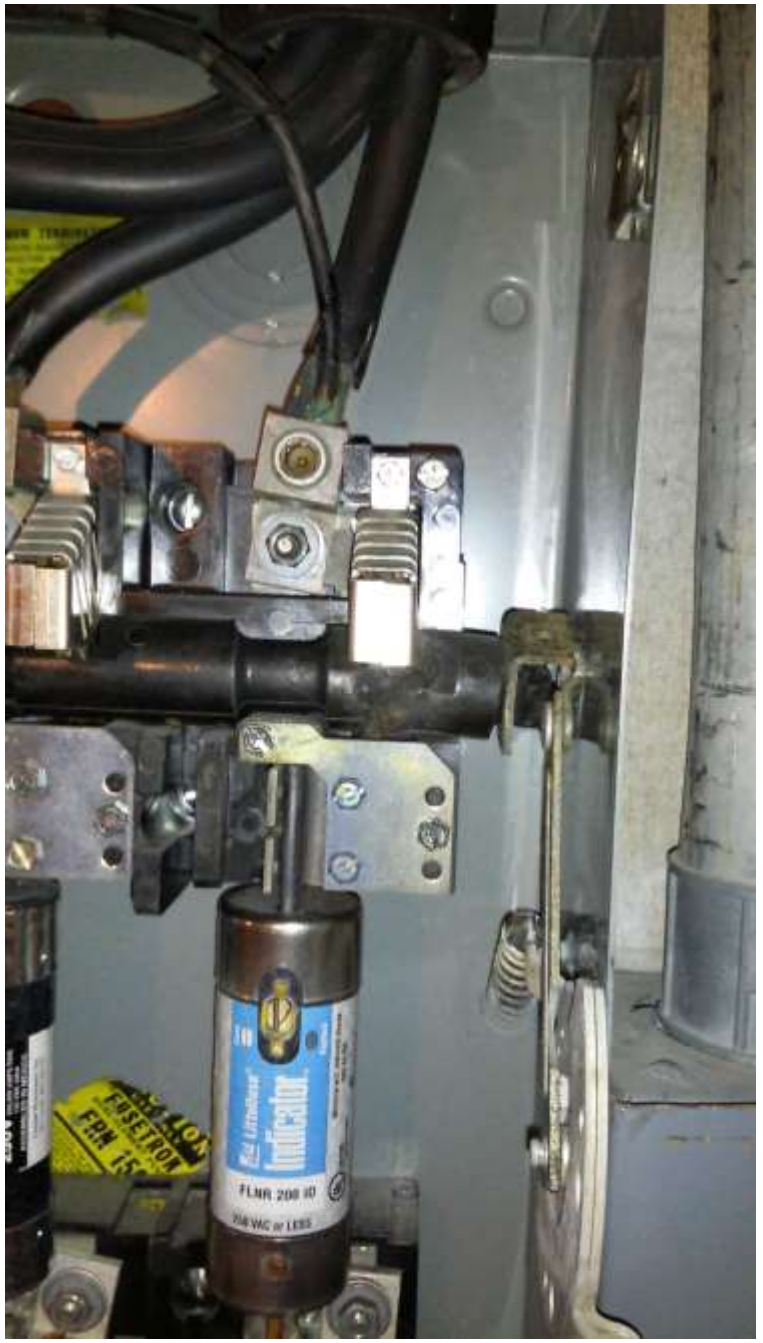
- Current draw is provided in a lot of manuals
  - TPO/efficiency in decimal (* mod index for AM) = power consumption
  - Power Consumption/phase to phase voltage = single phase current draw… divide this by the square root of 3 for three phase
  - Add 25% safety margin
  - For 10kW @ 70% efficiency, with 240V 1-ph… 10,000/.7=14,285
  - 14,285/240 = 59.5A, or 75A with safety margin

Surge Protectors

- Series vs. Shunt type?
- Best location?
- Other thoughts?

Three Phase Power





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Bond Grounds

- Compression connections WILL get loose over time
- Will be worse with stranded cable
- Exothermic bonds are longer lasting
- Facility ground and electrical grounds must be bonded together (Article 250.4 of NEC)

Heat Load

Calculate transmitter heat load:

TPO/efficiency = power consumed *

Power consumed – TPO = waste heat (in watts)

Waste heat * 3.413 = BTU/hr

BTU/hr/12,000 = tons of AC required

Eg: 10kW/0.72 = 13.889 kW of power consumption
13.889 – 10kW) = 3888.9 watts wasted as heat
3888.9 * 3.413 = 13,273 BTU/hr
13,273/12,000 = 1.11 tons of air conditioning

* - allow for modulation in AM transmitters… multiplying by 1.25 will be close

Note that this is only looking at heat produced by the transmitter, it does not consider convection heating of building by the sun, or any other heat sources in the building, which also need to be accounted for!

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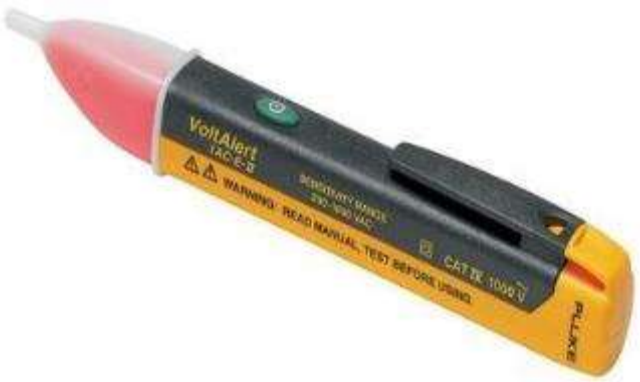
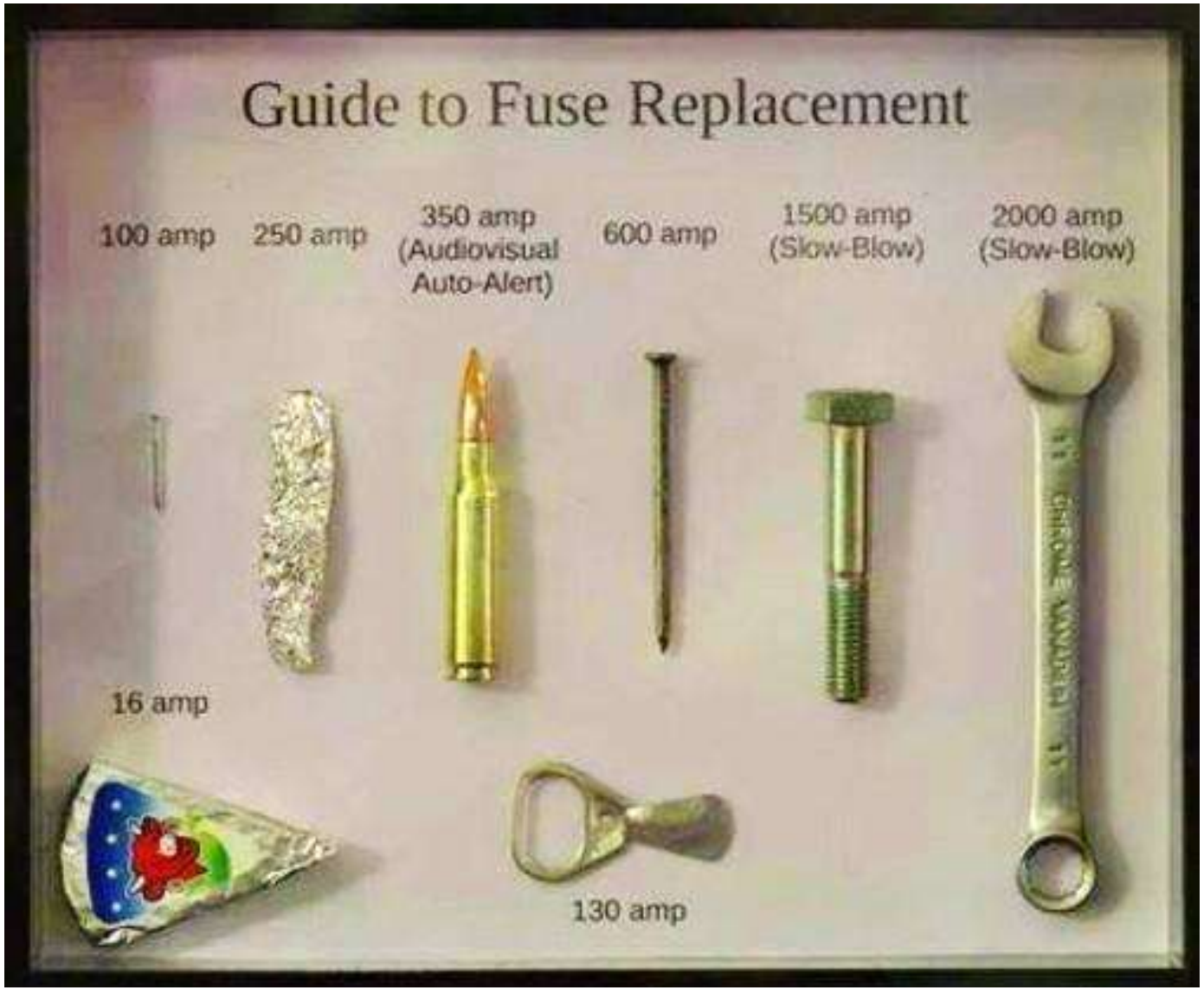
Be Safe!



Be Safe!


Guide to Fuse Replacement
100 amp
250 amp
350 amp (Audiovisual Auto-Alert)
600 amp
1500 amp (Slow-Blow)
2000 amp (Slow-Blow)
16 amp
130 amp

Check your measuring tools!

https://www.fluke.com/en-us/product/electrical-testing/basic-testers/prv240-proving-unit#

Online Information

Webinars
https://www.nautel.com/resources/webinars/

Nautel Waves Newsletter
https://www.nautel.com/newsletters/

YouTube
http://www.youtube.com/user/NautelLtd

Online Info, such as the Broadcasters' Desktop Resource
https://www.thebdr.net/

THANK YOU!

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