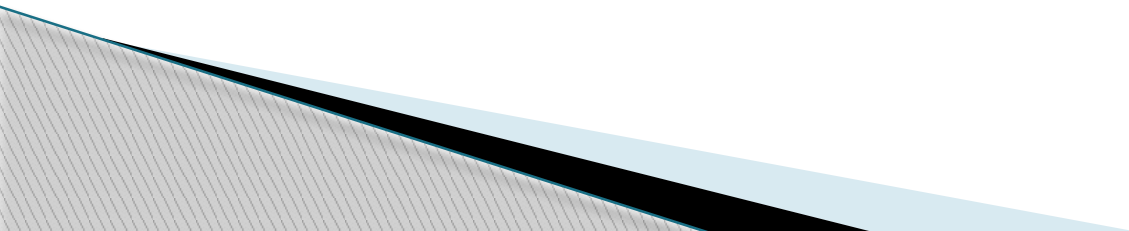




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Isolated? Lonely?



Isolation

- ▶ The worst cruelty that can be inflicted on a human being is isolation. Sukarno

Isolation

- ▶ Isolation is the one sure way to human happiness. Glenn Gould

- ▶ Confused?

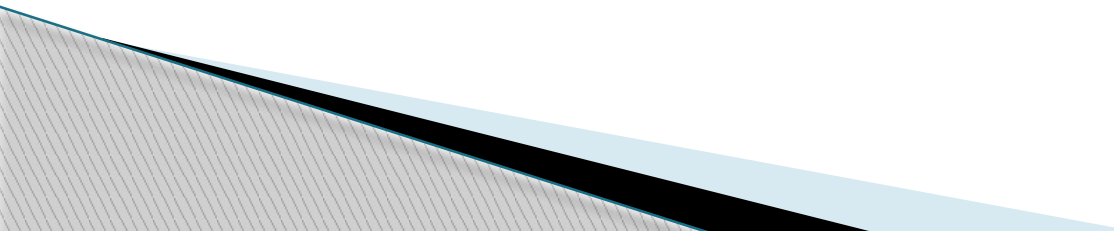
Isolation

- ▶ Electrical Isolation

This Evening

- ▶ Define electrical isolation.
 - ▶ Brief look at UK domestic supply system.
 - ▶ Why do we have an earth?
 - ▶ Look at benefits of electrical isolation.

 - ▶ Demonstrate isolation transformer.
 - ▶ Provoke thought / discussion.

 - ▶ I DON'T HAVE ALL THE ANSWERS
- 

Isolation

- ▶ What does Isolation mean?
- ▶ Isolation from what?
 - Noise
 - Mains LIVE
 - Earth

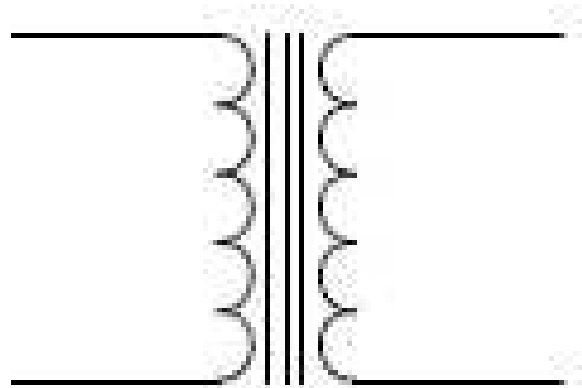
Isolation transformers

- ▶ Isolation from mains LINE
- ▶ **Isolation from mains EARTH**

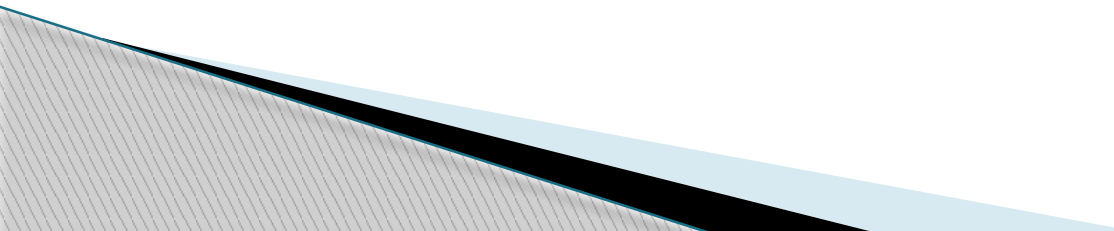
What is an isolation transformer?

- ▶ 2 windings with electrical isolation
- ▶ Linked only by magnetic field
- ▶ BUT there are traps! Later

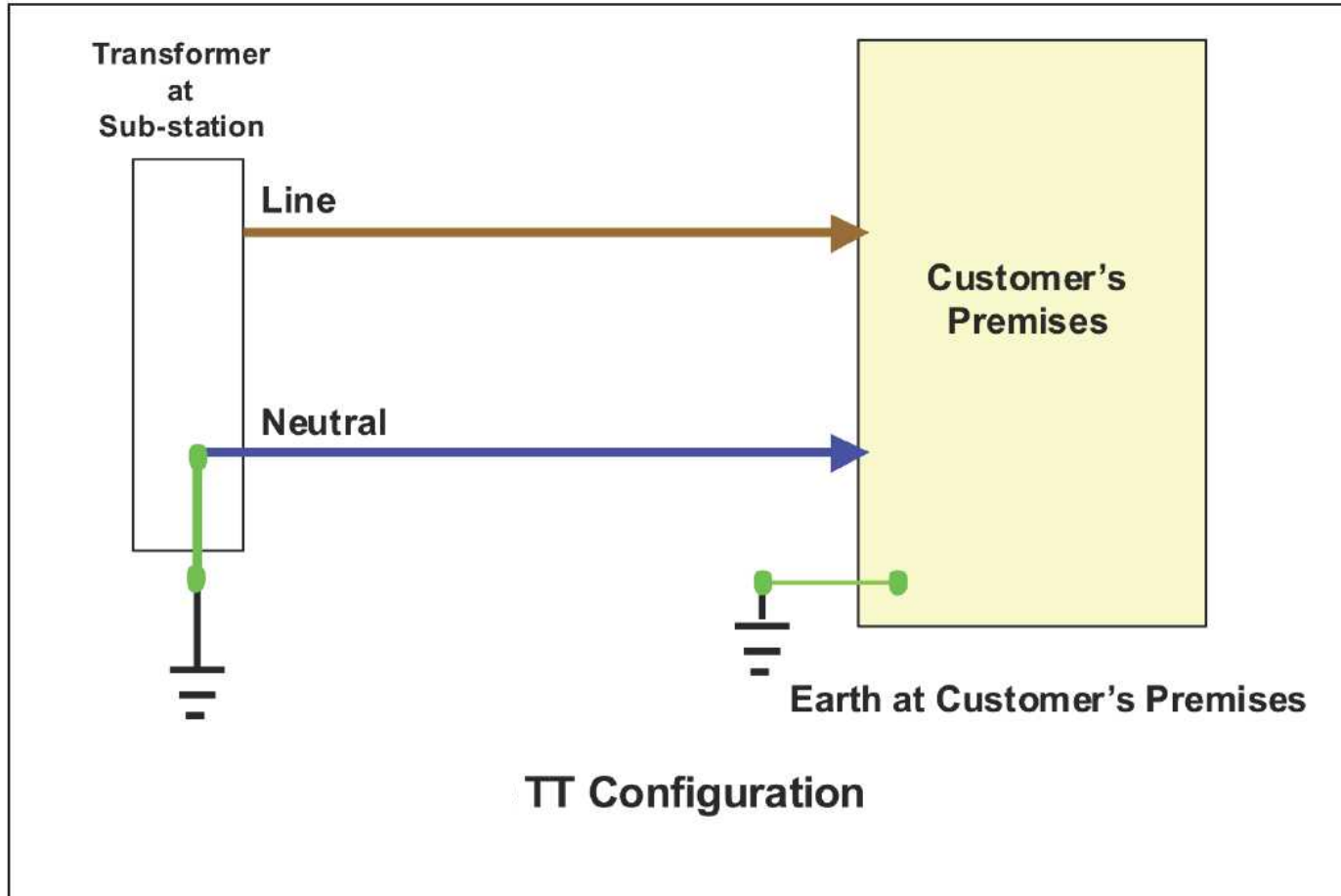
Electrical isolation



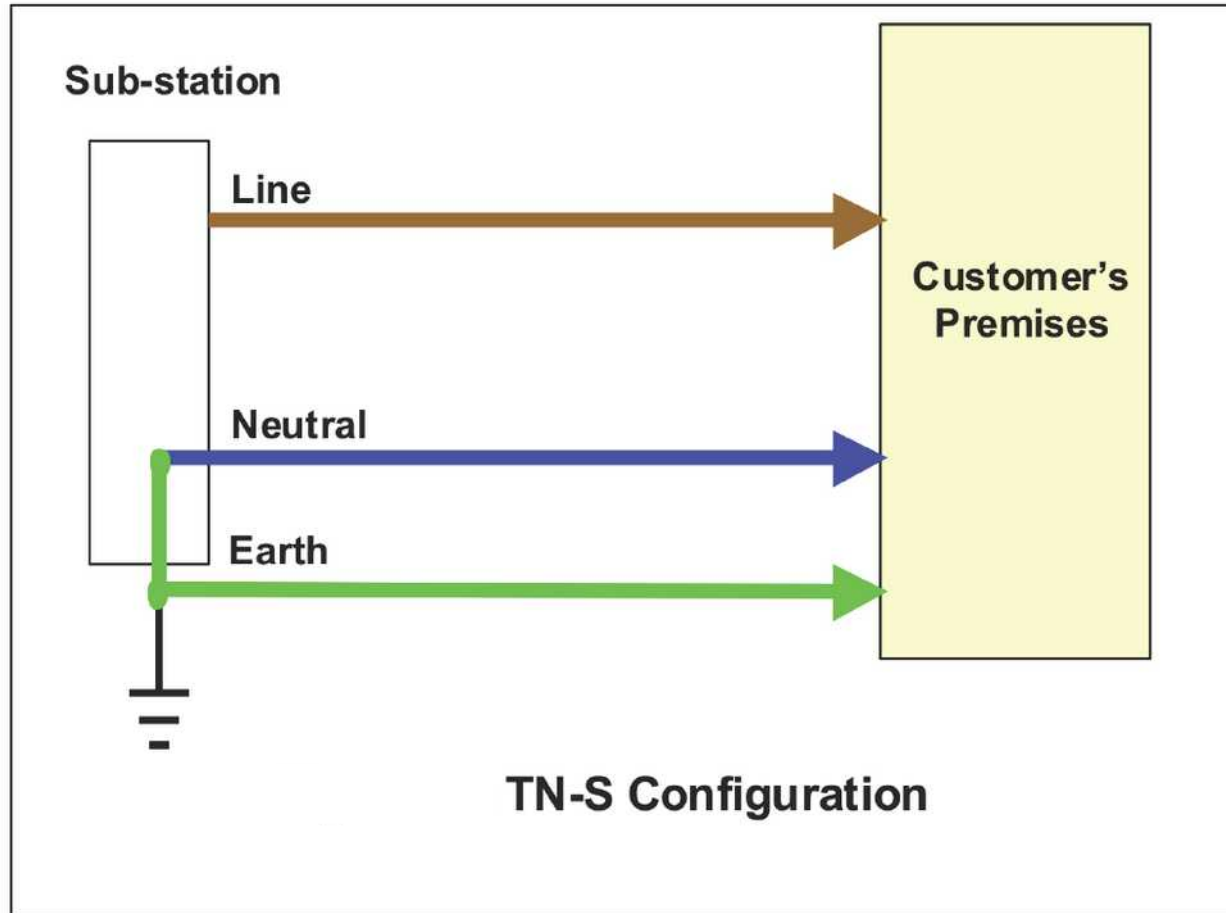
UK Mains Supply

- ▶ TN-C-S PME
 - ▶ TT
 - ▶ TN-S
- 

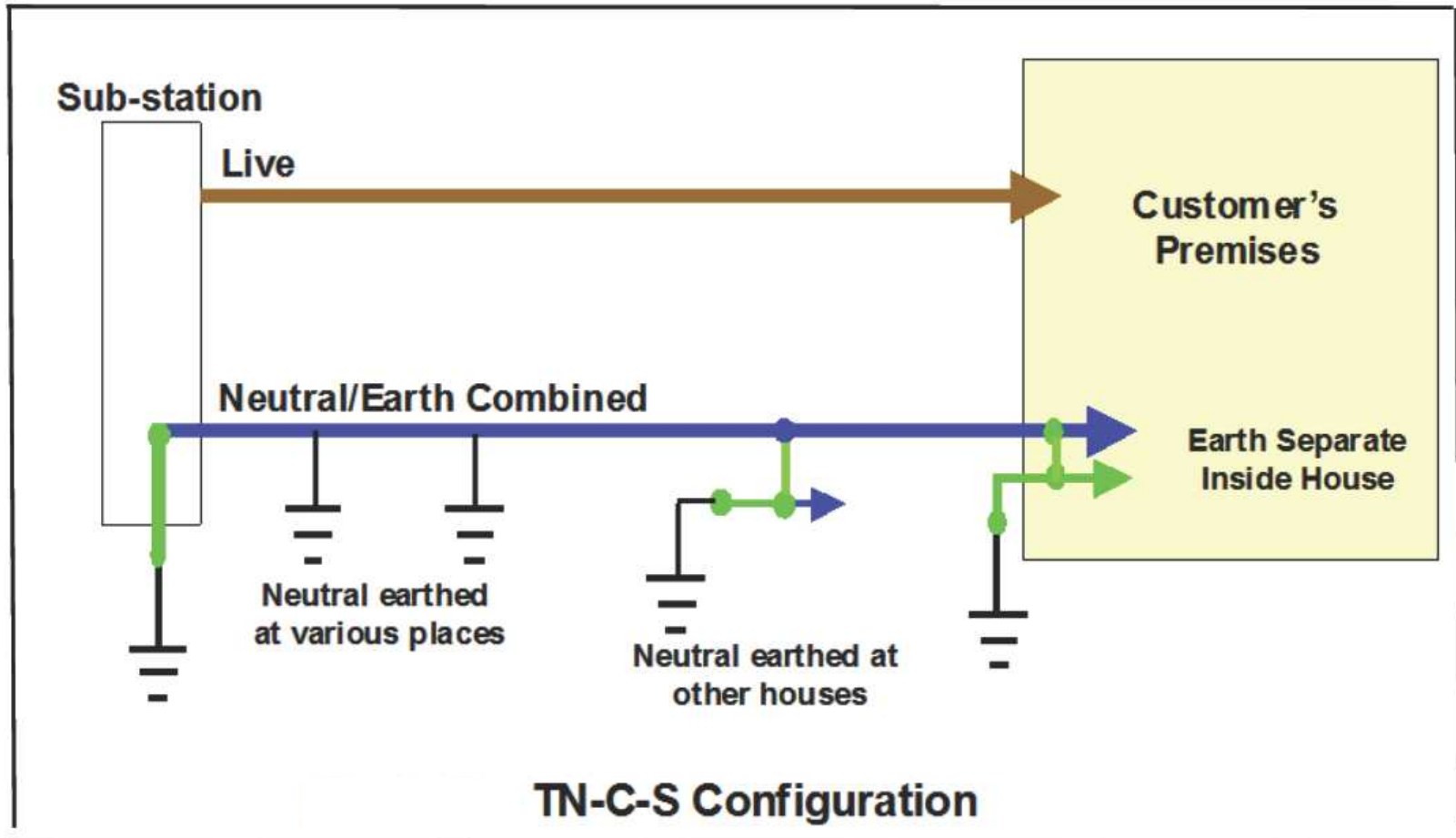
Two Conductors + Earth Rods



Three Conductors



PME- Protective Multiple Earthing



Sub-station

Line

Neutral/Earth Combined

Neutral earthed
at various places

Other house load

Household Load

B

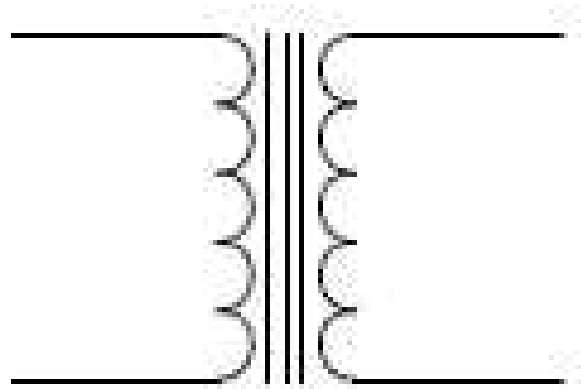
A

Possible large currents
through earth connection

A Ruptured Neutral In a TN-C-S System

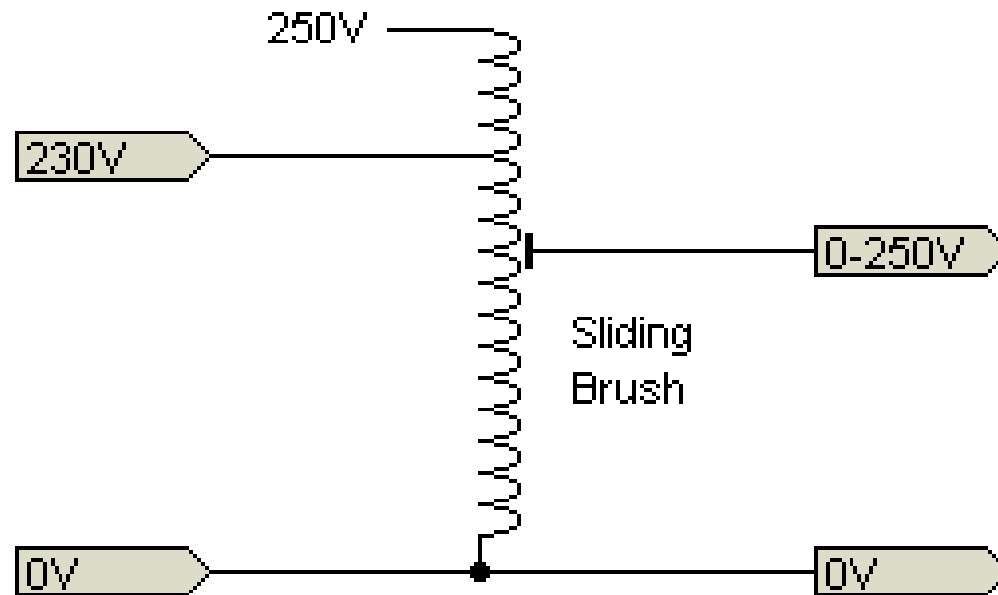


Electrical isolation



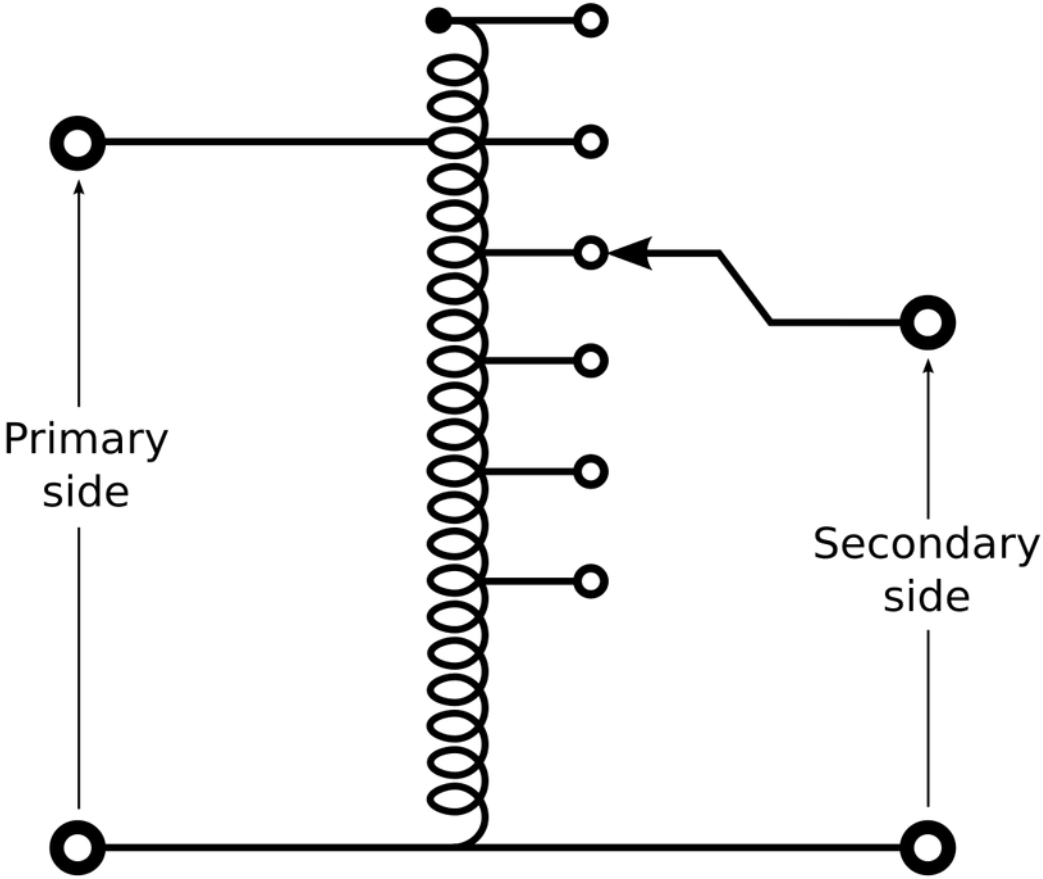
What it's not

Variac

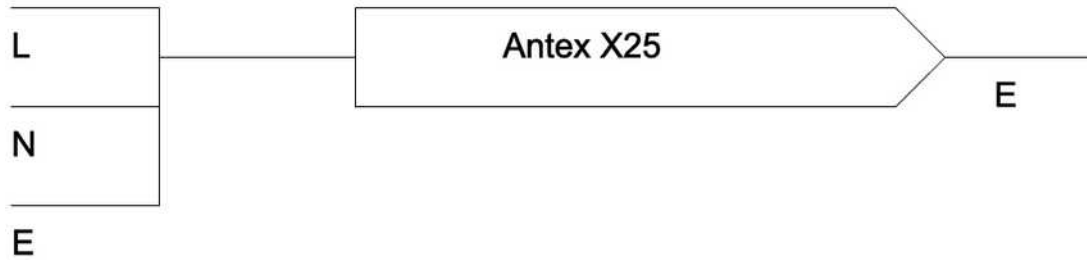




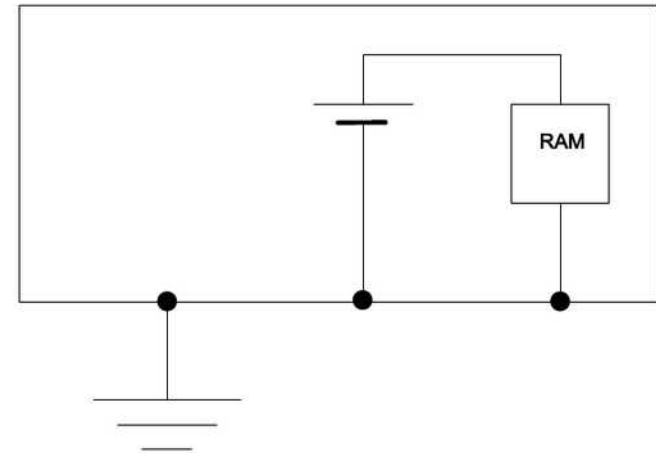
Autotransformer



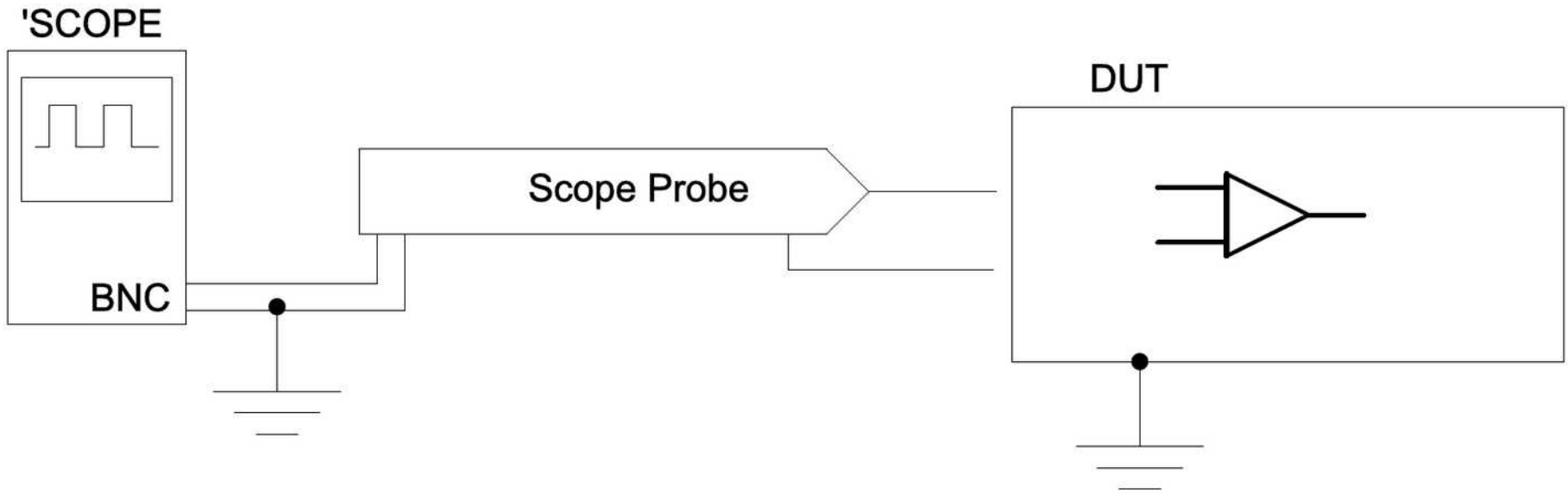
Why isolate earth?



Voltmeter / Scope

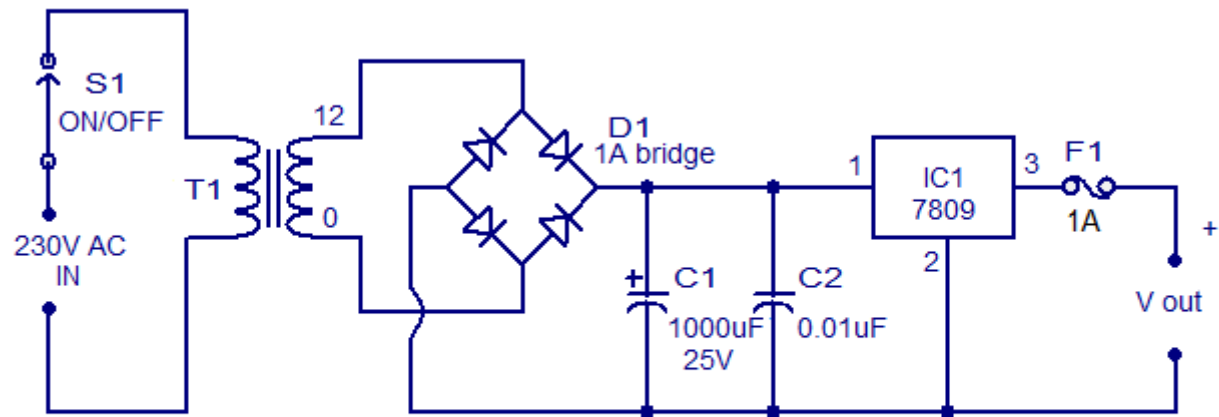


Why isolate earth?

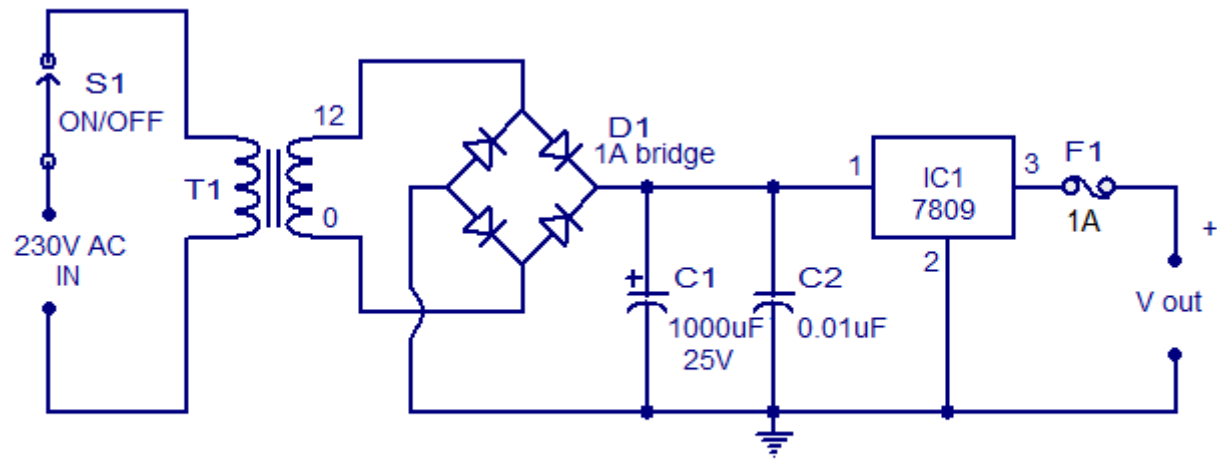


Why isolate earth?

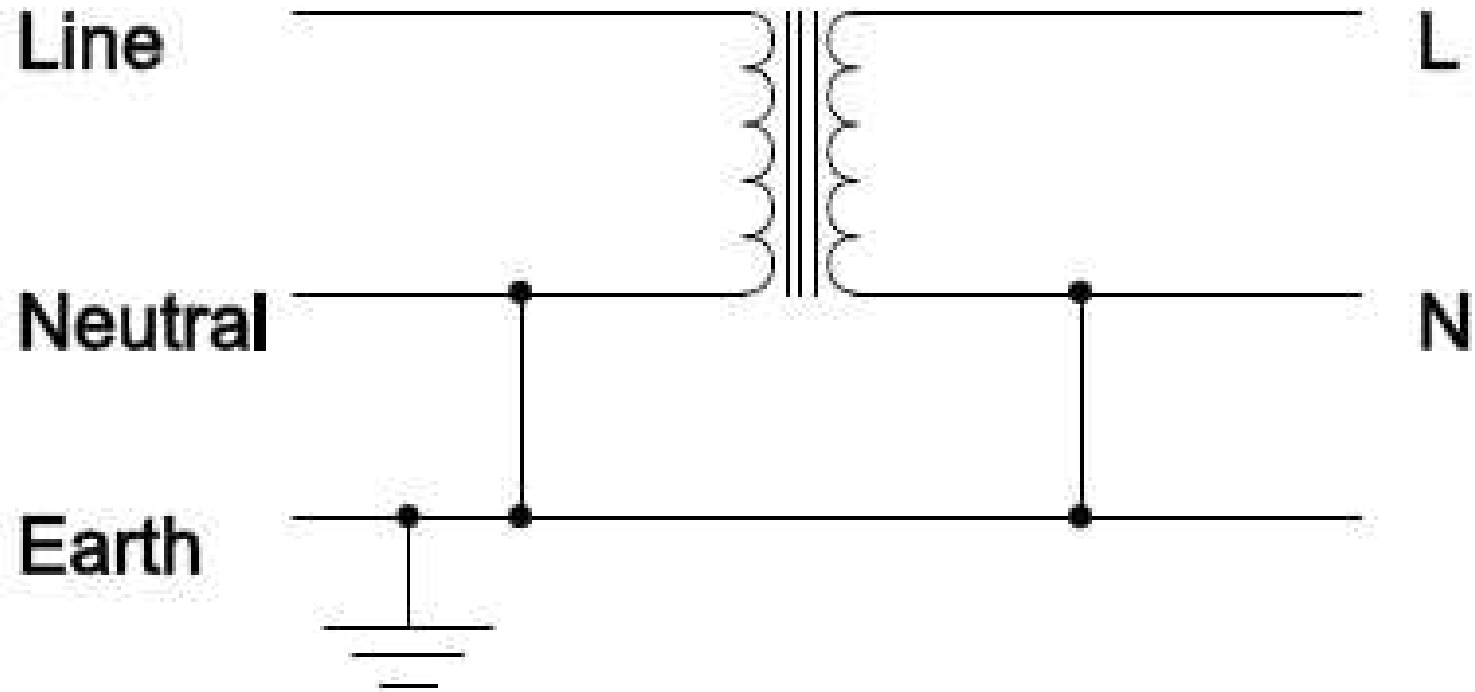
- ▶ SAFETY

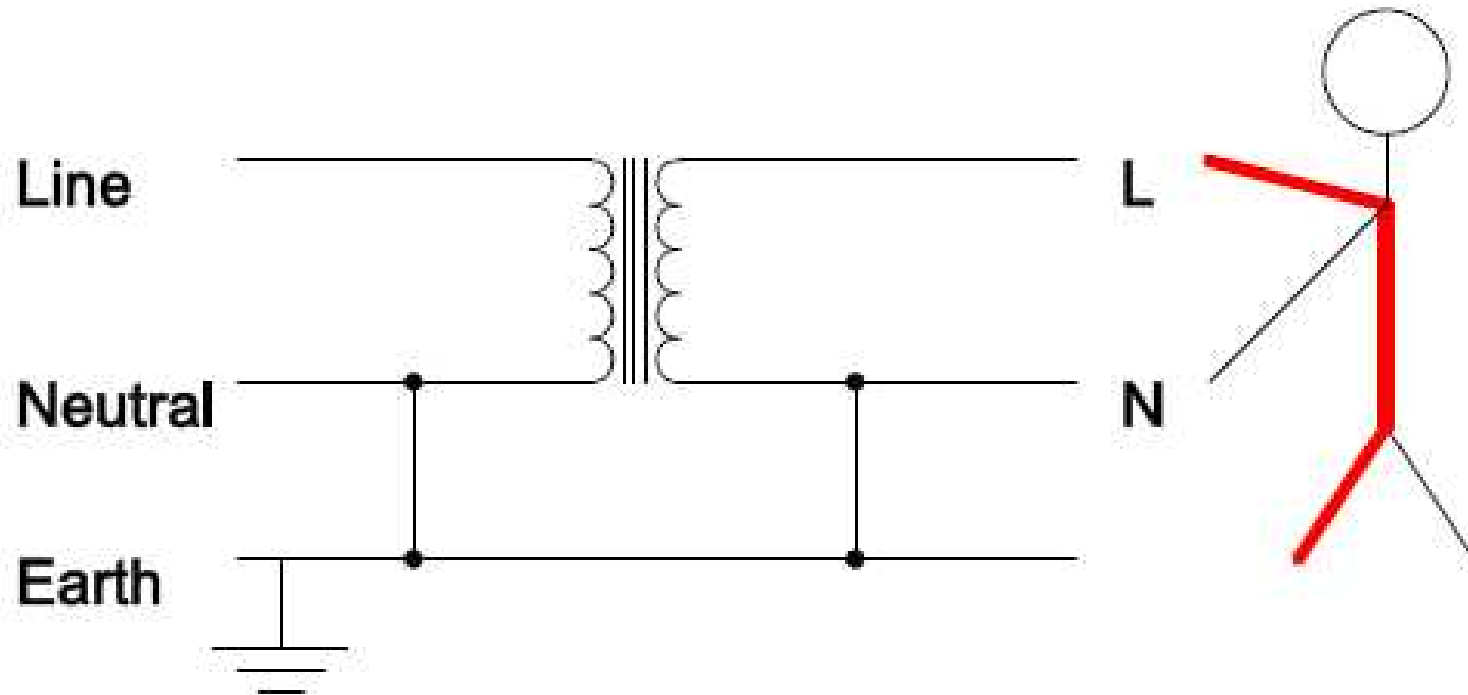


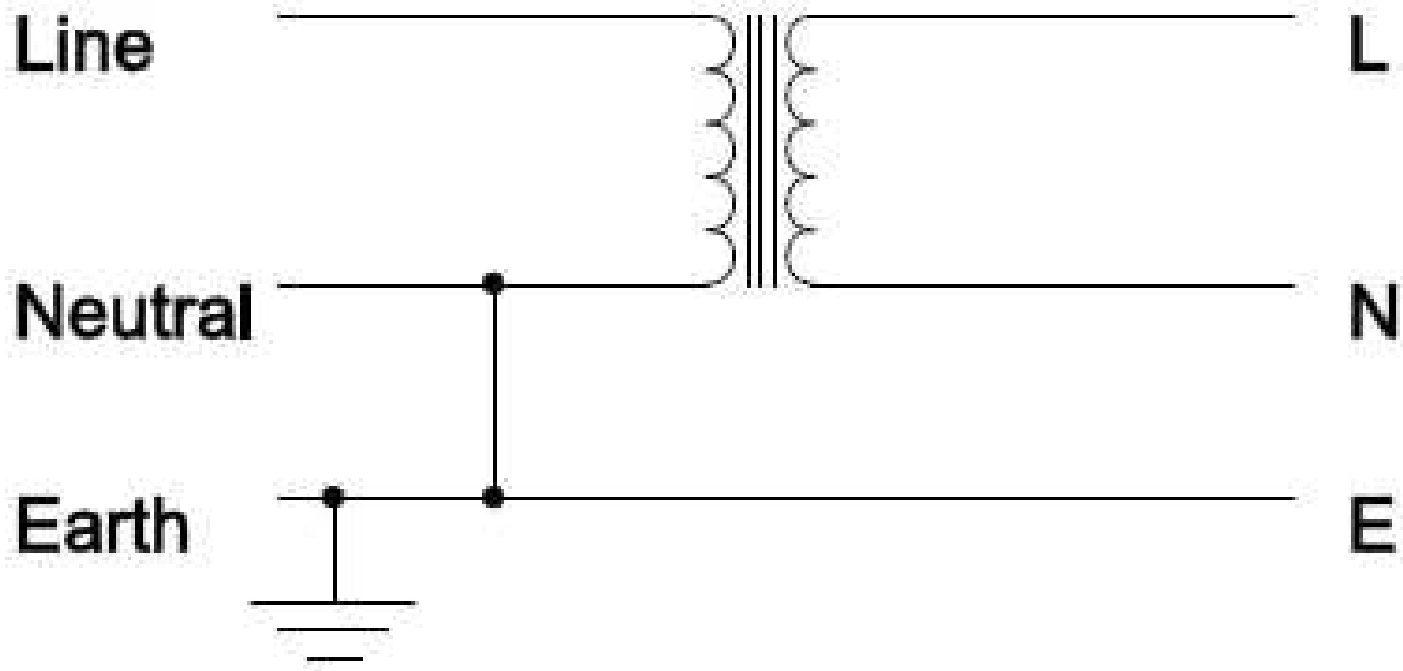
9V power supply

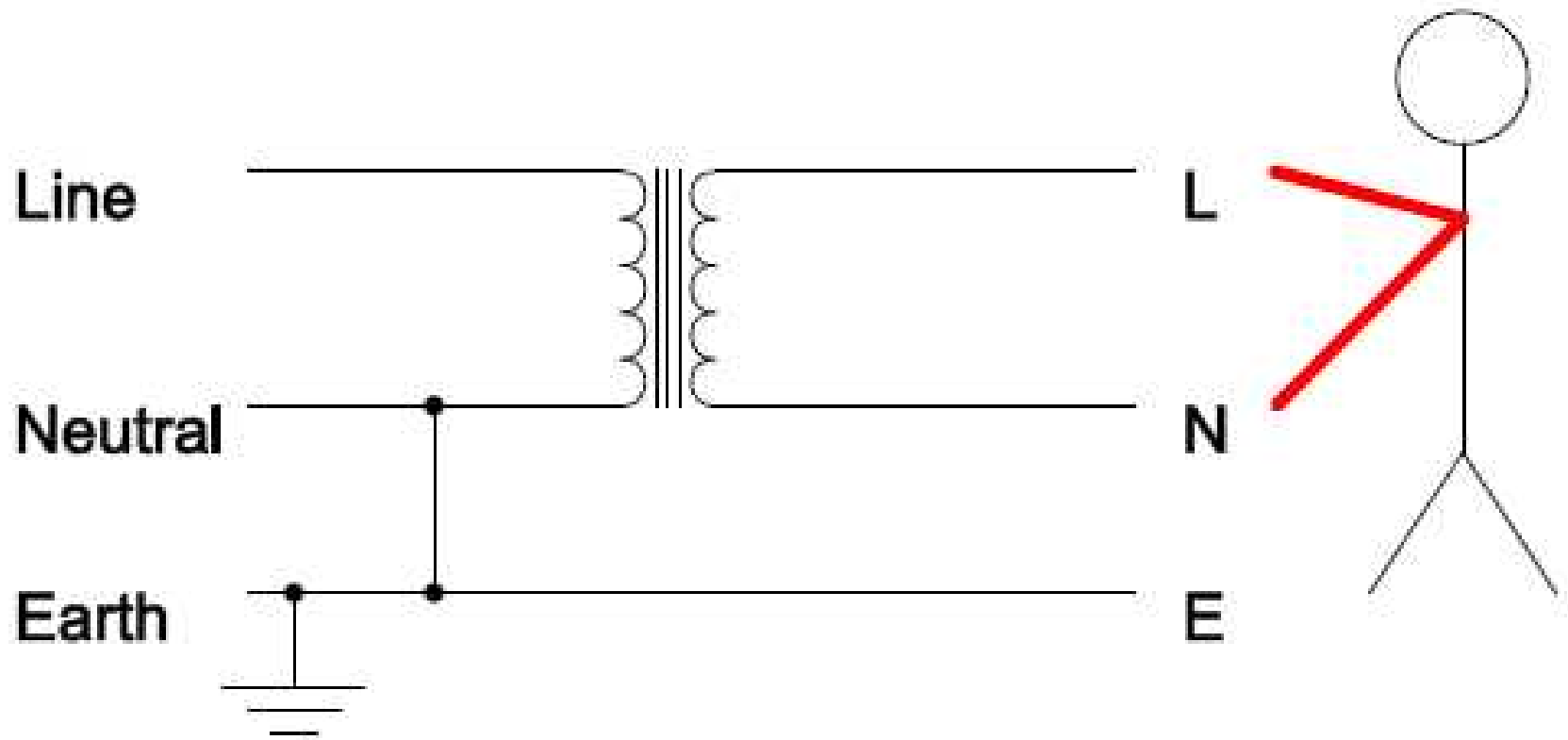


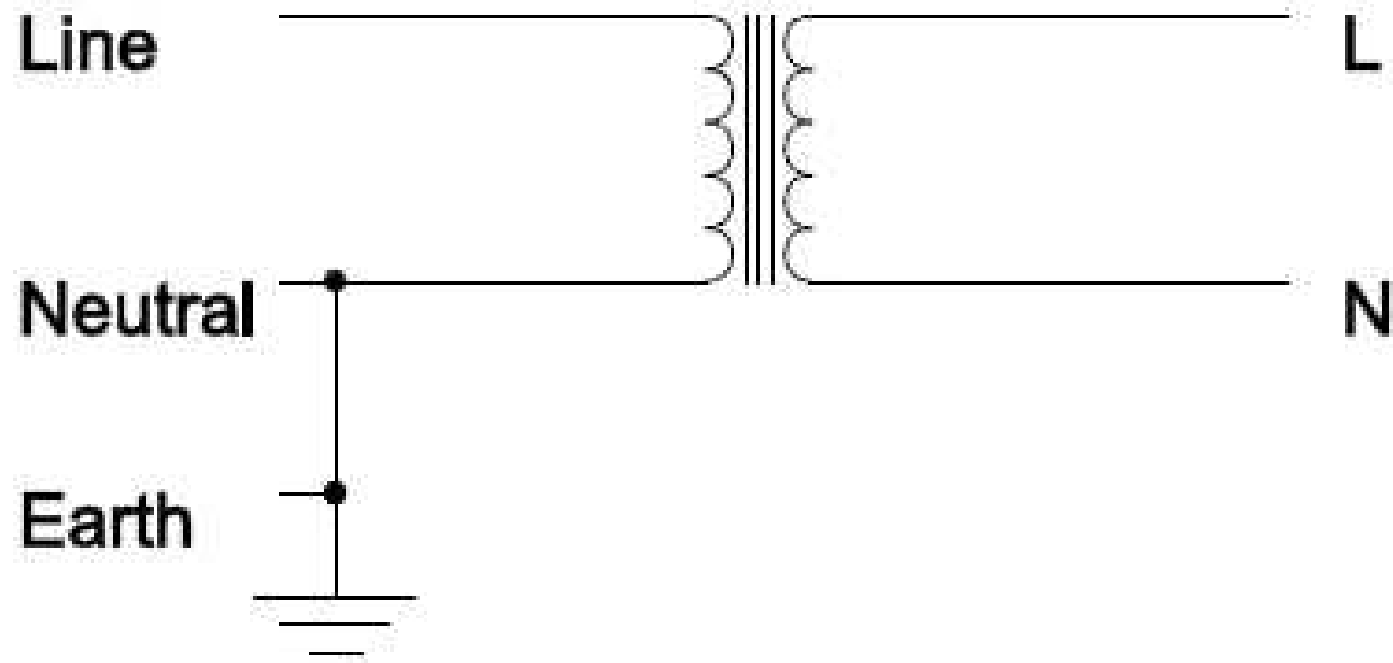
9V power supply











Medical Grade Isolation

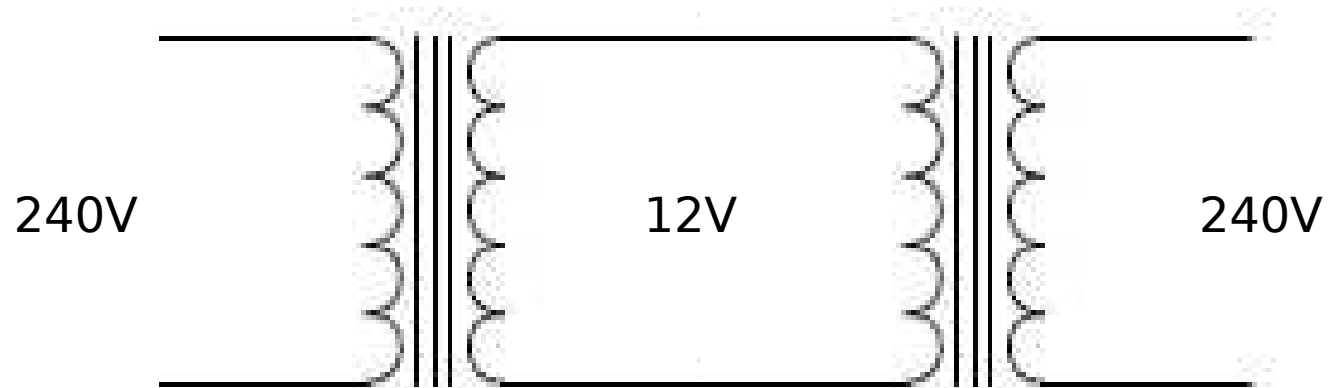








Poor Man's Isolation Transformer



alde francis

IT-15 ISOLATION TRANSFORMER



OUTPUT CURRENT

HI-TEMP



OUTPUT MODE

FLOATING

OFF

GROUNDED



AC OUTPUT



240V

RESET



FUSE



POWER

OFF



ON



CE

alder *power*

ITV-15 ISOLATED AC POWER SUPPLY



CURRENT



VOLTAGE

HI-TEMP



RESET



FUSE



AC OUTPUT



0-260V

OUTPUT MODE

FLOATING

OFF

GROUNDED



OUTPUT VOLTAGE



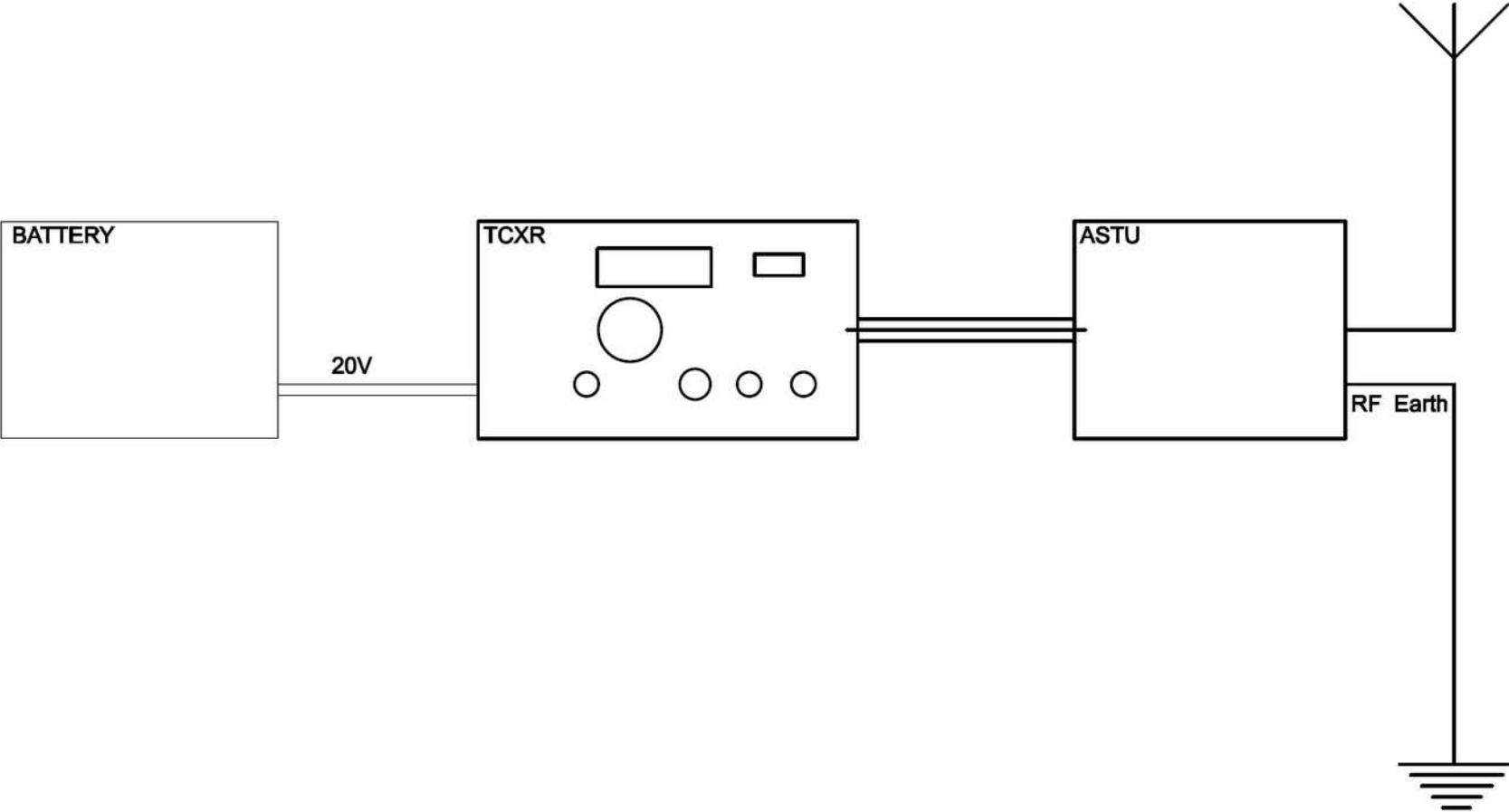
POWER

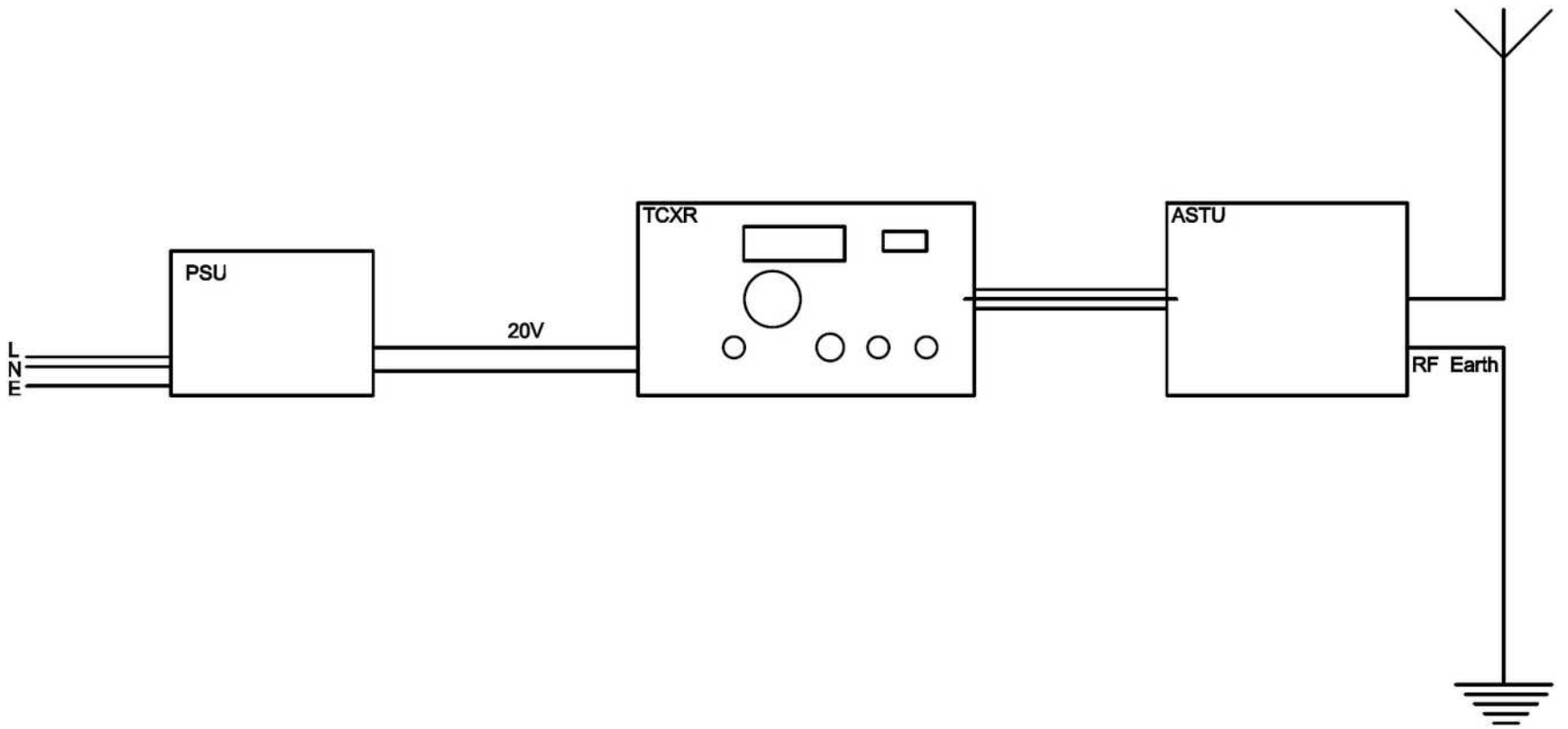
OFF



ON

CE





RSGB ADVICE

- ▶ Next, if you have a TN-C-S supply and must have that metal tower (with good tower grounding against lightning/static) and provided you have the space, then consider separating your shack from the TN-C-S system neutral-earth. If your shack is in an outbuilding or separate garage or similar, **convert it to a TT system, with its own dedicated earth.** Otherwise you have to cross bond the tower to the MET – and import the noisy mains earth with all that conducted interference possibly adding a couple of S points or more of background noise.
- ▶ If you have the funds, **convert the whole house to TT.** However, this is only possible if you have dedicated services to the property. If you have a flat, maisonette or terraced property the distribution network company may not let you convert your property due to the presence of shared services with your neighbours.
- ▶ **Convert a room to TT.** However, if you do this all forms of earthing in that room, must be separate from the house earth or electrically insulated. This includes radiators, pipes, exposed structural steel etc. It may be that an electrical storage radiator connected to the TT supply could be used to replace a metal water heating radiator, with its water bonding and gas bonded to the TN-S-C system.



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