



RADIO STATION GROUNDING

Sparks, for MARC, May 2024

- **Why**
- **How**
- **How NOT !!!**
 - **Ground Loop Penalty**
- **Examples ... good and bad**
- **Upstairs Station ground**
- **References**



WHY

- Power Line Surge Protection

- Lightning strike “protection” ... mitigation

- **noise reduction especially at HF**

- - - - -

- **you don't need lightning to get damage!**

cloud static discharge can do serious damage.



Station Grounding Objective

provide a really good path for electrical discharge away from your goodies.

Ground rods: 8' minimum

water them ... hint: gutter drain on it

How many ground rods do you need?

Where should they be?

near your Tower/mast/pole (metal)??? or not? ... OR ...

near station cable entry point OR BOTH!

attach the #4 ground wire to the ground rod, use the correct device —>>



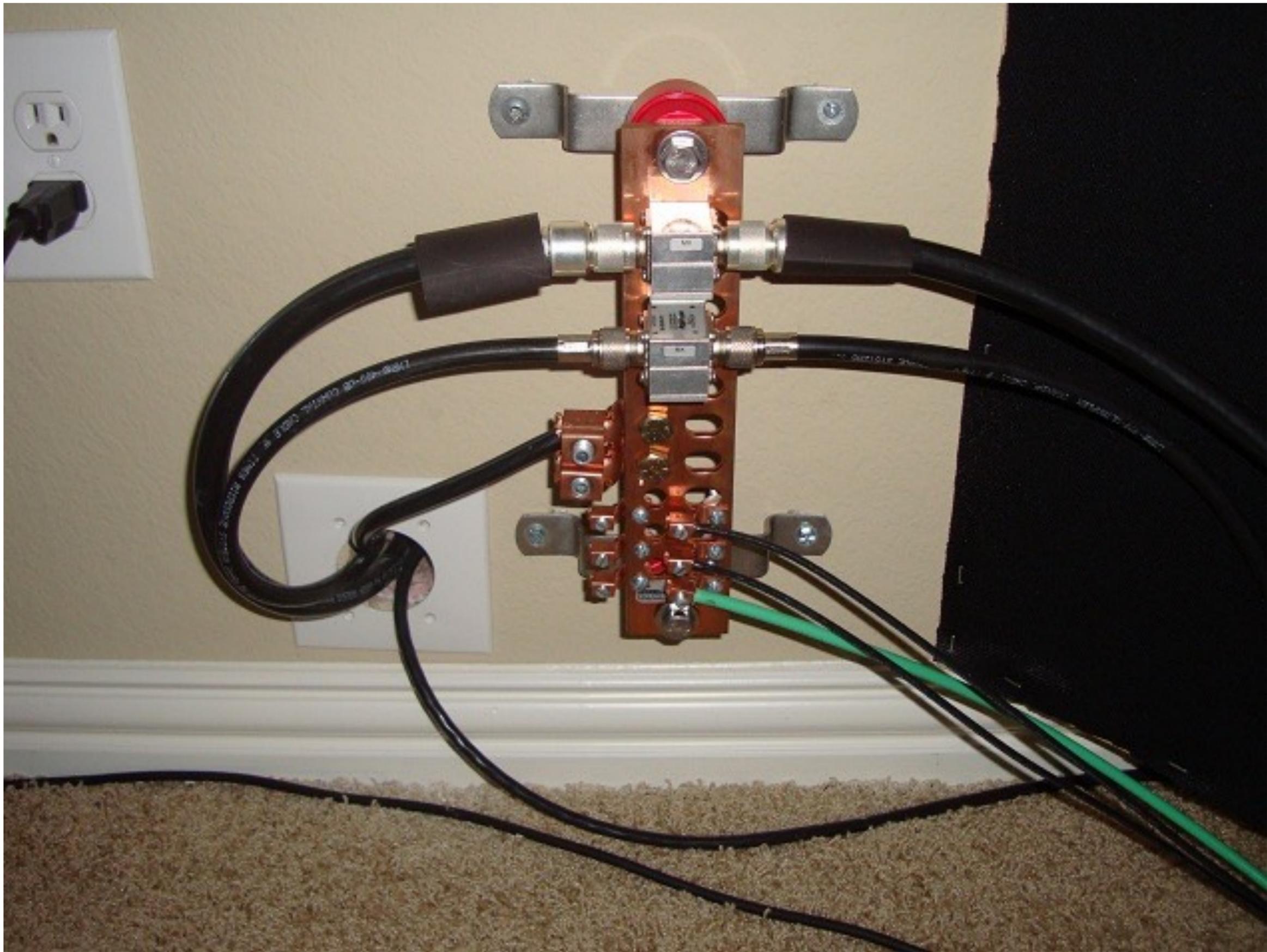


A simple effective example

a great solution if
no tower or metal mast

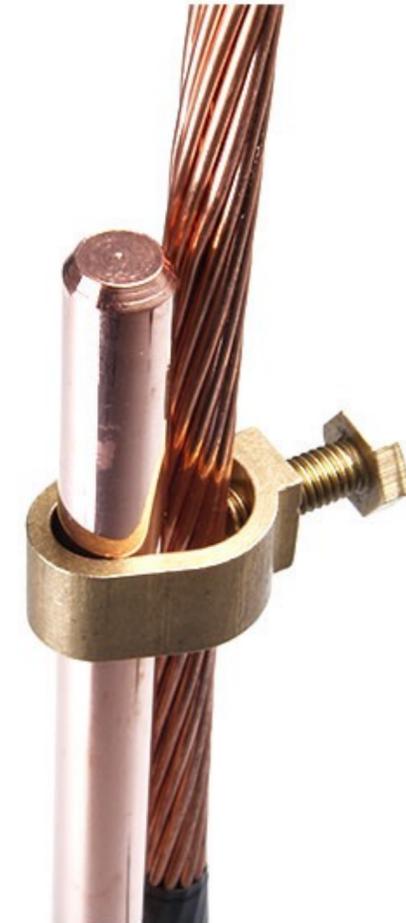
but this is only part of it, ...
other part is inside ...





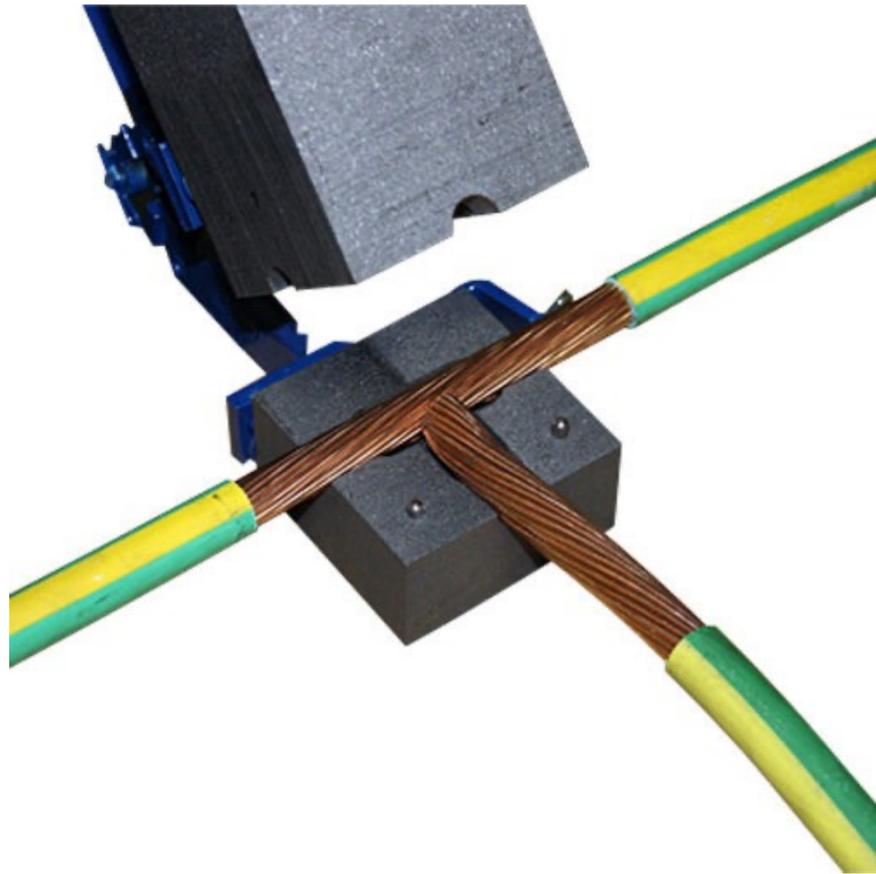






But ... there is a better way to make this connection ... and it's fun!!!

Cadweld



Yeah, fire and pestilence aaaarrggghh!

The CADWELD® PLUS ONE SHOT Process



Fig. 14
Remove and dispose of the used CADWELD® PLUS
weld metal cup.



Fig. 15
Break the ceramic CADWELD® ONE SHOT mold off
of the connection. Avoid contact with hot materials.
See the "Installers & Inspectors Guide" to see
whether a quality connection has been made.

The secret word is Thermite

REF: <https://www.nuclearelectricalengineer.com/cadwelds-work/>

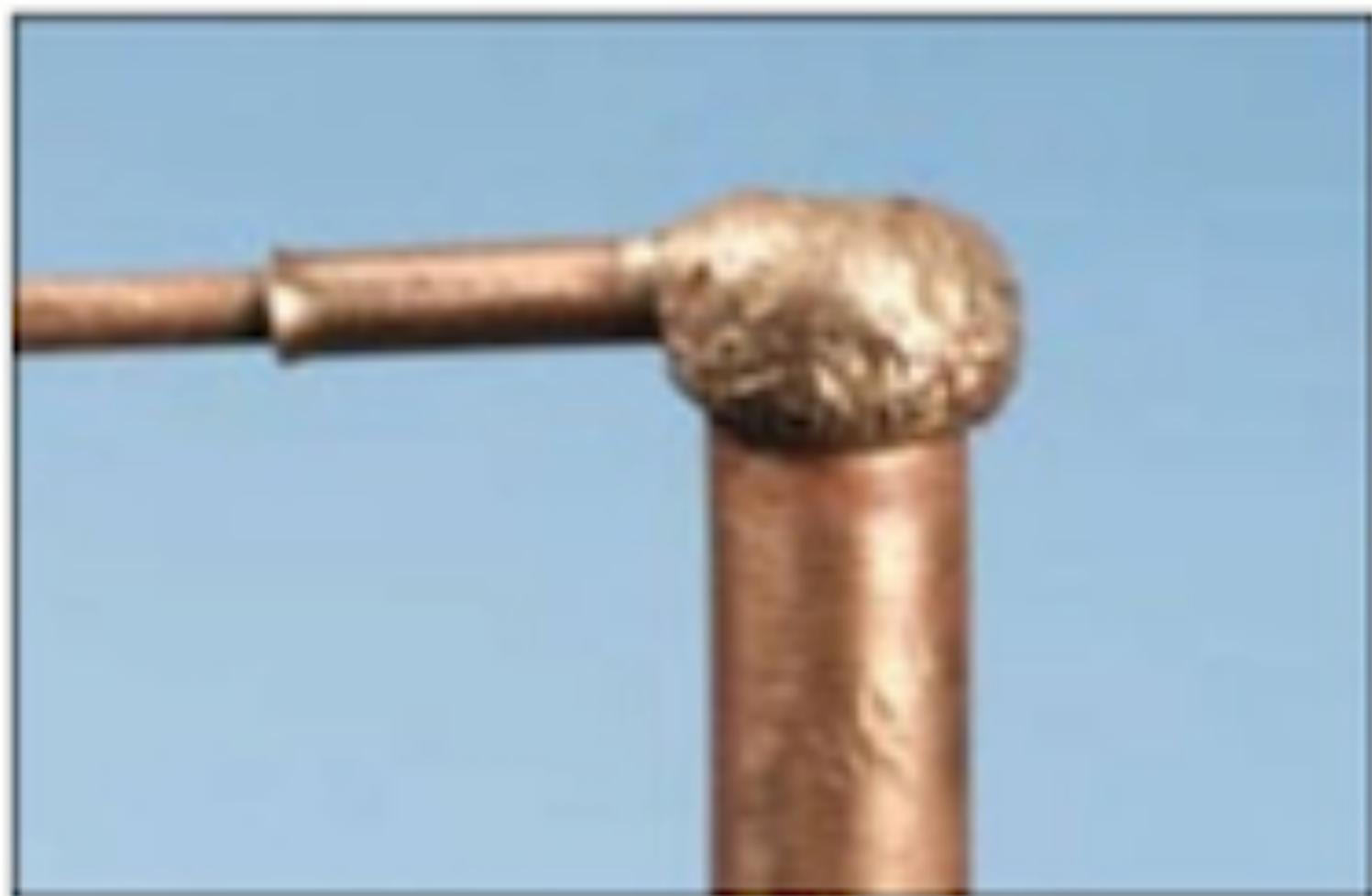


Fig. 16

You are ready to make another CADWELD® connection.

Another Example, but ...

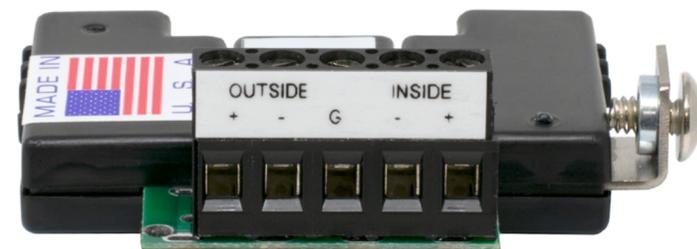
Use the most direct route from strike to earth.

In and out cables should not be in the same conduit.



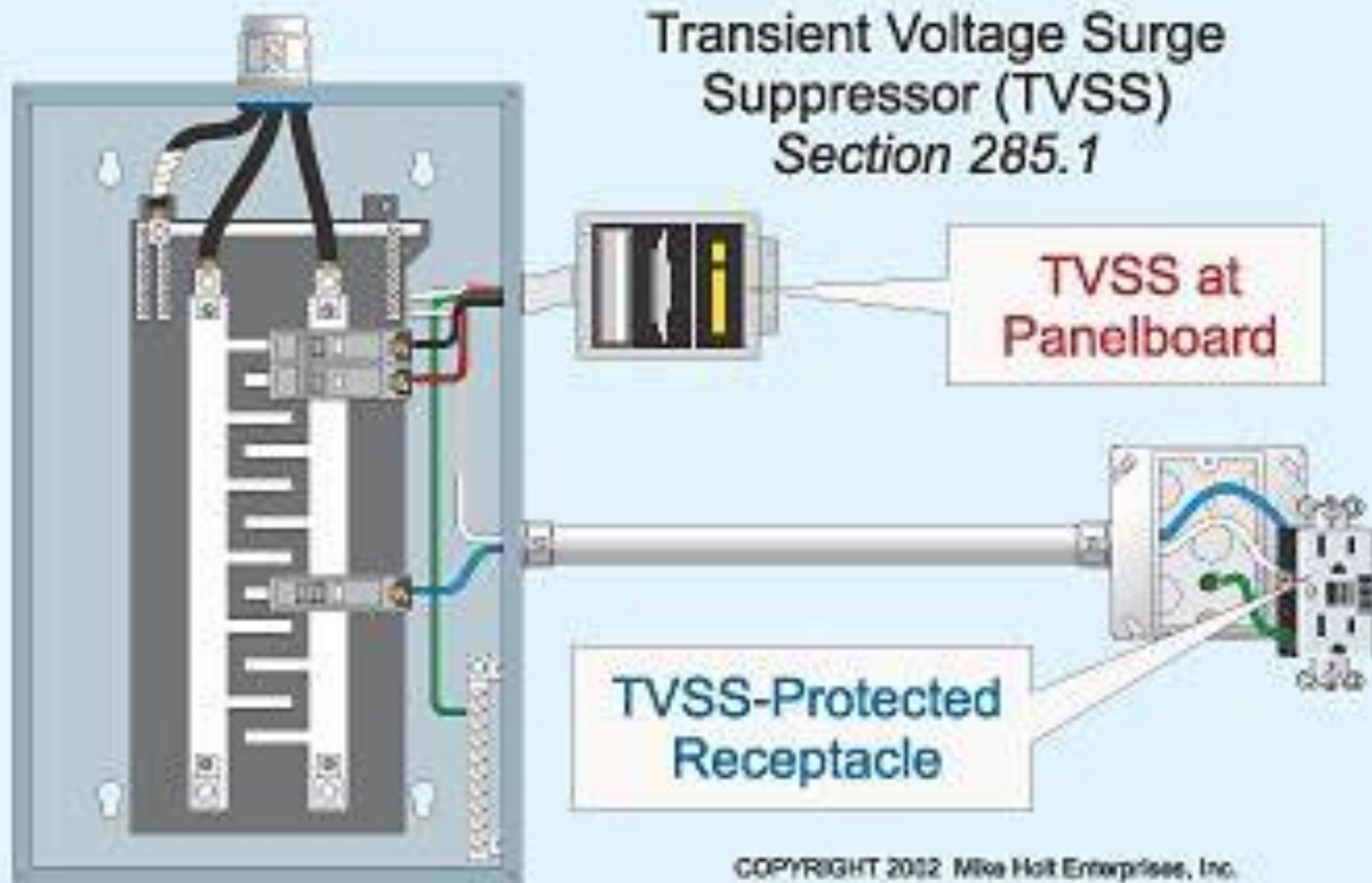


Surge Suppressors



Is your rotator cable protected?

Transient Voltage Surge Suppressor (TVSS) Section 285.1



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DON'T ... unless it's in a basement.



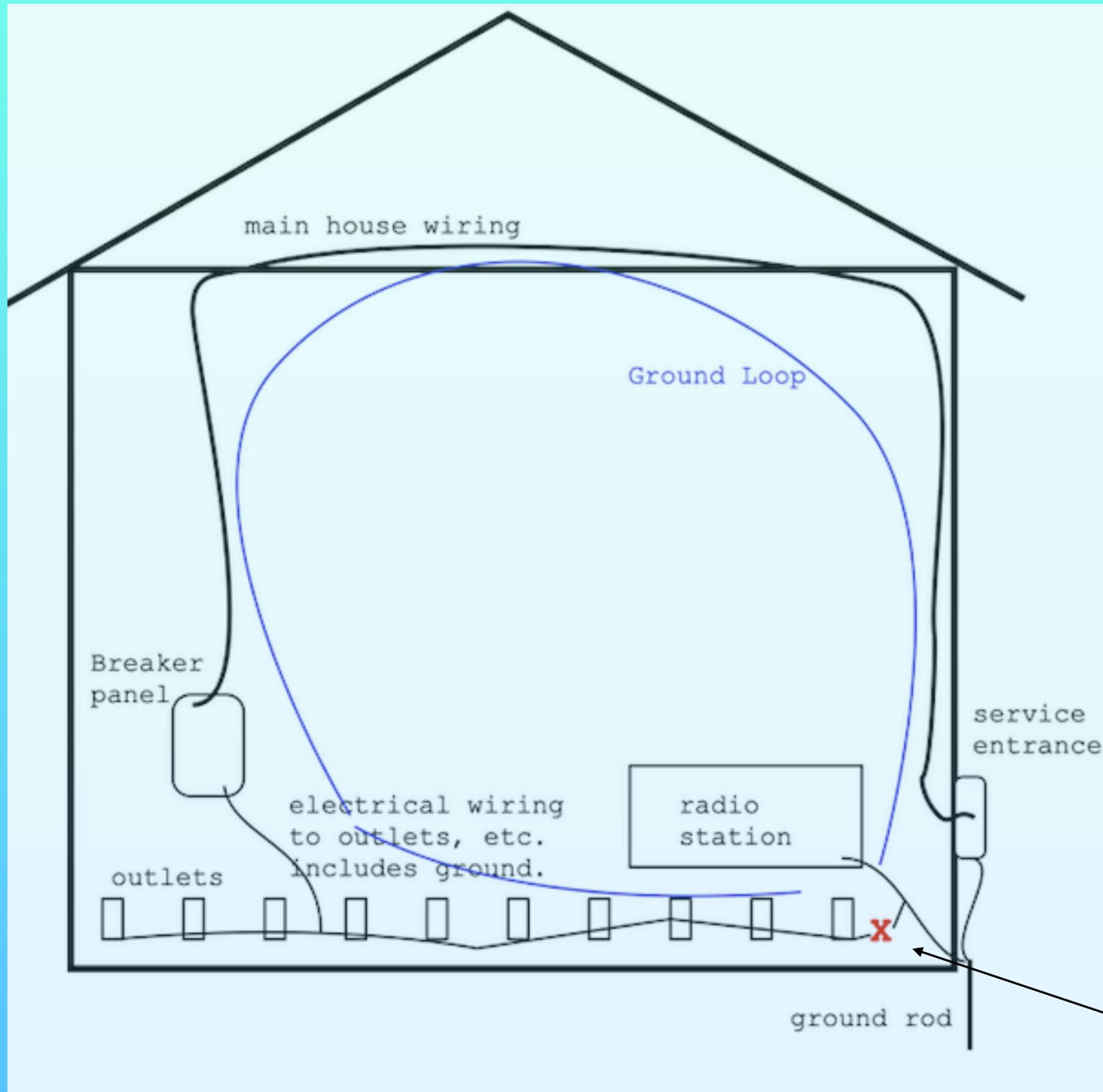
NO Ground Loops Allowed

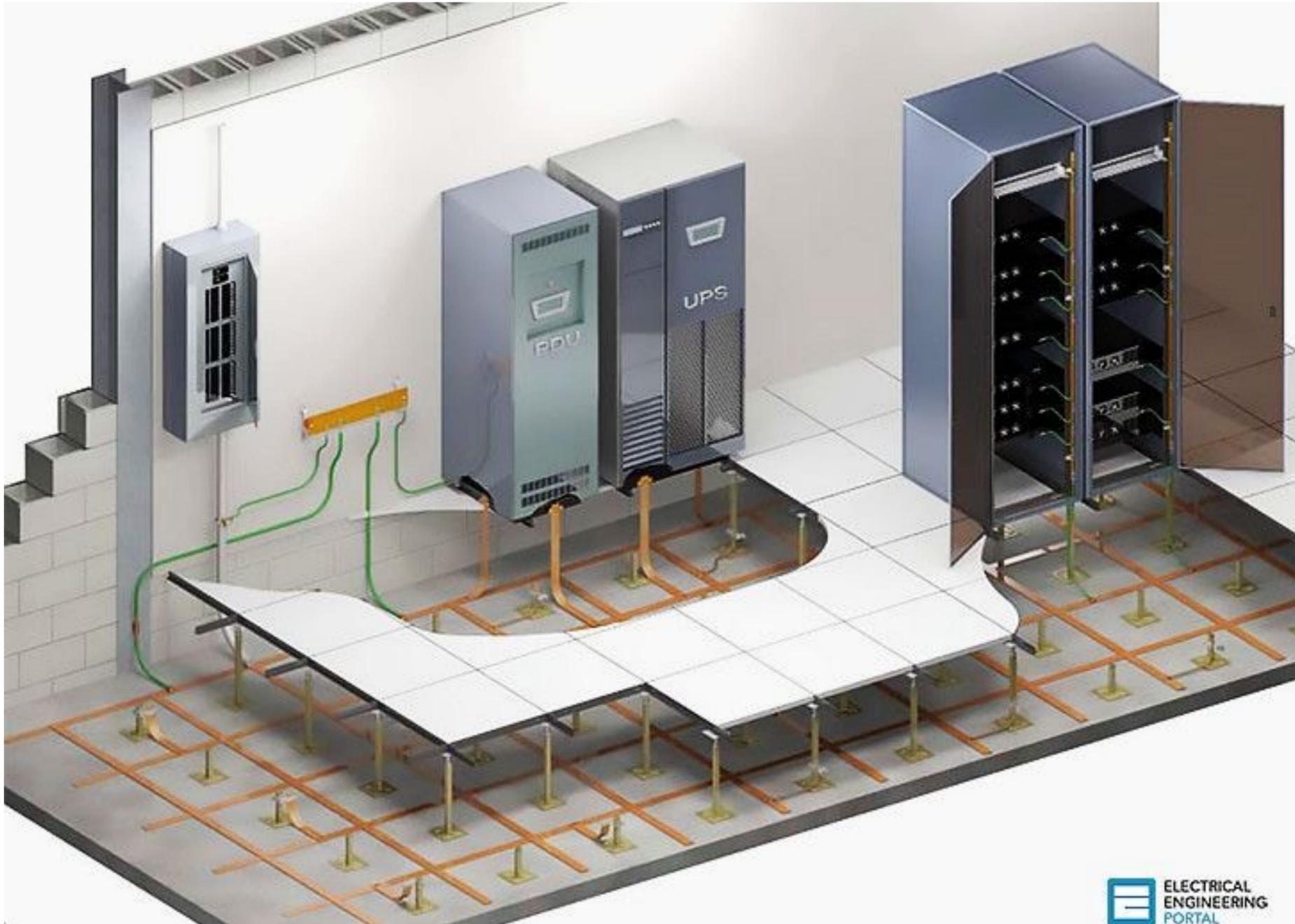
The “MAINS” power is taken from the Service Entrance (Meter) Box to the breaker panel, and then to each light and outlet.

A ground loop picks up noise and may even cause the station to have elevated ground potential ... AC and DC.

Your **station power supply** isolates the electrical mains from the 12V equipment power; including and especially **GROUND**

MUST keep it isolated, see the **X**.





What about an upstairs station

—>>> START HERE: https://www.w8ji.com/second_floor_grounding.htm

“Installing a ground plane at room level is the most practical way to minimize RF in the above-ground shack.” Tom, W8JI.

Inexpensive approach that works:

copper mesh on the floor “under the carpet” with a ground buss strap to the ground rod. ... or on the station desk under the “blotter”.

For upstairs station: Cover the desk or floor or work top ... and run a copper strap or braid ... shortest length possible to the ground rods and each item gets its own short lead to the ground mesh.



Roll over image to zoom in



12" x 120" Copper Mesh Screen 40 Mesh Pure Copper Wire Copper Fabric for Grounding Copper Dense Filter Screen Mesh Woven Copper Mesh Crafts Window Protection

Brand: Therwen

4.8 ★★★★★ 20 ratings | [Search this page](#)

Amazon's Choice Overall Pick

100+ bought in past month

\$23⁹⁹

Get Fast, Free Shipping with Amazon Prime

FREE Returns

| | |
|-------------|----------|
| Material | Copper |
| Brand | Therwen |
| Finish Type | Polished |

About this item

- Size and Dimensions: copper screen wire is about 12 x 120 inches/ 30.48 x 304.8 cm, the mass is about 14 ounces/ 0.404 kg, the diameter of copper wire is about 0.13 mm/ 0.01 inches, 40 mesh, rolled packaging, not easy to bend and there are soft creases, nice folding packaging makes it will not be broken and more beautiful

https://www.amazon.com/Therwen-Copper-Screen-Grounding-Protection/dp/B0C1YPJG4R/ref=sr_1_2_sspa?dib=eyJ2IjojMSJ9.-o6dD4nIACY0E4KFSxPUCKKBtmAZYvop2BrZRJbEoy9eMBucO2dpsz-Tx_tmShXH7Cf0nDMQJk1vZLLhi9Zgk8QQG4jo6Sei7UEnvkB-5JFk3HVmb8cAbNviXpl5K32yWd1_Whpsl6lCufCYM3gZpebHninhEGb4W_R4UYnIZ9xNH1ymELiik7KiiqNHF9BLjhs4klaamL1P7fpEGBVPnKSiihT0xHlhxGhDsLnsXEo.qjBX7ZMbkaQulbMBqNpWv9hIIXLDr2u_VtB4iaRJCTe&dib_tag=se&keywords=copper+screen+mesh&qid=1716219066&sr=8-2-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1

REFERENCES

<https://www.arrl.org/grounding-and-bonding-for-the-amateur> a book

<https://www.arrl.org/forum/topics/view/2600> a forum

<https://helpdesk.flexradio.com/hc/en-us/articles/204779159-Grounding-Systems-in-the-Ham-Shack-Paradigms-Facts-and-Fallacies>

<https://www.youtube.com/watch?v=EE7CbKAbo4Q> a youtube video

<https://www.nf8m.com/nf8m/presentations/grounding-and-bonding-for-the-average-ham/>

Look at W2VP's QRZ page; scroll down to see the grounding pictures.

<https://k6hr.com/index.php/2018/02/08/grounding/>

<https://laradioa360gradi.blogspot.com/2015/05/grounding-systems-in-ham-shack-du1anv.html>

- - - - SEARCHING - - - -

Use this search term: "grounding a radio communications station" ... but note this: use duckduckgo

Use this search term: "images grounding a radio communications station" ... use duckduckgo

or [startpage.com](https://www.startpage.com)