



# AR Station Grounding

- ◆ Grounding - Why do We Ground?
  - ◆ Radio Performance
  - ◆ Personal Safety
  - ◆ Lightning "Protection"
  - ◆ Tradition ?



# AR Station Grounding

- ◆ Station Performance
  - ◆ Receiving - Signal Reference
  - ◆ Receiving - Noise Rejection
  - ◆ Transmitting - Radiative Efficiency
  - ◆ Antenna & Noise - Balanced or Not
  - ◆ This Ground is Part of the Antenna



# AR Station Grounding

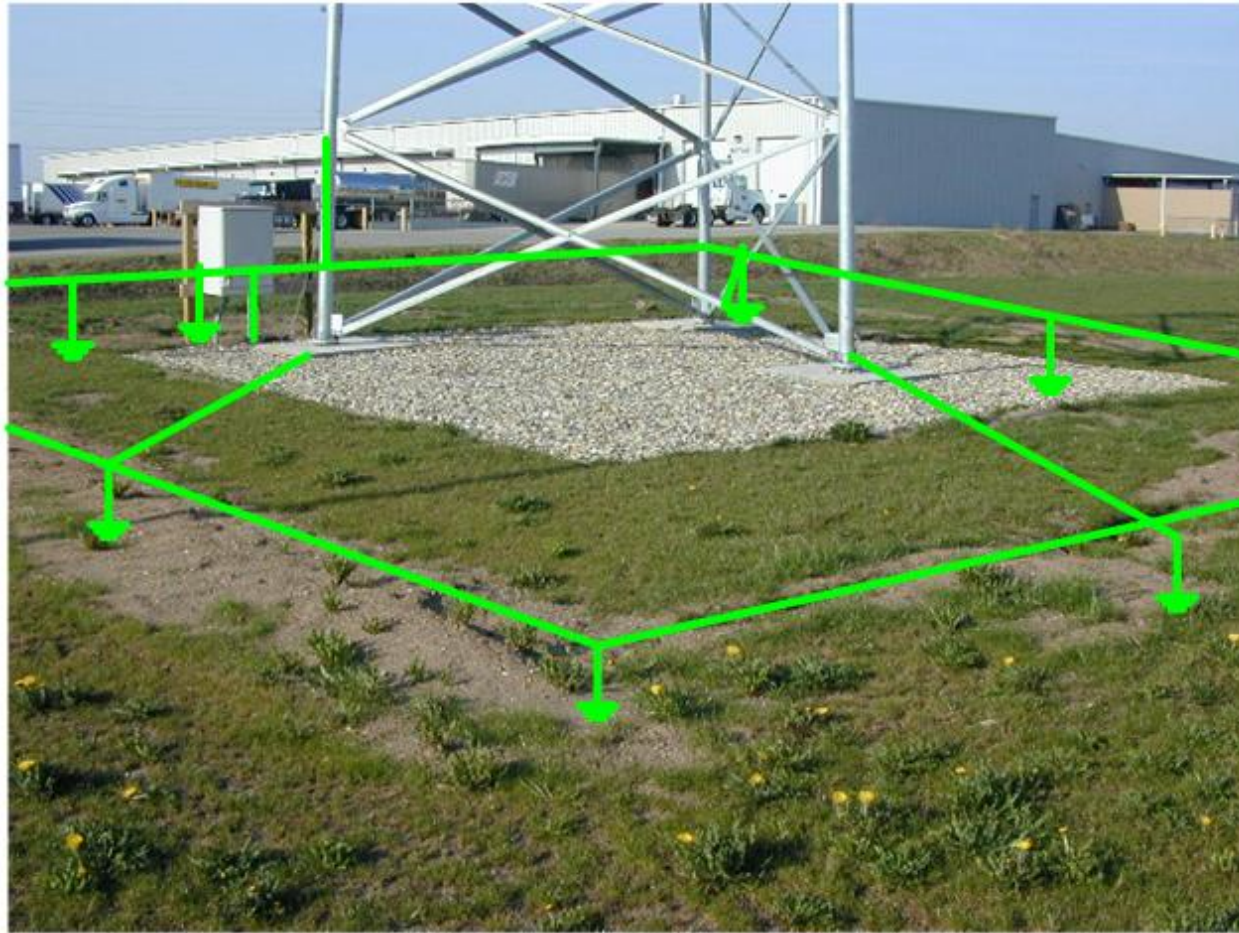
- ◆ Personal Safety - Codes
  - ◆ Power Ground
  - ◆ Bypass Leakage Currents
  - ◆ No Float - Voltage Feedback Radio



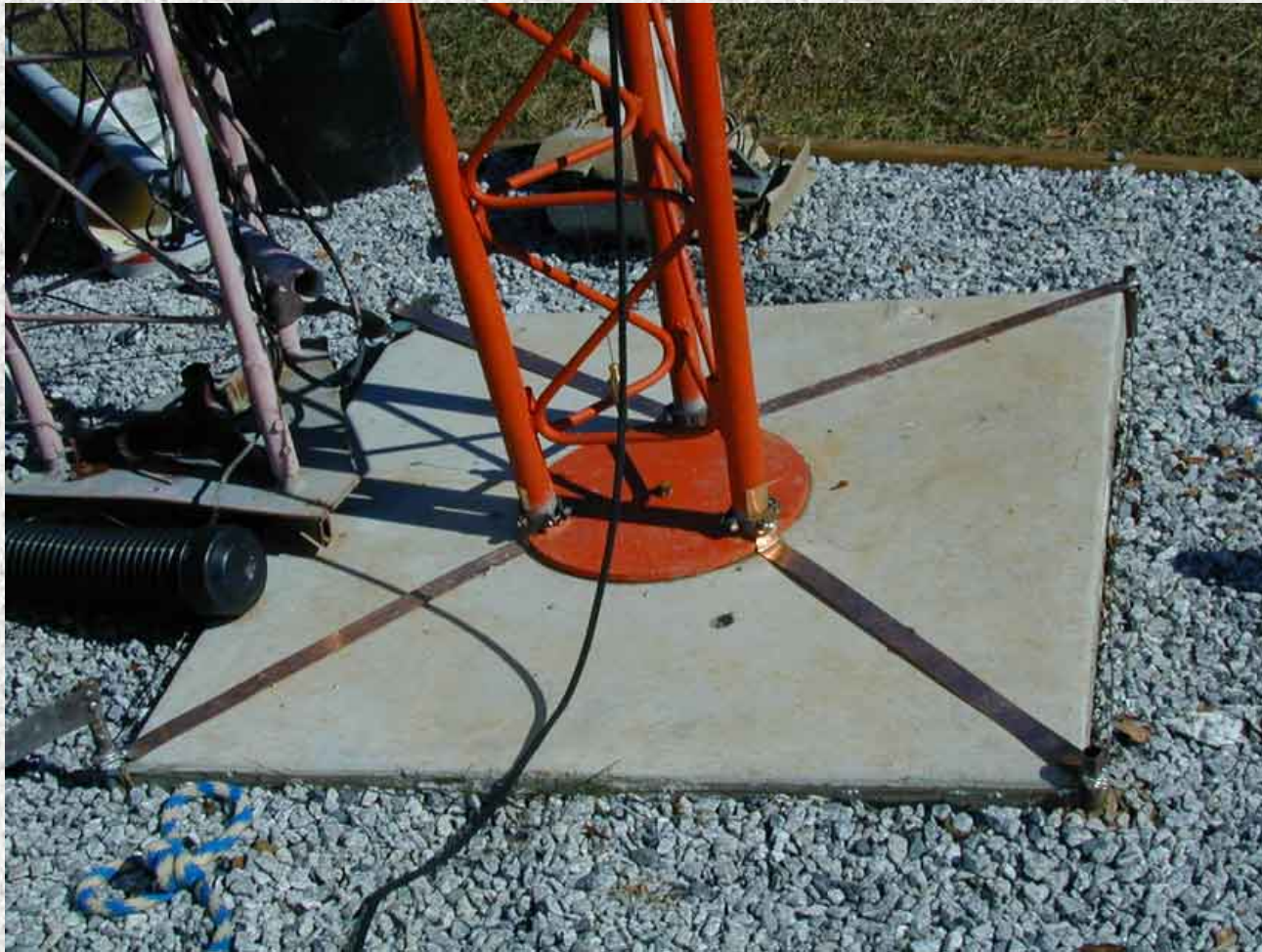
# AR Station Grounding

- ◆ Lightning & Static Protection
  - ◆ Structure Protection - Tower
  - ◆ High Voltage Surges
  - ◆ Current Effects (EMP)
  - ◆ Static Build-up (Wind Static)
  - ◆ Virtual Grounding Ineffective
  - ◆ All Lightning Issues are Probability

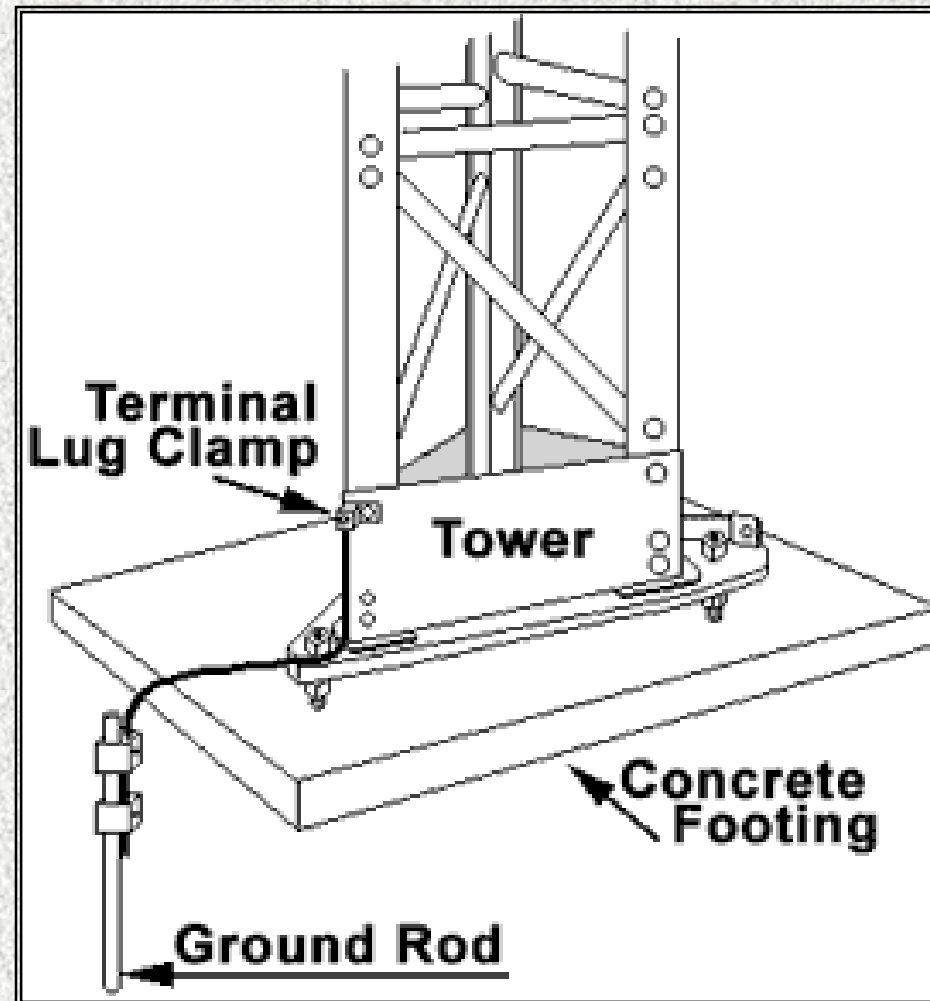
# Tower Grounding



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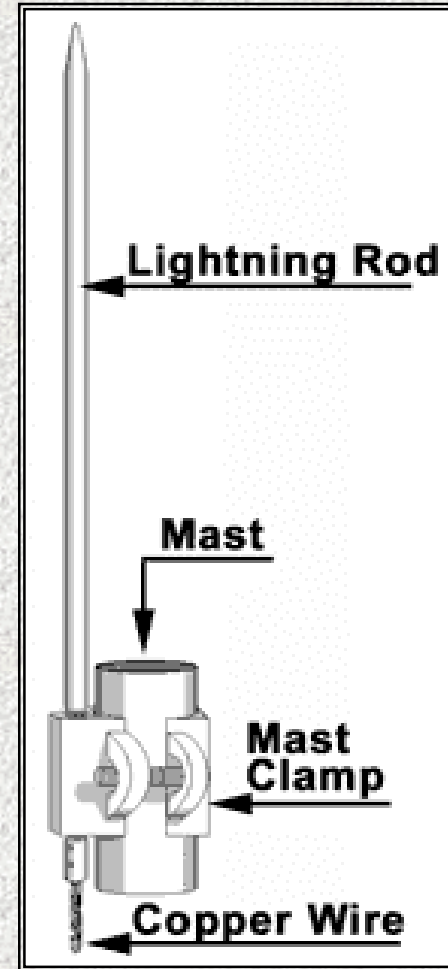
# Tower Grounding

**WRONG WAY !!!**





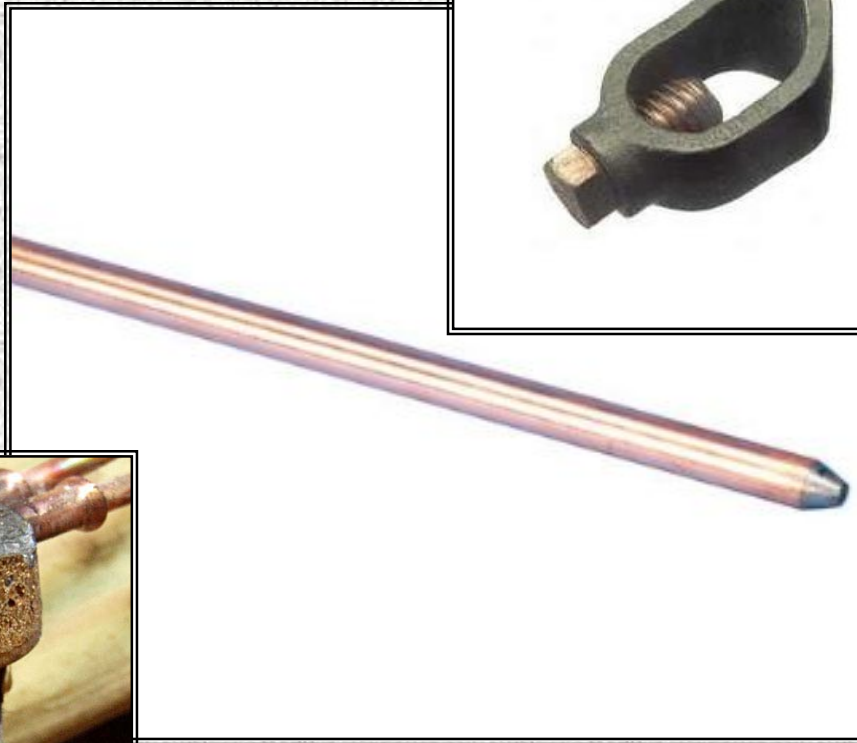
# Tower Static Control



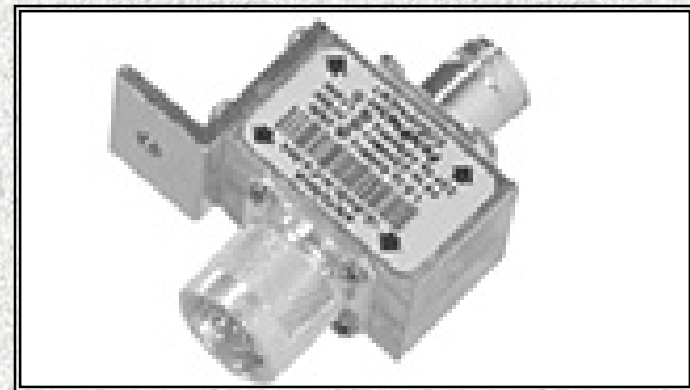
# Antenna Grounding



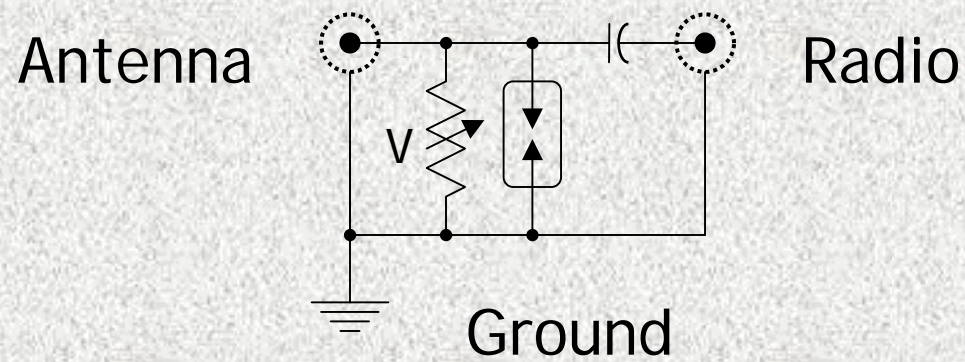
# Grounding Hardware



# Voltage Surge Control



# Voltage Surge Control





# AR Station Grounding

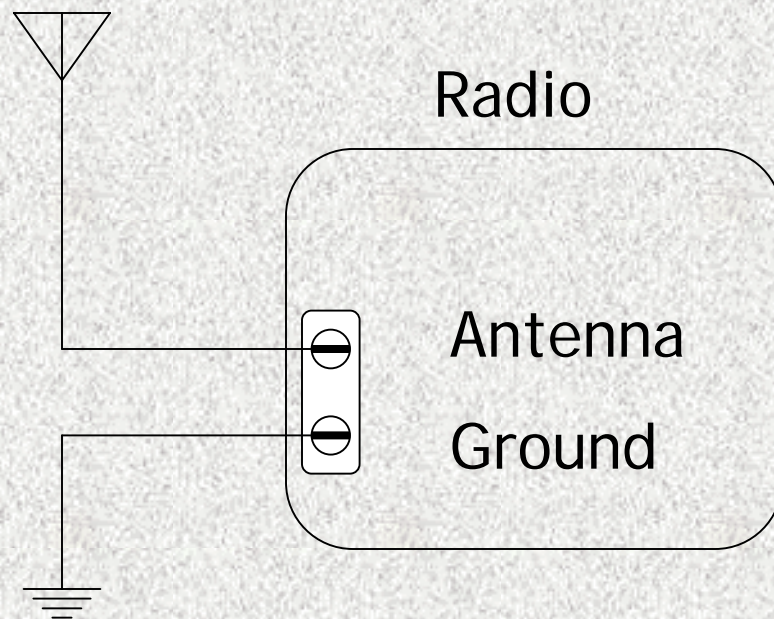
- ◆ Solutions
  - ◆ No One Solution for All Cases
  - ◆ Don't Ground Just to Ground
  - ◆ Set-up One Case for "On-air"
  - ◆ Set-up Another for "Sleeping"
    - ◆ Ground Everything In Case of a Storm
    - ◆ Unplug Everything Also
    - ◆ Disconnect Antennas



# AR Station Ground (1)

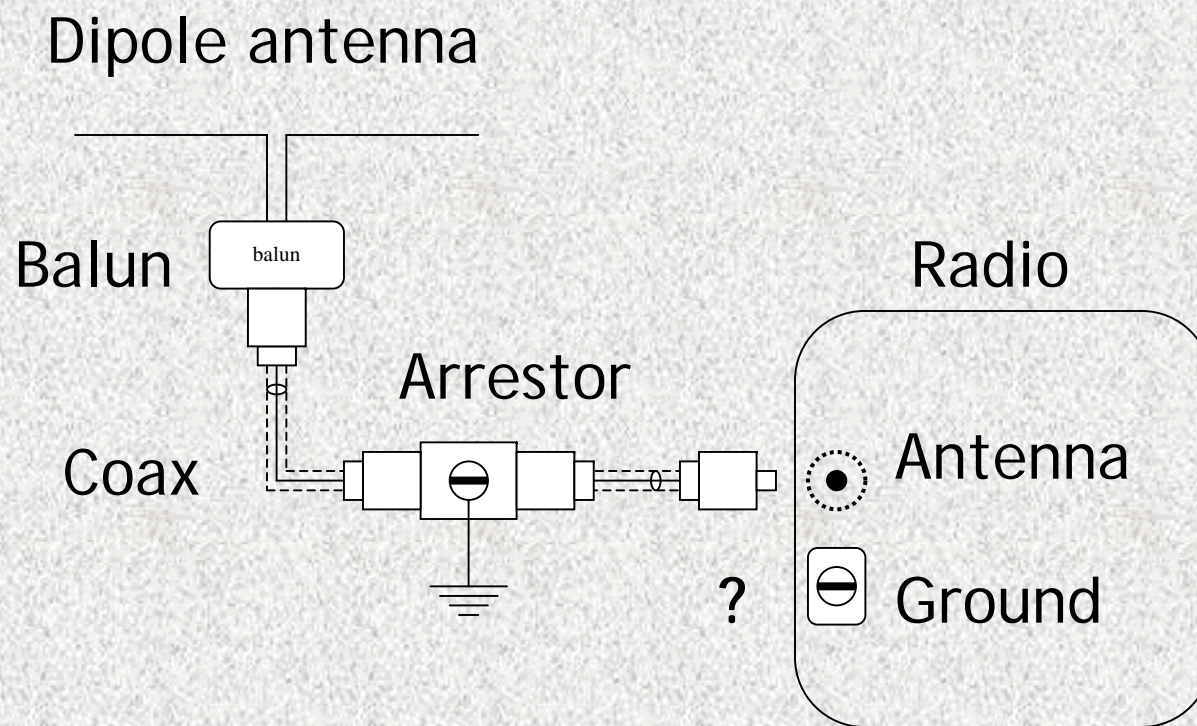
- ◆ Discussion (1)
  - ◆ Who Says We Need a Ground ?
  - ◆ The NEC (Code) Only Specifies One
  - ◆ Let's Think About This Logically
  - ◆ So Many Configurations Possible
  - ◆ Ground by Trial

# Traditional Radio Connection





# Modern Radio Connection

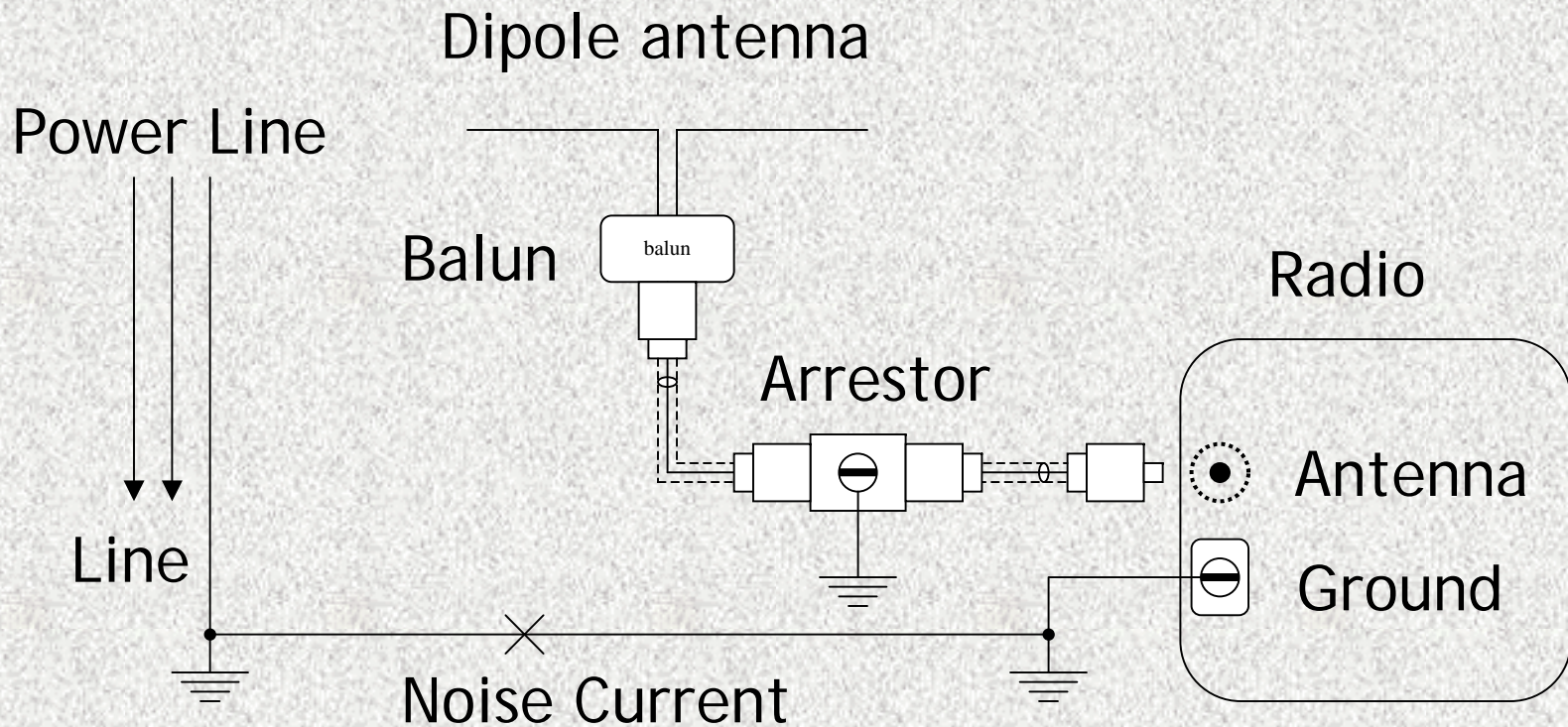




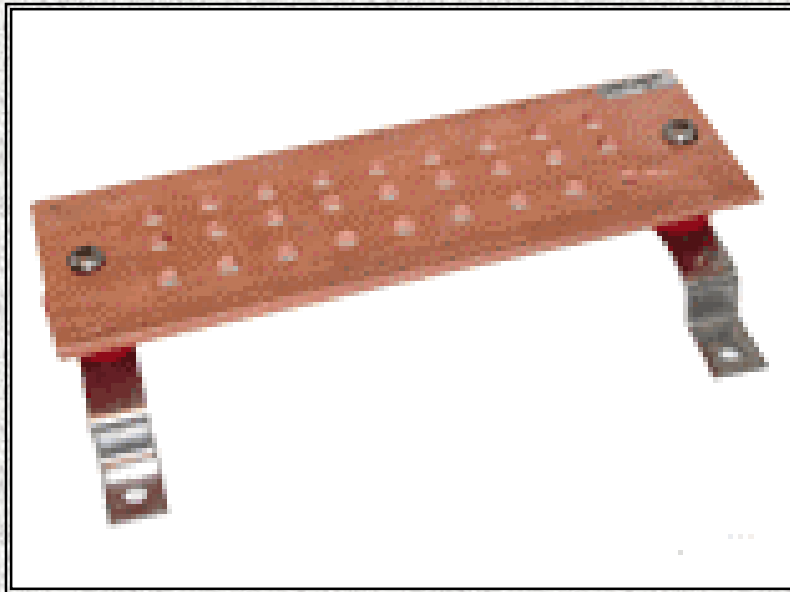
# AR Station Ground (2)

- ◆ Discussion (2)
  - ◆ Station Ground ?
  - ◆ The Theoretical Single Point Ground
  - ◆ Ground Noise Currents
  - ◆ Portable Operation
  - ◆ Mobile Operation

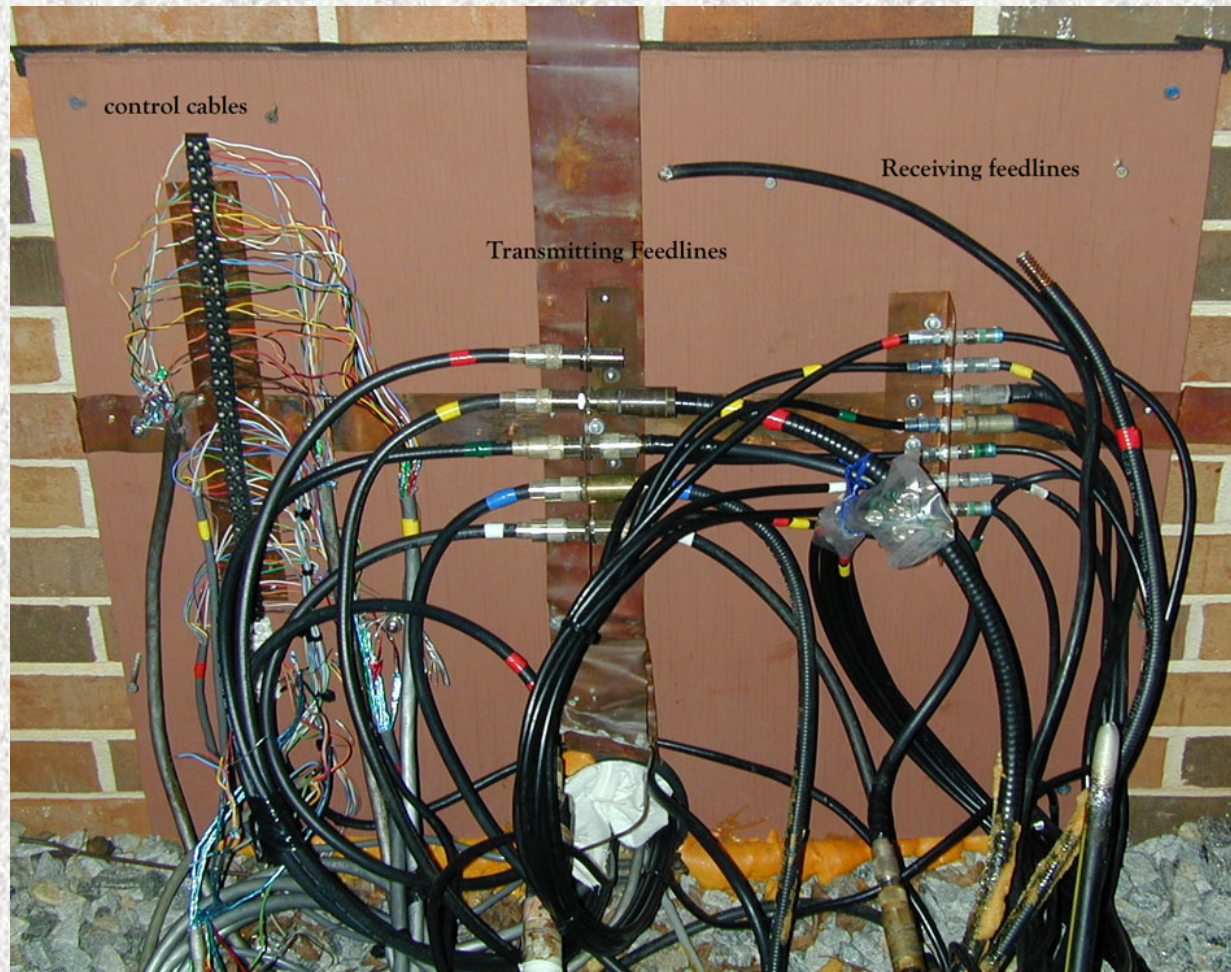
# Ground Noise Sources



# Station Ground Bar



# Station Ground



## Grounding and Lightning Protection Resources

1. ARRL has many sources on Grounding and Lightning
2. List of Information links:
  - <http://www.arrl.org>
  - <http://www.protectiongroup.com/PolyPhaser>
  - <http://n3oc.dyndns.org/trench.htm>
  - [http://www.w8ji.com/station\\_ground.htm](http://www.w8ji.com/station_ground.htm)
  - <http://www.ve3sqb.com/hamaerials/kf6gdj/>
  - [http://www.dxzone.com/catalog/Technical\\_Reference/Grounding/](http://www.dxzone.com/catalog/Technical_Reference/Grounding/)
  - <http://www.dxengineering.com/pdf/LightningProtection-Rev2.pdf>

## Grounding and Lightning Protection Resources

### 3. List of supplier links:

- <http://www.harger.com/>
- <http://www.dxengineering.com/>
- <http://www.protectiongroup.com/PolyPhaser>
- <http://www.alphadeltacom.com/>
- <http://www.stormcopper.com/>
- <http://www.gacopper.com/index.html>
- <http://www.aesham.com/>
- <http://www.grainger.com/Grainger/wwg/start.shtml>