

Lightning Protection



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Lowell Digisonde International, LLC

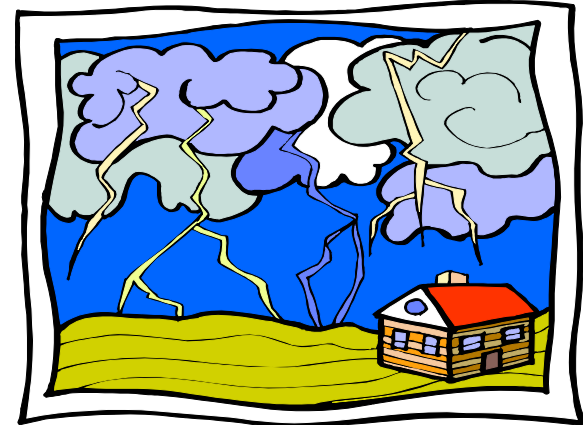
IGF 2014

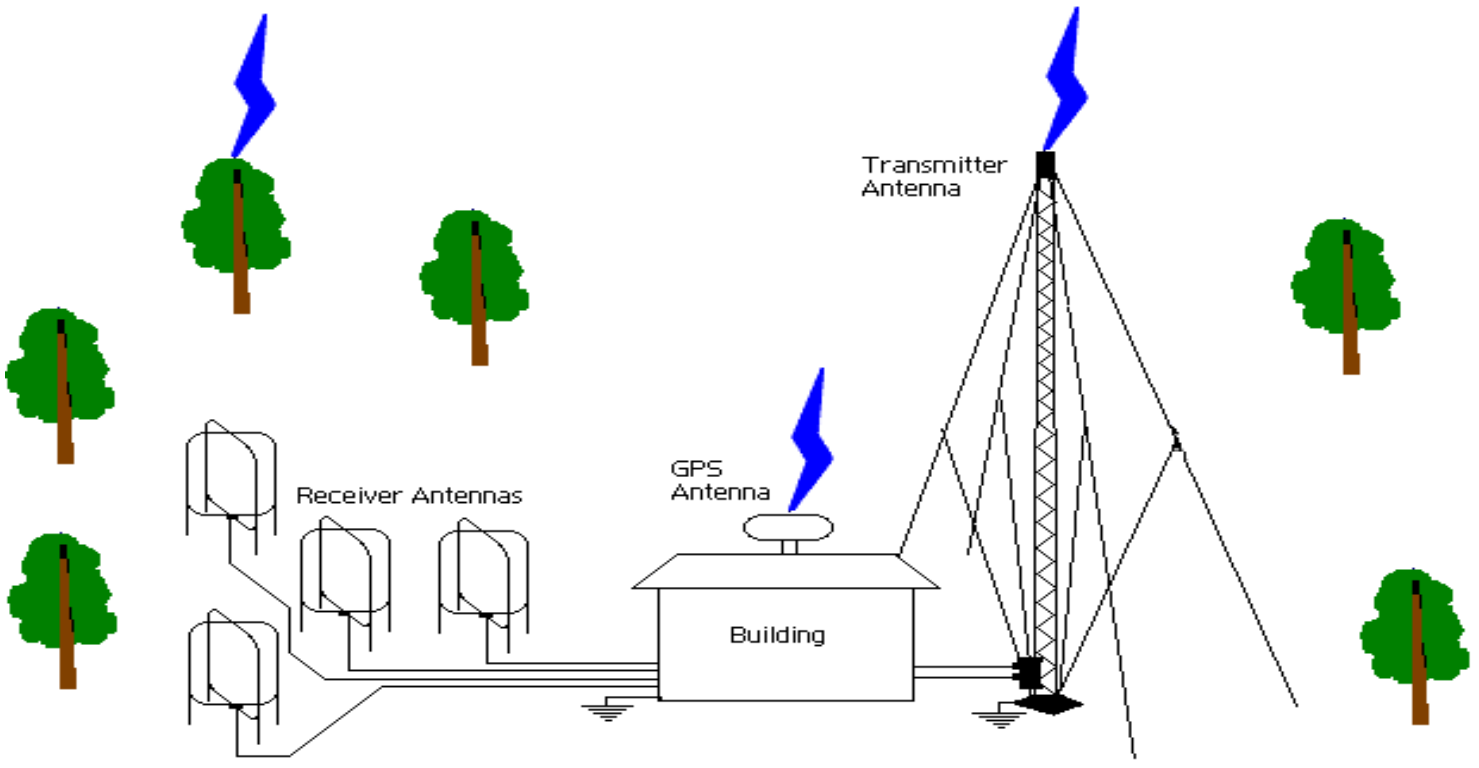
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Types of effects

1. Direct hit
2. Direct electromagnetic field
3. Ground current effect

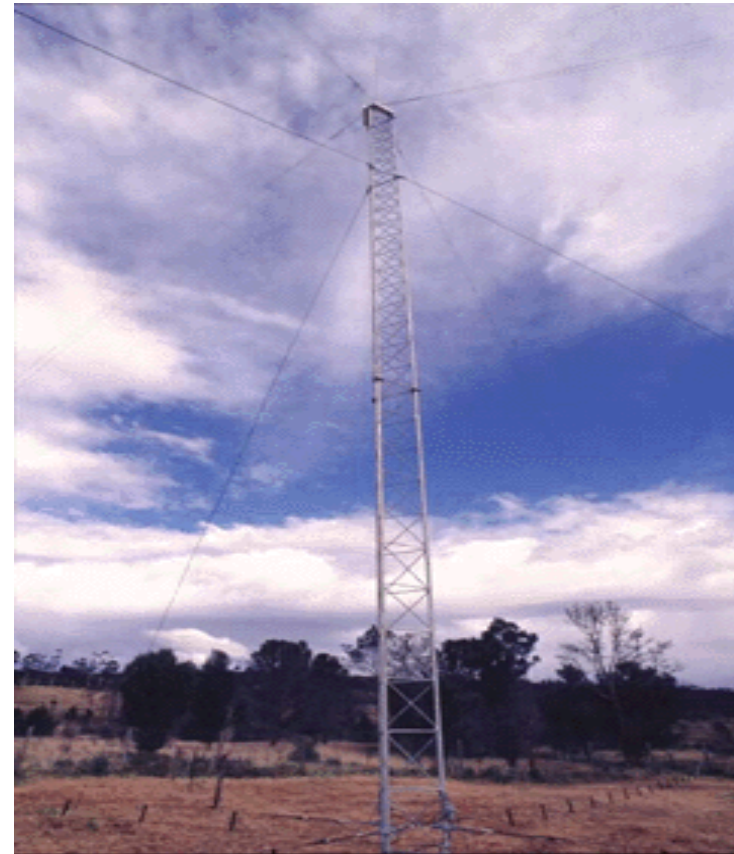
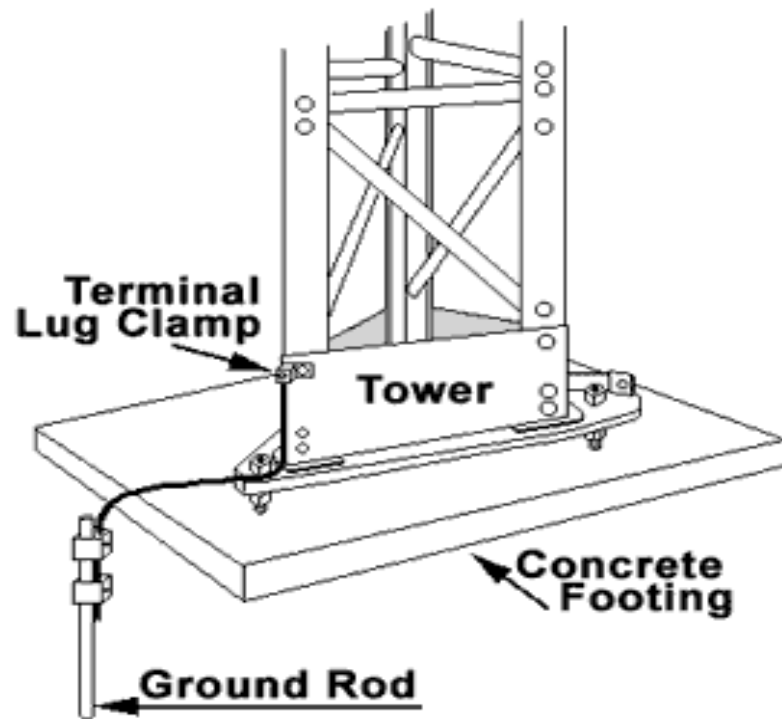




Receiver Antenna

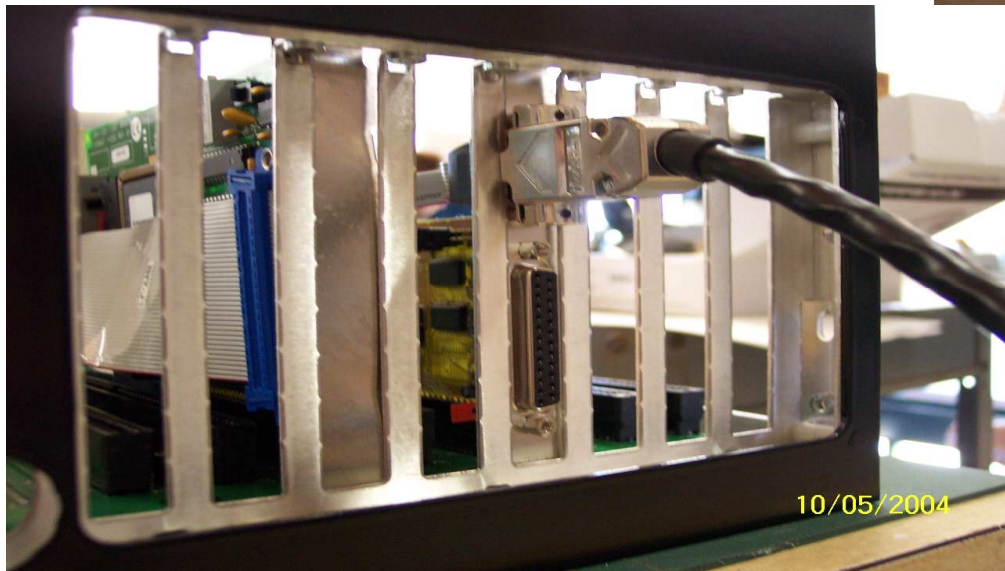


Grounding Tx Antenna mast against direct hit

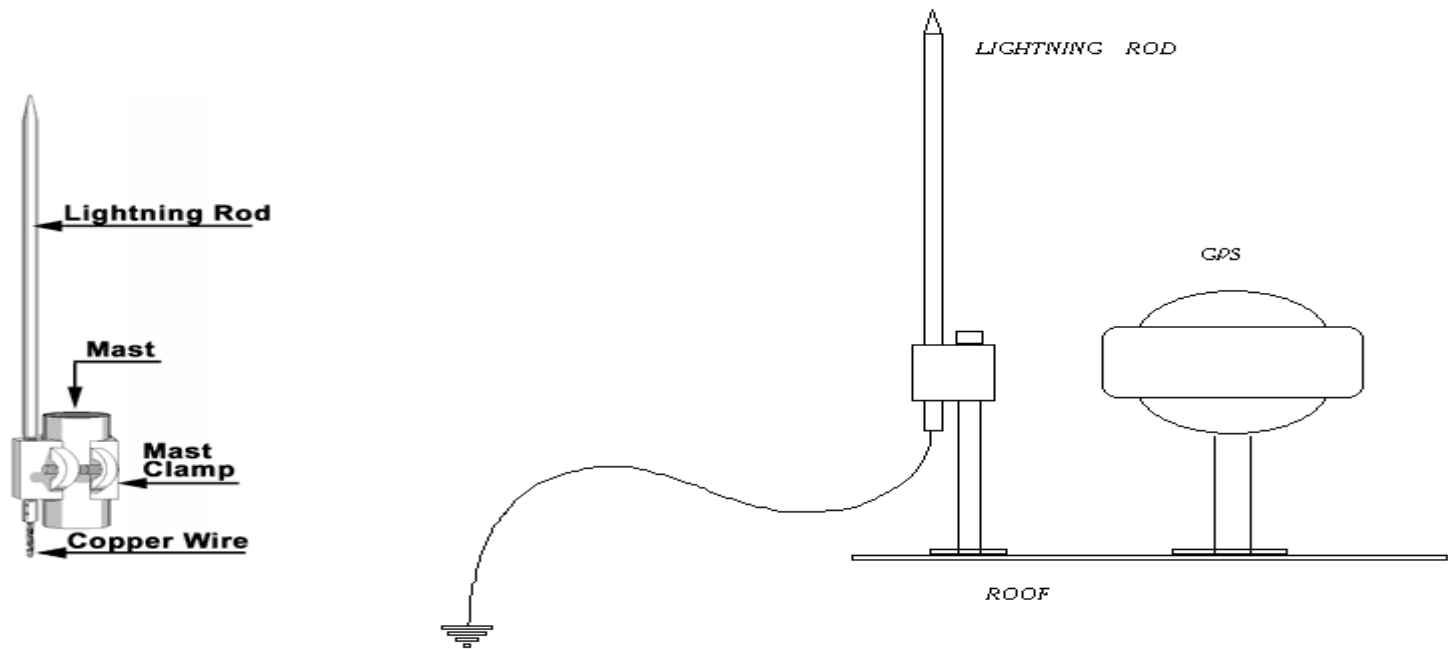


GPS Protection

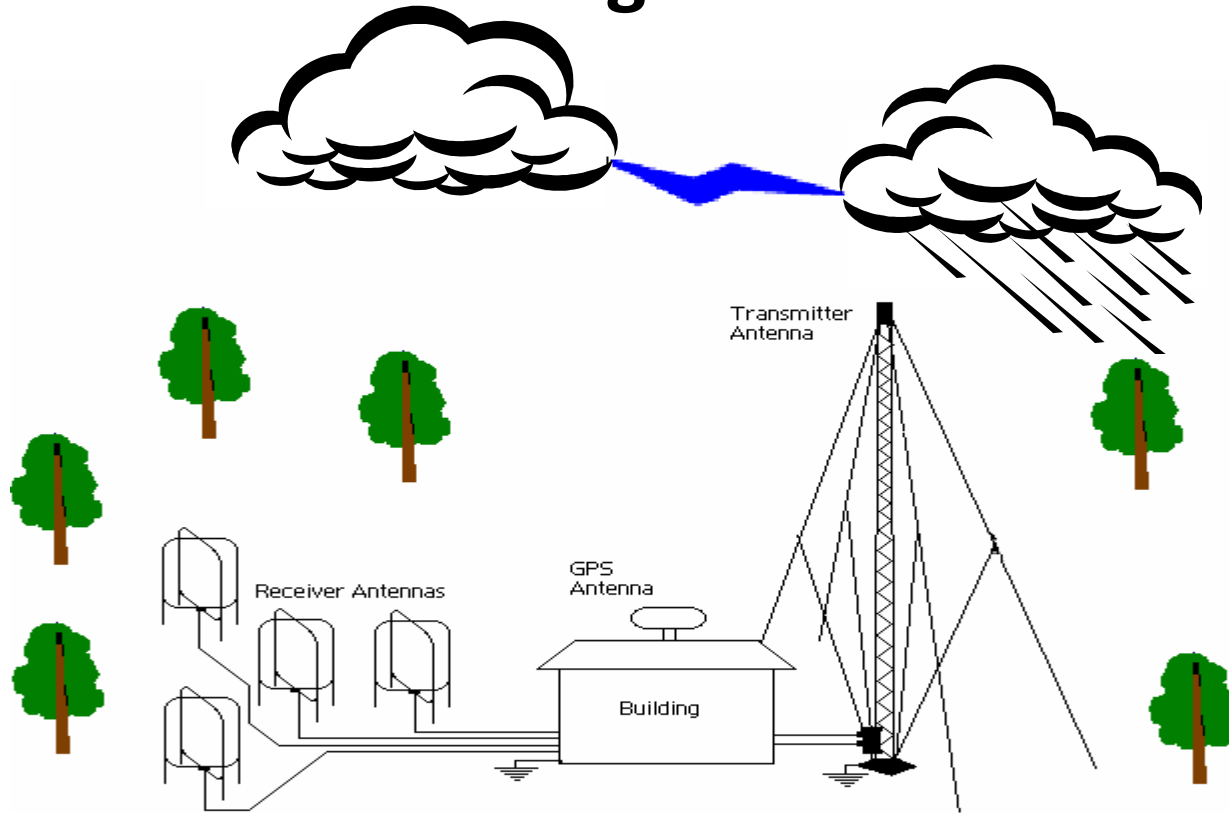
RS-232 – to separate card
RS-485 – directly to computer



GPS Protection

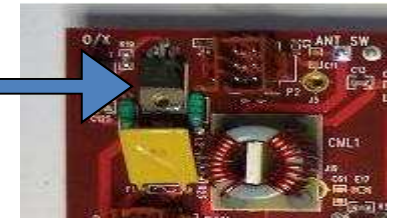


Electromagnetic field

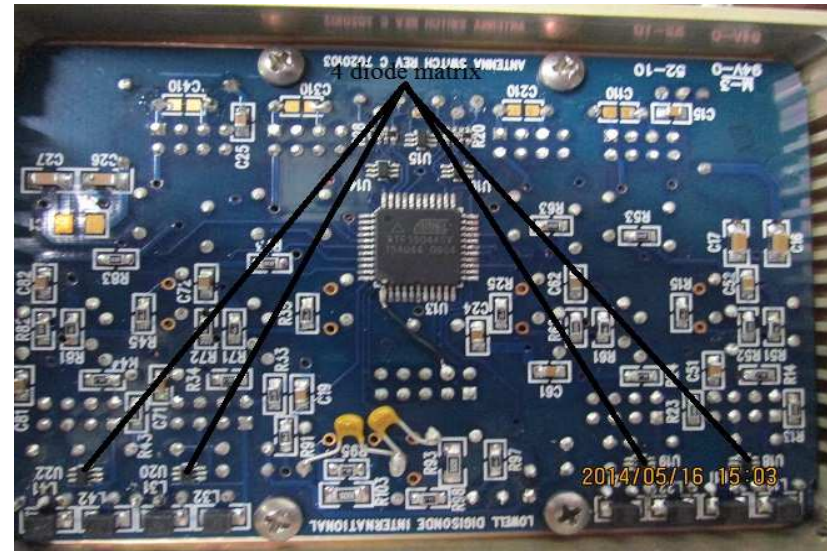
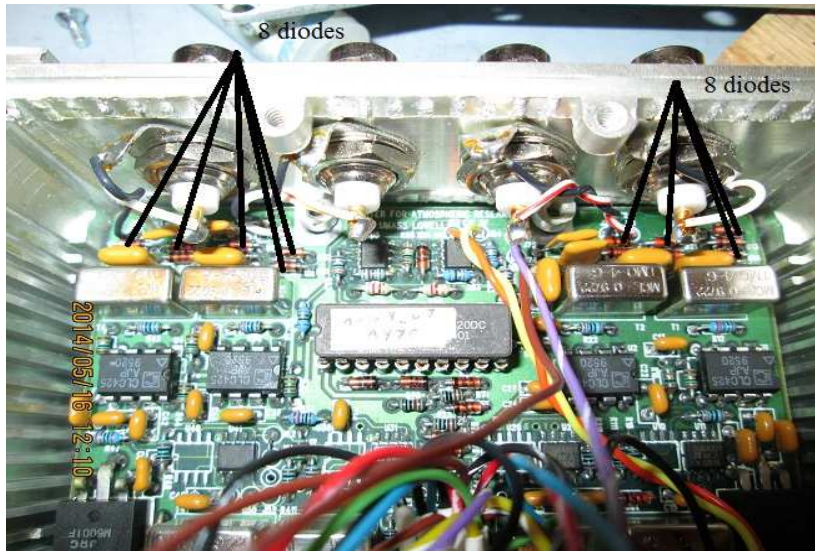


Typical Lightning Damages

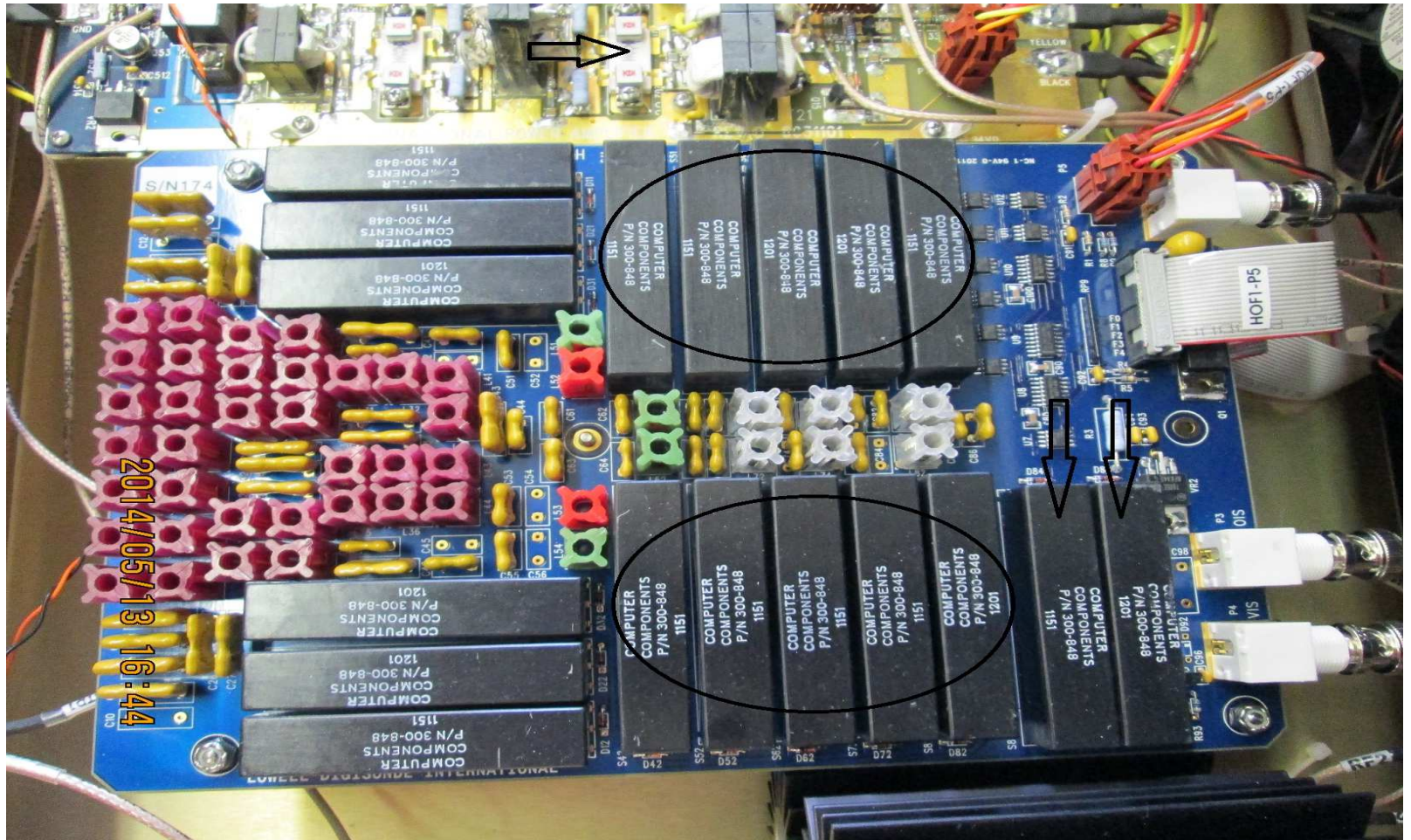
- Polarization Switch (Rx Antenna Pre-amp)
 - 7812 Voltage Regulator
 - CLC425 Amplifier
 - 0.1 μ F Bypass Capacitors
- Antenna Switch Op Amps, Diodes
- Power Distribution Card

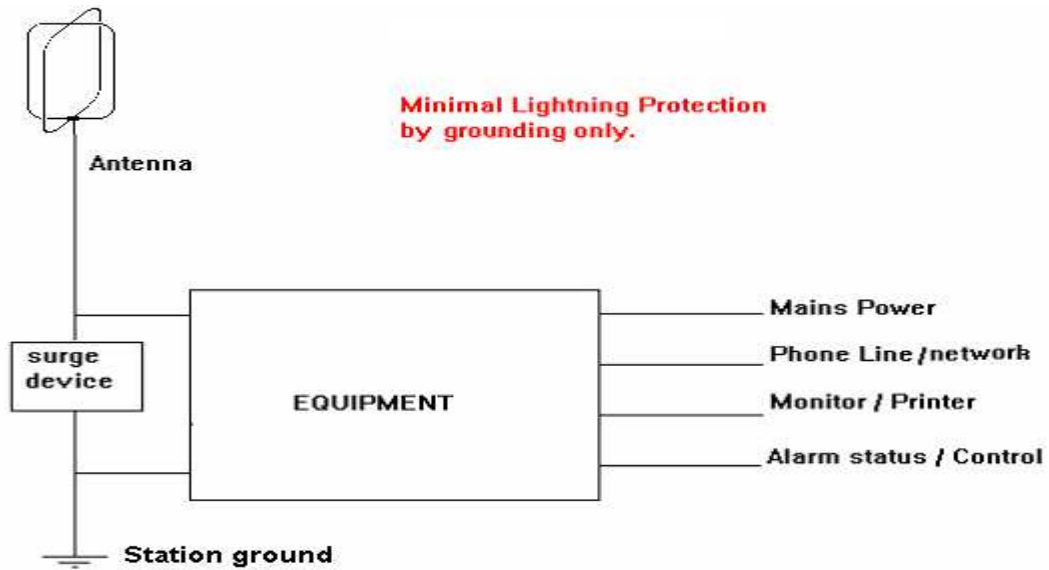


Antenna Switch damage



Typical Lightning Damages (cont.)







ALPHA DELTA COMMUNICATIONS

AA

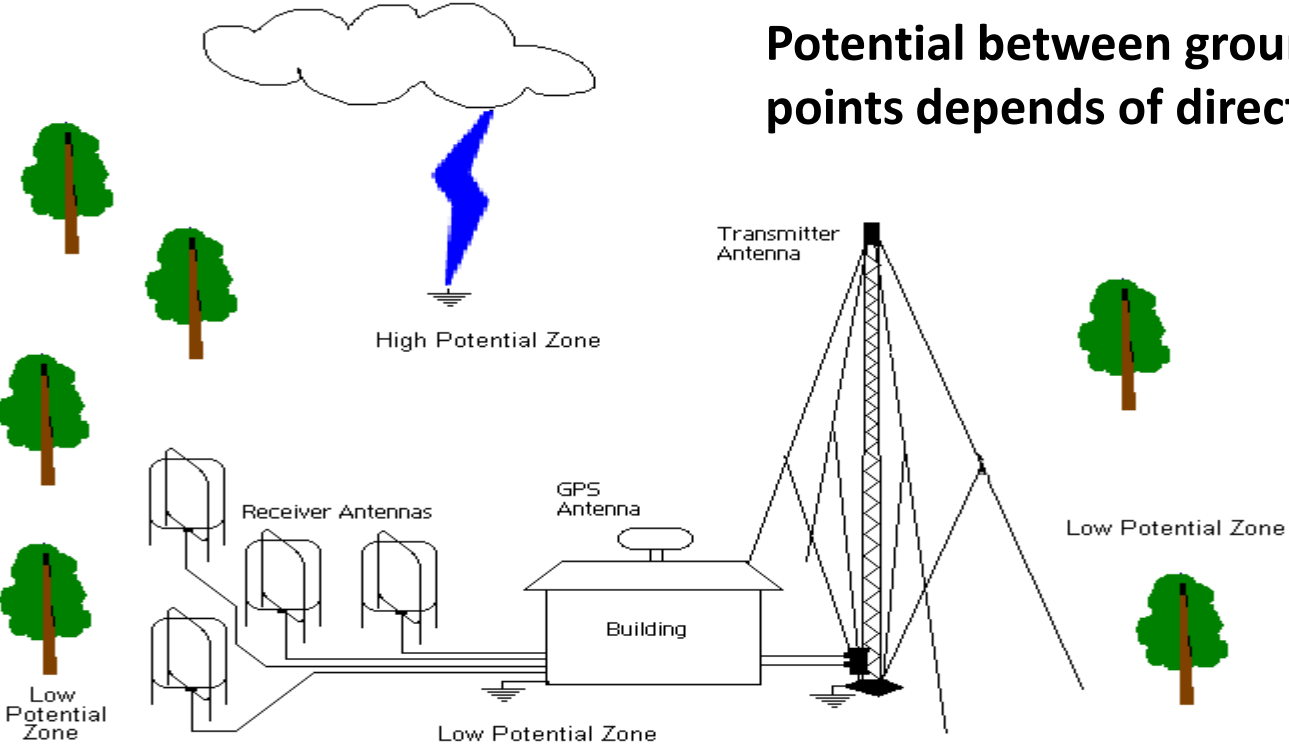
TRANSI-TRAP
SURGE PROTECTOR

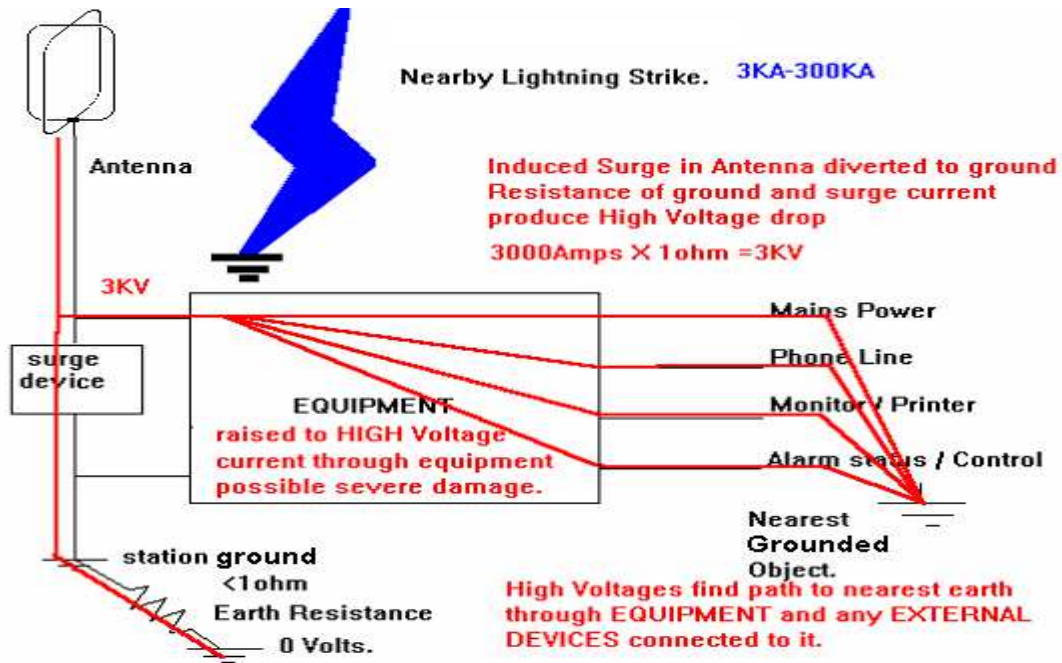
Centerville, Ohio

Made in U.S.A.

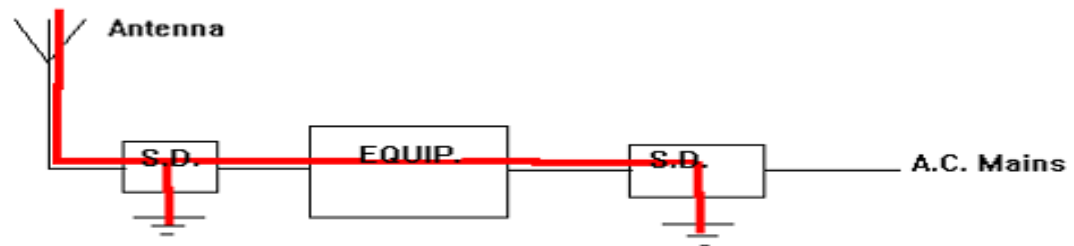
10/06/2004

Potential between grounding points depends of direction to hit

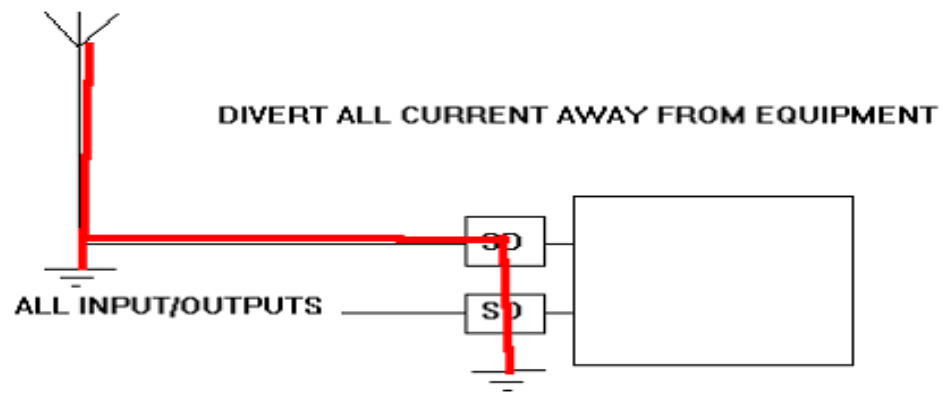




SUMMARY OF LIGHTNING PROTECTION



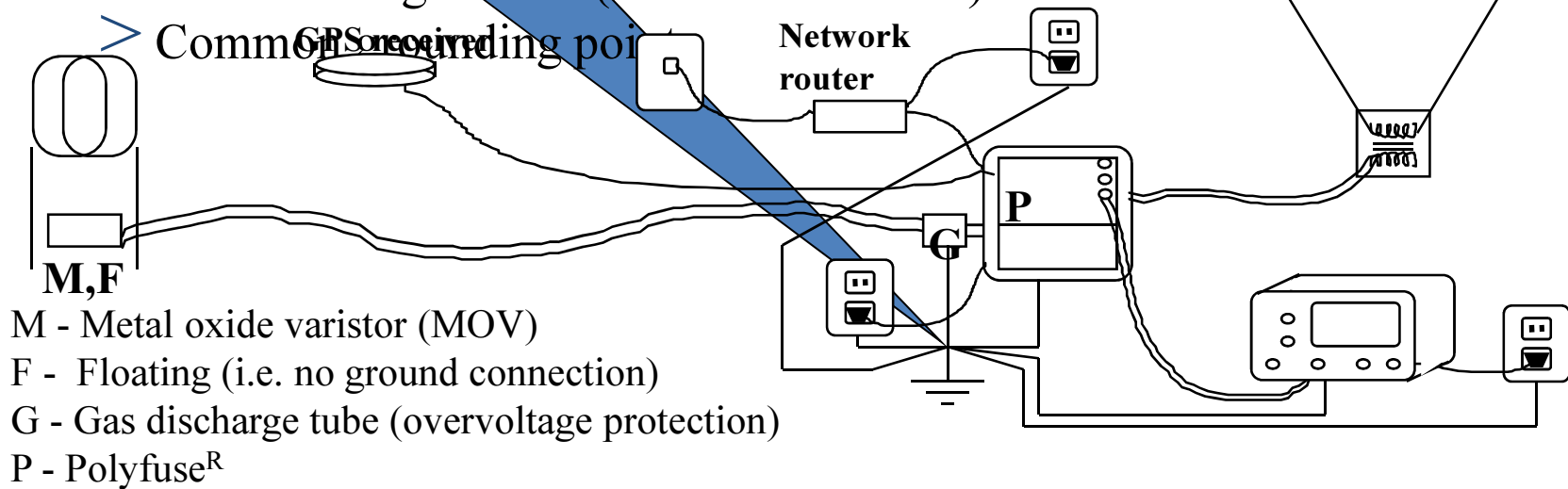
Avoid separate earths for Surge protect Devices , and paths through equipment.



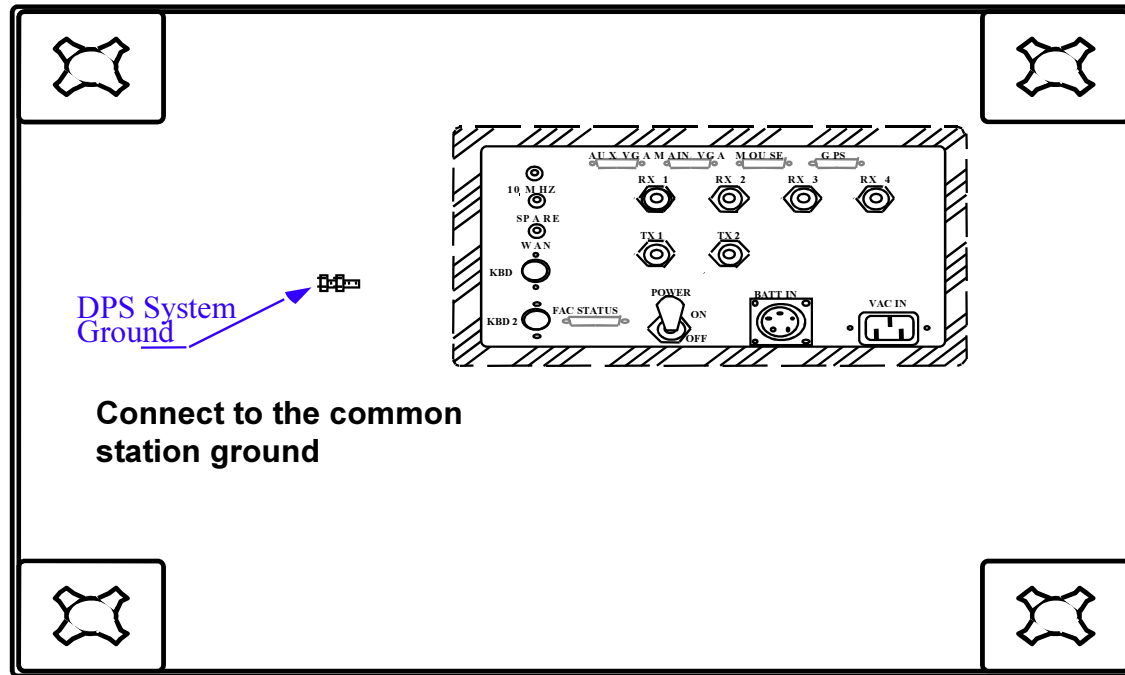
DIVERT ALL CURRENT AWAY FROM EQUIPMENT

Design of Station Grounding

- > No ground at Rcvr Antenna
- > Solid-State Fuses (Polyfuse^R)
- > Varistor (100ms thermal off 1sec on)
- > MOVs - Back-to-Back Zener Diodes (27V)
- > Gas Discharge Tubes (200V and 1.5kV)
- > Common Grounding point



Single Point Chassis Ground



DPS System Ground

Connect to the common station ground

DPS Enclosure Rear Panel

 EMI Gasket Area

