AM Directional Antenna Essentials

Figuring out that it’s broken

And fixing it

State of Repair

- 30% to 50% of arrays are out of tolerance
- Usually one or two MP's or Antenna Monitor parameters are out
- Some arrays won't make MP values within 3 degree 5% tolerances
- Some licenses have errors in parameters

Inspection

- Every array should be periodically inspected – the quarterly lighting inspection interval is a good timetable
- Regular MP measurements aren’t required, but should probably be made at the same interval
- The Commission doesn’t require that you or the station own a field meter, but it’s hard to make measurements without one

INFORMATION BULLETIN

FEDERAL COMMUNICATIONS COMMISSION

AM BROADCAST STATION SELF - INSPECTION CHECKLIST

Bulletin EB-18AM
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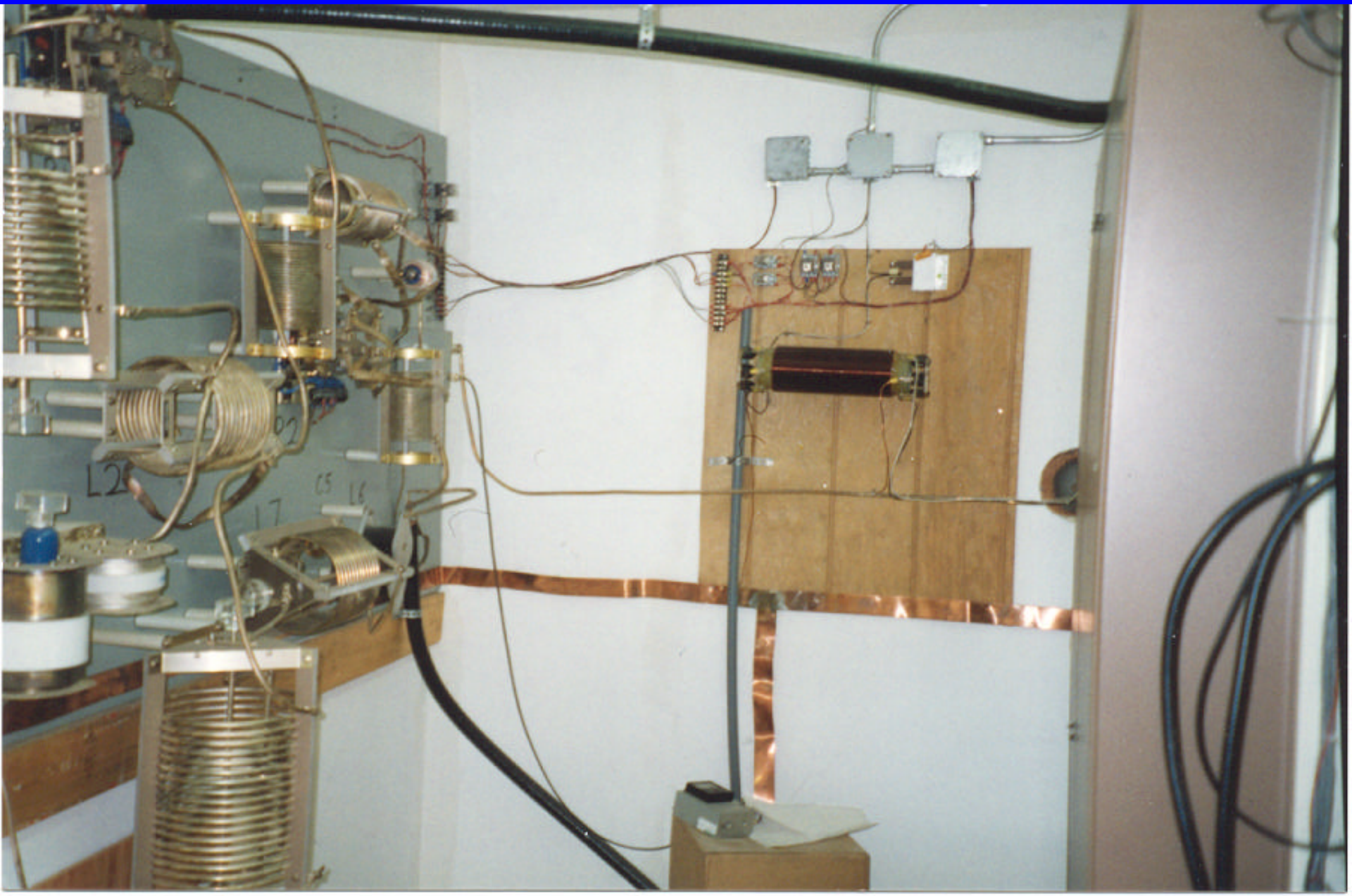
L2
L7
C5
L6


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Sample System

- Repeatability
- Repeatability
- If the sample system isn’t stable, how can you know if the antenna system is?

Antenna Monitors

- Unreliability
- Environment

Sample Lines

- All terminations and splices should use factory hardware
- Braided jumpers may be a problem
- Toroids die
- Sample loop connections get corroded
- Coiled up cables can cause ground loops and affect readings

Monitor Points

- Should be selected for long term stability but it's hard to predict development
- Old proofs may have points that are off distance and bearing (and perhaps have site coordinates wrong)
- Repeat the location not the incorrect distance and bearing

If a Monitor Point is Out

- NEVER assume that an array is out of adjustment if the MP is out but the Antenna Monitor parameters are in
- ALWAYS repeat 5 or 6 points on the radial if you find the MP out to see if it's just the point
- If non-D is easy, make non-D measurements at the same points

Changing a Monitor Point

- Now easier than ever thanks to MM Docket 93-177
- Partial proof on the MP radial to change the point
- Partial proof with non-DA measurements on the radial to pick a new point not in the proof

Maintenance

- Lightning
- Mechanical Failure
- Heat
- Water
- Keep clean and rodent/insect free! Huntavirus is not trivial

Parts

- Meters and meter switches
- Vibration shock from contactor operation
- Systems with no fail-safe protection

Contactor Failure Modes

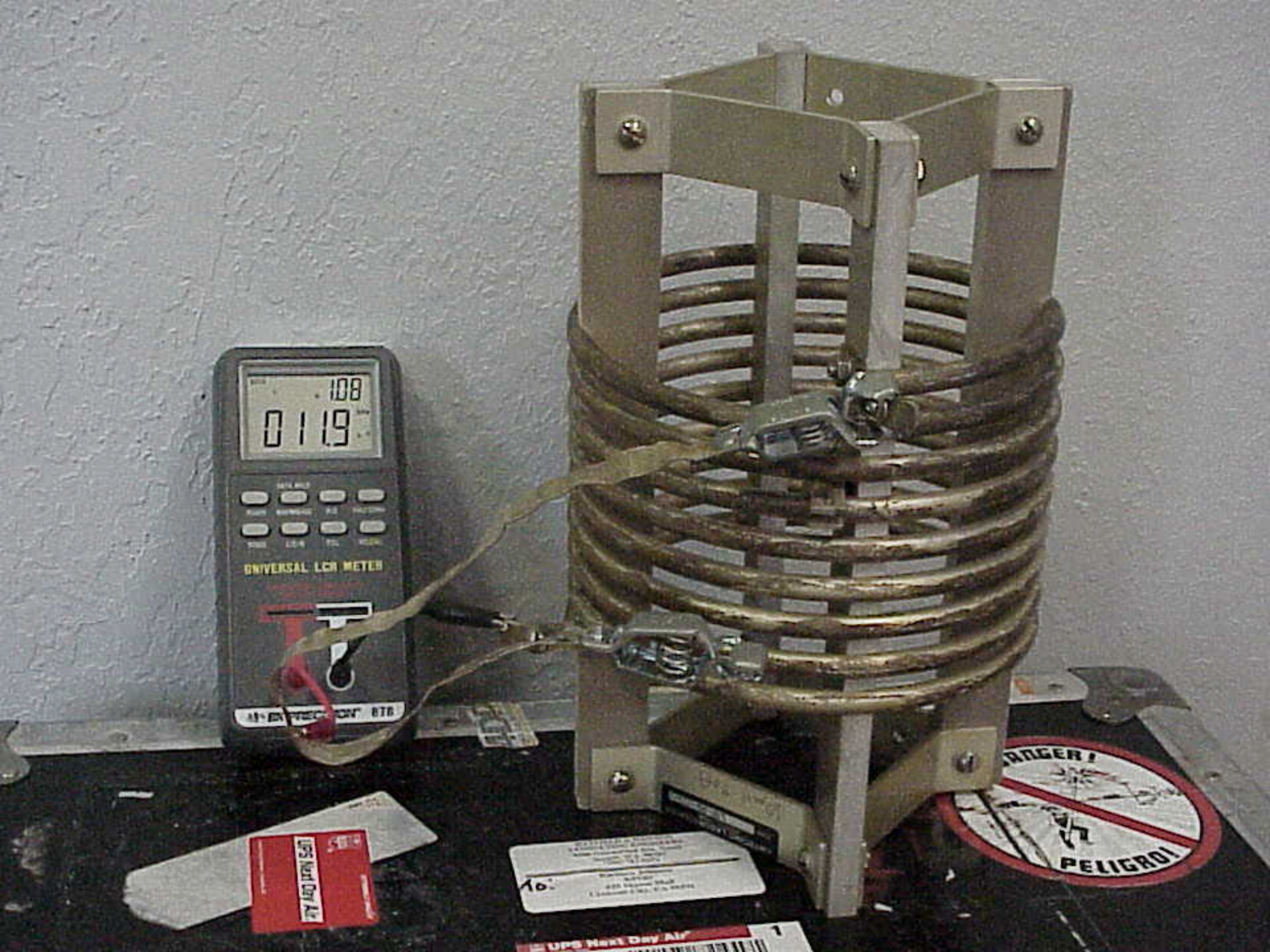
- Switch contacts fail when switched under power
- Vibration from operation loosens bolts
- Inadequate solenoid current

Base Current Meters

- Ignore them
- Take them and the switches out if you rebuild
- Replace them with “J” plugs

Parts Testing

- If no impedance bridge is available, use an LCR meter, as parts have high “Q”
- LAN network TDR’s are very useful


1.08
011.9
UNIVERSAL LCR METER
DANGER!
PELIGRO!
UPS Next Day Air


FLUKE
MONITOR
SETUP
OFF
UPS Next Day Air

Ground System Damage

- A sharp shovel
- A field strength meter desensed and held upside down with a handle in the ¼-20 mounting hole

Current Distribution

- Use of a desensed field strength meter

Skirt Detuning

- Use of a field meter on a stand or tripod with the antenna oriented correctly

Thank You!

- Time for Questions