

Problems in EMC Test Set-ups..... and How to Fix Them



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 \parallel









WAR STORY #1



•LF test, poor match LF antenna, high power LF amplifier

•Embarrassing whiff of overheating fiber glass substrate

•Proved to be an under-rated component

•Staff stuck in 'fast AC theory' mode





Rated at 500W CW





Rated at 500W CW







WAR STORY #2











All connectors have a finite operating lifetime, and any connector's operating lifetime is specified by the number of mating cycles, typically 500







<u>Connector savers</u> preserve the quality and integrity of the connector by absorbing connect and disconnect abuse.

Commonplace use with precision RF test instruments found on a RF test bench – but savers expensive

For chamber tests, use regular adaptors as connector savers





Use a bead of anti-tamper paint



Alternative Bulkhead Connectors

Type SC is higher power type N

7/16 connector good to 6GHz



Always terminate unused connectors in 50R



- •Make part of data trend analysis
- •5 spot frequencies, boresight readings
- •Receive only antenna damage another reason for completely separate paths
- •Pre-amp performance data on file simple test set-up
- •Power-amp performance data on file simple test set-up



Existing diagnostic tools



Gives system VSWR



Test Signal Source



Bore-sight Field Strength Monitor



Test Signal Monitor



Existing diagnostic tools

Slide 20

Amplify Sig Gen Signal













Likely Faults

Instrument / Component

Connector / Connection



RISK ANALYSIS – 10+ YEARS OLD TEST SET-UP

Failure	Risk	Impact	Mitigation
Cable			
Connector			
Amplifier			
Antenna			
Room			
Coupler			
PC			
Software			



RISK ANALYSIS – 10+ YEARS OLD TEST SET-UP

Failure	Risk	Impact	Mitigation
Cable	Н	L	Spare cable(s), PN & Lead-time on file
Connector	Н	L	Replace connector, adopt connector
			savers
Amplifier	М	Н	Rental details on file, subcontract on file
Antenna	L	Μ	Use next day supplier
Room	Н	Н	Palettes, targeted absorber replacement,
			Pre-shaped Connection-Paths
Coupler	М	Μ	PN & Lead-time on file, expeditable?
PC			
Software			



Covering Room Mitigation Steps Only

Improve repeatability

Route cable using supports in horizontal plane to wall. Use semi-rigid pre-formed feeder segments for repeatable tight bends. Bear in mind horizontal polarization coupling too

Vertical runs at wall and very close to absorber

Separate Immunity / Emissions Paths, Adopt Savers

Palette placement

Replace pivotal absorber blocks













Repeatable Tight Cable- Bend Radii



0.250" RG401





Arsenal of Tests Supporting Test Procedure

Return Loss (high power attenuator / termination)

Through Loss (high power attenuator / termination)

Microphonic check

Improve repeatability

Reduce floor effect, optimal cable routing, improve hot wall performance

Sample procedures on AH website





ARTICLE Applying Stealth Technology to EMC Test Chamber Designs

Tom Mullineaux 2/05/2014



http://www.interferencetechnology.com/applying-stealth-technology-to-emc-test-chamber-designs



EMCLIVE

- Avoid Crisis Mode
- Efficient Fault Location and Pre-arranged Corrections
- Locating Intermittent Faults
- Test Procedure
- Sample Risk Analysis Form and Sample Test Procedures on AH site



Thanks for attending!

Don't miss our Test Bootcamp!

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