EVLALA Receivers PDR

RFI Issues
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• 1) Design-in RFI immunity. (Essential goal)
• 2) Engineer-in low radiation from all internal designs, accept only low radiation devices from external suppliers. (Essential goal)
• 3) Monitor & reduce external & internal RFI. (Important goal)
• 4) Excision & post-processing techniques. (Important goal)
RFI Issues: Immunity

• 1) First stages gain limited to what is required to maintain low noise figure—Careful attention to IDR at all stages.
• 2) Use medium-level mixers where possible.
• 3) 8 bit ADC @ L-band where RFI is worst.
• 4) Wide LDR using post-dewar AGC.
RFI Issues: Lower Internal Emissions

1) Keep MIB “static”—Only clock when transferring data or processing.

2) Use LVDS where possible to reduce emissions.

3) Use high-quality shielding for all radiating circuits.

4) Characterize & document all un-avoidable RFI.
RFI Issues: Reduce External RFI

• 1) EMC-test all incoming electronic devices.
• 2) “Sweep” the site on a periodic basis.
• 3) Monitor & ID external RFI
• 4) Work with external sources to reduce unintended emissions.
• 5) Frequency Coordinate with “friendly” external spectrum users.
RFI Issues: Excision

• 1) Observe “around” the RFI in frequency.
• 2) Observe “around” the RFI in time.
• 3) ID transient signals in post-correlation data—Snip-it-out, in amplitude or time.
• 4) Fine DDS frequency resolution will allow more precise separation of non-sidereal “motion” emitters.