EVLA Feeds CDR

Feed Radomes

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EVLA Feeds CDR – Feed Radomes
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Radome Windows

• All of the feeds will require a radome (or weather window) to provide environmental protection.

• These radomes must:
  • be low loss
  • be non-absorbent,
  • have good UV characteristics
  • provide a moisture seal
  • protect against insect/bird/rodent access

• All but the Ka & Q-Band receivers have their feeds protruding through the Feed Cone roof.
Feedcone View of Radomes (excluding L-Band)

L, S & C Radomes will use a Stronger, Low Frequency Radome Material

X, Ku, K, Ka & Q Radomes will use a Low-Loss High Frequency Radome Material
“K-Band” Style Mount

- K, Ku, X, C, S (& even L) use similar style of mounting
- Feed is mounted to the Feed Cone and the Receiver is then mounted to the Feed
- Radome membrane covers the mouth of the feed
- Esscolam 10 for L, S & C
- Gore RA7906 for X, Ku & K
Radomes for Low Frequency Bands

- Esscolam 10 will be used on L, S & C-Band Feeds
- 72” by 72” sheets
“Q-Band” Style Mount

- Q & Ka use similar style of mounting
- Feed is considered to be part of the Receiver
- Rx bolted to Feed Tower
- Air-tight seal formed between Rx and Tower
- Radome membrane covers the top of the Feed Tower
- Gore RA7906
Radome Materials
Esscolam vs. Gore-tex

• **Esscolam 10**
  – Loss similar to Esscolam 8
  – Thickness 0.024”
  – 72” wide sheets
  – OK below 8 GHz

• **Gore RA7906**
  – Thickness 0.012”
  – 45” wide sheets
  – Best above 8 GHz
Radome Windows at W-Band
Gore RA7906 vs. Gore 3T20

W#8 : Effect of Goretex Windows
SNA Swept LO1 Data
28 Sept 2004

![Graph showing the effect of Goretex windows on RCP Trx.](image-url)

- Red line: RCP Trx with No Window
- Yellow line: RCP Trx with RA7906 Goretex
- Orange line: RCP Trx with 3T20 Goretex

**Trx (K)**

**Frequency (MHz)**
Radome Windows at K-Band
Gore 3T20

K#28 With Cryo Isolators
Test Feed with Orange Mylar vs. Orange Mylar + Goretex 3T20
15 July 2004
K28-Trx-Test-Feed-Orange-and-Goretex-Elev-Loads-18-26-Cryo-Iso.xls

RCP Trx - Orange
RCP Trx - Orange + Goretex

Trx (K)

Frequency (MHz)
Radomes for High Frequency Bands

• Originally purchased 8m of 3T20 ($3200)
• Now obvious that RA7906 is preferred
• Reuse existing K & Q RA7906 membranes
• W.L. Gore has agreed to allow us to return the 3T20 and replace it with RA7906
  – incur a 20% restocking fee ($640)