EVLA Front-End CDR

Vertex Cabin Infrastructure

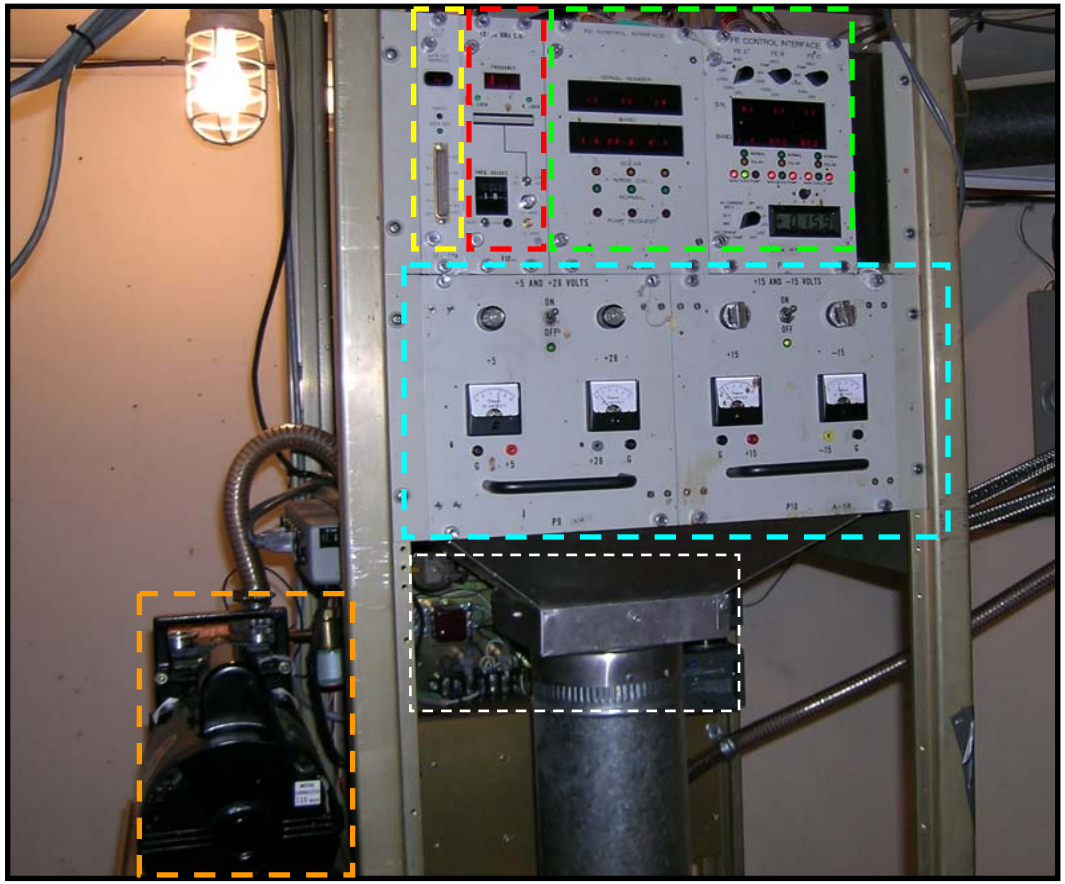
All-New Vertex Cabin Infrastructure

1. EMI/RFI Shielded Front End Rack
2. New duality for subsystems, A or B “sides”
3. A & B Pump request boxes, DC distribution boxes, AC distribution boxes (Scott-T)
4. P Band bulkhead connector panel
5. Cable Tray for RF & Control cables

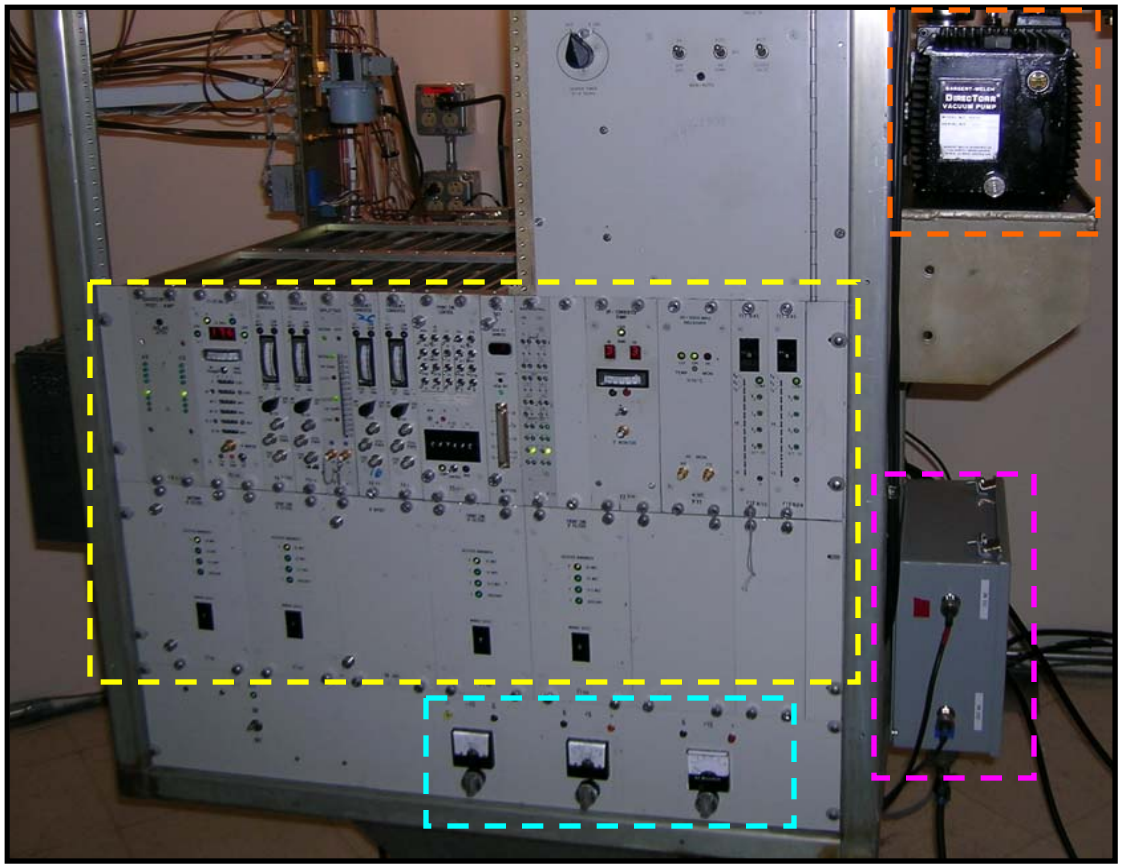
Original VLA F Rack

- Open Frame with F14 modules, AC & DC power supplies, RF downconverter
- Noise Diode (Cal) Timing Box (in back)
- Pump Request Box (in back)
- Vacuum Pump
- Monitor & Control Data Set

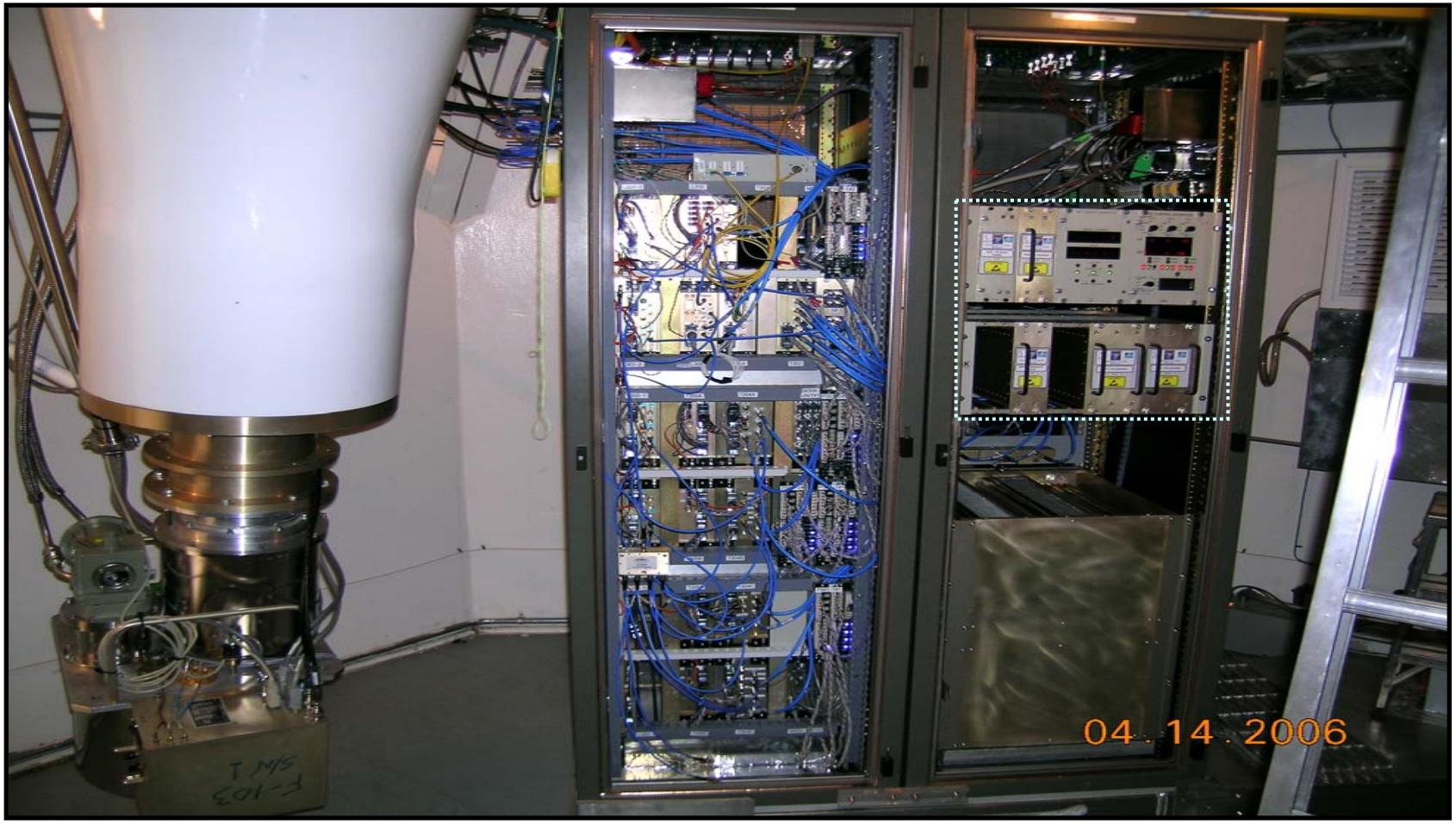
VLA F Rack
FE Modules, Power Supplies



VLA A Rack
FE Modules & C, Ku Dewar

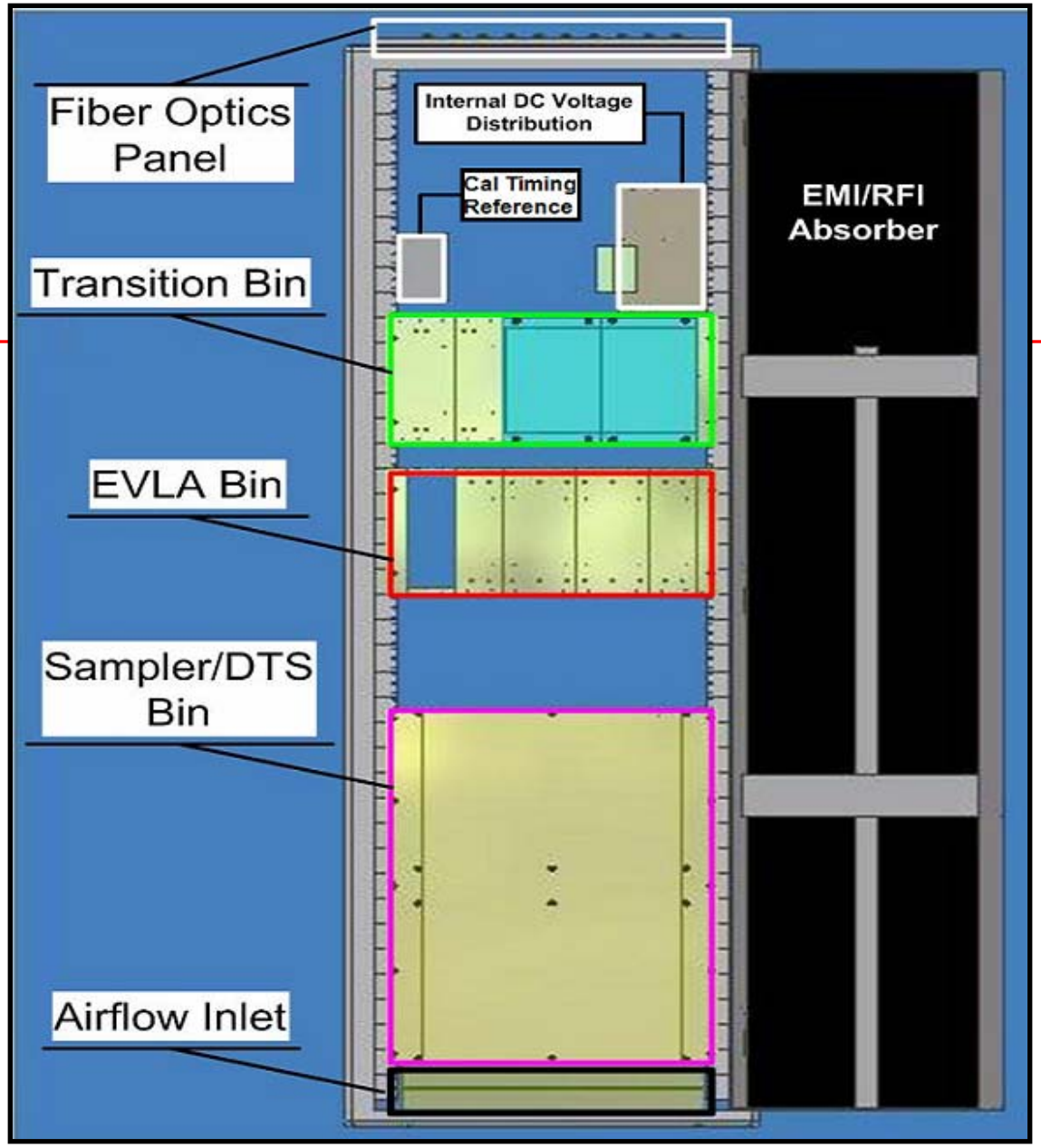


EVLA Electronics LO/IF & FE Racks

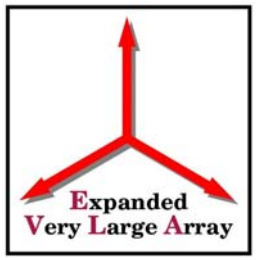


New Front End Rack

- EQUIPTO shielded cabinet with added RF absorber panels (≈ 20 dB more attenuation)
- F.E. ~ Interface modules, DC power supplies, DC distribution/Control cable connector panel, Cal timing reference box
- Extras ~ F.O. connector panel, DTS modules, Utility module

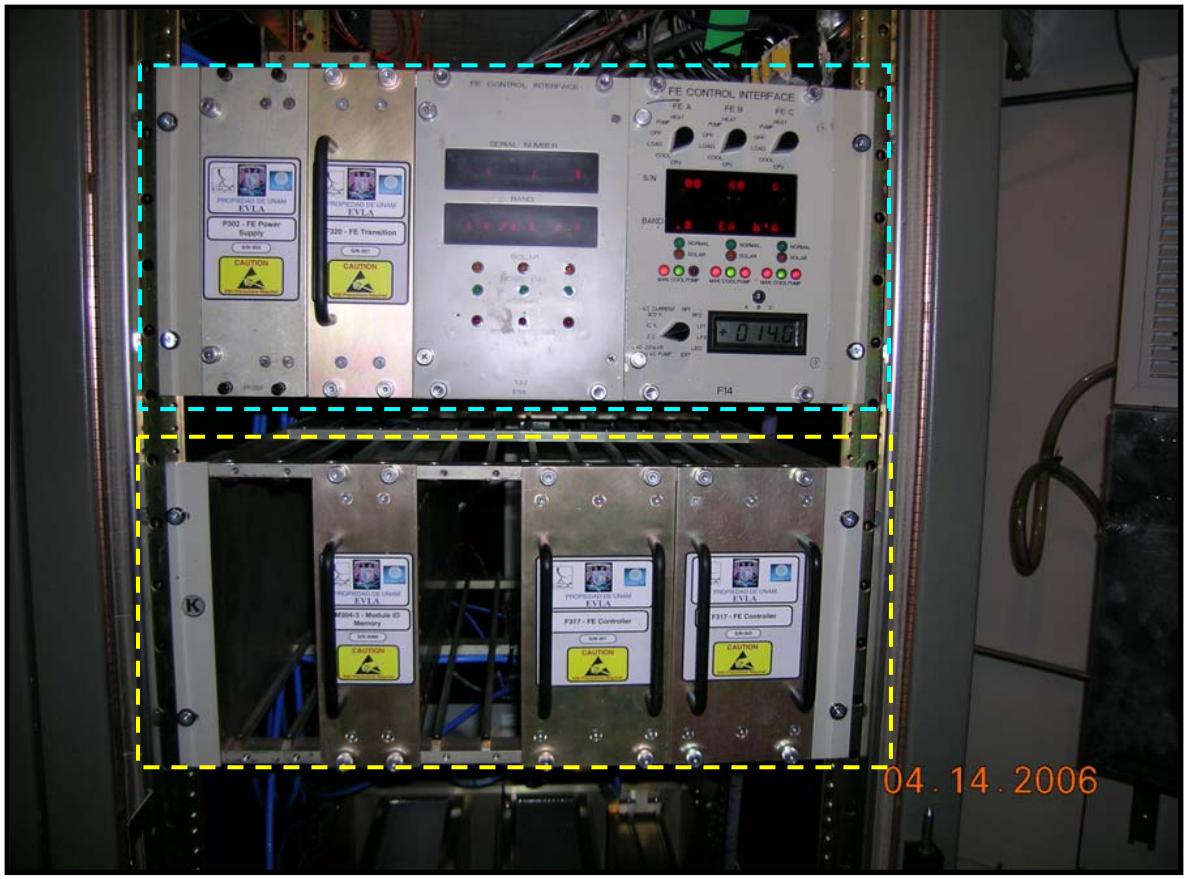

Fiber Optics Panel
Internal DC Voltage Distribution
Cal Timing Reference
EMI/RFI Absorber
Transition Bin
EVLA Bin
Sampler/DTS Bin
Airflow Inlet

F Rack New Features



- No AC power, uses -48 VDC main supply
- Contains 2 types of bins/modules, transition and EVLA
- One DC power supply for all F.E. modules and DC distribution voltages to card cages
- Interfaces with new (EVLA) and old (VLA) card cages
- Vacuum pumps located in feed-cone segment

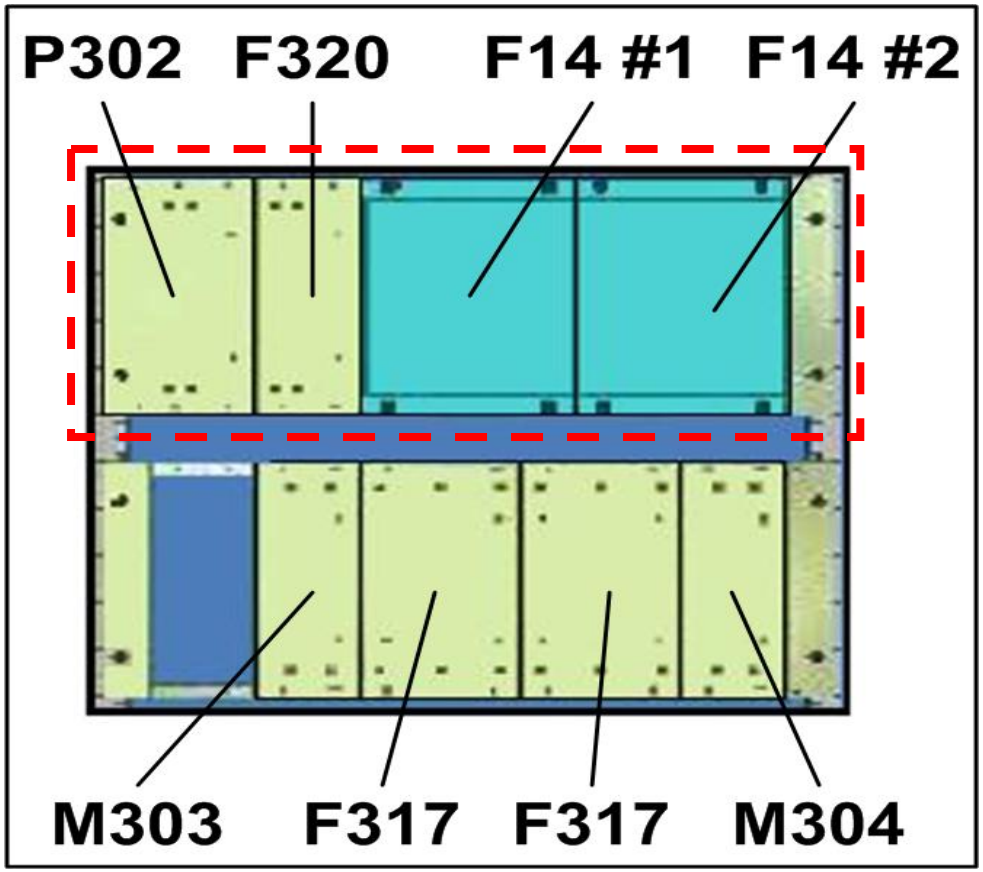
Transition Bin & EVLA Bin modules



Transition Bin
New and Old Modules

Transition Bin

- P302 DC Power Supply
- F320 Transition Interface
- F14 VLA Front End Interface



Transition Bin
P302 Power Supply

- ✓ F Rack & receiver DC power supply
- ✓ Supplies +17 V, –17 V, + 7 V, & + 32 V for DC distribution boxes A & B → new card cage
- ✓ Voltages are regulated in the EVLA receivers or routed through the F14 modules for old card cage
- ✓ Microprocessor equipped (MIB)

Transition Bin Monitor and Control

- F320 Transition Interface (new)
- Provides Ethernet interface to the monitor and control system of transition receivers through the F14 modules
- Controls the feed heaters and Iridium filters
- Microprocessor equipped (MIB)

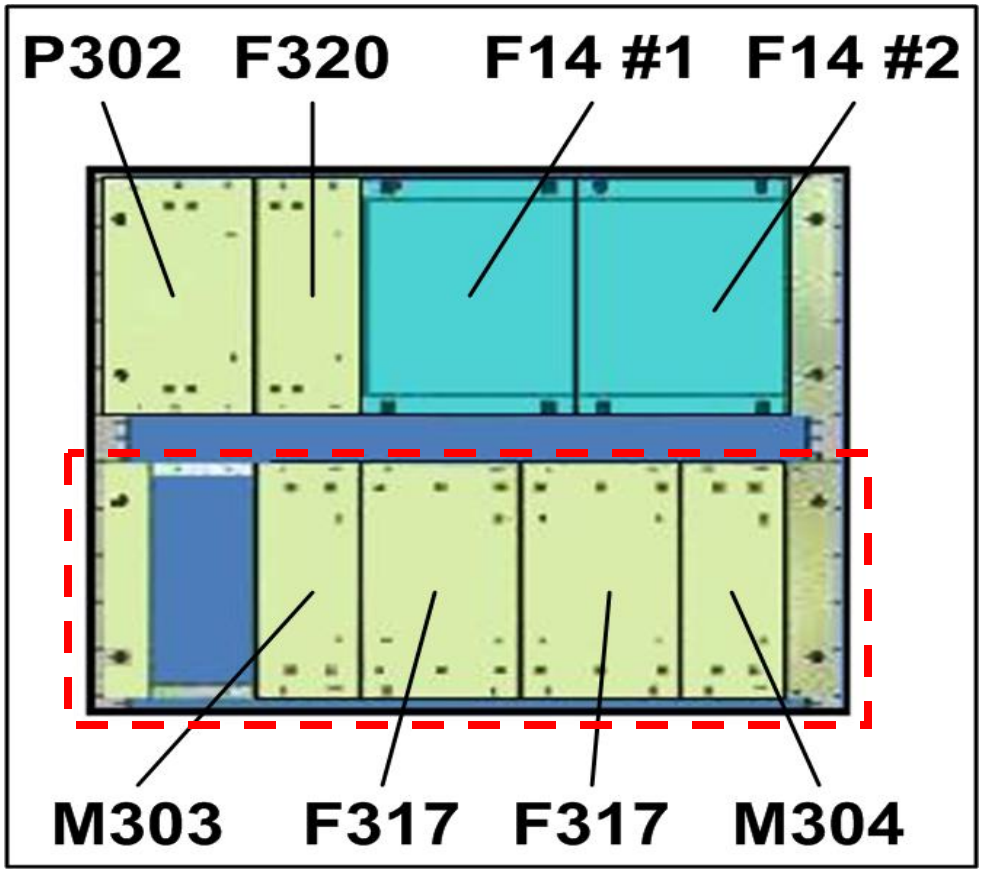
Transition Bin
Original M & C

- VLA F14 modules (3 receivers each)
- Original interface for old card cage on the transition receivers
- Routes ± 15 VDC to VLA style Card Cage
- Routes + 15 VDC and noise source control for the 74 MHz and P band receivers

EVLA Bin
All New Modules

EVLA Bin

- M303 Utility Module
- F317 EVLA receiver interface, 5 receivers each
- M304 Slot ID Memory



EVLA Bin
M303 Utility Module

- Monitors Antenna tilt angle (~5° of stow)
- Future feed heater control (post F320)
- Provides the feed heater current monitor
- Reports air handler fan status (2-speeds)
- Provides MIB reset control (LO/IF & FE)
- Allows for future environmental monitoring

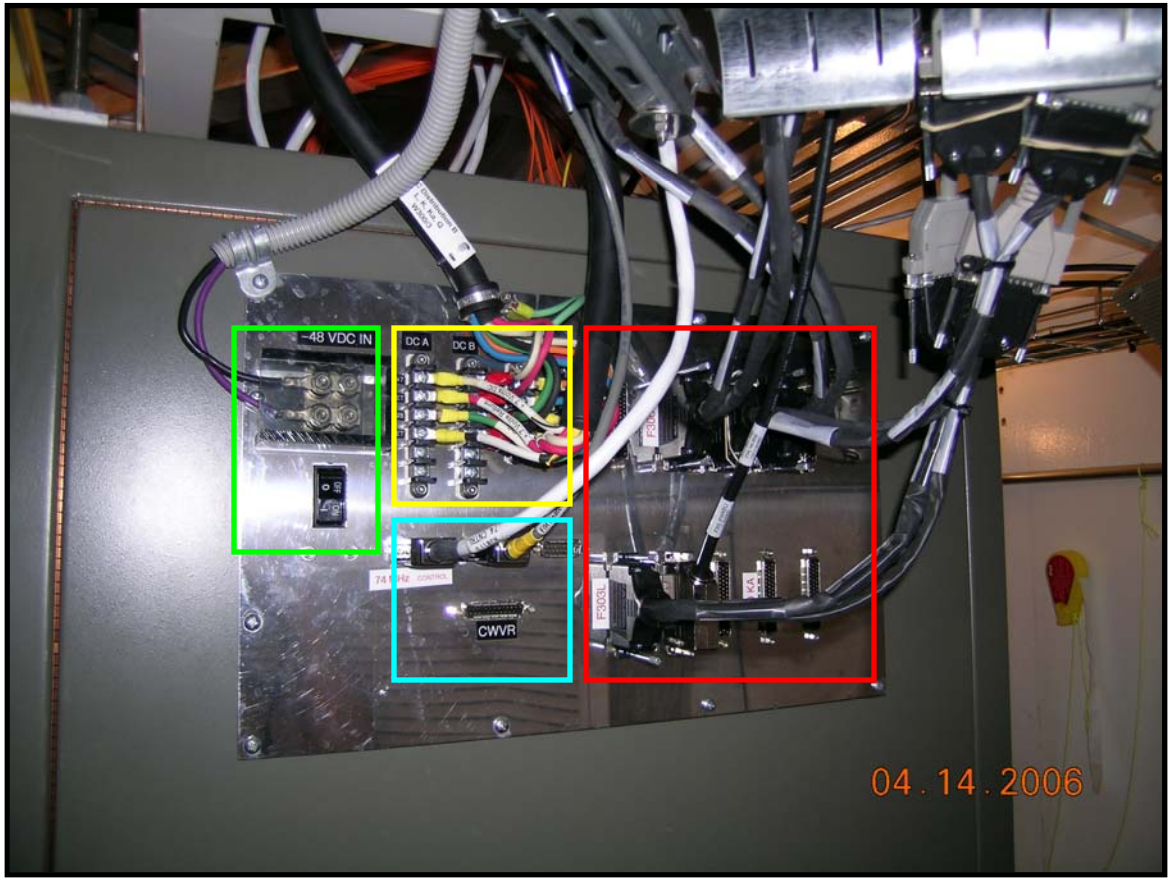
EVLA Bin Monitor & Control

- Two F317 EVLA receiver interface modules
- Provides monitor and control of new EVLA style card cages
- Each module can interface with five receivers
- One DB-50 cable per receiver vs. 2 DB-25 cables
- Microprocessor equipped (MIB)

EVLA Bin
M304 Slot ID Memory

- Provides Internet Protocol address for all MIB-equipped F.E. modules by slot assignment
- Each M304 is uniquely programmed for its respective antenna (not interchangeable)
- Allows for a maximum of 11 individual slot IDs
- Six unused IDs allows for expandability

F Rack DC Power & EMI/RFI Connector Panel



F Rack DC Power & EMI/RFI Connector Panel

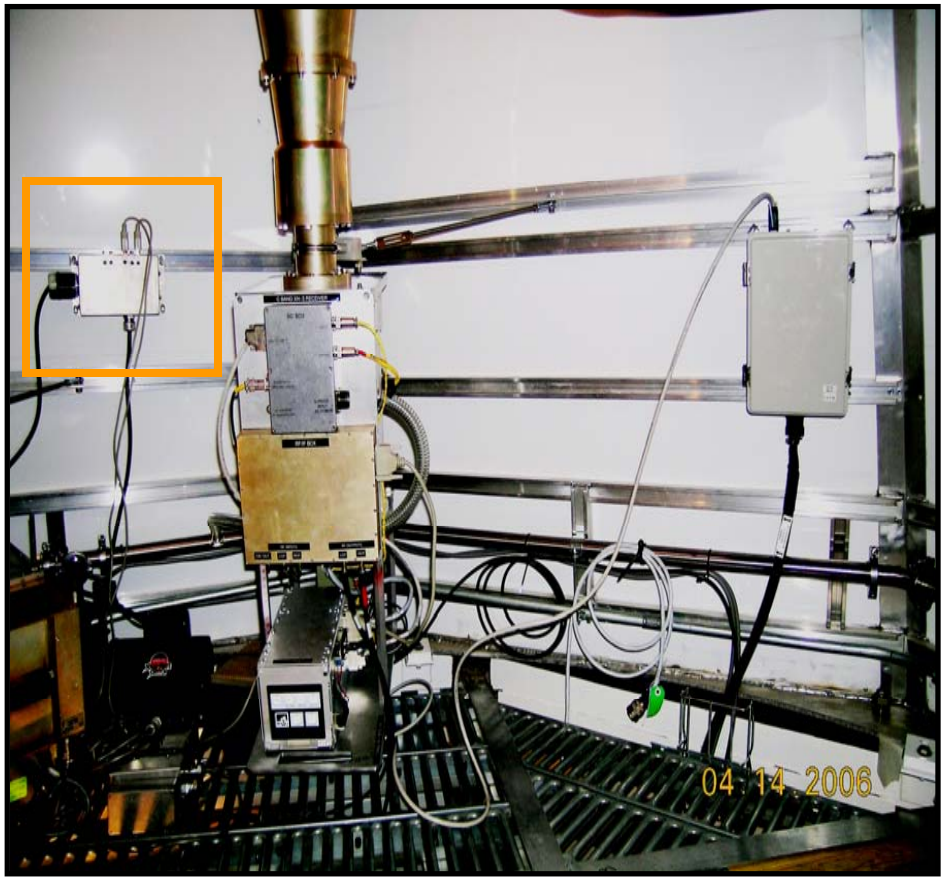
- -48 VDC Input Power Filter/On-Off switch
- Filtered Barrier Strip DC distribution (A&B)
- M&C cable connectors (DB-50)
- Utility Module I/O port (DB-50)
- 74 MHz/P Band power & control port (DB-15)
- Feed heater control cable port (DB-15)
- CWVR control cable port (DB-25)

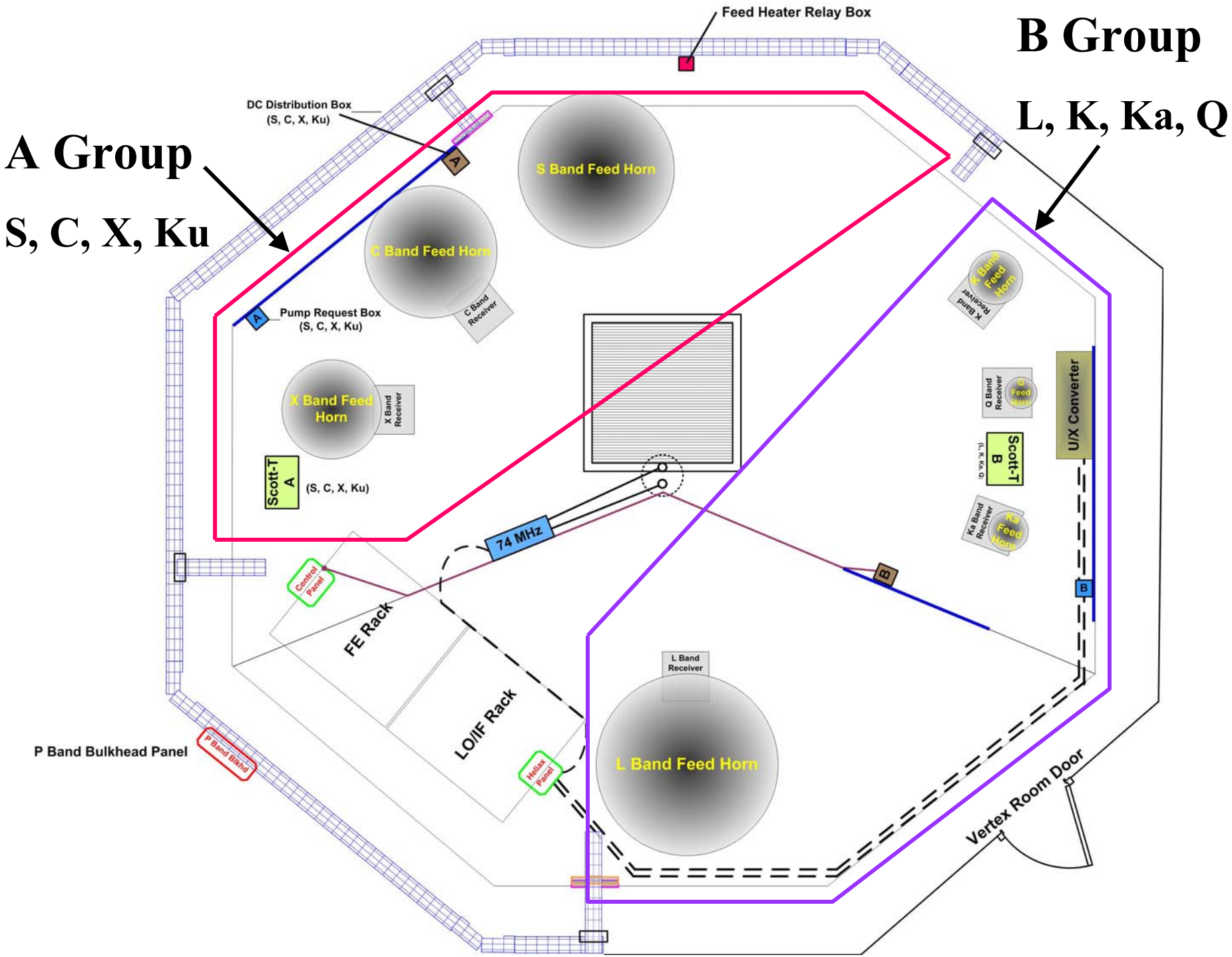
DC Distribution Box

- One pair (A & B) in each Antenna
- Distributes P302 DC + 17 V, –17 V, + 7 V, and + 32 V (EVLA)
- Each voltage fused
- 5 Output Ports

Pump Request Box

- One pair (A & B) in each Antenna
- Request logic signal powers vacuum pump via SSR
- 5 input ports with LED indicators




A Group
S, C, X, Ku
B Group
L, K, Ka, Q
Feed Heater Relay Box
DC Distribution Box
(S, C, X, Ku)
S Band Feed Horn
C Band Feed Horn
C Band Receiver
Pump Request Box
(S, C, X, Ku)
X Band Feed Horn
X Band Receiver
Scott-T A
(S, C, X, Ku)
74 MHz
Control Panel
FE Rack
LO/IF Rack
Hollax Panel
P Band Bulkhead Panel
P Band Bkhd
L Band Receiver
L Band Feed Horn
K Band Receiver
K Band Feed Horn
Q Band Receiver
Q Feed Horn
Scott-T B
(L, K, Ka, Q)
Ka Band Receiver
Ka Feed Horn
U/X Converter
Vertex Room Door