
Radiator Removal During OBS EMI Testing

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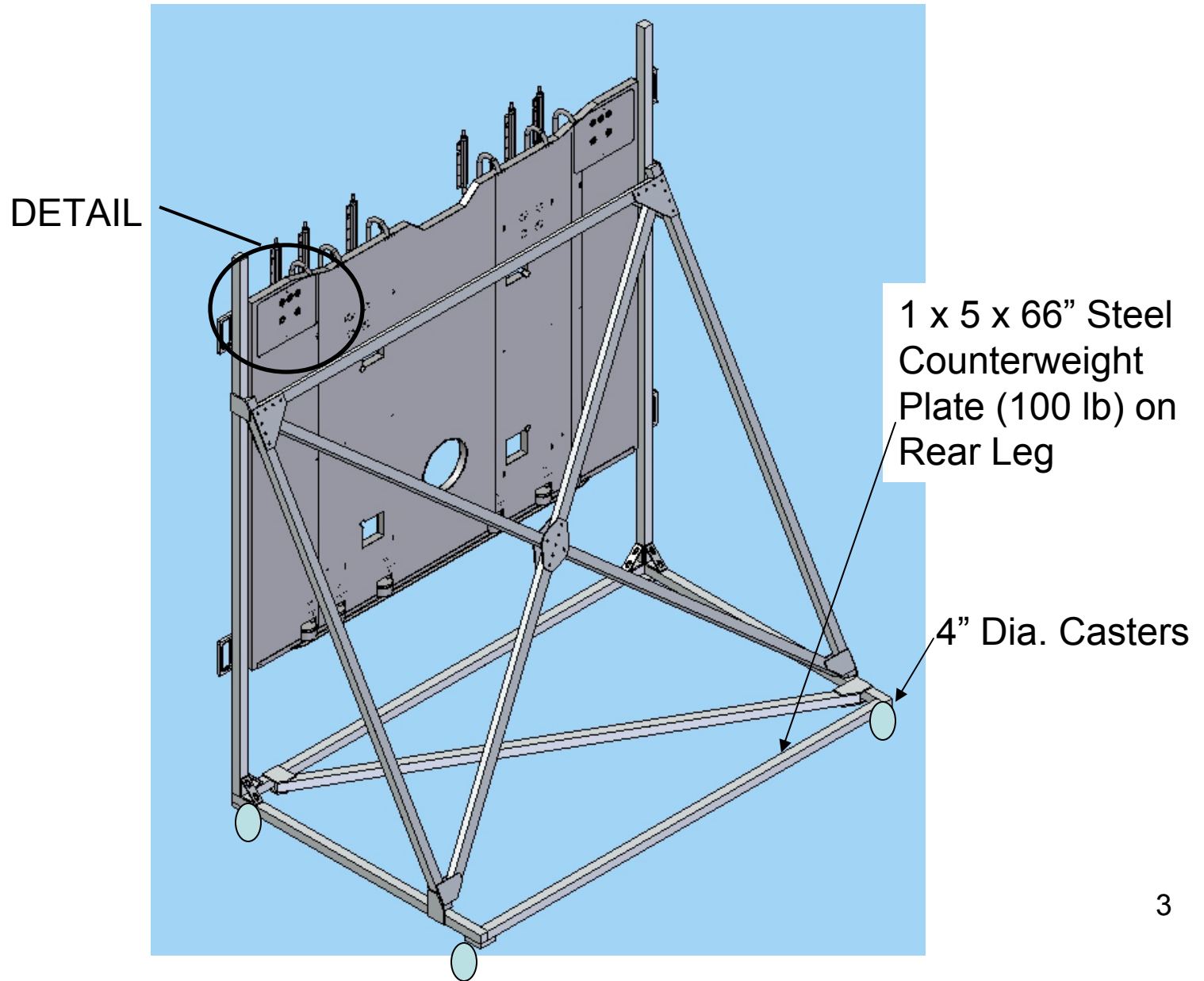
M. Swift

Updated 6/05/07

Basic Concept

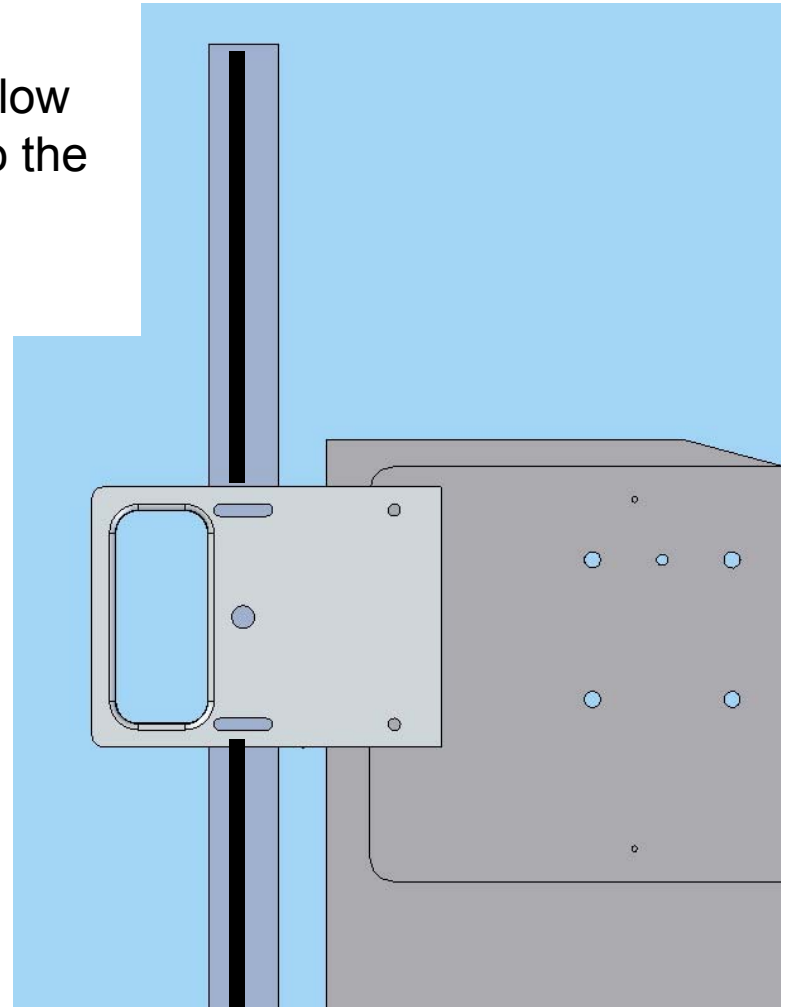
- Build frame from 80/20 frame material
- Frame rolls up to Radiator
- Mounts to Adapter Plates that are mounted to the Radiator Handling inserts
- Disconnect Radiator from LAT
- Roll Radiator away from OBS
- Radiator is stored in Frame until ready for installation
- Installation is reverse of removal

Radiator in Frame



Radiator Attachment & Alignment

- Slotted frame allows for vertical alignment
- Slotted adapter plate allows for horizontal alignment
- Threaded stem casters at each corner allow frame assembly to be rotated to square to the panel face
- Bolt to existing Radiator handling inserts



Status

- Design Complete, drawing is 75%
- Stress Analysis in work, ECD 6/7
- Framing is in transit, due 6/6 (recv'd) and 6/7
 - Cost ~\$1000
- Adapter in work in SLAC shop, ECD 6/7/07
 - estimated cost \$200 each X 4
- Proof load procedure in work
- Radiator removal procedure draft out for review

Next Steps

- Frame Assembly will be built up at SLAC per LAT-DS-08881
 - Frame assembly will be squared up on large surface table prior to final torque of fasteners
- Frame Assembly will be proof loaded at SLAC per LAT-DS-08881
 - 2X mass Radiator simulator bolted into frame
- Ship assembled to GD via truck
- GD and NASA review design and procedure

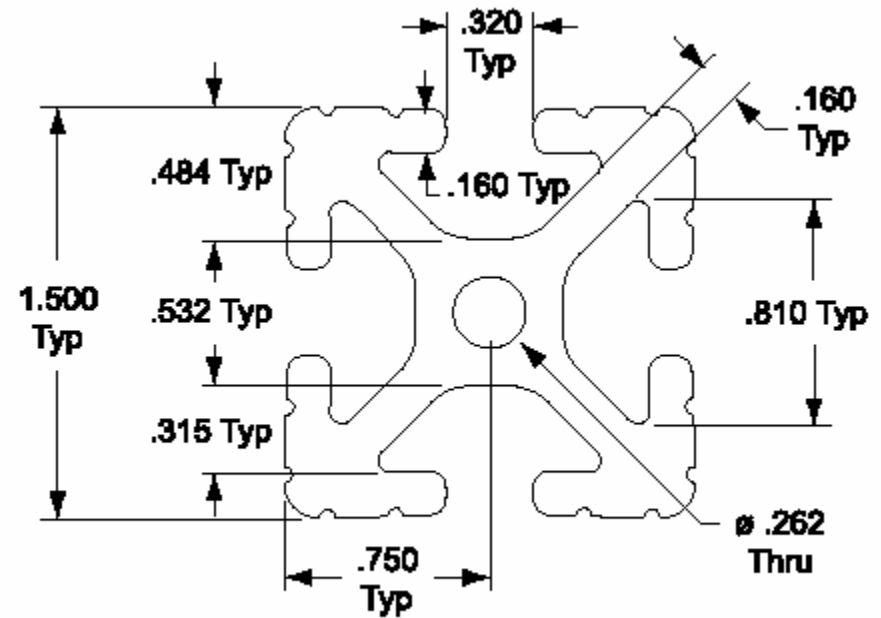
Design

- 80/20 Framing material is high strength aluminum alloy
 - Modular design – off the shelf components
 - Bolted connections (5/16" dia. fasteners)
- Frame interfaces with Radiator Handling inserts (1/4-28 fasteners)
- Frame design minimizes shear and bending loads going into Radiator

Design (cont)

- 1515 Extrusion

Part No.	1515
Material	6105-T5
Finish	Clear Anodized
Weight Per Foot	1.3433 Lbs.
Stock Length (+/- .125")	97" - Part No. 1515-97 145" - Part No. 1515-145 242" - Part No. 1515-242
Moment Of Inertia	$IX=.2524^{in^4}$ $IY=.2524^{in^4}$
Estimated Area	1.1540 Sq. In.



Design (cont)

Fractional Profile Standards

- Yield strength 35,000 lbs. /sq. in. minimum
- Tensile strength 38,000 lbs. /sq. in. minimum
- Elongation A5 minimum 10%
- Elongation A10 minimum 8%
- Elasticity E approximately 10,200 k lbs./sq.in.
- Rockwell hardness approximately E-88
- Extrusion conforming to DIN 17 615 specifications
- Twist per foot of length not to exceed .25 degree and total twist over 20 feet of length not to exceed 1.5 degrees
- Flatness .004" per inch of width
- Straightness 0.0125" per foot of length, not to exceed .120" over 20 feet of length
- Unless otherwise specified, all extrusions will have etch and clear (204R1) anodizing with depth of .0004" and surface hardness of approximately 250 HV (anodized profiles should not be welded because of toxic fumes)

Analysis

- Structural analysis of the frame ECD 6/7
 - Details of analysis are found in separate package (LAT-TD-XXXXX)
 - Static and dynamic handling loads considered
 - Appropriate MGSE Factors of Safety are applied
- Tip over analysis complete
 - counterweight applied at rear leg to prevent tipping under lateral handling loads
 - high margins of safety against tipping
- Stress analysis includes
 - simple FEA model of radiator in frame created
 - interface loads at radiator inserts calculated
 - frame joint loads calculated
 - member stresses calculated
 - margins of safety are all high

Timing

- -Y Radiator would be removed between EMI test segments when OBS needs to be rotated
- OBS is moved to center of chamber and large door is opened
- OBS is on test stand casters
- Test cabling is disconnected for the move

Approx Frame Footprint 80 x 48"





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