Mobile GPS Payload

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Background

Sponsor: Space Vehicles Directorate, Air Force Research Lab (AFRL)
Dr. Madeleine Naudeau – Principal Investigator, Advanced GPS Technologies Program (AGT)

AGT's Goal: Plan, manage, and execute Positioning, Navigation, and Timing (PNT) portfolio that will advance the state-of-the-art of GPS and future PNT payloads. Plans to attend NAVFEST with Mobile GPS Payload.

Objectives

Supports Technicians

- Temperature control → 66°F - 77°F
- Adequate workspace → Accommodates 1-3 workers

Enables Operation

- Lab equipment storage → Storage racks up to 6 ft.
- Self-sufficient → 6 kW power for up to 55 hours

Protects Equipment

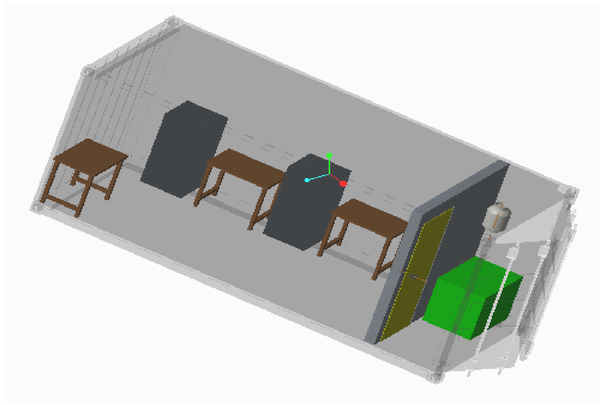
- Withstands harsh environment → 75 mph winds

Economical Solution

- Reasonable initial investment → Less than $150,000
- Manageable operation costs → Less than $2500

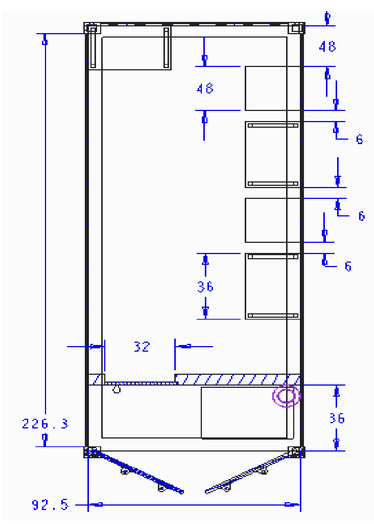
Selected Concept

Modified Shipping Container



Ergonomic Design

- Workspace conditions determined from ergonomic analysis
- BIMFA ergonomic guidelines suggest workstations and equipment racks aligned for maximum workspace
- False wall for generator reduces length, requiring a desk to be placed on the back wall



*Dimensions in inches

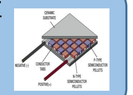
Subsystems

HVAC: Packaged
Saves floor space and requires no duct work

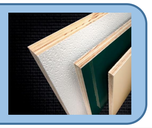
Flooring: Vinyl
Durable, Aesthetically pleasing, Waterproof

Power Generation: Dual Fuel Generator
Propane allows for longer runtimes between fill-ups and the ability to use gasoline also adds versatility

Equipment Cooling: Thermoelectric Cooler
Most compact, Greater cooling ability, Rated for higher temperatures than necessary



Insulation: Fiberglass Reinforced Panels
Sturdy, Waterproof, Interlocking features, Highest R value for the cost R-4.2 per in thickness



Future Work

Mechanical
Determine specifications for HVAC and insulation
Secure equipment for transit

Ergonomics
Optimize individual workstations

Electrical
Spec generator to proper power supply, power conditioning

References

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