N992NA Payload Interface

- Aircraft Summary
  - General
    - ⇨ Gulfstream III, N992NA
    - ⇨ Operated out of Ellington Field by NASA/JSC Aircraft Operations Division (AOD)
    - ⇨ Modifications were completed in 2012 to integrate an external radar payload and the supporting instrumentation
    - ⇨ Modifications were completed in 2016 to add sonobuoy launch tube in aft end of aircraft
    - ⇨ Cabin is configurable between science missions
    - ⇨ This document contains the approved payload operating envelope and the available aircraft systems for payload interface
      - – **Expansion of operating envelope and systems possible through coordination with AOD engineering**

- Aircraft Summary (cont.)
  - Payload capabilities
    - ⇨ External pod via belly mounted MAU-12C/A interface
    - ⇨ Cabin equipment racks mounted to seat track for payload interface and operation
    - ⇨ Dry-air supply to the external pod from pressurized cylinders in the cabin
    - ⇨ Pressure bulkhead feed through from the cabin to payload for power, data, and signals
    - ⇨ Aircraft systems
      - AC/DC power
        - » Both to the pod and inside the cabin
      - Flight Management System (FMS) / GPS, IRS, air data
      - Platform precision autopilot
      - Wireless intercom system between cabin experimenters and flight deck
      - Satellite phone
      - Spare GPS antennas
      - Iridium antennas

- External Pod
  - MAU-12C/A interface, manually operated locks, 30” hook spacing, figure 1
  - Weight and center of gravity
    - ⇨ 1200 lb maximum
    - ⇨ Center of gravity limits, figure 2

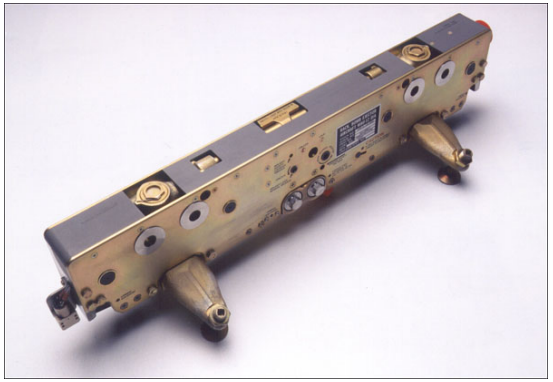

Figure 1

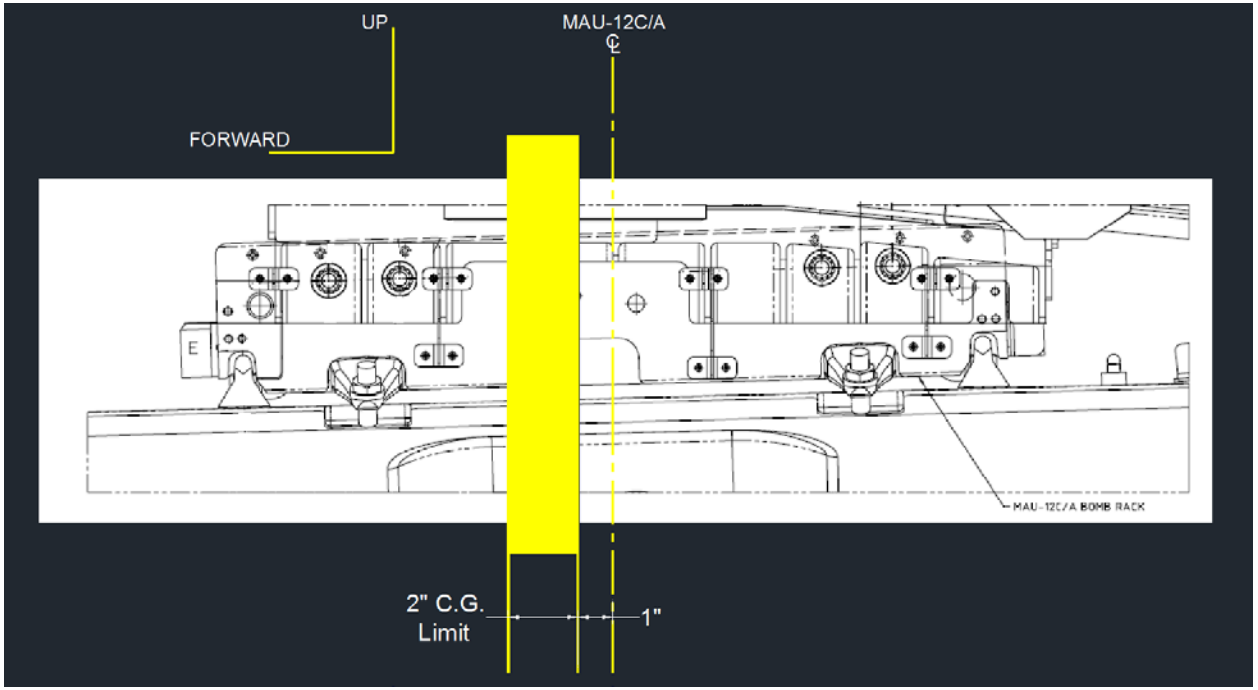

Figure 2

- External Pod (cont.)
  - Shape
    - ⇨ Aerodynamically shaped cylinder up to 30” in diameter and 130” long
  - Structural Integrity
    - ⇨ Must be compliant with requirements given in FAR part 25 and AOD document #8594002
      - – If requirements conflict between documents, the more conservative requirement shall be applied
    - ⇨ Compliance with “crash loads” given in part 25.561 is not required
  - Maximum airspeed and altitude
    - ⇨ 337 KCAS, M0.82, 45,000 ft MSL
  - Disconnect panel installed in forward portion of pylon to provide electrical connection between pod and payload, figure 3

Figure 3

- Cabin and Cockpit Equipment
  - Available cabin area, figure 4
    - ⇨ Installation of instrumentation must allow path for emergency egress

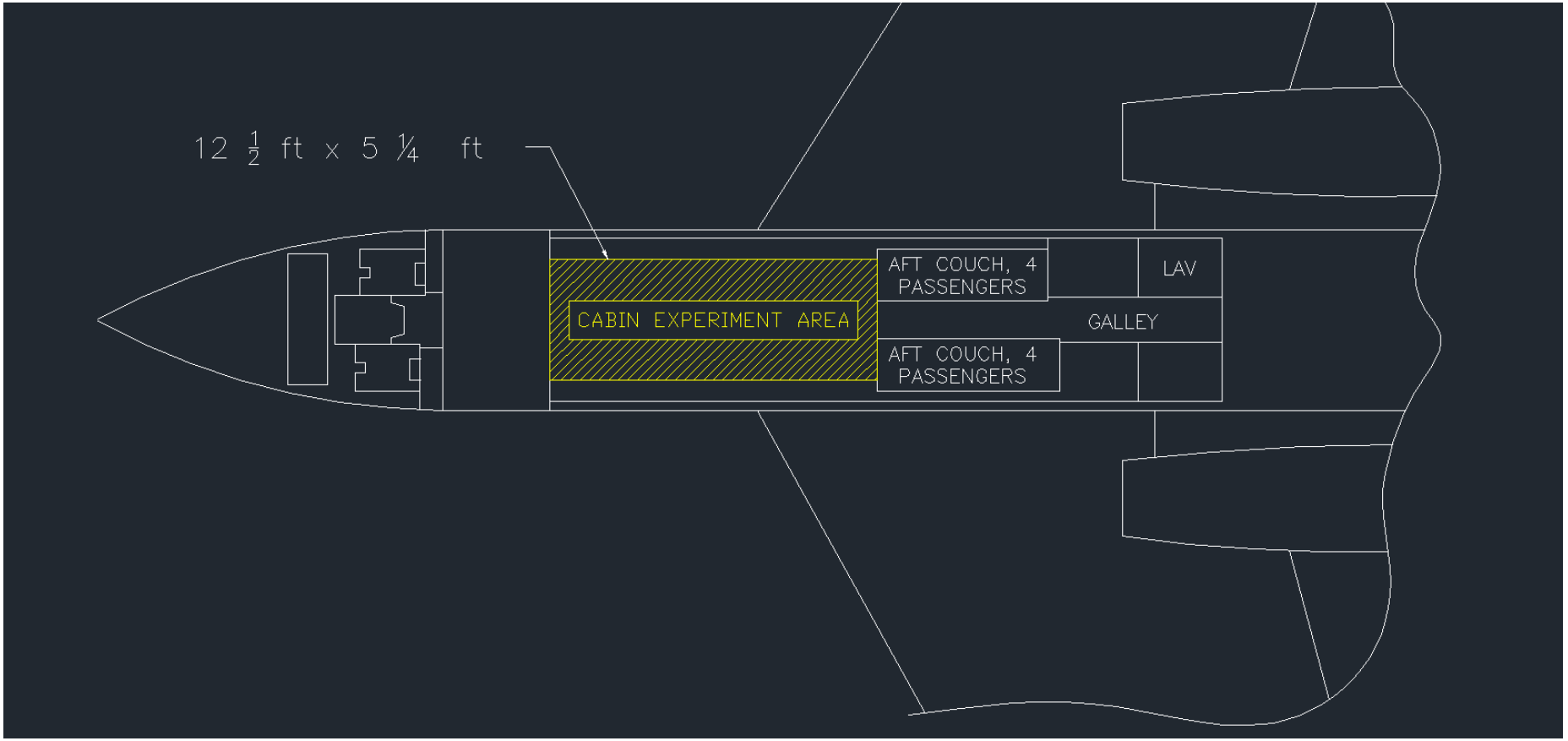

Figure 4

- Cabin and Cockpit Equipment (cont.)
  - Existing equipment racks
    - ⇨ Accommodates standard 19” rack equipment, figures 5 to 6
    - ⇨ 22” x 25” x 50”
    - ⇨ Maximum 3450 lb or 6225 in-lb overturning moment

Figure 5

Figure 6

- Cabin and Cockpit Equipment (cont.)
  - Other custom equipment racks
    - ⇨ Must be adapted with Gulfstream seat track and fittings
      - – Seat track fitting utilizes 3/8”-24 threaded post for mounting, figure 7
        - » Forward/aft spacing of fittings is 3/4” increments, figure 8
      - – 2 seat tracks per side in the cabin, left and right with center aisle
        - » Lateral spacing of seat tracks is 12” on center, figure 8

Figure 7

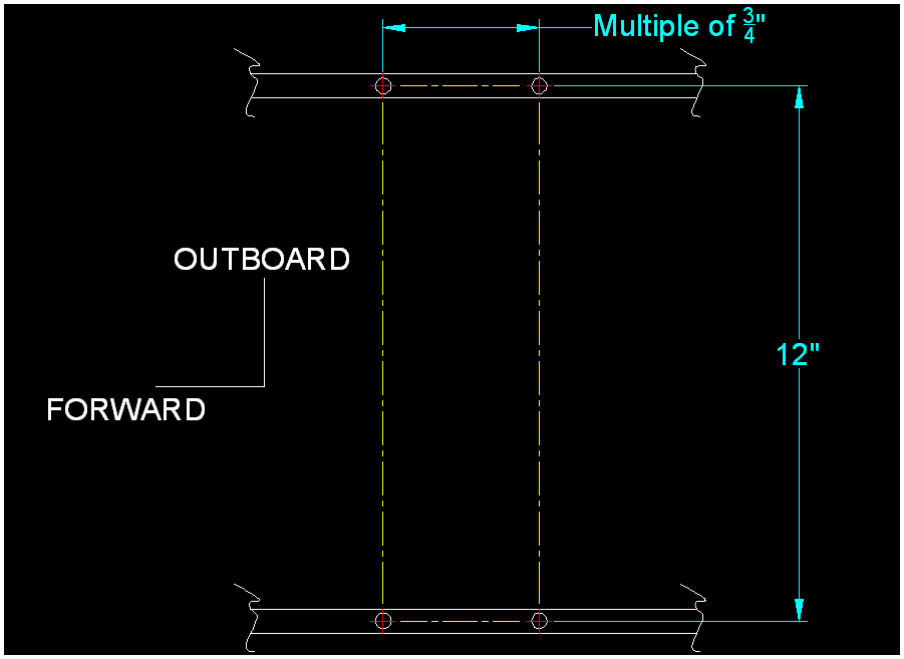

Figure 8

- Cabin and Cockpit Equipment (cont.)
  - Available seating
    - ⇨ Aft couches, 8 people
    - ⇨ Standard Gulfstream chairs, 1 person per chair
    - ⇨ Two seats with locking, inertial reel harnesses to allow sensor operator to operate and monitor equipment racks during taxi, takeoff, and landing, figures 9 and 10

Figure 9

Figure 10

- Cabin and Cockpit Equipment (cont.)
  - Dry-air supply to pod
    - ⇨ Two 1300 in^3, 1950 psi cylinders installed in cabin below aft couches
    - ⇨ Pressure bulkhead feed through provides routing to pod
    - ⇨ Pressure delivered to the pod is adjustable between +0 to +5.5 psig (relative to cabin)
  - Wireless intercom system to connect cabin experimenters with flight deck through push-to-talk button
  - Yoke mounted tablets with Ethernet/GPS/Power interface

Figure 11

- Electrical Power
  - AC, 115V / 60Hz
    - ⇨ Power cord (figure 12) installation on both sides of cabin provides normal household, 15 A outlets to cabin equipment racks
    - ⇨ Maximum 60 A
  - DC, 28V
    - ⇨ Power cord installation (figure 12) on both sides of cabin provides 15 A outlets to cabin equipment racks
    - ⇨ Maximum 100 A

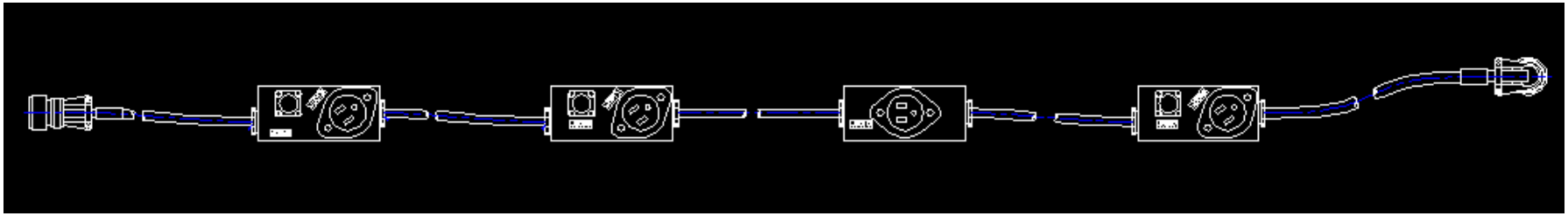

Figure 12

- Aircraft Systems
  - Arinc 429
    - ⇨ Air Data
      - – Dual, independent sources
    - ⇨ IRS
    - ⇨ FMS/GPS
      - – Capacity to load user defined flight plans via external thumb drive
  - Discrete outputs indicating weight-on-wheels and landing gear down
  - Aircell Axxess II Iridium satellite phone
  - Platform precision autopilot for flying a given course at precise altitudes, +/- 5 m

- Aircraft Systems (cont.)
  - Installed experimenter antennas, figure 13
    - ⇨ 2, GPS antennas
      - – Aeroantenna Technology P/N AT2775-81W-TNCF-000-RG-39-NM
    - ⇨ 3, Iridium antennas
      - – Antcom Corporation P/N S5GIR1616RR-PP-XTT-1

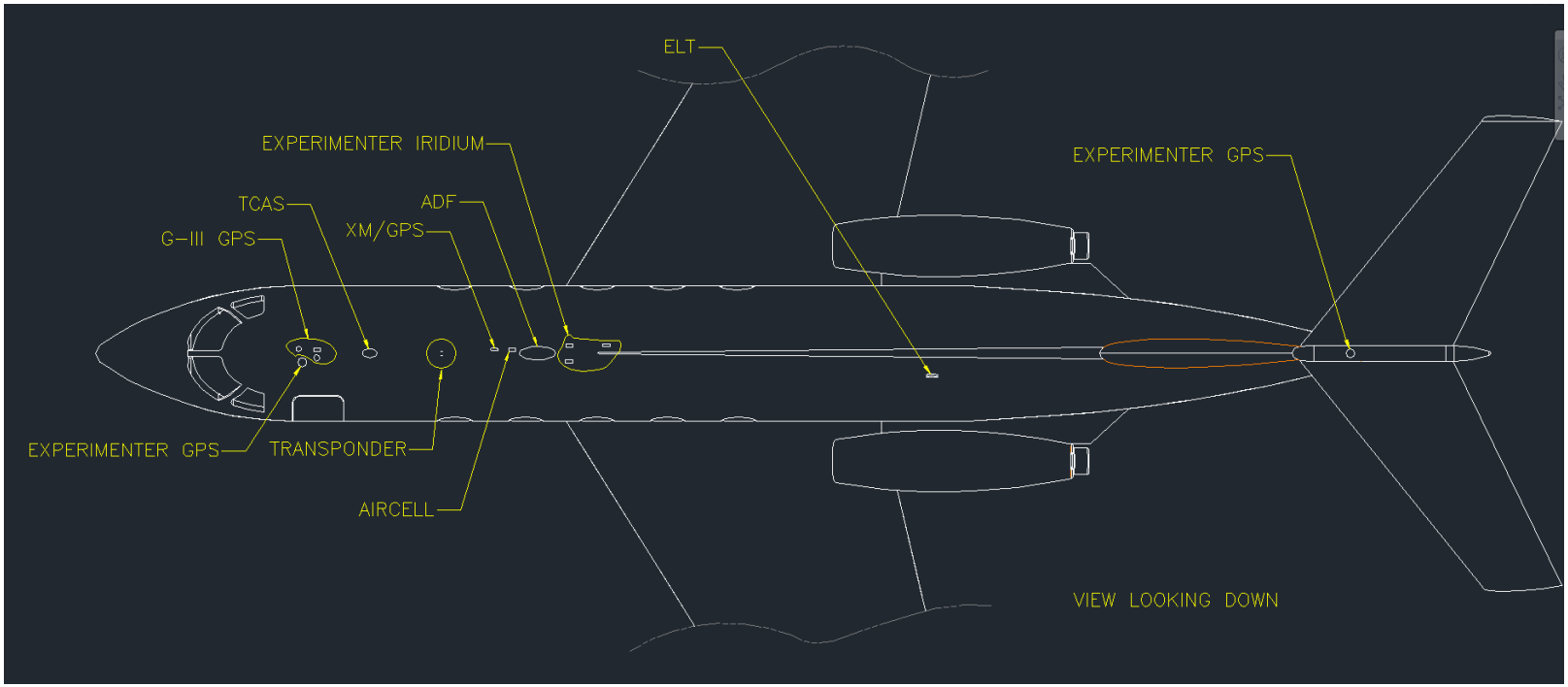

Figure 13

- Aircraft Systems (cont.)
  - Sonobuoy Tube

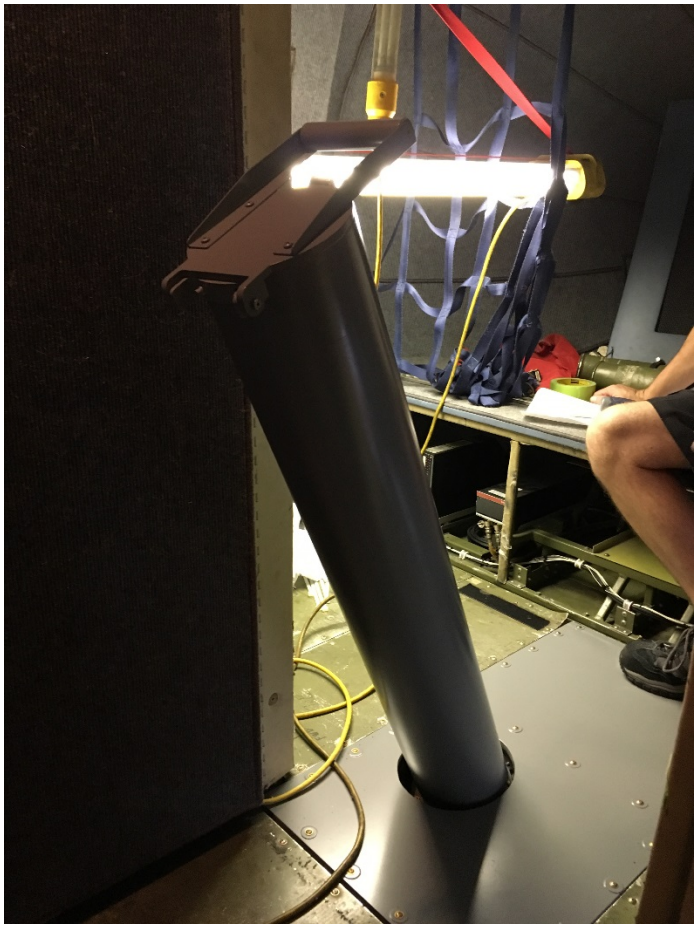

Figure 14

Figure 15