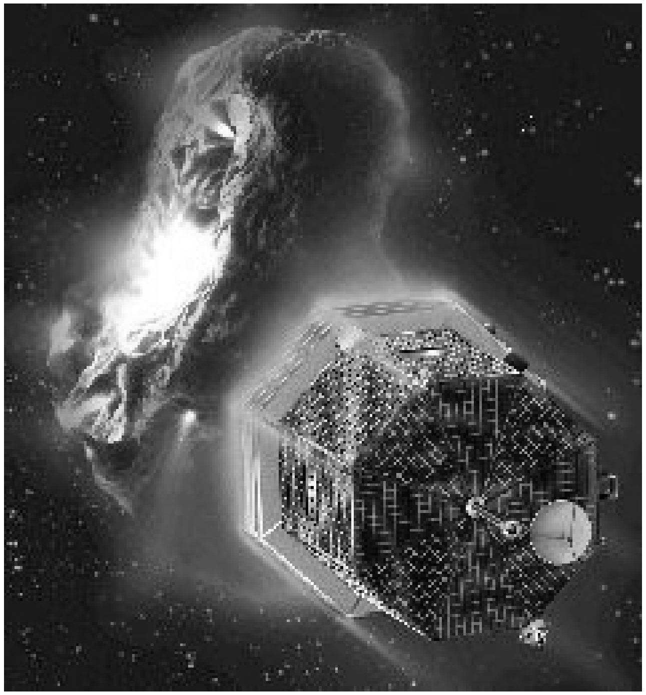


CONTOUR NGIMS Electronics Test History

Florence Tan

Code 915/Swales

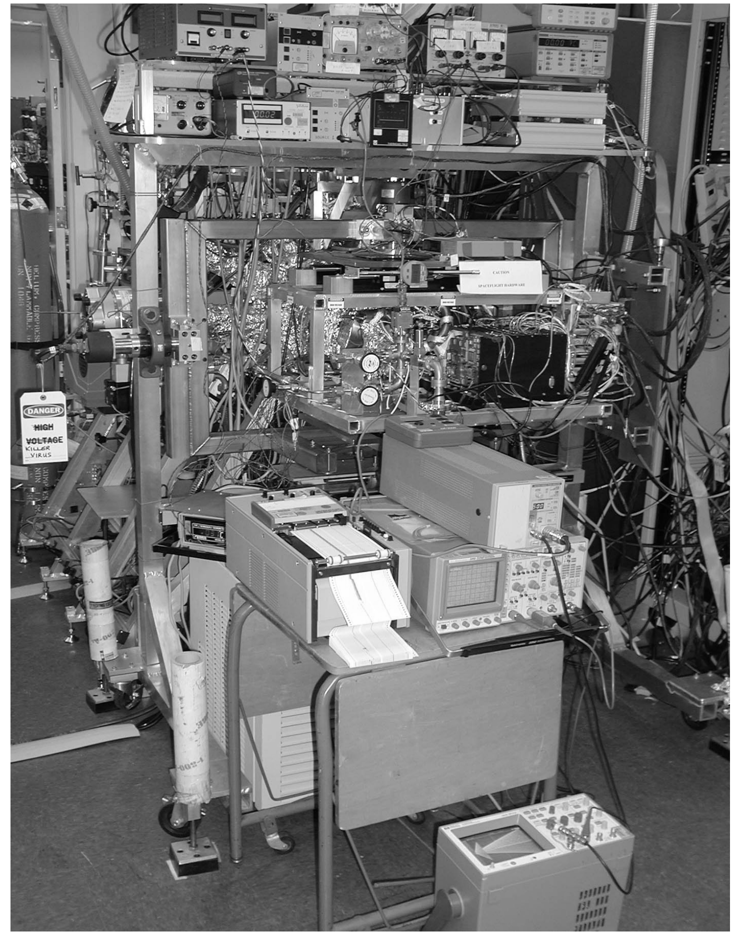
Oct 29th, 2001

NGIMS Flight Electronics Test Summary

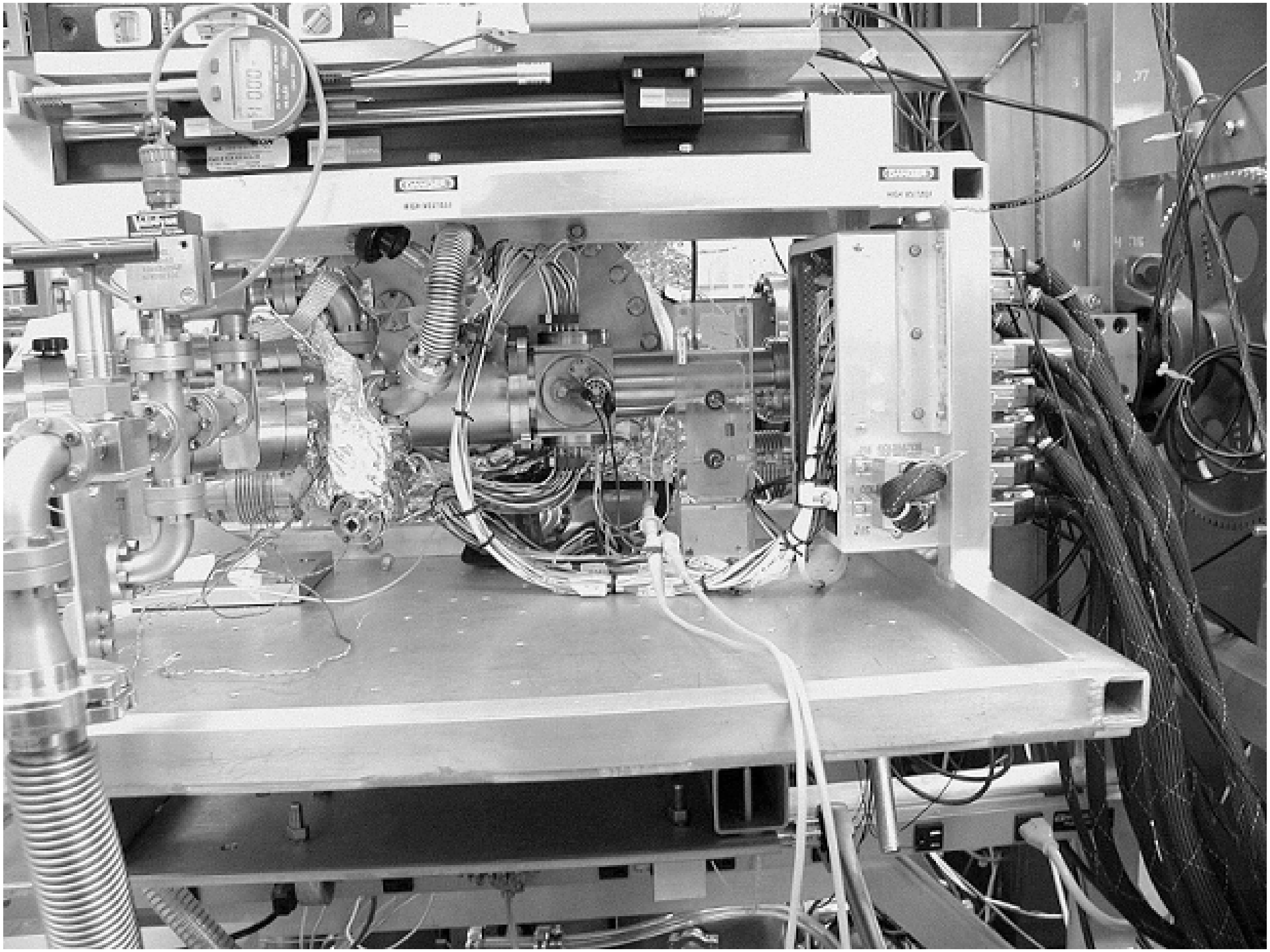
- All boards tested individually at
  - temperature (-45C, RT, 60C)
  - voltage (+/- 10% where applicable)
- Number hours assembled flight electronics tested: 400-500 at room temperature
- Comet encounter mass sampling strategies for closed and open sources

NGIMS Test Configuration

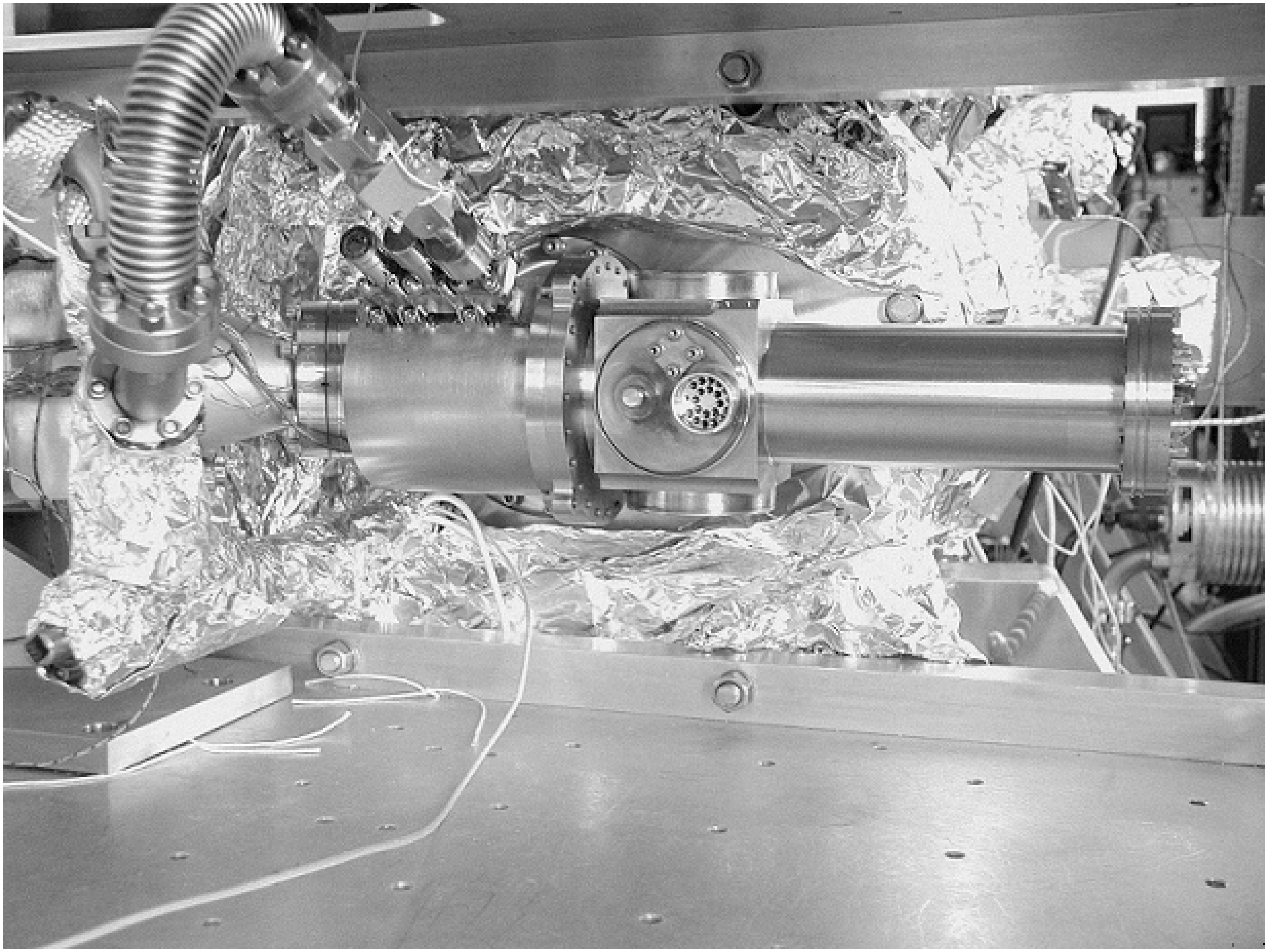
- Vacuum Test System
  - Simulates comet environment except for dust and high speed neutral gas
- Spacecraft Simulator
  - Simulates spacecraft command and data handling system
  - A PC with a 1553 I/F card
- Ground Support Workstation
  - Oracle database for:
    - Commanding functions
    - Telemetry data repository



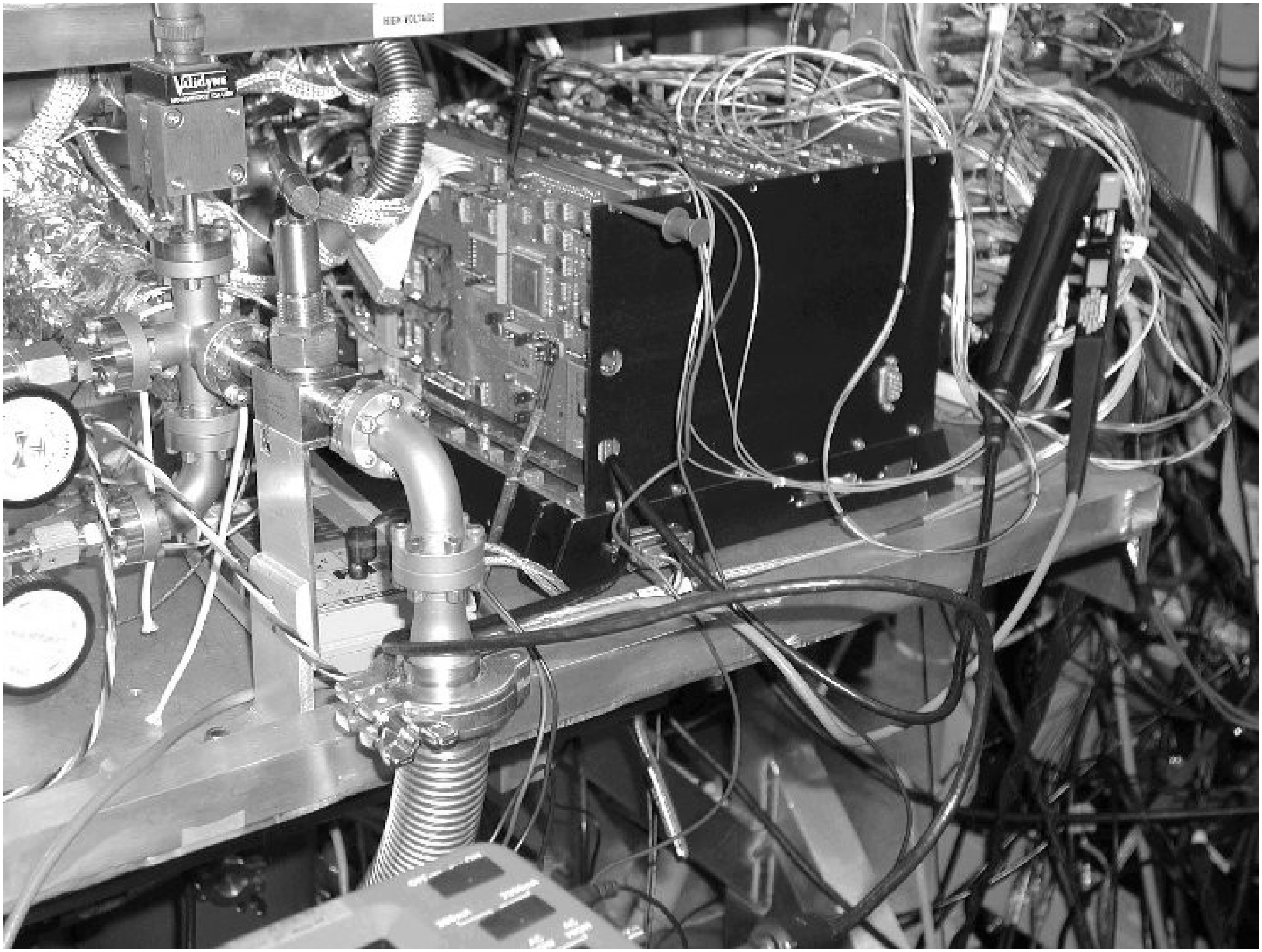
Vacuum Test System



NGIMS Sensor



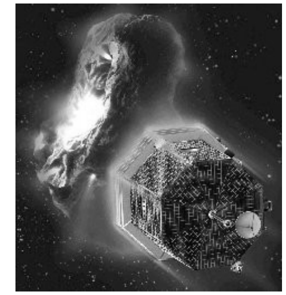
NGIMS Electronics



NGIMS Flight Electronics Testing

- Testing done between July 9th - October 12th 2001
- Room Temperature
- Phases:
  - Ongoing V&V
  - Ongoing Baseline
  - Lens Tuning at Goddard
  - Calibration at Goddard
  - Spacecraft interface at APL

Testing Details – Ongoing V & V and Baseline Tests



- July 9th 2001 – Oct 12th 2001
- Tested GSE, HW & SW using V&V SW
- Generated and tested instrument baseline and functional tests for verifying operation of the instrument from calibration to post-launch

Testing Details – Lens Tuning

- July 9th 2001 – September 16th 2001
- To determine best lens voltages
- Ion source cleanup prior to gas calibration by simultaneously operating all 4 filaments
- Analog hardware
  - DAC's calibrated and engineering unit conversions determined
  - Exercised limits of high voltage amplifiers
  - Characterized analog response times and slew rates

Testing Details – Calibration

August 28th 2001 – September 16th 2001

- Calibration
  - closed source and open source thermally accommodated gas modes tested using single gases
  - mass peak tuning determined using high molecular weight compound
  - open source testing with an ion gun over energy range expected for comet encounter and flight parameter values determined for equations
  - tested in-flight gas calibration system
- 500+ Baseline, characterization & calibration runs

Testing Details – Spacecraft Interface at APL

- Oct 9th, 10th, 11th 2001
- Verified connector between S/C and NGIMS
- Powered on using S/C power
- Commanded NGIMS using S/C GSE
- Collected and verified telemetry from S/C

GSE Test Setup at APL

CONTOUR Spacecraft / NGIMS Interface Test