NIC-FPS 1-Year Review

Integration and Test Plan

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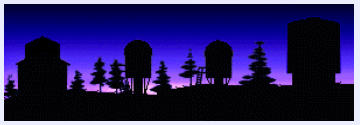
CASA-ARL

Boulder, CO



Integration and Test Plan defines scope and nature of effort to completion

- Shows effort from CDR to completion/delivery
- Identifies additional needs for delivery
- Emphasizes systematic build-up and test

NIC-FPS integration and test will assure turnkey delivery to APO

CDR

Fabricate/procure Dewar mechanical and thermal components (7/29 thru 12/31)

A. Receipt inspect, fit checks, acceptance tests

B. Initial Dewar fit check and vacuum test (2nd Qtr '03)

E. Integrated Dewar thermal testing (3rd Qtr '03)

Fabricate/procure optical, detector, electronics, control system s/w, and cable harnesses (4/15 thru 8/15)

Optics arrive (late-April)

C. Receipt inspect, acceptance tests, component assembly and test

D. Optical bench integration and test (3rd Qtr '03)

F. System integration and test (4th Qtr '03)

Support equipment
Control software
Alignment hardware
(4/15 thru 8/15)

G. APO delivery and test (1st Qtr '04)

Front-end inspection, fit checks, interface verification minimizes integration problems

A.

Receive/inspect all mechanical and thermal parts and components → Verify fabrication and procurement specifications → Perform fit checks and verify mechanical interfaces → Clean, store, catalog, parts with receiving documentation and acceptance test data → **B.**

Initial Dewar assembly and test characterizes mechanical and thermal performance

B.

Assemble/align cold standoff and optical bench; align and epoxy G-10 ring; fit check to vacuum bulkhead

→ Install optical bench and cold standoff

→ Install FPA mirror and mass models on optical bench

↓

Pressure test and fit check LN2 tank, rear bulkhead, thermal shield and vacuum shell assembly

→ Install vacuum shell assembly, LN2 tank assembly, thermal straps, getters, window, and other penetrations

→ Initial vacuum test and warm alignment

↓

Cryotest Dewar; characterize cooldown and warmup rates; determine hold time with thermal shields

→ Check rotational alignment and thermal displacement with retro-reflector and/or theodolite

→ **E.**

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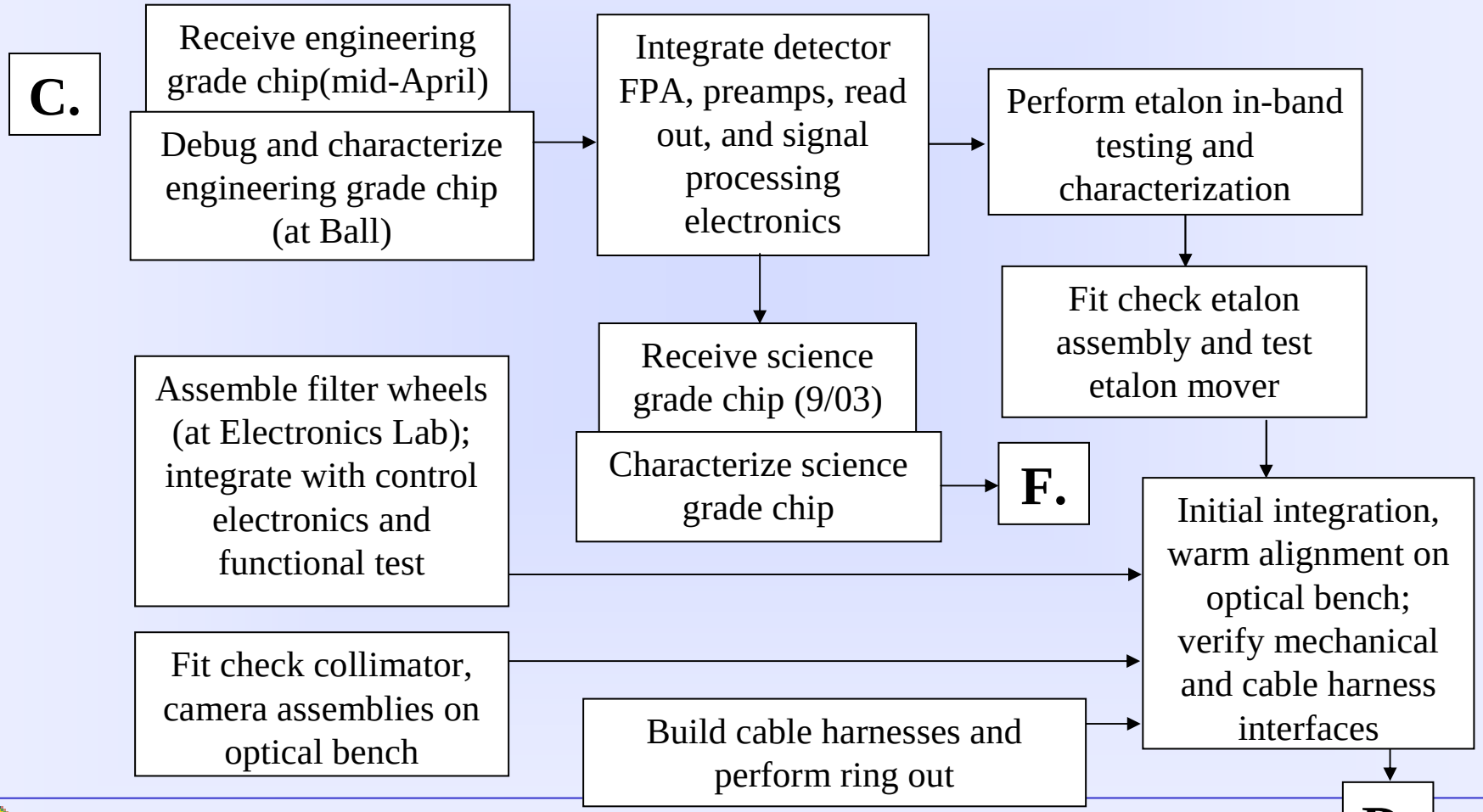
Optical and detector assemblies are checked out and characterized prior to integration onto optical bench



Optical bench integration verifies warm alignment and mechanism interfaces

D.

Optical components and assemblies acceptance and verification tests:
Collimator assembly
Camera assembly
Filter wheels
Lyot Stop
Etalon mover
Detector package

→ Install optical components in mounts; install assemblies on optical bench

→ Integrate mechanisms and verify control system interfaces:
Filter wheels
Etalon mover

→ Integrate detector package and electronics; install cable harnesses

→ Perform coarse warm alignment

→ Verify optical/detector mechanism/control interfaces

→ **F.**

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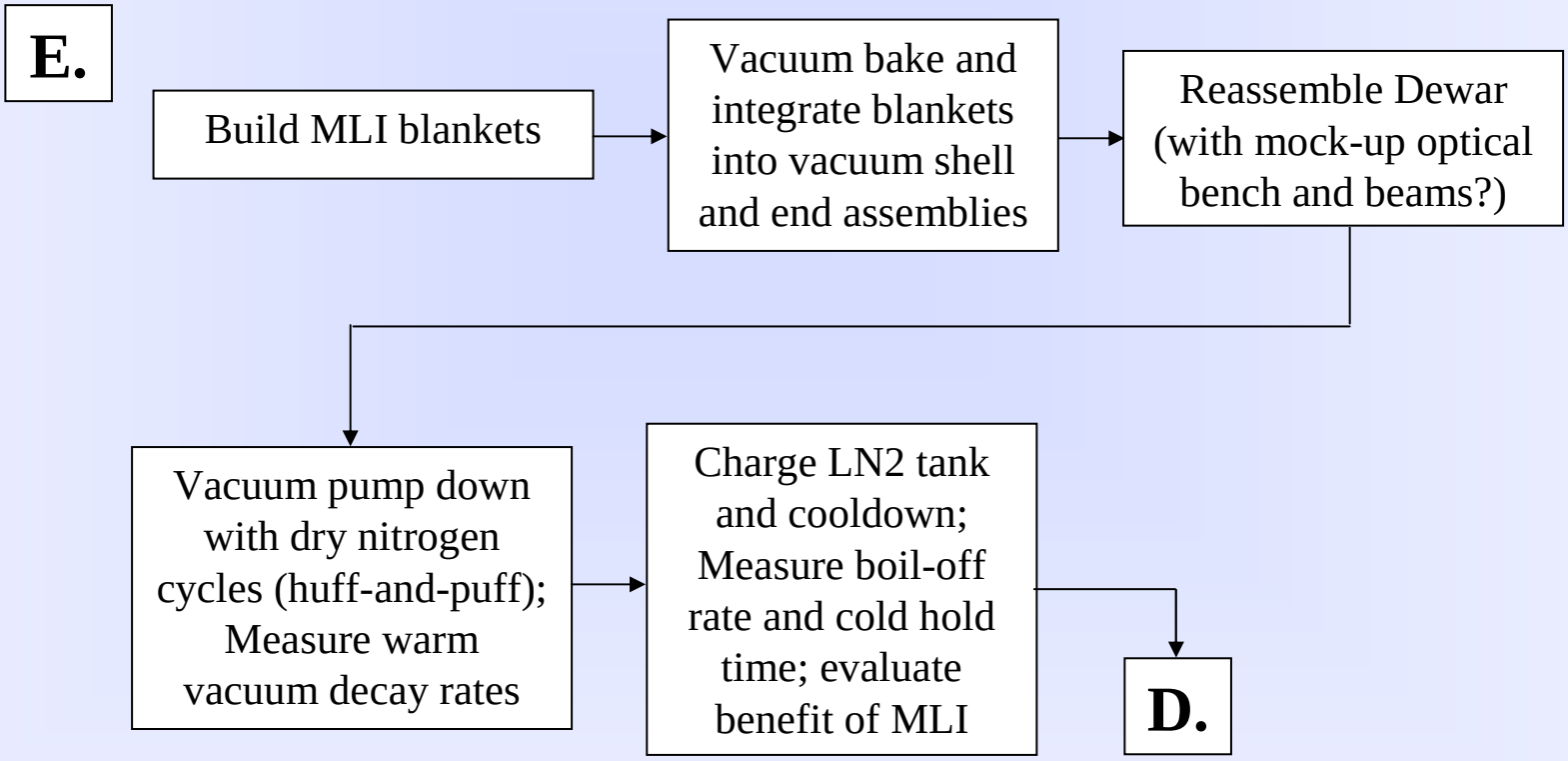
Integrated Dewar assembly incorporates critical thermal and vacuum components



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System integration and test at C.U. verifies all system functions and tests operational performance

F.

Install integrated optical bench with engineering chip and baffles onto cold standoff

Assemble full Dewar thermal and mechanical system; include MLI if determined by test

Perform warm check-out of electrical and control systems

Perform pump-down, LN2 fill, and full system cooldown

Lab First Light
Perform cold alignment check:
Image quality
Dark current
Readout performance
Stray light check

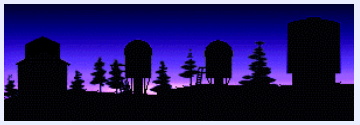
Mechanism functional tests and cold alignment to image quality criteria (thermal cycles)

Warm up and install science grade chip; cool down

Final cold alignment check and system performance measurement:
Detector performance, system noise, stray light

Pack and ship to APO

G.



Observatory level integration and test verifies APO interfaces and generates optical performance data

G.

APO receipt, unpack, inspect

Integrate instrument at telescope; fit check at rotator; counter weight for rotational balance

Integrate control system and data interface; perform warm functional checks; GUI, filter wheels, etalon mover, environmental feeds

Perform pump-down, LN2 fill, and full system cooldown

APO First Light
Perform cold alignment check:
Detector performance
Readout/GUI checks
Rotational offsets
Stray light check

Mechanism functional tests and cold alignment to image quality criteria (thermal cycles if needed)

Instrument commissioning runs:
Optical performance measurement
System characterization
Calibration observations
Science demonstration observations

Delivery to APO
- Test data
- Test report
- System docs
- User's manual
- Spare parts

Additional support/equipment required to meet I&T completion

- Alignment Plan
- Test procedures (selected activities)
- Telescope simulator (fiber optic on translation stage?)
- CCD Package? (per Alignment Plan)
- Alignment support equipment
- Control S/W
- Diagnostic S/W
- Laser/lamp sources