OPERATIONS MANUAL
FOR QA INSPECTION
AND FLIGHT STORES

GP-B SCIENCE MISSION PROCEDURE

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APPROVED
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APPROVED
1. SCOPE

This document describes operations procedures for QA Inspection and Flight Stores. The QA/Inspection room is located in the FIST OPS auxiliary area in the HEPL building. The operations are divided in this document as follows:

- Raw Materials Issuing
- Flight Parts Receiving
- Flight Parts Inspection
- Acceptance Inspection
- Flight Parts Storage
- Flight Part Traveler
- Flight Part Issuing
- QA/Inspection Hardware and Paper Flow

1.1 Acronyms

The following acronyms are used in this document:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE</td>
<td>Responsible Engineer</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>QE</td>
<td>Quality Engineer</td>
</tr>
<tr>
<td>PO</td>
<td>Purchase Order</td>
</tr>
<tr>
<td>IIR</td>
<td>Inspection Instructions and Report</td>
</tr>
<tr>
<td>SEM</td>
<td>System Effectiveness Manager</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
<tr>
<td>IRM</td>
<td>Inspection/Receiving Manager</td>
</tr>
<tr>
<td>PQA</td>
<td>Government Quality Assurance Acceptance Stamp</td>
</tr>
</tbody>
</table>
2. RAW MATERIALS ISSUING

Purchased Parts using Stanford Supplied Raw Material

- The Responsible Engineer (RE) requests raw Material by submitting a “Raw Materials Request Form” (available in the QA area or in database @ “Relgyro'(O;)\forms”) to the IRM, or his designate. This form (Attachment A) calls for the material name, its specification, size, drawing number, quantity parts, quantity material, date required, magnetic zone, flight or non-flight part, vendor, and Purchase Order (PO) number.
  - The request must be submitted prior to material being issued for any flight part.
  - Raw Material for flight parts may be issued only if Vendor, PO#, Traveler and Drawing are provided.
  - The IRM or designate issues the raw material and fills in the appropriate fields in the raw Material Request form which includes The materials Stanford number, magnetic screen report number and quantity issued.

- A Document Package is created by QA with RE assistance, when issuing raw material. The package consists of the following:
  - Material Certificate
  - Magnetic screening report (Attachment B) (available in the QA area or in database @ “Relgyro'(O;)\forms”) Screened to the appropriate zone as requested on Raw Material Request Form
  - Drawing
  - Inspection Instructions & Report (IIR) (Attachment C) (available in the QA area or in database @ “Relgyro'(O;)\forms”)
  - Storage location
  - Flight Parts Request Forms (Attachment D) (available in the QA area or in database @ “Relgyro'(O;)\forms”)
  - Travel sheet

- When issuing raw material, magnetic zone appropriate material will be issued first; e.g., Zone 1 material will not be issued for Zone 3 parts use if there is Zone 3 material available.
3. **FLIGHT PARTS RECEIVING AND INSPECTION**

- When a flight part arrives at the HEPL receiving office the GP B QA/Inspection will be contacted. The QA IRM or designate will perform the initial inspection pertaining to ID, count and condition. This will be performed at the receiving area. Flight Parts are to be received by authorized QA personnel only. Authorized personnel include the IRM or his designate. The RE is to be immediately notified by QA of flight parts received, and any discrepancies noted.
- All flight parts received will have the acceptance inspection performed in accordance with the approved travel sheet instructions. The QA/Inspection Manager or his designate, in accordance with the Traveler, will perform acceptance inspection. Authority to stamp off the acceptance inspection block of any travel sheet will be limited to these personnel only. Specific inspection instructions are specified in the IIR. The inspection will be performed by the QA and recorded on the IIR form (Attachment C). Once the IIR is complete the associated travel sheet operation will be bought off.
- A review of the requirements called out on the PO attachment (Attachment E) (available in the QA area or in database @ “Relgyro’(O;)orms” will be verified. All required items must be available prior to the parts final acceptance.
- An inspection drawing must accompany the IIR. The drawing is to be stamped with “I” stamps, indicating features or measurements to be inspected, and an “Inspection Drawing” stamp, with RE signature, date, and Inspector signature.
- Flight parts can not be released to the floor until final acceptance is completed. A part is considered accepted only after requirements of PO are met and travel sheet completed.
- Upon completion of acceptance inspection, the hardware container will receive a green GP B Flight Hardware label and stored with other flight hardware in the bonded stores area.

**In the event a part is needed prior to acceptance a DR must be generated and the RE’s explanation of the need for early release. QA will document the specific items left prior to final acceptance. This DR will be closed when all required items are completed.**

If Government source inspection (GSI) is imposed at the supplier’s facility, receiving inspection shall verify that the government PQA stamp is present on the shipping document.
2. **FLIGHT PARTS STORAGE**

- After each process is completed in the Inspection travel sheet the flight part shall be returned to QA/Inspection for storage. Parts are physically segregated according to processing status.
- After acceptance inspection is completed the flight parts are stored in a segregated area marked as “Inspection Completed.”
- Once stored any other processes will be followed according to the operations called out in subsequent approved travel sheet.
- Parts are segregated in 3 ways:
  - Storage cabinet
  - Individual location within cabinet
  - Bagging and Tagging
- Storage cabinets are segregated by:
  - Parts in process
  - Parts accepted as Flight Parts
  - Backup Flight Parts
  - Engineering Units (Non-flight parts)
  - Failed Parts
  - Vendor Supplied Parts
5. TRAVEL SHEET

A detailed guide is available for the preparation and use of travel sheet. (Refer to P0406)

- A travel sheet is generated by the RE and may be modified only by the RE listed on the bottom of that traveler. The RE and Program Quality Engineer must approve the generated traveler prior to being put in use. (Attachment F)
- Travel sheets are kept with the flight part from Raw Material Issue forward. At the completion of each operation, the appropriate personnel must buy off each individual step.
- Any process performed on a part must be documented on the travel sheet.
- Completed travel sheet must include
  - Part Name
  - Lot Date Code or Serial Number
  - Vendor
  - PO#
  - Part Number, including dash number
  - Revision Number
  - All processes, operations and required tests, must be documented on the travel sheet in chronological sequence. For each operation, the following information is required:
    - Operation
    - Specification
    - By Whom Performed
    - Date Completed
    - Space for Inspection and Approval Stamp
    - Space for Buy Off Initials
    - Space for Discrepancies and Remarks
  - Space for Completion Signature by travel sheet RE and QE
- After the travel sheet is completed and bought off by both RE and QE, the part is accepted for flight, and stored as a Flight Part.
6. FLIGHT PARTS ISSUING

- Flight Parts may be issued by QA/Inspection once the part is inspected and accepted by receiving inspection. This will occur only if all provisions required by the PO and IIR are met. The travel sheet must be signed off and stamped by the RE and program QE.
- A “GPB Flight Hardware” decal must be attached to the bag containing the hardware.
- Flight parts may be removed from Stores by the RE filling out a “Flight Parts Request” form. (Attachment D) (form available in the QA area or in database @ “Relgyro’(O;\forms)” and submitting it to QA Inspection. Forms are located outside the bonded stores area. The completed forms can be left in the Flight parts request box, clearly marked outside the flight stores area. This box will be checked several times each day to ensure a timely turn around. Forms can also be given directly to a program QE.
- After the request form is reviewed by QA the RE will be contacted on the part availability.
  A flight part that has not completed the QA Inspection can only be issued if a DR is generated, detailing the reason and listing the remaining items required to completion of acceptance (See section 3)
- If an assembly requires kitting, the kit list must be completed documenting all articles and materials needed for assembly. Individual parts must include serial numbers or lot date codes. These parts shall be organized together and placed in the appropriate bin. This bin will be labeled with the assembly part number, serial number and GPB Flight sticker.
- Approved Traveler for next assembly must be presented to QA Inspection.
- All nonflight parts will be issue with a nonflight sticker.
QA/ INSPECTION HARDWARE AND PAPER FLOW
ATTACHMENTS

SAMPLE FORMS

- Attachment A, Raw Materials Request Form
- Attachment B, Magnetic Screening Test report
- Attachment C, Inspection Instructions and Report (IIR)
- Attachment D, Flight Parts Request Form
- Attachment E, Special notes for PO
- Attachment F, Travel Sheet Form
Raw Materials Request

****All information in Italics must be answered to process request****

Material ______________ Spec. __________ Size__________

Drawing. # ___________ Qty. parts _________ Material Qty. _______

MAGNETICS TESTING REQUIRED: YES / NO Zone: 1 2 3 4
FLIGHT PARTS: YES / NO

GTU / Science mission / other ______________

Requester _______________________ Phone ___________ Date __________

Deliver to ______________ Phone ______________

VENDOR ________________________ PO ______________________

--------------------------------------------------- For QA use only ---------------------------------------------------

Date request received: ______________________

Material Serial # ______________ Magnetic Screen # ______________

Magnetic Zone Approved for ____________ Quantity material issued ____________

Date filled: ______________ Initial / stamp____________________
ATTACHMENT B

Magnetic Screening Test Report

To be completed by engineer (SU) or Magnetics Lead (LMS) Date: January 24, 2010

Component Raw Material Coupon Magnetic Zone: (1)
P.O. #: E51823 Part #: 25097-101 Rev.- Qty _5_____

Part name: PLATE, BOTTOM, SQUID BRACKET Requester: Ben Taler Phone: 5-6403

Material name & spec: COPPER, UNS C10100 060 ASTM B 152

(ex: beryllium copper, ASTM B196, UNS C17200)

Lot or heat number rod/bar/sheet #: ______ (ex: heat# 14290)

Vendor: Watts (ex: CHAMP Co.)

Material producer: ________ (ex: Alcoa Aluminum)

coupon __________

Mass of material total grams = ______ grams/part x _____parts

Minimum distance of part from any gyro cm Range of distances _____ - _____ cm

No etch

Soap & water Chem etch, type: _____ time/depth of etch: ______ by: _______

other _____ (ex: H2SO4) (ex: 1 mil)

Cleaning Data

Room Temperature Test Data Please return sample

Number of coupons 1st test: Mag _____ µG Demag _____ µG 2nd test: Mag _____ µG Demag _____ µG

(informal screening; no LMSC log book entry) initials of screener _____ date _______

Mag RT pass ≤ 1 µG Mag RT reject (> 1 µG) scrap, by: ___________ Send on, by: ___________

Cryogenic Test Data Date rcv’d ___________

Sample# ____________________ Mass ____________________ grams

Large Cryogenic Tester

Remanent moment ___________ emu Temp ______K Exp: ______ G

MPMS

Remanent moment ___________ emu Temp ______K Exp: ______ G

Susceptibility ___________ emu/G Temp ______K Field: ______ G

Mass susceptibility ___________ emu/G/g

Gradiometer

Remanent moment ___________ emu Temp _____K Exp: _____ G

Test conducted by: ______ date ______ Test approved by: ______

Comments: __________________________

Pass/Fail Criteria

Zone Remanent moment Mass susceptibility

O Passes zone criteria

1 (d3) x 10-7= ______ emu ≤ 5 x 10-6 emu/G/g

Approved by: ___________

2A ≤ 2 x 10-6 emu ≤ 5 x 10-6 emu/G/g

2B ≤ 4 x 10-6 emu ≤ 1 x 10-5 emu/G/g

O Fails zone criteria Mag Commitee disposition: O Approved O Rejected

Attach Waiver form to this report.

O Approved: O Rejected: Waiver# ___________ DR# ___________

enter data in Magnetic Screening Log Book, and apply Mag Stamp as required.

Log # ___________, CS ___________ Closure Date ___________
## Inspection Instructions & Report

**PART NAME:** Pin, Contact, R/O Cable  
**PART NUMBER:** 25012-101  
**PRODUCED BY:** MTE  
**QUANTITY ORDERED:** 50  
**PURCHASE ORDER NUMBER:** SM3545

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Inspection Method</th>
<th>Results</th>
<th>Date Completed</th>
<th>Initials or Stamp</th>
<th>Remarks/Discrepancies (Ref. Related Docs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inspect for damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Check part identity against dwg.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Verify vendor's documents [are they all there and signed?]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fill in shaded portion of IRR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 5 | Inspect parts for dimensions and other criteria marked by RE on Inspection Drawing dated [underline] | Qty of to be inspected: | | | List actual dimensions on dwg.  
List all discrepancies below for RE buy-off. Keep qty inspected for mag & GTU-1. | |

**LIST DISCREPANCIES BELOW FOR REVIEW AND DISPOSITION BY RESPONSIBLE ENGINEER**

{Continue on another sheet if necessary and attach to this one}

<table>
<thead>
<tr>
<th>#</th>
<th>DISCREPANCY DESCRIPTION</th>
<th>Should be</th>
<th>IS</th>
<th>RESPONSIBLE ENGINEER'S COMMENTS</th>
<th>RE Buyoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ATTACHMENT D

FLIGHT PARTS REQUEST FORM   UPDATED 21 JULY 1998
(required before parts can be issued)

Part Name ________________________________
Part No. ________________________________
Next Assembly Number __________-_____ REV ___
Mag certs Required? {  } Zone ___________
USE: {  } Proto Eng.  {    } SM*
*only fully signed off parts may be issued for SM.

Are these parts being removed prior to acceptance?  
YES / NO
  If Yes, RE must initiate a DR & record nos. here ________

Are parts to be returned to stores as flight parts after use?  
YES / NO
  If Yes, separate traveler required documenting use or next
  assembly traveler returned with new assembly.

Requester _______________ Phone _______________

Quantity required ________           Need Date __________

_________________________________________________________________________________

Quantity issued ________ By __________   Date __________
(Name & Stamp)

Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________
Serial Nos. ________ LDC _______ Mag#__________

Please contact Phil Unterreiner @ 3-3264 or Grace Brauer @ 51484 or 34790
with any questions regarding this form.
SPECIAL NOTES FOR FLIGHT PART ORDER

P.O.# ________________________ Vendor: ________________________

___ 1. Prior to using any other supplier source, vendor is to notify Stanford Buyer of this supplier including name, address and telephone number. This must be done before completing this flight part order.

___ 2. In conjunction with Travel Sheets provided by Stanford, vendor is to follow instructions that are specific to machine shop. Sign and return the travelers with delivery of parts.

___ 3. Materials provided by Stanford will include material COC and/or COT.
   a) Excess materials must be returned with delivery of parts and clearly identified.
   b) Show P.O.# for work and enclose copy of material COT or COC with material.

___ 4. Standard/Off-Shelf Parts, vendor is to include COC on parts and Lot No.

___ 5. Analysis, Inspection and Test Reports shall remain on file for no less than 5 years after completion of order.

___ 6. Mark packaging/shipping container "FLIGHT PARTS" (for fabrications identified as such), e.g. use dark ink marker to write bold lettering on packing list or outside of package.

___ 7. Unless specifically addressed in travel sheet or drawing packaging, shipping shall be per normal supplier system.

___ 8. The Contractor shall be notified of any articles having limited life or drift with age. Vendor shall provide records indicating life used prior to delivery and remaining life characteristics.

___ 9. Contractor QE shall be immediately notified of any discrepancy that will effect form fit or function or seriously impact schedule.

___10. Government Source Inspection (GSI):
     The Government has the right to inspect any or all of the work included in this order at the supplier's plant.

___11. Vendor will provide written sign off evidence that Quality Assurance has reviewed, completed and approved all requirements needed to satisfy this order.
## ATTACHMENT F

### Travel Sheet

<table>
<thead>
<tr>
<th>PART NAME:</th>
<th>SERIAL NUMBER OR LDC:</th>
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</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>DRAWING NUMBER:</th>
<th>REVISION: -</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#</th>
<th>OPERATION</th>
<th>SPECIFICATION NO. &amp; REV.</th>
<th>PERFORMED BY:</th>
<th>DATE COMPLETED</th>
<th>INSPECTION &amp; APPROVAL</th>
<th>BUY OFF</th>
<th>REMARKS/DISCREPANCI ES (REF. RELATED DOCS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Stanford</td>
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<tr>
<td>2</td>
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<td>Stanford</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>Stanford</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Stanford</td>
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</tr>
<tr>
<td>5</td>
<td>(Apply GPB Flight Decal)</td>
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<td>Stanford</td>
<td></td>
<td></td>
<td></td>
<td>Q</td>
</tr>
<tr>
<td>6</td>
<td>Final Buy Off RE</td>
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<td>Stanford</td>
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<tr>
<td>7</td>
<td>QA Buy Off</td>
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<td>Stanford</td>
<td></td>
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</tr>
</tbody>
</table>

**RESPONSIBLE ENGINEER:**

**SIGNATURE:**

**DATE:**

**QUALITY ASSURANCE:**

**SIGNATURE:**

**DATE:**