

Revision History Table

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 FREEFLIGHT <small>SYSTEMS</small>			Irving, TX
Supplier Manual			
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To Our Suppliers

FOREWARD:

We at FreeFlight Systems (FFS) believe that developing strong partnerships is key to our continued growth and success. As an integral part of this objective, we have developed this Supplier Manual to inform you, the supplier, of FFS's basic expectations, requirements, and procedures. We must work together to prevent defects and sustain on-going product improvements.

This manual is divided into sections, each covering a strategic part of the customer/supplier relationship. Please review its contents, familiarize yourself with the requirements, and address any questions you may have with FFS Quality Department.

The overview of FFS procedures and examples of forms or documents shown in this manual are for reference purposes only and may be changed without notice. For further details on procedures or verification of the latest requirements, contact FFS Quality Department.

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Reference Documents

This manual provides an overview of the below listed policies and procedures which make up the FFS Supplier Management System, its associated standards, and specifications.

Document Number	Title
WI-14-01	FFS First Article Processing Procedure
SOP-05	Corrective Action
83610-DP	FFS Approved Vendors List (AVL) Policy
WI-11-03	FFS Supplier Control
WI-12-06	FFS Dry Pack Procedure
83614-DP	FFS Supplier Quality Survey Evaluation Procedure
FFS-QA-90-SPEC	Procurement Quality Assurance Provisions
17662-SPEC	Specification for Cosmetic Workmanship Inspection
16538-SPEC	Printed Circuit Board Assembly Specifications
32701-DP	Part Marking Specification
QF-11-01	FFS Supplier Quality Survey Form
QF-11-02	Supplier Setup & Quality Approval

1. Introduction To FFS Requirements

1.1. Background

FFS is a world leader in Aviation markets for Global Positioning System (GPS) based navigational, positioning and Communication data products. Our products are sold worldwide for diverse applications including military, general, corporate, and commercial aviation. Since our products may be critical to aircraft flight safety, it is crucial that our products are exceptionally high in quality and reliability to satisfy our customers' needs.

1.2. Policy Statement

In order to provide quality products to our customers it is essential that our suppliers provide us with products, materials, and services of the highest quality. To accomplish this objective, suppliers are expected to maintain a quality system that emphasizes problem prevention and closed loop corrective action rather than problem detection. Suppliers are also required to maintain a "Zero Defect" performance goal, providing products, materials and services that meet all FreeFlight Systems requirements the first time. The supplier's definition of quality should not be limited to "total conformance to specifications", but should encompass "total conformance with continuous product and process improvements".

1.3. Applicability

This document shall apply to all suppliers providing products, materials, and services to FreeFlight Systems. Any additional requirements, such as compliance with customer specifications and/or standards, shall be referenced on the purchase order and/or provided to the supplier as necessary.

1.4. Points of Contact

The supplier's primary point of contact for matters subject to conditions herein shall be the FFS Purchasing Department, unless further specified. The supplier's primary Point of Contact for technical or quality requirements will be FFS Quality Department, unless further specified.

1.5. Technical Issues

The supplier is encouraged to discuss technical and related issues directly with FFS Materials, Engineering, Quality or Manufacturing personnel as required to resolve issues. However, the supplier must obtain all requested changes in writing from FFS Quality Department.

2. Supplier Quality System Requirements

2.1. General Requirements

In order for a Company to be considered as a supplier to FFS, the following requirements shall be met, unless specified otherwise:

- A. A quality system that emphasizes defect prevention rather than detection.
- B. A program targeting to achieve on-time delivery performance.
- C. A closed loop corrective action system devoted to solving problems, preventing re-occurrences, and meeting customer needs.

2.2. Prior to Contract Requirements

Before production purchase orders can be placed with prospective suppliers, candidates must first be reviewed and approved by FFS Quality Department. The approval cycle ensures that new suppliers have adequate capabilities to fulfill FFS requirements and they have been informed of those requirements prior to the start of work. An overview of the approval process is outlined in section 3.

2.3. Pre-Production Requirements

Before production begins, the supplier with the agreement to comply with all stated requirements should review all drawings and specifications. Any concerns may be addressed by contacting FFS Purchasing Department and should be resolved prior to the initiation of work.

2.4. First Article Submittal & Approval

The supplier's ability to comply with all purchase order or contract requirements will be

verified through the inspection and test of First Article samples. First Articles will be required for all products manufactured to FFS specifications and as specified on the FFS purchase order. First Article samples and reports shall be submitted, evaluated, and approved as specified in the FFS First Article Processing Procedure, FFS Doc #WI-14-01.

2.5. On-Going Production Requirements

The supplier shall have an on-going capability study of all critical and / or control characteristics of the production process. In addition, the following requirements must be met:

2.5.1. Supplier Procurement Control

The supplier shall have a program for controlling the selection of material and services sourced. Chosen sources must have proven and / or previously demonstrated capabilities to provide materials or services meeting all applicable requirements. The technical and quality requirements listed on the FFS purchase order apply to supplier and the supplier's procurement source(s). As the direct supplier to and the representative of the sub-tier procurement source(s), it is the supplier's responsibility to ensure that all these requirements are met.

2.5.2. Process Changes

Process changes are normally instituted as a function of no-going product improvements and/or out of necessity. When considering changes, a supplier must evaluate the potential impacts the change may have on the customer's application. For these reasons, all process changes, which affect the quality of the materials and/or services supplied to FFS, must be approved by FFS quality prior to implementation. When proposed changes directly impact a control characteristic or specification, new First Article samples shall be approved as specified in the FFS First Article Processing, FFS Doc #WI-14-01.

2.6. Certifications of Conformance

When specified on the FFS Purchase Order or Subcontract, suppliers shall furnish a

Conformance (CofC) for all materials, products or services submitted for FFS acceptance. Separate CofCs shall list the shipment date, FFS purchase order number, part numbers, revision levels, quantities, descriptions, and serial numbers of the materials supplied and include a statement that the shipment conforms to all the specifications and requirements of the purchase order. CofCs shall be verified and signed by an authorized representative of the supplier.

2.6.1. Certificates of Test

When physical, electrical, or chemical test reports are required by the FFS Purchase Order or Subcontract, the supplier shall provide a Certification of Test (CofT) with each shipment. CofTs shall list the materials/products supplied and the specific tests conducted. CofTs shall be dated and signed by an authorized representative of the supplier. Copies of the test data sheets, including all recorded data, shall be attached to each CofT.

2.7. Materials Identification

2.7.1. Part Identification Marking

Unless specifically stated on the FFS drawing, all custom parts shall be clearly and permanently marked in accordance with the FFS Part Marking Specification, FFS Doc # 32701-DP.

2.7.2. Shelf-Life Items

Shelf -Life Items are defined as any part, product, or material, which degrade in quality the longer they are stored prior to use. These include electrical components, which decrease in solderability, chemical compounds (adhesives, solvents, paints, etc.) that suffer degradation in their characteristics, or miscellaneous items such as batteries, which lose charge or suffer plate degradation. In the case of shelf-life items, the supplier shall supply manufacturing and / or expiration date information for each shipment.

2.8. Non-Conforming Material

The supplier is required to establish and maintain an effective system for controlling non-conforming material. This system shall include procedures for identification, segregation, evaluation, and disposition of non-conforming and reworked/repaired material.

2.9. Rework Approval

When the rework or repair of non-conforming material could adversely affect the quality or reliability of the product, the supplier shall obtain written approval of the rework/repair operations from FFS Quality, prior to initiating the work, followed by a corrective action report (CAR).

2.10. Corrective Action

In the event of a rejection by FFS of supplier product, the FFS buyer shall notify the supplier of the reject. When the FFS Material Review Board (MRB) finds that the deficiency is the responsibility of the supplier, FFS may initiate a Corrective Action Request as specified in the FFS Corrective Action Procedure, FFS Doc# SOP-05. The supplier shall respond to the CAR within 5 working days (24 hours on critical applications) of receipt. Corrective actions shall include the cause of the deficiency, the actions initiated to correct it and ensure against reoccurrence, and a timetable of corrective action implementation. Failure to respond to a CAR may be cause for a reduction in the supplier's disqualification as deemed appropriate by FFS.

2.11. Records

The supplier is required to maintain records of all inspections and tests performed on products supplied to FFS. Records shall adequately reflect that the materials supplied fully conform to all the specifications as listed on the FFS purchase order and referenced documentation. Records shall indicate the number and type of observations made, the number and type of deficiencies found, the quantities approved and rejected, and the nature of any corrective

action taken. Records shall be maintained for a minimum of seven (7) years from the date of shipment.

2.12. Calibration

The supplier shall establish a system for the regularly scheduled inspection and calibration of equipment used to verify compliance with specifications in accordance with ISO 100 12-1 or ANSI Z540-1. Standards used for calibration shall be traceable to the National Institute for Standards and Technology (N.I.S.T.) or other internationally accepted standards. When production tooling, templates or fixtures are used as a medium for inspection, such devices shall also be proved for accuracy at established intervals. When equipment is found to be out of tolerance and may have resulted in the submission of non-conforming material, the supplier shall immediately notify the FFS buyer of the deficiency for evaluation and possible corrective action at FFS.

2.13. Electro-Static Discharge (ESD) Control

When applicable, the supplier shall maintain a documented system for the prevention and control of ESD. ESD programs shall ensure that all electrical parts and assemblies supplied to FFS are handled, packaged, and marked in accordance with the applicable sections of MTL-HDBK-263B.

2.14. Drawing and Specification Changes

2.14.1. Change Approvals

Any changes to FreeFlight Systems drawings, specifications or processes shall have the FFS Quality written approval prior to implementation. Changes include minor design changes made by FreeFlight Systems Engineering that deviate from the original drawings, specifications and/or purchase order requirements.

2.14.2. Change Incorporation

The supplier's system shall ensure that only the latest drawings, specifications and instructions as required by the purchase order are used for fabrication, inspection, and

test. The supplier's system shall also provide for the immediate removal from use of obsolete or superseded documentation.

2.15. Packaging & Shipment

2.15.1. General Packing Requirements

The supplier shall ensure that all materials supplied to FreeFlight Systems are packaged in a manner that prevents damage or degradation during handling, shipment, receipt, and storage. The packing materials selected shall not be abrasive or contaminate the packaged materials. The supplier shall consider conditions affecting the product while at the supplier's facility, transportation to destination, and the expected or specified conditions at the destination, when determining packaging requirements. Suppliers shall also minimize the amount of disposable packaging when making packaging decisions. Any additional requirements shall be determined by FFS Engineering and specified on the drawing or purchase order.

2.15.2. General Marking Requirements

The packing slip shall list the FFS purchase order number, part number(s), drawing/specification revision level(s), quantities, and number of containers in the shipment.

2.15.3. ESD Sensitive Devices & Assemblies

Any parts, components, materials, or assemblies, which are susceptible to damage from Electro-Static Discharge (ESD), shall be handled, packaged and marked in accordance with the requirements of MIL-HDBK-263B. Failure to properly protect sensitive items may require replacement, as ESD damage may not be immediately evident by inspection and/or test.

2.15.4. Dry Pack Components

Moisture sensitive devices shall be pre-treated and packaged in desiccated packages as specified in the FFS Packaging, Storage and Handling.

3. The Supplier, Selection, Survey and Approval Process

3.1. Purpose

FreeFlight Systems' goal is to develop long term partnerships with its suppliers, which benefit both parties. To accomplish this goal, FreeFlight Systems uses careful consideration when selecting suppliers. By carefully evaluating prospective supplier's capabilities, FFS ensures that the supplier can consistently meet our needs and provide a basis for a long-term relationship. Details on supplier selection and approval shall be as specified in the FFS Supplier Control, FFS Doc# WI-11-03.

3.2. Supplier Selection

When requirements warrant, FFS Purchasing will identify the critical aspects of the requirement and begin a search for prospective suppliers whose capabilities match those needs. Searches utilize data from existing FFS suppliers and, if needed, extend to new suppliers not already approved by FFS. The number of prospective suppliers identified may vary depending on the product requirements, supplier capability and anticipated volume of product required. Suppliers chosen who are already approved by FFS may be used without further action. New suppliers shall be surveyed and approved as described in paragraph 3.3 through 3.5.

3.3. On-Site Surveys & The FFS Supplier Quality System Survey Forms

FFS Quality may schedule on-site survey(s) with prospective suppliers. An on-site survey is not required for all suppliers, only when deemed necessary by FFS Quality to mitigate risk. Survey teams will consist of representatives whose expertise matches the requirements of the commodity to be supplied. The team will generate a survey agenda and develop a list of areas to be reviewed during the survey. The team may then visit the supplier's facility and compare the supplier's capabilities against the list of FFS requirements. Survey findings shall be recorded on FFS Supplier Quality Evaluation Form, FFS Doc# QF-11-02.

3.4. Survey Evaluation Process

After completion of the on-site survey, the FFS Survey Team shall meet and review the

capabilities of the candidate(s). Each supplier shall be reviewed on their ability to meet FFS requirements and be issued an approval status based on those results. Items not applicable to the supplier's system of the commodity supplied are not considered in the evaluation process.

3.5. Initial Approval Status

Approved suppliers shall be added to the FFS Approved Vendors Listing (AVL) in accordance with the FFS Approved Vendors List Procedure, FFS Doc# SOP-11. The supplier's initial approval status may be periodically updated based on performance, as part of the on-going supplier evaluation program.

4. On-Going Supplier Performance Evaluations & Rating Process

Periodically, FFS may initiate an evaluation of supplier performance. Evaluation periods may vary dependent upon supplier performance and the volume of products supplied to FFS. The buyer may perform evaluations alone or by a team assembled by the buyer. Performance may be rated based on Product Acceptance data, Technology, Delivery, Customer Service and Cost.

5. Procurement Quality Assurance Requirements

All requirements shall be specified on the FFS purchase order. General requirements are as specified in the FFS Procurement Quality Assurance Provisions Specification, FFS Doc# FFS-90-QA-SPEC. In addition to the general requirements, special conditions/requirements may be incorporated by code number as defined in the FFS Procurement Quality Assurance Provisions Specification, FFS Doc# FFS-90-QA-SPEC, Para 3.2. Requests for clarification on any purchase order requirement should be directed to the applicable FreeFlight Systems Buyer.

6. Cosmetic Workmanship Requirements

Requirements for cosmetic workmanship shall be specified on the applicable FFS drawing and/or purchase order. Specific acceptability criterion, are as specified in the FFS Specification for Cosmetic Workmanship Inspection FFS Doc# 17662-SPEC. Requests for copies of this

specification or clarification on any specific requirement should be directed to the applicable FreeFlight Systems Buyer.

7. Electro-Static Discharge (ESD) Control Requirements

Suppliers handling parts, components, materials, or assemblies, which are susceptible to damage from Electro-Static Discharge (ESD), shall incorporate ESD controls in accordance with the requirements of MIL-HDBK-263B. ESD controls must include all areas where handling, packaging, storage, and shipment occur. Failure to properly protect sensitive items may require replacement at the supplier's expense, as ESD damage may not be immediately evident by inspection and/or test.

8. Printed Circuit Board (AKA Printed Circuit Assembly or Circuit Card Assembly) Assembly Requirements

When contracted services involve the assembly of printed circuit boards (PCB's), the requirements specified in the printed Circuit Board Assembly Specifications, FFS Doc# 16538-SPEC, shall be applicable. Requests for copies of this specification or clarification on any specific requirement should be directed to the applicable FreeFlight Systems Buyer.

9. Moisture Sensitive Devices

Many of the plastic packaged devices used on FFS PCB's absorb slight amounts of moisture which rapidly expands during soldering or re-flow operations. This results in the microscopic cracking of the package and failure of the device. To prevent this damage, all moisture sensitive devices must be packaged, stored, and handled in accordance with the FFS Dry Pack Procedure, FFS Doc# WI-12-06. Requests for copies of this specification or clarification on any specific requirement should be directed to the applicable FreeFlight Systems Buyer.

10. Federal Aviation Administration (FAA) Surveillance

Federal laws require the FAA to ensure all aviation related materials, goods and services are compliant. FreeFlight Systems must comply with these laws. As a supplier to FreeFlight Systems, your Quality System may come under FAA surveillance. The FAA is not in the business of controlling suppliers and will leave the “control” with FreeFlight Systems, who approves its own suppliers. If your FreeFlight Systems approved Quality System changes, please notify FFS Quality Department.