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## 1.0 SCOPE

### 1.1 PURPOSE

This procedure defines the accepted methods for Fairchild Controls Corporation (Fairchild) suppliers to perform statistical sampling inspection of parts and assemblies produced to Fairchild drawings and specifications.

### 1.2 POLICY

The supplier may elect to perform 100% screening of all characteristic specified on the Fairchild drawing/specification or perform attribute acceptance sampling of the Fairchild drawing/specification characteristics in accordance with this document. Any deviation from this procedure requires prior written approval from Fairchild Supplier Quality Assurance.

### 1.3 APPLICABILITY

This procedure is applicable when inspection code V15 is specified on the Fairchild Purchase Order, unless otherwise directed by the drawing or specification.

### 1.4 DEFINITIONS

#### 1.4.1 Attribute Data (for the purpose of this procedure)

Attribute data is the result of determining a characteristic to be either conforming or nonconforming (pass or fail) when evaluated against the requirements. The evaluation method may include actual dimensional measurements, inspection fixtures, go/no-go gages, optical and/or mechanical comparators, etc.

#### 1.4.2 Attribute Statistical Sampling

The entire inspection lot is accepted or not accepted based upon the results of inspecting the sample for each category of characteristics.

#### 1.4.3 Characteristic

Each distinguishing feature (dimension, pressure, flow, weight, etc.) indicated on the Fairchild drawing/specification. (Classification of characteristics as Critical, Major, or Minor, shall be provided by Fairchild as defined herein.)

1.4.4 Lot Production “Isolated”

When one lot is rejected, there is no assumption that the same nonconformance will exist in follow-on lots.

1.4.5 Lot Production “Repetitive”

When one lot is rejected, there is a good probability that the same nonconformance will be present in follow-on lots.

1.4.6 Inspection Lot/Batch

All items manufactured to the Fairchild drawing/specification under the same conditions, at the same time, and presented for inspection.

1.4.7 Nonconformity

Any characteristic that fails to meet a specified requirement.

1.4.8 Random Sampling

Selecting a sample of one or more items at random from the inspection lot or batch without regard to the quality and whereby each item in the inspection lot/batch is assumed to have an equal chance of being selected.

1.4.9 Sampling Plan

Indicates the number of items to be selected from each inspection lot/batch to be inspected for each characteristic (sample size), and the criteria for determining the acceptability of the inspection lot/batch (acceptance and rejection numbers).

1.4.10 Switching Rules

Utilizing the inspection results of previous inspection lots/batches to determine when inspection severity is to be switched from Normal Sampling to Tightened, or Reduced, as applicable. Suppliers must conform to the thresholds specified for switching for Nondestructive Verification of “Repetitive Lots”. Switching rules do not apply to Nondestructive Verification of “Isolated Lots” or Destructive Verification.

2.0 APPLICABLE DOCUMENTS

ANSI / ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes

D1-8007 The Boeing Company, Approval Guide for Supplier Statistical Sampling Plans

### 3.0 GENERAL REQUIREMENTS

#### 3.1 Classification of Characteristics

Fairchild will classify characteristics as Critical, Major, or Minor on each drawing. The characteristics shall be considered “Minor” if not otherwise indicated on the drawing.

#### 3.2 Supplier’s Quality Control Personnel and Records

When statistical sampling is utilized, the supplier’s inspection personnel shall select and inspect samples as defined herein. Sampling plans and instructions shall be available to applicable personnel in all areas where sampling is to be performed. Records shall be maintained that indicate the sampling plans used, lot size, sample size, and results of sampling, including documentation of any nonconformance. **No sampling is authorized for Critical characteristics. Critical Characteristics MUST be inspected 100%.**

### 4.0 PROCEDURES FOR STATISTICAL SAMPLING

In order to avoid excessive lot rejections and tightened sampling, practitioners need to maintain a process average as least as good as the specified acceptable quality limit.

#### 4.1 Authorized Methods

There are two approved methods for nondestructive statistical sampling.

- 1) Suppliers may perform statistical sampling in accordance with Boeing, D1-8007, if the supplier has been approved by Boeing and has provided Fairchild with evidence of Boeing approval.
- 2) Suppliers may perform statistical sampling in accordance with ANSI / ASQC Z1.4, using the Acceptable Quality Limits (AQL) specified herein for nondestructive verification of characteristics for repetitive production lots or nondestructive verification of characteristics for isolated production lots. Suppliers required to perform destructive verification of characteristics shall sample in accordance with the table in Appendix “A”. The remainder of this procedure will address the use of ANSI / ASQC Z1.4.

Suppliers may submit other sampling plans for approval; however, statistical analysis of sufficient detail to support the plan must be provided to Fairchild. Analysis must demonstrate protection equal to or greater than ANSI / ASQC Z1.4, and include a comparison of Operating Characteristic Curves. Suppliers must receive written approval from Fairchild prior to implementation of these plans.

#### 4.2 Sample Size and Acceptable Quality Limits

The sample size and accept number shall be determined using the following AQLs based on the supplier's lot production - repetitive or isolated, see definitions paragraph 1.4.4 and 1.4.5.

No sampling is authorized for Critical characteristics. Critical Characteristics MUST be inspected 100%.

##### 4.2.1 Nondestructive Verification of Characteristics for “Repetitive” Lot Production

Major and minor characteristics shall be sampled using Single Sampling Plans beginning at General Inspection Level II, Normal Inspection and switching rules are applied as required. The required AQL for major and minor characteristics are as follow:

- a. **Major Characteristics** – AQL shall not be greater than 1.0 – The acceptance number shall be modified to 0 (zero) for all lot sizes. C=0
- b. **Minor Characteristics** – AQL shall not be greater than 4.0 – The acceptance number shall be modified to 0 (zero) for all lot sizes. C=0

##### 4.2.2 Nondestructive Verification of Characteristics for “Isolated” Lot Production

Major and minor characteristics may be sampled using Single Sampling Plans at General Inspection Level II, Normal Inspection and no switching rules are applied. The required AQL for major and minor characteristics are as follow:

- a. **Major Characteristics** – AQL shall not be greater than 0.25 – The acceptance number shall be modified to 0 (zero) for all lot sizes. C=0
- b. **Minor Characteristics** – AQL shall not be greater than 1.5 – The acceptance number shall be modified to 0 (zero) for all lot sizes. C=0

#### 4.3 Selection of Samples

Samples shall be drawn at random from the total production lot and the method for selecting the sample must provide that each item in the lot has an equal chance of being selected. Use of a random number table is recommended. If random sampling is impractical, stratified sampling may be utilized in accordance with these guidelines:

- a. Divide into sub lots and select sub-samples proportional to the size of the sub-lot.
- b. Draw sample items from all parts of each sub-lot.
- c. Draw sample items as randomly as practicable.

#### 4.4 Inspection of Samples

Once the sample items have been selected the characteristic requirements (dimensions, weight, pressure, etc.) are evaluated for compliance. Verification must be performed on all articles in the sample for all major and minor characteristics. Any feature not meeting the requirement shall be documented as a nonconformance. Inspector's discretion is not permitted.

#### 4.5 Lots Not Accepted

If the number of nonconforming characteristics in the sample exceeds the acceptance number of the sampling plan, the lot cannot be accepted. Rejected Lots shall be documented. If processing is to continue, all parts in the production lot must be screened 100% for each nonconforming characteristic noted.

#### 5.0 TRAINING

All personnel engaged in statistical sampling must be trained. The training program shall include:

- a. Sampling objectives and methods
- b. Random sampling selection
- c. Filling out forms / records
- d. Switching rules
- e. Refresher training and criteria for when needed
- f. Training records which include the results of proficiency assessments

#### 6.0 INTERNAL AUDIT

Suppliers shall conduct internal audits to assure effectiveness of the training program. This may be done in conjunction with reviews of the sampling process.

## **Appendix A**

### Tables for Destructive Verification (C=0 Applies)

When parts must be destroyed to gain access to features that can not be inspected by any other method, the following special sampling tables shall apply:

#### **Major characteristics**

<u>Lot Size</u>	<u>Sample Size</u>	<u>Lot Size</u>	<u>Sample Size</u>
Up to 25	3	151-500	11
26-90	6	501-1200	15
91-150	7	1201-10000	20

#### **Minor characteristics**

<u>Lot Size</u>	<u>Sample Size</u>	<u>Lot Size</u>	<u>Sample Size</u>
Up to 15	2	151-500	8
16-50	4	501-3200	12
51-150	6	3201 and up	15