Spectron Engineering

Quality Manual

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MANAGEMENT RESPONSIBILITIES

Quality Policy

Spectron Engineering, Inc. (Spectron) is dedicated to the design, development, and production of automated test equipment using the best commercial practices. Each employee is provided access to this manual and is required to be familiar with and support the policies and procedures contained herein.

Specifically, this manual will be utilized by the management and employees of Spectron to produce customer confidence that any test equipment purchased from Spectron has been designed, developed, and produced using consistent, high quality procedures, and that the final product is of the highest quality and reliability.

Furthermore, each employee is encouraged, with management support, to identify and suggest improvements, not only to the design, development, and production of Spectron products, but to the contents of this manual.

Organizational Structure

Although the ultimate authority and responsibility for the quality of Spectron products resides with the President of Spectron, the responsibility for the development of this quality system and the authority necessary for the day-to-day implementation of the system has been delegated to the Production Manager.

Further delegation of specific quality responsibility and authority is detailed in this quality manual under appropriate headings below. However, two important points are appropriately made here. First, it is Spectron policy that at least two employees are specifically involved with quality at each stage of production. One employee will be designated to purchase, or build, or assemble according to certain procedures and quality standards described herein, and a different employee will check the results. Second, it is Spectron policy that, under managerial control, any and all resources of the company are available to employees to resolve quality issues.

Effectiveness Review

Senior managers will utilize the following procedures to review and monitor the effectiveness of the quality system described in this manual:

Monitor Customer Feedback

It is the policy of Spectron that all telephone calls and communications relating to quality issues be handled by senior management and either a log of the telephone call be kept, or the correspondence be kept in the company files.

Second, any items returned to Spectron for warranty work or non-warranty repairs will be tracked through the use of a comprehensive Repair Report that is filed according to item and serial number when the work is complete. The Production Manager will review previous Repair Reports when a product is returned to Spectron for evidence of unresolved quality problems.

Conduct Weekly Meetings

Spectron regularly holds weekly meetings attended by all employees of the company. Employees are encouraged to report on any quality problems encountered during the previous week and the resolution of the problems.

Senior management will report any customer contact relating to quality to all employees and on the action necessary to resolve any quality issues. In addition, employees are regularly briefed on any internally recognized quality issues noted by management during the preceding week.

Portions of this Quality Manual are periodically reviewed with all employees to ensure uniform and cooperative application of the procedures contained herein.

QUALITY SYSTEM REQUIREMENTS

Quality System and Manual

The Spectron quality system described in this manual is intended to apply to the design, development, production and servicing of Spectron products. The detailed plans and procedures set forth herein are intended to be consistent with Spectron policy set forth above.

Quality Plans and Procedures

Spectron quality plans and procedures detailed in this manual cover Contracting Review Requirements, Product Design Requirements, Document and Data Control, Purchasing Requirements, Customer and Government Supplied Products, Product Identification and Tracing, Process Control Requirements, Product Inspection and Testing, Control of Inspection Equipment, Inspection and Test Status of Products, Control of Nonconforming Products, Corrective and Preventive Action, Handling, Storage, and Delivery, Control of Quality Records, Internal Quality Audit Requirements, Training Requirements, Servicing Requirements, and Statistical Techniques.

Contract Review Requirements

Spectron generally manufactures and sells to customers commercial off the shelf (COTS) automatic test equipment built according to best commercial practices. Spectron provides its customers with a current catalog of its products that sets forth pricing information and Spectron policy on all sales. Spectron provides a separate technical specification sheet for each of its products.

In addition, Spectron may contract for the design, development and production of new products or accessories, for consultation on the use of its products or on the development of specific customer testing procedures, for service, and for training in the use of its equipment. The quality procedures for contract review set forth herein generally cover all such orders or contracts.

Customer Contact and Negotiations - Prior to Sales Order or Contract

Because of the complex nature of Spectron products, and because of the unique aspect of individual customer's test requirements, it is Spectron policy to only consider an initial Customer Order or Contract for review and acceptance after comprehensive contact with the customer. This policy is enforced whether the initial negotiations are initiated by Spectron or by the customer through a Request for Quotation (RFQ) or direct receipt of a Sales Order.

As a minimum, the goal of the initial negotiations is to ensure that the customer is familiar with Spectron's policies with respect to sales, that the customer is familiar with the technical specifications of Spectron products, and that the customer's needs are properly specified and will be satisfied by the purchase of a Spectron product.

The only company personnel authorized to conduct preliminary negotiations with a customer are; 1) Spectron's President, 2) Contracting Officer, 3) Director of Research and Development (R&D) and Engineering, and, in the case of Spectroradiometer products only, 4) Director of the Spectroradiometer Division of Spectron.

A record of all correspondence relating to preliminary negotiations will be kept in the company General Files.

Review of Sales Order or Contract Requirements

Unless received and accepted as a verbal order, see below, all initial customer sales orders or contracts will be in written form. When received by Spectron, copies will be provided for review by the President, Contracting Officer, Production Manager, and Director of R&D and Engineering. Orders or contracts involving spectroradiometer equipment will be reviewed by the President and the Director of the Spectroradiometer Division. The personnel involved constitute the Contract Review Board.

After individual review, a collective review of the Sales Order or Contract will occur prior to acceptance of the document by Spectron. The Contract Review Board will appoint one of the above individuals, usually, but not necessarily, the Contracting Officer, to act as the customer contact for all matters pertaining to the sales order or contract. The primary purpose of the collective review is to ensure that all of the proposed contractual requirements are acceptable to Spectron.

In the event the proposed sales order or contract is not acceptable, the customer contact will attempt to negotiate with the customer for acceptable terms. In no event will an authorized Spectron employee knowingly accept a Sales Order or Contract that contains unacceptable terms with a view toward later amendment or nonperformance of the offending terms.

Acceptance of written Sales Order or Contract

Authorization to accept written Sales Orders or Contracts is reserved to the following personnel; 1) President, 2) Contracting Officer, and 3) Director of Spectroradiometer Division (spectroradiometer equipment only).

Acceptance of verbal Sales Order or Contract

In limited circumstances involving an established customer with a well defined business relationship with Spectron, a verbal Sales Order or Contract not involving a substantial monetary amount may be accepted by one of the following personnel only, 1) President, 2) Contracting Officer, and 3) Director of Spectroradiometer Division (spectroradiometer equipment only).

If a verbal Sales Order or Contract is accepted without the normal review process above, it is the responsibility of the person accepting the Sales Order or Contract to ensure that all terms are acceptable to Spectron and to gather the necessary information. In no event will a verbal Sales Order or Contract be accepted without obtaining the information necessary for documentation and tracking set forth below.

Amendment to Sales Orders or Contracts

Amendments to Sales Orders or Contracts may be initiated by the customer or by Spectron. The review, acceptance, and documentation and tracking procedures for an Amendment are identical to that of the original Sales Order or Contract.

Sales Order and Contract Record Keeping

1. Initial receipt of a written Sales Order or Contract is made by the Office Manager who will make and distribute copies to the Contract Review Board and place one copy in the general file. The original Sales Order or Contract will be given to the President or to the customer contact (if known). At this time the Office Manager will make an initial entry in the Current Orders form using information available from the proposed Sales Order or Contract and indicating in the Notes section that the Sales Order or Contract is 'Pending Approval'.
2. Initial receipt of a verbal Sales Order or Contact is made by an authorized customer contact who will obtain and give to the Office Manager the information required at Step 5, below.
3. After individual review, the President will call a meeting of the Contract Review Board. After collective review, if all terms of the

4. If the Contract Review Board determines that the Sales Order or Contract is not acceptable in its current form, a customer contact will be appointed to initiate negotiations with the customer to obtain acceptable terms. The customer contact will keep the President apprised of the progress of negotiations until such time as a revised or amended Sales Order or Contract is received and the procedures set forth in Step 1, above, are begun on the revised or amended document.
5. Upon acceptance of a Sales Order or Contract, the customer contact will ensure that the Office Manager has all necessary information to complete the Current Orders form to include:
    A. Company and Company contact.
    B. Company Purchase Order number (Sales Order or Contract).
    C. Spectron point of contact.
    D. Description of Order.
    E. Date of Order.
    F. Delivery Date (If more than 1 Delivery is contemplated a separate line item on the Current Orders form will be completed for each delivery).
    G. "Pending Order" will be removed from the Notes entry on the Current Orders form.
    H. Cost entry will be completed with the Sales Order or Contract amount for each line item on the Current Orders form.
6. After acceptance of a Sales Order or Contract, and prior to shipment and invoicing, the point of contact is responsible for monitoring the progress of Spectron's obligation with respect to the Sales Order or Contract. The point of contact will keep the customer informed of Spectron's progress and communicate to the customer in a timely manner any potential problems that arise in connection with fulfilling Spectron's obligation under the Sales Order or Contract.
7. If the Sales Order or Contract involves production items or repairs, the point of contact will coordinate with the Production Manager who will be primarily responsible for scheduling the items or repairs to be complete for shipping prior to the scheduled delivery date.

8. If the Sales Order or Contract involves Research and Development or Engineering services, the point of contact will coordinate with the Director of R&D and Engineering who will be primarily responsible for scheduling the required work to be complete prior to the scheduled delivery date.
9. Upon completion of Spectron's obligation under the Sales Order or Contract (or a line item portion of the obligation), the point of contact will be responsible for completing any shipment required, for ensuring that all documentation required by this manual and the Sales Order or Contract is complete, and with coordinating with the Office Manager to ensure that the line item is properly invoiced and that the Invoice Number and Actual Ship Date entries in the Current Order form are properly completed.
10. The Office Manager will monitor the Current Orders form and will follow up on all payments not received by the date designated under the terms of the Sales Order or Contract. When payment is received in full under the terms of the Sales Order or Contract, the Payment Date entry on the Current Order form will be completed and the record moved from the Current Order form to the Completed Invoice form and the Sales Order or Contract will be considered complete.
11. If the Sales Order or Contract is for warranty work or service, the Office Manager will enter N/C in the Payment Date entry on the Current Order form and transfer the record to the Completed Invoice form as of the Actual Ship Date and the Sales Order or Contract will be considered complete.
12. If, for any reason, the terms of the Sales Order or Contract involve a partial billing of the Current Order line item, Shipment Date, Invoice Number, Amount, and Payment Date information will be entered in the Notes entry field of the Current Order form until such time as the line item is complete and transferred as above described.

PRODUCT DESIGN REQUIREMENTS

The documentation and procedures described in this section control the development of new products as well as material changes to existing Spectron products. In addition, the development of Spectron tools used in the manufacture or testing of Spectron products is governed by the provisions of this section. On occasion, the requirement may arise for a feasibility study, or for the development of test procedures to be used with Spectron equipment. All such undertakings shall be collectively referred to as a "development product" in this manual.

The initial requirement for a development product, as above defined, may arise from a customer Sales Order or Contract or the requirement may be internally generated. All development products will be approved by the President prior to proceeding, however the Director of R&D and Engineering has the primary responsibility and authority to initiate the projects and scheduling necessary to complete the development process according to the schedule as determined below.

Planning Procedures

The Director of R&D and Engineering will develop a design goal or statement of purpose for the overall project. This will be a short statement that will be as specific as possible and include target specifications if known. The statement may be taken from the Sales Order or Contract, if applicable, or it may be internally generated.

The Director of R&D and Engineering will develop an initial planning chart that will show the major tasks to be accomplished and the timeline for those tasks. The chart will identify the employees to be charged with the major responsibility for completing the task as well as those more peripherally involved. Where applicable, the chart will indicate where testing will be accomplished to ensure that the design goals of the project are being met.

The Director of R&D and Engineering will meet with the President and the Production Manager to review the two documents. If they are acceptable, they will be placed in a Project Folder and maintained by the Director of R&D and Engineering. All employees will be briefed on the project at the next weekly meeting.

The President, Director of R&D and Engineering, and the Production Manager will meet weekly and review the progress of the overall project. If changes are necessary to either the Project Goals, or to the Initial Planning Chart, the Director of R&D and Engineering will make the changes, place the documented changes in the Project Folder, and communicate the changes to all employees at the weekly general meeting. If a customer is involved in the project, all changes material to the customer's interest will be communicated to the customer through the point of contact.

Design Input (Documentation and Tracking)

1. The Director of R&D and Engineering will direct the Production Manager to assign Project Numbers, Due Dates, and responsible personnel appropriate to the tasks required to be completed.
2. The Production Manager will be responsible for tracking personnel time and material on each project on a daily basis according to the documentation and review process more fully detailed below in the Process Control Section of this manual. In addition, the Production Manager will notify the Office Manager to initiate a Project Tracking File for each project.
3. A summary of the time and materials involved in each project will be entered in the Monthly Cost Accounting file and reviewed by the President on a monthly basis.
4. The Director of R&D and Engineering will meet with, explain the goal and due date, and assign primary responsibility for each project to the appropriate employee.
5. Each employee will be directed to charge all inventory material used in the project out on the Daily Inventory Log, and to log all time spent on the project on the Daily Time Sheet. Items purchased specifically for a project from outside vendors will follow the procedures described more fully below in the Purchasing Requirements section of this manual. The Project Number and Account Number 5150 will be used on the Purchase Order.
6. In addition, each employee who works on a development project will provide to the Office Manager, on a daily basis, a brief statement of the work accomplished. The Office Manager will enter the information into the Project Tracking File and provide a copy of all Project Tracking Files having activity to the President, Director of R&D and Engineering, and Production Manager for review on a daily basis.

Design Output (Drawings, Testing and Documentation)

1. If drawings are required for a design project and are integral to the product, the Director of R&D and Engineering, or a designated employee, will prepare and document the drawings according to the procedures set forth below in the Process Control section of this manual. Drawings not integral to the product, but which are supplied only to aid in some aspect of the project, may be retained on the drawing computer, and hard copies need not be stored in the Master Print File.
2. If a Prototype product is required to be designed and/or supplied under the terms of a customer Sales Order or Contract, all drawings integral to the product (including Assembly Drawings and Bill of Materials) shall be prepared, documented and stored in the Print File according to the procedures set forth below in the Process Control section of this manual.
3. At a minimum, the Director of R&D and Engineering will develop testing procedures for use at the completion of each project to ensure that the goals of

the project have been met, and that all design flaws, ambiguities, contradictions and deficiencies have been resolved. The testing procedures and results will be documented and placed in the Project Folder. If intermediate testing within a project has been specified, it will be documented in a similar manner.

4. Upon Completion of a project, the Production Manager will Close the project according to the procedures set forth below in the Process Control section of this manual. A Project Summary of all time and materials used in the project will be printed and placed in the Project Folder. In addition, the Production Manager will instruct the Office Manager to close the Project Tracking File and place a printed copy in the Project Folder. This procedure applies whether the project referred to is the main project, or a project initiated as a task within the main project.
5. If the main project is controlled by a customer Sales Order or Contract, and involves a Prototype product, the Director of R&D and Engineering will develop a Final Acceptance Test Procedure for the product or system that will ensure all customer specifications set forth in the Sales Order or Contract are met. The documented results of this procedure will be sent to the customer with the product or system and a Spectron copy will be filed in the Project Folder.

Design Reviews

In addition to any review dictated by the documentation and tracking process detailed below in the Process Control section of this manual, the following reviews are conducted on all design projects:

1. Individual daily review of the Project Tracking File by the President, Director of R&D and Engineering, and Production Manager.
2. Collective weekly review of all ongoing projects by the President, Director of R&D and Engineering, and the Production Manager.
3. Monthly budgetary review of the time and materials for all projects for which there was activity during the month.
4. Test Review – At any point where testing has been designated to ensure compliance with product specifications, the Director of R&D and Engineering will review the test procedures and results with the employee conducting the test. If the Director of R&D and Engineering is the person conducting the test, the procedures and results will be reviewed by the President.
5. If any test procedure indicates that either the specifications for the specific project, or of the overall project, cannot be met, the Director of R&D and Engineering will communicate his concerns to the President who will be responsible for determining a course of action consistent with the procedures in this manual. If it appears, at any time, that a customer Sales Order or Contract specification cannot be met in a timely manner, the Point of Contact will contact the Customer

Contact in accordance with the procedures described above in the Contract Review Requirements section of this manual.

6. Project completion review – The Director of R&D will review the Project Folder to ensure that all required tests and procedures have been completed and that all quality documents required by this section are present and complete.

Verification of Design Output

At each Test Review, the Director of R&D and Engineering, or the President, will verify that the test procedures were followed and that the results meet the design criteria for the test.

If the main project involves the design of a Spectron Product, the Director of R&D and Engineering will develop Acceptance Test Procedures for the product that will ensure that the product will meet the required design specifications. A qualified employee will be instructed to complete the Acceptance Test Procedures and the Director of R&D and Engineering will verify the results. If the Acceptance Procedures are completed by the Director of R&D and Engineering, the President will verify the results.

Validation That Product Meets Customer Needs

If the designed product is the result of a customer Sales Order or Contract, the customer contact will maintain contact with the customer and obtain feedback from the customer with respect to the performance of the Spectron designed product.

If the designed product is internally generated by Spectron, it is the general policy that a potential customer will be encouraged to use the product at their facility. This may come about through the sale or rental of the newly designed product, or in some cases involving potential future sales of production units, Spectron may provide the newly designed product to the customer for limited testing at no cost to the customer.

Product Design Modifications

Product design modifications are documented, reviewed, and authorized according to the procedures set forth in detail below in the Process Control section of this manual. Authorization for product design modifications will only be granted by Director of R&D and Engineering or the President.

DOCUMENT AND DATA CONTROL

Although Spectron makes extensive use of computer programs and files to manage the quality system described in this manual, all quality documents and the data contained

therein, as well as supporting data where necessary, is stored in hard copy according to the general procedures described in this section.

Quality System Document and Data Control

Quality Manual Control

The Production Manager will be responsible for the control of this Quality Manual. The original will be stored in a file cabinet in the Production Manager's office. All employees will be provided a copy of the manual.

Sales Order or Contract Document Control

The Office Manager will be responsible for the control of all quality documents described above in the Contract Review section of this manual, including any amendments, revisions, or additions thereto. All such documents will be stored in a file cabinet under the customer name in Spectron's general files.

Product Design Document and Data Control

With the exceptions noted in this section, directly below, the Director of R&D and Engineering will be responsible for the control of all quality documents described above in the Product Design Requirements section of this manual. The required documents will be stored in a Projects Folder in a file cabinet under control of the Director of R&D and Engineering.

All Sales Order or Contracts documents relating to Product Design will be controlled by the Office Manager as above stated in this section.

All drawings relating to Spectron products that are involved in the Product Design Requirements section of this manual are the responsibility of the Production Manager who will control such drawings as more fully detailed below in the Process Control section of this manual. All such drawings will be stored in the Print File cabinet, or in the Archive Print File.

Purchase Document Control

The Purchasing Agent will be responsible for control of all quality documents relating to Purchasing Requirements as set forth below in the Purchasing Requirements section of this manual. Original copies of all Spectron Purchase Orders will be filed in a folder under control of the Purchasing Agent.

Customer Supplied Products Document Control

The Office Manager will be responsible for control of all quality documents relating to Customer Supplied products as detailed below in the Customer Supplied Products section of this manual. All such documentation shall be stored in a folder under control of the Office Manager.

Product Identification and Tracing Document Control

Unless otherwise specifically delegated in this manual, the Production Manager will be responsible for and control the initial assignment of unique project numbers and/or serial numbers to Spectron products or product batches.

Hard copies of all quality documents required for product identification and tracing will be stored under the control of the Production Manager or Office Manager in the manner set forth below in the Product Identification and Tracing section of this manual.

Process Control Requirements Document Control

Record keeping suitable to each product or product batch will be the responsibility of, and under the control of, the Production Manager as set forth in detail below under the Process Control Requirements section of this manual.

All quality documents identified below in the Process Control Section of this manual will be stored as indicated in that section under control of the Production Manager.

Product Inspection, Testing, and Calibration Document Control

All quality documents related to Product Inspection, Testing, and Calibration will be the responsibility of, and stored under the control of, the Production Manager as designated below in the Product Inspection, Testing, and Calibration section of this manual.

Inspection Equipment Document Control

All quality documents relative to the calibration and maintenance of inspection equipment shall be stored in a file cabinet under the control of the Director of the Spectroradiometer Division of Spectron.

Inspection and Test Status Document Control

All quality documents relating to the Inspection and Test Status of Spectron Products shall be the responsibility of the Production Manager

and will be stored as more fully detailed below in the Inspection and Test Status of Products section of this manual.

Control of Nonconforming Products Document Control

All quality documents relating to the Control of Nonconforming Products shall be the responsibility of the Production Manager and will be stored as more fully detailed below in the Control of Nonconforming Products section of this manual.

Corrective and Preventive Action Document Control

All quality documents relating to Corrective and Preventive Action shall be the responsibility of the Production Manager and will be stored as more fully detailed below in the Corrective and Preventive Action section of this manual.

Handling, Storage, and Delivery Document Control

All quality documents relating to Handling, Storage, and Delivery shall be the responsibility of the Production Manager and will be stored as more fully detailed below in the Handling, Storage, and Delivery section of this manual.

Servicing Requirements Document Control

All quality documents relating to Servicing Requirements shall be the responsibility of the Production Manager, except that Servicing Requirements documents relating to Spectron Spectroradiometer Products shall be the responsibility of the Director of Spectroradiometer Products. All such documents shall be stored as more fully detailed below in the Servicing Requirements section of this manual.

Review, Approval, and Management of Quality System Documents and Data

The Production Manager will review the contents of this Quality Manual and all documents and data required herein on an annual calendar year basis. Any changes, deletions, or additions resulting from this review will be communicated to the President and any employee affected. The President will approve any changes, deletions, or additions prior to implementation.

All employees of Spectron are encouraged, on an ongoing basis, to suggest changes, deletions, or additions either to the contents of this manual, or to any documents or data required herein. All such suggestions will be reviewed by the Production Manager and the President. The President will approve any changes, deletions, or additions prior to implementation.

Procedures to Control Changes to Quality Documents and Data

The Production Manager will control the implementation of all changes, deletions, or additions approved by the President as above described. All approved changes, deletions, or additions to this manual will be by replacement of the affected section or sections of the manual and all employee copies thereof. In addition, the approved changes, deletions, or additions will be communicated to all employees at the weekly company meeting.

If the approved changes, deletions, or additions involve the contents of a Quality Document or the data contained therein, all unused previous versions of the document will be destroyed and the new version implemented immediately under control of the Production Manager. Quality Document changes, deletions, or additions will be communicated to all employees as above.

PURCHASING REQUIREMENTS

The following procedures are designed to ensure that all items purchased by Spectron for use in Spectron products meet all design and production requirements for the item. In addition, these procedures will cover the selection, evaluation and monitoring of vendor performance and the acceptability of vendor supplied items.

Except as otherwise explicitly provided in this section, the Purchasing Agent will be primarily responsible for purchasing items for Spectron Products as directed by the Production Manager. Items purchased as Inspection Equipment, items purchased for use in Design or Testing of Spectron Products, or items purchased as substitute or replacement parts for Production Products will be under the direction of the Director of R&D and Engineering.

All items purchased, as directed above, will be on a preprinted and consecutively numbered Spectron Purchase Order that will be properly filled out to include:

1. Vendor Name
2. Vendor Contact (Name and Telephone)
3. Account Number
4. Date of Order
5. Due Date (or method of shipment for stock items)
6. Terms of Sale
7. Quantity of items
8. Spectron Part No. (All Production Items)
9. Description of item (to include Mfg. Part No. if specified in Spectron description of part)
10. Vendor Part No. (if available)
11. Unit Price
12. Authorization Signature
    A. Production Items - President, Production Manager, or Purchasing Agent
    B. Other items, above described - President, Director of R&D or Engineering, Production Manager, Purchasing Agent, or Designated Employee under the direction of one of the above.

Purchased Product Requirements and Specifications

Production Products

Upon completion of the Production Design Requirements phase (see above), the Director of R&D and Engineering will provide the Production Manager with a Bill of Materials for any product scheduled for production. The Bill of Materials will contain information on each item

required to produce the product including; 1) Spectron Part No., 2) quantity, and 3) description. The description will include all information necessary to purchase the correct part and, if necessary, will include a Manufacturer and Mfg. Part No., material and dimensional specifications, and other identifying characteristics deemed material by the Director of R&D and Engineering. If the item is a 'manufactured part', the Spectron Part No. will represent a drawing number where the specific information required to manufacture the part can be found, and the Bill of Materials description will coincide with the drawing title.

It will be the responsibility of the Production Manager to schedule production of all Spectron products, to provide the Purchasing Agent with a list of all items required to be purchased for production to include Spectron Part No., description, quantity, and due date information. The Production Manager will make a determination as to whether a Manufactured Part or Assembly is to be purchased or manufactured by Spectron.

If a Manufactured Part is purchased, the drawing and all specifications thereon will be incorporated and made a part of the Purchase Order.

If a Spectron Assembly is purchased, the vendor will be supplied with a Bill of Materials for the Assembly, drawings for all individual Manufactured Parts in the Assembly, Assembly Drawings, Build Instructions, and the Final Quality Check document that will be used by Spectron to verify the acceptability of the Assembly when delivered. Vendor compliance with all specifications contained in the above documentation will be required by the Purchase Order.

Inspection Equipment, items for use in Design or Testing of Spectron Products, or items as substitute or replacement parts for Production Products

The Director of R&D and Engineering will determine specifications of the above items sufficient to ensure that the Purchasing Agent, or other authorized employee, purchases the item intended.

In the case of an item intended for eventual use as a substitute or replacement for a Spectron Production Part, or in the case of an item for use in the design of a new Spectron Product, the specification will be described as for a production product above. Such items will not be included in the Bill of Materials for a Spectron Product until the Director of R&D and Engineering determines that the item meets all requirements through the use of appropriate testing procedures set forth above in the Product Design section of this manual.

Vendor and Subcontractor - Selection, Evaluation, Monitoring and Control

Selection

The Purchasing Agent (or other authorized employee) has the authority to select a Vendor or Subcontractor for Spectron Purchased Products subject to the following guidelines:

1. If quantities, lead time, and vendor policies permit, items should be purchased directly from the manufacturer of the item.
2. Initial purchases of a production item should be bid out to at least 3 vendors using estimated production quantities and lead time to obtain competitive pricing.
3. Subsequent purchases of a production item may be made from a previous vendor of the product who has provided satisfactory service provided there is no significant price increase in the item.
4. Unusually large quantities of a production item should be bid out as above.
5. Long lead time items, difficult to obtain items, or items with significant price breaks for quantity purchases may be purchased in quantity with scheduled delivery schedules. (Requires approval by the President or Production Manager).
6. Quality and on time delivery, as well as price, will be a major consideration in vendor selection for the purchase of production items that do not have a specific manufacturer or Mfg. Part No. specified (i.e. manufactured parts, hardware, generic components, etc.).
7. In general, the Production Manager will act as the Purchasing Agent for the purchase of Manufactured Parts or Production Assemblies using the above criteria. In addition, the Production Manager will use reasonable means, including vendor site visitation, to the determine the suitability of the vendor's personnel, facilities, and equipment to manufacturer or assemble Spectron products.

Evaluation, Monitoring, and Control

All Spectron vendors will be monitored and evaluated on a regular basis using Quality, On Time Delivery, and Pricing as follows:

1. The Purchasing Agent, when initiating an order, will compare the vendor price with previous purchases of like quantities of the same item. The Purchasing Agent has discretion to seek another vendor if satisfactory pricing cannot be negotiated with the primary vendor.

2. Upon delivery of an order, the Purchasing Agent will mark the received date on the original Purchase Order and make note of a late delivery. The Production Manager will monitor deliveries on a daily basis. In addition, the Production Manager will, on a monthly basis, or more often if ordered production parts are not available for a scheduled product build, provide the Purchasing Agent with an action list of all overdue purchased parts.
3. All received goods will be inspected for quality in accordance with the incoming inspection procedures set forth below in the Verification of Acceptability of Purchased Products section of this manual. All quantity and quality discrepancies will be noted on the Packing Slip and reviewed by the Purchasing Agent and Production Manager on a daily basis.
4. It is Spectron policy that the Receiving process will not be complete if the incoming inspection indicates that the received item does not meet all Spectron requirements. Under the direction of the Production Manager, the authorized employee who placed the order will be directed to notify the vendor and will be given the authority to resolve the problem. In no event, will a purchased Production Product that does not conform in all respects to Spectron requirements be placed into inventory.
5. The Purchasing Agent and the Production Manager have the authority to remove a vendor from the approved vendor list if, in their judgment vendor performance is unsatisfactory in any of the above mentioned areas.

Verification of Acceptability of Purchased Products

The following procedures will be used to verify the acceptability of all Purchased Parts:

1. All Purchased Products shipped to Spectron will be delivered to the Receiving Officer immediately upon receipt.
2. In all cases, the Receiving Officer will first obtain the Packing List and verify that the count on the packing list matches the number of actual items shipped. If there is a discrepancy, the actual count will be clearly indicated on the Packing List to be later reconciled with the vendor according to the procedures set forth below.
3. If Purchased Products are received without a Packing List, if the Packing List does not indicate a Spectron Purchase Order No., or if there is a discrepancy in count as above indicated, the shipment will be given directly to the Purchasing Agent who will contact the vendor and reach agreement on the items actually received. In all cases where one of the above discrepancies occur, the original Packing List or a Spectron generated Packing List will clearly be marked to indicate; 1)

4. Inspection and verification of all Spectron Purchased Products will be made according to category as follows:
    A. Inventory items requiring a Mfg. Part No. – The items received will be inspected for proper labeling by the vendor and compared with identical items in stock before acceptance.
    B. Items not requiring a Mfg. Part No. - The items received will be confirmed to comply with all specifications contained in the Purchase Order description and will be compared with similar items in stock.
    C. ‘Manufactured Products’ - The items received will be checked against the Spectron print for the product by the Machinist who will ensure that all print requirements for the product are met. Second, the product will be checked for functionality in the assembly of which it is a part by a second employee qualified to build the required assembly.
    D. Purchased Assemblies - A purchased assembly will be inspected using the Final Quality Acceptance Test sheet for the assembly by an employee qualified to quality check the assembly.
    E. Circuit Boards - All circuit boards will be visually checked by an Electronic Assembler and a document from the vendor that the boards have been ‘electrically tested’ must be present in the shipping documents if specified by the Purchase Order. Spectron policy is to have the vendor ‘electronically test’ all boards except for prototype and very simple boards.
    F. In no event, will a purchased Production Product or Assembly that does not conform in all respects to Spectron requirements be placed into inventory.

CUSTOMER SUPPLIED PRODUCTS

All contractual arrangements for customer supplied products will be complete as above described in the Contract Review Requirements section of this manual prior to receiving a Customer Supplied Product. The procedures below will be followed for all government furnished products as well as civilian customers.

Upon receipt of a Customer Supplied Product, initial receipt, inspection, and documentation will be as described below in the Product Identification and Tracing, Incoming Spectron Products For Service, Update, or Repair. If any evidence of the product not being in the condition described in the shipping documents, the Customer Contact immediately contact the customer and determine a course of action.

The Director of R&D and Engineering will be notified and be responsible for the following procedures:

1. Note and observe any special handling or operation requirements for the product while it is in possession of Spectron.
2. Determine which Spectron employees are qualified to handle and operate the product. Conduct training if necessary.
3. Determine a proper and secure storage location for the product while at Spectron.
4. Report to the customer any damage, malfunction, or deterioration that occurs to the product while at Spectron.
5. Keep and maintain records of all inspections and maintenance work on the product while at Spectron.
6. Control the return of the product by ensuring that all shipping documents are properly prepared and that the shipping container is sufficient to prevent damage to the product during shipping.

PRODUCT IDENTIFICATION AND TRACING

Spectron identifies and traces its products from start to finish using interrelated identification and tracing procedures that involve the use of one or more of the following during each step of the manufacturing and servicing process:

1. Spectron Purchase Order No.
2. Vendor supplied Packing List
3. Purchase Order Log Book
4. Receiving Log Book
5. Spectron Part No.
6. Spectron Serial No.
7. Mfg. Serial No.
8. Spectron Serial No. Log Books
9. Spectron Drawing No.
10. Spectron Drawing No. Revision Date
11. Spectron Circuit Board Revision Date
12. Spectron Project Numbers
13. Spectron Project Log Book
14. Spectron Project Bill of Materials
15. Inventory Storage Locations
16. Daily Employee Time Sheets
17. Daily Inventory Log Sheets
18. Shipping Log Book
19. Shipping Packing List
20. Incoming Repair Log

Incoming Products and Assemblies Into Inventory

Purchased Products

Following the procedures set forth above in the Purchasing Requirements section of this manual, the Purchasing Agent, on a daily basis, will provide the Production Manager with the Receiving Log, Purchase Order File, and all Vendor Packing Lists for items received by Spectron on the previous day.

With one special handling exception, noted directly below, the Production Manager will make a final check of all incoming purchased products as follows:

1. Vendor Packing List will be checked
    A. Proper reference to an open Spectron Purchase Order
    B. Packing List product description matches Spectron Purchase Order description

C. Spectron Part No. is referenced on Spectron Purchase Order.
D. Packing List quantity matches Spectron Purchase Order quantity and Receiving Officer actual count, or any discrepancies have been resolved by the Purchasing Agent and noted on the Packing List according to the procedures set forth above in the Purchasing Requirements section of this manual.
E. Proper indication on the packing list that all product verification and quality checks have been complete and the product stored in its proper inventory location according to the procedures set forth above in the Purchasing Requirements section of this manual

2. Special handling and testing requirements for all incoming Detector Chips
   A. In addition to the above requirements, the Packing list for Detector Chips must be documented with the Mfg. Serial No. for each Chip
   B. The Packing List indicating the receipt of the Detector Chips will then be processed by the Production Manager as indicated directly below.
   C. Rather than placing the incoming Detector Chips in their proper location in inventory, however, the Purchasing Agent will give the Detector Chips to the Electronic Test Officer for extensive test and characterization processing.
   D. The Electronic Test Officer will maintain a Detector Chip Log and assign a Spectron Serial Number to each Detector Chip, cross referencing the Mfg. Serial Number and Mfg. Lot No.. An individual Reticon Log Sheet will be prepared to document the test and characterization results for each Detector Chip.
   E. Depending upon the test results 3 courses of action are possible. First, the Detector Chip passes all tests, retains its original Spectron Part No. and is placed in its proper inventory location with no further action required. Second, the Detector Chip meets the Manufacturer Specifications, however, it does not meet all Spectron Requirements. The Detector Chip will be signed out of inventory on the daily inventory log under its original Spectron Part No. and be marked and signed into stock under a different Spectron Part No. and stored in a different inventory location reserved for Detector Chips of this category. Third, if the Detector Chip does not meet the Manufacturer Specifications it will be signed out of inventory on the daily inventory

log, treated as a nonconforming product (Control of Nonconforming Products, below), and returned to the Manufacturer.

3. If the incoming item consists of a Spectron Serial No. Product, the Production Manager will check the Spectron Serial No. Log Book for proper entry prior to proceeding.
4. The Production Manager will enter the Packing List information into the computerized inventory control system, note the entry date on the Packing List, and forward the Packing List to the Office Manager to be reconciled with the Vendor Invoice and stored in Spectron's General File.

Spectron Manufactured Products and Assemblies

All Spectron Manufactured Products and Assemblies will be identified and tracked into inventory using the following procedures. Only products and assemblies that have been verified to meet all Spectron Requirements (see Product Inspection and Tracing, below) will be received into inventory.

1. The Spectron Employee responsible for the build Project No. for the product or assembly will sign the product into inventory on the Daily Inventory Log. This will certify that all parts used in the project have been signed out of inventory to the project, that all employee time expended on the project has been submitted, that all required inspections and tests on the product have been completed (see Product Inspection and Testing, below), and that the Product or Assembly has been stored in the proper inventory location.
2. The Production Manager, on a daily basis, will enter the information from the daily log into the computerized inventory control system. For incoming Products or Assemblies the Production Manager will verify that employee time has been logged against the Project, that, if required, Spectron Parts have been pulled from inventory for the project, and that any parts or services ordered specifically for the Project have been accounted for. In addition, if the product being checked into inventory is a Final Assembly Serial Numbered Product, the Production Manager will verify proper entry into the Serial No. Log Book and that the proper quality documents are in the Serial No. Product Folder.
3. The Original Inventory Log indicating a Spectron manufactured Product or Assembly being placed into inventory will be filed in the Inventory Log File Book and a Printed Copy of the Daily Inventory Log transactions entered into the computer will be stored and archived under control of the Production Manager.

Incoming Spectron Products For Service, Update, or Repair

All incoming Spectron Products will be identified and traced as follows:

1. All Incoming Spectron Products For Service, Update, or Repair will be delivered to the Receiving Officer immediately upon receipt.
2. The shipping documents will be examined by the Receiving Officer to ascertain; 1) that the items shipped are properly identified on the shipping documents, to include Part No. and Serial No., 2) that all items on the shipping documents have been received by Spectron, and 3) that there is no visible shipping damage. Any discrepancies will be clearly noted on the shipping documents. A copy of the shipping documents will be made by the Receiving Officer and placed with the products received. The original documents will be given to the Purchasing Agent who, on a daily basis, will make an appropriate entry in the Receiving Log and will route the Receiving Log and the shipping documents to the Production Manager for review and further action.
3. The Production Manager will do the following:
    A. Check the shipping documents for discrepancies in shipment as noted above by the Receiving Officer. If so, the Production Manager will contact the customer and resolve the discrepancies before proceeding further.
    B. If the received product is not under warranty, the Production Manager will verify that a valid Service Contract or customer Purchase Order for service or repair is in place. If not, the customer will be contacted and a Contract or Purchase Order will be negotiated as above provided in the Contract Review Requirements section of this manual. Spectron will not proceed further until such agreement is reached with the customer.
    C. The customer Contract or Purchase Order identification number will be written on the shipping documents by the Production Manager if it is not already present, and the Production Officer will verify or provide the Office Manager with the information necessary to complete the Current Orders form (see Contract Review Requirements, above).
    D. A Project Number will be assigned to the Product and a Repair Log will be initiated and provided to the Spectron employee responsible for the service, update, or repair.
    E. Upon completion of the service, update, or repair, the completed Repair Log will be returned to the Production Manager who will close the Project, complete the shipping procedures (see Handling, Storage, and delivery, below), store the Repair Log in the Product Serial No. Folder, and provide

the information to the Office Manager required to close the customer Contract or Purchase Order and to invoice the customer.

Spectron Products Removed From Inventory

For Manufacture of Spectron Products or Assemblies

1. The Production Manager will initiate a Project No. for all Product or Assembly manufacturing operations and assign the project to a qualified Spectron employee who will be responsible for completion of the project. The Project will be entered in the Project Log Book and entered into the computer inventory control system when initiated.
2. The Production Manager will provide the employee with a printed Work Order identifying the Project No., the Spectron Product or Assembly to be manufactured, the Print or Assembly Drawing to be used to manufacturer the Product or Assembly, and a Bill of Materials for the Product or Assembly. For all assemblies requiring procedures not clearly depicted or noted on the Assembly Drawing, a copy of the Build Instructions for the Assembly will be provided.
3. If the Project involves more than one Product or Assembly to be manufactured it will be considered a Batch. All items in a Batch must be built using identical Bill of Materials, Build Instructions, and Quality Check procedures.
4. If the Project is for the manufacturer of the Final Assembly of a Serial No. Product(s), the Production will assign and enter the appropriate numbers in the Serial No. Log book and write the serial numbers on the Work Order. (If the project is for a circuit board assembly, this will be done by the Electronic Test Officer after the boards have been completed and tested).
5. When the employee has pulled all parts identified on the Work Order Bill of Materials and indicated the quantity pulled for the project thereon, the Work Order will be returned to the Production Manager. In all cases, the Work Order must be returned prior to signing the manufactured Product or Assembly into inventory on the Daily Inventory Sign Out Log. If parts are pulled for the Project after the Work Order has been turned in to the Production Manager, the parts will be signed out to the Project on the Inventory Sign Out Log.
6. A copy of the Work Order will remain with the Product or Assembly until completion of the Project and the Product or Assembly is signed into inventory as a Spectron Manufactured Product or Assembly (see Spectron Manufactured Products and Assemblies, this section).
7. On a daily basis, the Production Manager will enter the Spectron Products pulled on returned Work Orders and items checked In or Out on the Daily Inventory Log into the computer inventory control system. All transactions will be Printed, stapled to the returned Work

Orders and filed as indicated in the Incoming Products and Assemblies Into Inventory, Spectron Manufactured Products and Assemblies, this section.

Spectron Use For Other Than Manufacture of Spectron Products or Assemblies

1. Prior to removing Spectron Products or Assemblies from inventory, all employees will first check with the Production Manager to ensure that the items to be removed are available and have not been allocated for manufacturing purposes. This need not be done for common items known to be readily available from local vendors.
2. All Spectron Product or Assemblies removed from inventory for other than Spectron Manufacture purposes will be signed out on the Daily Inventory Log to the project for which they are being used
3. If there is no specific Project Number assigned for the use intended, the Spectron Product or Assembly will be checked out to Project No. H0000.
4. If the Spectron Product or Assembly removed from inventory is a Spectron Serial No. Product or Assembly, a notation as to the destination of the Serial No. Product or Assembly will be made in the Spectron Serial No. Log.
5. On a daily basis, Spectron Products or Assemblies removed from inventory for the above purposes will be entered into the computer inventory control system. The transactions will be printed and filed as indicated in the Incoming Products and Assemblies Into Inventory, Spectron Manufactured Products and Assemblies, this section.

Customer Purchase of Spectron Products or Assemblies

1. The Production Manager will ensure that all customer contract or purchase order requirements are met as set forth in the Contract Review section of this manual.
2. The Production Manager will assign a shipping Project No. to the order being shipped and make an entry in the Project Log.
3. All Spectron Products or Assemblies being purchased will be signed out from inventory on the Daily Inventory Log and identified and traced according the procedures identified in the subsection entitled, Spectron Use For Other Than Manufacture of Spectron Products or Assemblies, directly above.
4. If the Products or Assemblies are Spectron Serial No. Products or assemblies, the Production Manager will make an entry in the Serial No. Log for each such Product or Assembly identifying the destination of the Product or Assembly. If a Serial No. Product or Assembly is to be installed in, or used with, another Spectron Serial No. Product by the customer, that information will be included in the Serial No. Log if available.

5. All quality documentation and procedures identified below in the Delivery subsection of the Handling, Storage, and Deliver section of this manual will be complete prior to shipment.

PROCESS CONTROL REQUIREMENTS

The primary tool used to plan, monitor, and control the production and servicing processes at Spectron is the proprietary, internally developed, computerized Inventory Control System under the control of the Production Manager. The system involves a series of interrelated files making available on a 'real time' basis the following information:

1. Access to vendor information
2. Purchase order history and current status for any given inventory product or assembly purchased by Spectron to include pricing and actual delivery times
3. Current inventory status of any Spectron Product or Assembly including quantity, on order and due date, allocated quantity, and storage location information.
4. Project history and status for all Spectron Projects, to include quantity, cost, delivery time, and due date information.
5. Current and historical Bill of Materials for all Spectron Products and Assemblies to include quantities and cost of each product or assembly used in the Product or Assembly
6. Labor and Material Files that are referenced on a current or historical basis to provide time and materials information for any current or historical Spectron Project.
7. 'Can Build' capabilities that allow the user to immediately determine the availability of Spectron Products or Assemblies needed to manufacturer any other Product or Assembly.

Production and Service Planning

The President, Director of R&D, and Production will conduct weekly meetings to review production and service requirements and assign priorities to production, service, R&D, and other company projects according to overall company strategy.

The Production Manager will be responsible for developing specific manufacturing and service project schedules, to include employee work schedules and purchasing requirements that will meet planned production and service requirements and promote overall company strategy.

Monitoring of Production and Service Processes

Daily Basis

The Production Manager will monitor the status of Production and Service Processes through daily review and record keeping of the following information. Documentation will be as described in the specific sections of this manual relating to the category of the information reviewed:

1. New Purchase Orders
2. Receipt of all incoming Purchased Products
3. Receipt of all other Production or Service related products
4. Review of employee Daily Time Sheets
5. Review of employee Project Tracking Files
6. All products signed into or out of inventory through the Daily Inventory Log or returned Work Orders
7. New and Completed Projects
8. New customer Contracts and Purchase Orders
9. Any change in status of the Current Orders Form

Weekly Basis

Weekly employee meetings, attended by all employees, are regularly held and each employee is required to report on the status of all projects with which the employee was involved during the previous week. Senior management will report on any significant events that occurred during the previous week that would affect previously announced plans for Production or Service, and will announce significant Production or Service related Plans or Goals for the next week.

The weekly meeting of the President, Director of R&D and Engineering, and the Production Manager, referred to directly above, will review the status of all Production and Service projects. Any management action required that involves Production or Service will be communicated directly to the employees involved and/or presented at the next weekly Employee meeting.

Monthly Basis

The Production Manager will, on a monthly basis, print out a Project Summary Sheet reflecting employee time and labor cost, and all material costs, on every Project for which there was activity during the month. This information will be entered into the Monthly Cost Accounting worksheet where the accumulated labor and material costs for each Project is readily available. The President will review the Monthly Cost Accounting worksheet with the Production Manager.

Control of Production and Service Processes

Under the direction of the President, the Production Manager will control all Spectron Production and Service Processes as follows.

1. Direct the Purchasing Agent to purchase all required products in a timely manner to ensure adequate inventory for Production and Service requirements
2. Generate Projects and assign primary responsibility for each Project to a qualified Spectron employee
3. Assign appropriate serial Numbers and make an entry in the Serial Number Log for each Spectron Serial Numbered Product as provided in the Product Identification and Tracing section of this manual
4. Maintain and provide the responsible employee with the latest version of all Prints, Assembly Drawings, Build Procedures, and required Quality Check documents necessary to completion of the Project
5. Take appropriate action to ensure that all open Projects which have exceeded the due date for the Project are completed so as not to jeopardize Spectron Contract or Purchase Order obligations.
6. Inspect all Quality Documents required by this manual for proper entries and filing prior to closing the Project

PRODUCT INSPECTION, TESTING, AND CALIBRATION

Incoming Purchased Products and Assemblies

Incoming Purchased Products and Assemblies will be inspected according to the procedures set forth in detail in the Purchasing Requirements, Verification of Acceptability of Purchased Products section of this manual. Certain Spectron Purchase Products and Assemblies will undergo additional testing procedures prior to being accepted into inventory (see Product Identification and Tracing, Incoming Products and Assemblies Into Inventory, Purchased Products section of this manual).

Incoming Purchased Assemblies will be inspected and tested according to the procedures set forth in this manual directly below for Incoming Spectron Manufactured Products and Assemblies.

Incoming Spectron Manufactured Products and Assemblies

General Procedures

All Spectron Manufactured Products and Subassemblies will be inspected by a minimum of two qualified employees. First, the employee assigned responsibility for the Project will verify that all specifications in the Print, Assembly Drawings and Build Procedures were followed by giving a copy of the completed Work Order to a second Spectron Employee who is Qualified to complete the Final Assembly of the Product in which the Manufactured Product or Assembly will be used. The second employee will indicate check and acceptance of the product or assembly by initialing and returning the Work Order to the Production Manager and signing the Manufactured Product and Assembly into inventory.

All Spectron Manufactured Final Assemblies will have Serial Numbers assigned and will have a separate Final Quality Acceptance Test sheet which is to be completed by a Spectron Qualified Quality Check employee and filed in the Serial Number Folder for the Product.

Testing and Calibration Procedures

Many testing operations are performed during the In-process procedures directly below, however the following test and calibration procedures are considered especially significant to the quality process and are detailed as follows:

1. All Spectron Final Assemblies that have luminance or spectral characteristics will undergo testing and calibration as part of the manufacture Project. The Director of the

Spectroradiometer Division of Spectron will develop and store the test procedures for each unit and the Final Calibration Sheet results will be filed in the Serial Number Folder for each unit prior to signing the unit into inventory.

2. All Spectron Circuit Board Assemblies will undergo specific test and burn-in procedures as part of the manufacture Project. The Director of the Spectroradiometer Division of Spectron will develop and store the test procedures for each unit. By signing the unit into inventory and making the appropriate entry in the Circuit Board Serial Number book, the Director of the Spectroradiometer Division of Spectron certifies that the test and burn-in procedures have been completed satisfactorily.
3. Testing and Calibration of certain Spectron products (Camera, Transport, and Controller) involves a certain complexity that requires the following special procedures for these units. The special Test and Calibration Procedures for these units are as follows:
    A. When the manufacture Project is complete for these units, they will be signed into inventory according to the procedures above. However, the Production Manager will immediately create a Calibration Project for the unit and the Calibration Officer will immediately sign it out of inventory to the Calibration Project.
    B. The Director of R&D and Engineering will develop and maintain the Test and Calibration procedures for the units, and the procedures will be kept and stored by the Calibration Officer.
    C. Upon satisfactory completion of the Calibration Project, the Calibration Officer will file the test and calibration data for the unit in the Serial Number Folder for the unit and will sign the unit into inventory as above provided.

In-Process Inspection, Testing, and Calibration

Except for the special testing and calibration procedures relating to the Spectron camera, transport, and controller, above, all required In-Processing Inspection, Testing, and Calibration requirements will be specified in the Build Procedures for the unit, or incorporated in this manual as Spectron policy and procedures.

The Spectron employee primarily responsible for the manufacture Project will perform the following as part of all manufacture Projects:

1. Initially inspect the following documents for completeness and ensure that the most current version of the document is provided

A. Work Order
B. Print and Assembly Drawings, including all subassembly or manufactured drawings referenced by the Assembly Drawing
C. Bill of Materials
D. Build Procedures

2. Inspect each item pulled from inventory for the project to ensure that it meets all Spectron requirements for the item. If not, treat the item as a non-conforming product according to the procedures set forth below in the Control of Non-Conforming Products section of this manual
3. Perform all intermediate and final tests required of the builder following the Build Procedures. If an intermediate test is required by another Qualified Spectron employee, do not proceed until the test is performed and documented by the second employee
4. Upon completion of the build the Product or Assembly will be inspected, and any required testing and calibration performed, by a second Qualified Spectron employee as provided in this section under the subheading, Incoming Spectron Manufactured Products and Assemblies.
5. In no event will a manufactured product or assembly be turned into inventory and the Project Closed until all required inspections, tests, and calibrations been performed satisfactorily.
6. The return of a properly documented Work Order to the Production Manager and the filing of any required Final Acceptance Test and Calibration Data Sheets in the Serial Number Folder will verify that all required inspections, tests, and calibrations have been completed.

CONTROL OF INSPECTION EQUIPMENT

Externally Calibrated Inspection Equipment

The Director of the Spectroradiometer Division will be responsible for the control, calibration and maintenance of all externally calibrated Inspection Equipment that is used ensure that Spectron Products meet all requirements for the product.

A Calibration Folder will be maintained to store the calibration data for each such unit, and a computer spreadsheet will be maintained to monitor the calibration status of all units.

Each unit will be labeled with a Calibration Label showing the date of the most recent calibration and will be checked by the person using the unit to perform any quality procedures required by this manual.

Each unit will only be used by a Qualified Spectron employee for the purposes intended, and when not in use, will be stored in a proper storage location under control of the Director of the Spectroradiometer Division.

Spectron Calibrated Inspection Equipment

The Director of R&D and Engineering will develop Calibration Procedures and Standards for all Spectron Calibrated Inspection Equipment (Calibrated Tools) that are used to ensure that all Spectron Products meet all requirements.

The control, calibration and maintenance of all Calibrated Tools will be under the control of the Calibration Officer.

A Calibration Folder will be maintained to store the calibration data for each such unit, and a computer spreadsheet will be maintained to monitor the calibration status of all units.

Each unit will be labeled with a Calibration Label showing the date of the most recent calibration and will be checked by the person using the unit to perform any quality procedures required by this manual.

Each unit will only be used by a Qualified Spectron employee for the purposes intended, and when not in use, will be stored in a proper storage location under control of the Calibration Officer.

INSPECTION, TEST, AND CALIBRATION STATUS OF PRODUCTS

The inspection, test, and calibration status of Spectron Products is controlled in detail by the provisions in this manual relating to Document and Data Control, Purchasing Requirements, Product Identification and Tracing, Process Control Requirements, Product Inspection and Testing, Control of Non-Conforming Products, Corrective and Preventive Action, and Handling, Storage, and Delivery.

Inspection, Test and Calibration Quality documents revealing the status of the Product will remain with the Product until such time as the Project is closed and the Product is stored in its proper inventory location.

Certain Spectron Products are used In-House to test and calibrate Spectron Products going into inventory or going to a customer. Such Spectron Products will be clearly marked with a Serial Number, the Serial Number Log Book will reflect that the Product is for In-House use only, and there will be a Tag firmly affixed to the Product indicating that the Product is for In-House only. If the Product requires calibration, a calibration tag will be in place as described above in the Control of Inspection Equipment section of this manual.

In certain events, a Spectron Product will fail an Inspection, Test, or Calibration and the problem cannot be remedied in a timely manner. In that event, the Production Manager will be notified and will make the decision as to how to proceed. In the event that the Product is not to be treated as a non-conforming product as described below, the Product will be clearly marked with its current status and placed in a storage location apart from the normal build, test and calibration areas.

The calibration procedures for the Spectron Camera, Transport, and Controller are extensive and require considerable time to complete. The Calibration Officer will maintain a Grease Board, clearly visible to all employees, that will identify the Product being calibrated and the steps completed thus far.

Prior to delivery of a Spectron Product to a customer as detailed below in the Handling Storage and Delivery section of this manual, the Production Manager will confirm that all Inspection, Test, and Calibration procedures have been satisfactorily performed and the all required documentation is stored in its proper place.

CONTROL OF NON-CONFORMING PRODUCTS

If, at any time, any Spectron employee, either through the Quality processes described in this manual or otherwise, determines that a Spectron Product or Assembly does not meet all Spectron requirements, the Production Manager will be notified and take action as follows:

1. If it is determined that the Product or Assembly cannot be economically made to conform to Spectron requirements, the Product or Assembly will be removed from its inventory location and signed out on the Daily Inventory Log to a 'scrap' Project Number (H0000). If the product is a vendor supplied product that does not meet the Spectron Purchase Order Specifications, the Purchasing Agent will be directed to return the Product to the vendor, otherwise the Product will be placed in the 'scrap' location at Spectron.
2. If it is determined that the Product or Assembly can be economically made to conform to Spectron requirements, the Production Manager will initiate a Rework Project to repair the Product, and will instruct the Spectron employee primarily responsible for the Project to remove the Product from inventory and sign it out to the Rework Project on the Daily Inventory Log. The Product will return to inventory upon satisfactory completion of the Project, to include all inspections, tests, and calibrations required for the original product.

The above procedures do not apply to a Spectron Product that is work In-Process and does not satisfactorily pass a required inspection, test, or calibration. In that event, the Spectron employee responsible for the inspection, test, or calibration will have the Spectron employee primarily responsible for the completion of the Project correct the non-conformity and resubmit the Product for test, inspection or calibration. If such corrections are necessary during testing or calibration, the test or calibration procedures may provide that the test or calibration does not need to be run from the beginning, but may commence at some specified point in the procedures prior to the point where the discrepancy was discovered.

CORRECTIVE AND PREVENTIVE ACTION

The procedures set forth in this manual are designed to prevent non-conformities in Spectron Products. In addition, the procedures are designed to identify and correct non-conformities at the earliest possible stage in the manufacturing process. However when non-conformities do occur it is Spectron policy to correct such non-conformities without delay.

HANDLING, STORAGE, AND DELIVERY

Handling

Incoming Spectron products will be kept in the original packaging supplied by the vendor when consistent with the inspection and inventory storage location for the product.

All Spectron products will he handled carefully to respect the original finish of the product. This is particularly important during the manufacturing process.

Spectron Products that are bulky, awkward, or heavy are to be handled by a minimum of two people. It is Spectron employee responsibility to obtain help from another employee when handling such Products.

Spectron Products requiring anti-static protection will only be handled by employees using static preventative measures.

Storage

Only Spectron Products that have been determined to meet all Spectron requirements will be placed in designated inventory locations. It is the Production Managers responsibility to designate a storage location for all Spectron Products. If there is not adequate room for storage in the primary storage location, the Production Manager will be notified and an appropriate alternate location will be designated.

Spectron Products that consist of Final Assemblies will have an inventory storage location that consists of a room separate from that designated for other Spectron Products. Such Products may be stored in the shipping container designed for the Product.

On occasion, Spectron may contract to store customer products that have been 'Shipped In Place'. Such products are customer property and will be stored in a limited access storage location, and under lock with the key controlled only by the Production Manager and President.

Delivery

Prior to delivery of any Spectron Product, the Production Manager (or the Director of the Spectroradiometer Division, in the case of spectroradiometer products) will ensure that all inspections, testing, calibration, and documentation required by this manual is complete for the Product being shipped.

The Shipping Officer will make a final inspection and cleaning of the Product being shipped in accordance with the posted Shipping Procedures in order to detect any damage to the Product while in storage.

In some instances, the customer will require an Acceptance Test Procedure be provided for Spectron Products. That test will be completed prior to shipping by the Calibration Officer, who will follow procedures prepared by the Director of R&D and Engineering. The Acceptance Test Procedure results for the Product will be shipped with the Product. Spectron copies of the results will be placed in the Serial Number Folder for the product, and may otherwise be provided to the customer as directed by the contractual arrangement with the customer.

Spectron will ship a Certificate of Conformance with the original shipment of all Spectron Products that states; “Spectron Engineering, Inc. maintains a record and affirms that all items listed above, including subcontracted supplies and services, meet all drawing, specification, and purchase order requirements”. This Certificate will be signed by the Production Manager or the President.

Spectron Products will be shipped in specially designed containers for the product being shipped if such containers have been designed for the product. If not, the Product will be shipped in secure packaging with adequate padding to protect the product during shipping. All containers for Spectron Products will be marked with ‘Fragile’ labeling and ‘This End Up’ indicators if appropriate.

It is Spectron policy to ship its Products by Air Freight. If contractual arrangements with the customer prevent such shipment, extra caution in packaging will be taken and the final packaging will be approved by the Production Manager, or by the President.

CONTROL OF QUALITY RECORDS

Although extensive use is made of computer generated records and procedures to control and monitor the procedures described in this manual, all quality records are kept in printed form with the content collected and stored as follows:

1. Spectron Customer Contracts and Purchase Orders - Stored, Spectron General Files
2. Spectron Purchase Orders - Filed, Purchasing Agent Area
3. Vendor Packing List - Filed, Spectron General Files
4. Purchase Order Log Book - Stored, Purchasing Agent Area
5. Receiving Log Book - Stored, Purchasing Agent Area
6. Spectron Serial No. Log Books - Stored, Electronic Test Area
7. Spectron Current Print and Assembly Drawings - Stored, Print File
8. Spectron Print and Assembly Drawing Changes and Previous Versions - Stored, Print Archive Files
9. Spectron Project Log Book - Stored, Production Manager Area
10. Spectron Work Orders and Project Bill of Materials, Current Month - Stored in Reception Area
11. Spectron Archived Work Orders and Project Bill of Materials - Stored in Records Storage Room
12. Daily Inventory Log - Filed in Inventory Log Book, Reception Area
13. Daily Employee Time Sheets - Stored, Reception Area
14. Product Build Procedures - Filed, Production Managers Area
15. Final Acceptance Test Sheets - Filed, Product Serial No. File
16. Circuit Board Test Procedures - Filed, Electronic Test Area
17. Calibration Test Procedures (Luminance and Spectroscopy) - Filed, Director of Spectroradiometer Area
18. Calibration Test Procedures (Optical Measurement System) - Filed, Calibration Officer Area
19. Calibration Data Sheets - Stored, Product Serial No. File
20. Acceptance Test Procedures - Stored, Calibration Officer Area
21. Acceptance Test Procedure Results - Filed, Product Serial No. File
22. Certificate of Conformance - Filed, Product Serial No. File
23. Repair Log - Filed, Product Serial No. File
24. Shipping Log, Stored, Shipping Area
25. Spectron Packing List - Stored, Spectron General Files

INTERNAL QUALITY AUDIT REQUIREMENTS

The Production Manager will, on an annual basis in conjunction with the Spectron Physical Inventory, conduct a review and examination of Spectron Quality Records and Documents.

TRAINING REQUIREMENTS

It is Spectron Policy to have at least two employees trained and qualified to perform all manufacturing and quality procedures described in this manual. Initial training in manufacturing, inspection, test, and calibration procedures for a new Spectron Product is provided by the Director of R&D and Engineering. Subsequently, training an employee to perform a task for which he/she is not qualified may be accomplished by any trained and qualified Spectron employee. New employees may be trained by various qualified Spectron employees depending upon the expected work duties of the new employee.

SERVICING REQUIREMENTS

Spectron Products returned for Service or Repair will be received as indicated above in the Product Identification and Tracing, Incoming Spectron Products For Service, Update, or Repair section of this manual.

STATISTICAL TECHNIQUES

Spectron does not employ statistical techniques in the manufacturing process or in its quality check, testing, or calibration procedures.

EMPLOYEE QUALIFICATIONS

Spectron Engineering has a highly educated and experienced workforce; every employee is fully qualified to provide quality assurance in their area of expertise.

Norman E. Herz, Jr.

Mr. Herz is the president, founder, and CEO of Spectron Engineering, Inc. He has a B.S. in Mechanical Engineering and is a trained machinist. He is actively involved in all aspects of the company. Mr. Herz is responsible for creating and verifying all internal software used in company products. He is qualified to perform all quality procedures.

Forrest R. Claypool

Mr. Claypool is Spectron's Director of R&D and Engineering. He has thirty years experience in physics, electronics, and machining. He is responsible for all Design, Test and Calibration procedures used by Spectron. He is qualified to perform all quality procedures described in this manual.

Matthew Herz

Mr. M. Herz is Spectron's Production Manager. He is in responsible for controlling all aspects of production and for implementing all quality procedures described in this manual. He is qualified to perform all quality procedures described in this manual. Mr. M. Herz also serves as Spectron's Contract Officer.

Chris Runyan

Mr. Runyan is IT Manager and Computer Programmer at Spectron. His responsibility is to maintain the network systems and the integrity of the Data system. He writes software for Spectron products and internal use.

Barbara Icke

Ms. Icke is Spectron's Purchasing Agent, Receiving and Shipping Clerk, and Circuit Board Assembler. She has twenty five years of circuit board building experience. Ms. Icke is additionally qualified to perform all incoming inspections of Spectron or Customer Supplied Products, and to perform all quality procedures related directly to shipping.

Arben Danaj

Mr. Danaj is Spectron's Machinist and Fixture Assembly Technician. He has an A.S. in Machining and over twenty years of experience. He is in responsible for, and qualified to, build all Spectron in-house manufactured parts. He is responsible for, and qualified to, perform all incoming inspections of vendor supplied manufactured parts. In addition, Mr. Danaj is trained and qualified to assemble and to perform Final Acceptance Tests on all Spectron Fixture Products not requiring calibration.