

# IPC-1720A

## Assembly Qualification Profile

Developed by the OEM council of the IPC, IPC-1720A categorized an electronic assembly manufacturer's capabilities and supplies the OEM customer with detailed, substantive information.

### IPC-1720A

May 2004     A standard developed by IPC

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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## **FOREWORD**

It is not intended that this Assembly Qualification Profile (AQP) satisfies all the requirements of the customer, however, conscientious maintenance of this document and or registration to ISO 9000 requirements should satisfy the major concerns. Thus, audits should be simpler, required less frequently, and facilitate less paper work as customers and suppliers work closer to meeting each others needs.

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### **HOW TO USE THE AQP**

Although the AQP is for a single site or location, information about the overall company is helpful in establishing the relationship of the existing site to the total company and to other sites or divisions. The first page of section 1 is intended to convey the overall company description and is reflected in the optional financial review detailed in section 8. The remainder of the AQP is devoted to information about a single site (see section 9 for examples).

Although intended to be site specific, the AQP may be used to convey total corporate capability. When this practice is preferred, section 1.2 (intended for site description) is modified to reflect total corporate capability, as are all other sections of the AQP.

The Electronic Assembly Manufacturer should keep all sections current. In the initial contact between the manufacturer and a new customer, an abbreviated AQP will suffice (site description from Sections 1 and 2). Access to AQP in electronic media is suggested in order to facilitate the appropriate manufacturer/user information interchange. The remaining sections of the AQP provide details of the site assembly capability and the quality principles that have been incorporated into the systems used to manufacture products. The information is of use to the assembly company in assessing where the organization stands on implementing quality and technology; the same data helps the customer in determining how well the manufacturers' capability matches the customer need.

### **ACKNOWLEDGMENTS**

The IPC is indebted to the members of the OEM council who participated in the development of this document. A note of thanks is also expressed to the members of the Electronic Manufacturing Services Industry (EMSI) for their review and critique and construction recommendations in finalizing the principles developed for the AQP.

Although the IPC is grateful for all the involvement and individual contributions made in completing the AQP, a special acknowledgment is extended to the following individuals. It was their dedication and foresight that made this publication possible.

|                                                         |                                              |              |
|---------------------------------------------------------|----------------------------------------------|--------------|
| <b>Donna H. Hodgson</b> <i>Merix</i>                    | <b>Emily Nikoo</b> <i>ESAT, Inc.</i>         | <b>Kevin</b> |
| <b>Sheehan</b> <i>Standard Microsystems Corporation</i> |                                              |              |
| <b>Sue Jones</b> <i>Wilcox Electric</i>                 | <b>Steve Pudles</b> <i>Ronic Assoc. Inc.</i> | <b>Mario</b> |
| <b>Suarez-Solis</b> <i>Encore Computer Corp.</i>        |                                              |              |

|                    |      |
|--------------------|------|
| <b>SECTION 1.1</b> | DATE |
|--------------------|------|

COMPLETED

## COMPANY DESCRIPTION

### GENERAL INFORMATION

|                  |            |       |  |
|------------------|------------|-------|--|
| LEGAL NAME       |            |       |  |
| PHYSICAL ADDRESS |            |       |  |
| CITY             | STATE      | ZIP   |  |
| PROVINCE         | COUNTRY    |       |  |
| TELEPHONE NUMBER | FAX NUMBER | TELEX |  |

NUMBER

|                |              |                |
|----------------|--------------|----------------|
| E-MAIL ADDRESS | MODEM NUMBER |                |
|                | DATE FOUNDED | PUBLIC PRIVATE |
| INTERNET URL   | FTP SITE     |                |

### MANAGEMENT

|                                    |
|------------------------------------|
| PRESIDENT                          |
| CHIEF OPERATING OFFICER            |
| VICE PRESIDENT OF MANUFACTURING    |
| VICE PRESIDENT OF QUALITY          |
| VICE PRESIDENT OF MARKETING/SALES  |
| VICE PRESIDENT OF CUSTOMER SERVICE |
| VICE PRESIDENT OF PURCHASING       |

|                       |                               |                     |      |
|-----------------------|-------------------------------|---------------------|------|
| CORPORATE DESCRIPTION | NUMBER OF CORPORATE EMPLOYEES | NUMBER OF EMPLOYEES | SITE |
| COMMENTS              |                               |                     |      |

|                        |                   |  |  |
|------------------------|-------------------|--|--|
| DESIGN AND DEVELOPMENT |                   |  |  |
| ENGINEERING            |                   |  |  |
| MANUFACTURING CONTROL  |                   |  |  |
| MANUFACTURING DIRECT   |                   |  |  |
| INDIRECT               |                   |  |  |
| QUALITY CONTROL        | QUALITY ENGINEERS |  |  |

|  |                   |  |  |
|--|-------------------|--|--|
|  | INTERNAL AUDITORS |  |  |
|--|-------------------|--|--|

|  |                    |  |  |
|--|--------------------|--|--|
|  | GENERAL MANAGEMENT |  |  |
|--|--------------------|--|--|

|                |  |  |  |
|----------------|--|--|--|
| ADMINISTRATION |  |  |  |
| <b>TOTAL</b>   |  |  |  |

|                    |                |
|--------------------|----------------|
| <b>SECTION 1.2</b> | DATE COMPLETED |
|--------------------|----------------|



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|                  |                                 |        |
|------------------|---------------------------------|--------|
| SITE DESCRIPTION | (TO BE COMPLETED FOR EACH SITE) | ATTACH |
|------------------|---------------------------------|--------|

#### APPROPRIATE CHARTS (OPTIONAL)

|                        |            |       |  |
|------------------------|------------|-------|--|
| MANUFACTURING FACILITY |            |       |  |
| COMPANY NAME           |            |       |  |
| PHYSICAL ADDRESS       |            |       |  |
| CITY                   | STATE      | ZIP   |  |
| PROVINCE               | COUNTRY    |       |  |
| TELEPHONE NUMBER       | FAX NUMBER | TELEX |  |

|               |              |          |
|---------------|--------------|----------|
| E-MAIL NUMBER | MODEM NUMBER | YEARS IN |
|---------------|--------------|----------|

#### BUSINESS

|                                         |          |
|-----------------------------------------|----------|
| PRINCIPLE PRODUCTS/SERVICES/SPECIALTIES | BUSINESS |
|-----------------------------------------|----------|

CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.)

|                     |                                 |
|---------------------|---------------------------------|
| FACILITY MANAGEMENT | TITLE                           |
|                     | REPORTS TO (Function/Job Title) |

|                                                |  |
|------------------------------------------------|--|
| OVERALL OPERATION RESPONSIBILITY FOR THIS SITE |  |
|------------------------------------------------|--|

|               |  |
|---------------|--|
| MANUFACTURING |  |
|---------------|--|

|                       |  |
|-----------------------|--|
| TECHNICAL/ENGINEERING |  |
|-----------------------|--|

|                              |  |
|------------------------------|--|
| MATERIALS/PRODUCTION CONTROL |  |
|------------------------------|--|

|            |  |
|------------|--|
| PURCHASING |  |
|------------|--|

|         |  |
|---------|--|
| QUALITY |  |
|---------|--|

|                      |  |
|----------------------|--|
| SALES REPRESENTATIVE |  |
|----------------------|--|

|                  |  |
|------------------|--|
| WASTE MANAGEMENT |  |
|------------------|--|

|           |                               |
|-----------|-------------------------------|
| BUILDINGS | SYSTEMS (INDICATE % COVERAGE) |
|-----------|-------------------------------|

|        | AGE     | AREA (Sq. Ft.) |                  | Construction (Wood/Brick) |                 | Power Conditioning |  |  |  |  |
|--------|---------|----------------|------------------|---------------------------|-----------------|--------------------|--|--|--|--|
|        | Heating | Ventilation    | Air Conditioning | Sprinklers                | Waste Treatment | Other              |  |  |  |  |
| Office |         |                |                  |                           |                 |                    |  |  |  |  |

|               |  |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|--|
| Manufacturing |  |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|--|

|         |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|
| Storage |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|

|                   |  |  |  |  |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|--|--|--|--|
| Planned additions |  |  |  |  |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|--|--|--|--|

#### SAFETY AND REGULATORY AGENCY REQUIREMENTS

|                                                                |     |    |         |
|----------------------------------------------------------------|-----|----|---------|
| Are fire extinguishers functional and accessible to employees? | YES | NO | What is |
|----------------------------------------------------------------|-----|----|---------|

the distance to the nearest fire station? (in minutes) Minutes

|                                                                             |     |    |
|-----------------------------------------------------------------------------|-----|----|
| Do you conform to local/federal environment protection agency requirements? | YES | NO |
|-----------------------------------------------------------------------------|-----|----|

Date of last OSHA visit Date of last EPA visit

|                                                                                              |     |    |
|----------------------------------------------------------------------------------------------|-----|----|
| Are you currently operating under a waiver or in violation of local government requirements? | YES | NO |
|----------------------------------------------------------------------------------------------|-----|----|

Other Agency Audits, UL, ISO 9000, CSA Approval and Number

UL # \_\_\_\_\_ CSA # \_\_\_\_\_ ISO 900\_ Reg# \_\_\_\_\_ Reg

Date

|                                        |          |            |                        |                         |              |                 |  |  |  |
|----------------------------------------|----------|------------|------------------------|-------------------------|--------------|-----------------|--|--|--|
| Do you have a safety program? Describe |          |            |                        | YES                     | NO           | Hazardous Waste |  |  |  |
| Number Trade Waste Account Number      |          |            |                        |                         |              |                 |  |  |  |
| PLANT PERSONNEL (TOTAL EMPLOYEES)      |          |            |                        |                         |              |                 |  |  |  |
| Permanent                              | Contract | Office     | Technical/ Engineering | Production              | Full-Time QA | Part-Time       |  |  |  |
| QA                                     | Union    | Non- Union | Union Name             | Contract Expires (Date) |              |                 |  |  |  |
|                                        |          |            |                        |                         |              |                 |  |  |  |

## SECTION 2.1 PRODUCT TYPE

DATE

COMPLETED

This section is intended to provide overview information on the product types being fabricated by the manufacturer. **Site Capability Snapshot (Please Check all that apply)**

|   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <b>Designators</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|   | <b>Remarks</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                      |
| A | Electronic Assembly Type               | 1A 1B 1C 1X 2B 2C 2X 2Y 2Z Other:                                                                                                                                                                                                                                                                                                                                                                                    |
| B | Board Construction Type                | Rigid Printed Board Flex Printed Board Rigid Flex Board Rigid Backplane<br>Molded Board MCM-C Ceramic Modules & Hybrids MCM-L Laminated Modules MCM-D Deposited Dielectric Other:                                                                                                                                                                                                                                    |
| C | Board Size Diagonal                    | <250 [10.00] 250 [10.00] 350 [14.00] 450 [17.50] 350 [14.00] 650 [25.50]<br>750 [29.50] 850 [33.50] >850 [33.50] Other:                                                                                                                                                                                                                                                                                              |
| D | Maximum Thru Hole Work Area            | <300 CM <sup>2</sup> <[50 IN <sup>2</sup> ] 300 CM <sup>2</sup> [50 IN <sup>2</sup> ] 600 CM <sup>2</sup> [100 IN <sup>2</sup> ] 1000 CM <sup>2</sup> [160 IN <sup>2</sup> ]<br>1500 CM <sup>2</sup> [203 IN <sup>2</sup> ] 2100 CM <sup>2</sup> [330 IN <sup>2</sup> ] 2800 CM <sup>2</sup> [430 IN <sup>2</sup> ] 3600 CM <sup>2</sup> [550 IN <sup>2</sup> ] 3600 CM <sup>2</sup> [550 IN <sup>2</sup> ] Other:   |
| E | Maximum SMT Work Area                  | <300 CM <sup>2</sup> <[150 IN <sup>2</sup> ] 300 CM <sup>2</sup> [50 IN <sup>2</sup> ] 600 CM <sup>2</sup> [100 IN <sup>2</sup> ] 1000 CM <sup>2</sup> [160 IN <sup>2</sup> ]<br>1500 CM <sup>2</sup> [230 IN <sup>2</sup> ] 1000 CM <sup>2</sup> [160 IN <sup>2</sup> ] 2800 CM <sup>2</sup> [430 IN <sup>2</sup> ] 3600 CM <sup>2</sup> [550 IN <sup>2</sup> ] >3600 CM <sup>2</sup> [550 IN <sup>2</sup> ] Other: |
| F | Distance Wiring Terminals & Connectors | Solid Wire Standard Wire Shielded Wire Coax Wire Terminal Bifurcated &<br>Turret Clip & Pin Terminals Crimped Terminals Board Connectors Backplane Connectors Other:                                                                                                                                                                                                                                                 |
| G | Cable & Harness (Multiple Wire)        | Hi Power Eq. or Lgr. 10 Gauge Lower Power Thinner than 10 Gauge<br>Electrical Cable (Wire) Optical Cable (Glass) Electrical Harness Optical Harness Ribbon Cable Harness Combination Harness Other:                                                                                                                                                                                                                  |
| H | Mechanical Assembly Operations         | Electronic Hardware Mechanical Hardware Shielding Hardware Thermal<br>Conductive Hardware Front Panel Hardware Jumper Wires Molded Cable Final System Assembly (Box Build) Other:                                                                                                                                                                                                                                    |
| J | Completed End Product                  | Consumer Products General Purpose Computers Telecommunications<br>Products Commercial Aircraft Products Industrial & Automotive Products High Performance Military Outer Space (LEO & GEO) Military<br>Avionics Automotive (Under the Hood) Other:                                                                                                                                                                   |

\*For product type description, see Glossary, Page 10-2, Section 10.2



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## SECTION 2.2 PROCESSES

DAT

E COMPLETED

This section is intended to provide overview information on the assembly processes used by the manufacturer. **Site Capability Snapshot (Please Check all that apply)**

|   | Designators                    | Remarks                                                                                                                                                                                                                                                                                                                  |
|---|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | Through Hole Insertion         | Two Leaded-Axial Two Leaded Radial Multiple Leaded ≤6-Radial Single-In-Line Packages (SIPS) Dual In-Line Pkgs. (DIPS) ≤24 PION Dual In-Line Pkgs. >24 PION Pin Grid Arrays (PGA's) Component Sockets Card Edge/Two Piece Connectors Other:                                                                               |
| B | Surface Mount Placement        | Chip Resistors/Cap. (Reel) Bulk Chip Resistors/Cap. Tantalum Capacitor Metal Faced Components (MELFS) Sm. Outline Diodes (SODS) Sm. Outline Transistors (SOTS) Sm. Outline IC's (SOIC's) Variable Resistor Trim Pots Surface Mount Sockets/Test Pts. Connect Other:                                                      |
| C | High Pin Count                 | Chip-on-Tape (Molded ring) >0.4 mm pitch Chip-on-Tape (Molded ring) ≤0.3mm pitch Quad Flat Pack (QFP) ≤0.4mm pitch Quad Flat Pack (QFP) ≤0.3mm pitch Shrink Quad Flat Pack (SQFP) Thin Small Outline Pkg. (TSOP) Ball/Post Grid Array >1.0mm pitch Ball/Post Grid Array ≤1.0mm pitch Land Grid Array Any Pitch Other:    |
| D | Bare Chip Attachment           | Thermal Wire Bonding Ball Bonding Ultrasonic Wiring Bonding Beam Lead Chip Bonding Generic Tape Automated Bonding Custom Tape Automated Bonding Flip Chip on Ceramic or Glass Based Flip Chip on Rigid Printed Boards Flip Chip on Flex Circuit Boards Other:                                                            |
| E | Attachment Techniques          | Hand Soldering Hot Bar Soldering Focused Hot Air Soldering Wave Soldering IR Reflow Soldering Vapor Phase Soldering Hot Air Convection Soldering Laser Soldering Conductive Adhesive Attachment Other:                                                                                                                   |
| F | Cleaning & Cleanliness Testing | No Clean/Never Clean System Aqueous Cleaning In-line Sys. Aqueous Cleaning Static Soak Modified Solvent Clean. In-line Modified Solvent Clean. Static Soak Ultrasonic Agitation Cleaning Ionic Salt/Residue Test Organic Contaminate Impreg. Test Surface Insul. Resist. (SIR) Test Other:                               |
| G | Coating & Encapsulation        | Bare Die-Glob Top Bare Die-Total Assembly Assembly (1 or 2 sides) Epoxy Coating Assembly (1 or 2 sides) Polyurethane Coating Assembly (1 or 2 sides) Acrylic Coating Assembly (1 or 2 sides) Vacuum Dep Coating Encapsulation Exterior Access (Test) Encap. Ex-access (Tuning) Encap. Entire Assembly (Thin Coat) Other: |
| H | Inspection                     | In-coming In-Process Final Inspection 100% Inspection Audit Inspection Manual Semi-Automatic Automatic Other:                                                                                                                                                                                                            |
| J | Testing & Repair               | Test Equipment Design Test Equipment Fabrication Test Development Failure Analysis Repair Depot Rework Depot Other:                                                                                                                                                                                                      |

## SECTION 2.3 TESTING

DA

TE COMPLETED

This section is intended to provide detailed information on the test, equipment and testing capability of the manufacturer. **Site Capability Snapshot (Please Check all that apply)**

|   |                                |                                                                                                                                                                                                                                                                               |
|---|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <b>Designators</b>             |                                                                                                                                                                                                                                                                               |
|   | <b>Remarks</b>                 |                                                                                                                                                                                                                                                                               |
| A | Test Type                      | Automatic Test Generation X-Ray Joint Evaluation Cleanliness Testing<br>Auto in-circuit Electronic Assembly Electro-magnetic Interference Auto Function Electronic Assembly System Level Test Electrical<br>System Level Test Function System Level Test Environmental Other: |
| B | Test Fixture Type              | No Fixture One-sided Probe Generic Electrical Cam Shell Test-Generic<br>Electrical Custom Fixture Electrical Dedicated Test Bed Electrical Humidity Test Temperature Test Vibration Test Shock Test Other:                                                                    |
| C | Probe Point Pitch              | >1.0 [.040] 1.0 [.040] 0.8 [.032] 0.65 [.025] 0.50 [.020] 0.40 [.016]<br>0.30 [.012] 0.20 [.008] <.20 [.008] Other:                                                                                                                                                           |
| D | No. of Probe Points            | <200 200 500 1000 1500 2000 2500 3000 >3000 Other:                                                                                                                                                                                                                            |
| E | No. of Test Vectors            | <500 500 1000 2000 3000 4000 5000 6000 >6000 Other:                                                                                                                                                                                                                           |
| F | Environmental Stress Screening | Burn-in at Temperature Burn-in with Temperature Cycling Burn-in/Hi<br>Temperature Cycles Burn-in with Temperature Cycles Burn-in with Temperature Cycles Hi-humidity Power Cycling On-Off Vibrations<br>Testing Shock Test Salt Spray Testing Other:                          |

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|---------------------------------------|------|
| <b>SECTION 2.4</b> PRODUCT COMPLEXITY | DATE |
|---------------------------------------|------|

COMPLETED

This section is intended to provide overview information on the product complexity being fabricated by the manufacturer. Based on component density. **Site Capability Snapshot (Maximum Component Density\*)** \*PERCENT COMPONENTS AND LAND AREA/AVAILABLE BOARD AREA (Please Check all that apply)

| Designators |         |     |    |    |    |    |    |    |    |     |        |  |
|-------------|---------|-----|----|----|----|----|----|----|----|-----|--------|--|
| Remarks     |         |     |    |    |    |    |    |    |    |     |        |  |
| A           | Type 1A | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| B           | Type 1B | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| C           | Type 1C | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| D           | Type 1X | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| E           | Type 2B | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| F           | Type 2C | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| G           | Type 2X | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| H           | Type 2Y | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |
| J           | Type 2Z | <30 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | >90 | Other: |  |

## SECTION 2.5 PRODUCT VOLUME

DATE

COMPLETED

This section is intended to provide overview information on the volume of product being fabricated by the manufacturer. Site Capability Snapshot (Please Check all that apply)

| Designators |                               | Remarks                                                                                                                                              |  |
|-------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| A           | Volume of Electrical Assembly | Prototype Low (Under 100) Low-Medium (To 1,000) Medium (To 5,000) Medium (To 10,000) Medium-High (To 20,000) High (To 50,000) High To 500,000 Other: |  |
| B           | Volume of Discrete Wiring     | Prototype Low (Under 100) Low-Medium (To 1,000) Medium (To 5,000) Medium (To 10,000) Medium-High (To 20,000) High (To 50,000) High To 500,000 Other: |  |
| C           | Volume Cable/Harness          | Prototype Low (Under 100) Low-Medium (To 1,000) Medium (To 5,000) Medium (To 10,000) Medium-High (To 20,000) High (To 50,000) High To 500,000 Other: |  |
| D           | Volume Mechanical             | Prototype Low (Under 100) Low-Medium (To 1,000) Medium (To 5,000) Medium (To 10,000) Medium-High (To 20,000) High (To 50,000) High To 500,000 Other: |  |
| E           | Volume Full System            | Prototype Low (Under 100) Low-Medium (To 1,000) Medium (To 5,000) Medium (To 10,000) Medium-High (To 20,000) High (To 50,000) High To 500,000 Other: |  |



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## SECTION 2.6 QUALITY DEVELOPMENT

DATE

COMPLETED

This section is intended to provide overview information on the quality systems in place in the manufacturing facility. Site Capability Snapshot (Please Check all that apply)

|   | Designators                  | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | Strategic Plan               | Functional Steering Committee Formed TQM Plan & Philosophy Established & Published Documented Quality Progress Review Implementation & Review of Project Team Recommendations TQM Communicated Throughout Organization Controlled New Process Start-up Management Participates in TQM Audits Employee Recognition Program Total TQM Plan/Involvement Customer Training Other:                                                             |
| B | Employee Involvement         | Certified Training Available Training of Employee Base TQM Team Trained Design of Experiment Training and Use New Process Implementation Training Support Personnel Training Advanced Statistical Training Quality Functional Deployment Ongoing Improvement Program for Employees Other:                                                                                                                                                 |
| C | Quality Manual               | Quality Manual Started Generic Quality manual for Facility 10% of Manufacturing Depts. have Process Specifications 25% of Manufacturing Depts. have Process Specifications 50% of Manufacturing Depts. have Process Specifications Non-manufacturing Manuals Developed 25% of all Departments have Quality Manuals 50% of all Departments have Quality Manuals All Manufacturing and Support Depts. have Controlled Quality Manual Other: |
| D | Instructions                 | Work Instructions Started Quality Instructions Started 10% Work Instructions Completed 10% Quality Instructions Completed 25% Work Instructions Completed, Controlled 25% Quality Instructions Completed, Controlled 50% Work Instructions Completed, Controlled 50% Quality Instructions Completed, Controlled Quality and Work Instructions Completed, Controlled Other:                                                                |
| E | SPC Implementation IPC-PC-90 | Plan Exists Training Started Process Data Collected & Analyzed All employees Trained First Process Stable & Capable Several Major Processes Stable & Capable Continued Improvement of Stable Processes Additional Mfg Processes Under Control All Processes Under Control Other:                                                                                                                                                          |
| F | Supplier Programs/Controls   | Supplier Rating Program Monthly Analysis Program Key Problems Identified Supplier Reviews Performance Data Provided TQM Acceptance by Suppliers 10% of Suppliers Using SPC 25% of Suppliers Using SPC 50% of Suppliers Using SPC All Key Suppliers Using Certified Parts Program Other:                                                                                                                                                   |
| G | Third Party IPC-QS-95        | Instrument Controls in Place Measurement System in Control IPC-PC-90 Document Controls in Place Reduced Lot Sampling 10% of Processes Under Audit Control 50% or Greater of Processes Under Audit Control ISO-9003 Certified ISO-9002 Certified ISO-9001 Certified Other:                                                                                                                                                                 |



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## SECTION 2.7 SERVICES

DATE

COMPLETED

This section is intended to provide overview information on the customer services offered by the manufacturer in addition to the assembly manufacturing services. **Site Capability Snapshot**  
(Please Check all that apply)

|                    |                          |                        |                          |                  |                     |
|--------------------|--------------------------|------------------------|--------------------------|------------------|---------------------|
| <b>Designators</b> |                          |                        |                          |                  |                     |
| <b>Remarks</b>     |                          |                        |                          |                  |                     |
| <b>A</b>           | <input type="checkbox"/> | Component Procurement  | <input type="checkbox"/> | Consignment      | Passive Thru-Hole   |
|                    | <input type="checkbox"/> | Pin Count (Peripheral) | <input type="checkbox"/> | Passive SMT      | I/C SMT             |
|                    | <input type="checkbox"/> | Hi-Pin Count (Array)   | <input type="checkbox"/> | I/C SMT          | Hi-                 |
|                    | <input type="checkbox"/> | Bare Die (CHIPS)       | <input type="checkbox"/> | ASIC's           | Other:              |
| <b>B</b>           | <input type="checkbox"/> | Board Procurement      | <input type="checkbox"/> | Consignment      | Single Sided        |
|                    | <input type="checkbox"/> | (Rigid-Flex)           | <input type="checkbox"/> | Double Sided     | Multilayer (Rigid)  |
|                    | <input type="checkbox"/> | Metal Core Boards      | <input type="checkbox"/> | Multilayer       | Multilayer          |
|                    | <input type="checkbox"/> | CTE Boards             | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | MCM's & Hybrids        | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | PCMCIA's               | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | Other:                 |                          |                  |                     |
| <b>C</b>           | <input type="checkbox"/> | Design Services        | <input type="checkbox"/> | Outsource        | Simulation          |
|                    | <input type="checkbox"/> | Rule Implementation    | <input type="checkbox"/> | Circuit Analysis | Placement & Routing |
|                    | <input type="checkbox"/> | Impedance Control      | <input type="checkbox"/> | Design           |                     |
|                    | <input type="checkbox"/> | High Speed             | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | MCM's (L) (C) or (D)   | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | ASIC's                 | <input type="checkbox"/> |                  |                     |
|                    | <input type="checkbox"/> | Other:                 |                          |                  |                     |

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## SECTION 3.0 MASTER EQUIPMENT LISTING

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### FORM AQP 20

Please complete a Master Equipment List. You may use your own form or the AQP Form 20.

|                |                            |                         |                       |  |  |  |
|----------------|----------------------------|-------------------------|-----------------------|--|--|--|
|                |                            |                         |                       |  |  |  |
| IDENTIFICATION | EQUIPMENT NAME/DESCRIPTION | MANUFACTURER TYPE/MODEL |                       |  |  |  |
|                | EQUIPMENT LIMITS           | ACCURACY                | CALIBRATION FREQUENCY |  |  |  |
|                | REMARKS                    |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |
|                |                            |                         |                       |  |  |  |

|                  |      |
|------------------|------|
| <b>SECTION 4</b> | DATE |
|------------------|------|

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## TECHNOLOGY PROFILE SPECIFICS

|              |                                                                                    |              |                 |      |
|--------------|------------------------------------------------------------------------------------|--------------|-----------------|------|
| <b>4.1</b>   | <b><u>ADMINISTRATION</u></b>                                                       |              |                 |      |
| <b>4.1.1</b> | <b>CAPACITY PROFILE</b>                                                            | <b>EST %</b> | <b>COMMENTS</b> |      |
|              | A) Total Capacity in units per month (based on best quarter)                       |              |                 |      |
|              | B) Presently running at _____ % of total unit capacity.                            |              |                 |      |
|              | C) Revenue from manufacturing services. Revenue from non-manufacturing activities. |              | <b>Total</b>    |      |
|              | 100%                                                                               |              |                 |      |
|              | D) Work dedicated to consignment. Work dedicated to turnkey.                       |              | <b>Total</b>    | 100% |

|              |                                                                           |              |                 |  |
|--------------|---------------------------------------------------------------------------|--------------|-----------------|--|
| <b>4.1.2</b> | <b>PERCENTAGE OF DOLLAR VOLUME</b>                                        | <b>EST %</b> | <b>COMMENTS</b> |  |
| *            | 1) Type 1A electronic assembly                                            |              |                 |  |
|              | 2) Type 1B electronic assembly                                            |              |                 |  |
|              | 3) Type 1C electronic assembly                                            |              |                 |  |
|              | 4) Type 1X electronic assembly                                            |              |                 |  |
|              | 5) Type 2B electronic assembly                                            |              |                 |  |
|              | 6) Type 2C electronic assembly                                            |              |                 |  |
|              | 7) Type 2X electronic assembly                                            |              |                 |  |
|              | 8) Type 2Y electronic assembly                                            |              |                 |  |
|              | 9) Type 2Z electronic assembly                                            |              |                 |  |
|              | 10) Wire wrap assembly                                                    |              |                 |  |
|              | 11) Cable/harness assembly                                                |              |                 |  |
|              | 12) Mechanical assembly                                                   |              |                 |  |
|              | 13) Full system assembly                                                  |              |                 |  |
|              | * For description of product types, see glossary, Section 10.2, page 10-2 |              |                 |  |



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| 4.1.3 | UNIT PRODUCTION PROFILE                                                                                        | UNITS PER MONTH |
|-------|----------------------------------------------------------------------------------------------------------------|-----------------|
|       | A) What do you consider, in number of units per month the definition of the following (units=units per month)? |                 |
|       | 1) High Production                                                                                             |                 |
|       | 2) Medium Production                                                                                           |                 |
|       | 3) Low Production                                                                                              |                 |
|       | 4) Prototype Production                                                                                        |                 |
|       | B) What is your average lead-time (delivery) as defined in (A)?                                                |                 |
|       | 1) High Production                                                                                             |                 |
|       | 2) Medium Production                                                                                           |                 |
|       | 3) Low Production                                                                                              |                 |
|       | 4) Prototype Production Quick turn - No. of days                                                               |                 |
|       |                                                                                                                |                 |

| 4.1.4 | MARKETS SERVED                      | YES | NO | COMMENTS |
|-------|-------------------------------------|-----|----|----------|
|       | A) Consumer Products                |     |    |          |
|       | B) General Purpose Computers        |     |    |          |
|       | C) Telecommunications Products      |     |    |          |
|       | D) Commercial Aircraft              |     |    |          |
|       | E) Industrial Products & Automotive |     |    |          |
|       | F) High Performance Military        |     |    |          |
|       | G) Outer Space LEO & GEO            |     |    |          |
|       | H) Military Avionics                |     |    |          |
|       | J) Automotive (Under the Hood)      |     |    |          |



| 4.1.5 | APPROVAL & CERTIFICATION PROFILE    | YES | NO | COMMENTS |
|-------|-------------------------------------|-----|----|----------|
|       | What company approvals do you have? |     |    |          |
|       | A) J-STD-001                        |     |    |          |
|       | B) IPC-A-610                        |     |    |          |
|       | C) MIL-STD-2000                     |     |    |          |
|       | D) UL Approval                      |     |    |          |
|       | E) UL Level 94V0                    |     |    |          |
|       | F) UL Level 94V1                    |     |    |          |
|       | G) UL Level 94V2                    |     |    |          |
|       | H) Canadian Standards               |     |    |          |
|       | J) MIL-P-55110                      |     |    |          |
|       | K) MIL-P-50884                      |     |    |          |
|       | L) ISO-9003                         |     |    |          |
|       | M) ISO-9002                         |     |    |          |
|       | N) ISO-9001                         |     |    |          |
|       | P) BABT                             |     |    |          |
|       | Q) QC9000                           |     |    |          |
|       | R) EEC                              |     |    |          |
|       | S) Customer Evaluation              |     |    |          |
|       | T) Other                            |     |    |          |