APPLICATION	
NEXT ASSY	USED ON

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	INITIAL PRODUCTION RELEASE	2018-08-03	P. BAKER A. LAWRENCE
A	Reformatted document, moved all listed documentation tables under section 2, and added section 3.12	2022-08-05	T. Rodriguez
B	Complete rewrite of section 4.3. Removed Palomar Documents section 2.1 and renumbered subsequent paragraphs Clarified x-ray requirement in section 3.9.4 Clarified shipping documents in section 4.2 Made a few grammatical corrections	2022-09-22 (Released 2022-09-29)	T. Rodriguez
C	Removed the "SECP" reference in the 3rd paragraph of section 3.3 Removed all Q clause references from the document Removed section 3.7.1 and renumbered subsequent paragraphs Replaced the Q clause in section 3.11.2 with new procedure (QMS-PRO-99-40) Added sub bullet point "CT Scans" to section 4.2 Added section 4.5, Process Validation	2025-02-24	T. Rodriguez
D	Added the term "when used" to paragraph 3.4 regarding MESS. Made minor grammatical and format changes.	2025-03-11	T. Rodriguez

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Control List: EAR99

	CONTRACT NUMBER:		PALOMAR	**PALOMAR PRODUCTS, INC.** 23042 Arroyo Vista Rancho Santa Margarita, CA 92688		
MATERIAL	**(Acting) SUPPLY CHAIN** **ERIC ROMERO**	03-06-2025 /s/	**STATEMENT OF WORK (SOW)** **CONTRACT MANUFACTURER**			
	VP of OPERATIONS **ERIC ROMERO**	03-06-2025 /s/				
	QUALITY **TITO RODRIGUEZ**	03-06-2025 /s/	**SIZE**	**CAGE CODE**	**DRAWING NUMBER**	**REV**
	ENGINEERING **TRINA SHOWS**	03-07-2025 /s/	**A**	**00816**	QA-PRO-99-01	D

SCALE: NONE

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1 Scope

This Statement of Work (SOW) establishes the Supplier's effort required to support Palomar's assembly of Circuit Card Assemblies (CCAs). Supplier tasks encompass the procurement of components, assembly and test as directed by the documentation provided by Palomar. Additionally, storage of components and associated reports as described within this document will also be required. If there is conflicting information within this document, the following order of precedence shall be followed:

1) Purchase Order (with Q clauses)
2) SOW (With Q clauses)
3) MESS (Manufacturing Exemption Summary Sheet)
4) Drawing

2 Documents

2.1 *Industry Standards*

ANSI/ESD S 20.20	Protection of electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
IPC-A-600	Acceptability of Printed Boards
IPC-A-610	Acceptability of Electronic Assemblies
IPC-6012	Qualification and Performance Specification for Rigid Printed Boards
IPC J-STD-001	Requirements for Soldered Electrical and Electronic Assemblies
IPC J-STD-003	Solderability Tests for Printed Boards
IPC J-STD-004	Requirements for Soldering Fluxes
IPC J-STD-005	Requirements for Soldering Pastes
IPC J-STD-006	Requirements for Electronic Grade Soldering Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications
IPC/JEDEC J-STD-033	Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices

2.2 *Technical data package*

For each assembly purchase order covered by this document, Palomar procurement shall reference or provide the Supplier a technical data package including (as applicable):

QA-PRO-99-01 - SOW (This document)
MESS – Manufacturing Exemption Summary Sheet
Assembly Drawing
Assembly Drawing Parts List
Schematic diagram (If listed on the MESS and flying probe is performed)
PWB/PCB Drawing
ODB++ (or gerbers for older board types)
Manufacturing Assembly files – (For CCAs - contains files for stencils (paste masks) and silkscreens)
Manufacturing Fabrication Files – (For PWBs/PCBs – contains ODB++, pick and place, CAM files)
Cross Reference Parts List – CRPL – Lists all approved Manufacturers and Manufacturers Part numbers for PPI PNs
Component Drawings – Drawings which are specification drawings where Palomar is the design authority
Process Drawings – Palomar drawing which specify specific process standards to be followed by the supplier
ECN – Engineering Change Notices-Incorporated Change notices
EO – Engineering Orders – Unincorporated Change Notices

Technical data packages will generally not include military specification or components specifications prepared by component manufacturers. Suppliers may obtain military specifications from the Document Automation and production Service (DAPS), https://quicksearch.dla.mil or similar web services.

2.3 *Procurement Package Requirements*

For each purchase order, the procurement package shall contain the following IAW PO Q clause Q1:

Purchase Order
Engineering Drawings
Specifications
Engineering change orders to drawing or specifications
Data items, subcontracted for by Palomar, e.g. Quality Test Plans, Qualification Test Reports, Conformance Test reports, Qualification Inspection Procedures, Acceptance Test Procedures.
Data Items, Letter of Approval
Palomar inspection procedure, if applicable
Palomar Source Inspection Report (Quality Assurance Supplier Record – QASR)
Palomar Letter(s) of Approval for other applicable 'Q' Purchase Order Attachments.
Process Drawings – Palomar drawing which specify specific process standards to be followed by the supplier
ECN – Engineering Change Notices-Incorporated Change notices
EO – Engineering Orders – Unincorporated Change Notices

3 General Requirements

3.1 *Point of Contact*

Palomar point of contact for all Supplier inquiries shall be the Buyer listed on the Purchase Order. Information from other Palomar personnel shall be used at the Supplier's risk.

3.2 *Palomar Drawing and Revision System*

Palomar document and drawing numbers normally consist of a 7-digit number and may have a 1 to 3 digit dash number added to the end to distinguish various similar assemblies from one another.
The associated parts list will contain the same part number as the associated assembly drawing and may be preceded by a 'PL'. This will be provided in Excel and pdf format.

Example of a part number and associated parts lists:

118XXXX-100
PL118XXXX-100

Associated electronic files to be used are listed on the front of the assembly, fabrication drawing, or associated parts list and shall direct the supplier to the correct file name and revision to be used. The electronic files may be identified as manufacturing data, and the part number may be preceded by 'MD' and followed with a dash number of "-601". MD files for the PCB will be provided in gerber or ODB++ format. MD files for the assembly will be in gerber format.

Example of a manufacturing data part number: MD118XXXX-601

3.3 *Changes*

Palomar uses an Engineering Change Notice (ECN) to change drawings, documents and contents of electronic files. The ECN will identify the change performed and the new revision of the drawing listed as well as the effectivity of the change. The effectivity is used to direct when the change is to be incorporated into the affected product.

Palomar uses Engineering Order (EO) to direct changes to drawings, documents and contents of electronic files where the change has not been incorporated into the drawing. The EO is considered 'hanging' and is part of the configuration of the item to be provided by the supplier. The EO will affect the drawings listed until it is incorporated into the drawing and the effectivity will direct when the change is to be incorporated into the affected product.

If the Supplier has a recommendation for process or product changes to specified requirements in the Palomar documentation, Seller shall generate and submit a change request in the seller's own format to the Buyer listed on the Purchase Order. No changes to Palomar requirements shall be made by Seller until approved by Palomar. ECNs and EOs will be provided in pdf format.

3.4 *Deviation and Waivers*

A Waiver documents a nonconformity to Palomar requirements after the nonconformity is discovered. A Deviation, documents anticipated nonconformity to Palomar requirements before the nonconformity is produced. Palomar is to be notified of any deviation or waiver required by the Supplier at any point while the Supplier is under contract. The notification shall be in writing and Palomar will respond with an approval or rejection. The Manufacturing Exemption Summary Sheet (MESS), when used, shall list any pre-approved Deviation or Waiver for each assembly. Additional documentation or approval for items listed on the MESS are not required.

3.5 *Serialization and labeling*

Each drawing will define the type of serialization required by the Supplier for traceability. The drawings may also list labeling to be performed. The serialization and labeling of the items may be under an exemption as listed on the MESS. Palomar will require the supplier to have a system in place to allow for lot and date tracking of assemblies for which the Supplier is under contract. It is recommended that the Seller identify each assembly with the Seller's unique tracking identifier (e.g. work order, internal serial number, or other number). Suggested marking processes are Mylar labels or permanent ink stamping. Identification shall be placed in an area not used for any other purpose. Marking process and location shall be approved by Palomar before use.

3.6 *Assembly and Parts Lists*

Palomar will deliver Parts lists (in excel format), identifying each part to a specific assembly. The parts listed on the Parts List are in Palomar part number format but there may be some part numbers which are direct manufacturer part numbers – such as military approved part numbers.

The associated manufacturers part numbers are provided in a second document identified as a Cross Reference Part List and is identified as CRPL. The CRPL will be provided in Excel format. The two parts lists are to be used together to properly identify the parts that are approved for each assembly.

3.7 *CCA Assembly Requirements*

3.7.1 Thermal Profile

The thermal profile for each assembly shall be documented and available upon request by Palomar Source. The thermal profile shall contain the graph of the profile, the number of zones, temperature and time, the date that the profile was acquired and the number of the assembly at a minimum. The thermal profile shall be provided for the following efforts.

1) FAI - Initial run verification (Required with every new Assembly Part number or new PCB part number)
2) Report with every shipment (The Profile shall be available if requested by Palomar for specific shipments)
3) Process Audit (The Profiles shall be available for Palomar maintenance audit, profile validation, as requested by Palomar)

3.7.2 General Assembly Requirements

All Circuit Card Assemblies shall comply with IPC-A-610, class 3 requirements. Gold removal shall be performed prior to assembly on those components which have this finish (commonly known as pre-tinning).

Supplier to provide Palomar with manufacturing/work instructions for each assembly under contract prior to start of build, for Palomar approval.

3.7.3 Repair

The Seller is not granted MRB authority. A repair makes an item useable; a rework makes an item conforming. A repair may be required when an item does not meet the current assembly characteristics as defined within the provided documentation. Any deviation from the current documented item is considered nonconforming and shall be reported to Palomar at each occurrence if the item cannot be reworked back to conformity. The Seller may generate an internal nonconformance document for purposes of documented information. Repair performed by the supplier shall be reported to Palomar prior to the time the effort is performed. All repairs shall require prior Palomar approval. If the repair is not done in house, the supplier shall ensure the subcontracted entity has been properly authorized to work on ITAR commodities. The repair will require Palomar approval to determine if the repair, when completed will meet the current material requirements. Refer to the Material Review Board (MRB) section for further information.

3.8 *Component Handling*

3.8.1 Precautions

All assemblies are ESD sensitive and shall be handled in accordance with IPC-A-610 section 3.

3.8.2 Moisture Sensitive Components

Palomar requires that all contract manufacturers have a documented process and records for the handling, storing, and processing of moisture sensitive components compliant to J-STD-033. The supplier shall ensure that component packaging properly lists the moisture sensitivity per J-STD-033.

3.8.3 Baking Requirements

All moisture sensitive components are to be baked prior to use.

3.9 *Inspection*

3.9.1 AOI requirements

Palomar AOI expectation, at a minimum, is 100% of all components, top and bottom on all finished assemblies. If any components cannot be verified by the AOI's the CM's need to inspect the specific components manually.

3.9.2 AOI Reports

AOI findings shall be documented and available to be presented at Source as requested. It is recommended that the AOI reports be evaluated to report failure trend analysis and corrective action based on auditable results that can be presented at Source.

3.9.3 Process Audits

The Supplier shall have a process in placed to ensure that following items are routinely audited:

1) Stencils
2) Profiles
3) Material
4) Testing

3.9.4 X-Ray

All BGA require 100% X-ray inspection.
All TH connectors to be verified for barrel fill per IPC J-STD-001, class 3 requirements.
Any component with solder connection that cannot be verified manually or by AOI will need X-ray inspection.

3.10 *Test*

3.10.1 Flying Probe Requirements

All finished assemblies are to be tested on ICT/flying probe to a 90% minimum coverage. For assemblies where this is not possible, the deviation/waiver will be noted in the associated technical documents or the purchase order.

3.10.2 Flying Probe Reports

The percent coverage and pass/fail reports shall be recorded for each assembly and available upon request for Source.

Design criteria used for the generation of the flying probe program, components tested, pass/fail limits for each component and special testing instructions (which include why certain components are not available to be tested) shall be made available upon request. If 100% pass yields on all testing over a six (6) month production period, reevaluation of the Flying Probe testing requirements can occur, as determined by Palomar.

3.11 *Material*

3.11.1 Procurement

Material Control

Palomar Products directs, authorizes and approves all material purchases for turnkey operations. Palomar will provide a cross-reference parts list (CRPL) which lists all approved manufacturers and associated manufacturer's part numbers (See 3.2.7, Assembly and Parts Lists). Only those items listed are authorized for use. Any deviation from this list requires the prior approval of Palomar before the material is purchased.

Material Availability Monitoring

The Contract Manufacturer will be the purchasing agent for all turnkey operations and will be responsible for monitoring the health of the material required to fabricate the assemblies. Palomar is to be notified by the Seller of any End-Of-Life notification, Obsolescence Notification, Last-Time-buy notification, or any other event which can place the current assembly at risk. Palomar shall be notified in writing within 1 business week upon receipt of the notification and a copy of the notification shall be delivered to Palomar. Seller shall have a formal, documented notification system in place.

3.11.2 Excess Material

Material in excess of minimum buy shall be processed in accordance with General Quality Assurance Notes of the PO Requirements and Q Clause Procedure (QMS-PRO-99-40).

3.11.3 Costed BOM

Due to Truth in Negotiations Act (TINA) requirements, PPI requires a costed BOM showing the PPI part number, the supplier's part number, and the current item cost for each RFQ or new order. Cost variation for any item of 10% or more shall be reported to Palomar before procurement is initiated.

3.12 *Initial Builds*

A manufacturing readiness review prior to initial build is recommended but not required, at the discretion of the supplier.

For all first-time builds, the supplier is required to provide three (3) parts to Palomar Engineering for testing before production parts can be shipped. Once testing is completed and found acceptable, production parts can ship. For parts that do not pass tests, the supplier shall make the necessary corrections and resubmit new samples for testing. Only upon successful testing will product be allowed to ship.

Verification testing is only done once. Once the part has completed testing and approved, all subsequent builds need not be tested.

4 Quality

4.1 *Supplier Quality Management System*

Supplier Quality Management System shall be certified to the latest revision of AS9100 or ISO-9001.

4.2 *Documents Required with Shipment*

- Certificate of Conformance (CoC)
- Final QC report (Vendor document identifying the final QC activities and the results of those activities; i.e.: Visual for damage, 35 inspected 35 passed, etc.)
- The following documents are summaries and only apply to First Article shipments:
    - AOI report
    - FP report
    - X-ray report
    - CT scans

4.3 *Shipping/Packaging*

Items shipped to Palomar shall be wrapped in material conforming to MIL-PRF-81705, Type I or Type III. Lead or terminal configurations for all items shall be maintained as manufactured without causing loads or stresses capable of causing damage to the item. Materials used to maintain item position and lead or terminal configuration, shall permit item removal without damage to the item. Electrostatic discharge (ESD) sensitive caution labels shall be applied in accordance with MIL-STD-129. Each CCA shall be individually wrapped and packaged in a way to prevent contact with other CCAs in the shipping package. The external package shall prevent damage to the parts to the final destination.

4.4 *MRB*

Supplier shall document nonconforming material by means of a Material Review Board (MRB) or equivalent. Palomar is the design authority and shall determine the disposition of the nonconforming material which may include scrap, repair, rework, use-as-is prior to receipt of material and requires advance approval from Palomar. Items that can be returned to full compliance with all Palomar requirements may be reworked by Seller without prior Palomar approval.

4.5 ***Process Validation*** *(BGA/FPGA specific)*

It is required that the supplier perform process validation to ensure the temperature profile will yield proper wetting of all BGA/FPGA components. The supplier is required to perform CT scans of all BGA/FPGA components as part of the first article/process validation. This is required on the first initial build. If the scans show poor/non-wetting, the supplier will take corrective action (C/A) and validate those actions are effective by repeating the CT scans after C/A implementation. The results of the scans will be provided as part of the First Article Inspection Report. If the scans show proper wetting, then the process is validated for all current and future builds.