PHILLIPS
AEROSPACE DIVISION
MACHINE & WELD DIVISION

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
Phillips Company History

- Phillips Machine & Welding Company, Inc. (Phillips) was established in 1971 and has been in continuous operations since that time.
- Phillips added the Aerospace electronics division in 1997; focused on complete solutions for our customers, including mechanical, electronic and software design.
- The charter of the Phillips is broad scope engineering and manufacturing for hire by our customers.
- Phillips has become experienced through completion of a wide range of projects, including launch systems, satellites, and aircraft.
• Phillips is a privately held California Corporation, owned and operated exclusively by its key executive management shareholders.

• Project managers are specifically assigned to each project on a case by case basis during the proposal phase.

• Project managers organize Integrated Product Teams (IPTs) at the internal kickoff phase.

• We are currently AS9100 certified as of February 2009
Phillips Aerospace, Industry CA

- Phillips operates from this facility:
  - Industry, CA: 26,000 sq-ft
Equipment & Tools

• **Design Tools**
  – Mentor Boardstation, OrCAD, PCAD,
  – AutoCAD / Inventor
  – MaxPlus, Quartus, Synplicity, ModelSim FPGA

• **Software Development**
  – Visual Studio, QNX, VxWorks
  – LabView, LabWindows CVI
  – PowerPC, Windows, Solaris, Unix, Linux, RTEMS

• **Assembly**
  – J-STD-001 Soldering Certified Personnel
  – Board Inspection to IPC-601
  – Ground and flight hardware assembly
  – Circuit card assembly and inspection lab
  – Mechanical assembly / integration work cell
  – Cable and harness assembly work cell

• **Test Lab**
  – Digital / Analog / RF Manual & ATE
  – Thermal Cycle Chamber
  – 170 hp Dynamometer
Equipment & Tools

• Machining
  – HAAS VF-2, VF-3, VF-4
  – Dynapath CNC Knee Mills
  – Bridgeport Series 1 Mills
  – Moriseiki Lathes with 24" and 17" swing
  – Cincinnati #3 Horizontal Mill
  – Clausing -4 spindle- varispeed with table
  – Cevalier model Surface Grinder

• Weld Shop
  – Accupress Press Brake -1/4 -10 ft -130 ton
  – W.F. Wells saw W-9 Series 1
  – Miller 300 AC/DC (TIG welder)
  – Lincoln RSA 400 welders (MIG)
  – Lincoln Gen model welders (ARC)

• Wire & Cable
  – Spectrum Technologies Capri Laser Marking System
  – New England Cable Braider (32 Carrier)
  – Pneumatic Lugger
  – Termination and Crimping Tools
Development Capabilities

- **Circuit Card Design and Manufacture**
  - Design from requirements or partial design, build-to-print services
  - Layout & route from schematics / netlist, customer requirements
  - FPGA design, coding, simulation / verification
  - Embedded software development
  - Inspection to design files and specifications
  - Full functional & parametric testing

- **Capabilities**
  - Differential pairs & controlled impedance
  - Matched length traces, trace guarding
  - Multilayer (successful designs to 26 layers)
  - Analog & digital designs
  - RF (>6 GHz)
  - Column Grid Array, Micro-Ball Grid Array
  - Ultra high-speed digital designs (3.5 GHz)
  - Flex circuits
  - Design for flight and space
Development Capabilities

- **Custom Test Devices**
  - Rackmount test & control equipment
  - Production ATP systems
  - Fault-simulation systems
  - Development test systems
  - Analog, digital, RF, power
  - Telemetry simulation
  - Instrument simulation / emulation
  - Sensor emulation & monitoring
  - Recording / monitoring equipment
  - Control panels
  - Power load simulation
  - Portable and fixed launch site test and control
Development Capabilities

• Manufacturing
  – Mechanical assembly & fabrication
  – Enclosures, chassis, frames, brackets
  – Integrated electro-mechanical sub-assemblies
  – Cable & harness assembly
  – Rack integration and wiring
  – Machining of complex parts and weldments
  – Aircraft prototypes
  – Aircraft ground support equipment
  – Certified welding MIL-STD-2219
Development Capabilities

- **Software**
  - Turnkey custom graphical user interface tools
  - Control, simulation, and monitoring Systems
  - Dynamic & real-time simulation & data acquisition
  - Automated test controllers, script-based, sequencer-based, reporting tools
  - Embedded development
  - Driver development
  - Windows, VxWorks, Neutrino, Unix, Linux.
  - ISA, MB, VME, VXI, cPCI, PMC, PXI bus architectures.
Development Capabilities

• General Areas of Expertise and Capability
  – Hi-rel command and control design
  – Space telemetry & command protocols
  – Instrument bus emulation & control
  – Sensor simulation and control (sun sensor, imager, sounder, etc.)
  – EED (squib) firing control and test
  – Payload services, T&C
  – Stepper & servo motor control and load simulation
  – Analog data acquisition (>3.5GSa/sec)
  – Experienced with many hi-rel space rated components (ASICs, CPUs, memory, CPLD, etc.)
  – EMC/EMI and environmental design and testing methods (MIL-STD-461, MIL-STD-810)
Cable and Unit Production Work-Cells
CCA Production Work-Cells
Machining & Tooling Area
Machining & Tooling Area
Welding & Assembly Area
Circuit Card Gallery

MILSATCOM Communication Controller (PowerPC VME / CPCI)

MILSATCOM Computer (PowerPC / CPCI)

CHIPSat Flight Control Computer (PowerPC / CPCI)

JUNO Communications Controller (Triple PowerPC / CPCI)

DELTA IV Solid State Relay Control Board

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
Circuit Card Gallery

ESPE
(PowerPC VME / CPCI)

GOES EACE
(MIL-STD-1750 / VME)

JUNO Emulio3
(PowerPC / 13 FPGAs / CPCI)

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
Test and Simulation Gallery

- Delta IV Avionics Simulator
- ODIN
  Magnetic Torquer Production Tester
- MILSATCOM
  Flight Test Production Tester
- Delta IV
  Hydraulics Test System
- Spaceway
  Production Tester
- MCP
  Hardware in the Loop Simulator
- Delta IV RF Test Systems

Institutes trade secrets and / or information that is commercial or financial and confidential or privileged to Phillips Aerospace
Test and Simulation Gallery

Spaceway Satellite RF Switch Control Production Tester

Wideband Gapfiller Satellite Payload Services Unit Tester

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace
Sub-Assembly Design & Fab

Delta IV MILSPEC Squib Firing Control System

PANAMSAT CORTEX Telemetry Buffer Unit

MCP Thruster Load Simulator

Airborne Laser (ABL) MILSPEC Ethernet / ATM Switch

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
Sub-Assembly Design & Fab

KG75 Encryption Unit Controller

18 GHz RF Switch Matrix

Watering Control Unit

Military Grade Handheld Terminal

Electro-Mechanical Assemblies

Inductive / Resistive Load Simulator

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace
Package Design, Wiring & Assy

High Power Dense CCA & Wiring Designs

RF and Fiber Optic

Mass Wiring

This document constitutes trade secrets and / or information that is commercial or financial and confidential or privileged to Phillips Aerospace
Package Design, Wiring & Assy

Military EMI / Thermo-Vac Cable Assembly

Panel and Unit Wiring

Interface Test Adapters
C130 Gunship Control Console

Shuttle Ground Support Equipment

Artillery Flash Suppressors

AT2FTS Collimator Housing

Pegasus Rocket Cradle

Aircraft Window Frame

F-18 Laser Pod Shroud

Calibration Fixture

HERA Missile Fin

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
GPS S-Band STE RF Sub-Assembly
GPS IIF Frequency Synthesizer Distribution Unit
GPS IIF FSDU Receiver
Augusta Satellite Gimbal Drive Electronics Tester

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
ISP Satellite Support Slice Tester
X47A HITL Breakout Box
X47A HITL Breakout Box
X47A HITL Double Depth Double Height VXI Chassis
X47A HITL ICX VXI Cards
ICX Real-Time Simulation Cards
X47A HITL Fuel Probe Simulator
Ground Midcourse Defense
Launch Control Rack
B1B Flight Utility Power Distribution Panel
Mobile Launch Control Vehicle
Test Unit

This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace
Mobile Launch Control Vehicle Test Unit
Mobile Launch Control Vehicle Test Unit
C130 Airborne Tactical Laser Weapons Control System
B1B Instrument Panel
B1B Instrument Panel
Satellite Payload Services Unit Emulator
Satellite IRAD RF Front End
Circuit Card
Ruggedized Conductively Cooled PowerPC Computer
Ruggedized Conductively Cooled PowerPC Computer
Satellite Payload Services Unit Emulator
PXI Servo Motor Test Card
PXI Linear Variable Displacement Transducer Test Card
3.5 GS/Sec Data Acquisition Card
3.5 GS/Sec Data Acquisition Card
CHIPSat
Flight Control Computer
Custom Avionics Backplane
Custom Avionics Backplane I/O Adapter Interface
Battery Discharge Test Box
ATM / gBE Network Switch for Airborne Laser
Data Acquisition Controller for Airborne Laser
Laser Executive Controller for Airborne Laser
This document constitutes trade secrets and/or information that is commercial or financial and confidential or privileged to Phillips Aerospace.
B1B Relay Panel
C17 Control Harness Cables
Satellite Valve Test Box Cables
Conclusion

• Whether your needs are commercial, military, or space, Phillips can assist in the development process.
• Our team has an extensive experience in the design, manufacture, and test procedures for a wide range of applications and targets.
• Based on your needs, Phillips can provide estimates for cost and schedule that are firm fixed price, giving you total control over the project cycle.