GE Aerospace
Electrical Engineering Task 1

Design Your Power Distribution

To design your power distribution system in PowerPoint, consider the following guidelines on how to use shapes to represent different components:

Lines and Arrows: Use these to depict electrical connections between components. For example, a solid line could represent primary power connections, while a dashed line might indicate secondary or backup connections.

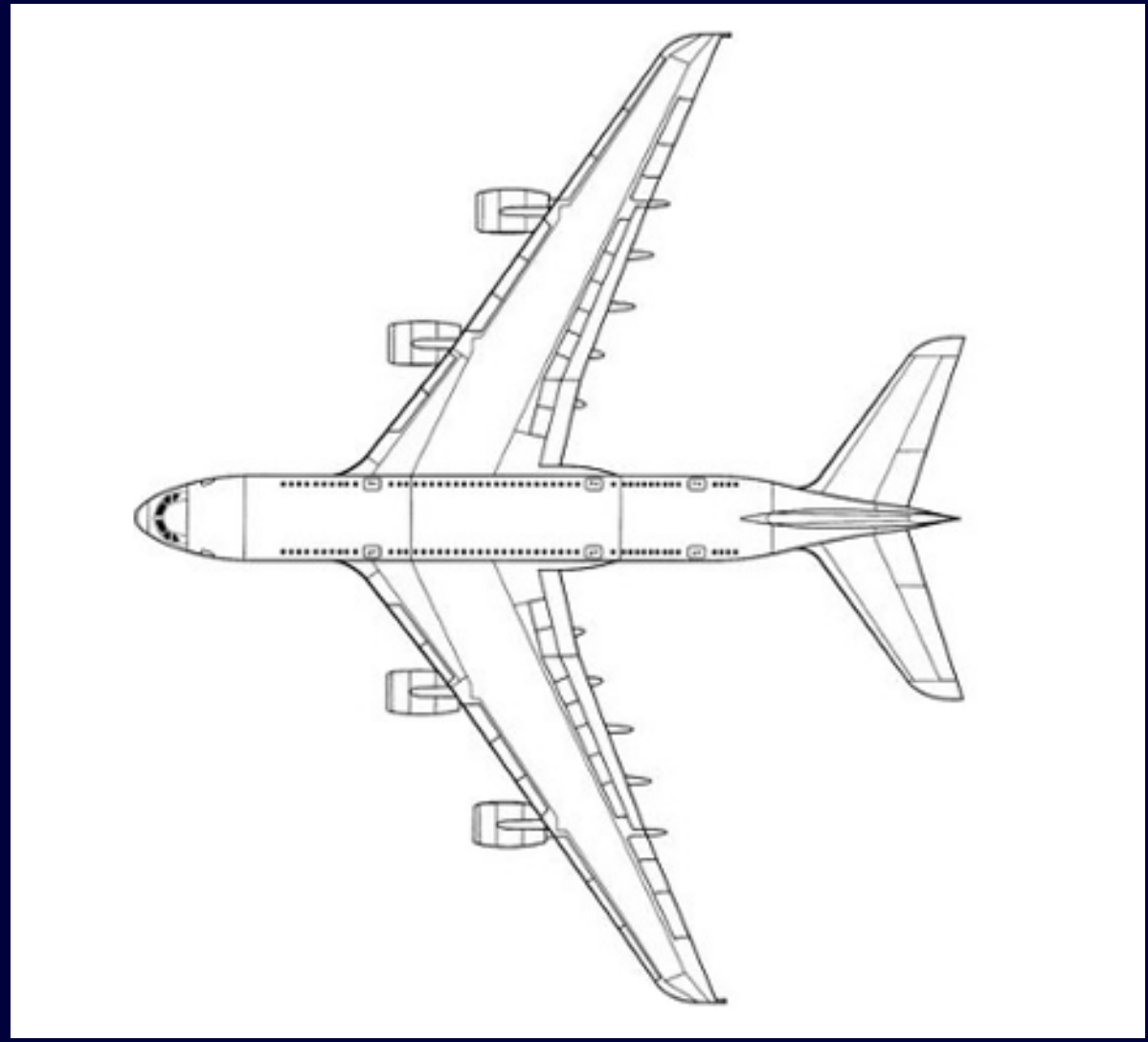
Rectangles and Squares: Ideal for representing distribution panels and circuit breakers. You can use labels or different colors to differentiate between primary and secondary panels.

Circles or Ellipses: These could symbolize generators or other power sources. Position them at the beginning of your power flow diagram to indicate where the power originates. Engine 1 generator, engine 4 generator, and the main battery are common power sources, shown on the following diagram.

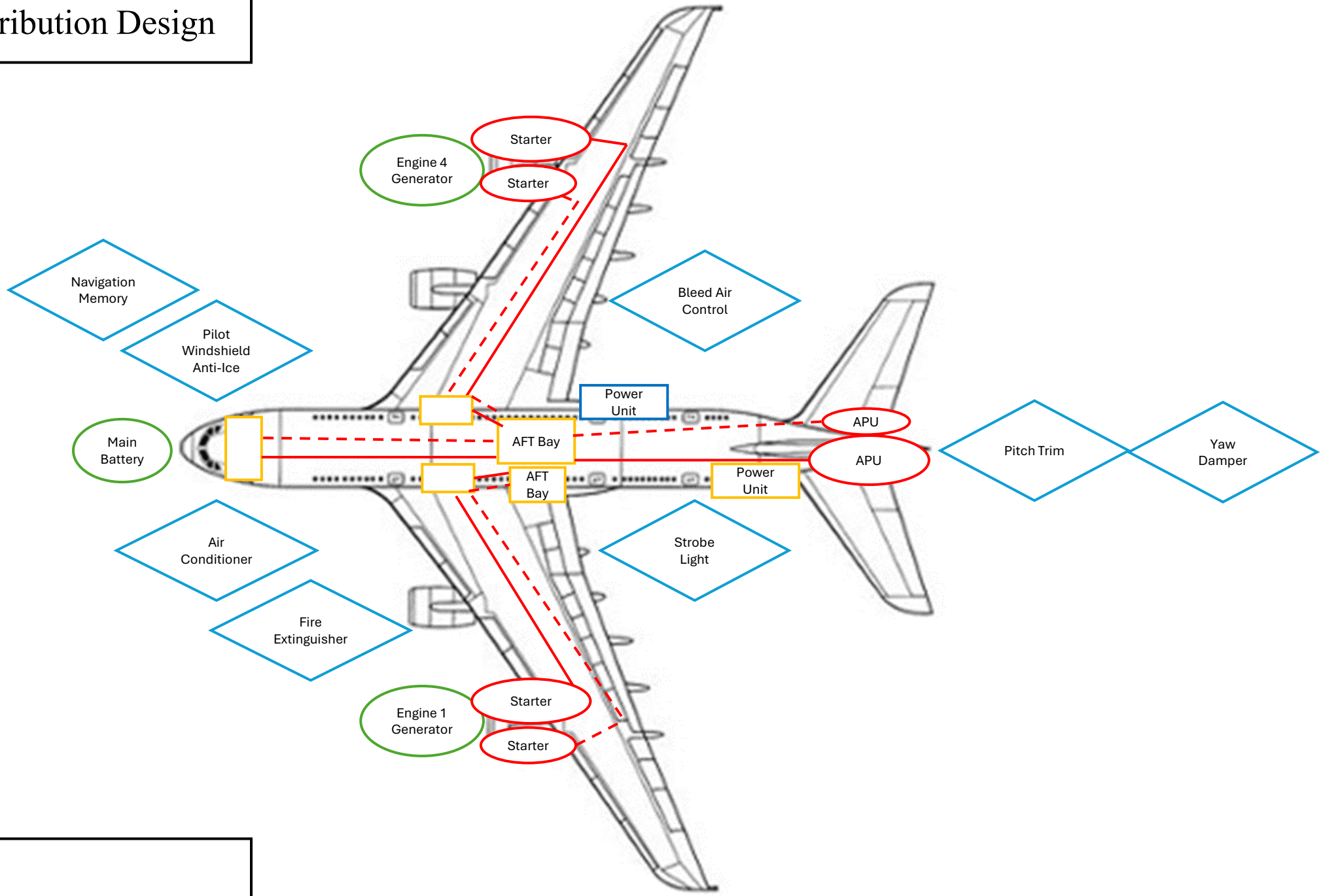
Triangles or Diamonds: Use these shapes to denote electrical and avionics systems that require reliable power from the distribution panels. Common systems are shown on the following diagram.

Remember, each shape's size, color, and placement should help clarify the system's layout and operation, making it intuitive for someone else to understand your design rationale.

Use the aircraft diagram on the next slide to design your power distribution system.



My Power Distribution Design



Design Rationale

Aerospace Standards

- Follows **FAA AC 43.13**
- Circuit breakers selected per **MIL-C-55629** and **MIL-STD-975** for aerospace-grade reliability.
- Complies with **RTCA DO-160** (Environmental Conditions and Test Procedures).

Safety Considerations

- **Redundancy**: Dual power paths for essential systems ensure no single point of failure.
- **Manual Override**: Crew can manually trip or reset breakers for troubleshooting.
- **Segregation**: Electrical wiring for primary and emergency systems routed separately to minimize cross-impact from failures.

Efficiency and Modularity

- **Digital Monitoring**: Real-time current and voltage monitoring to detect faults early.
- **Load Shedding Strategy**: Automatically disconnects non-essential loads during power loss.

Verification Procedure Outline

Test	Purpose	Method	Expected Result
Thermal Stress Test	Simulate high operating temps (up to 70°C)	Place system in thermal chamber, power on at full load	No tripping of essential breakers, no component degradation
Humidity Test	Ensure moisture resistance (up to 95% RH)	Expose panels to high-humidity environment	No arcing, insulation integrity maintained
Vibration Test	Simulate in-flight and landing shocks	Mount on vibration platform (per DO-160)	No loose connectors, no intermittent faults
Overload Protection Test	Validate circuit breaker trip times	Inject overload currents gradually	Breakers trip within rated limits
Emergency Mode Test	Confirm power to emergency bus	Disconnect main and APU power	Battery or RAT maintains essential functions