

INTRODUCTION

VARIABLE FREQUENCY POWER GENERATION SYSTEM

The Global Express utilizes an AC power generation system based on Variable Frequency Generators (VFG). The use of variable frequency power engenders several advantages including:

- An increased efficiency of 80% compared with fixed frequency systems where efficiency is in the order of 65%
- Ease of voltage conversion
- Reduction in system weight due to lighter alternator and distribution cables; and
- Increased reliability due in large part to the eradication of Integrated Drive Generators (IDGs)

GENERAL

The airplane AC electrical power generation and distribution system (EPGDS) consists of four 40 kVA, engine-driven, variable frequency generators (VFG), and one constant frequency 40 kVA APU generator. Control and protection of the generators is provided by five identical generator control units (GCU). Distribution systems furnish power to the following buses, through the AC power center (ACPC) and the cockpit circuit breaker panel (CCBP).

- AC bus 1, 2, 3, 4 (ACPC)
- AC bus 1A, 2A, 3A, essential (CCBP)

A ram air turbine (RAT), deployable during flight, supplies 115-volt, 400-Hz, 3-phase AC power 9 kVA for emergency use (when all other AC sources have been lost) to supply AC power to the AC essential bus. Mounted on the RAT is a hydraulic pump which powers hydraulic system No. 3.

For other load devices requiring DC power, 115-volt AC power is converted to 28-volt DC power by four 150 Amp transformer-rectifier units (TRU). 28-volt DC power is distributed through the DC power center (DCPC) and the secondary power distribution assemblies (SPDA) onto the following buses:

- DC bus 1 and 2
- DC essential bus
- Battery bus
- DC emergency bus

The 25-ampere-hour, 24-volt DC avionics battery provides power to the following:

- Stored energy to selected electronic equipment during normal ground operations
- During flight in an emergency (loss of all generators) to the flight essential DC loads

