WHAT AVIATION MEANS TO YOU

AVIATION PROVIDES
favorable balance of trade
U.S.A.

AVIATION PROVIDES
transportation

Research - 20,000
Airline Operations - 450,000
Manufacturing - 750,000
Support (Butcher, Baker, etc.) - 2,500,000 jobs

GLOBAL
TRANSCONTINENTAL
REGIONAL
LOCAL
ENERGY EFFICIENT AIRCRAFT

KEEPING AMERICA'S LEADERSHIP THROUGH ADVANCES IN

light composite structure

aerodynamics

computer operated active control surfaces

50% FUEL SAVINGS
Energy Conversion Alternatives Study

A Department of Energy-sponsored study managed by the Lewis Research Center to recommend the most efficient conversion of coal into electricity.

Energy Resources: Identified fossil fuels in the United States
- 1.3% natural gas
- 4.7% petroleum
- Coal

Percentage of identified resources

Conventional Steam Power Plant

Efficiency - 33%
Coal is burned in a boiler to make steam to turn a turbine to generate electricity.
Heating & Cooling of Buildings
DEPARTMENT OF ENERGY - NASA JOINT PROJECT
Combined Cycle
Gas Turbine and Steam

POTENTIAL EFFICIENCY 45 - 50%
GENERATING ELECTRICITY BY COMBINING GAS TURBINE & STEAM POWER PLANTS.

Combined Cycle
MHD and Steam

POTENTIAL EFFICIENCY 50 - 60%
MAGNETO - HYDRO - DYNAMICS. GENERATING ELECTRICITY FROM HIGH-SPEED GAS FLOW THROUGH A MAGNETIC FIELD.
Fuel Conserving Engines

Gas Turbine
THE ERDA-CHRYSLER AUTOMOTIVE GAS TURBINE

Technological Goals

COMBUSTION
STEADY, UNIFORM TEMPERATURE GAS PRODUCTION; MINIMUM HEAT LOSS AND POLLUTION

MATERIALS
HIGH STRENGTH PROPERTIES AT HIGH TEMPERATURE

HEAT TRANSFER
MAXIMUM RECOVERY AND UTILIZATION OF HEAT GENERATED

BEARINGS AND SEALS
LUBRICATION OF HOT BEARINGS AT HIGH ROTATIONAL SPEEDS; SEALING OF LUBRICATING FLUIDS

POWER TRANSMISSION
VARIABLE SPEED DRIVE FOR A RANGE OF SPEEDS AND LOADS
The Planet Mars

Two Voyagers will examine Jupiter, Saturn, several of their moons, and the space around them. One Voyager may possibly provide the first spacecraft observation of Uranus and Neptune.

Because these planets developed more slowly than those closer to the sun, they present an opportunity to study different stages in the development of the solar system.

The outer belt of solar bodies lies beyond the orbit of Mars. Many scientists believe that this belt of particles may be the core of a ninth planet which may have been captured by Jupiter after its formation.