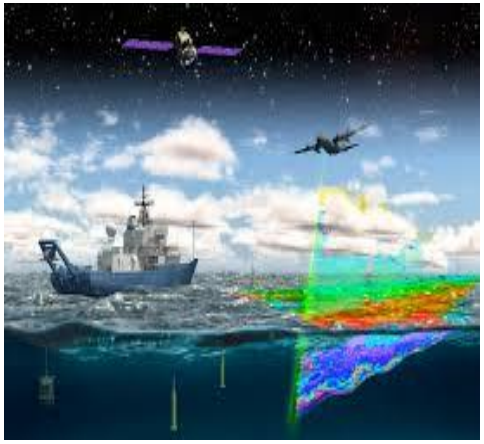
SCIENCE AND TECHNOLOGY DEVELOPMENT (KNOWLEDGE/INTRODUCTION)



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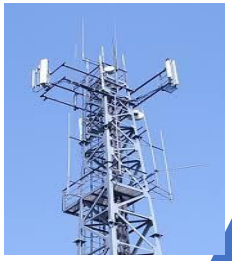
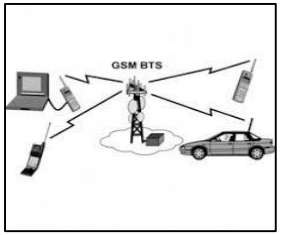
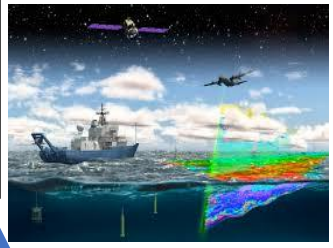
Telkom University

Electrical Engineering





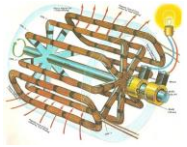


Information And Telecommunications System

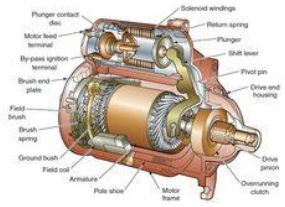
Eletronic Analog & Digital

Electrical Engineering

(Electromagnetic /Physics; Electric Circuit)

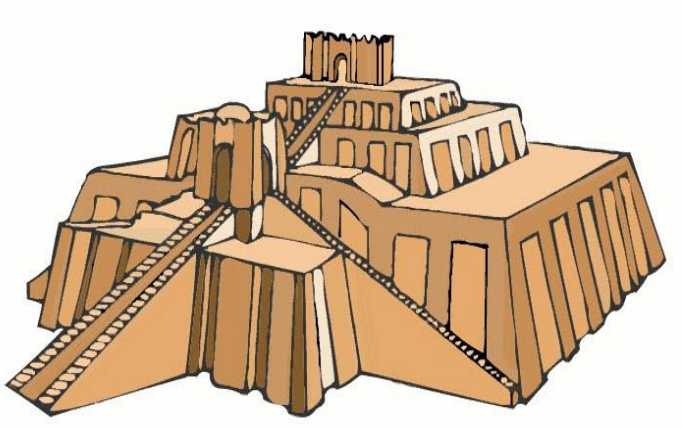


Electrical Energy System



Control System

Basic Technology or Engineering Development



This picture, shows the era of engineering, applying the logic of Physics, Statics / Mechanics.

The building must have a resultant perpendicular to the surface of the earth.

If the building has a resultant not perpendicular to the surface of the earth, then it is easy to collapse. Because of what ... ? from that example:

- Which part is the development of Physical Science ... ?, (Mathematical Formula ...?)
- Which part is Technology Development (Civil) ....?

Image: resultant model of a building structure.

Engineering or Technology

Engineering/Technology

Electric/Electronic Engineering/Telecommunications

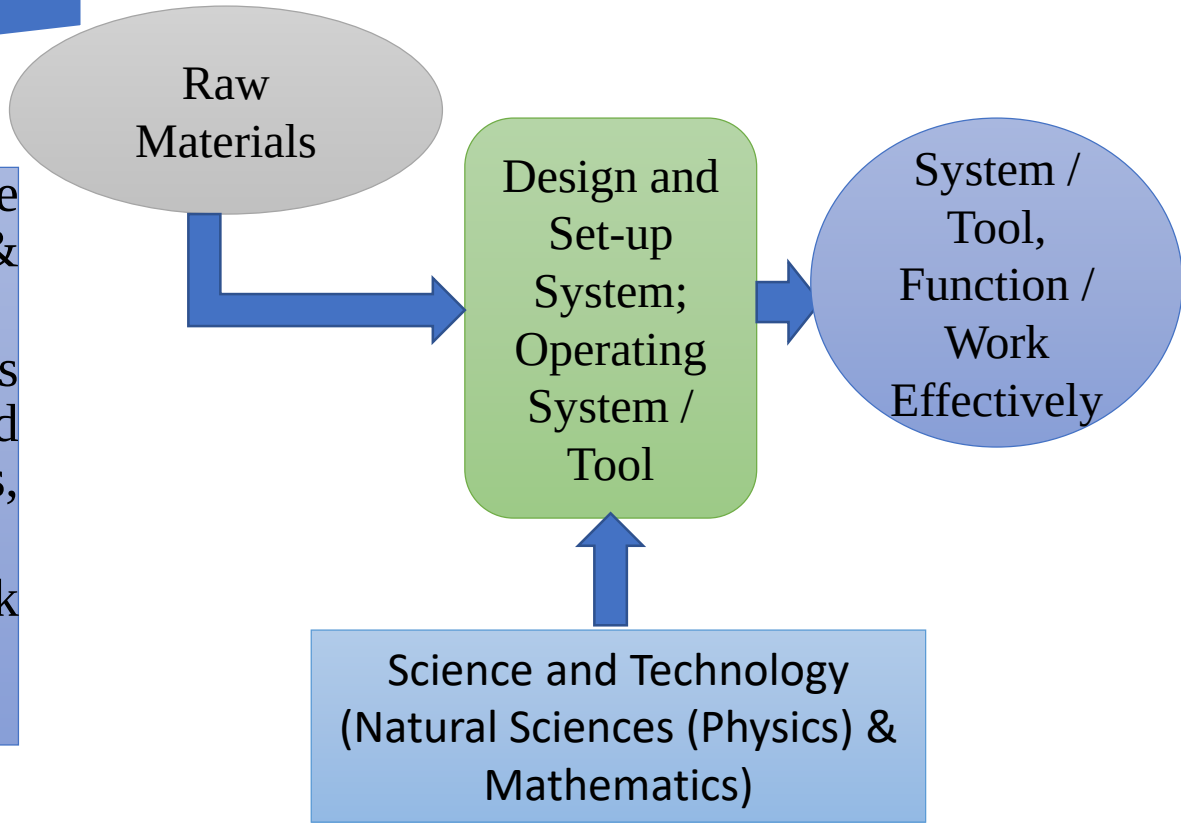
Electrical/Electronic

Engineering

Engineering (According to the Dictionary)

Engineering is:

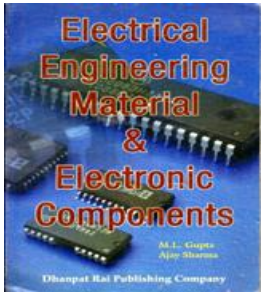
- The application of the principles of science & technology.
- In implementation (such as design, construction, and operation of frameworks, equipment, and systems).
- To get an effective work system.

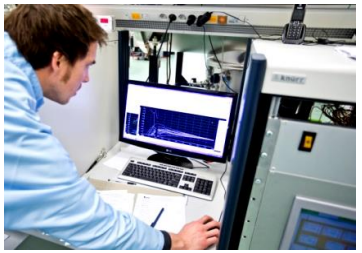


NOT

Bad plans or conspiracy to harm others parties, etc.

Engineering 2



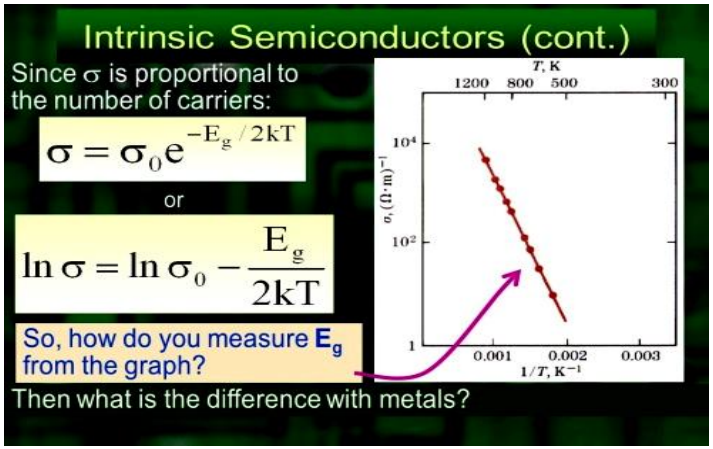


Raw Materials

Design and Set-up System; Operating System / Tool

System / Tool, Function / Work Effectively

Science and Technology (Natural Sciences (Physics) & Mathematics)

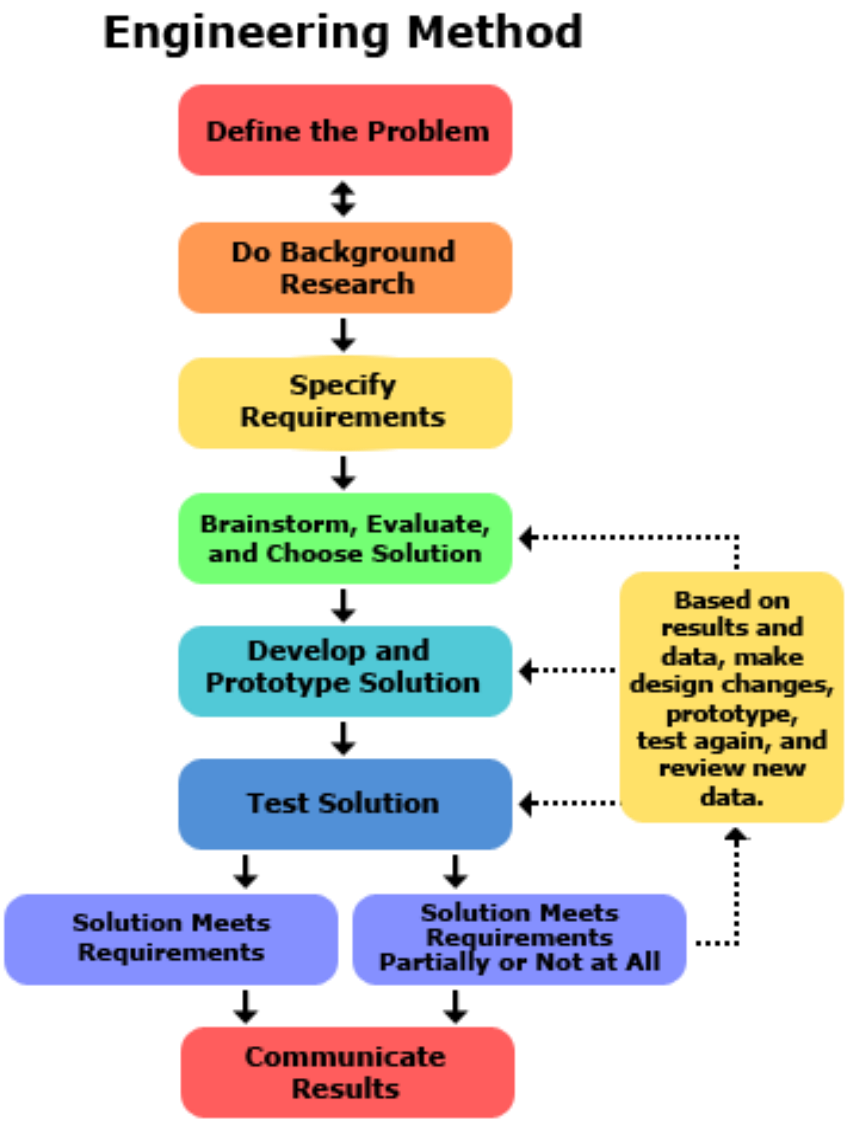


Engineering Branch

ENGINEERING/ TECHNOLOGY

- Electrical and Telecommunications Engineering
- Computer Engineering
- etc
- Biotechnology
- Mechanical Engineering
- Agricultural Engineering
- Industrial Engineering
- Material Engineering
- Mining Geology Engineering
- Marine Engineering
- Civil Engineering
- Architectural Engineering

The Flow of Concepts Science Vs Technology Development



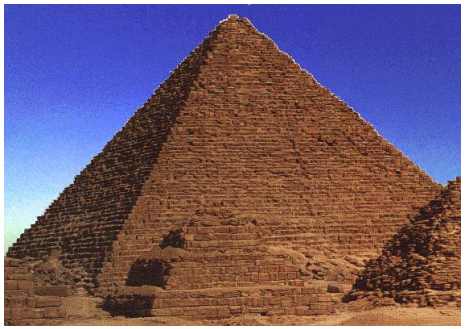
Engineering History

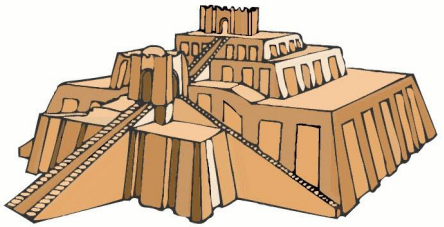
- Engineering at the Beginning of Civilization
- National Contribution of Greek and Roman
- Engineering in the Middle Ages
- Progress in Science : 1300 – 1750 AD
- Engineering in the 20th Century
- Etc ...

Engineering at the Beginning of Civilization

Mesopotamia People

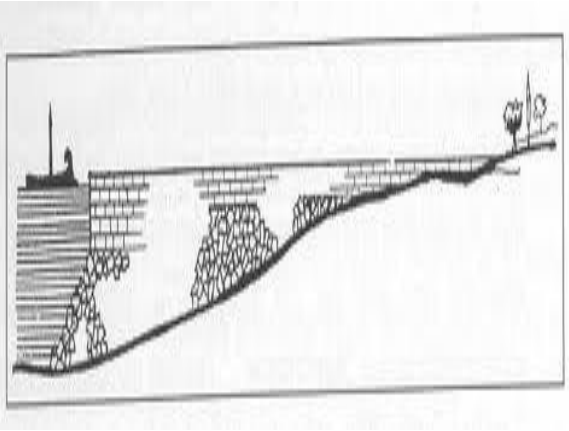
- The Egyptian Nation



National Contribution of Greek and Roman

- Greeks People (Mole)



Romans People (Circus Maximus)

KPST, 2020

Engineering

- Engineering is the application of technical and scientific knowledge to the profession.
- People who implement engineering is called Engineer.
- An Engineer must be concerned with:
  - Economic development and finding solutions to practical problems
  - Application of Engineering / Technology and science to the profession of work.

Roman People (Pantheon)

Engineering in the Middle Ages

- Not much progress has been made, there is one important development that occurred in this period, namely in the design of structures and in the development of machinery and equipment energy saving and power addition
- Mechanical findings in the form of spinning wheels and hinged rudder for ships
- Using the title engineer for the first time, the words "engine" and "ingenious" come from the Latin word "in general", which means "to create". So the people who invent or design machines or similar inventions are known as inventors or "engines-er"

Progress in Science : 1300 – 1750 AD

- Progress in transportation and communication
- Johann Gutenberg was the inventor of the movable print and was named as the person who printed the first book around 1450
- Thomas Newcomen invented one of the first steam engines in 1712, his creative steam engine, which uses air pressure, was used to pump water from mines in England for nearly 75 years before being replaced by the more efficient James Watt steam engine.

Engineering in the 20th Century

- The invention of aircraft
- Car invention
- Construction of tall buildings and skyscrapers
- Dam Construction
- Use of nuclear power
- The most rapid progress is perhaps the most striking in the electronics field
- Computer
- Internet (IoT)

Complex Problems

Efforts to find, to develop and to utilize alternative energy sources to replace coal and petroleum is running low

Efforts to develop some methods to maintain and to repair the public facilities that sooner or later will get defective

Further efforts to bring forward the microcomputer technology and apply them widely

Efforts to develop technologies that can increase agricultural products due to the increasing world population and famine

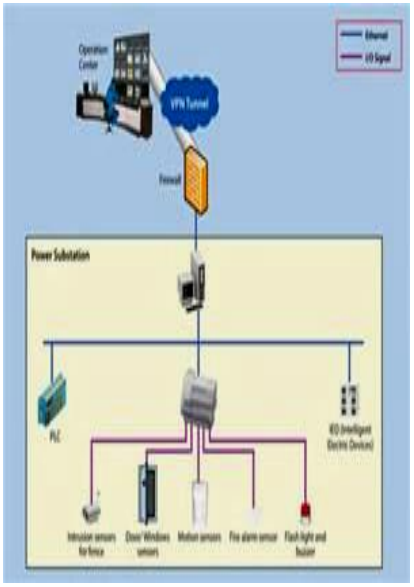
Efforts to find earthquak proof building designs and other types of natural disasters

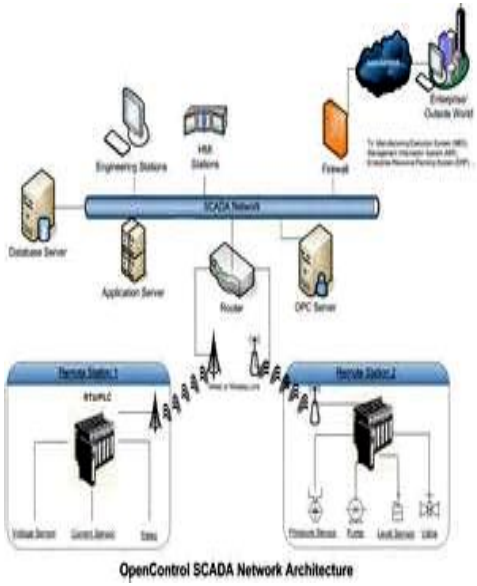
Efforts to find better methods to handle hazardous waste including radioactive waste generated from the production process to obtain nuclear energy

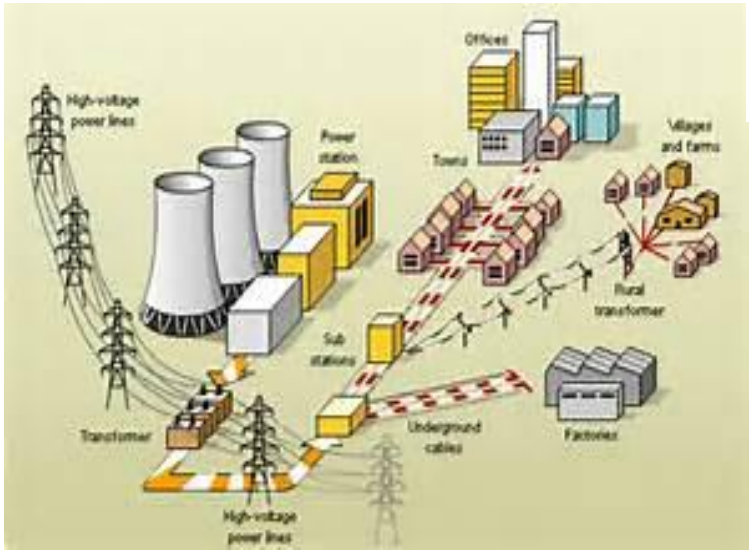
Space exploration efforts and the efforts to find implementation of space research for both military and peaceful purposes

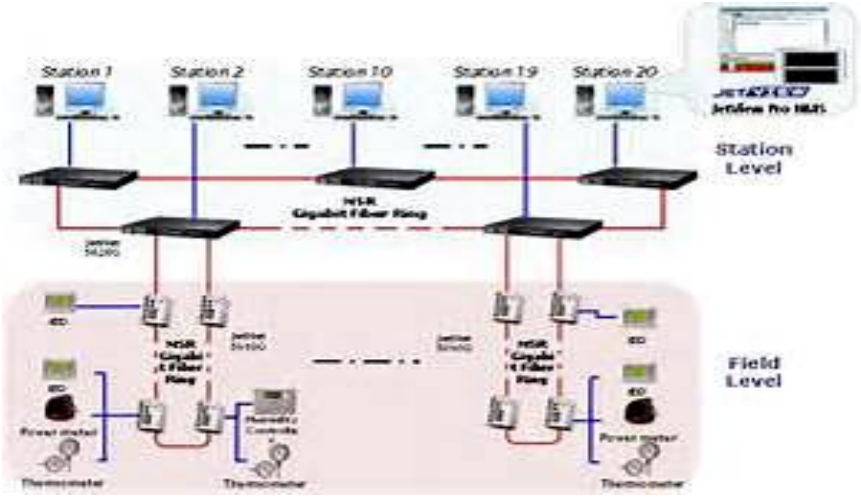
SCADA of Distribution Power System Control

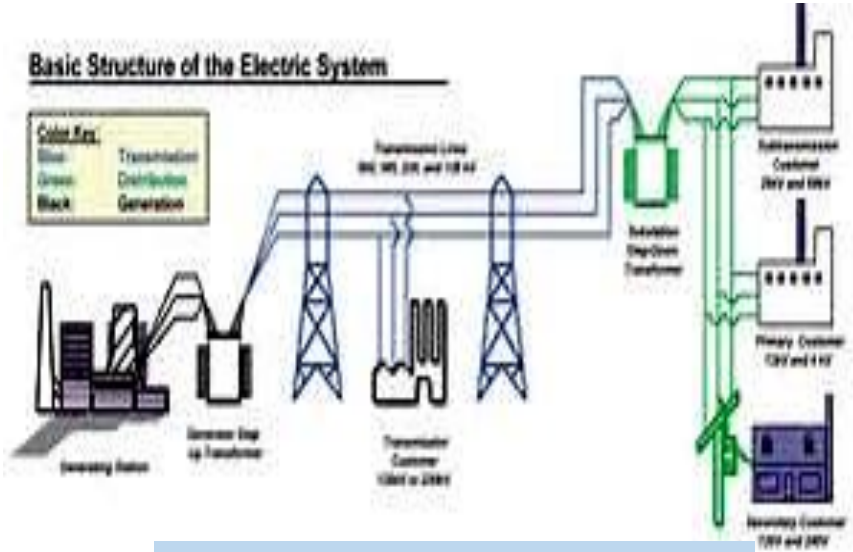
Electric Power System







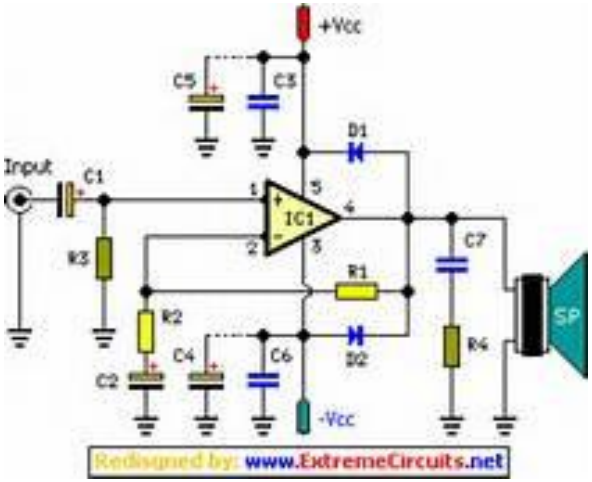


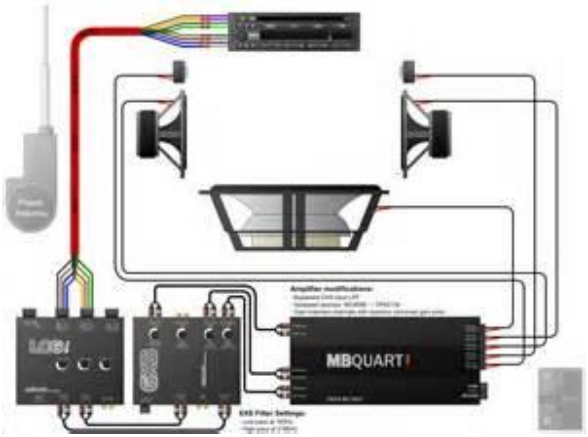


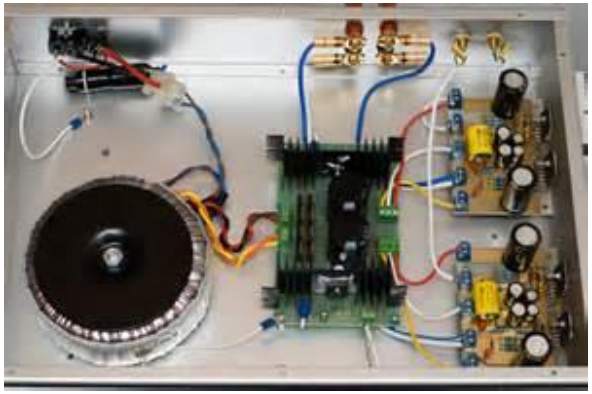
Distributed Control Power System Plant

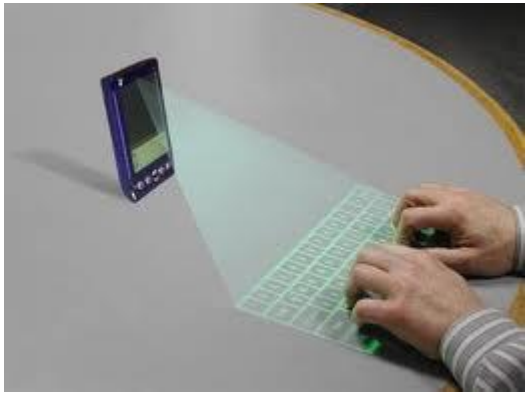
Basic Electric Power System

Audio Power System Amplifier Diagram







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It's a sunny day.
Good morning
27
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Meeting with Min
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Transition