



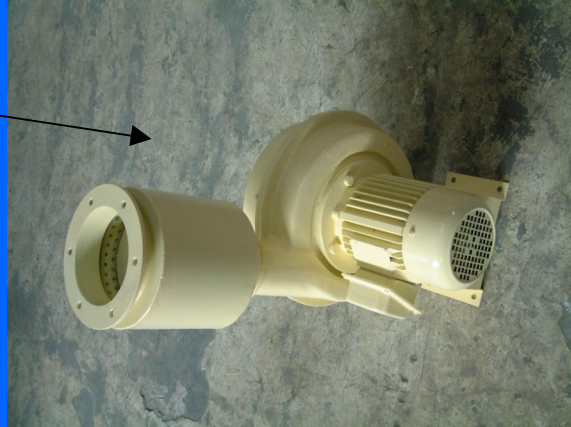
What is a Vibration System?

The following components constitute a turnkey Shaker System

Power Amplifier



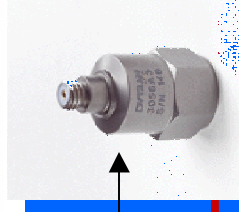
**Cooling Blower
(or water supply)**



**Electro-Dynamic
Exciter (Shaker)**



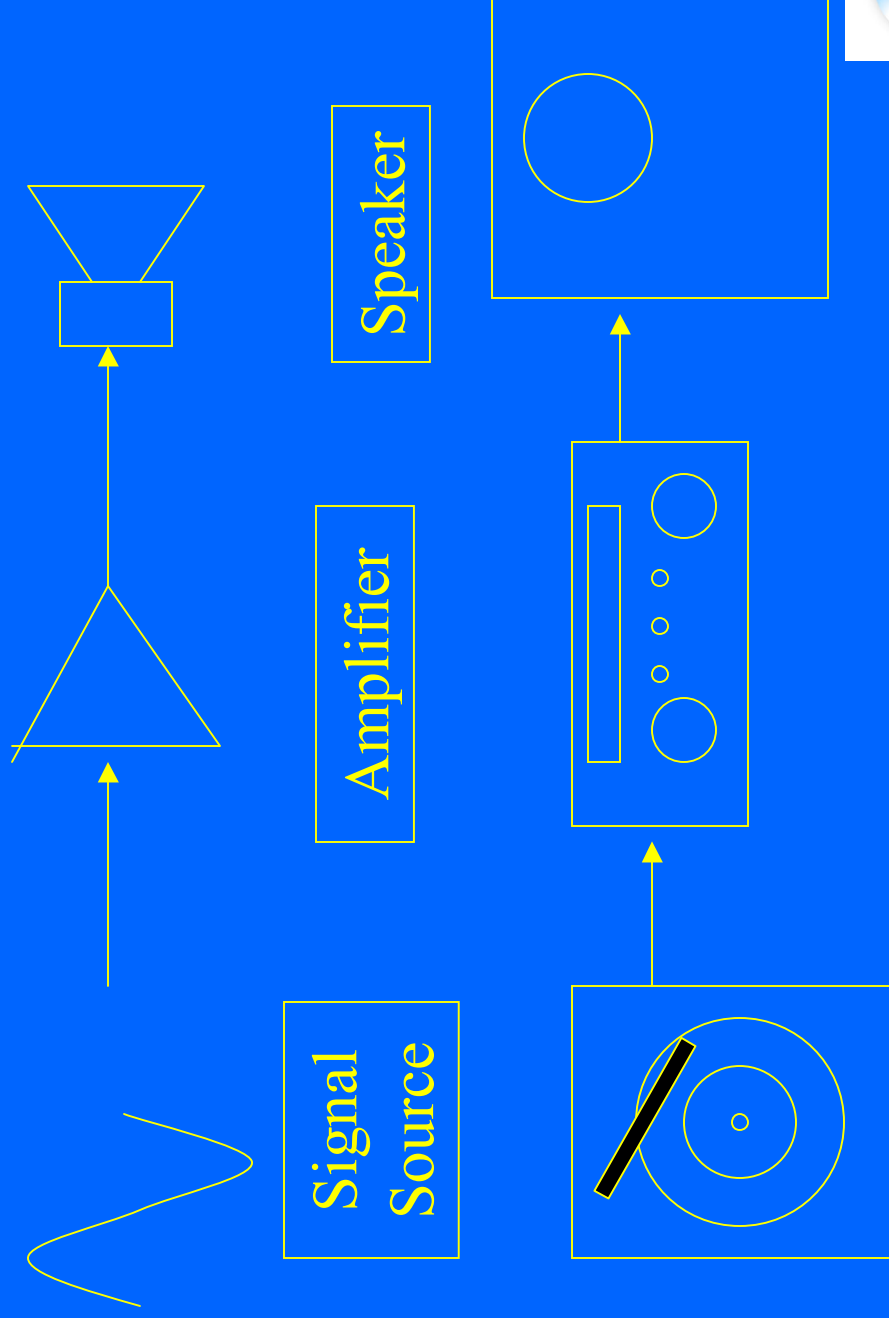
Accelerometer



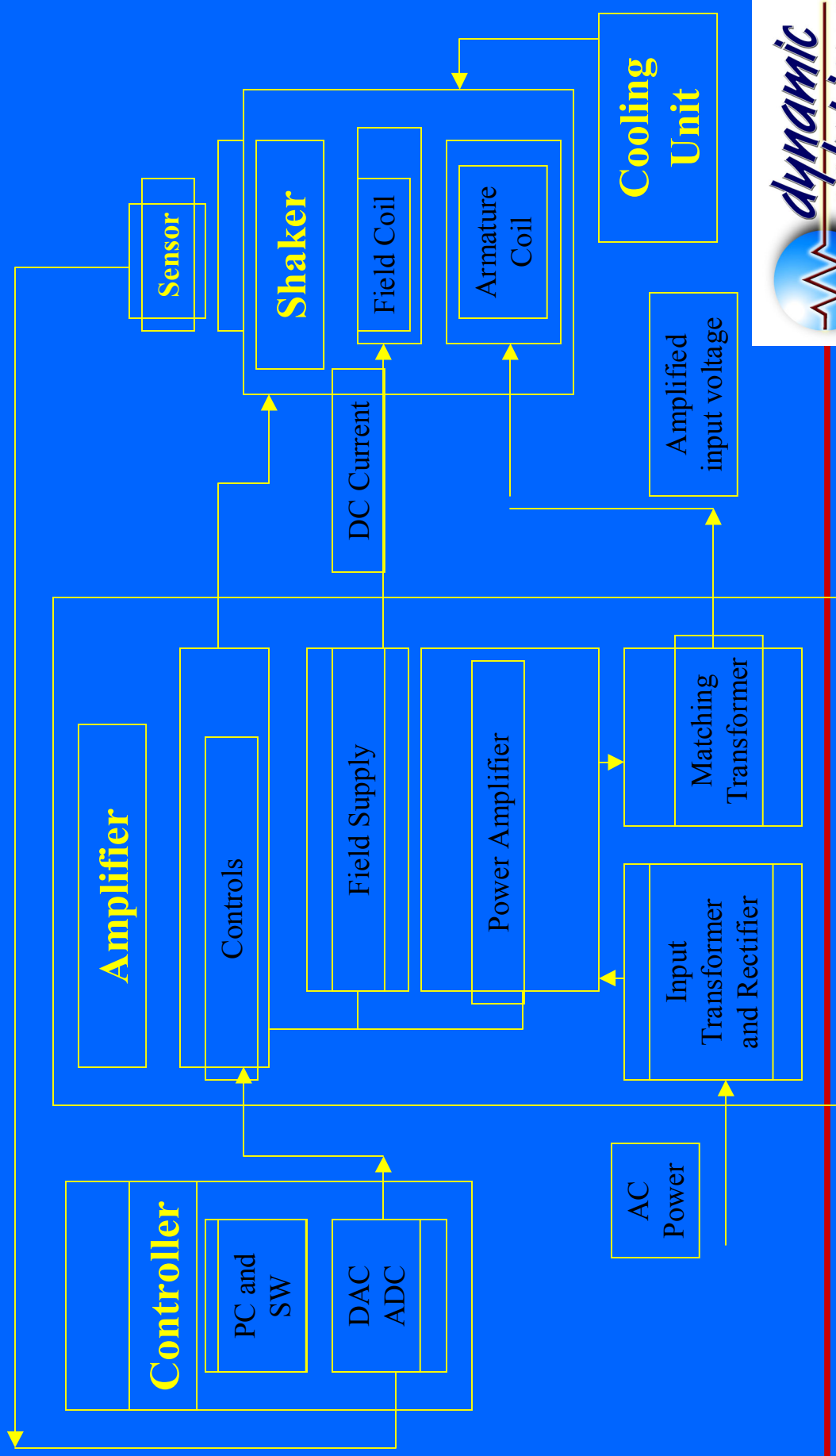
Vibration Controller



A Simplified Shaker System

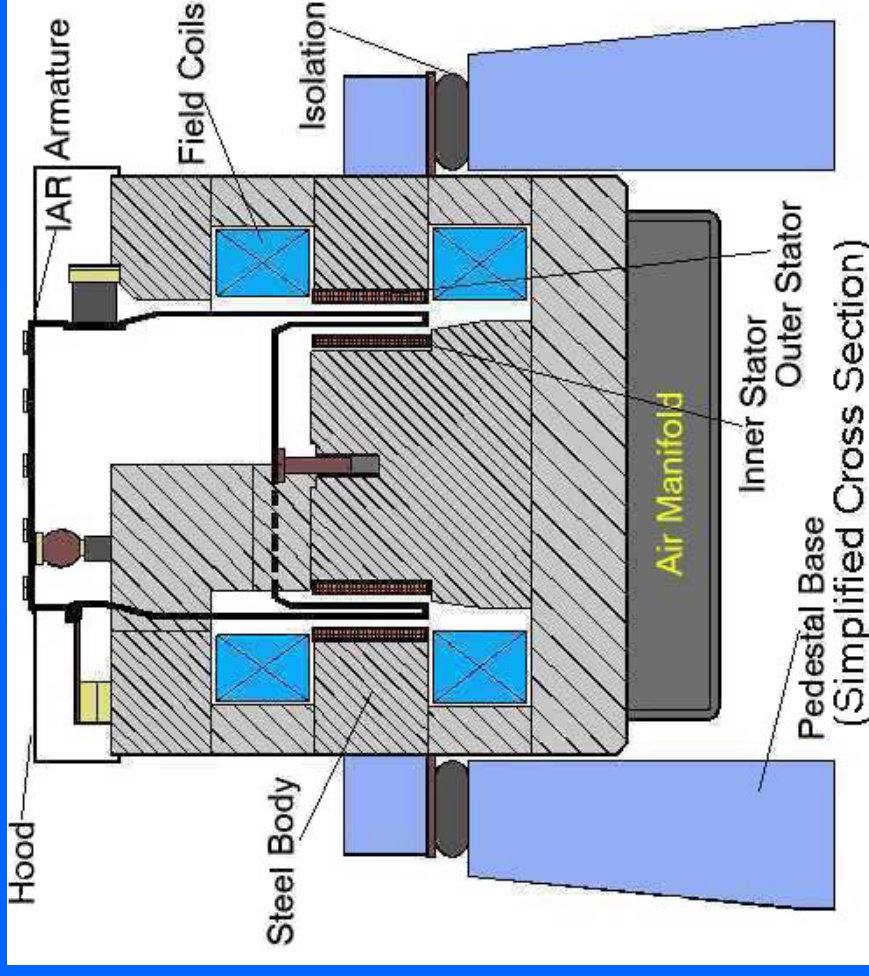


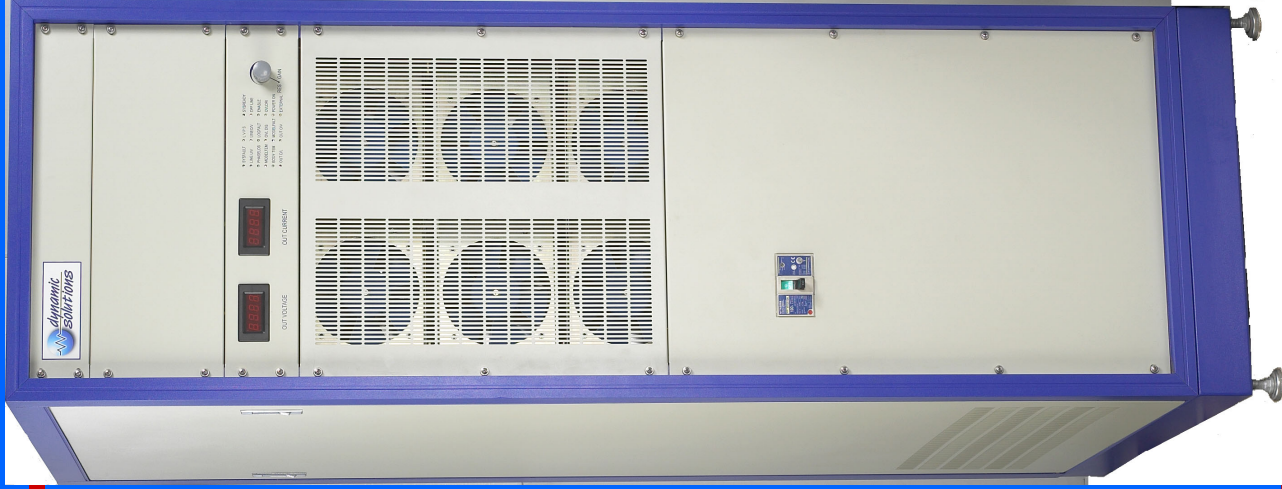
System Block Diagram



The (Inductive) Shaker

An inductive driven shaker consists of two stationary coils, stator and field, that induce current into a single-turn secondary winding on the armature. There are no direct wires or coolant lines going to the armature. Energy is transmitted magnetically or via inductive coupling.

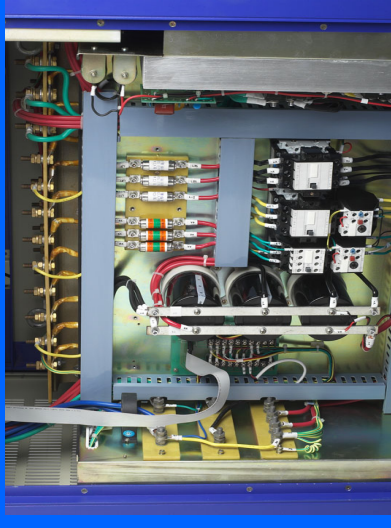




The Power Amplifier

An electronic device that increases the volume of a signal. A basic unit of all shaker systems.

- Direct or Transformer Coupled?
- KVA Output?
- Voltage & Current Requirements of Exciter Armature?
- Voltage & Current Requirements of DC Field Supply?
- IGBT versus MOSFET?
- Interlocks?

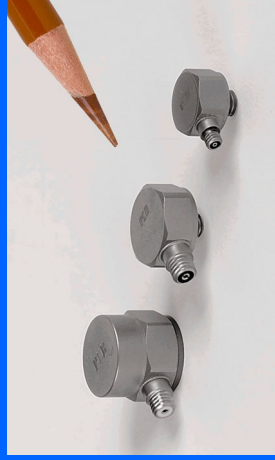
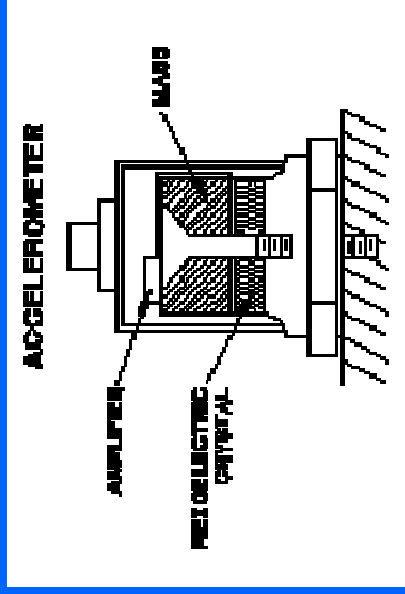


Shaker Cooling (Water or Air)



1/27/2005

Accelerometers

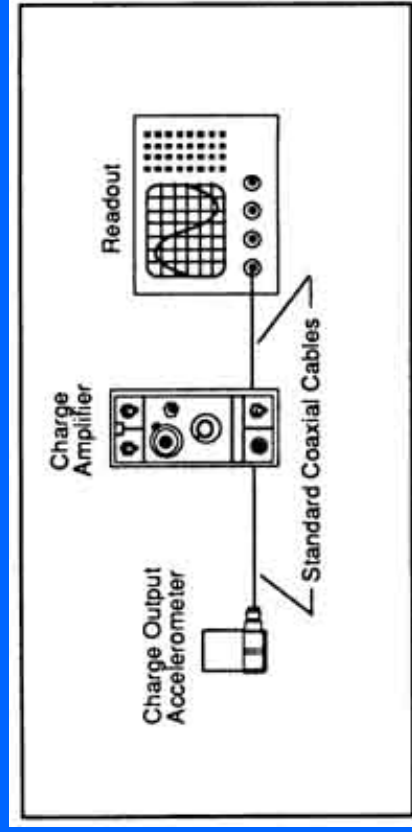


Accelerometer

A sensor or transducer or pickup for converting acceleration to an electrical signal. Two common types are piezoresistive and piezoelectric.

- **Piezoelectric (PE) transducer.** One which depends upon deformation of its sensitive crystal or ceramic element to generate electrical charge and voltage. Many present-day accelerometers are PE.
- **Piezoresistive (PR) transducer.** One whose electrical output depends upon deformation of its semiconductor resistive element, offering greater resistance change than does the wire of a strain-gage transducer, for a given deformation.

Signal conditioner: An amplifier following a sensor, which prepares the signal for succeeding amplifiers, transmitters, readout instruments, etc. May also supply sensor power



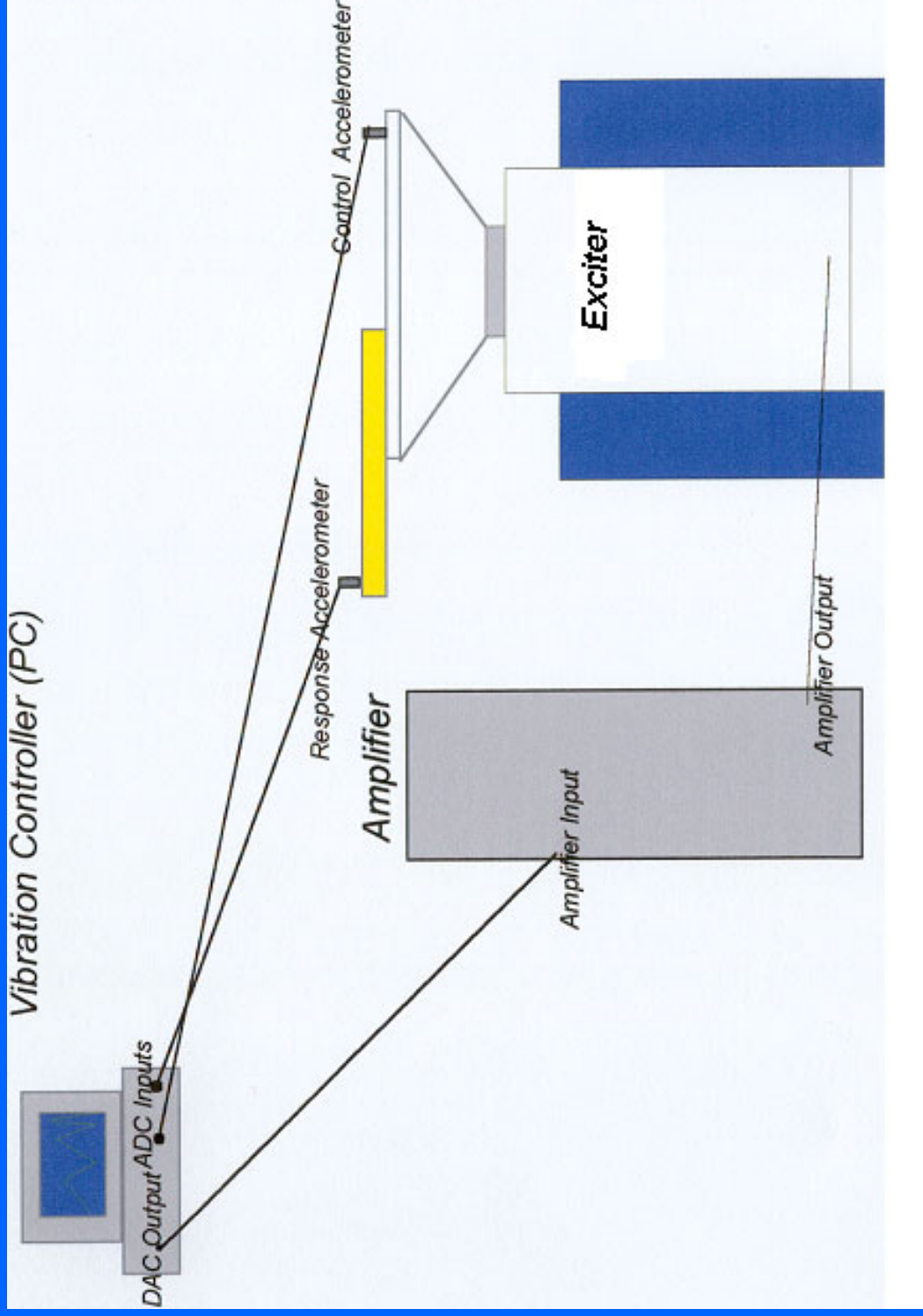
Charge amplifier: An amplifier which converts a charge input signal (as from an accelerometer) into an output voltage; A charge-to-voltage converter.

Vibration Controllers



Control System (Brains)

- **Iterative closed loop** control pre-calculates drive signals but then modifies those signals based upon resulting motion, in order to better match measured with desired motions. Evaluation and modifications take place after each excitation, repeating until the desired result is achieved. Responses are measured and fed back to the control system so as to refine or modify drive signals in order to bring responses closer to the reference or desired motions



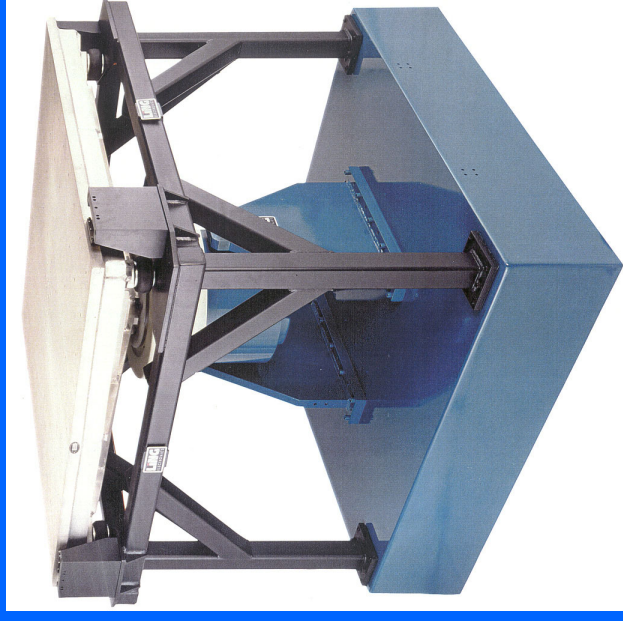
Considerations in selecting a Controller

- ADC channels required?
- Software required?
- ADC sample rate?
- Multiple DAC outputs?
- Hardware quality?
- Engineering features? (Transfer functions, phasing, coherence, limiting, safety/abort, multiple graphics etc)



Fixture

The Intermediate Structure That Attaches a Device Under Test (DUT) to a Shaker or Shock Test Machine



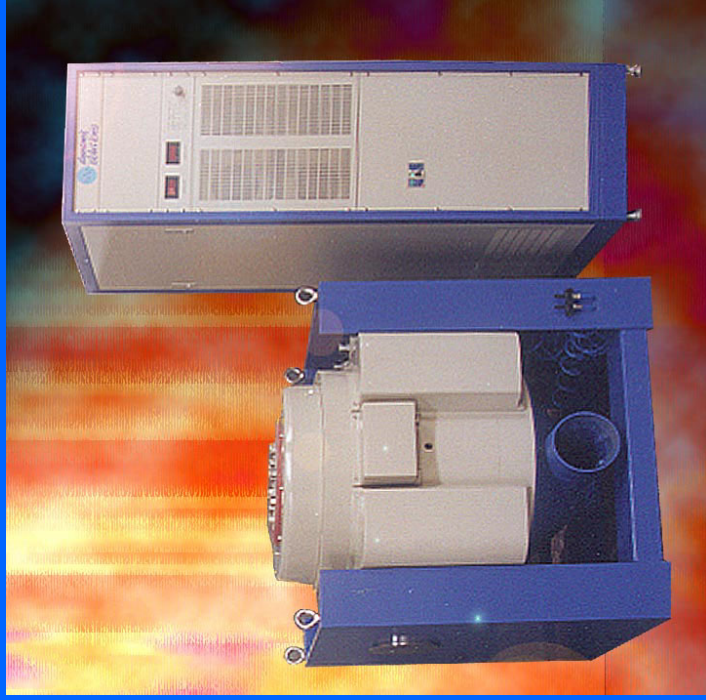
Fixture Considerations

- Useable frequency range?
- Mass?
- Temperature range?
- Ease of use?
- Specific uses?



Purpose Of Fixture

- To uniformly transmit vibration to the mounting points of the Device Under Test (DUT) to levels and frequencies of the test specification



For TURNKEY SOLUTIONS,
custom fixtures or replacement
components for your existing
system...





Reliable and Affordable Vibration Test Equipment

With a THREE YEAR PARTS
WARRANTY!!