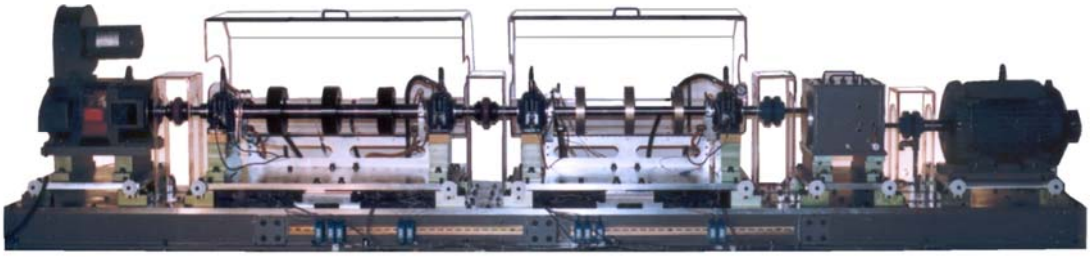
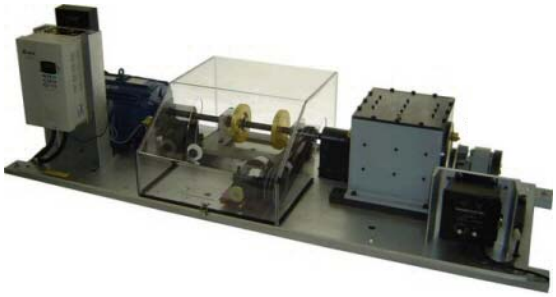
Custom Designs





Custom Made Simulators and Test Rigs
to Customer Specifications

SQi
SpectraQuest, Inc.
8227 Hermitage Road, Richmond, VA 23228 U.S.A.
TEL +1-804-261-3300/FAX +1-804-261-3303
www.spectraquest.com

Custom Design

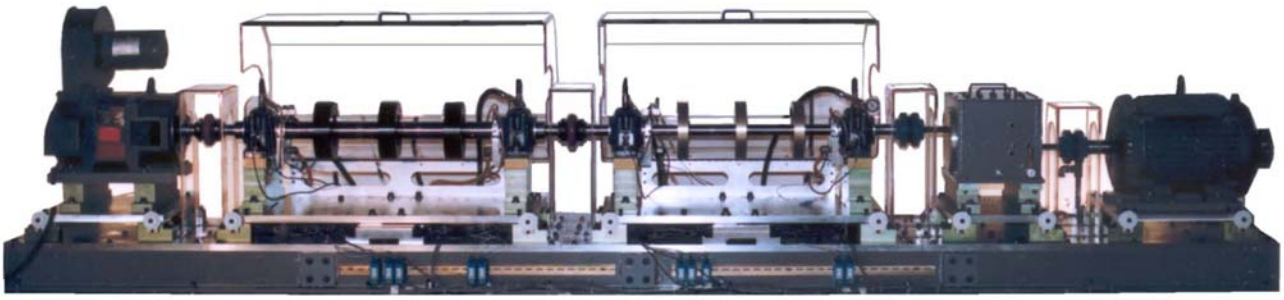
Test Rigs Meeting Your Exact Specifications

SpectraQuest has a long experience in making custom machinery to meet our customers' exact needs. From small modifications to our standard simulators to complete custom designs weighting more then ton, we will provide you with the test rig that you need for your research, development, or training requirements. This brochure provides a sample of the custom designs we have delivered to date. If you can't find it, we will make it.

Complete Rotordynamics

This rotor dynamics test rig has been specifically designed to simulate different rotor dynamics phenomena for experimental and educational purposes. With the innovative design of two rotor assemblies connected in series, the customer has more choices in selecting different rotor parameters. Most of the rotor dynamic topics can be simulated and studied with this system.

- Fluid film bearing research
- Rotor rub simulation
- Balancing/Alignment studies
- Machinery condition monitoring
- Gearbox dynamics and noise study
- Maintenance training
- Instrumentation testing platform
- Two rotor assemblies with different dynamic characteristics
- Robust, modular and flexible design for easy reconfiguration
- 14-ft long, 4500 lb, 20 HP



High Temperature Blade Crack Propagation

This high temperature (1000F), high speed (10000rpm) disk and blade crack propagation test system was designed for NASA to develop new techniques for crack detection of turbine blades and disks.

SpectraQuest, Inc.
8227 Hermitage Road, Richmond, VA 23228 U.S.A.
TEL +1-804-261-3300/FAX +1-804-261-3303
www.spectraquest.com

Custom Design

Transmission Diagnostics / Prognostics

The have delivered several variations of this heavy-duty transmission test rig for several customers. Each turnkey system enabled our customer to study large scale transmission diagnostics-prognostics and gearbox dynamics. Most of the common gear faults and configurations can be research though the versatile, modular, and easily instrumented simulator. With seeded fault tests, quantitative performance predictions can be modeled for every piece of the gearbox. Each custom design is configurable with different gear types and sizes, convenient instrument mounting, and drivetrain alignment.

Customer 1

- User configurable three-stage planetary gearbox mimics helicopter gearbox
- Custom designed parallel shaft gearbox can be configured as single/double stage increaser/reduction
- Instrumented self-contained lubrication system.
- Load torque provided by two vectors AC drives in a power sharing configuration
- 12-ft long, 45 HP drive, 75 HP load

Customer 2

- Three-stage transmission using one bevel and two planetary stages
- Separate oil lubrication for each stage
- Transmission ratios: output planetary stage 4.4:1, input planetary stage 4.5:1, bevel stage 2:1, total 40:1
- May be operated with two-stage gear train bypassing the bevel gear stage
- 12-ft long, 40 HP drive, 100 HP load

Customer 3

- Two or three stage transmission using bevel-planetary gear train.
- Custom designed parallel shaft gearbox can be configured as single/double stage reduction/increaser.
- Instrumented self-contained pumped lubrication system.
- Load torque provided by two vectors AC
- 12-ft long, 45 HP drive, 75 HP load

SpectraQuest, Inc.
8227 Hermitage Road, Richmond, VA 23228 U.S.A.
TEL +1-804-261-3300/FAX +1-804-261-3303
www.spectraquest.com

Custom Design

Turbine Blade Crack Research

This test machine is specifically designed to simulate turbine blade crack and other machinery faults for research and educational purposes. The blade crack diagnosis/prognosis can be studied thoroughly using the wireless strain gauges mounted on the blades.

- Study blade crack propagation, diagnostics/prognostics
- Other mechanical and motor faults
- Generator used as a braking mechanism
- Telemetry system
- Weights to change mass moment of inertia

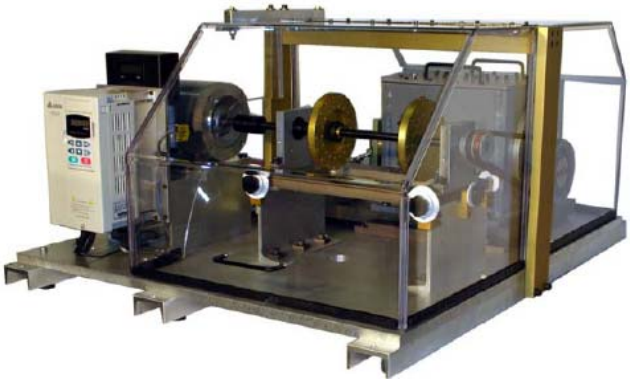
- An adjustable blade rub excitation attached to the base plate at the circumference of the blades

Modified Machinery Fault Simulator (MFS)

Even though SpectraQuest's line of simulators is very versatile, we have modified our standard designs to meet our customers' specific requirements. In the two examples shown, a configurable parallel shaft gearbox was added to further study gearbox faults.

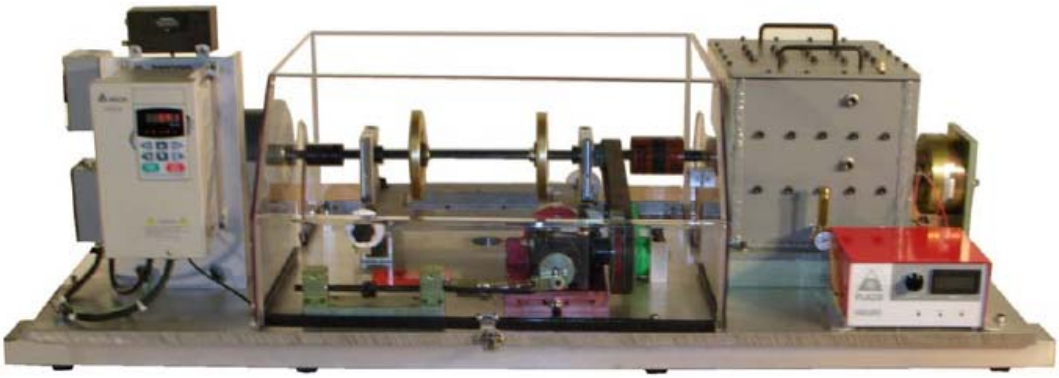
Customer 1

- Belt driven gearbox.



Customer 2

- Shaft driven gearbox.



SpectraQuest, Inc.
8227 Hermitage Road, Richmond, VA 23228 U.S.A.
TEL +1-804-261-3300/FAX +1-804-261-3303
www.spectraquest.com