DIVERSIFIED TECHNOLOGIES, INC.®

Solid-State Tetrode Test Stand

M. A. Kempkes, R. Phillips, K. Schrock, M.P.J. Gaudreau, D.M. Robinson

Diversified Technologies, Inc.

35 Wiggins Avenue, Bedford, MA USA 01730 • (781) 275-9444 • www.divtecs.com

Overview

- 500 kW DC Tetrode test stand for Burle 4648 High Power Tetrode
- Tetrode is part of ISIS system at RAL
- Funded by UK Science & Technologies Facilities Council
- Located at Burle Industries, Lancaster PA USA
- Installed & Operational March 2009

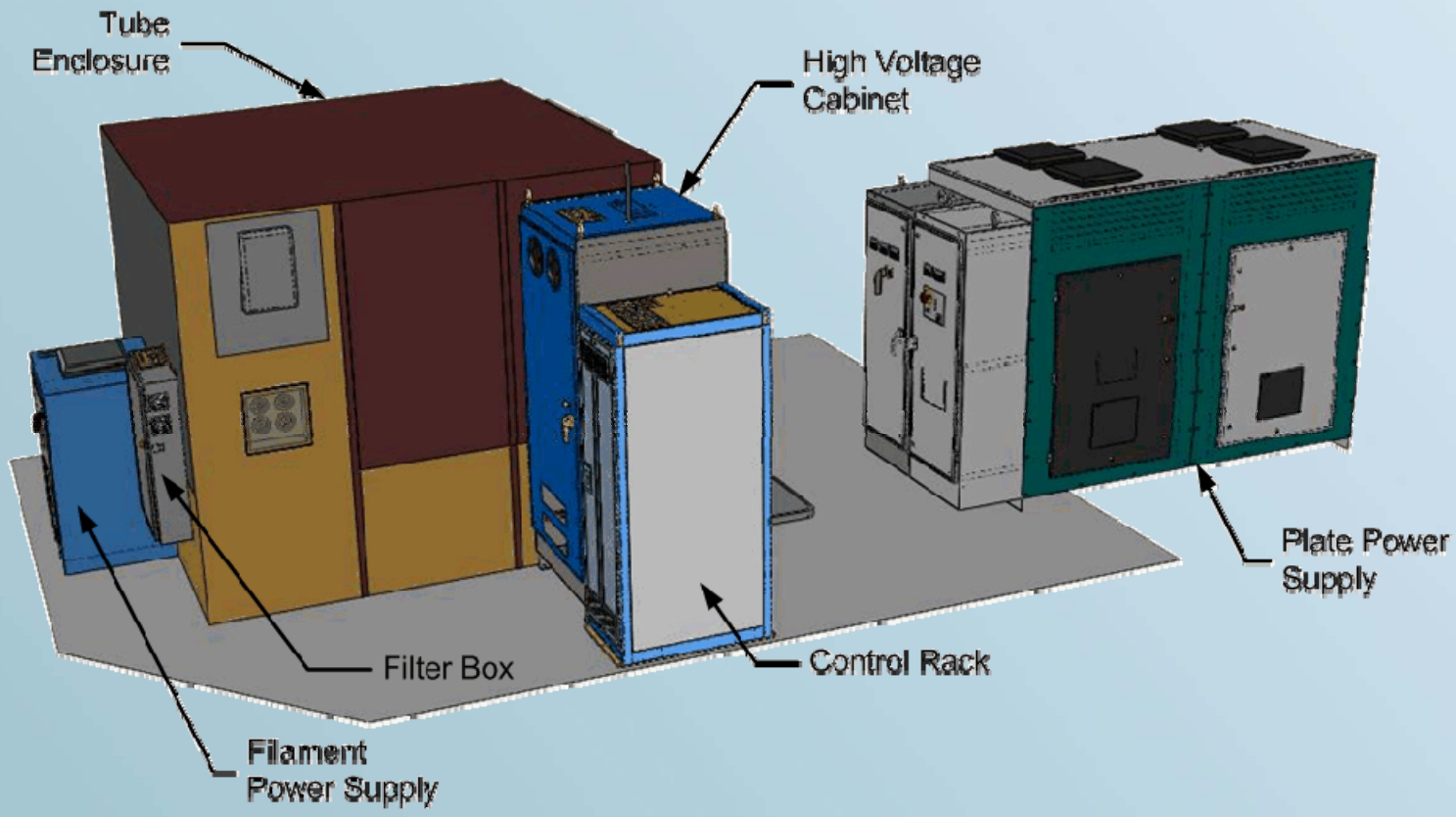
Program Goals

- Streamline testing of new tetrodes for ISIS
- Improve reliability of test system
- Improve testing throughput
- Support range of CW and pulsed tube designs

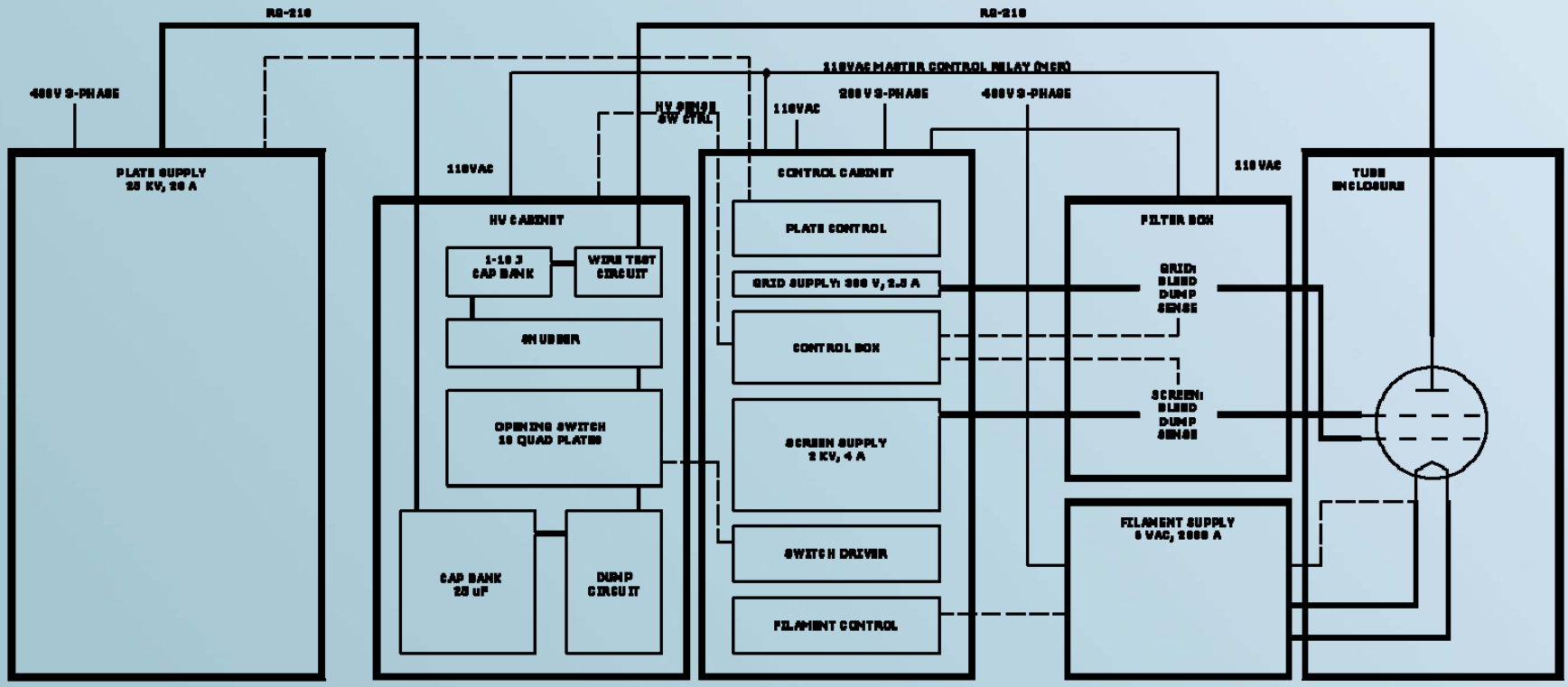
Test Stand Specifications

Anode Output Power (Plate)	+25 kV adjustable, 20 A max; 20 kV, 20A nominal average
Screen Output Power	+2 kV adjustable, 4A max; 1400 V, 2 A nominal
Bias Supply (Control Grid) Power	-300 V adjustable, 2.5 A max.; -200 V, 1 A nominal
AC Filament Supply	6 V adjustable, 2 kA max; 4 V, 1650 A nominal

System Layout



System Block Diagram



Control Rack

- Screen Supply and Controls
- Control Chassis
- Grid Supply
- Filament Supply Controls
- Plate Supply Controls
- Opening Switch Drive
- Kirk Key Panel

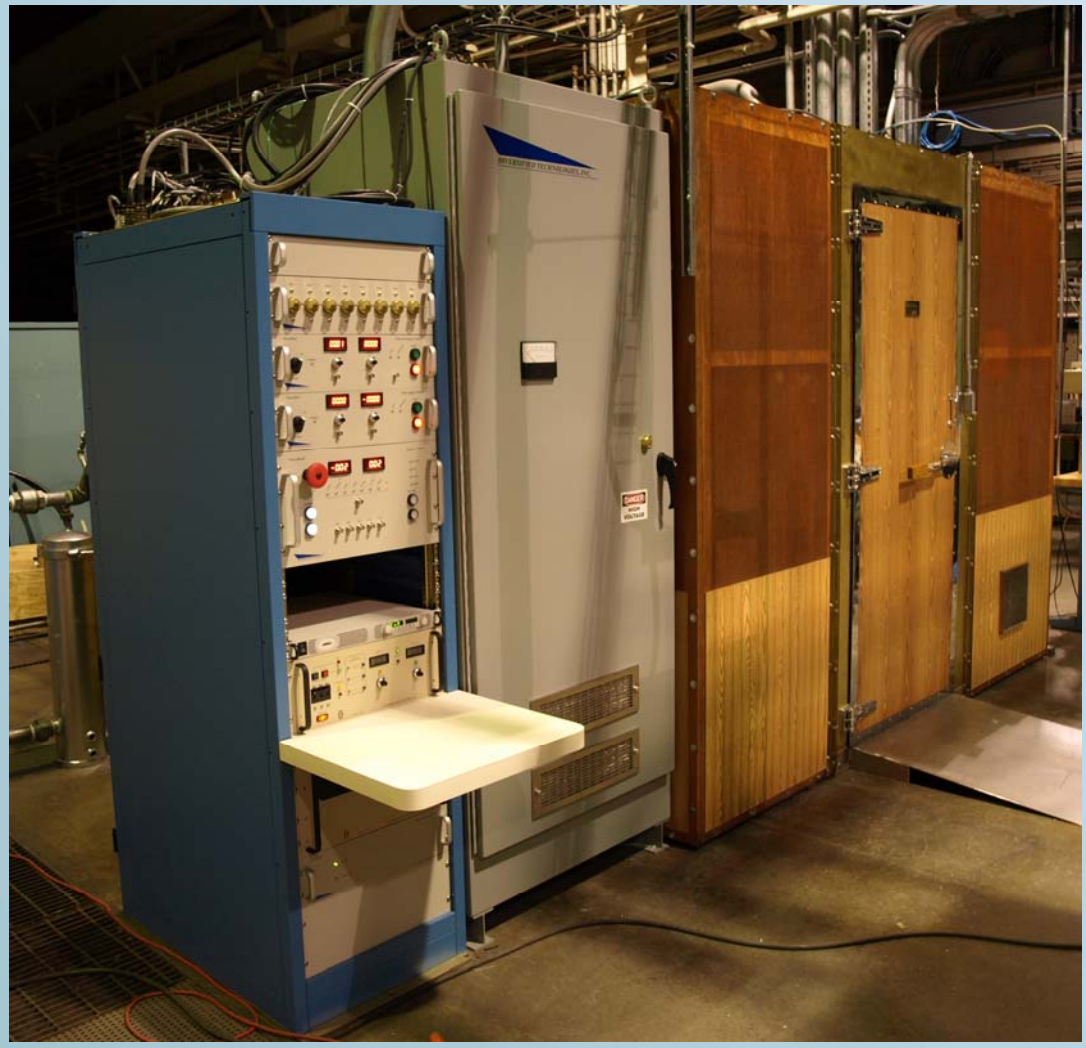
HV Cabinet Interior

- Filter Cap Bank
- Dump Circuit
- Series Resistance
- Opening Switch
- Current Sense and Limiting
- Arc Test Wire
- 10J Load Cap Bank for Tube Conditioning

Component Descriptions

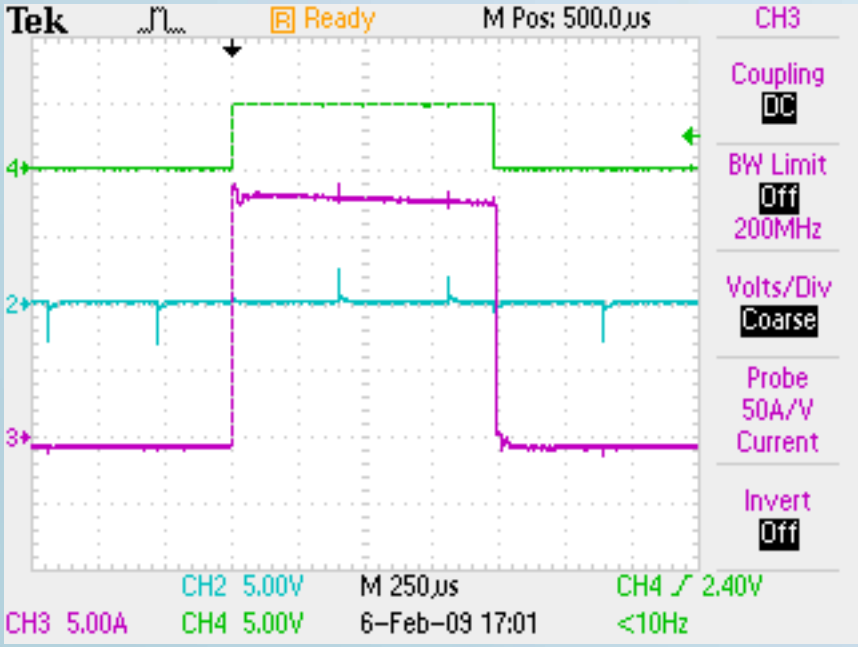
Tube Enclosure	EMI tight screen room contains 4648 tetrode
Control Rack	Houses screen, grid, filament power supplies
High Voltage Cabinet	Contains opening switch, caps (two Maxwell 12.5 µF 25 kVDC)
Plate Power Supply	Marelco 0-25 kVDC @ 20 ADC via 480 V TR & SCR controller
Filament Power Supply	0-6 VAC 0-2000 A. Directly drives the tetrode filament.
Filter Box	Contains monitoring equipment, safety relays, etc.

Installed Test Stand



Test Stand Flexibility

- Test Stand Designed for CW Testing
- Series Switch Allows Pulsing
- High Level of Flexibility
  - Different Tubes
  - Different Functions
  - Burin-In
  - Testing
  - Reconditioning Gassy / Arcing Tubes



Test Stand Advantages

- Elimination of Crowbars
  - Rapid Arc Response
  - Controllable Arc Energy
- Full Pulse Control
  - Pulsewidth
  - Frequency
- Full Voltage / Power Control without Tuning or HV System Exposure
- ¼ Size of Original Test Stand
- Single Operator Control (vs 3 in Original Test Stand)
- Automated Burn-In / Test Possible

Thank You

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