

## **SPECIFICATION FOR HIGH-SPEED, MULTICHANNEL DATA-ACQUISITION SYSTEM**

### **1. INTRODUCTION**

NRL has ongoing R&D missions in the areas of DoD Nuclear Weapons Effects Simulation (NWES), high-power, penetrating radiography for DOE stockpile stewardship, and various ONR pulsed-power applications. To support this work, the Laboratory requires the capability of recording electrical signals arising from various transducers and probes. The number of signals often reaches 80, and typically they must be recorded at sample rates exceeding 1 Gigisamples/sec [Gs/S] for durations of several microseconds. In typical operation the time available between successive acquisitions ranges from 6 hours down to less than one minute.

### **2. SCOPE**

This procurement is for a data-acquisition system comprising multiple, high-speed, transient-response digitizer channels, a computer for controlling the digitizers and performing rapid data analysis, and associated components necessary to verify system performance.

### **3. TECHNICAL REQUIREMENTS**

The contractor shall provide a data acquisition system that meets or exceeds the desired specifications described below.

#### **3.1 Performance Specifications**

This system shall include the following digitizer channels, divided into three groups:

1. 72 channels with sampling rates of 5 Gs/S, analog bandwidths of 500 MHz, and 10 kPoint record lengths.
2. 8 channels with sampling rates of 2.5 Gs/S, analog bandwidths of 500 MHz, and 10 MPoint record lengths.
3. 2 channels with sampling rates of 1 Gs/S, analog bandwidths of 200 MHz, 2.5 kPoint record lengths, and provided by a handheld device.

This system shall include the following accessories:

4. Accessories for the above, including: rack-mount components for 16 of the first group of channels and 8 channels of the second group; GPIB connectivity modules for all channels of the first two groups; a spare battery for the device providing the third groups of channels above;
5. Scope probes, providing equivalent performance to the TekP5210 (qty 1), the Tek P6015A (qty 2), the Tek TCP312 (qty 1) Tek TCP303 (qty 1), and Tek TCPA300 (amplifier, qty 1)

This system shall include the following components to aid in calibration and setup:

6. A 240-MHz, 2-channel function generator.

7. A 68-channel logic analyzer with 2-ns resolution on all channels.

This system shall have the following computer control for operating the scopes, acquiring, and analyzing data:

8. A control computer cluster, comprising 10 units. Each unit shall have two dual core Intel Xeon Processors, with 5150 4MB cache, 2.66GHz and 1333MHz FSB, 2 GB of 667-MHz DIMM's, an 80GB, SATA, 3.5-inch 7.2K RPM hard drive, a Dual Embedded Broadcom NetXtreme II 5708 Gigabit Ethernet NIC, a 24X IDE CD-RW/DVD ROM Drive, and a 1x2 backplane for 3.5-inch Hard Drives

### **3.2 Interface specifications**

These digitizers providing the required channels shall have computer-control compatibility with Tektronix scopes.

### **4. SOFTWARE**

The system will be used with our existing, in-house software, therefore no software is required. Satisfaction of requirement [3.2] above is sufficient to insure compatibility.

### **5. DOCUMENTATION**

The system must be supplied with user manuals as well as any other documentation customarily provided to the public in a commercial transaction.

### **6. WARRANTY**

The contractor shall provide a standard commercial warranty for the system.