NLCTA-Note #69

January 12, 2009

Subject: Modifications for Toshiba Ion Pump Control
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This document describes the changes of the Toshiba Ion Pump Control Unit VT-69060U-E power supply required to meet SLAC electrical safety requirements and to support the testing of the E3736KS Toshiba Multi-beam (L-band) Klystron at NLCTA.

Attached is a schematic of the stand-alone power supply.

Specifications (inferred)

Input:	120 VAC, front panel switched
Voltage:	3.6 kV
Polarity:	Positive
Maximum current:	50 mA (maximum meter reading, not verified)
HV Connector:	SHV
Ground connection:	Black 2-way banana-plug binding post
Current monitor:	See note below.
Current Monitor output:	2-way banana-plug binding posts, Black (-) and Red (positive). Red is at ground potential.
Meter:	Internally amplified analog meter with adjustable setpoint.
Modes:	5 uA to 50 mA by decades, 5 kV
Relay output:	Three white 2-way banana-plug binding posts, form C (Common, NO, NC). Note: Relay output depends on front-panel meter range setting.

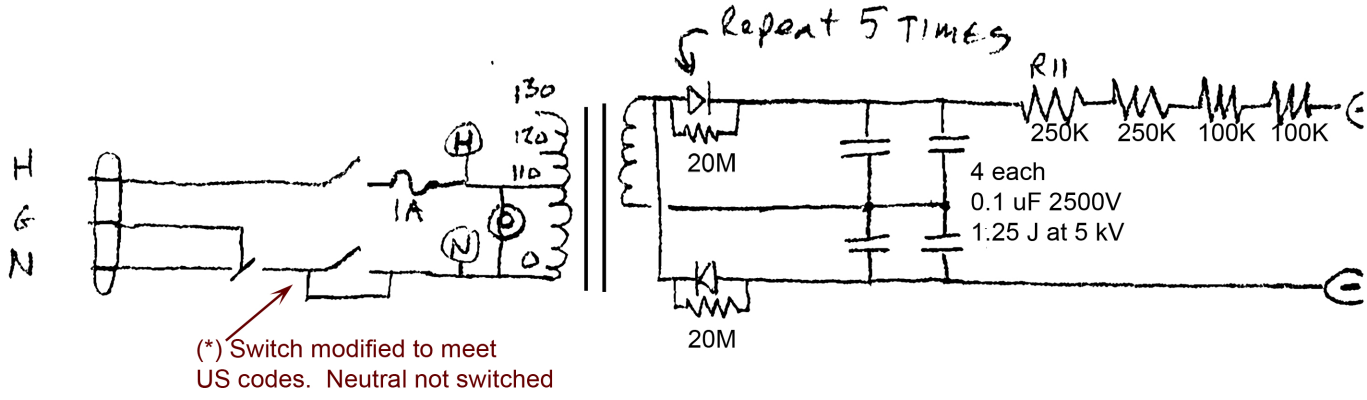
The power supply was modified as follows:

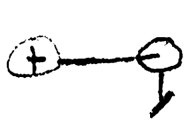
1) Front panel power switch modified to only switch hot leg of input power lead.

2) Current sense resistor (R19) increased from 10k to 100k. This results in an output signal of 100 mV/uA (increased from 10 mV/uA). Note: Minimum resistance of monitoring equipment for 1% loading of signal is 10 Mohm.

3) Keep-alive resistor of 237 Kohm added to provide an offset in monitored current. While power supply is turned on, a minimum current monitor reading of 10 mV (0.1 uA equivalent) is expected.

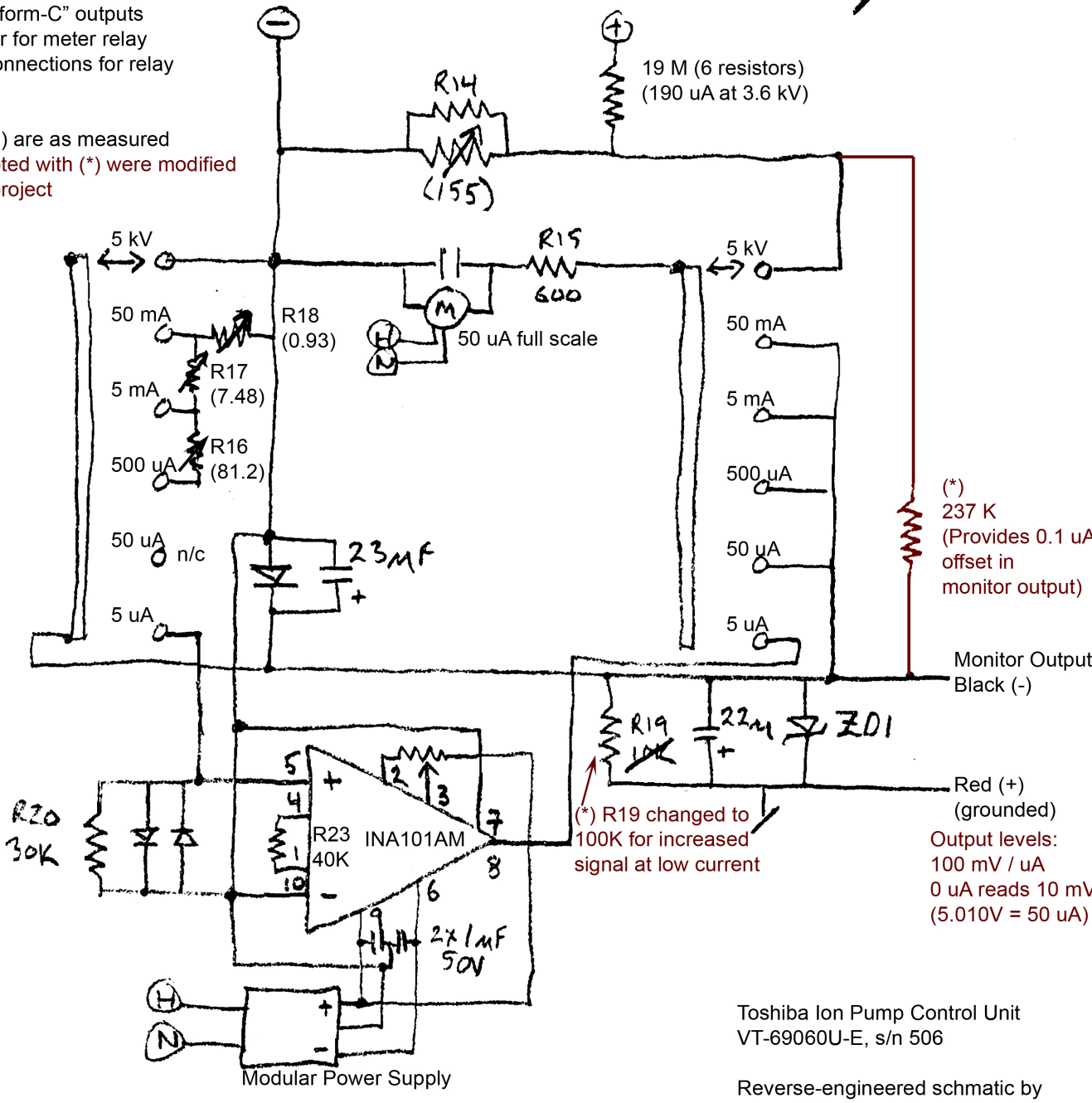
The schematic is attached. Modifications are shown in red.





Not shown in Schmatic:
- Meter relay "form-C" outputs
- repeater relar for meter relay
- rear panel connections for relay

Note:
1. Values in ( ) are as measured
2. Items annoted with (*) were modified for use in project



Toshiba Ion Pump Control Unit
VT-69060U-E, s/n 506

Reverse-engineered schmatic by
Keith Jobe 12/10/2008