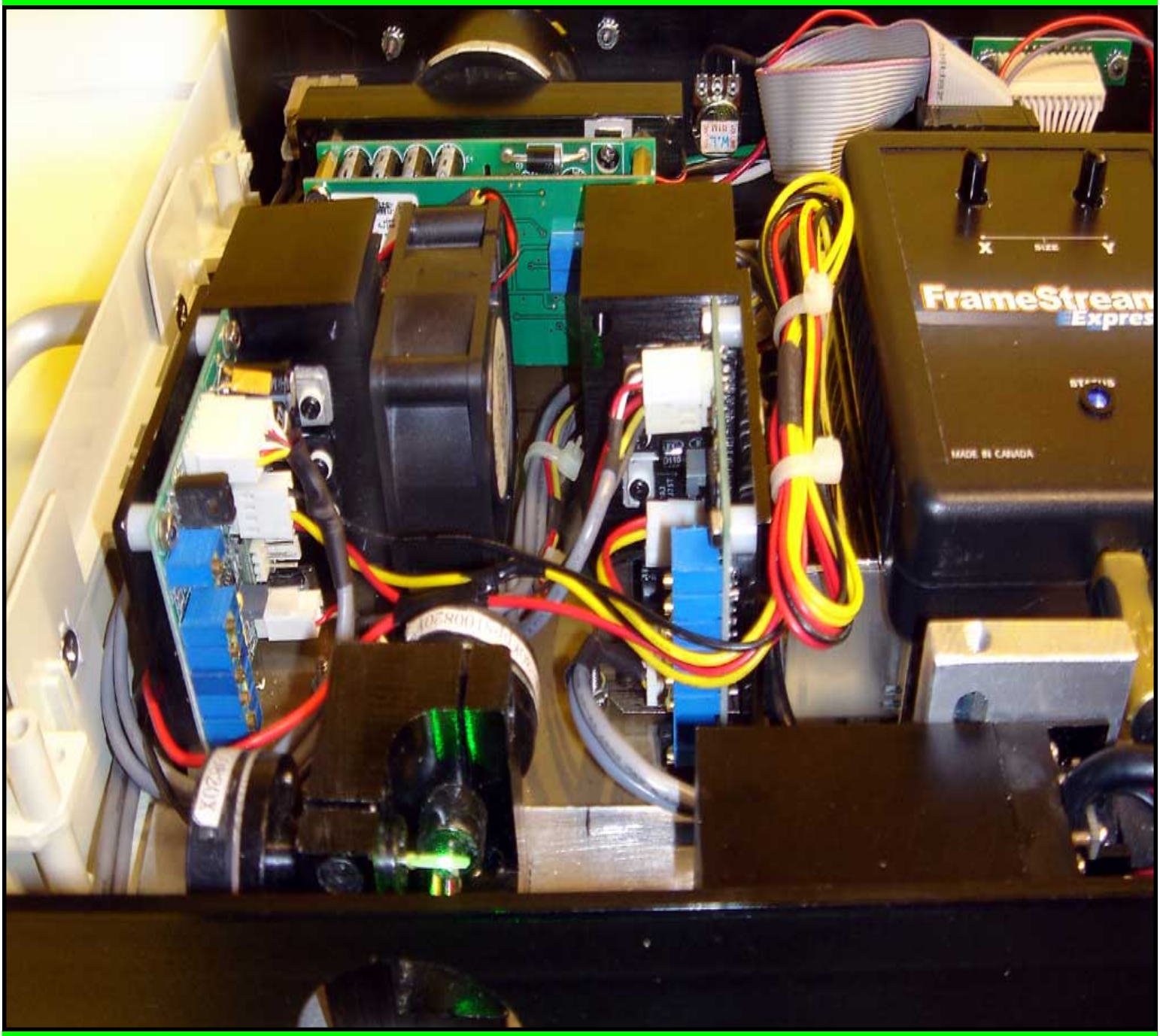
LASER *Graffiti* ACTIVISIM

Build a portable laser graphics projector.



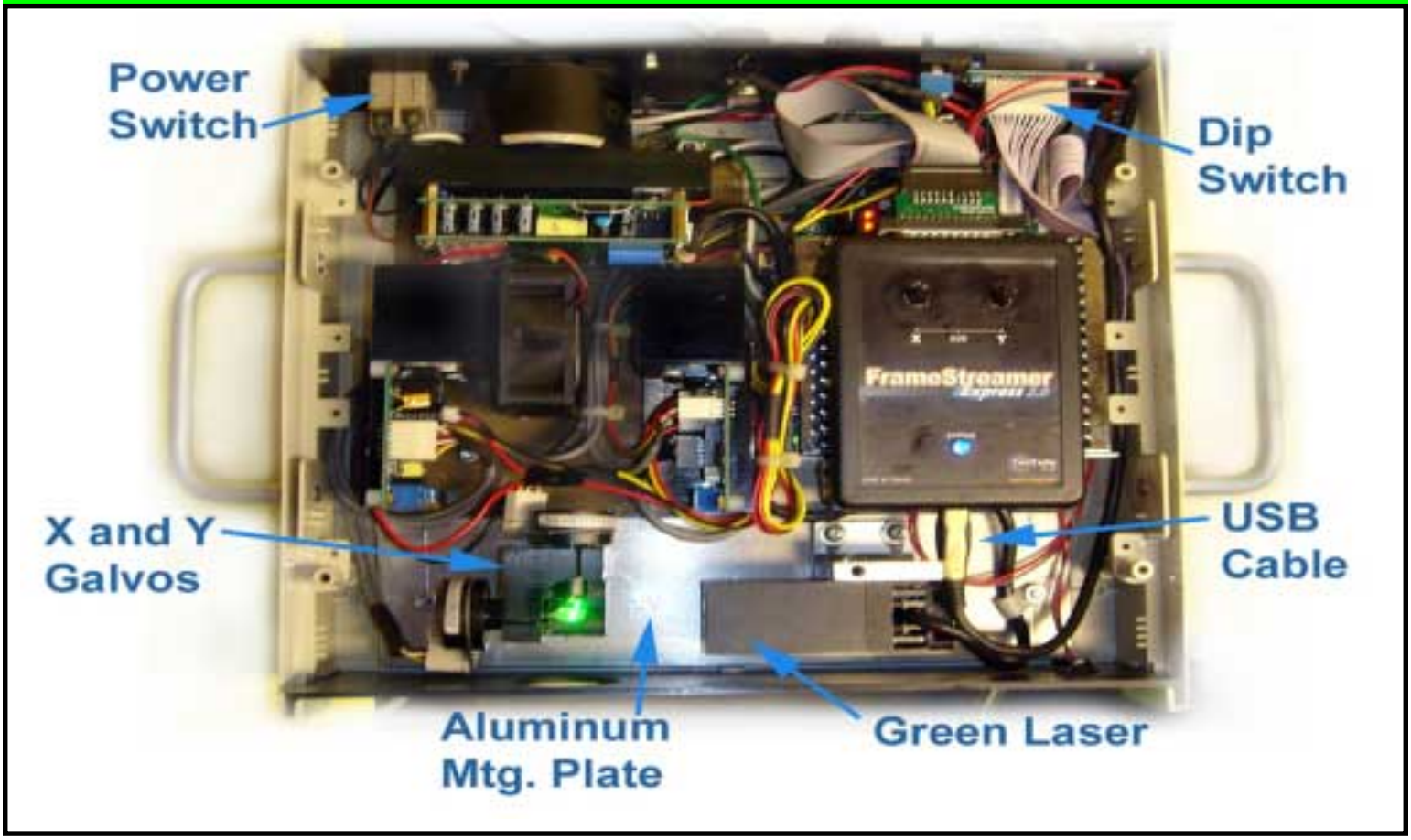
USB Controlled Laser Graphics Projector.
Provides an opportunity to “reach out” with your message.
Property friendly guerrilla graffiti is a reality.

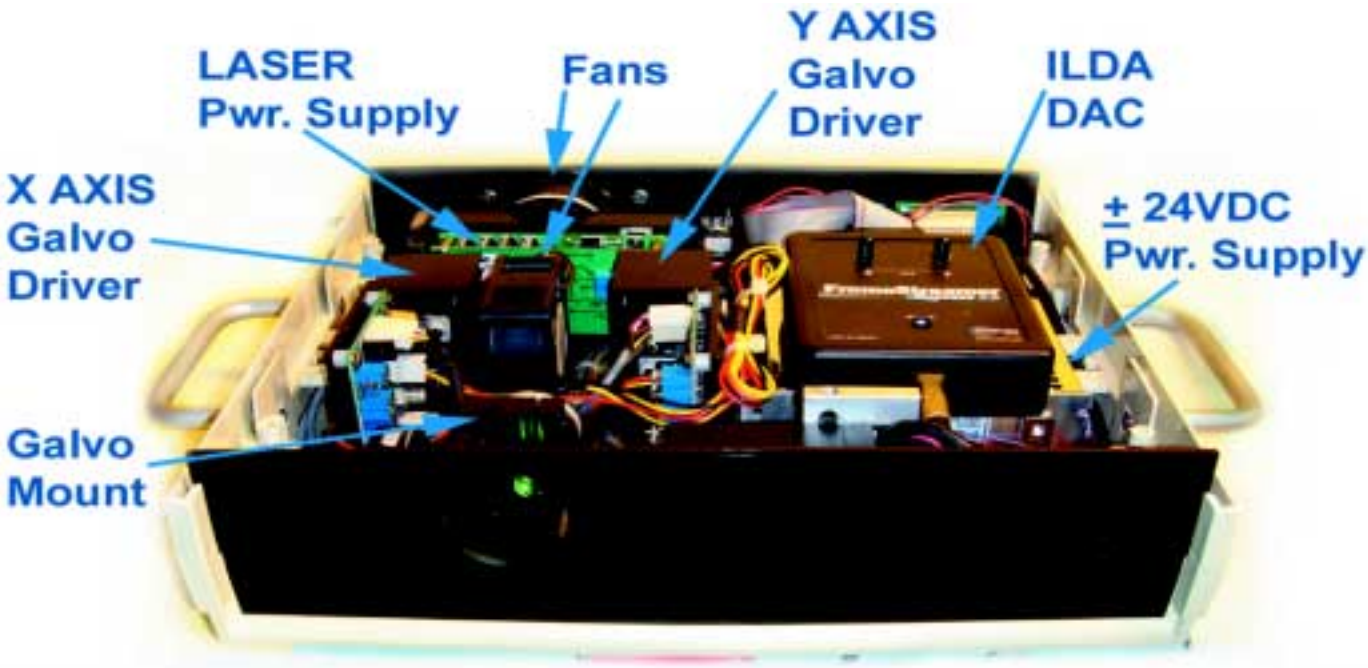
Learn what is required to construct your own system.

WHAT DETAILS WILL BE REVEALED?

The purpose of this article is to give an overview of what is required to construct your own laser graphics projector. I would consider this build an intermediate to advanced level project. You will need to be capable with both mechanical and electrical / electronic construction methods and techniques. This article is not intended to provide step by step instructions but rather, block level explanations pointing you in the proper direction to achieve a similar end result. Please note: this projector took about three days to build. This is my third projector build. Your results may vary.

SO LET's TAKE A LOOK INSIDE SHALL WE?





WHAT's IN THE BOX?

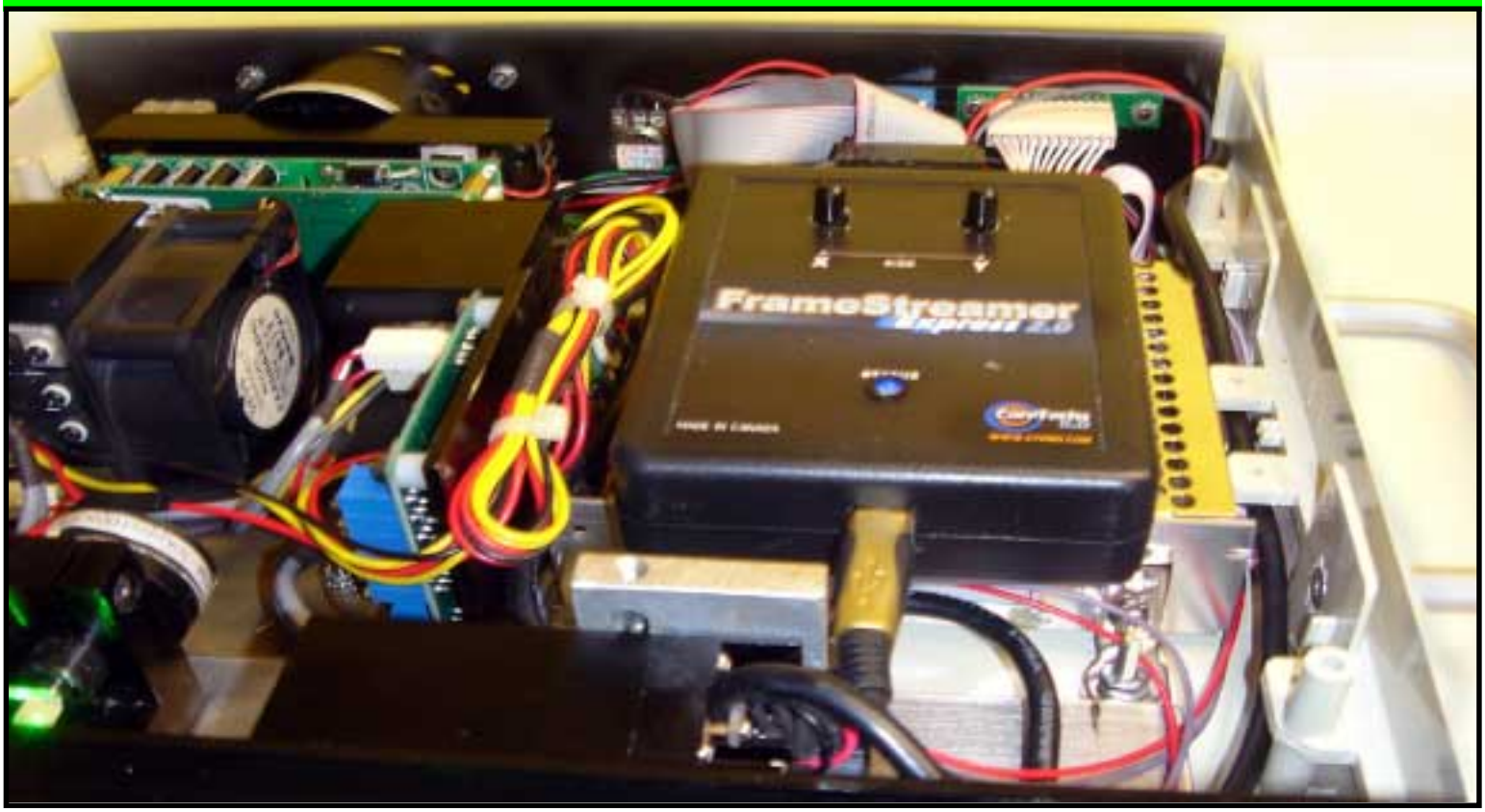
The photo above shows the cover removed and the main components labeled. Parts placement is not critical. I would suggest a larger enclosure for first time builders as this build was a little tight. A quick operating description is in order. The 532nm green laser projects a beam onto the lower x-axis galvo mirror. This mirror is at a 45 degree angle to the beam and reflects the beam to the upper y-axis galvo mirror. The upper mirror is also at 45 degrees which "turns" the beam and projects it out of the enclosure. The mirrors are low mass, highly reflective and capable of being positioned by the galvos at up to 30,000 points per second. (30K PPS) The galvos are controlled by the X and Y axis drivers. They receive their signals from the DAC (digital to analog converter) and provide a precise an repeatable voltage to the galvos. During scanning the DAC also turns the laser on and off as required in order to eliminate stray lines between characters. This is called "blanking" and is handled in software. The DAC receives it's commands via USB form the laser software running on the your computer. You simply type text into the GUI and click start. The galvos will move as required to create the text. Your message can now be seen several hundred feet away. It's that simple!

SOME CONSTRUCTION CONSIDERATIONS

GET RID of THE HEAT.

The enemy of solid state lasers and electronics in general is excess heat. All these components stuffed into a compact enclosure generates significant heat. How warm does your laptop or desktop computer become? Fans and ventilation solve this problem. There are three fans used in this project. Two are shown an the previous photos. (Laser power supply and galvo drivers) The third is part of the laser head. Do not skimp on the fans. You will be very unhappy with the early demise of your projector. Remember whatever volume of air the fans are capable of moving must pass through openings in the enclosure. Appropriately sized for the required volume. In short, don't put a thee inch fan behind a 2 inch opening. Mounting the components on an aluminum base plate goes a long way to help with distributing and dissipating unwanted heat.

MECHANICAL CONSIDERATIONS



THIS THING NEEDS TO BE RUGGED!

Be sure to use fasteners sized appropriately for the task. Tighten all mounting hardware securely. Don't forget to include a tripod socket on the bottom. This is a delicate optical instrument. Handle accordingly.

WHAT YOU WILL NEED and WHERE to GET IT.

ITEM	DESCRIPTION	P/N	PRICE
1.	Enclosure:	PAC TEC, CL400	$51

http://www.pactecenclosures.com/product-detail.php?productid=55&seriesid=44&classid=26

2.	DAC	FRAME STREAMER 2.0	$200
3.	LASER SOFTWARE	NLS 1.7	Free

Hardware, http://www.ctrnd.com/NormLaserShow/FSX20.htm
Software, http://www.ctrnd.com/NormLaserShow/Downloads.htm

4.	GREEN LASER, 200mW	Meierlight or Equivalent	$288

http://cgi.ebay.com/200mw-532nm-green-laser-Diode-ANALOG-lightshows-/170655868533?pt=LH_DefaultDomain_2&hash=item27bbe1e675

5.	GALVO KIT, 30K	Space-LAS	$244

Includes: X & Y Galvos, mount and Drivers, show card, 24VDC power supply, cables
http://cgi.ebay.com/laser-scanner-system-30K-20-Max-50kpps-show-card-/300580231627?pt=LH_DefaultDomain_0&hash=item45fbfa59cb

6. Misc. Hardware, Including:
Aluminum plate, laser mounting bracket, fasteners, handles, fans, switches, wire etc.

SAFETY CONSIDERATIONS and REGULATORY NOTICE

WARNING: DO NOT SHINE LASER AT AIRCRAFT, MOTOR VEHICLES, BOATS OR LAW ENFORCEMENT!
Laser products described in this article are considered "OEM" components and the purchaser is responsible for properly assembling and installing the components into a finished product that, if entered into commerce, is in compliance with all laws and regulations. For additional information about regulatory compliance, visit the FDA website at http://www.fda.gov/cdrh.

That being said. **RON PAUL REVOLUTION 2012**