

Live Interactive Virtual Exploration (LIVE) System Details

LIVE Back-pack hardware:

- 1) Wirelessly enabled lap top computer. We use older Dells ready for donation and recycle them for LIVE programs.
- 2) Digital camcorder with firewire connector, zoom capability, and image stabilization. We use Canon ZR930 \$225.
- 3) A laptop back-pack. We use Skull Candy model with speakers in the shoulder straps.
- 4) A headset which connects to the laptop. We prefer model with the analog plugs.

LIVE Back-pack software:

- 1) Skype – download for free from www.skype.com
- 2) Orangeware webcam DV \$20 – download from <http://www.orangeware.com/endusers/webcamdv.html>

LIVE Audience needs:

- 1) Skype and set up a Skype account to receive video.
- 2) A computer with an Internet connection.
- 3) A cheap USB microphone to connect to a computer.
- 4) A multimedia projector connected to the computer.



StSS LIVE Backpack Equipment...

...includes the obvious backpack that you see pictured here.

Inside the backpack is an array of equipment used for Sea to Shining Sea (StSS) LIVE activities.

These are the primary components in the backpack:



1. Dell Laptop



2. Headset with Mic



3. Digital Video
(DV) Camera



4. Camera Cable

Cabrillo National Monument Distance Education and Research System - approximately \$ 10,000

Two Solar power stations - \$ 2,500 each - HPWREN funded one solar powered camera station at Zone 3 \$ 2,500
 Wireless system -Trango 5830 set of 1 access point and 3 subscriber units - \$ 2,900 (SU not in use)
 2 Motorola Canopy radio/antenna pairs (these were donated by Nebraska Education Service Unit 5)
 Four real-time Iqeye 302w web cameras and weather proof enclosures- \$ 1,500 each = \$6,000 (see webcams below)

Pablo's Bare Bones Distance Education System using existing structures with power and Non-NPS Internet

One Medium Aluminum tripod	300.00		
One wireless router	60.00	Add Solar Power Station	\$ 2,700
One Network Switch	95.00	Add a small portable Quiet generator	\$ 1,000-\$2000
One pair point-to-point Radio panel antenna	2000.00	Add a web camera	\$ 100 -\$ 1,500
Network cable	100.00		\$ 4,800 +
Misc. hardware(clamps, bolts fittings)	200.00		
Two HyderLink planar antennae	100.00		
One laptop	1000.00		
One headset	25.00		
DV camcorder	225.00		
Firewire	25.00		
Camera tripod	50.00		
Power strip	15.00		
TOTAL	around	\$ 4,000	

Maxed Out - remotely located Distance Education System using existing structures and power at one relay station and at the Internet connection site. **Approximately \$20,000** is overestimate including 20% contingency.

Cabrillo Visibility Camera

Canon G7 digital camera	\$458.88
Canon G7 power	\$ 50.69
4GB CF card	\$ 62.99
USB over RJ45	\$ 48.99 (of the Soekris is not local)
Soekris mini computer net4801-60	\$290.00 (#10480161)
Power for Soekris computer_4801 power	\$ 15.00 (#31321215)
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	\$926.55

Mike Maki's Web Camera Solution (aka Cheap)

Hardware

- NSLU2 (~ \$50)
- Camera (\$0 - \$400)
- Flash Drive (\$5 - \$50)
- Wireless Access Point (~ \$50)

Operating System

- Flash firmware with Debian Linux.
- Simple script to run continuous
- image capture (gphoto2)
- <http://www.cyrius.com/debian/nslu2>

A camera housing, power, and Internet connectivity are also needed to make this a real-time web camera.

More resources:

Santa Margarita Ecological Reserve web page which details all of the hardware for each sensor station (Pablo's shopping list).

<http://fs.sdsu.edu/kf/remot2/hardware.php>

High Performance Wireless Research and Education Network

<http://hpwren.ucsd.edu>