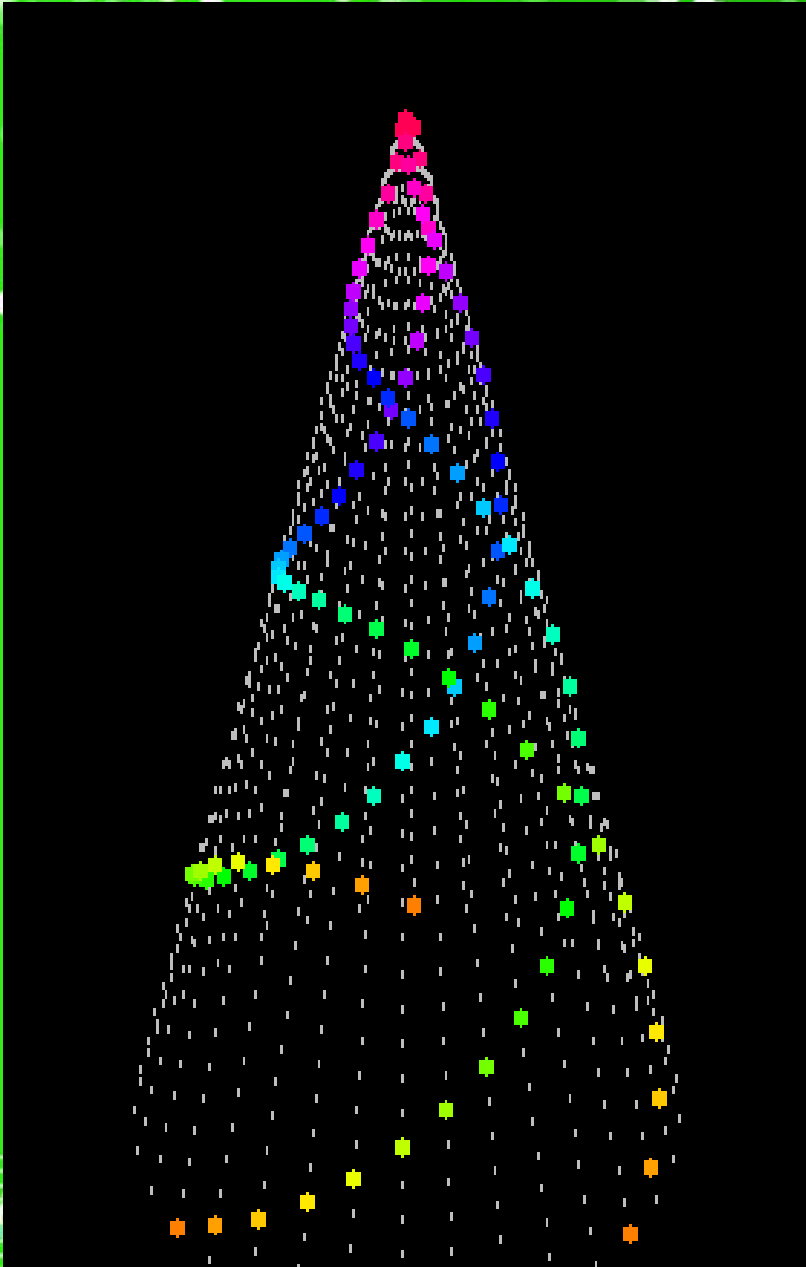# Pixel Trees

Tom Hammond
tominohio@gmail.com

www.itwinkle.org

Topics

- Why a pixel tree?
- Tree Styles
- Light Technology
- Planning
- Construction
- Challenges
- Maintenance

Overview

- Why a Pixel Tree?

Why a Pixel Tree?

- Centerpiece of the entire show

- Easy to program effects

  – Matrix-like display perfect for animations, videos, and text

- Leads show for other props. to follow

- "Natural" addition to a yard

- Can be easy to build

Joe

Jeffrey

Joel

Tree Styles

Tree Styles

- 360 degree (denser lights, more power, more expense, light interference)

- 180 degree (good viewing angle)

- Flat (high density, easier to build, good for animations)

- Spiral (easy to build)

- Existing real/artificial tree (good daytime prop., natural look)

Robert

Light Technology

- Light Technology
- Light Packaging
- Controllers

Light Technology

- WS2811 (digital control)

  - Most common

  - Data line, power, ground

- RGB (analog control)

  - 1 power, 3 grounds

  - Uses relays

- Incandescent

  - Uses relays, inexpensive, still nice

Light Packaging

- Bullet

- Pixabulb

- Strips

- Multi-pixel packages & square

- 100% bright is not recommended

Controllers

- Alphapix, CMB24, Falcon, LOR, PixLite, Raspberry Pi, SanDevices

- Resale value?

- Forum help?

- Local community help?

- Easily available to buy?

- Cross-vendor hardware compatibility?

- Comparison webpage: www.nutcracker123.com/nutcracker/rgb_controllers

- Use wired Ethernet instead of wireless (many pixels)

Planning

- Size
- Skill Level
- Cost
- Materials

Size

- 74% are 10 feet or taller
  - Difficult to build, erect, and power
- 17% are 6-10 feet
  - Easier to build & erect (can use a ladder!)
- 9% under six feet
  - Easiest to build
  - Multiple trees
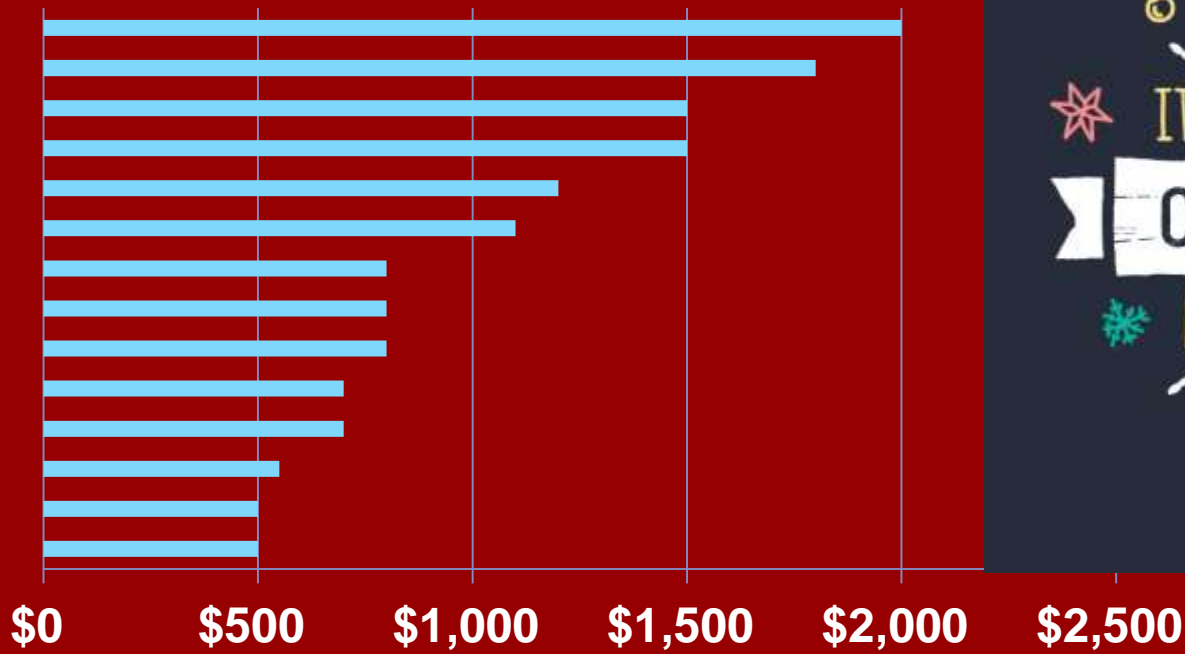 - Complement larger trees & props

Skill Level

- <u>Any</u> tree size can be easy/moderate/difficult to build, choose your method wisely!

- Consider buying a kit tree or used tree to save time

Easy   **Moderate**   **Difficult**
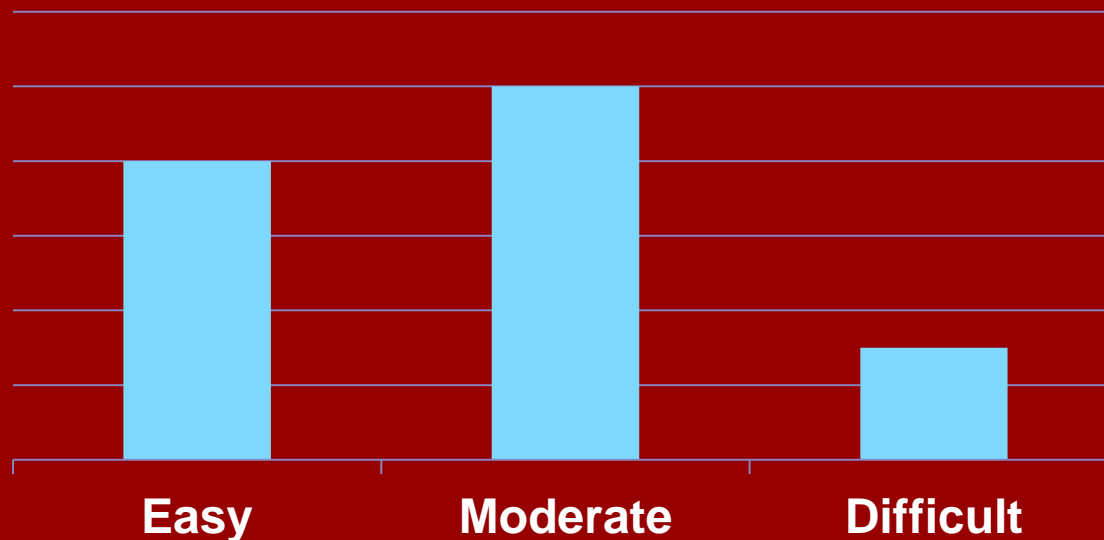
Cost

- Average pixel tree cost: $1,032

$0 $500 $1,000 $1,500 $2,000 $2,500

Where To Buy Materials

- Structural

  – Lowe's, Menards, Home Depot, Harbor Freight, Northern Tool, Auto Zone, local hardware stores, local plumbing stores, steel yards, local welding companies, Craig's List

- Lights and Props

  – diyledexpress.com, christmaslightshow.com, aliexpress (Ray Wu, Paul Zhang), Amazon, eBay, Holiday Coro, Boscoyo Studios
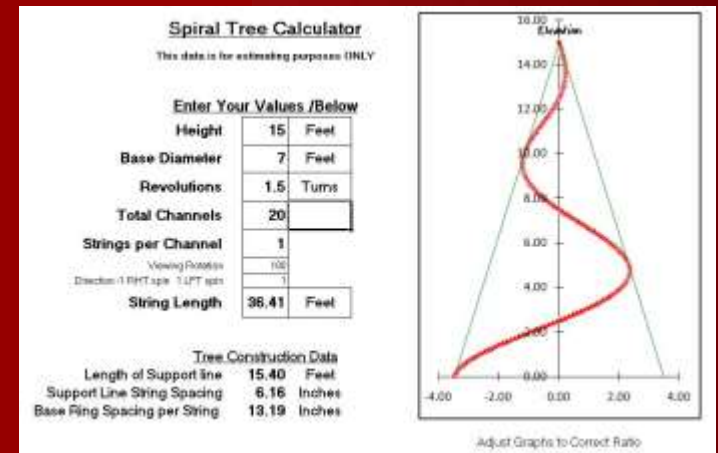
It's SEPTEMBER!

BOSCOYO STUDIO.COM

Construction

- Planning
- Structural Support
- Electronics

Planning

- Dimensions

- Number of strings

  - Max pixels per string, cutting strings, strings & strands

- Calculators

  - Mega Tree Calculator & Simulator
    Helps plan your mega tree, calculates power usage and many more important calculations

  - www.altoonalights.com/mega/mega_calc.php

- Pixel spacing vs. distance from viewer

Spiral Tree Calculator
This data is for estimating purposes ONLY

Enter Your Values /Below

Height	15	Feet
Base Diameter	7	Feet
Revolutions	1.5	Turns
Total Channels	20	
Strings per Channel	1	
Viewing Rotation	n/a	
Direction -1 RHT spin 1 LFT spin	1	
String Length	36.41	Feet

Tree Construction Data

Length of Support line	15.40	Feet
Support Line String Spacing	6.16	Inches
Base Ring Spacing per String	13.19	Inches

Adjust Graphs to Correct Ratio

Structural Support: Base

- Hole methods:

  - Existing flag pole hole

  - Portable hole

  - Concreted hole with metal sleeve

- Other methods:

  - Trampoline base

  - Snow fence stakes attached to artificial trees or pole (for smaller trees)

Structural Support: Pole Styles

- No pole: Tree hangs off the house

- ASAP (A Strap and Pole)

  – Telescopic pole designed to lift support & maintain tension on trees

  – In action video: tinyurl.com/asappole

  – How to build: tinyurl.com/asappole2

- Black iron pipe or muffler pipe

  – Coupled in the middle

- Wind is brutal! Never skimp on pole thickness & diameter
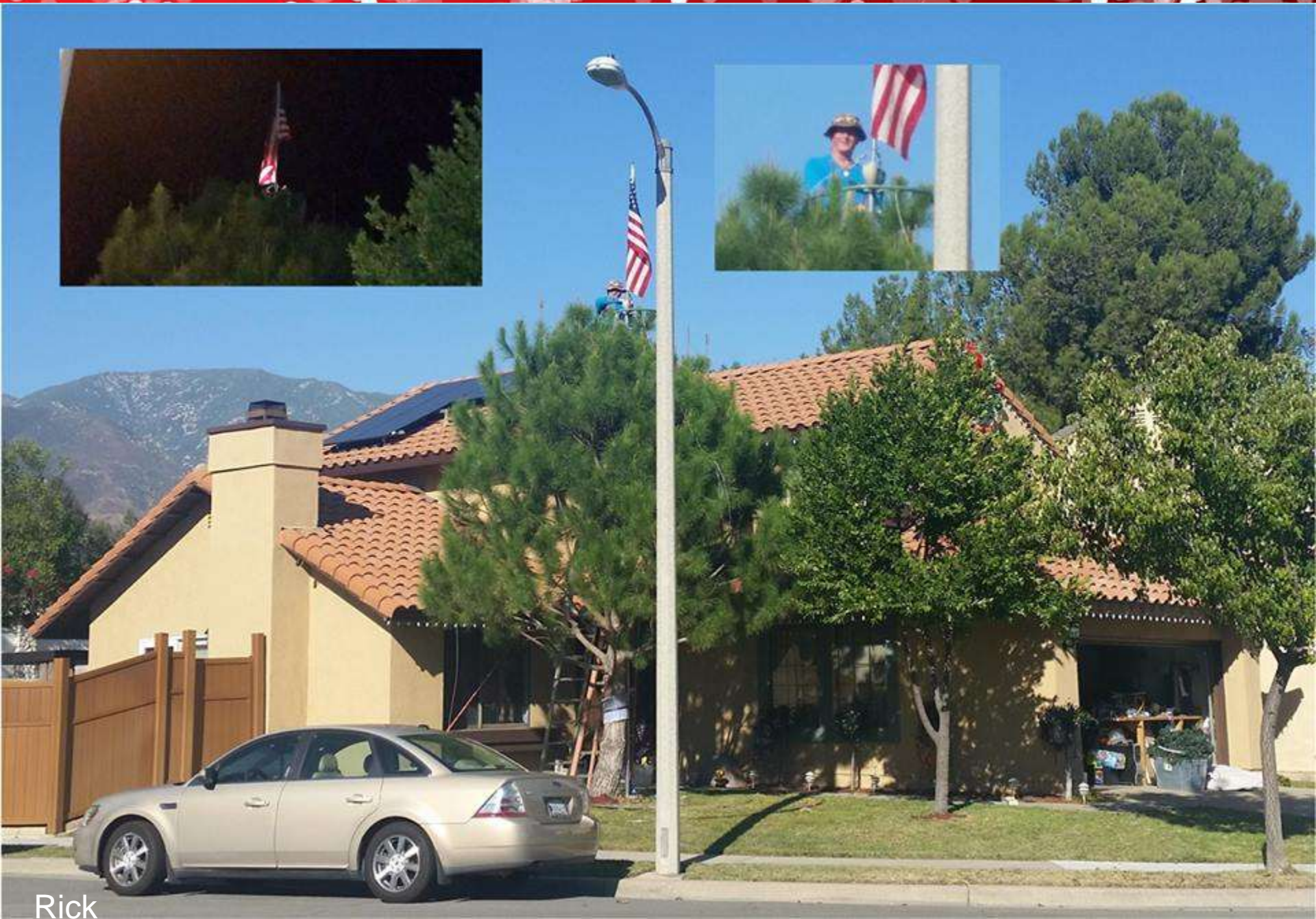
Todd

Structural Support: Raising the Pole

- ASAP pole

  - Attach lights to top of pole

  - Raise pole with ratchet

  - Lights anchored to ring at bottom with bungee cords

- Regular pole

  - Lay pole on ground, attach pole sections

  - Attach star and anchoring hardware

 - Raise pole, then attach light strips

Rick

Structural Support: Tightening Methods

- Ratchet strips / tie-down straps

- Guy wires

- Concrete and anchor bolts

- Bungie cords

Electronics: Attaching Lights

- Light Mounting methods

  - Boscoyo strips (most popular)

    - Pixel spacing vs. power & cost

  - Pixnode nets (for flat trees)

- Frame methods

  - Galvanized steel conduit (rigid)

  - Rings (suspended) with rope strung between them. Lights entwined along rope.

  - Boscoyo strips with crossbars for support (flexible)
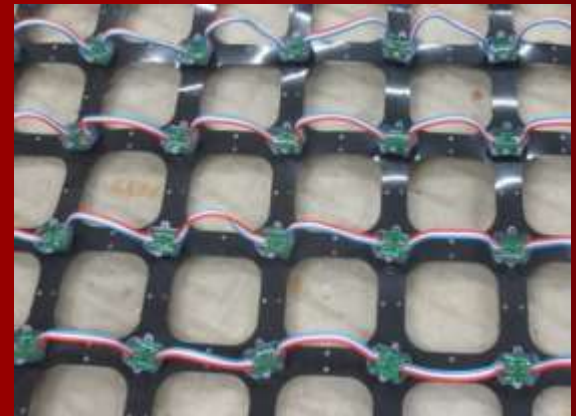
Robert

Cathy

Electronics: Weatherproofing

- Heatshrink
  - Marine grade
- Hot glue
- Dielectric grease
- Silicon caulking
  - Neutral cure!
- Liquid electrical tape
- 3- or 4-conductor pigtails
- Automotive/trailer connectors

Electronics: Enclosures

- Cable Guard
    - CG 1500
- Terminal Access
    - TA 200
- Ammo boxes with wire nuts
- DriBox
- Other enclosure ideas?

Challenges

- Erecting
- Other Challenges
- Ideas for Next Time

Erecting

- Pole weight
  - How to lift a non-ratcheting pole
  - Cross bar at top with pulleys to lift tree
- Base weight
  - Portable bases up to 150 lb.
- Pole height
  - How to reach top (ladder, lift)
- Keeping it straight
  - Tensioning with ratchet straps makes this difficult

Graeme

Mike

Other Challenges

- Storage
  - Can it be easily disassembled?
  - Does it collapse?
- Power considerations
  - Lots of lights, lots of power
  - Power injection
- Controller considerations
  - Lots of lights, lots of channels
  - Controller at base of tree to avoid long data runs

START HERE
HolidayCord.com/AlphaPix

5V

5V

Gary

Ideas for Next Time

- "I Should Have..."

  - Planned better for the wind

  - Made it taller

  - Used a portable hole

  - Not bothered with pipe, just bare pixel strips

  - Rented a lift

  - Used more lights and/or vertical strips

Storage

Gary

Storage

- Locations

  - Garage

    - Stand tree upright

    - Hang poles from wall brackets or from ceiling

  - Storage shed, basement, under or along house

- Lights storage

  - Pixel strips rolled up on a shelf

  - Lights/strips wrapped on reels, stored in tubs

  - Hang strips vertically or stuffed into PVC pipe

Support

- Facebook support groups

Facebook Groups

- Advanced RGB and Pixels 101

- FPP, Falcon Player

- Official xLights Support Group

- Buy/Sell Christmas Lighting

- Advanced RGB Pixels and Controllers

- LUO Café