Building a Micro Observatory

By: Jim Thompson

Presented: RASC Ottawa

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Overview

- WHY did I build it?
- WHERE did I build it?
- HOW did I build it?
- WHAT worked and what didn’t?

My Setup Before

Mallincam Xtreme

Orion Atlas
Mounted
8” + 80mm
(2011)

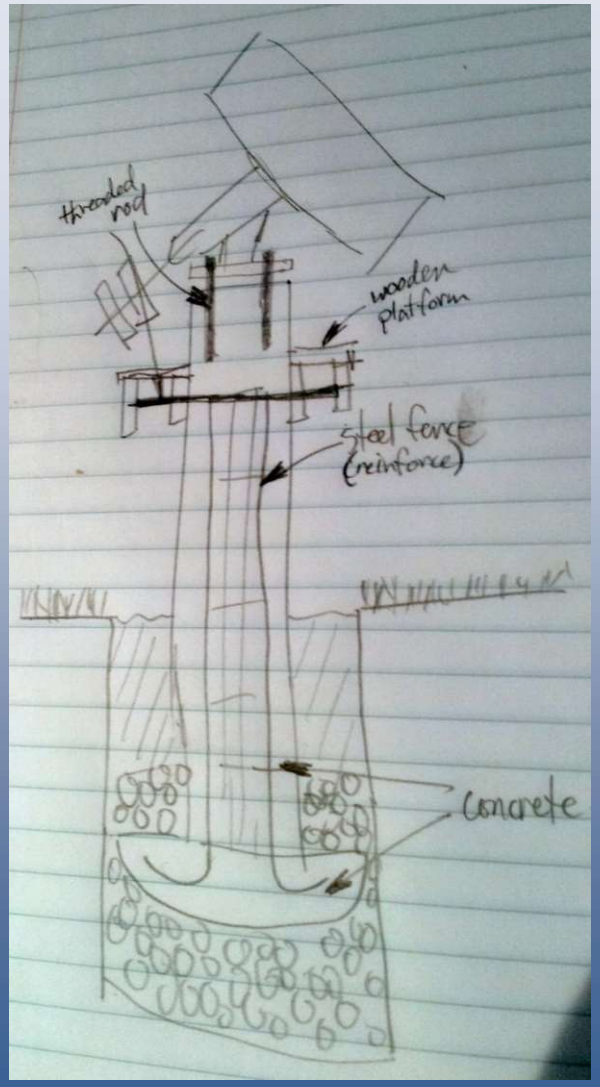
WHY?

- Work full-time + 2 kids = not a lot of spare time to observe
- Majority of observing from backyard
- Scope setup/tear-down eats into observation time (30 – 45min)
- Yard space a premium – need to make as small as possible

My Backyard

WHERE?

- Backyard has good view to East & South, no view North & West
- Houses, porch lights, & tall trees to contend with
- Maintain view of Polaris (polar alignment)
- Minimize impact on yard



HOW?

- Small footprint + stability = concrete pier w/ cantilevered table
- All components readily available at Home Depot
- Did everything myself, except mount adapter plate (see later)
- Built in phases, as time permitted

Dig A Hole

Start Date: July 19, 2014

all hard packed clay (ugg!)

final hole: 24” diam x 4’ deep

Put Something Into Hole 1

form wire mesh

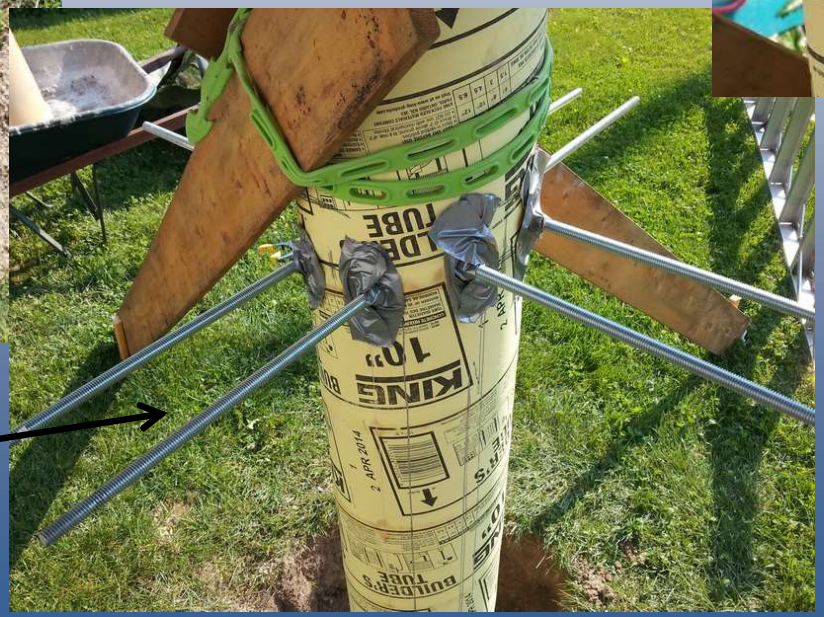
8” concrete base, support while setting

6” drainage gravel

high strength concrete

Put Something Into Hole 2

24hrs later, add Sonatube, backfill w/ gravel, then dirt leaving room for sod



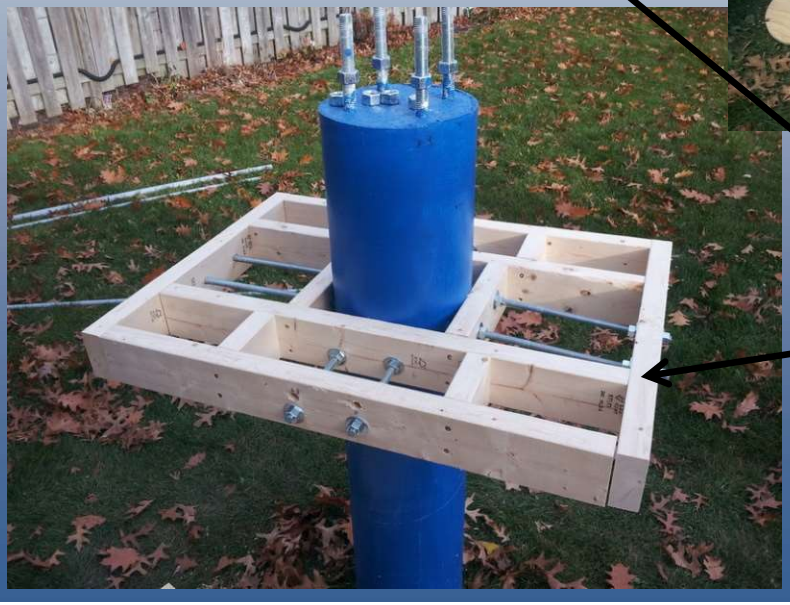
use wooden template to hold mount bolts (3/4” threaded rod), orientation wrt North important!

locate & insert ½” threaded rod, seal with tape, plumb tube & brace securely

FILL’R UP!

Trim Bits Off/Add Bits On

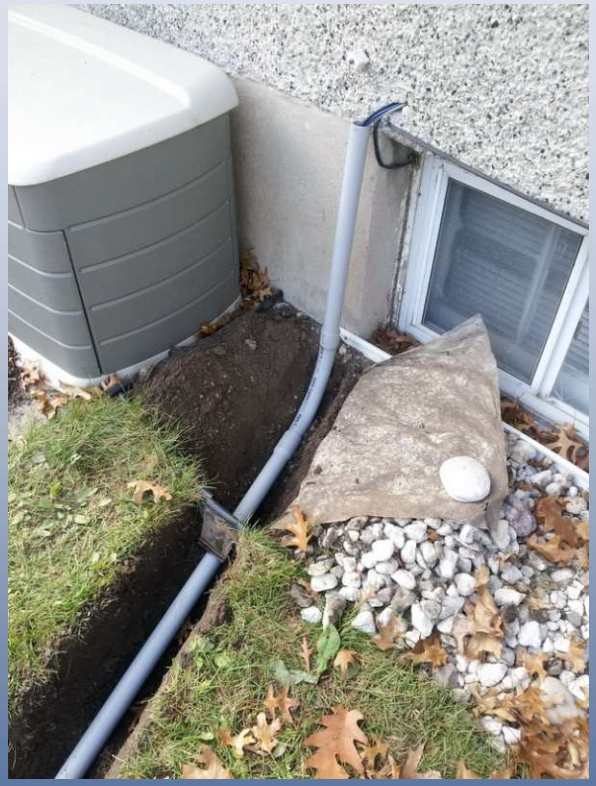
trim & paint Sonatube

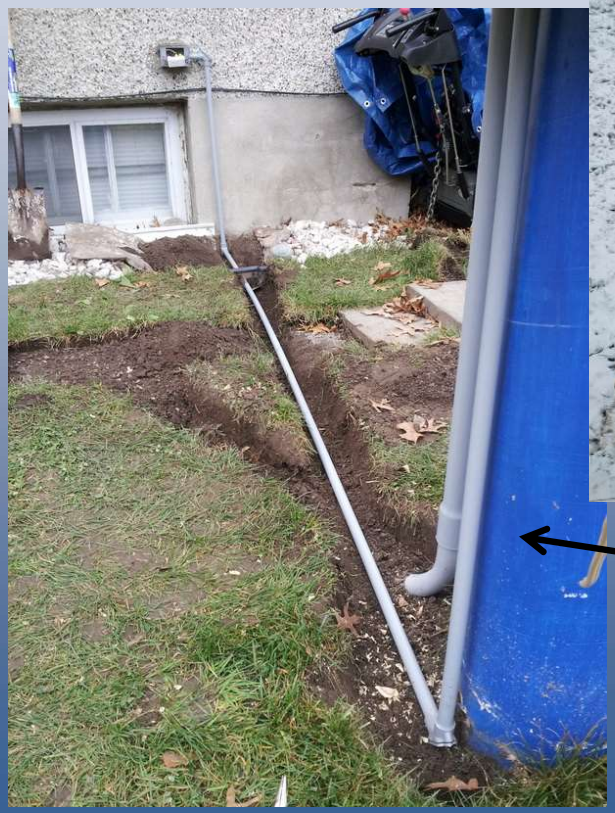


layout platform in advance, assemble on pier c/w plywood top

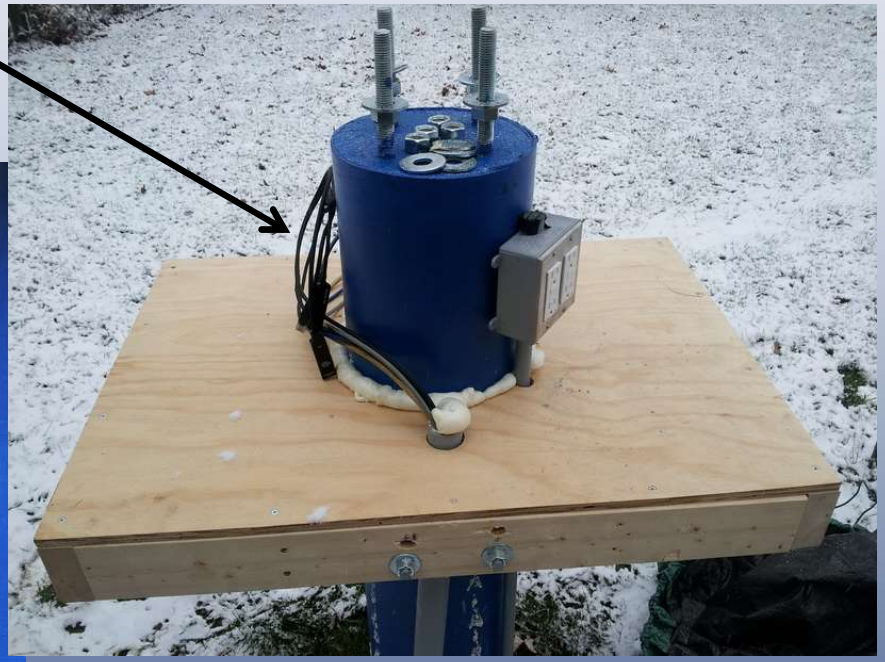
Phase 2: Nov. 2014

Dig A Trench/Lay Cables





2 x GFCI receptacles, seal holes with foam



2 x trenches: data cables & power in separate conduits

(2 x USB, Svideo, Composite, Serial, 2 x Cat6; 2x12ga AC)

Give’r A Go

machinist at work built adapter from wooden prototype

First Light: Dec. 7, 2014

Time For An Upgrade

Skywatcher EQ8-R Pro
Dec. 2019
(Merry Christmas to me!)

SWEET!

Into The Doghouse

lightweight spruce & aluminum frame, house wrap + PT fence board exterior

Finished: June 2020

WHAT Worked?

- Properly aligned GEM = rich creamy observing goodness (tracking + GOTO's)
- Telescopes already at ambient – no cooldown
- Doghouse kind-of ugly but works very well
- Set-up/tear-down time ~5-10min
  - Hook up laptop, cameras, power on, one-star align, focus…ready to go!

WHAT Didn't Work?

- Hand dug hole – laborious & limited depth
  - rental post hole digger would have been better
- Hand mixing concrete – laborious
  - rental electric mixer would have been easier
- Using tarp was "ok" but pushing my luck
- Tried wireless originally – not reliable
  - wireless may be better now
- Doghouse bottom a slight obstruction

Last Words

- Low cost (pier $200, cabling $200, doghouse $300)
- Very happy with final result
- Don’t give second thought to 15-20 minute observing sessions since so fast to open/close

TAKE THAT CLOUDS!