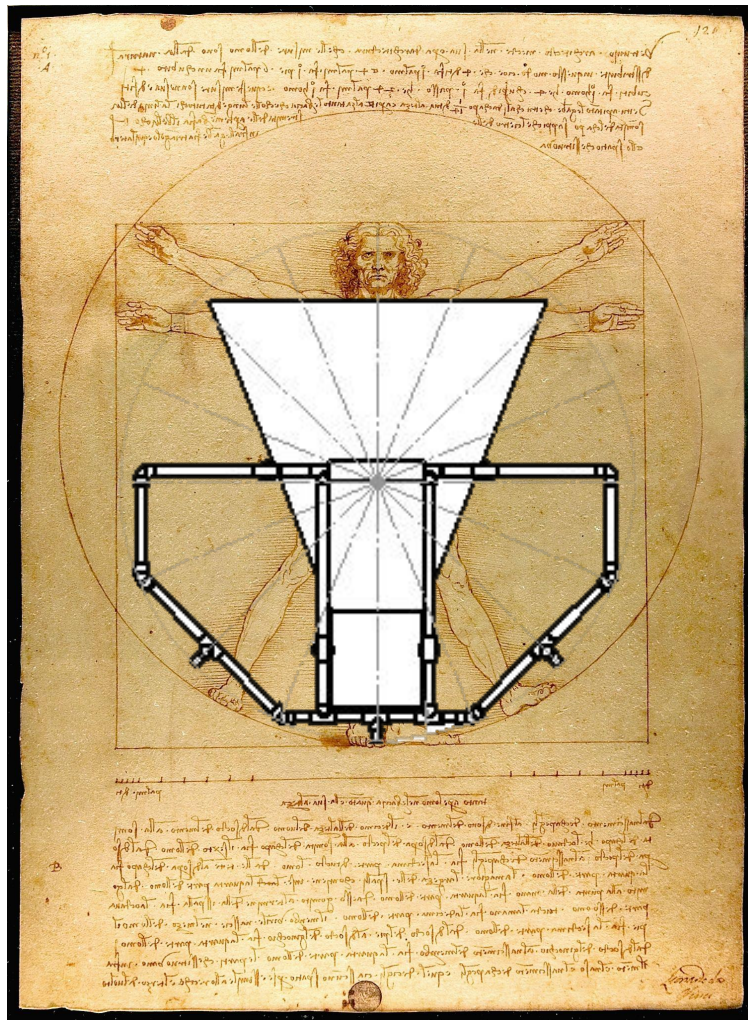




Rocking Horse Antenna Pointing for CHART Horn Joe DuBois 12/3/25

Project Overview

Design and fabricate a pointing system for CHART

- Must follow the spirit of CHART
 - inexpensive
 - doable in class by a high school teacher
 - achievable in a weekend

Requirements

Follow the spirit of CHART

- inexpensive
 - less than \$100
- doable by a high school teacher
 - no specialty tools or equipment required
- achievable in an afternoon

Provide pointing of the metal chart antenna

- vague requirement, since the beam FWHM is $\sim 20^\circ$,
- 22.5° was chosen

Options Considered

Concept	Pros	Cons
Antenna Rotator	Easy-ish, Reliable, Tracks position	commercial: amatuer: Yaesu G5500 \$800
DIY Rotator	Tracks position, cool	Difficult, \$\$, Risky
Tipsy Mount - Isaac Smith	Very Simple and low cost	May be difficult to set angle
Rocking Horse	Very Simple, Has angle settings	Slightly more cost than Tipsy

Available Rotators



Commercial \$2000+



Amateur \$1000

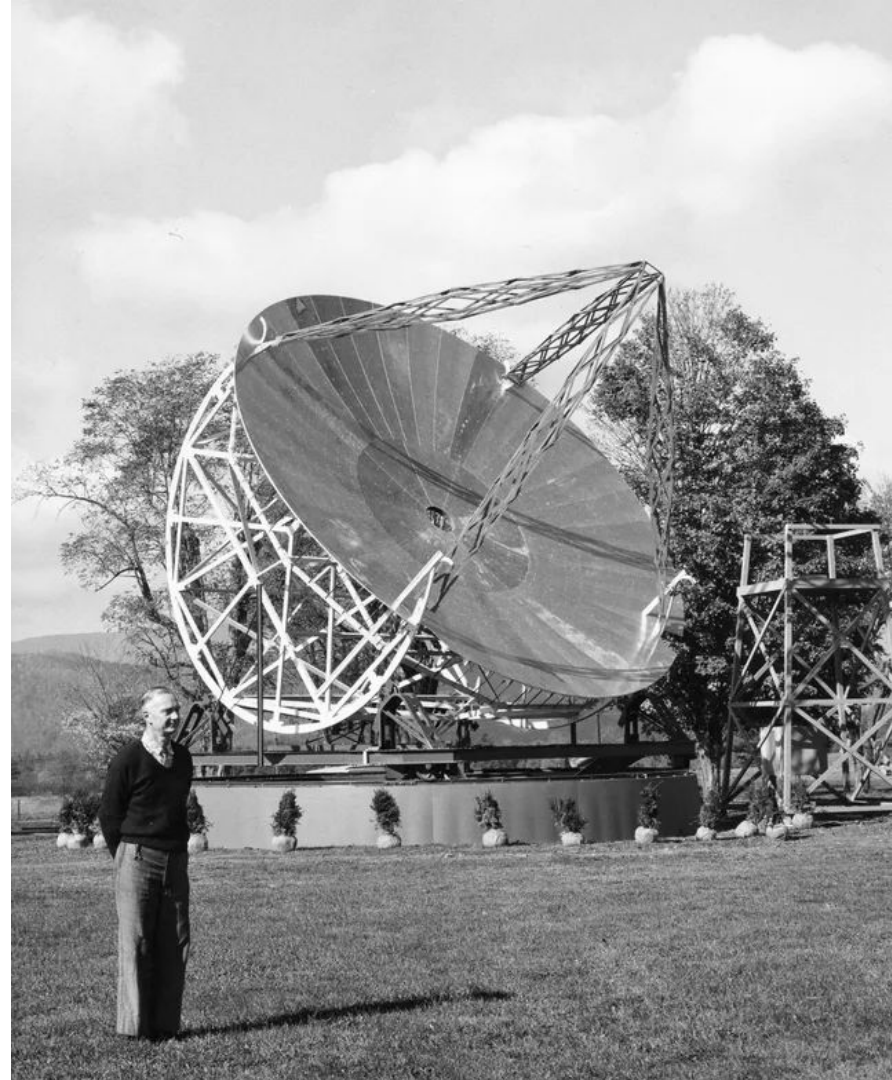


DIY \$350
and many hours

What About This Guy?

Grote Reber back in 1937

Maybe we can tip our hats to Grote





Chosen Concept - Rocking Chair

Inexpensive:

- built from PVC pipe and fitting from Home Depot

Accurate Pointing by design

- The antenna is stable at any selected pointing
- 11, 34, 56, 79 deg elevation with standard option
- 0, 22.5, 45, 67.5 deg elevation with extended option
- Any azimuth is available

Does not require power

Cost

Materials: <\$50

$\frac{3}{4}$ " Tees = $24 * \$0.79 = \15

$\frac{3}{4}$ " 45° Fit = $8 * \$1.36 = \11

$\frac{3}{4}$ " PVC pipe = $30\text{ft} * \$5.25 = \16

Pool Noodles = $2 * \$3.00 = \6

Tools: \$15-\$25

PVC Pipe Cutter = \$15

Yard Stick = \$2

Sharpie = \$3

Scissors or Knife for Noodle = \$3

Pipe Cut List

4x Top Maxi - 12"

4x Top Mini - 4 $\frac{1}{8}$ "

4x Vert Out - 10"

4x Vert Maxi - 17 $\frac{1}{2}$ "

4x Vert Mini - 6"

8x Slant - 9 $\frac{3}{8}$ "

4x Bottom Mini - 3 $\frac{1}{4}$ "

2x Center Top - 10 $\frac{1}{2}$ "

4x Center Bot - 4 $\frac{3}{4}$ "

4x Spreader - 16 $\frac{1}{2}$ "

10x Foot - 2.2"

Level of Effort

Conceptualization - 10 hours

Design - 4 hours

Construction - 4 hours the first time, 2 hours with instructions

Documentation - 4 hours

Sourcing Materials - 2.5 hours (3 trips to Home Depot)



Position Test



11°



34°



56°



0°



23°



45°



68°

Does It Meet Requirements? YES!

Follow the spirit of CHART

- inexpensive
 - less than \$100
- doable by a high school teacher
 - no specialty tools or equipment required
- achievable in an afternoon

Provide pointing of the metal chart antenna

- vague requirement
- 22.5° was chosen

Performance

- inexpensive (exceeds req.)
 - \$50 mat. + \$25 tools
- doable by a high school teach
 - tools are like scissors
- achievable in an afternoon
 - 2-3 hour build time

Provide pointing

- 22.5° standard
- 11.25° achievable

*this concept was designed for a metal horn. The lighter cardboard horns will need a slight re-design, or balance weights.

Questions?

Don't use screws as feet, they suck.

