

The "Canadian Tire" 6M Quad

6M on the cheap!



A project by John Romanec (VE4VJR) and Jessy Blanchette (VE4JBB)

The dream, the objective

Cheap

Light and portable

Local parts (nothing exotic)

3D Printed Components (its accessible)

A quad? Heck why not :)

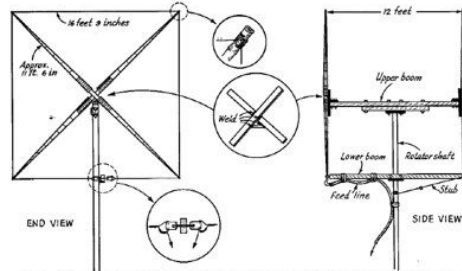
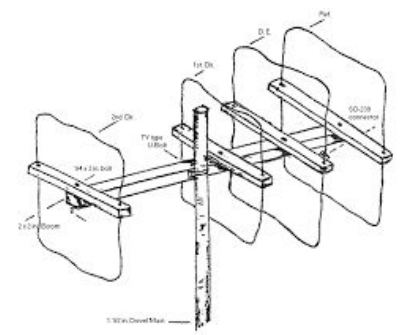
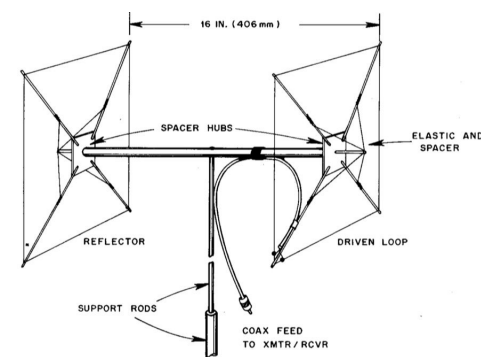
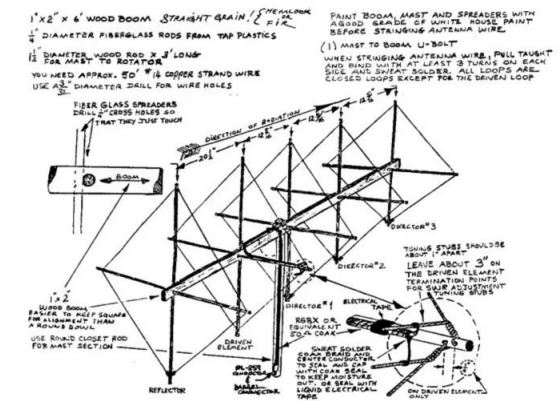


Fig. 3 - End and side views of 20-meter quad. Upper inset shows method of fastening antenna wire to support arms. Center inset shows construction of support-arm mounting bracket. Lower inset shows method of attaching feed line and stub to the center insulators. Two small egg insulators are used, fastened to end of lower boom as shown with a small nail.



The Sandbox (Modelling with MMANA-GAL)

50.250 Mhz target frequency

Basic 3 EL design. (calculators are online for starting)

7' Boom Length (easy to find parts)

3 EL reduces impedance from 100 to 36 ohms

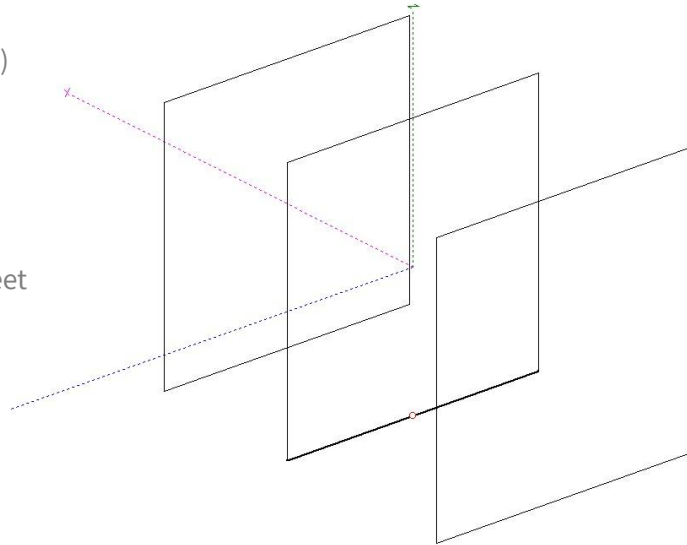
Reflector EL 1.58M across -- diagonal just under 8 feet
(woo hoos!)

Driven EL 1.539M (5'-5/8")

Reflector 1.577M (5'-2-1/8")

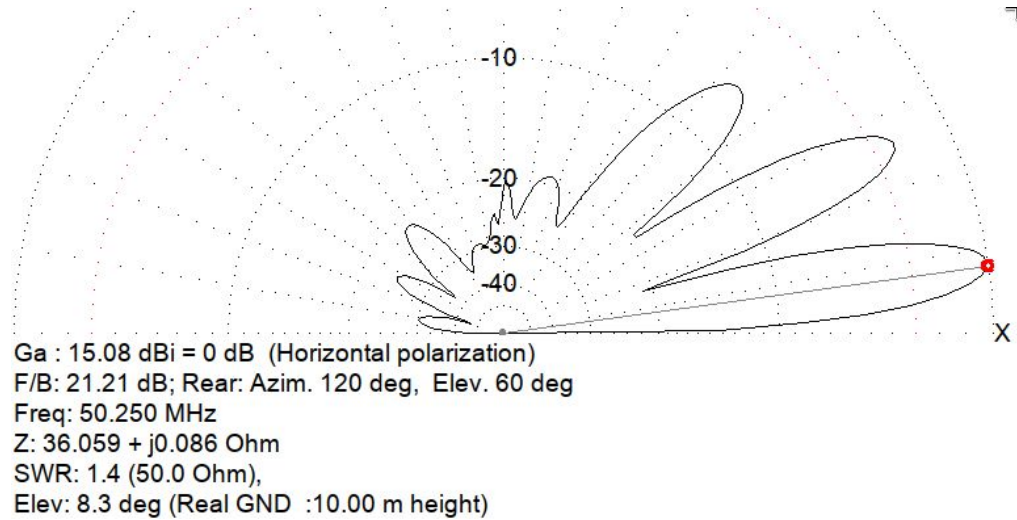
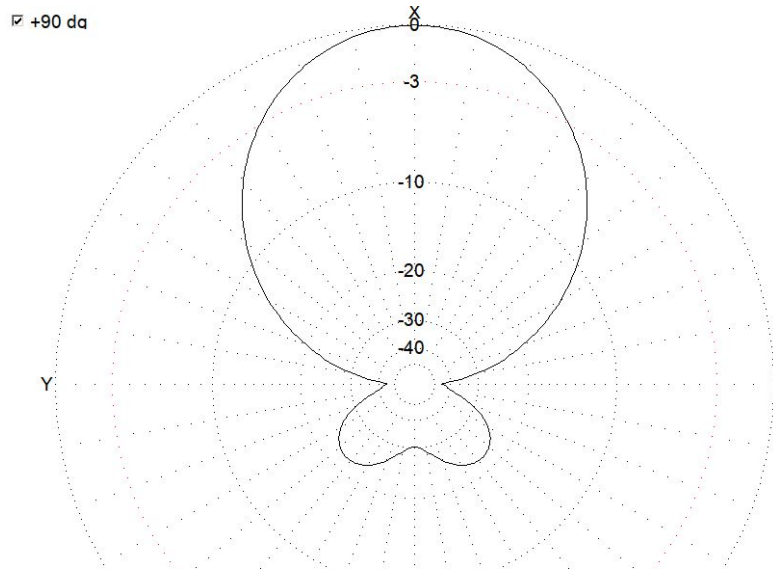
Director 1.493M (4'-10-3/4")

(per side 1/4 wave)



```
Wire No.1
X1 : 0.0 m
Y1 : -0.769 m
Z1 : -0.769 m
X2 : 0.0 m
Y2 : 0.769 m
Z2 : -0.769 m
R : 0.8 mm
Length : 1.539 m
Azim. : 90.0 deg
Zenith : 0.0 deg
```

Performance Models



Shopping List

12x 4 foot driveway markers [*Canadian Tire \$2.99 each*]

1x 7 foot $\frac{3}{4}$ " aluminum pipe(boom) [*Metal Supermarket \$19.31*]

3x 1- $\frac{1}{4}$ " hose clamps (element hubs) [*Canadian Tire < \$2*]

70 feet of 17 gauge aluminum fence wire (elements) but any antenna wire should do.

PETG plastic filament (hubs and spreader clamps)



Printed Parts

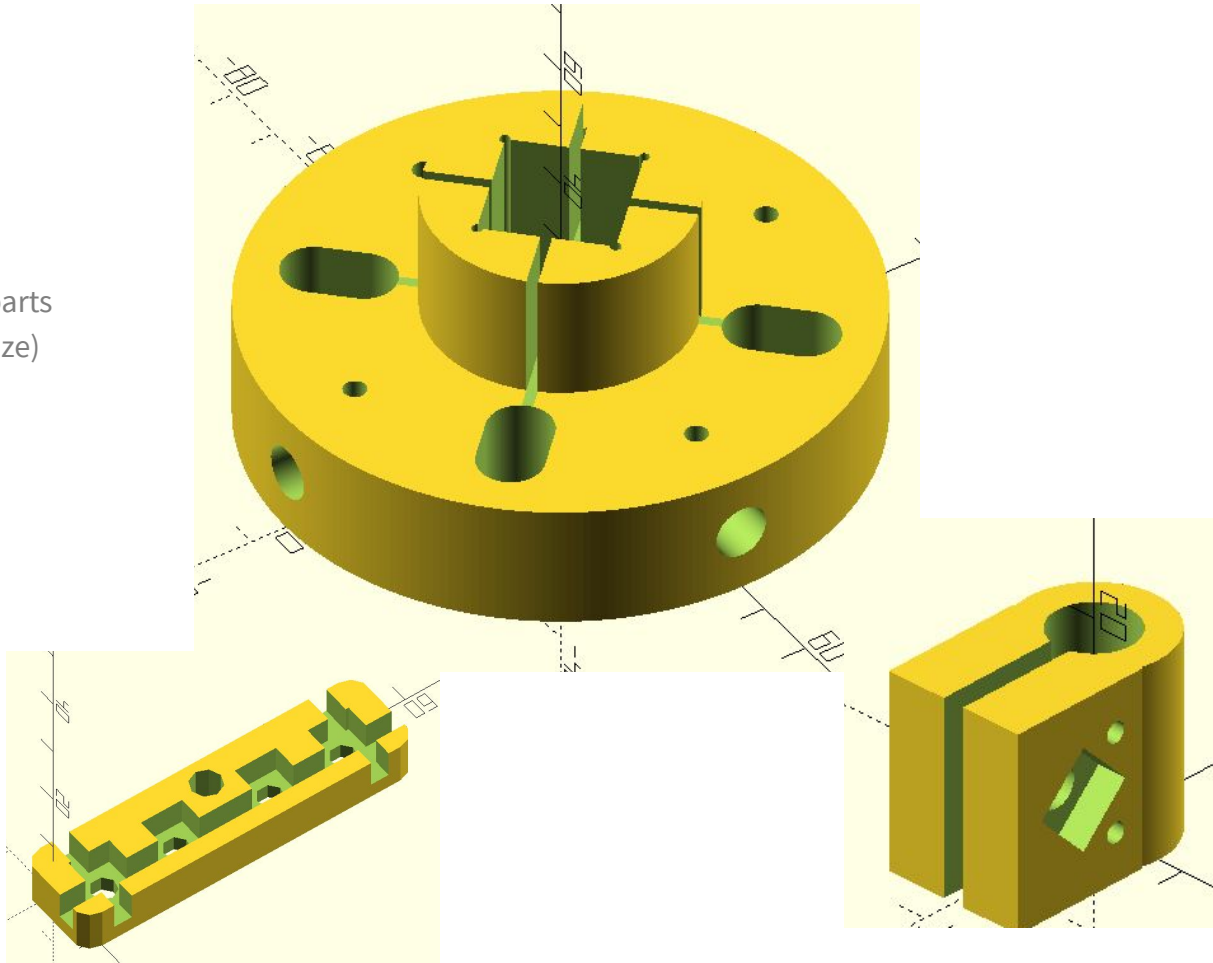
Custom designed with sourced parts
(spreader diameter and boom size)

Two basic core part designs

3x Hubs

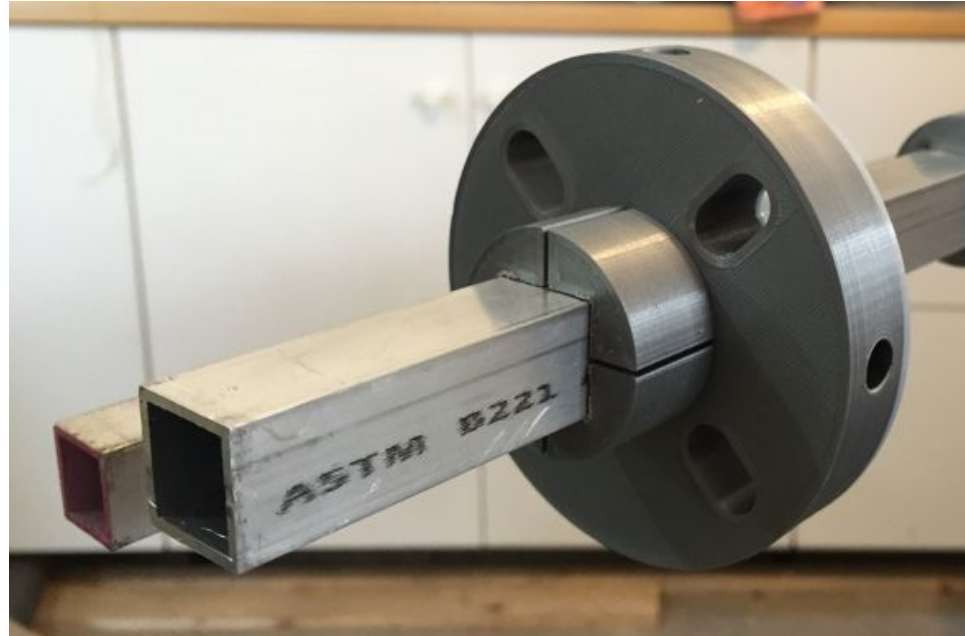
12x Spreader Clamps

Element Feedpoint/Adjusters



Printed Parts

A few design iterations for proper fitment.

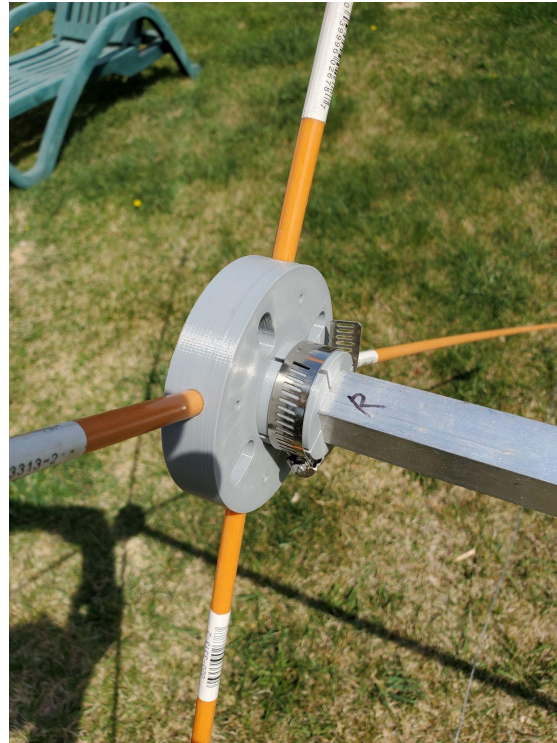


(test fit on boom material)

Assembly

Each element uses adjustable spreaders
(zero cutting)

Elements are assembled, slid onto boom
and hose clamped.



(spreader hub)

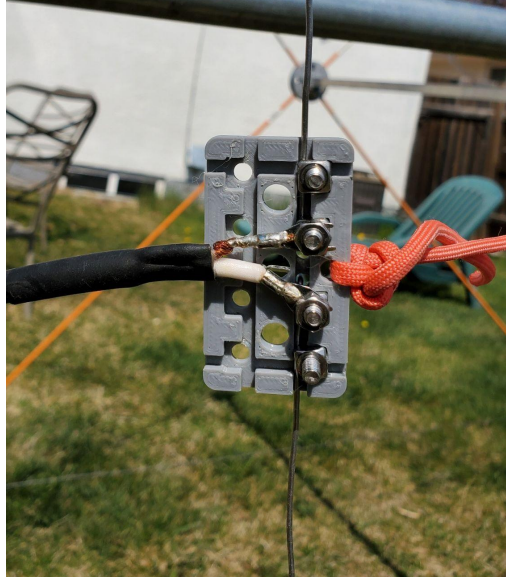


(adjustable element mount)

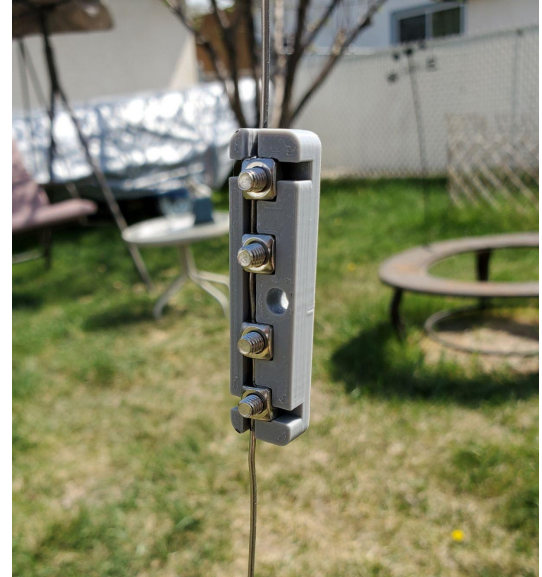
Assembly

Each element has adjustable feedpoint blocks

VNA to measure/tune elements
(individually and together -reflector /
director opened)



(feedpoint)



(reflector director splice)

Assembly

Hairpin match (simplest)



(hairpin on feedpoint)

Assembly

Ugly balun (simplest) - 3" loops

Spreader clamps tensioned slightly to bow elements.

Attach the antenna boom to the mast however works for you



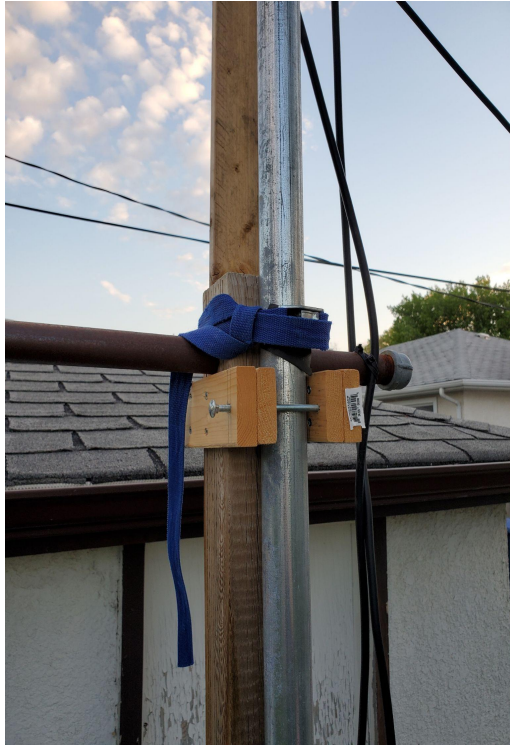
Deployment

Solo “Walk up” 20’ mast (no guys on demand of XYL therefore limited to 20’)

Armstrong™ rotator (rubber palmed work glove huge help)



(base tilt)



(secured / bolt)



(20 feet up)

Deployment

Easily walked up or down

Popup or chain link top rail

12' x 4" x 4" fence post (4' in ground)



(base tilt)



(OM Power)

Setbacks... Nothing is perfect

8 foot drop cracked the hubs (Everything else was ok)

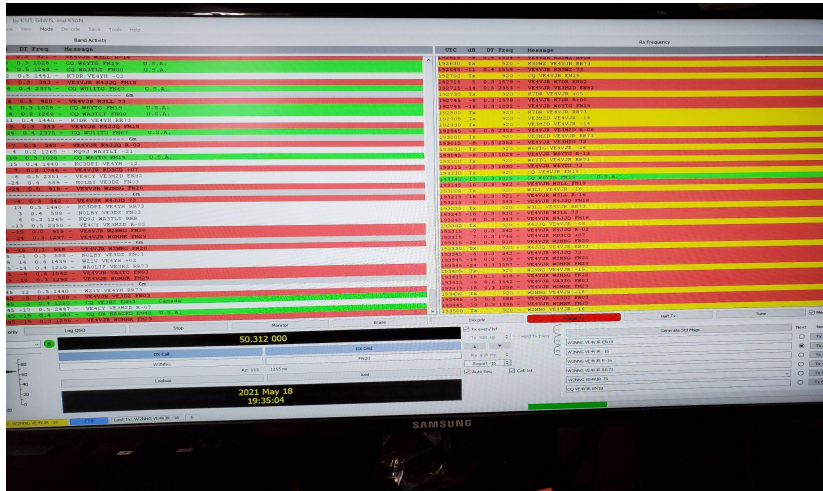
Aluminum wire is cheap and light but difficult to work with.



On Air Performance

K7EMX (UT) CW Beacon F/B measurement =
~3 S units (~18 db)

FT8 (NA and EU) during an opening



(FT8)



(front to back)

Future Possibilities... Tweaks

Interlaced 2M elements (with way more elements)

Dual horizontal and vertical polarization feedpoint options

Gamma match (we tried)

Foldable spreaders (portability)

Use copper wire

It's Alive

Questions, Comments?

