

Co-linear Array

Omni-directional with gain

Receiving 10 Watt data at

140 Km

KC2MAZ (VE3WIO)

The Array

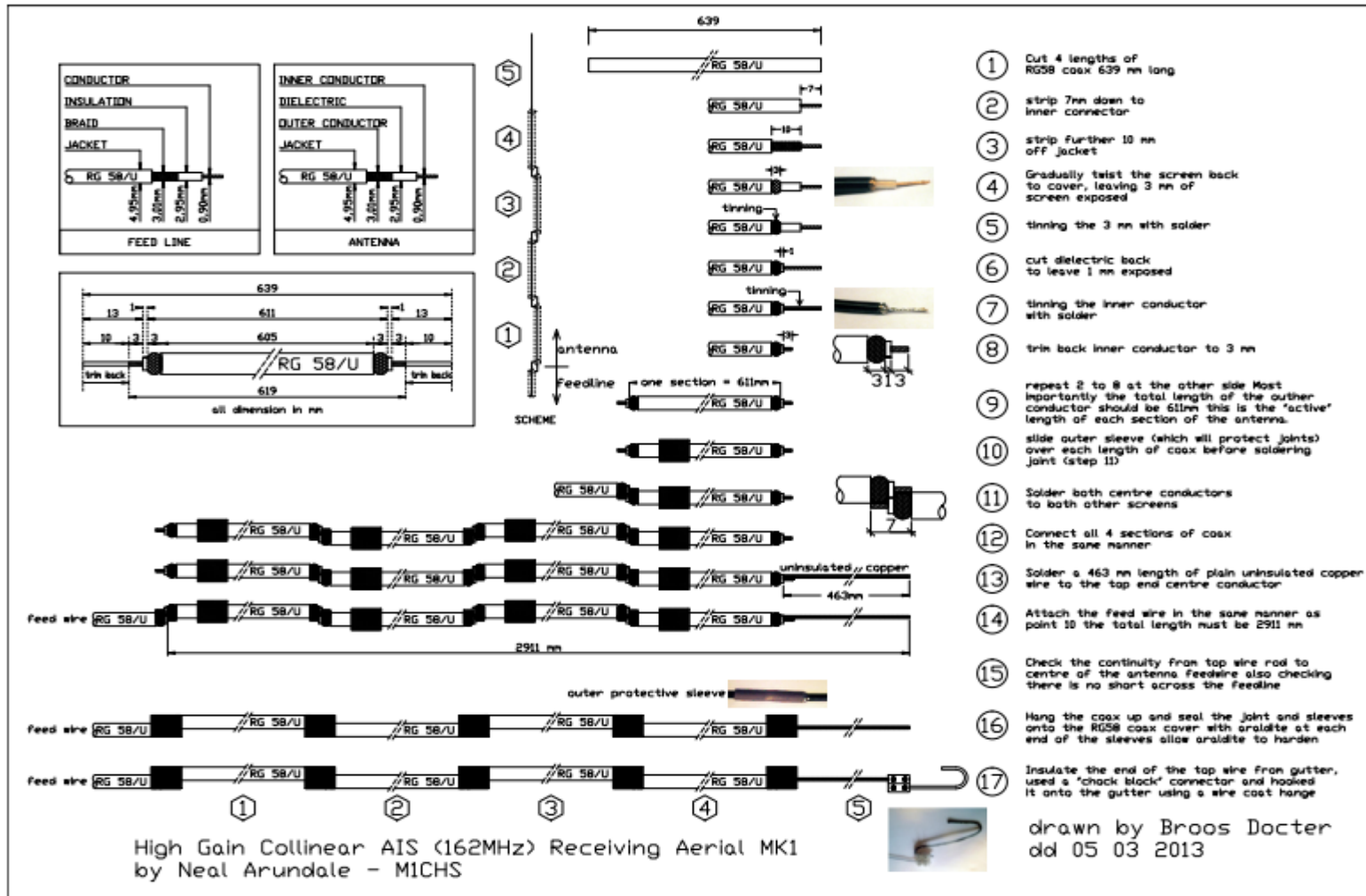
- Multi-element
 - Vertical
 - Coax elements
 - Mix inner-shield
 - Cut for 161 Mhz (1.86 meters)
 - Typical
 - 3db 3 element 1.6 m
 - 6db 5 element 2.91 m
 - 9db 9 element 5.4 m

Velocity Factor

- The speed of radio signals in a [vacuum](#), for example, is the [speed of light](#), and so the velocity factor of a radio wave in a vacuum is unity, or 100%. In electrical cables, the velocity factor mainly depends on the insulating material
- VF % Transmission
 - 95-99% [Open-wire "Ladder" Line](#)
 - 85% LMR 240 & 400
 - 82% RG-8X Belden 9258 [coaxial cable](#) (foamed polyethylene dielectric)
 - 66% RG-213 RG 58 [coaxial cable](#) (solid polyethylene dielectric)
- To determine the proper length of coax, use the following formula:

$$\text{length}_{\text{ (in Meters) }} = (300/F) * VF \quad VF = \text{Velocity Factor}$$

Construction of 5 element



Design considerations

- Type of Coax
 - RG 58G
 - Velocity factor, 65%
- # of elements
 - 9, 5.4 meters high
- Mount
 - $\frac{3}{4}$ " CPVC
 - 3 mounts coupled to 1 $\frac{1}{2}$ " ABS, 1 meter off tower
 - Top approx 13 meters
 - LINEAR IN LINE.....

Mounting But Linear!!!!



AIS

- An APRS type system required for commercial vessels and used by some recreational vessels
 - Speed, direction
 - Lat, long, destination,
 - MMSI # (world wide registration) SOLAS
- Packet, GSM type scheme, below voice, ch 81, ch 82 on Marine band Comar 350 receiver

Lessons learned

- Velocity factor
- Linear means in line
- Use at least RG 213 or better LMR400 as feed
- Easily converted to 2 meters
- Marine traffic www.marinetraffic.com/en/
- [Antenna](#) details