



Radio Transmitting antenna orientation 11/11/24

The antenna is mounted on the pole next to the yard office.

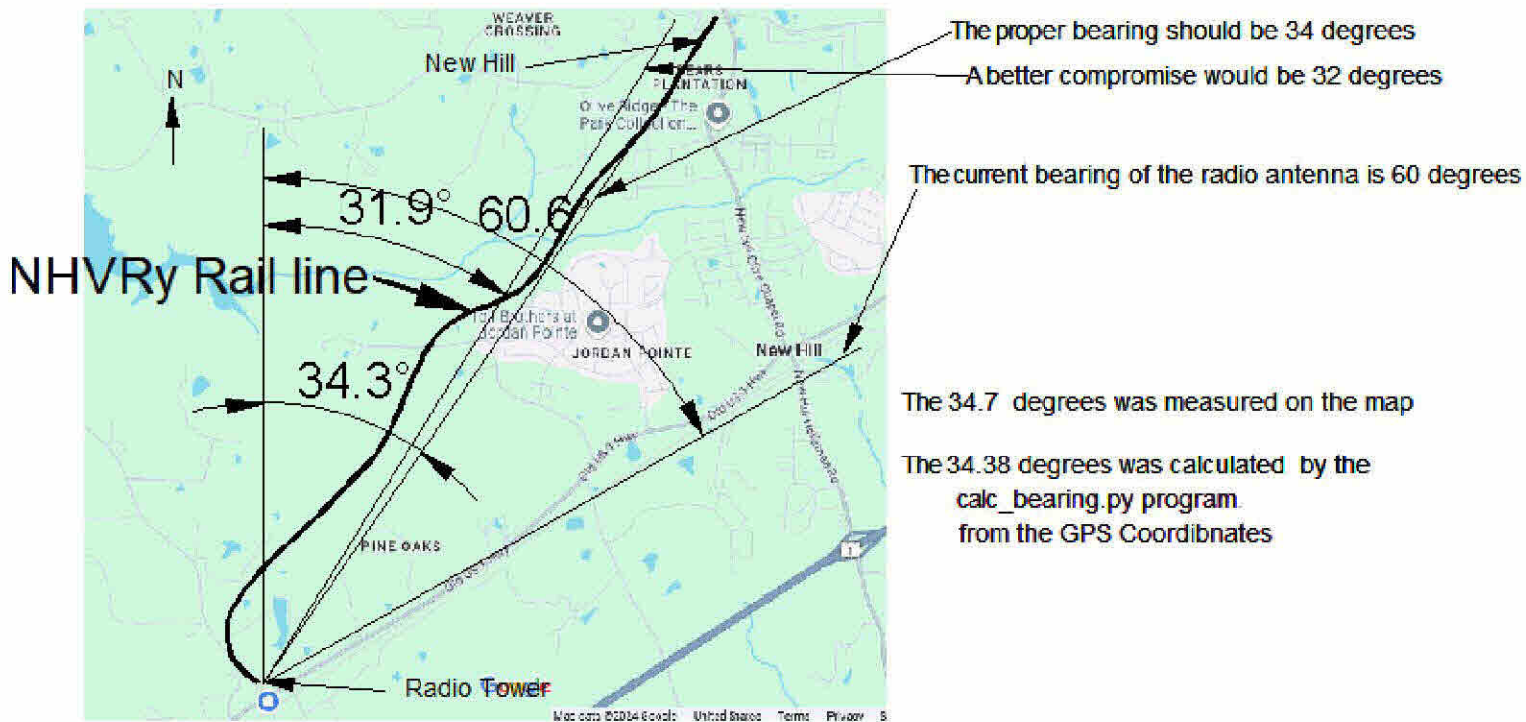
It is aimed at a bearing of about 60 degrees.

The bearing of the end of rail line at New Hill is 34 degrees.

These bearing measurements were determined using two methods:

- 1- Graphically using the sketch below. 34.3 degrees
- 2- Calculated from the GPS coordinates of the locations at the pole in Bonsal and at New Hill yard near Olive Chaple New Hill Rd. 34.387 degrees

A better compromise bearing would be a bearing of about 32 degrees as seen from the diagram below.



```
= RESTART: C:/Users/tdunn/AppData/Local/Programs/Python/Python311/calc_bearing.py
```

```
Location 1 is: 35.660386 , -78.975496
Location 2 is: 35.699844 , -78.942238
The bearing is: 34.38788148805247
None
```

Antenna Tower
New Hill



The Python program to calculate the bearing between two points from the GPS coordinates is *calc_bearing.py*.

```
import math

lat1 = 35.660386
long1 = -78.975496
lat2 = 35.699844
long2 = -78.942238

def calc_bearing(lat1, long1, lat2, long2):
    # Convert latitude and longitude to radians
    lat1 = math.radians(lat1)
    long1 = math.radians(long1)
    lat2 = math.radians(lat2)
    long2 = math.radians(long2)

    ### Calculate the bearing
    bearing = math.atan2(
        math.sin(long2 - long1) * math.cos(lat2),
        math.cos(lat1) * math.sin(lat2) -
        math.sin(lat1) * math.cos(lat2) *
        math.cos(long2 - long1)
    )###
    # Convert the bearing to degrees
    bearing = math.degrees(bearing)

print (lat1)
print (long1)

print
print(lat2)
print(long2)
print
```