



FCC Form 442, Exhibit: Directional Antenna
Cesium Mission 1
(Ground Stations)

FRN: 0029768140

CesiumAstro, Inc.
13412 Galleria Circle Suite H-100
Austin, Texas 78738

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1 INTRODUCTION

As required by reporting the use of a directional antenna (other than radar), this exhibit provides the required antenna information as prompted. This exhibit reports the requested information for the antennas mounted on the Cesium Mission 1 (CM1) ground stations.

2 GROUND STATIONS

The CM1 ground segment consists of two ground stations located at Cesium facilities. The ground stations in both Broomfield, CO and Austin, TX will consist of the same hardware for communication to Cesium Satellite 1 (CS1) and Cesium Satellite 2 (CS2). Ground stations use parabolic reflectors within their antenna systems.

Austin, TX: Latitude: 30° 18' 35" N, Longitude: 97° 56' 23" W

Broomfield, CO: Latitude: 39° 54' 53" N, Longitude: 105° 7' 14" W

2.1 HALF-POWER BEAM WIDTH

The width of beam in degrees at half power point are listed below:

- Ka-Band Ground Station: 0.25 degrees
- S-Band Ground Station: 5 degrees

2.2 ORIENTATION

The orientation in the horizontal and vertical plane for these ground station antennas is not fixed, and adjusts as needed to track the CM1 spacecraft as they make an overhead pass. Therefore, these antennas have the ability to track the spacecraft anywhere in the 0° - 360° azimuth and 15° - 90° elevation range. Ground stations will not communicate at a horizontal elevation angle less than 15 degrees.