

## Mk 99 Radar Concept of Operation

The Aegis Mk 99 radar illuminator is a shipboard Continuous Wave (CW) X-band transmitter that is used by the US Navy to support STANDARD missile. The Johns Hopkins University Applied Physics Laboratory (JHU/APL) in Howard County Maryland is a US Navy contractor and has been a land-based test facility for the Mk 99 since about 1997. The radar had not been used in a number of years, and the previous FCC license had been allowed to lapse. This STA is requested in order to support a specific experiment in which a prototype modification will be made to the antenna.

Usage of the radar will consist of space radiation of the CW X-band signal at elevation angles greater than 10 degrees. RFI is mitigated by the high angle and the narrow beamwidth of the antenna. The half power beamwidth is less than 2 degrees in both azimuth and elevation. The antenna will not be used in a scanning mode, i.e. transmissions will be done along a fixed line. In general, space radiation will be confined between 355° and 40° true bearing to avoid RF exposure to nearby occupied buildings and homes. The front/back ratio of the antenna is in excess of 60 dB that minimizes the potential for RFI outside the antenna's narrow beamwidth.

The attached figure shows the antenna and pedestal of the Mk 99 radar as installed on building 40 of the JHU/APL campus.

