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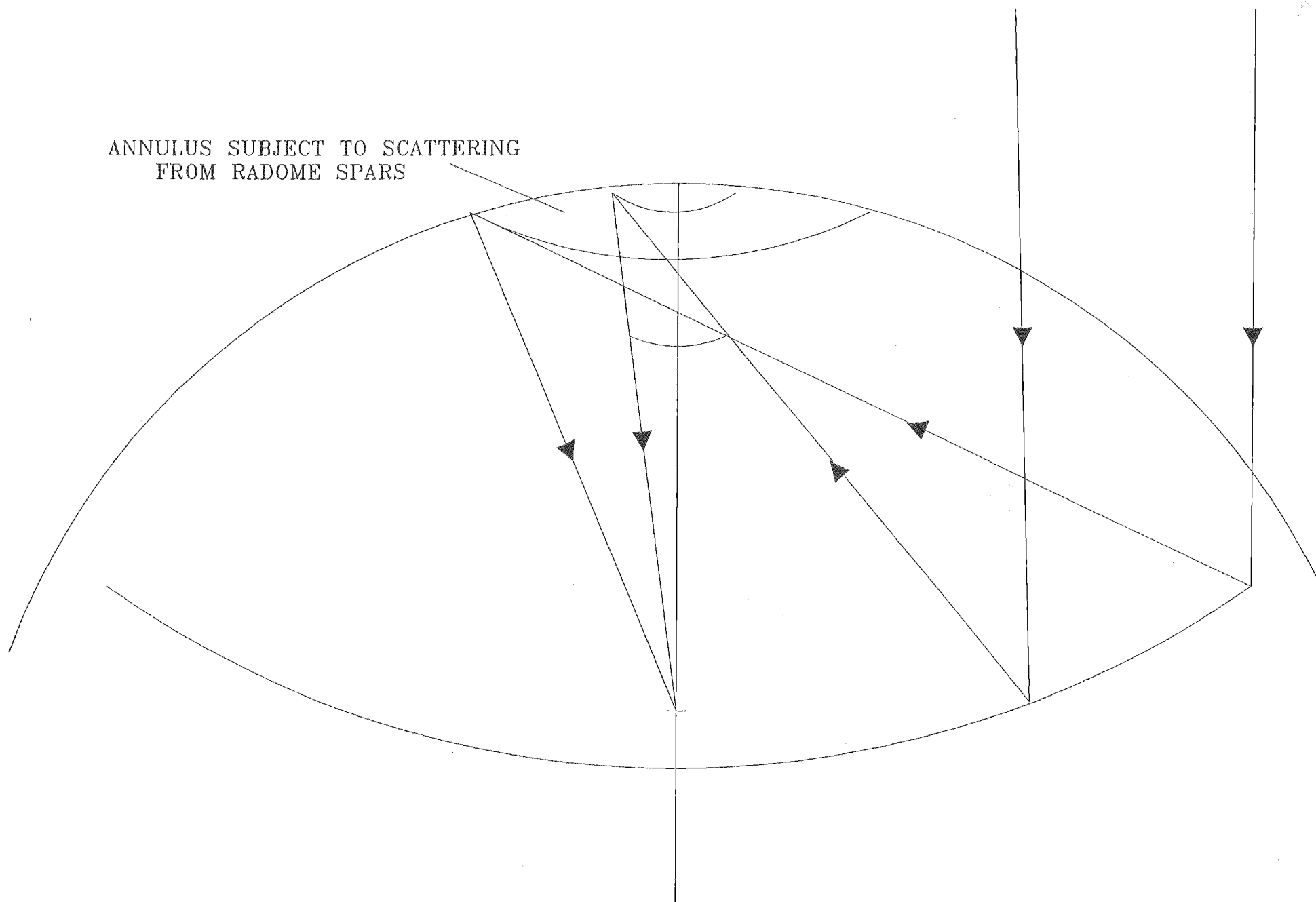
To: Holographers
From: Alan E.E. Rogers AEEER
Subject: Reflection scattering from radome

There is an annulus on the radome which is in the feed beam pattern and the main reflectors "gregorian" region. When looking directly at the source with an on-axis feed the radome is protected from receiving reflections from the main reflector - but when the antenna is scanned an annulus is subject to concentrated energy from the main reflector as illustrated in the figure. The level of sidelobes produced by this scattering is estimated to be as high as -40 dB for preferential patterns of spars in the annulus. This scattering mechanism is proposed to explain

- 1] Noisy holography (not reaching receiver noise floor) when using broad feeds - which put energy on the scattering annulus.
- 2] Low level ripple artifacts in holographic maps which depend on the direction of the satellite being observed.

Possible fixes are

- 1] Use better feed with sharp cut-off at edge of subreflector.
- 2] Place cylindrical sheet metal shroud around and behind subreflector to deflect the rays from the main reflector.
- 3] Model the scattering (probably difficult to predict exact phasing).
- 4] Model and blank regions of azimuth, elevation scans which have strong scattering from radome spars.
- 5] Make two maps. One subreflector moved by a quarter wavelength. Add to cancel the scattering from the radome.



ANNULUS SUBJECT TO SCATTERING
FROM RADOME SPARS

SCATTERING PATH FROM MAIN REFLECTOR TO RADOME TO FEED