

## An Airborne GBS/MILSTAR Wideband Antenna

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### **ABSTRACT:**

Satellite receiving antenna installations on airborne platforms must have a low profile to prevent drag. The antenna must have excellent wide-angle scanning performance and good gain properties over the full range of motion. This Global Broadcast Service (GBS) / Military Strategic and Tactical Relay Satellite (MILSTAR), airborne antenna is capable of satisfying these requirements and producing a wide-angle mechanically scanned beam with relatively constant antenna gain over the scanned coverage area. The subject antenna utilizes four Luneburg Lens hemispheres mounted on a reflective ground plane. The lens outputs are phased combined to provide an aperture of effectively the same gain for half the height of any mechanically steered array. The Information Connectivity Branch (IFGC) of AFRL has developed a low cost 20 GHz receive airborne antenna for reception of data from both The GBS/UHF follow-on (UFO) satellites and the MILSTAR satellites. The six inch high, 30-inch diameter Luneburg lens antenna array was developed in conjunction with Datron/Transco Inc of Simi Valley, Ca. The mechanically scanned antenna has been mounted atop an AFRL, C -135, SATCOM aircraft and tested in flight. The antenna has a G/T of 10 dB/°K, which will provide a data rate up to 23.5 Mbps. It will scan in elevation from 10° to 90° and 360° continuously in azimuth. The presentation will describe the subject antenna and give both ground and airborne test results.