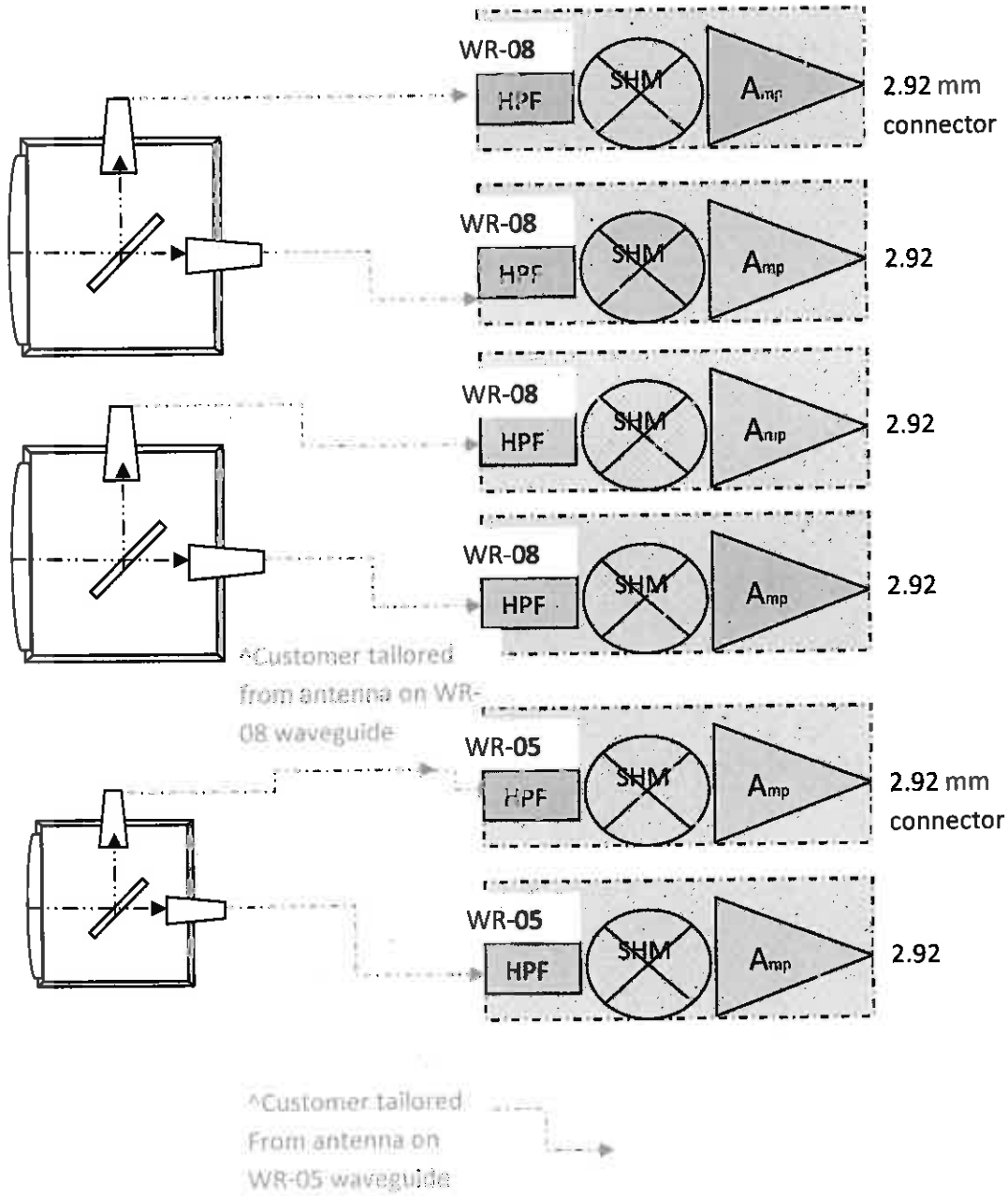
PR for Hyperspectral Microwave Atmospheric Sounder (HyMAS)

<u>Lens Antennas at 118 GHz and 183 GHz</u>

I. Itemized Components (typical)

A. Expected Configuration: Two Lens antennas will interface with WR-08 waveguide in each customer supplied (green) package. One lens antenna will interface w/2 WR-05 waveguide in each customer supplied (green) package.

Figure 1: The functional block diagram of the 3 lens antennas and the HyMAS receivers (items in green are not this procurement).



II. Evaluation Criteria(In order of importance)

A. The vendor's experience in delivering similar systems will be an important factor in order to minimize risk

B. Size:

All 3 (2 at 118 GHz + 1 at 183 GHz) lens antennas MUST be able to fit within an existing drum and share volume with the data system and receivers. There is no allowance for enclosure re-design. Antennas will be mounted on a metal plate by the customer.

C. Performance: In order to provide the quality of science needed to justify an aircraft flight mission , the performance must meet specified minimum requirements

D. Cost

III. Documentation: Specifications, operating instructions, operating conditions, and limits, and other pertinent information shall be delivered for the components supplied. System and component test results shall also be delivered. Supply package top assembly drawings 30-45 days after receipt of order.

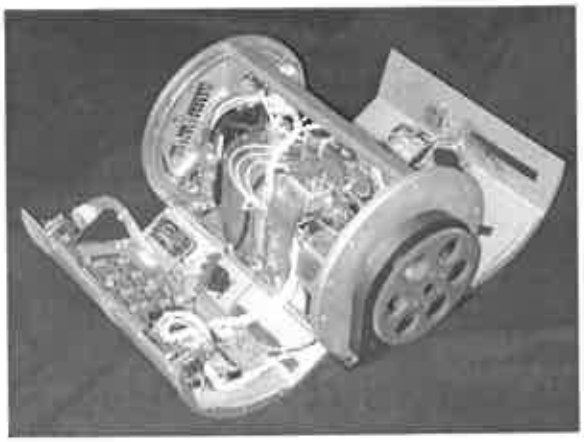
IV. Requirements

A. Packaging

All 3 lens antennas MUST be able to fit within an existing drum and share volume with the data system, power system and six receivers.

There is no allowance for enclosure re-design. The required volume envelope is cylindrical, approximately 8" in diameter and 9" long, and should be considered as a guide rather than a hard requirement. The photos show an example of an existing cylindrical enclosure integrated with radiometer hardware. The configuration for the new antennas will be different.

Figure 1: The delivered receivers will be packaged into a cylindrical enclosure like the one shown.



B. HyMAS Antenna Assembly

1. 183 GHz General : gold plated, integral circular to rectangular waveguide transition that includes captured screws that mate with customer supplied waveguide flange (WR-05, see figure 1). Antenna body shall have cylindrical or rounded rectangular surface perpendicular to the antenna aperture.

a) Mounting: The aperture face of the lens assembly must have space for drilling and tapping of mounting screws. Approximate lens diameter for 183 GHz antenna is 1.5 inches.

b) RF output ports

(1) 183 GHz Waveguide: WR-05

(2) Flange: MIL-F-3922/67B-M05

c) Test frequency, 177.5 GHz , and band edges , Bandwidth 172-183 GHz

d) Beamwidth: 3.1 – 3.3 degrees over the bandwidth

e) Sidelobes: 30 dB below main lobe

f) VSWR: <1.5:1

g) Polarization: dual linear

h) On-axis cross-polarization discrimination over bandwidth: 25 dB minimum.

C. 118 GHz General : gold plated, integral circular to rectangular waveguide transition that has captured screws that mate with customer supplied waveguide flange (WR-08, see figure 1). Antenna body shall have cylindrical or rounded rectangular surface perpendicular to the antenna aperture. (Quantity 2.)

a) Mounting: The aperture face of the lens assembly must have space for drilling and tapping of mounting screws. Approximate lens diameter for each of the two 118 GHz antennas is 2.3 inches.

b) RF output ports

(1) 118 GHz Waveguide: WR-08

(2) Flange: MIL-F-3922/67B-M08

c) Test frequency, 113.5 GHz , and band edges , Bandwidth 108-119 GHz

d) Beam width: 3.1 – 3.3 degrees over the bandwidth

e) Side lobes: 30 dB below main lobe

f) VSWR: <1.5:1

g) Polarization: dual linear

h) On-axis cross-polarization discrimination over bandwidth: 25 dB minimum.