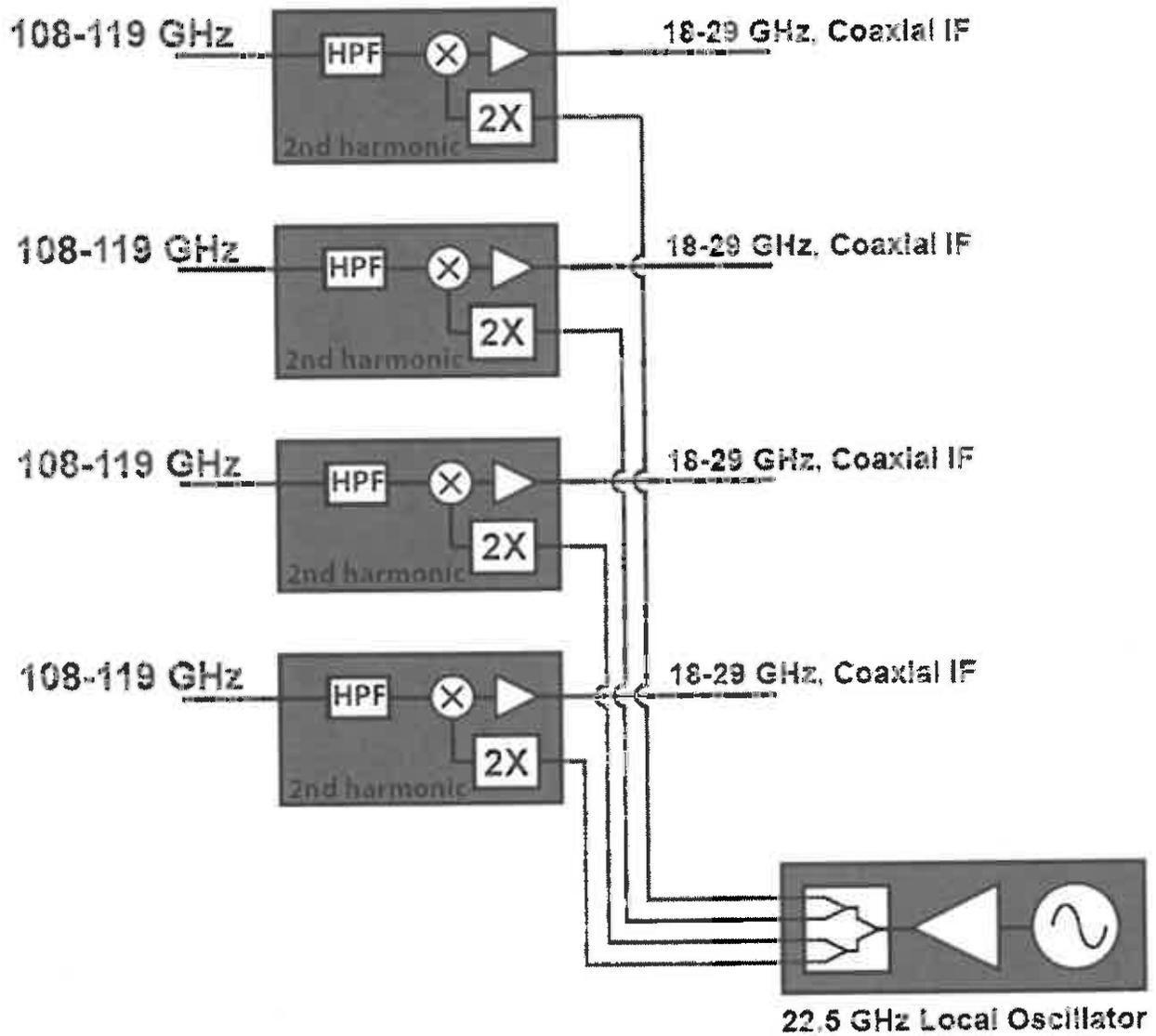


I. Itemized Components (typical)

- A. Expected Configuration: PDRO/x2/Amp/Four-way Splitter connected to four x2/SHM with integrated IF amplifier.

Figure 1: Functional Block Diagram for four 118 GHz radiometers



Evaluation Criteria (In order of importance)

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

C. Size:

Six (4 at 118 GHz + 2 at 183 GHz) receivers MUST be able to fit within an existing drum and share volume with the data system and lens antennas. There is no allowance for enclosure re-design. Components will be mounted to a metal bracket after delivery to customer. Compact design is required.

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

E. Cost

F. Power: Lower power is better, but not at the expense of size, performance or cost.

II. 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.

III. Requirements

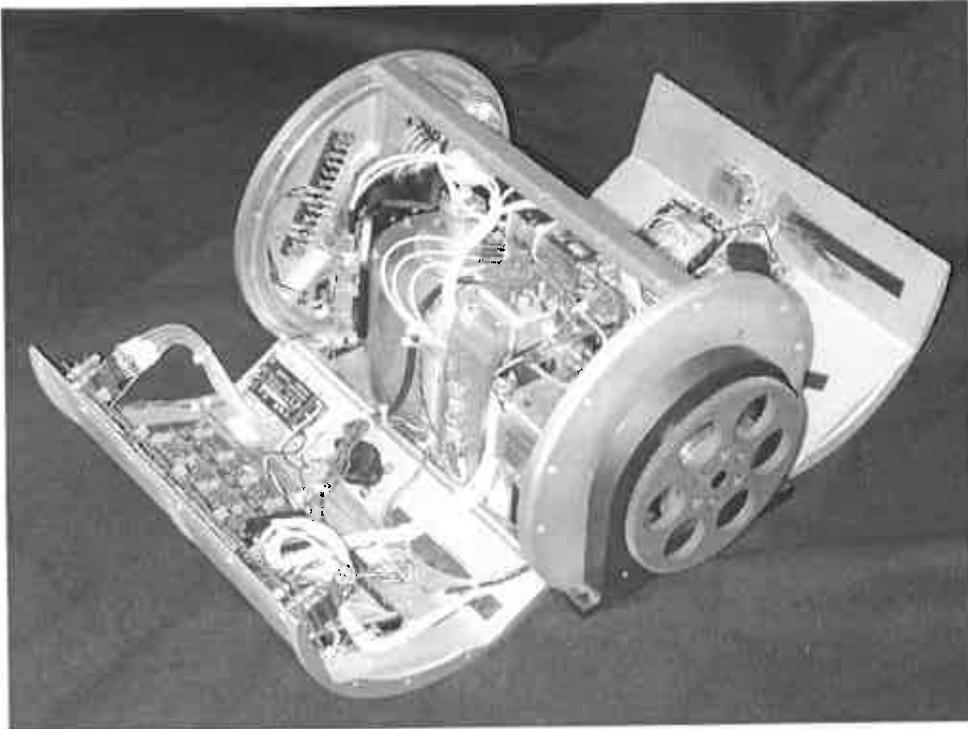
A. Packaging

Both receivers MUST be able to fit within an existing drum and share volume with the data system, power system and lens antennas. There are also 4 other radiometers that must share the same volume.

There is no allowance for enclosure re-design. Components are mounted on a metal bracket(s) supplied by the customer. 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 radiometers will be different.

Figure 2: The delivered receivers will be packaged into a cylindrical enclosure like the one shown.



Power Balancing: The vendor is responsible for the total system performance. PDRO power must be sufficient to drive the mixer after multiplier conversion, IF amplifier gain must be ~25 dB over the 18-29 GHz IF bandwidth on all 4 channels.

B. Mixer RF input port

1. Waveguide: WR-08
2. Flange: MIL.F-3922/67B-M08
3. Waveguide HPF incorporated into mixer port
 - a) *Pass band frequency 108-119 GHz*
 - b) *Reject band frequency 90- 103 GHz*
 - c) *Reject band attenuation > 40 dB*

C. Mixer

1. Subharmonic compatible with PDRO LO system
2. Conversion loss ~ 6 dB (DSB)
3. $T_{mix} \sim 500K$ (DSB)

D. IF amplifier

1. Incorporated into the mixer block
2. Bandwidth: 18-29 GHz
3. Gain ~ 25 dB over bandwidth
4. Gain Flatness: ± 2 dB over bandwidth
5. NF < 3 dB over bandwidth

E. IF amplifier output port (low loss 18-29 GHz)

1. Coax compatible connector
 - a) *The 2.92 mm connector (often called simply "2.9 millimeter") works up through 40 GHz.*
 - b) *Matching impedance $Z_0=50\Omega$*

F. Phase locked DRO – Multiplier and Amplifier Chain

- 1. Must provide required power to each of 4 mixers (estimate = 2-4 mW) at subharmonic mixing frequency to produce 18-29 GHz intermediate frequency.**
- 2. Frequency temperature stability 250 KHz/ degree Celsius centered at 44.875 GHz over -10 C to +40 C**