

## Datasheet

# Mast head preamplifier

## OPA-1090AS

jetvision® OPA-1090AS is a mast mounted preamplifier specifically designed for use with ADS-B and Mode-S. It can be used for all systems using 1090 MHz, such as Radarcape, Air!Squitter XGPS, other ADS-B receivers, transponder receivers, virtual radar systems or other comparable reception systems.

The mast preamplifier OPA-1090AS increases the reception range of these systems and essentially compensates losses in the cable to the actual receiver. jetvision® OPA-1090AS can be used with any passive antenna like our OPA-5 or similar products from other vendors. <sup>1)</sup>

Due to a special design the OPA-1090AS does not require an extra cable for the supply voltage. Supply voltage can be fed via the coaxial cable instead. There is no need for an extra power cable. The wide supply voltage is 5 V-14 V and can be taken from any USB port or USB power supply/charger and put onto the coax using our optionally supplied bias tee. The OPA-1090AS therefore usually does not require its own power supply unit and saves power and space in the overall system, but anyway other supply options are possible.

Thanks to the integrated bandpass filter with low insertion loss and a careful design, unwanted or even interfering signals from other transmissions such as GSM stations, LTE, WiFi, radio and TV transmitters are filtered immediately after the antenna. So they do not load the input of the downstream receiver. With this and the deliberately

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<sup>1)</sup> Must not be used with active antennas or multiband antennas, for example jetvision® Active Diapason or OPA-5-GPS combined ADS-B/GPS antenna



## jetvision Antennas and Receivers Program

### OPA-1090AS

#### Product Numbers:

69500 with Bias Tee  
69505 without Bias Tee  
69400 Bias Tee

#### Usage:

Amplification of 1090 MHz received signal including narrow band filtering.

chosen, moderate gain of typically 16dB, the dynamic range of the receiver does not become restricted due to overloading.

The mast preamplifier can only work efficiently when mounted as close as possible to the antenna, not at the other end of a potentially long and lossy cable. If the preamp is used at the end of the cable it will still amplify the signal but also the noise added by the cable. This leads to a worse signal-to-noise ratio (SNR) and thus to less effective decoding of signals. Another advantage of using the preamp directly on the antenna is that you can use a cheaper cable with higher attenuation. The attenuation of the cable between the OPA-1090AS and the receiver can be up to 20 dB.

Therefore, and especially to be mounted outside and on top of the mast, the OPA-1090AS comes with a rain and weather protected case, rain protected N-female connectors on the bottom side which itself are waterproof.

## Technical Data

### RF Parameters (typical)

Description	Value
Frequency range	1065 MHz – 1115 MHz
RX gain	17 dB
Noise figure	0.4 dB
Input and output impedance	50 Ω

### Connectors

Description	Value
RF connector	N female protected against rain
DC Input <sup>(1)</sup>	On output N-female connector Minus: Shield Plus: Center

<sup>(1)</sup> Recommended accessories jetvision® Bias Tee No. 69400

	Notes:	
	Title: OPA-1090AS 1090MHz Low Noise Masthead Preamplifier	Article No: 69500, 69505
	Author: Günter Köllner	© Copyright 2023

### DC Parameters (typical)

Description	Value
DC supply voltage	5 - 14 V
DC supply current	70 mA
Operating temperature	-20 °C - 60 °C

### Absolute Maximum Ratings

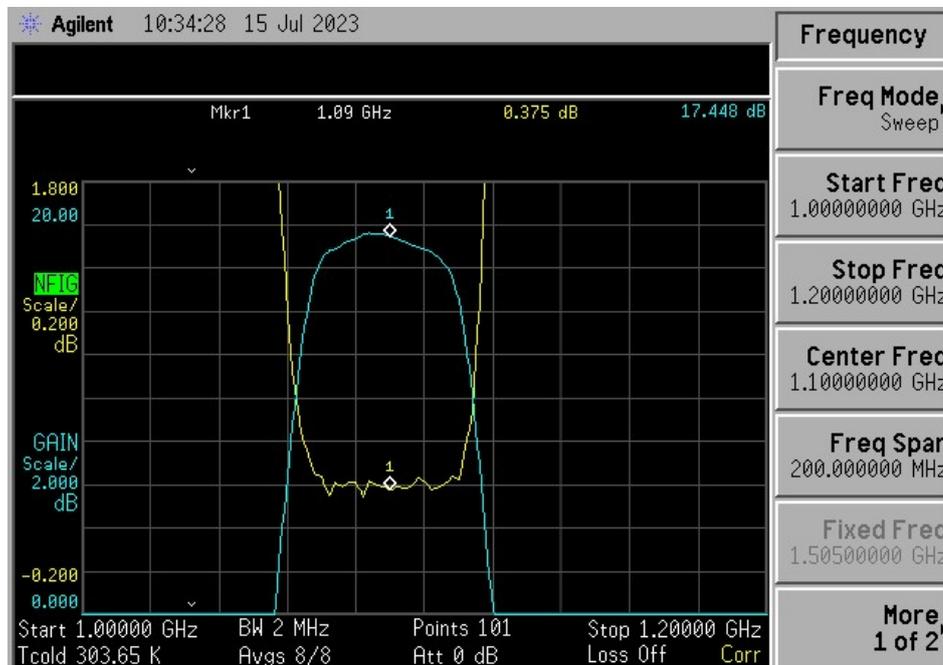
Description	Value
DC supply voltage	15 V <sup>(1)</sup>
Operating Temperature	-30 °C - +75 °C
Storage Temperature	-30 °C - +75 °C

<sup>(1)</sup> 25°C ambient temperature

### Block Diagram

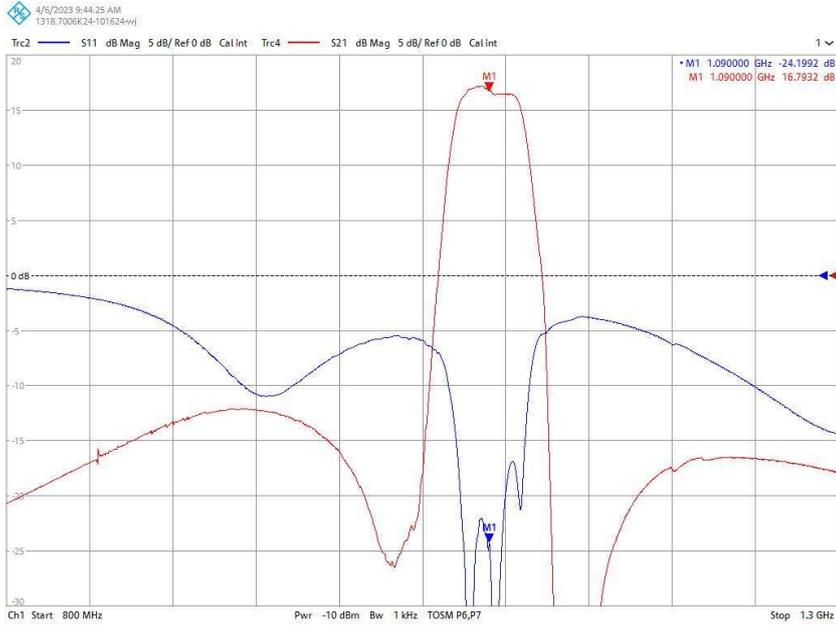
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### Noise Figure and Gain (typical)

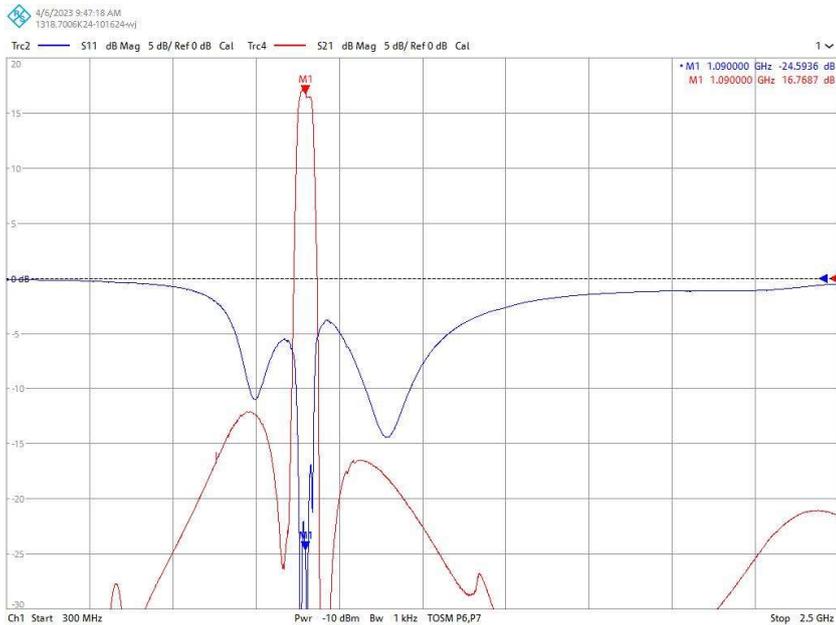


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### Receive Gain and Antenna Side Return Loss (narrow band) (typical)



### Receive Gain and Antenna Side Return Loss (wide band) (typical)



	Notes:	
Title: <b>OPA-1090AS</b> <b>1090MHz Low Noise</b> <b>Masthead Preampfier</b>	Article No: 69500, 69505	Version: 3.0
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## Mechanical Specification

Description		Value
Dimensions	Width	110 mm
	Depth	57 mm
	Height	110mm (incl. bracket)
Weight	Masthead unit	300 g
	Bias Tee	41 g
Mast Diameter	Range	25 mm - 62 mm

## Assembly Instructions

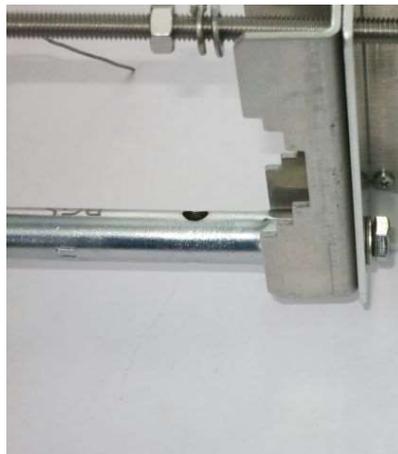
### Parts List

Part Description	Standard	Quantity
OPA-1090AS base unit		1
Mast clamp		2
Screw M6 x 100	DIN 933	2
Screw nut M6	DIN 934	4
Washer 6.4mm	DIN 125 B	6
Locking washer	DIN 127 A, DIN 7980	4

Step 1: Preassembly



Step 2: Tighten inner nut

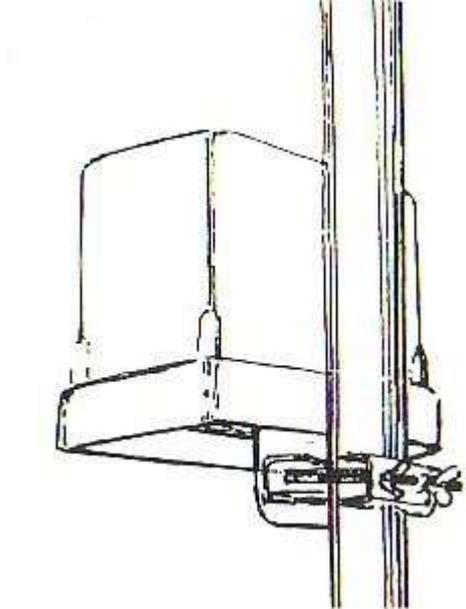


Step 3: Prepare outer mast clamp



	Notes:	
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## Mounting Recommendation



## Mounting Instructions

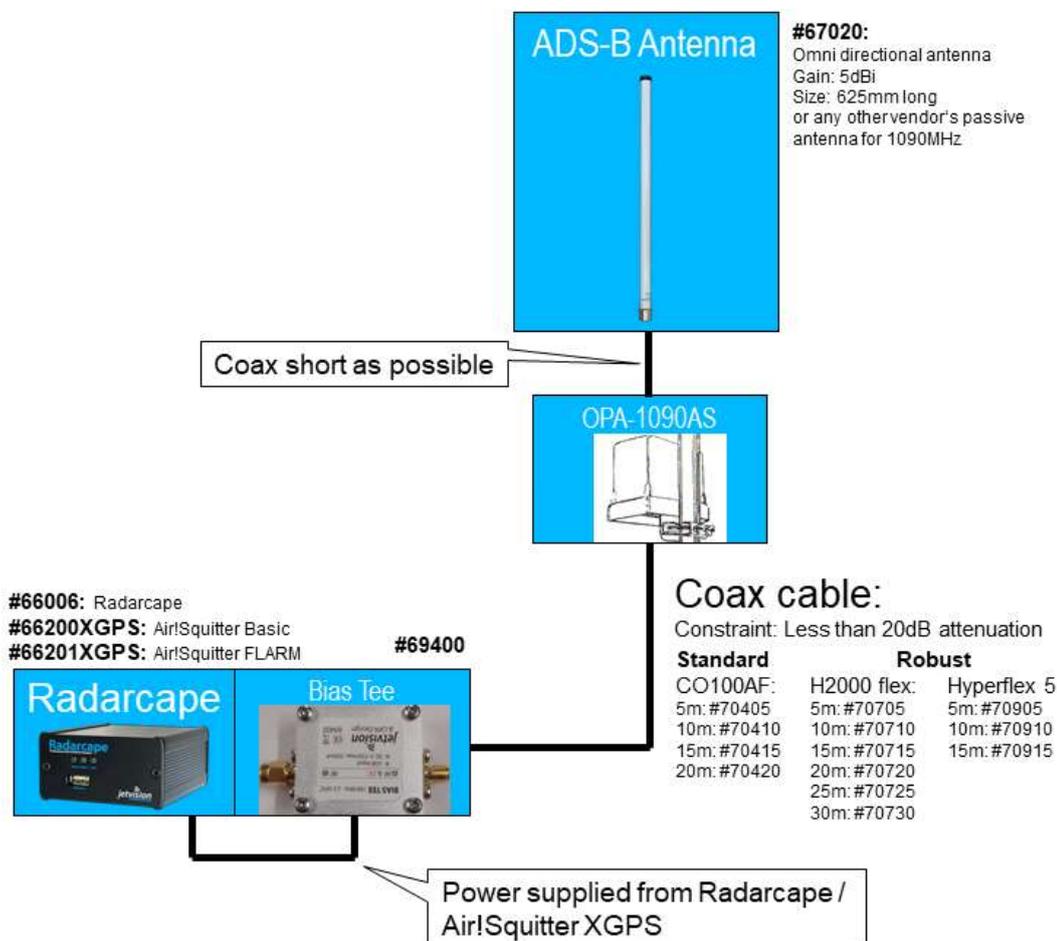
Description	Value
Mounting Direction	Upwards
N connector torque	1.5 Nm <sup>(1)</sup>

(1) If there is no torque spanner available just tighten with fingers. Do not overtighten when using regular spanners or any other tool. Only tighten moderately. Never use force as with regular hex head screws.

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## System Integration

Radarcape and Air!Squitter XGPS<sup>(1)</sup>:



<sup>(1)</sup> Air!Squitter XGPS option provides an external SMB-male GNSS connector equal to Radarcape. This is necessary because OPA-1090AS does not let GNSS signals pass.

## History of Changes

Date	Description
30.03.2023	initial
17.07.2023	Insert N8973A noise figure and gain picture
08.12.2023	Assembly instructions added

We reserve the right to make technical changes, which serve to improve the product, without prior notification.

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