

Deutsches Zentrum für Luft-
und Raumfahrt (DLR)
Königswinterer Straße 522-524
53227 Bonn

Selection Workshop and Proposal Presentation

ARESONUS :
**Altus. Repetitio. Sonus. - Measuring of
infrasound/aerosonic in the stratosphere**

Presenting Team ARESONUS: Niclas Bierwisch, Sabine Köhler, Sven Malag



Agenda

1. Goals and purpose of ARESONUS
2. Scientific background
3. Team and organisation
4. Technical requirements and project design



1.Goals and motivation

- ▶ Building a reference data bank
 - ▶ Creation of sound level-height model
- ▶ Recognition signal, a.o. infrasound reference database
- ▶ Secondary goal: possible proof of ELFI´s swinging
- ▶ Stratosphere: natural reduction of higher frequencies



2. Scientific background

2.1 Sound in general

- ▶ Sound
 - ▶ Mechanical waves
 - ▶ Physically: air pressure fluctuations
 - ▶ Frequency: number of oscillations per second → Hz
 - ▶ Sound level: height of air pressure fluctuations → dB



2. Scientific background

2.2 Infrasound

- ▶ Infrasound
 - ▶ Frequenz < 20 Hz
 - ▶ Large wavelength
 - ▶ Attenuate less → travels further



2. Scientific background

2.3 Infrasound sources

natural

- ▶ Geological activity
- ▶ Waves
- ▶ Thunderstorms

artificial

- ▶ Traffic
- ▶ Air turbines
- ▶ Blastings



2. Scientific background

2.4 ELFI (Extremely Low Frequency and IMU)

- ▶ Aim: evolve a system for non-stationary measurement of electromagnetic waves in low frequency
- ▶ Goal: Measuring Schumann resonance 7 Hz
- ▶ System: magnetic loop antenna
- ▶ Problem: antenna swung in magnetic field of earth and generated strong induction voltages



3. Team and organisation

3.1 The ARESONUS team

Member	Main purpose
Niclas Bierwisch	Management and Organisation
Sabine Köhler	Documentation
Sven Malag	Software Engineering
Ria Bele Pohley	Outreach
Johann Stiebritz	Testing and Hardware Engineering

- ▶ Additionally every team member is included in designing and mechanical engineering tasks



3. Team and organisation

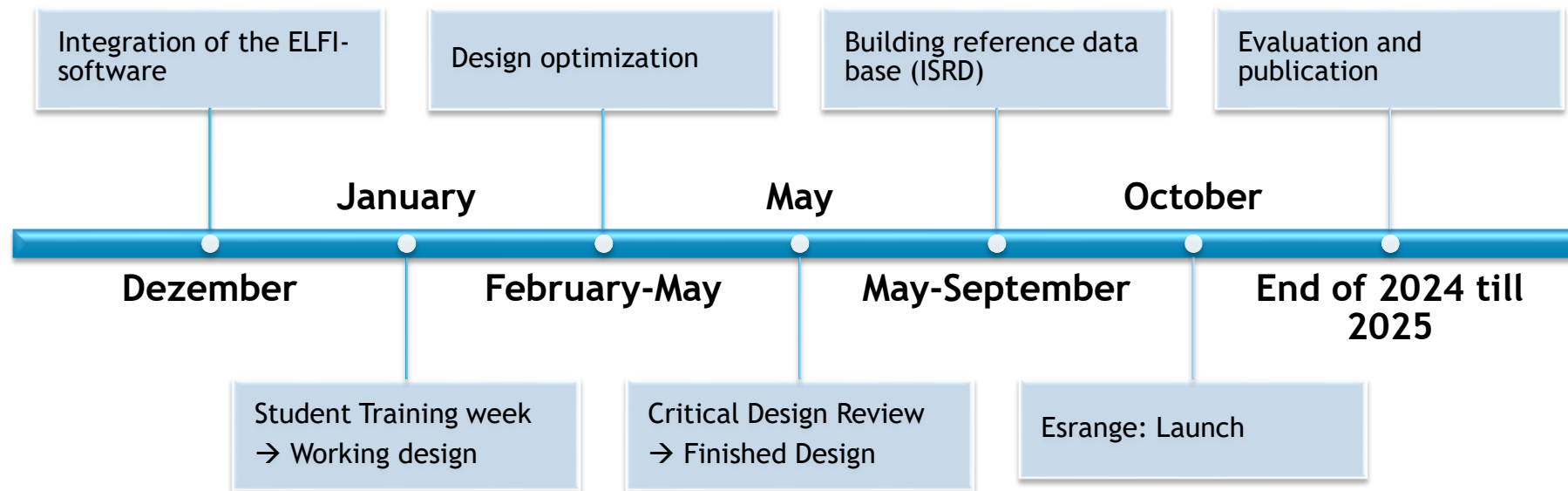
3.2 Outreach

- ▶ Regular publishing at least once a Month
- ▶ Social Media: X(former Twitter), Instagram, Facebook
- ▶ University: contributing in Newsletter,
creating webpage on universities website
- ▶ Newspaper artikel



3.Team and organisation

3.3 Time schedule



3.Team and organisation

3.4 Sponsoring

- ▶ Mikrophone ISV1611-infra sponsored by **ROGA Instruments**

[SELBSTAUFGENOMMENES BILD VON MIKROFON}



4. Technical requirements and project design

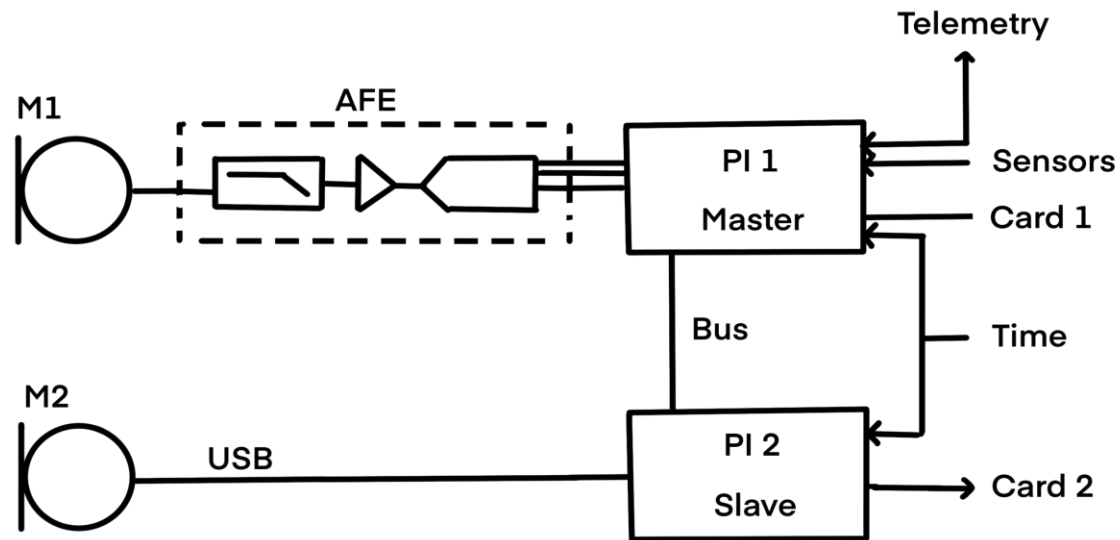
4.1 Technical requirements

- ▶ Data rate 2.5 - 4 Mbyte/min
- ▶ Total mass approximately 5 kg
(+5-10 kg for lowering construction with self build microphone)
- ▶ Power supply approximately 125 Wh
- ▶ Sources of disturbance (external): Fans, pumps, motors, moving parts
- ▶ Sources of disturbance (caused by us): Motor while lowering microphone



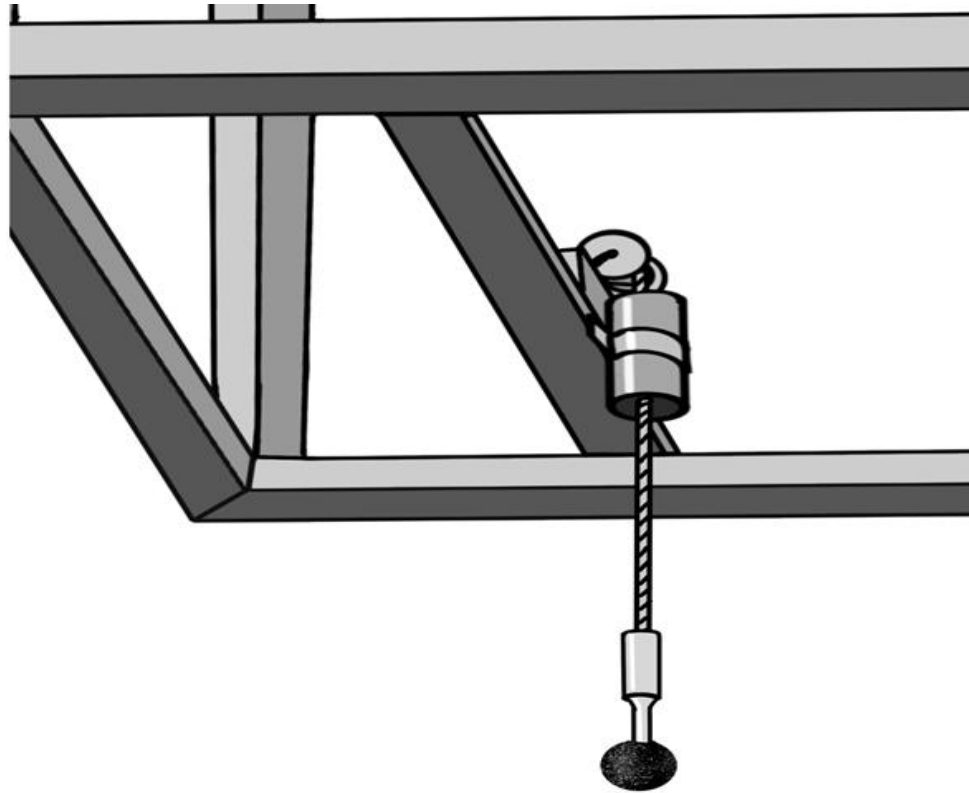
4. Technical requirements and project design

4.2 Measuring setup



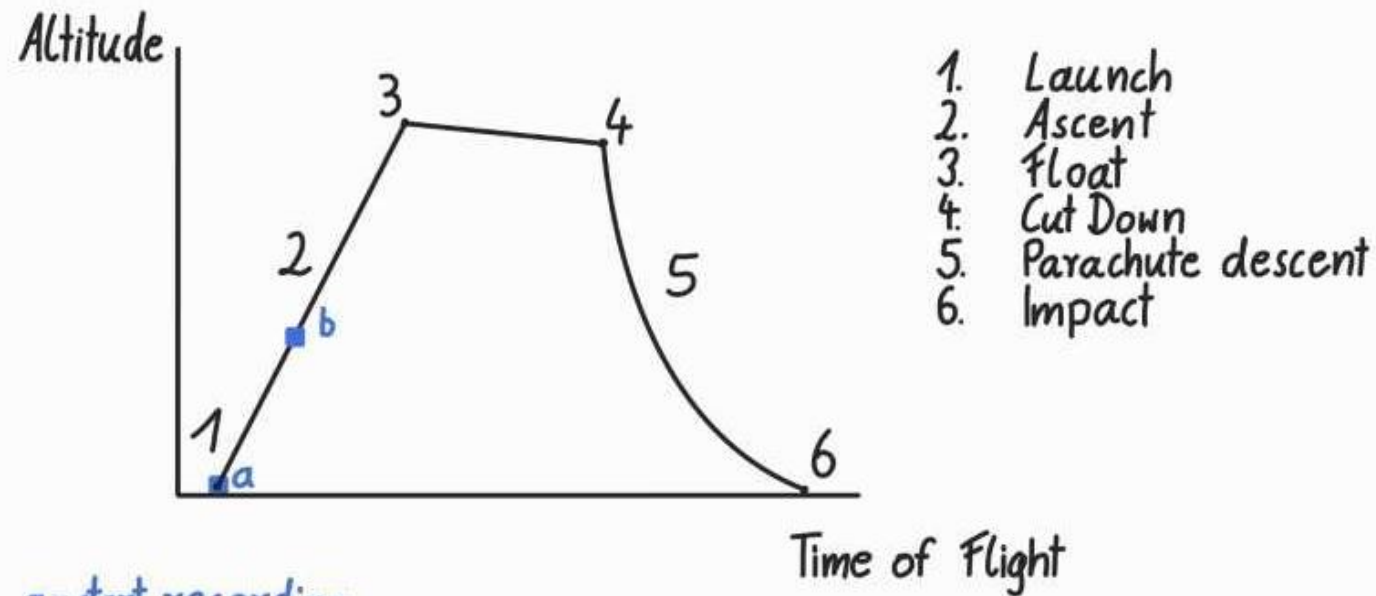
4. Technical requirements and project design

4.3 Gondola Placement



4. Technical requirements and project design

4.4 Flight timeline



a-start recording

b- Extend micro