



Carlo Gavazzi Space SpA

The MESBAH project

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Managing Director**

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Presentation outline

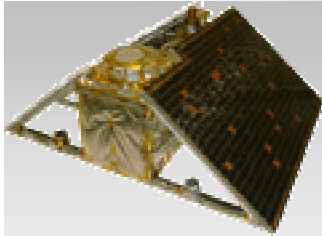
- Introduction
- MESBAH Program overview
- MESBAH Applications
- MESBAH Program Results
- MESBAH Future



INTRODUCTION: CGS Business Mission

PROVIDE THE USER COMMUNITY WITH SOLUTIONS TO LOWER THE COST OF FIRST CLASS SCIENCE AND APPLICATION PROJECTS

BY:



Exploiting the full potential of Small and Medium Size **Satellite** Missions.

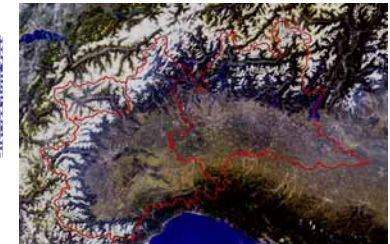
Exploiting new **Orbital** and **Transportation** Systems.



Turning technologies into products for **Scientific** and application projects.



Developing new technologies for **Earth Observation** services.



Realizing reliable systems for **Ground Segment** applications.



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INTRODUCTION: CGS Satellite Capabilities

Satellites: Turn-key systems for scientific and application missions

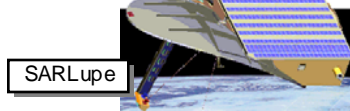


- Mission Analysis
- System Definition and Specification
- Detailed Subsystem Design on:
 - AOCS, Structure, Thermal Control, TMTC, Digital and Power Electronics and On board Software.
- Subsystem and System Integration
- Functional Testing
- Qualification:
 - Thermovac, Vibration, EMI/EMC and Mass Properties.
- Launch Campaign:
 - Satellite Verification
 - Satellite integration with the launcher
 - Flight readiness
- Commissioning and Operations:
 - LEOP
 - In Orbit Validation
 - Commissioning
 - Nominal and Emergency Operations

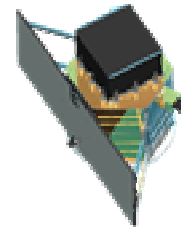
Smallsatellites (500-1000 Kg)

SARLupe (800)

EGPM (510)



SARLupe

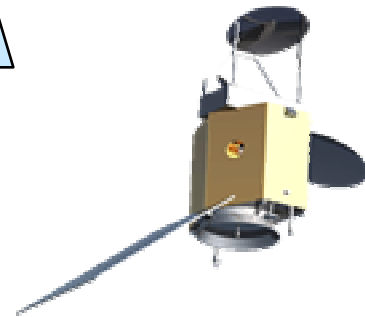


Microsatellites (10-100 Kg)

MESBAH (65)

SAFIR (60)

PALAMEDE (40)



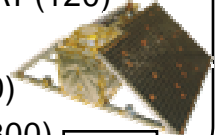
Minisatellites (100-500 Kg)

DESERTSAT (120)

MITA (170)

AGILE (300)

HYPSEO (300)



MITA



Telecommunication Satellite Market

- Geostationary Satellites
 - Large Platforms up to 15 Kw
 - Little GEO Platforms up to 3 Kw
- LEO Satellites
 - Store and Forward service
- Market Segments
 - Large/Little GEO: institutional and commercial mass market
 - LEO: specific niche market



MESBAH Initiative

The I.R. of Iran has set up the MESBAH satellite project with the following main objectives:

- Enable the Iranian Access to Space by developing, launching and operating a small LEO communication satellite for data collection/distribution, e-mails and store & forward services.
- Reinforce the Iranian Telecommunication Infrastructures by exploiting the capability of the MESBAH satellite of connecting remote villages and rural areas.
- Enhance the Iranian educational and scientific knowledge through practical involvement in Space activities especially in the field of satellite communications.



MESBAH Initiative

To reach the objective of the project, Carlo Gavazzi Space has worked in close cooperation with ITRC / IROST in the design, development and manufacturing of the MESBAH system, which is composed by the Space segment, the Ground segment and the User Terminals.

The work has been carried out in a cooperative way, with close interaction and co-ordination between the Iranian and Italian team.

This approach has been proven to be successful to reach the I.R. of Iran program objectives.



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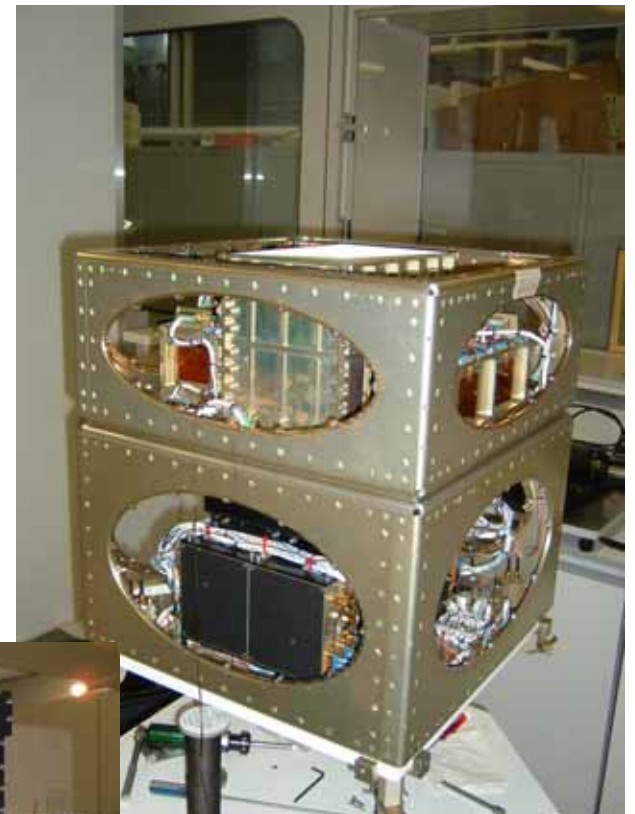
MESBAH Space segment

The MESBAH space segment is composed by one Flight Model currently under final testing for flight qualification.

The Flight Model has been manufactured partly in Italy and partly in Iran, with the work sharing scheme defined together with ITRC / IROST.

The main features of the satellite are:

- UHF Receiver/Transmitter Payload
- 700 x 500 x 500 mm volume
- 65 kg mass
- Transputer based board computer
- 4Mb Memory
- 100 W peak, 35 W average power
- Gravity Gradient stabilization
- VHF/UHF telecommunication



MESBAH Ground Station

The MESBAH satellite will be controlled from one Ground Station located at Teheran and operated by ITRC / IROST personnel.

A back-up station will be located in Italy and will be operated by CGS personnel.

The main components of the Ground Station are:

- Antenna Tracking System
- RF Rx/Tx Units
- Ground Station control SW
- Satellite Control Unit



MESBAH User Terminals

The MESBAH User terminals (fixed and mobile) have been developed in the frame of the program and 5 proto-types have been built by CGS.

The 1000 terminals to be used for the service will be produced by Iranian Industries.

The main features of the terminals are:

- BC3+ Computer
- UHF RF Tx/Rx Unit
- Data Rate up to 9600 bps
- UHF antenna
- SX25 communication protocol



MESBAH Applications

- Messaging service
 - Text
 - S.O.S.
 - Alarm
- E-mail services
- Metering stations monitoring
 - Oil/gas pipeline
 - Meteorological stations
- Mobile station tracking
 - Bus fleet monitoring
 - Truck tracking system
 - Car alarm tracking
- File transferring system
- Remote stations activations
 - Alarm reaction
 - Opening/Closing valves
 - Sensors activation/deactivation



MESBAH Program results

- MESBAH telecommunication satellite available to I.R. of Iran and operated by ITRC / IROST personnel
- ITRC / IROST capability in space activity



- Network of user terminals



MESBAH Life Cycle

The MESBAH satellite launch is foreseen at the end of 2005.

The satellite will be operated for its lifetime by Iranian personnel providing service to institutional and / or commercial users.

MESBAH will be in orbit for a minimum period of three years to support the planned services



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MESBAH Future

The future plans of I.R. of Iran is to build the next MESBAH satellite to:

- Reinforce MESBAH infrastructure
- Increase the MESBAH overall performance
 - Increase the telecommunication velocity
 - Increase the number of user terminals
- Upgrade the space segment according to the latest design of the market
- Increase the Iranian knowledge and capabilities in the space activity



Telecommunication Satellite Market

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Conclusions

- Having initiated the MESBAH project, the I.R. of Iran has acquired a space infrastructure and space capacity
- The I.R. Of Iran is now a new player in the space community prepared to face new challenging projects
- We look forward for future cooperation extended also on scientific missions for example by means of bilateral programmes

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