



# FLEXIBLE HTS SATELLITE SOLUTIONS WITH MULTI-LAUNCH CAPABILITY



GSATCOM Space Technologies Inc.

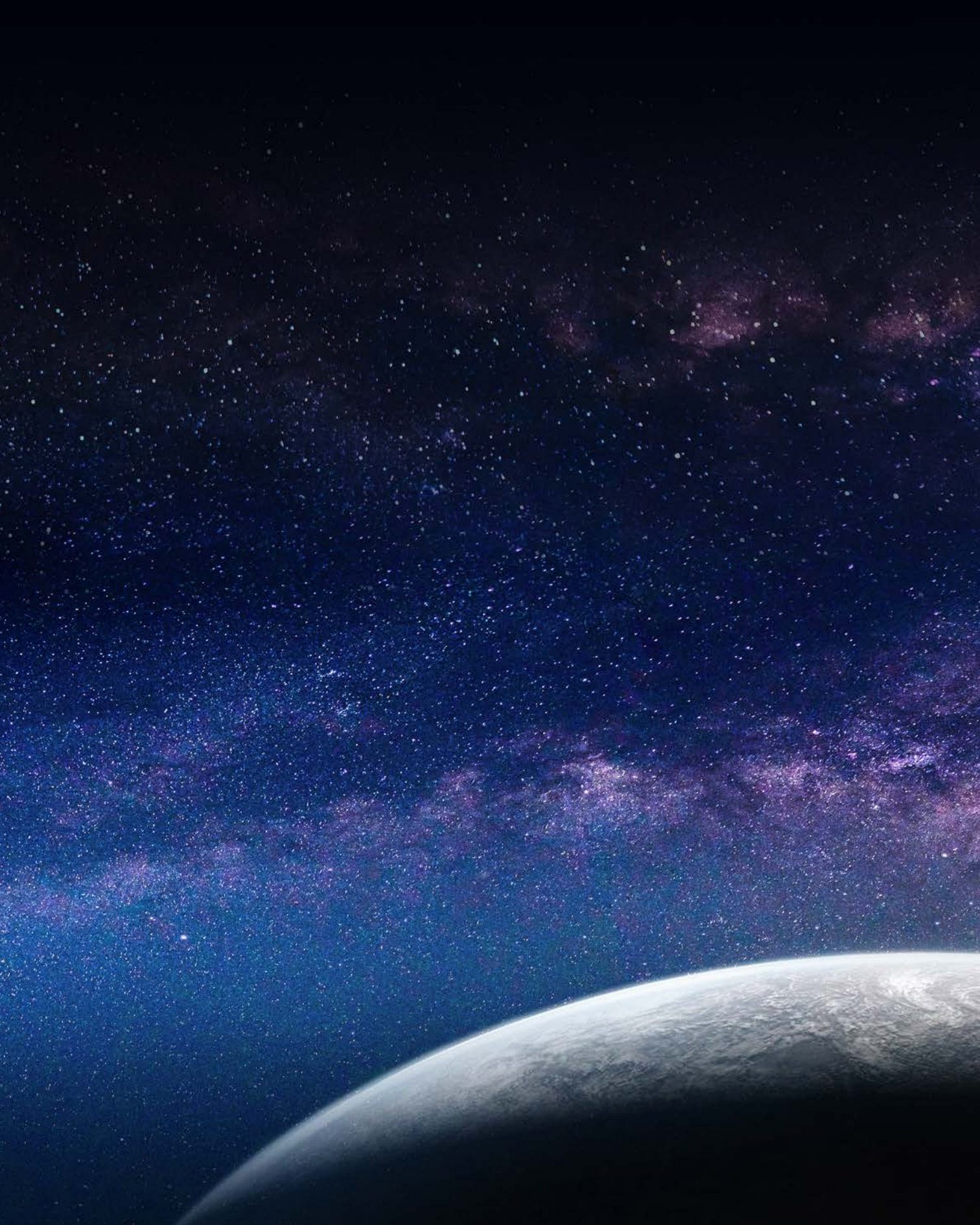
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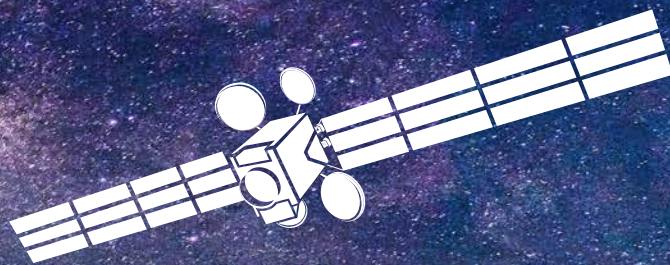








## WIDE BEAM AND HTS PAYLOAD FULL ELECTRICAL GEO SATELLITE FAMILY



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High-Throughput  
Satellite (HTS)



Payload  
Flexibility



Full Electric  
Propulsion



Optimized Payload  
Power Budget



Modular Design



Multi-Launch  
Support



Optimized for  
Rideshare  
Missions



Rapid Delivery



# FLEXIBLE GEO SATELLITE

## Flexible HTS Solutions with Multi-Launch Capability

GSATCOM Satellite Family offers broad range of telecommunication solutions implemented by a full-electric small size space segment. GSATCOM's new, modular and flexible design boosts global commercial operation capabilities and plays a significant role in cost efficient telecommunication market.

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Customized Wide or  
Spot Beam Operations



Supports Up to 6  
Reflector Antennas



Optimum Efficiency in  
CAPEX



15 Years Life Time



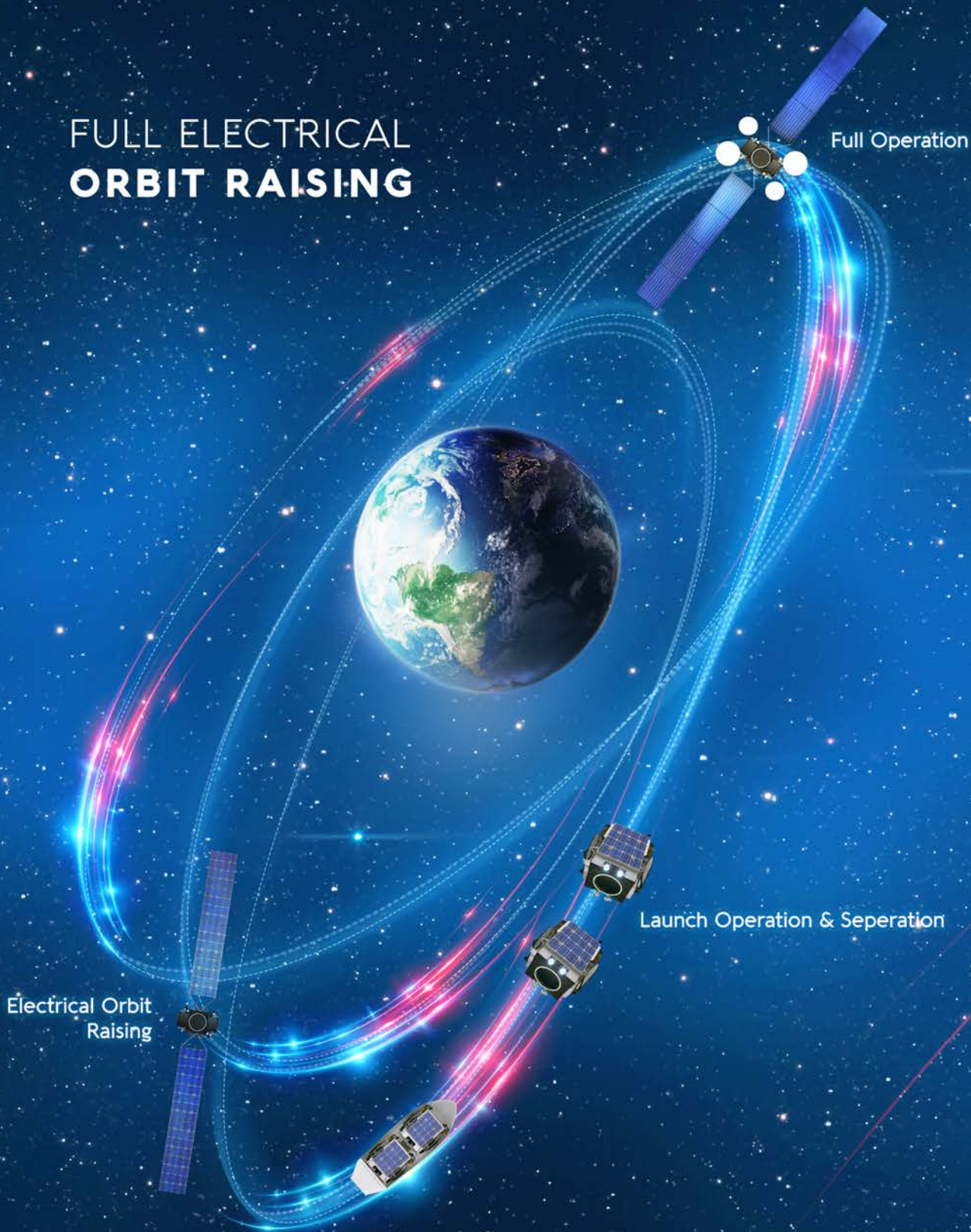
Flextile Antenna  
Support



Successful Track Record of  
GSATCOM Shareholders



# FULL ELECTRICAL ORBIT RAISING



Full Operation

Launch Operation & Separation

Electrical Orbit  
Raising



# INTRODUCTION

GSATCOM Small Size GEO Satellite is the telecommunication platform which is capable of accommodating a wide range of commercial payloads and missions from TV broadcasting to multimedia applications, data communication and mobile or fixed services in a wide range of frequency bands. Small Size GEO Satellite's new, modular and flexible design boosts competitiveness of the global operators in the commercial market.

The satellite has a small sized platform which employs telecommunication payloads for such as; Ka, Ku, X, C, S, L, UHF and other various frequency bands according to the end user requirements.

A precisely optimized modular design approach is adopted as the main baseline in Small Size GEO Satellite solution to meet diversified customer requirements.

**FLEXIBLE SATELLITE**  
**FLEXIBLE HTS SOLUTIONS WITH**  
**MULTI-LAUNCH CAPABILITY**

# ABOUT GSATCOM

GSATCOM Space Technologies, Inc. is the Joint Venture Company of Turkish Aerospace Industries, Inc. and INVAP SE.



With the state-of-art space system AIT\* facilities and strong capitalization of its shareholders, GSATCOM initiates conducts design based on its shareholders' space heritage, manufacture and market the cutting edge telecommunications satellites.

\* AIT: Assembly, Integration and Test



GSATCOM provides its shareholders' successful track record, vertical expertise, space heritage and top class space systems infrastructure located in Europe and South America.



With the state-of-art space system facilities and strong capitalization of its shareholders, GSATCOM designs, manufactures and markets cutting edge telecommunications satellites.

GSATCOM Space Technologies combines leading edge infrastructure and expertise to strengthen its operational capabilities worldwide. GSATCOM GEO Satellite Family offers a range of telecommunication solutions based on a full electric small size geostationary platform.

With highly adaptive project models, GSATCOM presents advanced technology with affordable solutions for the global telecommunications satellite market.



Strong Financial Background



Successful Track Record



25+ Years Heritage in Space



Dedicated Facilities in Europe & South America

# GSATCOM SHAREHOLDERS

## Turkish Aerospace



### Established in 1973

- Turkey's center of technology ranks among the top hundred global players in aerospace and defense arena

- Five Strategic Pillars:

- Space Systems Group
- Aircraft Group
- Helicopter Group
- Unmanned Aerial Systems (UAS) Group
- Aero-structures Group



More Than  
10,000 Employee



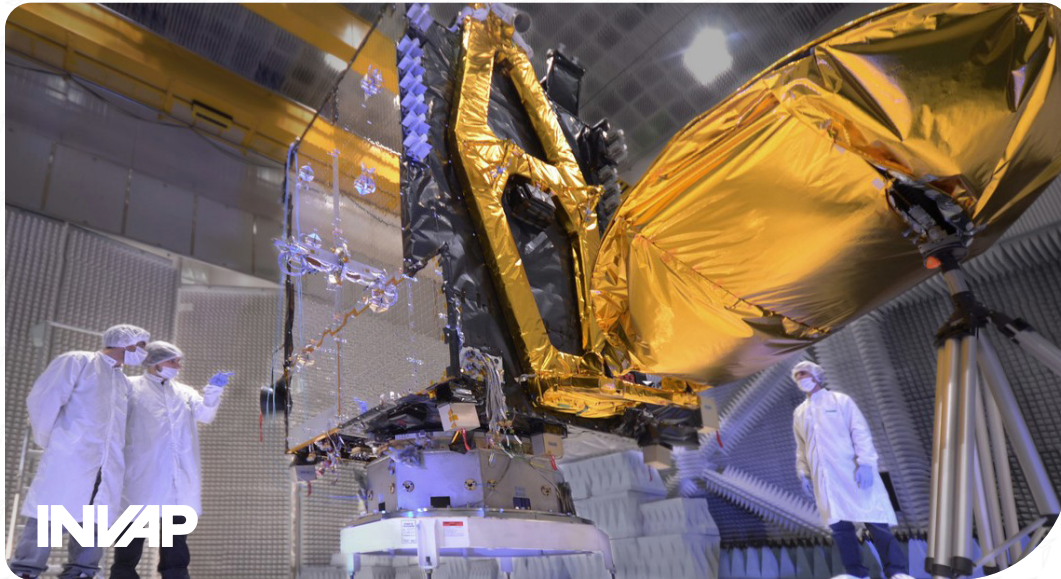
15.7 Billion \$  
Backlog



2.3 Billion \$  
Turnover



## INVAP



### Established in 1976

- World-class company located in Patagonia, Argentina
- Four Business Areas:
  - Nuclear: Research Reactors & Radioisotope Production
  - Space: LEO Earth Observation and GEO Telecom Satellites
  - Defense & Security: Radar for ATC, Defense and Meteorology
  - Technological Services and Information & Communications Technology



Prime Contractor of  
ARSAT 1 & ARSAT 2 GEO  
Satellites



Prime Contractor of  
SAOCOM 1A and 1B SAR  
Satellites



More Than  
1.400 Employee

# STRATEGIC ADVANTAGES

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## Taking Advantage of Parent Companies Strategic Assets

- Successful Track Record
- Space Heritage on LEO and GEO Missions
- Satellite Design Expertise & Proven Capabilities
- World Class Assembly, Integration and Test Facilities
- Global Operation Capability
- Servicing Locations in Europe and South America
- Full Solution Covering Space & Ground Segments
- Strong Financial Background
- Turnkey Delivery on Orbit











# SYSTEM FEATURES

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A Small Size GEO satellite integrating a communications payload with power consumption up to 7.5 kW and typical throughput capabilities.

GSATCOM Satellite Family offers broad range of telecommunication solutions implemented by a full-electric small size space segment. GSATCOM's new, modular and flexible design boosts global commercial operation capabilities and plays a significant role in cost efficient telecommunication market.

- Optional Digital Flexible Payload
- HTS Payload for Re-use of Spectrum
- Spot and Wide Beams
- Full Electrical Propulsion
- Payload Power: 1.5 to 7.5 kW
- Launch Mass : 500 kg to 2000kg
- Multi Launch and Rideshare Compatibility
- 74 cm to 120 cm User Antenna Dish
- Including but not limited to Ka, Ku, C, X and UHF band support





### Communication Payload

- Flexible Payload
  - Digital Processor
  - Antenna Tile
- Wide Coverage Beams
- HTS Payload
  - Re-use of Spectrum
  - Multi-Spot Beams



### Launch Mass

- 1,000 to 2,000 kg
- Rideshare: ~ 500 kg Option



### Frequency Bands

- Ka, Ku, C, X, UHF etc.



### Payload Power

- Up to 7.5 kW
- ~1.5 kW for Rideshare Option



### Launch Compatibility

- Multi-Satellite Launch Compatibility



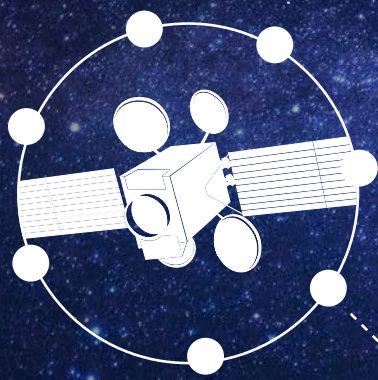
### Achievable Throughput

- Up to 50 Gbps @ ~74cm to 1,2m User Antenna Dish



### Propulsion

- Full Electrical Propulsion





# KEY FEATURES

## HTS ARCHITECTURE

*A new approach on satellite communication systems that is capable of delivering higher throughput*

## FLEXIBLE PAYLOAD

*Tailored payload solutions for in-orbit frequency re-configuration, adaptive coverage and power allocation needs of the users*

## ELECTRICAL PROPULSION

*A Highly Efficient Propulsion System to perform Orbit Raising, Station Acquisition and Station Keeping of the Satellite*

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## COST EFFICIENT AND RAPID DELIVERY

*Reduced overall cost, shortened delivery time and rapid response to new market opportunities*

## MULTI-LAUNCH CAPABILITY

*By optimized rideshare and multi-launch solutions, this unique feature allows prominent launcher cost efficiency to end users*

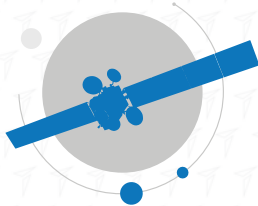
## MODULAR DESIGN

*GSATCOM modular and scalable concepts provide a more straightforward payload and platform integration*









### High-Throughput System (HTS)

Multi Spot Beam  
Frequency Re-use &  
Higher Spectrum Efficiency



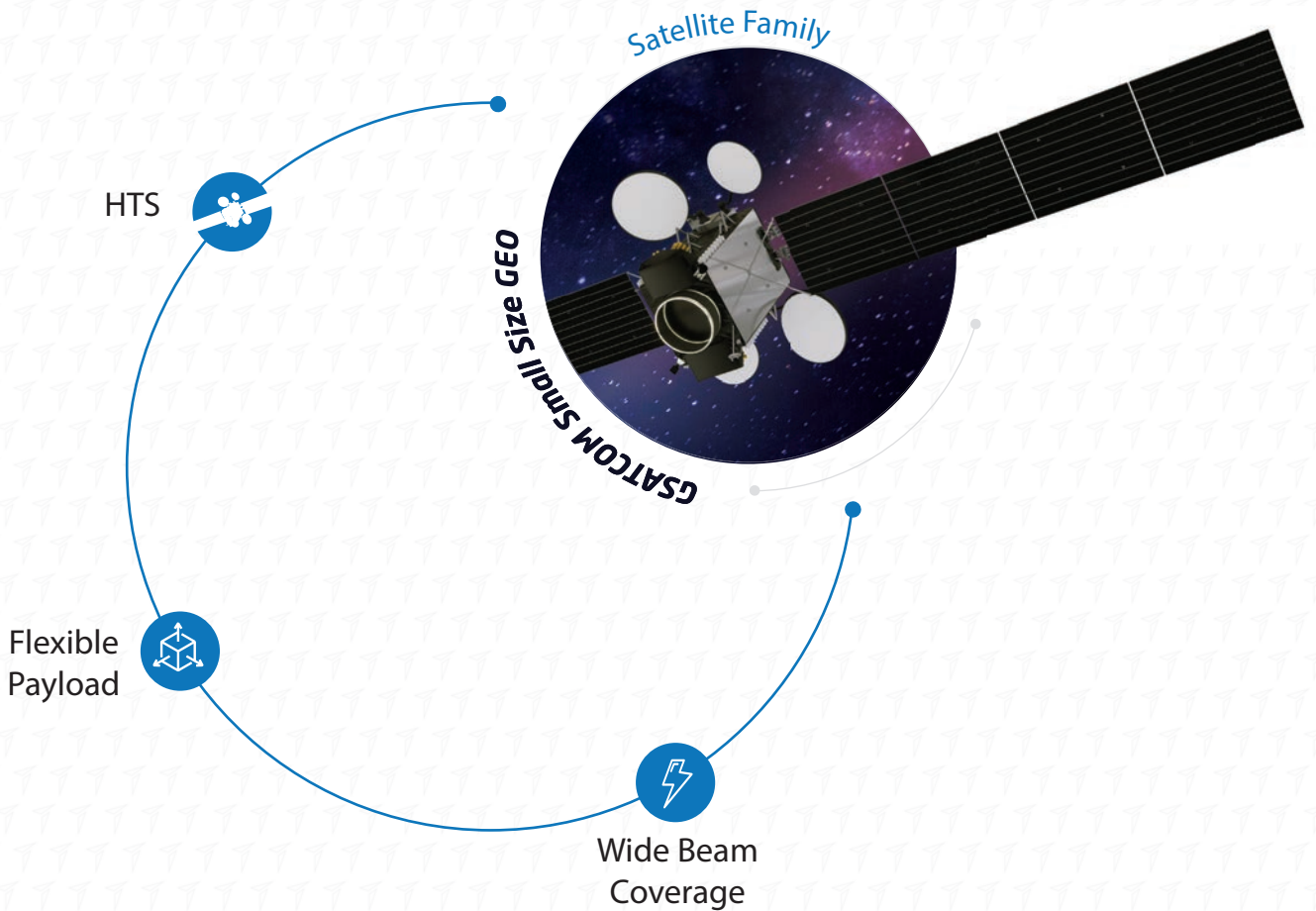
### Payload Flexibility

In-orbit re-configuration  
Dynamic Resource &  
Demand Management



### Wide Beam Coverage

Wide Beam Coverage  
Optimized for Exact  
Customer Needs





# CIVIL APPLICATIONS



Digital  
Terrestrial  
TV Connectivity



High Throughput  
Broadband  
Connectivity



Internet of  
Things (IoT)



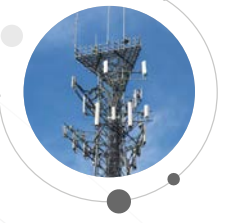
Mobility  
(Aviation & Maritim Applications)



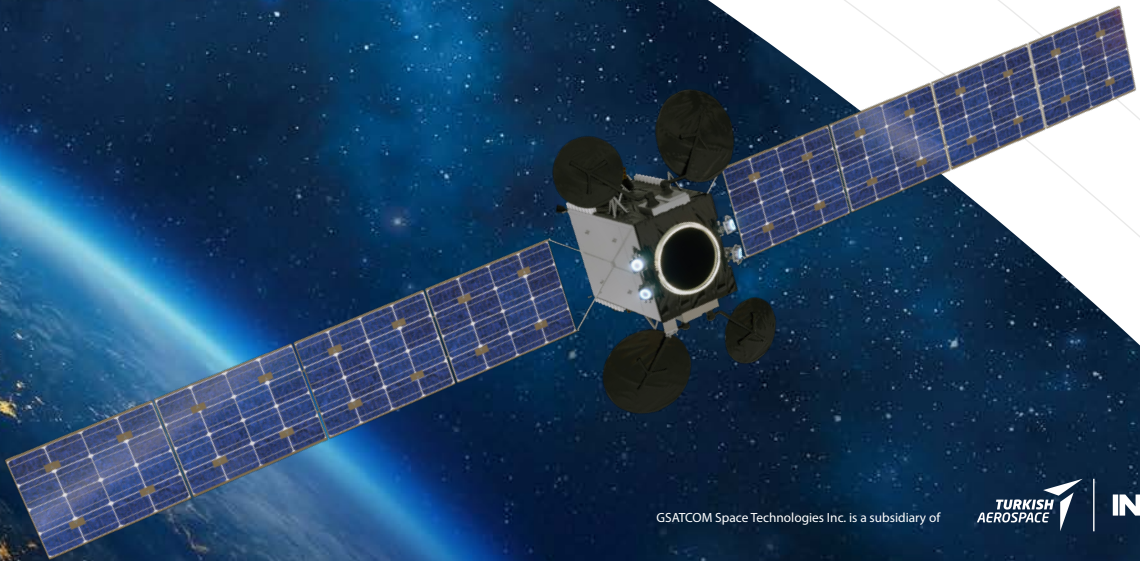
Content  
Streaming



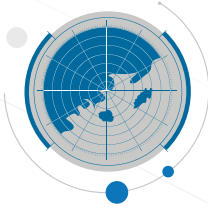
Cellular  
Backhaul



Backward  
Compatibilities  
with Legacy Networks  
(Wide Beams Coverage)



# SECURITY APPLICATIONS



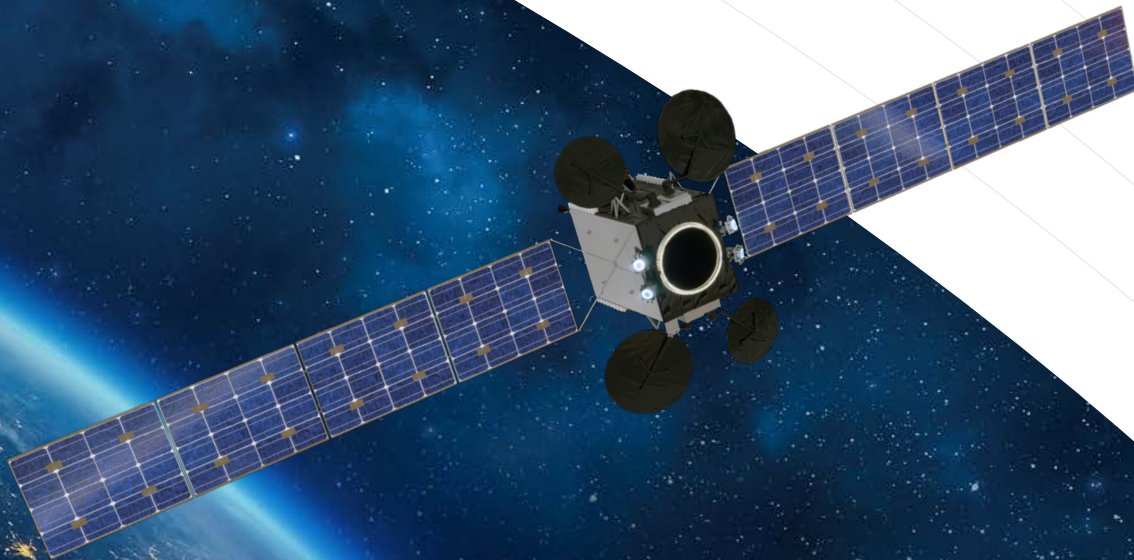
Intelligence  
Gathering



Precise  
Navigation



Secure  
Communications





# BENEFITS FOR THE OPERATORS



## Financial

- Efficient CAPEX
- Faster Return of Investment
- Higher Capacity Fill-Up Rate



## Business

- Dynamic Demand Management
- Quick Reaction for Evolving Market Needs
- Modular Capacity Investment



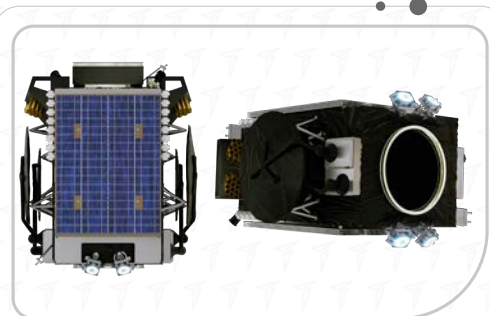
## Operational

- In-orbit Re-configuration
- Changing Orbital Slot
- Changing Geographical Coverage



## Regulatory

- Operational Built in to Use
- Saving the Existing Slot



# MULTI-LAUNCH MISSIONS

- Optimized for multi-launch missions
- Fits on stack and rideshare launch configurations
- Resizeable system solutions
- Modular central cylinder design
- Scalable design from 1.000 kg to 2.000 kg mass
- Compatible with most known launchers
- Alternative 500 kg configuration option for Built In Use missions



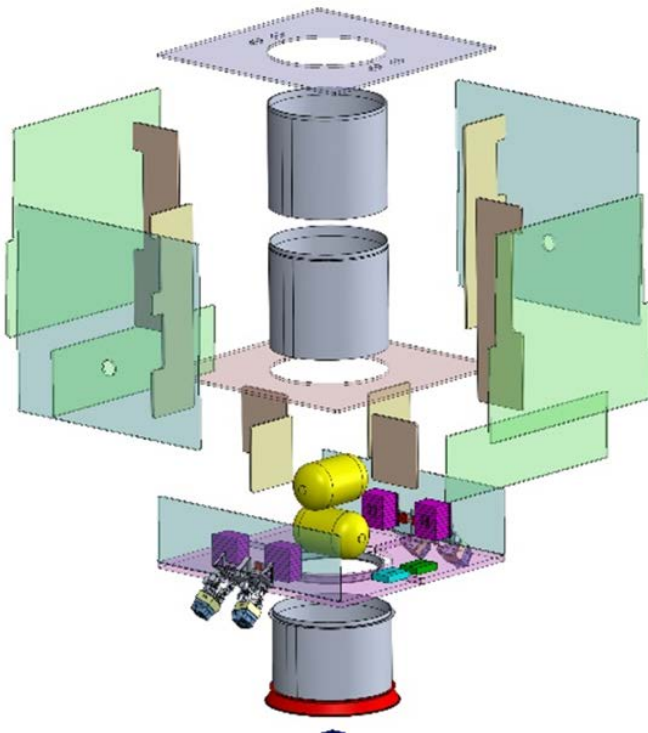
1194mm Interface  
2.2m X 2.2m X 2.5m



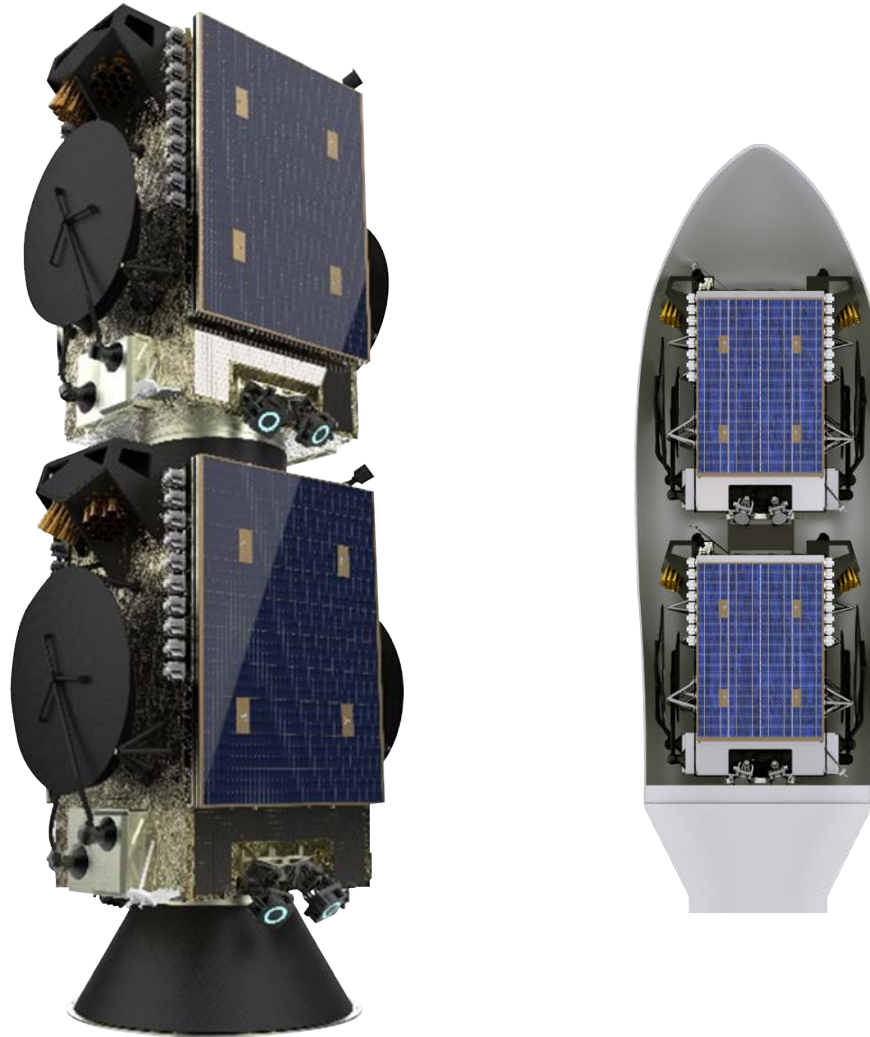
937mm Interface  
1.7m X 1.7m X 2.1m



610mm Interface  
1.2m X 1.2m X 1.7m



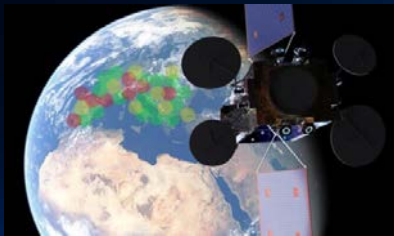




Artistic Impression: Stack Configuration of GSATCOM Small Size GEO Satellites

# PAYLOAD

- Optional Flexible Payload (Digital Processor & Antenna Tile)
- Payload Power: 1.5 to 5.7 kW
- HTS Payload & Re-use of Spectrum
- Ka, Ku, C, X, UHF Frequency Bands supported
- Multi-Spot & Wide Coverage Beams
- Achievable Throughput: 30 to 50 Gbps (typically 74 to 120 cm antenna dish at customer site)
- Modular Design and Optimized Interfaces



## High Throughput Satellite (HTS) Payload

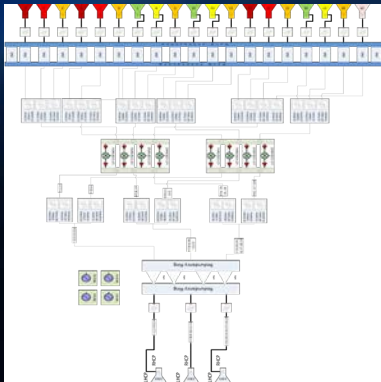
- Multiple Spot Beams
- Frequency Re-use

## Flexible Payload

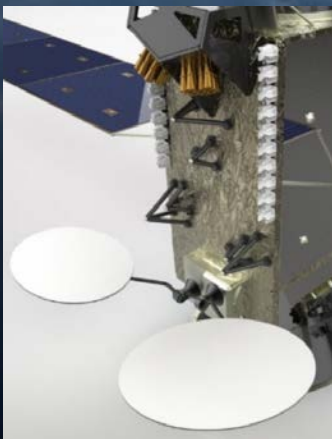
- In-orbit re-configuration
- Steerable beams

## Fixed Satellite Services (FSS)

- High Speed Two-way Internet
- Two-way TV
- Two Way Data, Telephone, Fax







#### Broadcast Satellite Services (BSS)

- Direct-to-Home (DTH) TV/Audio

#### Bent Pipe Type Payloads

- HTS with Multiple Spot Beams
- Traditional Wide Beam
- Different Antenna Types (Reflectors & Feeds)

#### Flexible Type Payloads

- Processing Communication Payload (SDCP)
- Flexible On-Board Processing Unit (FOPU)
- Antenna Tile for Phased Arrays (FlexTile)



FLEXIBLE HTS SATELLITE SOLUTIONS  
WITH MULTI-LAUNCH CAPABILITY





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