## Gottlieb's SATELLITE MOBILITY WORLD ™

Highlighting Disruptive, New, Mobility-Focused Satellite Ventures and Technologies

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### An Interview with Gilat CEO Yona Ovadia Gilat: LEOs & MEOs - The Challenge of the New Ground Segment

LEOs, MEOs and Very High Throughput Satellites are frequently mentioned in the media, yet the ground segment technologies required to accommodate these advanced technologies are seldom in the spotlight.

Satellite technology is not about "bent pipes" anymore. It's about onboard processing, virtualization, and beam steering - all advancements that require a new hub and modem infrastructure and flat-panel terminals. SES has already announced the incorporation of these technologies into its new O3b mPOWER network.

Recently, the contract to provide the ground segment for mPower was awarded to Gilat, placing them in a leading position to supply a new generation of network infrastructure to manage LEOs, MEOs, and VHTS deployments.

To find out more about Gilat's view of the changes in the industry wrought by these new satellite technologies and how Gilat will meet them, we are pleased to offer an interview with Gilat CEO, Yona Ovadia.

SMW: How does Gilat view the evolution of the Non-GEO constellations (NGSO) and Very High Throughput Satellites (VHTS) market, and what are the implications on the satellite industry?



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The satellite communication market is going through exciting times with the change introduced by the NGSO and VHTS technologies. We expect that these advancements will have a gradual yet profound impact on the industry in opening up new markets and opportunities in the coming years.

The new NGSO constellations and VHTS enable the delivery of orders of magnitude higher bandwidth at a lower cost. NGSO constellations also introduce much lower latencies, effectively providing fiber-like performance. Combined, these advantages fuel growth in demand in new and existing markets.

In addition to the more traditional markets such as maritime/cruise ships, commercial/business aviation, education, government and rich media services, some examples of new markets include 5G, video conferencing, tele-medicine, computation-intensive IoT,

"Some examples of new markets include 5G, video conferencing, tele-medicine, compute intensive IoT, banking/trading and other cloud-based applications. This is in addition to the more traditional markets such as maritime/ cruise ships, commercial/business aviation, education, government and rich media services."

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It is also important to note that the trends of significant growth in bandwidth and declining price will continue to grow due to demand and change in user patterns; which

> in turn will influence further the trends of capacity abundance and price decline. The internet is no longer mainly the provider of content, but the platform for considerable data sharing. This need to transmit data to the cloud, primarily social media photos and videos, requires faster VSATs delivering speeds and performances of over 1Gbps.

To accomodate these higher speeds and continuous tracking motion characteristic of NGSO constellations will require "higher capacity hub and modem infrastructure, network virtualization and new types of antenna terminals, namely, and Electronically

#### Steered Antenna (ESA) terminals.

SMW: What are the main challenges of NGSO constellations in general, and specifically what functionalities are required of the ground segment to address these challenges vs existing GEO platform?

There are several challenges for the ground segment to support NGSO constellations.

There is a clear need for an order of magnitude improvement in the cost per bit. Lower cost is required in order to economically scale up the ground segment and to efficiently manage the deployment and operation of these massive capacity networks which operate with many gateways.

New technologies such as network virtualization, software-defined networks (SDN), smart satellite resource capacity management, and overall service orchestration must be employed.



The ground segment is also required to take advantage of the LEO and MEO lower altitudes and assist in reducing the overall end-to-end latency and to deliver telco-grade connectivity to the terrestrial infrastructure.

> In addition, it is critical to include delivery of an effective network orchestration that ties together space and ground.

NGSO satellites as well as upcoming new generation of VHTS GEO satellites have advanced dynamic bandwidth management capabilities that enable changing beam size and beam capacity on the fly.

Supporting these added functionalities as well as the

bandwidth demand has major implications on the remote terminal's antenna as well. The need to track the orbiting satellites, rapidly and seamlessly transition from

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satellite to satellite, creates a huge need for flat ESA terminals.

### SMW: How is Gilat addressing the new requirements of NGSO constellations?

Gilat's product roadmap is all about delivering an innovative future-ready platform for the

NGSO and VHTS market. Our new platform advancements can be divided into five important dimensions:

#### Lowering the Ground Segment Cost per Bit

Gilat is developing a higher density ground segment to accommodate the terabits of bandwidth that are going to be delivered by NGSO, HTS, and VHTS.

The platform will become fully virtualized and will utilize software-defined radio and networking to enable simple and efficient management of ground segment functions and resources allowing GEO and Non-GEO deployments.

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#### **Modem Performance**

Gilat is developing a new generation of modems to enable very high service throughputs of over 1Gbps. Given the change in usage patterns we are focusing just as well on providing fast user-data

upload capabilities for connecting to cloud services in addition to providing fast download speeds.

The hardware developed for these new modems can be used over GEO satellites, MEO, and any LEO constellation. Moreover, the modems will be able to roam between GEO and non-GEO satellites to provide continuity of service for business and diverse mobility applications.

Flexibility & Scalability

NGSO and the new generation of GEO satellite are going to introduce dramatic improvements in their ability to reconfigure satellite beams on-the-fly with different coverage areas, power and bandwidth. Such flexibility requires the ground segment to adapt delivering fast beam switching, satellite handoffs, carrier and QoS adjustments, in support of up to thousands of beams.

In addition, our market leading network management system (NMS) will integrate with the satellite resource management system to enable full orchestration of the satellite segment and ground segment.

#### **Standard Based Connectivity**

In order to fully utilize their potential, the new generation of satellites and NGSO constellations must become part of the global terrestrial connectivity network.

Adaptation means that satellite services need to match the properties and standards used for terrestrial networks. Such adaptation enables communications service providers to widely adopt and integrate satellite connectivity and include it in their standard service portfolios. Here Gilat, is the undisputed global leading provider of broadband solutions. We are working on multiple fronts to ensure that our ground system and modems are configurable to support SD-WAN and 5G connectivity, as well as adopting Metro Ethernet Forum (MEF) standards for layer-2 connectivity.

In addition, we are making all networking functions fully configurable via a service orchestrator, allowing our customers to fully automate service deployment.

#### **ESA** Terminal

Gilat believes that as NGSOs go to mass deployment, flat panel electronically steered antennas (ESA) are a critical enabler to a widespread adoption of NGSO, particularly in aero mobility. Gilat has therefore been in the process of developing a state-of-the-art, fully flat, no-moving-parts, high throughput ESA. These antennas will be utilizing Gilat's in-house developed RFIC chipsets optimized for maximum performance and lower power consumption.

### SMW: Is Gilat directly involved in providing the ground segment for NGSO constellations?

Absolutely! Gilat is developing a general-purpose next generation platform available for the general market independent of the specific satellite type and constellation. We are of course in touch with most if not all the major NGSO and VHTS players and believe we have the most suitable platform to address their complex needs.

Gilat was recently selected by SES for its O3b mPOWER MEO Communications System to deliver innovative technologies including high density, software-defined virtualized ground segment to enable dynamic, demand-based, capacity steering, and thereby significantly reducing the service cost per bit. Reference: Gilat PR - SES mPOWER

Gilat's modems have already powered a series of tests in aero and maritime as well as 5G connectivity over Telesat's Phase-1 LEO satellite. A first-ever live in-flight demonstration for broadband connectivity over LEO and switching to GEO was the result of Gilat's cooperation with Global Eagle. Reference: Gilat PR - Global Eagle Inflight demo.

We are revolutionizing our modem technology to deliver gigabit services and have most recently

announced another remarkable industry milestone that was recorded of the fastest ever modem speeds of 1.2 Gbps total throughput using Gilat's modem over Telesat's Phase-1 LEO Satellite. Reference: Gilat PR - 1.2Gbps demo

Gilat also participated in the successful record test demonstrating 5G connectivity at the 5G Innovation Centre at the University of Surrey in the UK with a Tier-1 European operator, displaying 5G backhauling with Gilat's modem. Reference: Gilat PR - 5G demo

On top of this, Gilat is also at the forefront of breakthrough development to meet expectations of tracking antennas for the orbiting satellites. Seamless transition and high transmit/receive gain in relatively small aperture sizes is at the heart of Gilat's creative design for our Ka-band



ESA terminals. Recently, Gilat was the first to demonstrate this technology over a commercial aircraft. Reference: Gilat PR – ESA PR demo

## SMW: How would you summarize 2019 for Gilat, and what are your strategic goals for 2020?

Gilat is excited by the current developments in the satellite industry, and the vast opportunities that it opens for us. We are committed to enabling ubiquitous affordable quality broadband, through innovating technology, baseband products and services. We firmly believe that demand for such broadband will continue to grow, further accelerated by the start of service of NGSO and VHTS.

2019 was a year of martializing this strategy in support of NGSO constellations and VHTS satellites marked with two major milestones:

First, the landmark achievement of becoming a prominent player in the ground segment for NGSO Satellites through SES' selection of Gilat's ground segment for its next-generation platform, 03b mPower Medium Earth Orbit (MEO) - a major landmark positioning Gilat at the forefront of ground networks for NGSO constellations. SES' endorsement puts us in an excellent position to win additional opportunities in the vast market that NGSO and VHTS will create.

The other major milestone achieved in 2019 was the first-ever demonstration of the successful operation of Gilat's ESA terminal flying on Honeywell's commercial test aircraft. Using Ka-band capacity on Telesat's satellite, the results successful demonstrated Gilat's experise in ESA development and further positions Gilat for major opportunities in delployment of the technology.

Looking into 2020 and beyond, Gilat is planning to continue its leadership role in providing our renowned platform to existing GEO markets, introducing our revolutionary ESA terminals, while establishing ourselves as a leader in the upcoming VHTS satellites and NGSO



#### About Yona Ovadia

Mr. Ovadia joined Gilat in April 2015 and had previously served in various managerial posts at Amdocs for 30 years, including as Amdocs Executive Management member.

Yona holds a BSc in Math and Computer Sciences from Tel Aviv University.

## LEADING THE FUTURE

NGSO

VHTS

# Gilat is Taking Satellite Communications to the Next Level **LEADING GROUND SEGMENT TECHNOLOGY**





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