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C-COM – Pioneer in Mobile VSAT

- C-COM is an Ottawa-based technology company focused on research, development and design of fully motorized, auto-deploy, mobile satellite antenna products (iNetVu®).
- Established in 1997, C-COM is one of the largest Comm-On-The-Pause (COTP) mobile VSAT manufacturers in the world.
- Company is developing highly disruptive antenna technology (electronically steerable phased array).

Employees:	33
Exchange:	TSXV: CMI and OTCQB: CYSNF
Stock closing price:	\$1.31 (Canadian)
Dividend yield:	3.8%
Market cap:	\$55,000,000 (Canadian)

Note: As of August, 31, 2023.



C-COM by the Numbers



- 10,000+:** iNetVu® commercial mobile VSAT systems sold
- 106:** Number of countries in which you will find iNetVu®
- 600+:** Active dealer partners worldwide
- 40:** Models available of the iNetVu® auto-acquire, motorized antenna
- 10:** Modem manufacturers PLUG & PLAY Integrated with iNetVu® (35 different modem models)
- 8:** Sizes of antenna available (74cm, 75cm, 80cm, 98cm, 1.0m, 1.2m, 1.5m, 1.8m and 2.4m)
- 4:** Formats of antenna (Driveaway, Flyaway, Manpack, Fixed Motorized)
- 4:** Bands of antenna available (Ka, Ku, C & X band)
- \$23,566,505:** Working Capital (as of August, 2023 – Estimate)
- \$23,045,753:** Shareholder Dividends Paid (as of August, 2023)
- 46:** Consecutive Quarterly Dividends
- \$0:** Debt

Note: As of August, 2023. All figures in \$CAD



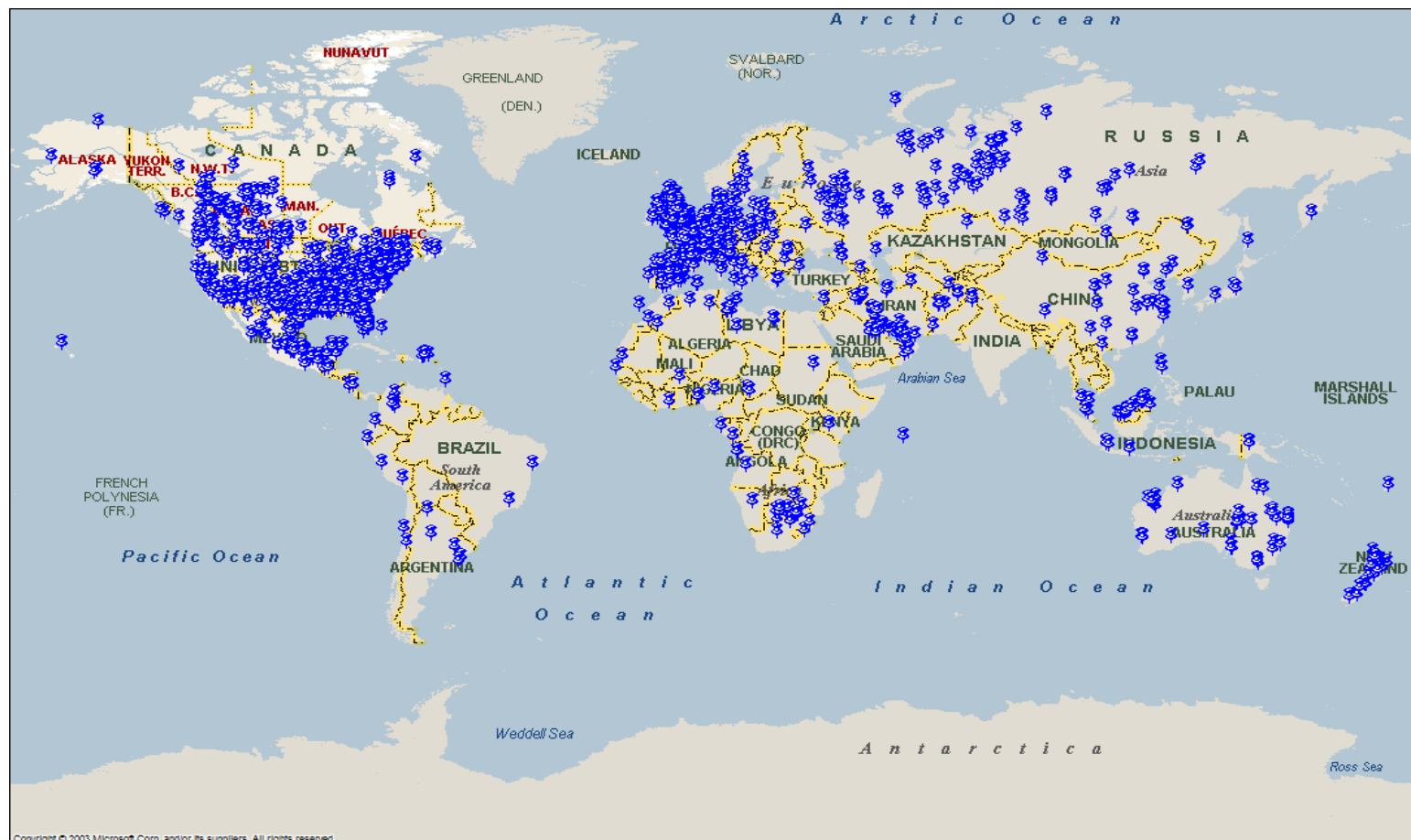
Commercial Markets Using Mobile SATCOM

- Government
- Military
- Emergency Response
- Disaster Recovery
- Blue Light Vehicles
- Oil & Gas
- Telecom Companies
- Banks
- Broadcasters
- Hospitals
- Schools
- Mining
- Events



Where terrestrial infrastructure is **LIMITED**
DISRUPTED
NON-EXISTENT
Broadband Internet via Satellite is the **ONLY** option

Worldwide Deployment



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iNetVu® Platforms (75cm – 240cm)



DriveAways



Ka-74/G

Ka-75V

Ka-75VP/KASAT 980+/982

Ka-98G/V/H/HJUP

1200+

1202

Ka-1202V

Ka-1202G

1501

1801

FlyAways



FLY-74/G

FLY-75V

FLY-981

FLY-98G/V/H

ACFLY-1200

FLY-1202

FLY-1202G/V

FLY-1801

MP-60/80/100

FMA's (Fixed Motorized Antenna)



FMA-121

FMA-121Ka

FMA-180+/181

FMA-241

The iNetVu Controller Series



- Simple stand-alone one touch operation to find satellite and stow antenna
- Typical satellite acquisition time in less than 2 minutes
- Ideal for applications that require a quick, simple setup and reliable connection
- Supports DVB-S1 and DVB-S2/ACM frequencies (modem independent)
- Optimal, high-precision antenna pointing, supports inclined orbit satellites
- Remote access and operation via Network, Web and other Interfaces
- Built-in motion and movement protection for safety
- Integrated with 20+ modems (Hughes, Gilat, Viasat, iDirect, Comtech, iPStar, etc.)
- 7 methods of finding satellite

74cm Auto-Acquire Ka-band DriveAway (Eutelsat, Hughes & Gilat)



NEW
GEN

iNetVu® Ka-74X



Ka-74G



- G – Eutelsat/Konnnect Approved; also compliant with Gilat (SkyEdge) Ka services

Ka-74H-JUP



- H-JUP- Hughes Jupiter modems. The Ka-74HJup is suitable to operate with HNS Jupiter Networks

iNetVu®7715 Controller

98cm Auto-Acquire Ka-band DriveAway (Hughes, ViaSat, Avanti & Gilat)



NEW
GEN

iNetVu® Ka-98X

(G/V/H/H-JUP)



iNetVu®7710 Controller

Ka-98G



avanti Approved Compatibility



Ka-98V



eutelsat
type approved for KA-SAT

ViaSat

Ka-98H



avanti Approved Compatibility

YahClick
POWERED BY AVANTI

Ka-98HJUP



HUGHES

- G - Avanti Approved; Thor7 Type Approved; also compliant with Gilat (SkyEdge) Ka services
- V - Exede by ViaSat / KA-SAT satellites using ViaSat Broadband Modems. Auto beam select is available on the KA-SAT Tooway service.
- H - Hughes Ka-band modems. The Ka-98H is suitable to operate over the Yahsat Yahclick network, and will be adapted as more networks become available.
- H-JUP- Hughes Jupiter modems. The Ka-98HJup is suitable to operate with HNS Jupiter (NA)⁽¹⁾, YAHSAT (MENA)⁽¹⁾ and Avanti⁽¹⁾
- Pod option available

⁽¹⁾Supported Radios: Spaceway or Jupiter. Please specify which radio being used when ordering.
<http://www.avantiplc.com/avanti-approved-compatibility>

New Generation 1.2 m Auto-Acquire Ku-band DriveAway



NEW
GEN

iNetVu® 1202



Ka-band or Ku-band

- Field Upgradable to Ka-Band
- Low Stow, high-precision antenna pointing, near zero backlash
- Excellent Cross-pol performance
- Based on Eutelsat approved Skyware 1.2m Antenna, Type 125
- Works on all Ku Supported Services
- Characterized with Eutelsat* and Intelsat Compliant
- Patented sleek aerodynamic form (Patent # D696649 & D696650)
- Optimal high-precision antenna pointing
- Wind deflector pod (optional)
- 2-piece thermoset-molded reflector (optional)

1.2 m Auto-Acquire FlyAway

iNetVu® FLY-1202



FLY-1202G



FLY-1202V

- 1.2m FlyAway Antenna
Designed for Ku and X Band
- Low cost, high precision
antenna pointing, near zero
backlash
- Setup less than 15 minutes
- Tool less, Captive H/W
fasteners
- Fits in 4 Transportable Cases,
under 35kg ea.
- Based on Eutelsat approved
1.2m Skyware antenna

iNetVu® ManPack

Ka

Ku

X

NEW
GEN

Manpack systems can be easily configured to provide quick access to satellite communications for any application that requires remote connectivity in a rugged environment.

Ideally suited for applications that require a quick, simple set-up; in vertical markets such as emergency response, disaster management, public safety, broadcast, media and more.



Simple to Assemble and Easy to Use

Manpack



**Auto-Pointing System Option
Includes Onboard Controller**

- Complete satellite acquisition in seconds
- Super quiet operation, no noise
- IP 66 Rating of whole system
- Assembly in 4-5 minutes without tools
- High precision reflector petal can be interchanged among one system and over multiple systems
- Multiple bands support: Ku, Ka, X
- Supports manual operation with handwheels and indicators

iNetVu® ManPack - MIL

Ka

Ku

X

NEW
GEN



Manpack Deployment for Film Production in British Columbia



Manpack Deployment in Japan following Typhoon 19

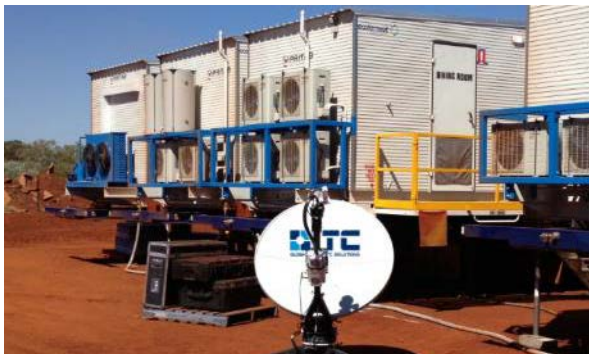




Oil & Gas



FracTech – Texas, USA - 1200



ITC Global - Australia - FLY-1201



Diverselt - Perth, Australia - 1200



TC Communication - Australia 1200



Oil & Gas – Halliburton - 980



Libya - Hermes - 1200



Sinopec - China - 1200



BSC - Beijing - 1200



Satellite News Gathering



WebTVLive OTT by C2D.eu - RTC
Belgium Broadcaster - Ka-75V



DDish TV - Mongolia - 1201



Spar Woman's Day Race - Grintek -
Africa - Ka-98H



SNG - ViaSat - USA - Ka-75V



SNG - Newspotter - Eusatnet
(SatSpeed) Germany - Ka-75V



CCTV in China - Sichuan
Earthquake - 1200



SNG - ARY News - Pakistan - 1200



Elections in Angola - Grintek - 1200



Emergency Response



Excelerate - UK - 1200



Landslide Disaster
JSC Japan - 980



Police Command Vehicle
Altegrosky - Russia - 1200



FireTruck - Xian - China - 1200



Fire Department - Japan - 1201



ER - Primetech - UK - Ka-75V



Disaster Recovery - Softbank - 980



Indonesia - 1200



TeleHealth



Telemedicine and Mobile Diagnostic
Center Altegrosky - Russia - 1200



Mobile Health - Remote Comm LLC
Midland, TX - 1200



Mobile Surgical Satellite Service
New Zealand - 1800



Loma Linda University - USA - 1200



Mobile COVID Vaccination Clinic -
Hughes - US - 1200



Mobile Health Care Services
Siberia - 1200



Breast Screening - NZ - 980



Transnet Phelophepa Health Train
Grintek - South Africa - 1200



Military



Polish Military - TTCom - 1800



Military - Russia - 1200 & 980



Russian Police Vehicle - 1200



Military - Russia - 1200



Military - 1200 transported on a Russian IL-76 Cargo Plane



Russian Military - Fly-1201



Military Forward Operations Base - USA FLY-1201 - Carolina Satellite



Vietnam Military Vehicle -980



Telecom



Telecom – TFL – Fiji – 1200



Telecom – TFL – Fiji – 1200



Telecom - Numix -Broadband
on Wheels - Malaysia- 1200



Telecom Malaysia Mobile Store
Numix - 980



AT&T – UK - 1800



Telecom – China - 980



Telecom Malaysia - Numix - 1200



Telecom Malaysia - Numix -980



Mobile Office



Gov. pension programme Vox
Telecom – South Africa – Ka-98H



Peru – FLY-981



Telespazio – Demo – Germany- 981



Government - Mobile ID Vehicles
Argentina - Telespazio - 1200



Mobile Sight Services - UK
Primetech - 750



Mobile Office - Eskom
South Africa - 980



Mobile Tax Office - Grintek
South Africa - 980 - SARS



Youth Services - UK – Primetech -
Ka-75V

Mobile Banking



NTI Soluciones – Spain - 1200



South Africa
Grintek - 980



UK - Primetech - Ka-75V



Numix - Malaysia 981



Transportable ATM Container
New Zealand - Bay City - 980



Coris Bank International - 980



Germany - 1200



SATCOM Business Innovating Aggressively

The Satellite business is a \$46B market. Flat Panel Satellite Antennas represent a \$17B opportunity over the next decade.

Many big players, with very ambitious projects, are now getting involved:



OneWeb
(UK+Bharti-
India)
648 Satellites



Musk (SpaceX)
4408 microsats



Bezos (Amazon-Kuiper)
3,236 satellite constellation



Telesat Lightspeed
188



Boeing 132



Gates funding
Kymeta



Entering the **GOLDEN AGE OF** the **SATELLITE BUSINESS?**

O3B, SpaceX, Amazon, Inmarsat, Telesat, Viasat, Intelsat, Hughes, Kepler, Boeing and others have large-scale goals.

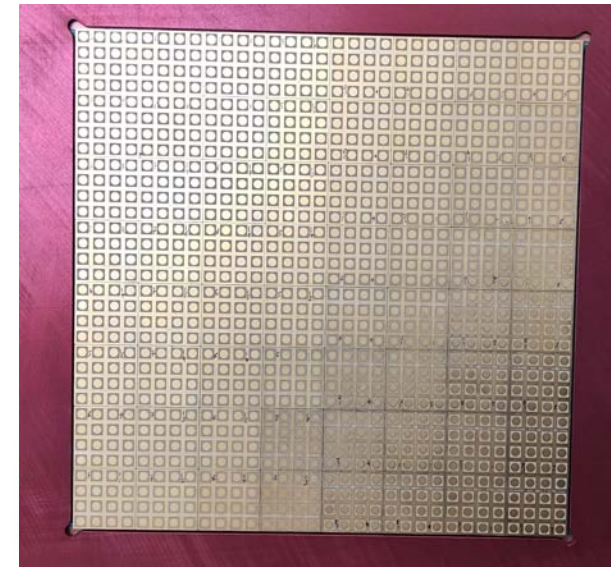
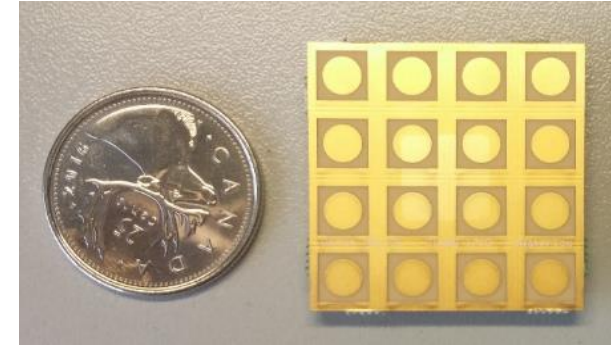
All of these grand schemes require antenna design expertise.

All require reliable & high precision ground station antennas.

Can they be cost effective?

Low Cost Phased Array Antenna System for Ka-band Mobile SOTM

- C-COM Satellite Systems, in partnership with the University of Waterloo, is creating its first Phased Array Antenna (PAA).
- C-COM tested its Ka-band Phased Array modules using the company's **patented phase shifter technology** in 2020.
- **The proof-of-concept prototype has been successfully concluded by satellite tests in 2021.**
- The concept is based on modules that are small, but contain everything — the antenna, plus the electronic circuit, parts of the control circuitry, and local memory.



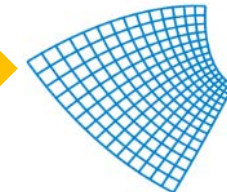
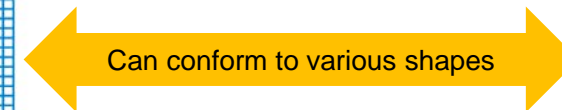
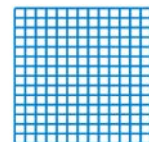
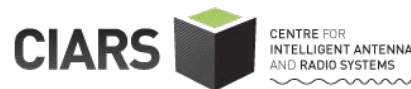
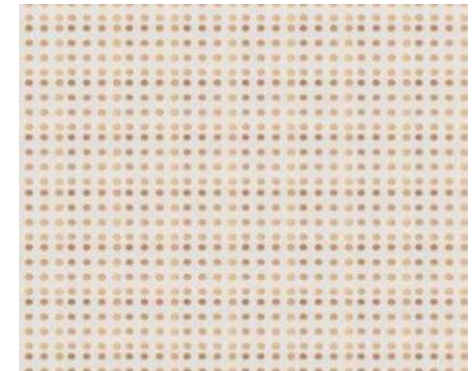
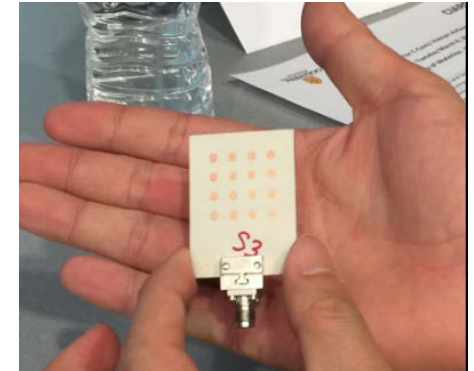
16x64 RX 4x4 Modules
(1024 Elements)

Advantages of Proposed Technology

INTELLIGENT CHIP BASED TECHNOLOGY

- System can have full control over each module
- Can perform electronic beam steering
- Can optimize the beam
- Can electronically scan 360 degrees
- **Scalable**
 - Gain can be increased by adding multiple modules
 - Allows for small building blocks which can be used to make any size of antenna;
- **Conformal**
 - Bends to fit various shaped surfaces

- **Dramatic cost reduction**
 - One antenna consists of several thousands chips, a few hundred antennas could reach a volume of millions of chips.
 - It will be easy to reach “economies of scale”, leading to significant cost savings.
 - Applicable to many vertical markets



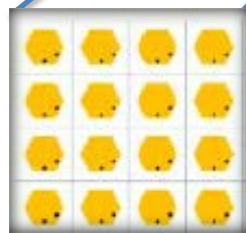
Scalable Architecture: 4x4 to 16x16 to 80x80 Antenna Sub-Arrays



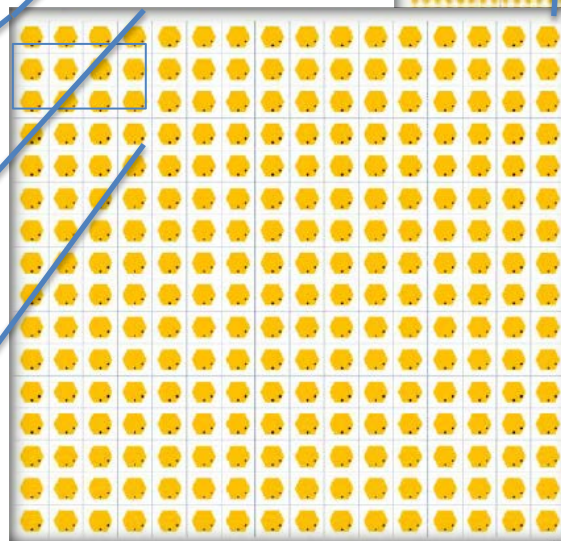
4 x 4 Antenna Sub-Array Module

4X4 Tile

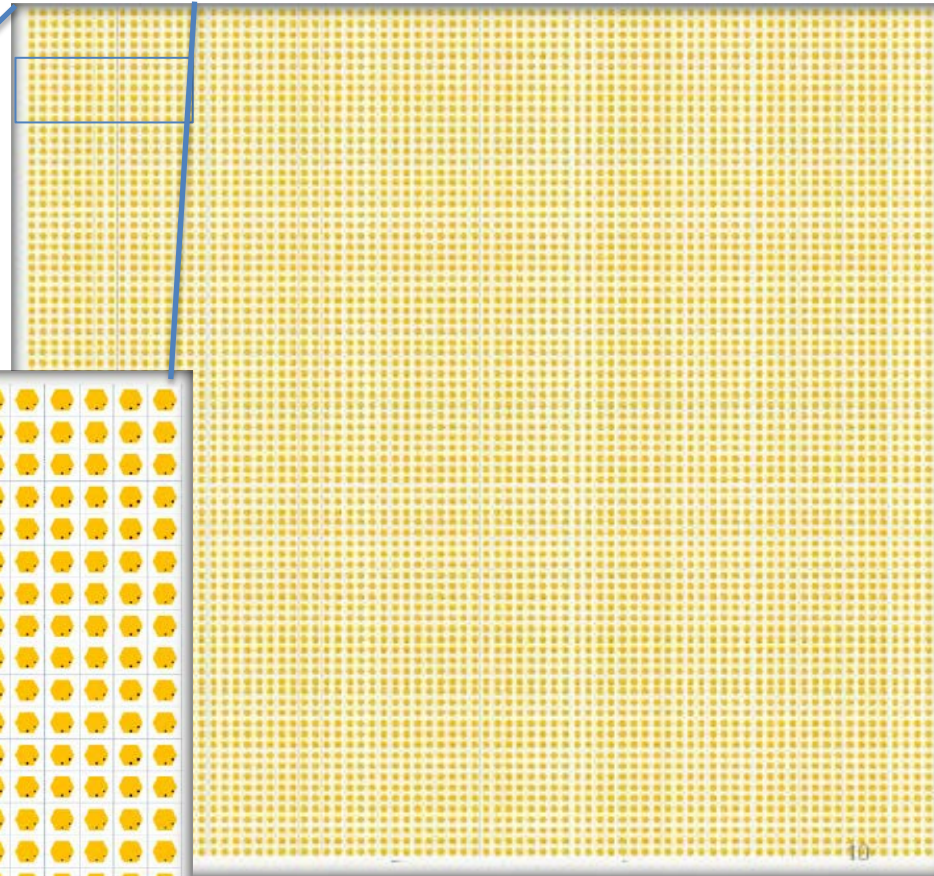
Microstrip-line feed circuit containing variable gain low noise amplifier (LNA) and the BST phase shifter



4x4 Sub-array Module



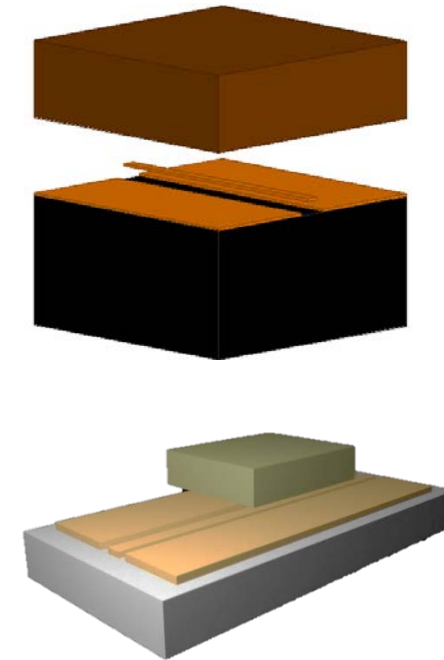
16x16 Sub-array Module



80x80 Array Panel
made of 25 of 16x16 sub-arrays

Novel Dielectric-Based Patented Phase Shifter

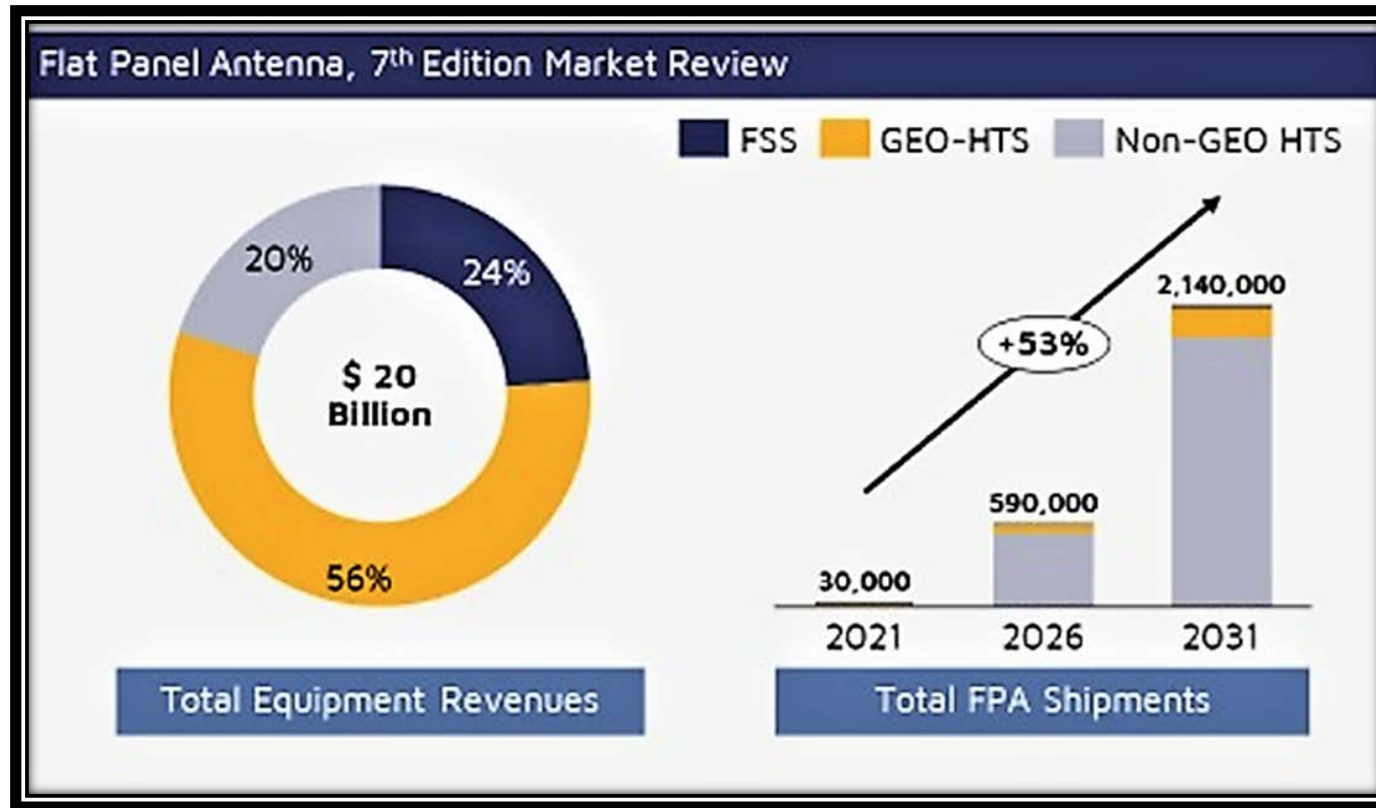
- Operating Principle:
- Based on coplanar waveguide (CPW) combined with a dielectric slab (BLT ceramic) and High Resistivity Silicon (HRS) ;
- Phase shift is tuned by reconfiguring the phase shifter components via physical actuation;
- Distances can be changed using piezoelectric transducers or micro-electromechanical systems (MEMS) actuators



Flat Panel Antenna vs Parabolic Under Test



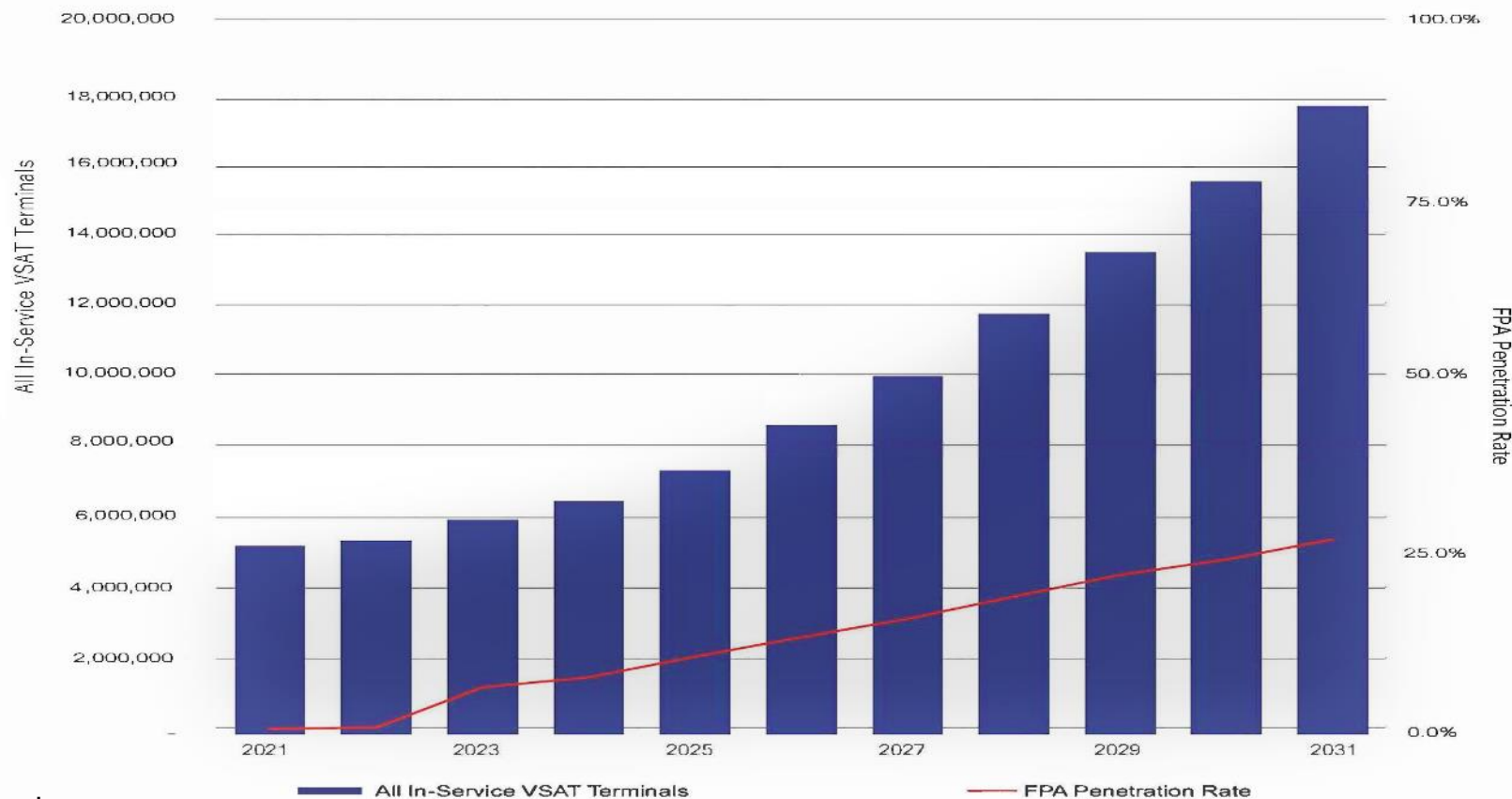
NSR's Flat Panel Satellite Antenna Analysis



* Credit by NSR - Northern Sky Research

NSR's Flat Panel Satellite Antenna Analysis

Global FPA Market FPA Penetration Rate



* Credit by NSR - Northern Sky Research

Source: NSR

ESA Antenna

Supports GEO, LEO, MEO
Constellations
Ka-band Frequency: Transmit: 27.5-
30.0 GHz Receive: 17.7-20.2GHz
Electronic Beam Steering and
Tracking
Elevation Angles: 20-90 deg; (70deg
from Boresight) with scan loss up to
5dB
Azimuth Angles: 360 deg Continuous
Polarization: Software switchable,
Linear (H/V) or CP (RH/LH)



Cars with ESA Antennas



High-Speed Trains with Phased Array Antennas



Simulation of Aircraft with Phased Array Antennas



Phased Array System for High Efficiency Millimeter Wave Wireless Communications of 37-48GHz

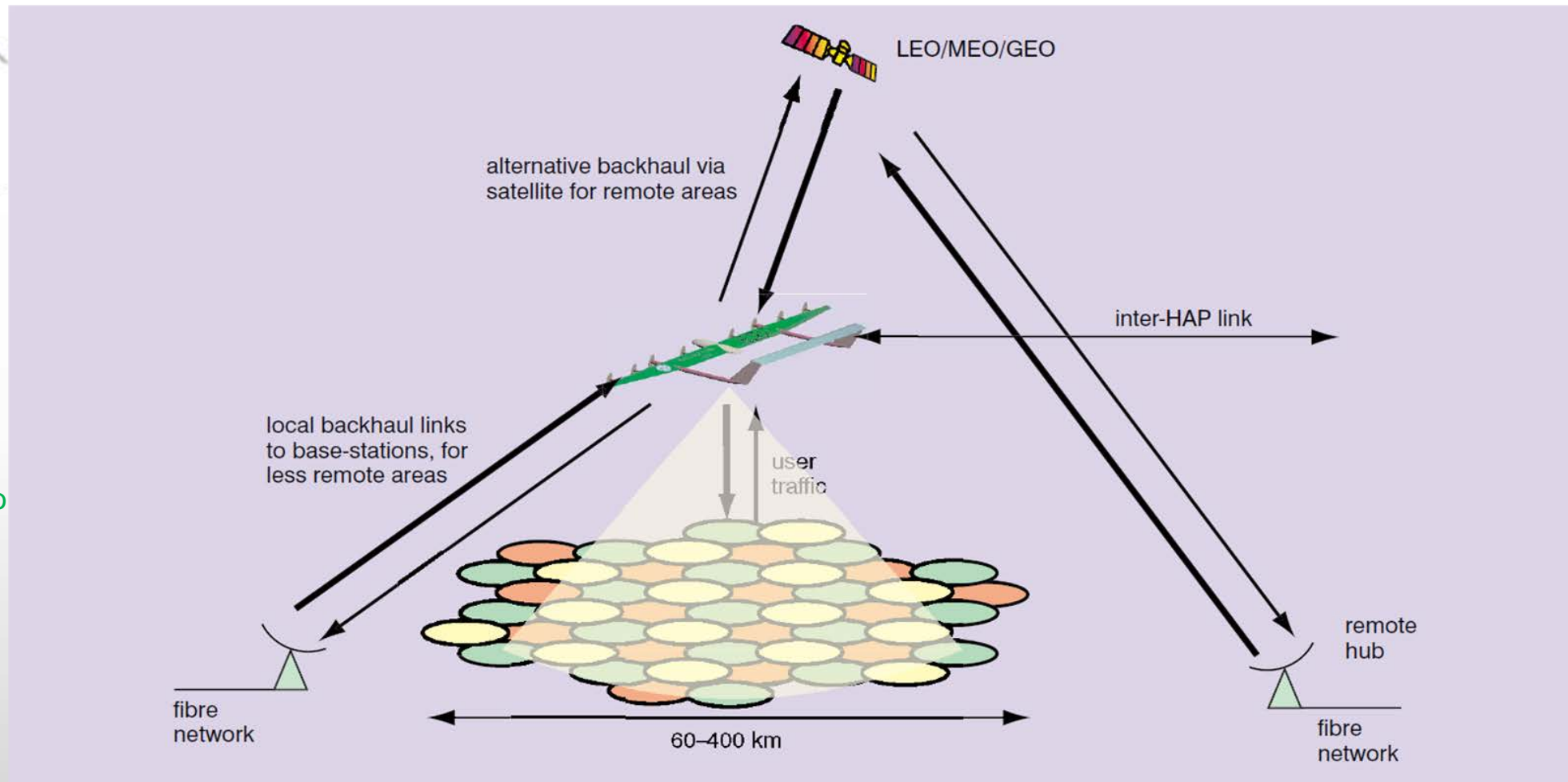


PARTNERS

C-COM Satellite Systems Inc.
Skyworks Solutions Canada Inc.
University of Waterloo
Eindhoven University of Technology
NXP Semiconductors
Semiconductor Ideas to the Market

COUNTRIES INVOLVED

Canada
Netherlands



Phased Array System for High Efficiency Millimeter Wave Wireless Communications of 37-48GHz



- 5G services currently being rolled out in Europe and elsewhere are based on updated 4G systems.
- A host of Low-Earth Orbit Satellite constellations are now in deployment that will leverage ubiquitous coverage between the north and south poles.
- The biggest gains will come from the introduction of new mmWave technologies, which use radio waves of much higher frequencies and shorter wavelengths.
- These technologies are the key to improved network capacity, faster downloads (anywhere from 10 to 100 times) and reductions of up to 10-fold in 'latency' (i.e. the time to respond to an instruction or a command).
- Softbank HAPS Mobile Mission Concept: <https://www.hapsmobile.com/en/media/>



Thank You!



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