TruePath Wireless: Who We Are

A 5G+ Wireless Infrastructure Company

- Serving Global Telecom, Marine and Aviation Customers with Next Generation Solutions & Services
- US Headquartered in Santa Clara, CA (Silicon Valley)

Craig Samuel, CEO, Board Member & Investor

- Formerly SVP UT Starcom (UTSI) Strategy, Innovation and Corp CTO
- Formerly Worldwide Corporate VP Innovation Unisys
- Formerly Worldwide CKO & Lead Innovation HP & Compaq

Michael Leabman, Board Member, CTO & VP Engineering

- Pioneer in phased array in OFDM incorporated in early WiMax Standards
- Worldwide expert in advanced wireless technologies including adaptive beamforming, advanced antenna arrays, noise cancellation over OFDMA, for military & commercial applications (Hughes, Radix, Beamreach)
- BSc and MSc MIT Electrical Engineering and Computer Science
- Has 10 wireless technology patents registered to his name
Business Model

• Business Model
  – Radio equipment sales, maintenance, and service to aviation, maritime, and telecom sectors worldwide
  – Specialized Network Operator in target markets

• Target Verticals include
  – Aviation, providing both in-flight entertainment connectivity and real-time cockpit to ground systems links
  – Marine, providing ship to shore broadband links enabling high speed broadband internet access for passengers and crew
  – Telco backhaul, enabling long-distance backhaul connectivity

• Channel Partnerships
  – TruePath leverages high quality, trusted channel partners with strategic operators, particularly in Aviation. MOU in place with major Airline for Europe wide roll-out.
TruePath Technology - why it’s different than anything else you have seen before
Key Technology Differentiators

• **State of the Art Antenna Technologies**
  – Advanced Interference mitigation and avoidance
  – Combination of Beamforming + 4x4 MIMO + Dual Band antenna
  – Horizontal and Vertical Polarizations for maximum throughput

• **Worlds most Sophisticated MIMO Multiple-In/Out RF**
  – Unprecedented frequency handling efficiency & performance
  – Unique power handling on BTS and CPE offers longest range

• **Highly Advanced Modem Design**
  – Optimized for throughput and Distance not number of users
  – Offers greater capacity in band (20/40MHz vs. 10MHz)
  – TDMA – provides higher QoS & Performance vs CSMA/CD
  – Adaptive uplink and downlink frame rate control
Key Technology Differentiators

• **Multi-Beam Connections (at both ends of the link)**
  – High reuse of Spectrum => very high data-rates & efficiency
  – Makes narrow licensed spectrum usable and useful
  – Transmit beam-forming – increases the transmission distance
  – Receive beam-forming – focuses the energy of the best path

• **Use of Unlicensed Spectrum possible due to active blocking of interference using beam-forming/null-steering**
  – Allows large bandwidths/ data rate (>80MHz)
  – No dedicated Spectrum required (FCC Part 15.247)

• **Products FCC Certified Part 15.247**
  – FCC Certified in United States and Canada for 2.4, 5.8Ghz and dual 2.4/5.8Ghz frequencies
Advanced Technology

- **Aero Technology**
  - Leveraging spectrum re-use, providing efficient use of RF signal guaranteeing ‘true’ broadband capability per aircraft
  - Beamforming (phased-array, smart antennas)
    - Multiple antennas working together providing dedicated, focused, tracking beam
  - Dedicated, secure bandwidth to each plane

![Diagram of Aero Technology](image-url)

Wireless BaseStation | 100+ miles | Wireless Client
Wireless Client | Wireless Client

TruePath Wireless Confidential
The TruePath Product Line
TruePath Product Lines

Aero/Telecom BTS  |  Telecom Client  |  Aero Client

• **TruePath LongReach BTS & AirConnect CPE – Up to 40Mbps**
  – For aviation, marine and Telco High Power long distance (max 125km)

• **TruePath Twiga BTS & Swala CPE – Up to 80Mbps**
  – For short distance (< 15 km) ground to ground applications

• **TruePath EMS + NMS**
  – A fully integrated EMS + NMS solution seamlessly managing and updating TruePath BTS systems deployed in the field

• **High Capacity OSS/BSS Billing**
  – A system integrated billing system & customer mngt system fully integrated into the BTS enclosure allowing true ‘edge distributed management.’
TruePath Longreach™
4x4 MIMO Base Station Specifications

System Highlights

**Base Station BTS (TPW24-B-4T)/(TPW58-B-4T)/(TPW2458-B-4T) – 4x4 MIMO**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>27” H x 19” W x 6” D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (estimated)</td>
<td>BTS 19 lbs.; Mount Bracket 12 lbs.; PSU 5 lbs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 10/100/1000 Ethernet Port</td>
</tr>
<tr>
<td>1 Power Port</td>
</tr>
<tr>
<td>1 Alternate Power Port*</td>
</tr>
<tr>
<td>1 GPS Antenna Port*</td>
</tr>
<tr>
<td>1 Grounding Lug</td>
</tr>
<tr>
<td>4 N-type RF Connectors*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LEDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Power</td>
</tr>
<tr>
<td>1 Network Activity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wireless Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEP, WPA, WPA2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;80Mb/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Radio Frequency Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 or 5.8GHz or Dual 2.4/5.8Ghz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>48VDC, 50 Watts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>-45C to 55C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>-45C to 80C</td>
</tr>
</tbody>
</table>
# TruePath Competitive Advantages for Aviation

<table>
<thead>
<tr>
<th>Evaluation Factor</th>
<th>Satellite Ku Band</th>
<th>Cellular 2.5 G</th>
<th>TruePath 4.5 G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight – (fuel cost factor)</td>
<td>450 lbs</td>
<td>125 lbs</td>
<td>&lt;30 lbs</td>
</tr>
<tr>
<td>Aerodynamic Drag – (fuel cost factor)</td>
<td>major</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>Installation – (plane out of service)</td>
<td>21 days</td>
<td>2 overnight stops</td>
<td>2 overnight stops</td>
</tr>
<tr>
<td>Cost of aircraft radio hardware</td>
<td>$400K+</td>
<td>$125K+</td>
<td>$50K</td>
</tr>
<tr>
<td>Cost of maintenance per year</td>
<td>$100K</td>
<td>min.</td>
<td>min.</td>
</tr>
<tr>
<td>Annual cost of link from ground to plane</td>
<td>$100K</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Data throughput rate per plane</strong></td>
<td>1.5 Mbps</td>
<td>.25–2 Mbps</td>
<td>40Mbps</td>
</tr>
<tr>
<td>Internet site accessibility (high volume content)</td>
<td>restricted</td>
<td>restricted</td>
<td>unlimited</td>
</tr>
<tr>
<td>Time to download a 2-hour movie</td>
<td>3 hours</td>
<td>3 hours</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Signal reliability</td>
<td>excellent</td>
<td>fair</td>
<td>excellent</td>
</tr>
</tbody>
</table>
System Components

Air Network
- TruePath AirStation
- TruePath Wireless BaseStation
- In-flight Network Server
- WiFi Access Points
- Switch
- WiFi Access Points

Ground Network
- Access Service Network (ASN) Gateway
- Access Service Provider Network

NOC / Back Office
- AAA Services
- Content Services
- Mobile IP
- IMS Gateway
- Billing Support Services
- Ops Support Services

Legend:
- **Green** = FAA-certified COTS (Existing)
- **Blue** = COTS (Commercial Off-The-Shelf)
- **Light Blue** = TruePath Equipment
OSS Features

- OSS with AAA, SLA’s, QOS, integrated into BaseStation
- Features include:
Aviation Vertical: FAA/FCC Certification Requirements

• **Air-To-Ground Radio**
  – Must be tested and certified compliant to DO-160E (hardware) and DO-178B (Class D/E - RF emissions)

• **Antennae and Networking Equipment**
  – Off-the-shelf FAA-certified components will be employed
  – Structural analysis & testing will be performed for antenna placement & mounting

• **Testing & Certification**
  – FAA Consultant Designated Engineering Representative (DER) on board
  – FCC Lab test in progress for Part 15.247 compliance
Airline and Government Services

Electronic Flight Bag (EFB)

Dynamic Turbulence and Weather Info

Video Conferencing

Passenger Manifests

Real-Time Cabin Surveillance
Free Passenger Services

- Flight Status
- Duty-Free Shopping
- Airline Reservations
- Hotel Reservations
- Gate Information
- Car Rentals
- Airport Maps

TruePath Wireless Confidential
Paid Passenger Services

eMail

Web Access

VPN Access

On-Demand Entertainment (FUTURE)

Interactive Gaming (FUTURE)
Enabling the Connection
To the Future