Introduction to the Ancillary Terrestrial Component (ATC)

MSUA-4 Conference

Tim Farrar

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We still have some way to go to create the “complete” quadruple play

<table>
<thead>
<tr>
<th></th>
<th>Voice</th>
<th>Broadband</th>
<th>Video</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telcos</td>
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<tr>
<td>Cable</td>
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<tr>
<td>Satellite TV</td>
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Availability 2000 2005 2010

Wireless may be used not only to provide mobility, but also to fill other gaps in the service portfolio.
What role could ATC play?

- “Dual mode cellular handsets, capable of receiving both terrestrial and satellite signals initially may cost $5 to $10 more than a regular terrestrial-only cellphone, but shouldn’t be heavy or bulky”

- “MSV’s goal is to provide ubiquitous cellphone service nationwide and ‘blazingly fast’ Internet access at ‘reasonable cost anywhere you are’”

- “The cornerstone of MSV's integrated network approach is the concept of ‘Transparency’, defined as the use of integrated satellite and terrestrial technology on standard wireless devices that are substantially similar to current PCS/cellular devices in terms of aesthetics, cost, form factor and functionality”

Although ATC was originally assumed to be focused around handheld phones, other approaches could include Wi-MAX (using in-home gateways) and broadcast applications (such as ICO’s MIM service)

1Gary Parsons, Chairman of MSV, quoted in Barron’s, June 2005
2MSV website at www.msvlp.com/nextgen/differentiation.cfm
What will it cost to deploy?

- **MSV**: $1,082M for three satellites + ground network ($1.1B for first 2 North American satellites incl. launch, excl. possible ~$250M ground spare)
  - terrestrial network estimated at $20M to $60M per market, total cost of $500M to $2.6B depending on technology, number of markets and service offering
- **ICO contract with SS/L**: $188M for first satellite + $112M for launch, ground spare estimated at $180M to $225M, $40M for MIM alpha trial
- **Terrestar**: ~$600M for first satellite, spare, launch and insurance, plus ~$200M for ground-based network, terrestrial infrastructure and handset development
  - terrestrial network estimated at $40M to $60M per market
- **Inmarsat**: $1.5B for first two I4 satellites and ground spare, plus $140M for launch of third satellite + $30M-$60M for additional Earth stations + ~$350M for Alphasat/extended L-band payload
- **Globalstar**: $120M for spare satellites, EUR661M contract for second gen satellite construction, plus up to $500M for launch and network upgrades
- **Iridium**: $2B+ second generation system planned

If all six systems are built out then the space segment cost alone is ~$8B (c.f. total MSS retail service revenues in 2006: ~$2B)
What is it worth?

- Historic PCS valuation quoted in ICO’s 2005 bond offering was $1.64/MHz-POP
  - on this basis the 141MHz of spectrum allocated to MSS could be worth up to $70B in the US alone
- AWS auction results: F-block $0.74/MHz-POP, average was $0.54/MHz-POP for 90MHz of spectrum
- Upcoming 700 MHz spectrum expected to raise be more expensive than AWS spectrum (due to lower frequencies and better propagation)

Is ATC spectrum worth more or less than terrestrial spectrum – is the MSS component a value-enhancer or value-destroyer?
Is MSS service quality sufficient to provide “ubiquity”? 

**Additional power required for reliable satellite coverage**

<table>
<thead>
<tr>
<th>Location</th>
<th>Power Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a car</td>
<td>5-10dB</td>
</tr>
<tr>
<td>In a house</td>
<td>10dB</td>
</tr>
<tr>
<td>In a motel/store/office</td>
<td>20dB</td>
</tr>
</tbody>
</table>

Nominal 10-12dB link margin

Will users expect their satellite phone to work inside a car or a building?

Source: Goldhirsh & Vogel (1998), TMF Associates estimates
Contact us

Tim Farrar
Telecom, Media and Finance Associates, Inc.
3705 Haven Avenue, Suite 113
Menlo Park
CA 94025

Tel: +1 650 839 0376
Cell: +1 650 642 5195
Fax: +1 650 839 0375
Email: tim.farrar@tmfassociates.com

For more details about our work on ATC, visit www.tmfassociates.com/ATC