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<td>Author(s)</td>
<td>Pisitsak Runkaputi.</td>
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Paper No. 6
Usage of Satellite Communication Technology

By
Pisiteak Runkaputi
# Thaicom 1&2 Satellite System

**DESIGN:**
- 2 identical Hughes' HS-376 dual spin stabilized spacecraft
- 2.16m dia., 6.76m high - in orbit

**POWER:**
- BOL 801W

**MASS:**
- 1080 Kg at launch

**LIFE:**
- 15 Years

**TRANSPONDER CAPACITY:**
- 10 C-Band each: total 20
- 2 Ku-Band each: total 4

**LAUNCHER:**
- Arianespace of France

<table>
<thead>
<tr>
<th>SATeLLITE LOCATION</th>
<th>Thaicom-1</th>
<th>Thaicom-2</th>
</tr>
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<tr>
<td>LAUNCH DATE</td>
<td>December 1993</td>
<td>October 1994</td>
</tr>
<tr>
<td>SERVICE DATE</td>
<td>February 1994</td>
<td>December 1994</td>
</tr>
</tbody>
</table>
Thaicom 3 Satellite

DESIGN:  Aerospatiale’ SpaceBus-3000
          3-Axis stabilized spacecraft

POWER:  5000 W at End of Life
MASS:  2800 Kg at launch
LIFE:  15 Years

TRANSPOUNDER CAPACITY:
C-band:
   Global Beam: 6 Transponders
   Regional Beam: 18 Transponders
Ku-Band:
   Thailand Beam: 7 Transponders
   India Beam: 7 Transponders

LAUNCHER:  Arianespace
LAUNCH DATE:  Q4, 1996
SATELLITE APPLICATIONS

DATA (Satellite Communication Network & VSAT)
- Provide high performance connection for high speed computer network
- Information can be Data, Voice and Video (video conferencing)
SATrLITE APPLICATIONS

TELEVISION: TV Distribution, Relay & Live Broadcasting
- The main studio sends TV signal via satellite to be picked up and rebroadcasted
by the local rebroadcast stations nationwide (TV Distribution)
- Live broadcasting with mobile system (Satellite News Gathering: SNG)
Radio (Radio Distribution & Relay)
- Transmit and relay signal among distance radio stations, to exchange programs or rebroadcasting within local areas

Telephone (Satellite Telephony)
- Connect regional switching centers together
- The use of small terminal to connect remote sites to major switching center
- Connection can be implemented much faster than terrestrial lines
System Comparison

Evolution of Television Program Delivery Mechanisms

C-Band

Ku-Band

Ku-Band Digital DTH
- Universal Access
- Less Obstruction
- Nation Wide Coverage
- Numerous Channels
- Small 60 cm. Dishe

Cable
- Investment & Complexity of Cable Wiring & Maintenance
- Limited Local Area Coverage

Off-Air Broadcasting (VHF, UHF, MMDS)
- Terrain Limitation
- Limited # Channels
- Mostly Free TV Only

VHF or UHF

- Backyard C-Band Dish:
  (Bulky 1.8-2.4 m.)
- Not directly designed & intended for home use.

SHINAWATRA SATELLITE PROPRIETARY. February 1, 1996.
tel: (96 2) 391-0736, fax: (96 2) 391-0719
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Enabling Technology

Digital Compression:
- Flexible Video and Audio Quality
- Subscription Services and Management
- Noise Immunity (Better Transmission Quality)
- Spectrum Efficiency (Expand Usable Bandwidth: Many More Channels)
- Power Efficiency (Smaller Antenna & Power Requirement)
Enabling Technology

Digital Compression Standards

- MPEG-2 (ISO 13818)
  - Video, Audio Coding & Multiplexing Standard
- DVB (Pending ITU)
  - Service Information
  - Scrambling System
  - Error Correction, Modulation & Channel Coding
  - Telephone Descriptor and Future Interactivity
  - Transports:
    » Satellite
    » Cable & SMATV
    » Terrestrial

- Standards & Cross Compatibility: Universal/off-the-Shelf IRD Products Will Reduce Price & Increase Availability
- Thaicom DTH: First MPEG-2 DVB implementation in the world
Multi-Media Services

DATA: High Speed Data Broadcast & DDB for downloading of Computer Programs, News, information

VIDEO: 50-100 Channel Universe of Very High Quality Video, Wide Screen & HDTV

AUDIO: CD-Quality, Surround Sound, Multi-Lingual & DAB Channels

Two-way: Telephone Connection for Return Link: Interactive Services

Integrated Receiver and Decoder (IRD): High End Consumer Entertainment System

Convenience: Small 80 cm. Dish: Aesthetic & Easy to Install
Digital DTH System

Program Origination
Tape Play, Fiber, Microwave, Satellite Feeds

Compression Encoding
Network Control
Monitoring
Conditional Access/Authorization
Multiplexing & RFSub-System

Uplink Station & DTH Broadcast Operations Center

PSTN

Telephone Return Path
Home Subscriber
Home Subscriber
Home Subscriber

SMATV
optional
Cable Headend

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Digital DTH Strategic Advantages

- **Channel Capacity & Addressable Capability:**
  - New Revenue Avenue with advanced multichannel subscription services
  - Better Copyright protection mechanism
  - Provide consumer the power to program: Control & Choose What they want, Whenever they want, & Anywhere they want to Watch

- **Nation-wide coverage with direct reach to millions of viewers**
  - National & Narrowcast programs
  - Uniform/Universal service to all locations
  - Bypassing local limitation

- **Technically, commercially and financially viable:**
  - High-end home entertainment system: Digital quality & capacity
  - Best fit to unwired and unsatisfied cable subscribers
  - A small penetration can make Digital DTH service feasible
  - Opportunities: for satellite, programming & consumer electronic Industries
Technology Trends

Space Segment Technology (Satellite)

» Super highpower
» Large transponder capacity
» Ku & Ka band