Program Executive Office
Command, Control, Communications, Computers and Intelligence (PEO C4I)

Shipboard Networks

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Future SATCOM Chief Engineer (PMW 170)

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Achieving Robust Bandwidth Afloat

**Desert Storm c.1990**
- UHF: "Quad DAMA" (16 2.4 kbps Networks, 25kHz only) Secure Voice/Data Netted Comms
- SHF: Voice at 16 kbps (Command Ship Only)
- INMARSAT (A): SALTS/FAX Official Phones
- 19.2 kbps: "Dual DAMA" (8 2.4 kbps Circuits, 25kHz only) Secure Voice/Data Netted Comms

**SATCOM Today**
- 48 kbps
  - UHF: 16 kbps Networks
  - EHF MDR: JWICS, SIPRNET, NIPRNET, MDU’s Secure Voice/Data
  - EHF LDR: 24 LDR Channels (8 Primary, 8 Secondary, 8 RCV Only)
- 4.8 kbps – 1.544 Mbps
  - EHF MDR: JWICS, SIPRNET, NIPRNET, MDU’s Secure Voice/Data
- 21.6 kbps
  - EHF LDR: 24 LDR Channels (8 Primary, 8 Secondary, 8 RCV Only)
- 384 kbps – 1.544 Mbps
  - SHF: JWICS, SIPRNET, NIPRNET, VTC, POTS, MSG TRAFFIC, TESS

**Typical Terminal Capacity**
- GBS (Receive Only): UAV Video, CNN/FOX NEWS Imagery (Secret/Intel), Web Site Replication (classified/unclassified), Immediate File Delivery (IFD)
- INMARSAT (B) HSD: NIPRNET, SIPRNET, JWICS, POTS, FAX
- 64-128 kbps
  - CWSP: JSIPS/JCA, JWICS, SIPRNET, NIPRNET, VTC, POTS, MSG TRAFFIC
- 1.544-2.048 Mbps
  - TV Direct to Sailors (Receive Only): News, Sports, Entertainment, 3 Radio Channels, 1 Data Channel

We’re Not Just Buying More Space Segment...
### Current Fleet Terminal Configuration (SatCom)

<table>
<thead>
<tr>
<th>Terminal Type</th>
<th>CV/CVN</th>
<th>AGF/LCC</th>
<th>LHA</th>
<th>LHD</th>
<th>LPD17</th>
<th>LPD</th>
<th>LSD</th>
<th>CG</th>
<th>DDG</th>
<th>DD</th>
<th>FFG</th>
<th>MCM/ MHC</th>
<th>SSN/ SSBN</th>
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<tbody>
<tr>
<td>USC-38 EHF</td>
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<td>SSR-2(A) GBS</td>
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<td>WSC-3 (UHF)</td>
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**Legend:**
- **Narrowband**
- **Commercial**
- **Wideband**
- **Protected**
- **Broadcast**

**HSD:** High Speed Data
<table>
<thead>
<tr>
<th>Increment I</th>
<th>Increment II</th>
<th>Increment IIa</th>
<th>Increment IIb</th>
<th>Increment III</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline Routing, Encryption, &amp; Network Mgmt Based System</strong></td>
<td><strong>Adds Load Balancing / Distribution – static routes with fail over ability</strong></td>
<td><strong>Increases throughput from INC II</strong></td>
<td><strong>Ila Functionality for unit level ships</strong></td>
<td><strong>Even greater throughput (25/50Mbps) in a converged, fully-connected network</strong></td>
</tr>
<tr>
<td><strong>ADNS feeds into Static TDM (Timeplex) Network across a Single RF Path</strong></td>
<td><strong>Traffic Management</strong></td>
<td><strong>Utilizes all wideband SATCOM BW</strong></td>
<td><strong>Increases IP BW utilization from 67% to 100% - due to increase in converged IP circuits</strong></td>
<td><strong>Adds Cipher-text Core Routing – Everything encrypted which a key enabler for 1000 ship Navy</strong></td>
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<tr>
<td><strong>Supports Email, Web Browsing, File Transfer, &amp; Security Enclaves Baseline Routing, Encryption, &amp; Network Mgmt Based System</strong></td>
<td><strong>Increases IP BW from 13% to 67% over dual RF paths (share JCA BW)</strong></td>
<td><strong>Eliminates dedicated BW for serial voice and VTC – eliminates serial circuits</strong></td>
<td><strong>Eliminates dedicated BW for serial voice</strong></td>
<td><strong>Incorporates IPv4/IPv6 Dual Stack Capability</strong></td>
</tr>
<tr>
<td><strong>Baseline Routing, Encryption, &amp; Network Mgmt Based System</strong></td>
<td><strong>IP Resources management</strong></td>
<td><strong>Eliminates need for TDM (Timeplex) WAN circuits</strong></td>
<td><strong>Leverages install of SCIP-IWF shout box</strong></td>
<td><strong>Enhanced QOS via ADNS QOS Edge Device (AED) through Optimized Edge Routing (OER)</strong></td>
</tr>
<tr>
<td><strong>Automatic Failover and Restoral of RF links</strong></td>
<td><strong>War fighter BW guarantees</strong></td>
<td><strong>Increases IP BW from 13% to 100% - due to increase in converged IP circuit gains</strong></td>
<td><strong>Eliminates need for TDM (Timeplex) WAN circuits</strong></td>
<td><strong>Continues compression</strong></td>
</tr>
<tr>
<td><strong>Application Prioritization (QoS) – added PacketShaper</strong></td>
<td><strong>Application Prioritization (QoS) – added PacketShaper</strong></td>
<td><strong>Increases throughput capacity to 8 Mbps</strong></td>
<td><strong>Adds Compression</strong></td>
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</tbody>
</table>

ADNS shipboard variants – B, C, D, E, F, G, and SUBS
ADNS shipboard variants – H
ADNS shipboard variants – J
ADNS shipboard variants – K SUBS
ADNS TODAY and TOMORROW

• Today's NAVY WAN:
  ➢ Single Path Access, Best Effort, Limited BW, No Guarantee’s
  ➢ No Network “Insight”, Little Visibility, Limited Decision Making Tools

• The NAVY’s Future WAN will be:
  ➢ Bandwidth Efficient, Possess Multiple Survivable Paths, Contain Quality of Service Guarantee’s and Provide Network Visibility to Remote/Local Users.