NAVY AV-8B
CRASH SURVIVABLE FLIGHT
INCIDENT RECORDER (CSFIR)

MEETING MINUTES OF THE
PROGRAM REVIEW
28 April, 1999

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3 May, 1999

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Distribution Statement A. Distribution approved for public release; distribution is unlimited.
On 28 April 1999, representatives from the Navy, Boeing and Smiths Industries (SI) met at the Naval Air Weapons Development Center, Building P302, China Lake, CA for a Program Review / Technical Interchange Meeting in support of the AV-8B Crash Survivable Flight Incident Recorder System (CSFIR) integration program. Smiths Industries is developing software for its Voice and Data Recorder (VADR®) under this contract. A list of attendees is in attachment #1. Attachment #2 lists the resulting action items.

The objective of this meeting was to provide an update on this program including the Program Status, Schedule, Interface Control Document Status, Software Design Changes, and System Test Status. A copy of the presentation material is shown in attachment #3. Additionally, there was a demonstration of the Smiths VADR® in the AV-8B simulation laboratory. This demonstration involved recording both voice and data. This recording was followed by downloading, processing and playback using the Dolch computer provided by DuoTech.

1. China Lake plans to do a formal verification test of the AV-8B VADR software in their lab after our final software release. No flight testing for the AV-8B CSFIR is currently budgeted. Successful completion of the laboratory testing will constitute final Navy approval of the software.

2. Boeing is funded to build three AV-8B Val/Ver Kits. These kits will be supplied to China Lake where they will be shelved until future funding (currently uncommitted) is received. The Val/Ver kits are currently scheduled for delivery by Boeing in July 2000.

3. The team agreed that an AV-8B CSFIR flight test would be worthwhile for the program. China Lake accepted an action item (AI #1) to produce a ROM estimate for conducting a flight test after formal verification lab testing in China Lake is completed. Boeing also accepted an action item to determine if they will have any unallocated money remaining from their ECP effort which could be diverted to a similar type flight test at Boeing. (AI #2)

4. Boeing accepted an action item to supply AV-8B ‘A’ Kit drawings to the Navy (China Lake) so the Navy can estimate the tasks necessary to conduct a flight test. (AI #3)

5. Boeing is under contract to produce preliminary AV-8B CSFIR technical publications which will list O-Level maintenance procedures.

6. A total of three Dolch portable computers were bought by the Navy. Duotech / Smiths integrated SI’s AV-8B CP software (35351-552663-01-01), AV-8B MP Software (35351-552664-01-01), AV-8B ASCDB (35351-552665-01-01), PC DECOMP (35351-549333-14-01, 35351-549342-14-01), DFIR2DDF(35351-552754-EX-02), WinDRT (35351-549651-EX-05), WinVoice, VOGP software plus SI’s ISA download card. One computer was demonstrated and delivered to AV-8B China Lake.
Lake at this meeting. China Lake requested that the latest manuals be supplied (AI #6).

### ATTACHMENT #1

**Attendance List**  
**AV-8B Program Review**  
**28 April, 1999**

<table>
<thead>
<tr>
<th>Name</th>
<th>Company/Role</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beitnes, Brian</td>
<td>NAWCWD Lab Man</td>
<td>760-939-5199</td>
<td><a href="mailto:brian.beitnes@chinalake.navy.mil">brian.beitnes@chinalake.navy.mil</a></td>
</tr>
<tr>
<td>Bock, Wolf</td>
<td>EMA (support to PMA-209)</td>
<td>301-863-8988 x390</td>
<td><a href="mailto:wolf_bock@emainc.com">wolf_bock@emainc.com</a></td>
</tr>
<tr>
<td>Brewer, Gene</td>
<td>NAWCWD China Lake (AV-8B)</td>
<td>760-939-5884</td>
<td><a href="mailto:gene.brewer@chinalake.navy.mil">gene.brewer@chinalake.navy.mil</a></td>
</tr>
<tr>
<td>Campbell, Paul</td>
<td>Boeing (support to PMA-257)</td>
<td>301-866-0500</td>
<td><a href="mailto:campbell@sfpsi.com">campbell@sfpsi.com</a></td>
</tr>
<tr>
<td>Conquest, Tom</td>
<td>Smiths Industries</td>
<td>616-241-7900</td>
<td><a href="mailto:conquest_tom@si.com">conquest_tom@si.com</a></td>
</tr>
<tr>
<td>Kimmey, Mark</td>
<td>Logicon (support to PMA-209FB)</td>
<td>301-757-0891</td>
<td><a href="mailto:kimmeymc@navair.navy.mil">kimmeymc@navair.navy.mil</a></td>
</tr>
<tr>
<td>Maxwell, James</td>
<td>NAWCD - MLVS</td>
<td>760-939-5918</td>
<td><a href="mailto:maxwellj@av8bmx.chinalake.navy.mil">maxwellj@av8bmx.chinalake.navy.mil</a></td>
</tr>
<tr>
<td>Otten, Bill</td>
<td>Smiths Industries</td>
<td>616-241-8928</td>
<td><a href="mailto:otten_william@si.com">otten_william@si.com</a></td>
</tr>
<tr>
<td>Page, Ronald</td>
<td>NAWCWD System Test</td>
<td>760-939-9984</td>
<td><a href="mailto:pagre@navair.navy.mil">pagre@navair.navy.mil</a></td>
</tr>
<tr>
<td>Parillo, Bill</td>
<td>PMA-209/AIR-4.5.3.2</td>
<td>301-757-6474</td>
<td><a href="mailto:parillow@navair.navy.mil">parillow@navair.navy.mil</a></td>
</tr>
<tr>
<td>Rogers, Dan</td>
<td>Duotech Services</td>
<td>828-369-5411</td>
<td><a href="mailto:duotech@dnets.net">duotech@dnets.net</a></td>
</tr>
<tr>
<td>Smith, Leo</td>
<td>Boeing</td>
<td>314-233-2079</td>
<td><a href="mailto:leo.w.smith@boeing.com">leo.w.smith@boeing.com</a></td>
</tr>
<tr>
<td>VanDorp, Jeff</td>
<td>Smiths Industries</td>
<td>616-241-7213</td>
<td><a href="mailto:vandorp_jeff@si.com">vandorp_jeff@si.com</a></td>
</tr>
<tr>
<td>Vermeulen, Ted</td>
<td>Smiths Industries</td>
<td>616-241-8264</td>
<td><a href="mailto:vermeulen_ted@si.com">vermeulen_ted@si.com</a></td>
</tr>
<tr>
<td>Wilcox, Donna</td>
<td>EMA (support to PMA-209F)</td>
<td>301-863-8988 x371</td>
<td><a href="mailto:donna_wilcox@emainc.com">donna_wilcox@emainc.com</a></td>
</tr>
<tr>
<td>Zavich, Walt</td>
<td>Boeing St. Louis AV-8B Team</td>
<td>314-234-2203</td>
<td><a href="mailto:vlado.zavich@boeing.com">vlado.zavich@boeing.com</a></td>
</tr>
<tr>
<td>Number</td>
<td>Action Item</td>
<td>Assigned To</td>
<td>Originator</td>
</tr>
<tr>
<td>--------</td>
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</tr>
<tr>
<td>1</td>
<td>Provide a ROM for the 'orange wire' installation of a CSFIR, based on preliminary Boeing drawings.</td>
<td>Gene Brewer</td>
<td>PMA-209</td>
</tr>
<tr>
<td>2</td>
<td>Provide a ROM for the 'orange wire' installation of a CSFIR, based on preliminary Boeing drawings, into Boeing a/c B2 or T1. Investigate funding with left over funds from canceled production effort.</td>
<td>Boeing</td>
<td>PMA-209</td>
</tr>
<tr>
<td>3</td>
<td>Provide preliminary install drawings to China Lake and PMA-209</td>
<td>Boeing</td>
<td>China Lake</td>
</tr>
<tr>
<td>4</td>
<td>Establish telecon to clarify bit ambiguity requirements.</td>
<td>PMA-209</td>
<td>SI</td>
</tr>
<tr>
<td>5</td>
<td>Provide PMA-209 with address of library to ship SW and data items.</td>
<td>China Lake</td>
<td>PMA-209</td>
</tr>
<tr>
<td>6</td>
<td>Ship ground software manuals to China Lake Library</td>
<td>DuoTech</td>
<td>China Lake</td>
</tr>
</tbody>
</table>
U. S. Navy AV-8B CSFIR
Program Review

April 28, 1999
Agenda

» Program Overview
  - Task Description
  - Deliverables
  - Schedule
  - Accomplishments to Date
  - EMI Test Results

» Software Status

» ICD / SRS Review

» Test Support Equipment (DuoTech)
Agenda (cont.)

» Software Laboratory Demonstration
» System / Software Test Status
» Planned Activities For Next Two Months
» Action Items (old)
» Action Items (new)
» Issues / concerns
USN CSFIR AV-8B Program Overview

- Develop Flight Software for US Navy AV-8B aircraft
- Recurring VADR hardware not included in the contract
- Specific aircraft variations in this effort are:
  - AV-8B Day/ Night Attack
  - TAV-8B (Trainers)
  - AV-8B Radar
- Single Flight Software will work for all AV-8B variations above
Task Description (AV-8B)

- Develop System / Software Requirement Specification for Flight Software
- Develop VADR® Flight Software configured for AV-8B
- Test final software (Government invited to witness)
- Support Navy AV-8B integration efforts
Deliverables

- AV-8B Flight Software (A004)
- Data Items
  - Meeting Agenda (A001)
  - Meeting Minutes (A002)
  - Software Requirement Specification - Flight Software (A003)
  - SI Test Plan (A006)
Accomplishments To Date

- Contract Signed (15-Sep-98)
- SRS submitted
- SI Software Test Environment established
- Initial Software delivered
EMI Testing

☐ SI contracted to “conduct limited RE02 testing to help identify the differences and the associated cause between the results obtained by the Navy and SI.”

☐ Status: Testing Complete, test report being finalized at SI.
EMI Testing

- A series of 20 different individual tests were run.

- No test implementation errors were revealed which would explain the differences between the original SI and Navy results.

- However, it is felt a combination of test set up factors contributed to the original Navy outages.

- The VADR® has demonstrated satisfactory EMI RE02 performance.
VADR Software Design

- Overview
- Loader Program (LP)
- Control Program (CP) and Mux Program (MP) core concept
- Control Program and Mux Program design
Overview
Loader Program (LP)

- Allows uploading a CP
- Transfers control to CP
- Plan to use Current released version of LP
  (Same version as being used on the C2, C130, VP-3, UP-3 and VH-3 / 60 applications).
Core Software Concept

- All VADR software functionality contained in core image.
- Core software designed to meet application common requirements.
- Application specific requirements met by filling configuration data structure with application specific values.
- Separate part numbers for Core and Application Software
Control Program (CP) Core Concept

Configurable Items:
- Crash Protected Memory (CPM) Size
- CPM Partition Specifications
- Frequency Input Sample Rate
- Audio Channels
- 1553 Card Installed
- VADR RS-422 Address
- Configured CP Part Number
- Record Inhibit Parameters
Multiplex Program (MP) Core Concept

Configurable Items:
- RTA Address if applicable
- Mux bus messages to monitor
- Parameter definitions
- Recording Rates
- Record Start / Stop
Two processes: Acquire Data, Record Data

Messages saved to buffer at bus transmission rates

Parameters recorded to crash protected memory at configured record rates

1553 Bus
28 April 1999

AV-8B CSFIR Program Review
VADR Software Status

Pre-production software coded, tested and delivered
ICD / ICN Status

- Interface Control Document (MDC 98H0002) approved
- Interface Change Notice (ICN) submitted to Boeing for
  » wiring change
  » software part numbers
  » currently in review / signature cycle
- BIT Ambiguity Identification
ICD / SRS Review

☐ Software Requirement Specification
   » Preliminary Submittal Approved
   » All comments resolved
   » Comments to be included in final submission
   » Final submission to coincide with final Navy Software approval.

☐ Navy Request to Identify BIT Ambiguity
   » Clarify aircraft interface and applicable signal test criteria

28 April 1999
Test Support Equipment

Dan Rogers (DuoTech)

28 April 1999
Software Laboratory Demonstration
Systems Software Test Status
Test Approach

Develop VADR Software → Informal Software Testing → Preliminary Test Procedure → Pre-Production Software

ChinaLake Testing → Software and SRS Adjustments → Final Test Procedure
System / Software Test Status

- Informal testing and test procedure development
- Test with captured 1553 bus traffic from AV-8B simulator.
- Pre-Production release test with Preliminary Test Procedure
- Revising Test Procedure as a result of Pre-Production testing.
Planned Activities For Next Two Months

☐ Support China Lake testing
☐ Incorporate software updates as required
☐ Submit test procedure
<table>
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<tr>
<th>#</th>
<th>Problem Description</th>
<th>Originator</th>
<th>Date Due</th>
<th>Assigned to</th>
<th>Date Completed</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Provide final EMI test report to Walt Zavich (Boeing). Once reviewed by Boeing coordinate with PMA-209, platform, and Tom for resolution.</td>
<td>J. Caudill</td>
<td>11-30-98</td>
<td>PMA-209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Coordinate with China Lake and Lakehurst on MDPS for upload/download into SEMP. Includes an asset (UYQ-76A) and ruggedized PC for voice capability to be used for lab testing at China Lake. SEMP coordinate with platforms.</td>
<td>B. Parillo</td>
<td>12-4-98</td>
<td>PMA-209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Provide schematic of T-Cable necessary to support data upload/download for F/A-18CSFIR application using AN/UYQ-76A Computer. Provide schematic designs for both aircraft and bench upload/download operations.</td>
<td>W. Zavich</td>
<td>11-17-98</td>
<td>G. Brewer/ Hines</td>
<td></td>
<td>Moved to F/A-18 action item, #7</td>
</tr>
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| 4  | Since production has been halted, need revisions to the following:  
1) ECP req ltr change (R. Cohen Ltr 11-12-98)  
2) Revise TDL  
3) Need new schedule (VAL/VER) | W. Zavich | 1-31-99  | PMA-209     |                |                                  |
| 5  | Get resolution of audio shield signal grounding.                                   | W. Zavich | 1-31-99  | SI          | 2/1/99          | Boeing EMI Group has concern that proposed shield grounding may introduce noise back into the A/C audio system. |
| 6  | Smiths Industries initiate an ICD change to provide new S/W Part Number.            | W. Zavich | 1-31-99  | SI          | 11-24-98       |                                  |
| 8  | Provide lab integration testing schedule based on Smiths Industries S/W delivery.    | G. Brewer | 1-7-99   | G. Brewer   |                |                                  |
Issues / concerns / New Action Items

integration Schedule / SI support