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1.0 Introduction

This report covers two week-long aviation training exercises which were conducted at the Aviation Test Bed (AVTB) located at the United States Army Aviation Center, Fort Rucker, AL as follows:

Aviation Training Exercise I (ATX I) was conducted from 31 March through 4 April 1997, to provide virtual training to assist in the preparation of the 229th Aviation Regiment for their upcoming deployment to Bosnia in support of United Nations Stabilization Force (SFOR) operations.

The Aviation Training Exercise II (ATX II) was conducted from 23 August through 30th August 1997, to provide virtual training to assist in the preparation of the 4th Squadron, 2nd Armored Cavalry Regiment for their upcoming deployment to Bosnia in support of United Nations Stabilization Force (SFOR) operations.

2.0 Participating Agencies

ATX I and ATX II were conducted by the United States Army Aviation Center's Department of Training, Doctrine, and Simulation (DOTDS). Supporting organizations and their roles were as follows:

- a. The AVTB provided the virtual environment, operators, technical support, and interactive After Action Review (AAR) support for the exercises.
- b. The Aviation Warfighting Simulation Center (AWSC) provided space for the Tactical Operation Centers (TOC's), and AAR sessions.
- c. The Army Aviation Center/School provided exercise control and augmentation personnel support.
- d. The Seventh Army Training Center (CMTC) provided Observer/Controllers for ATX I, and the National Training Center provided Observer/Controllers for ATX II.

3.0 Exercise Overview

The exercises were conducted as Distributed Interactive Simulation events during which the AVTB and the AWSC (both at Ft. Rucker, AL) were interconnected via fiber optic cable. Virtual simulation and role players were used to replicate an appropriate SFOR tactical environment.

The AVTB provided all tactical voice communication s systems, the virtual simulation systems and environment, and hosted the Exercise Control Group. The AWSC provided digital communications (Warlord System) and hosted the player unit TOC's and the AAR facility.

Appendix B depicts the AVTB facility utilization for ATX II.

3.1 Equipment

The following equipment was used to support ATX I and ATX II:

- a.) Manned Simulators: Six Rotary Wing Aircraft (RWA) and Two Fixed Wing Aircraft (FWA).
- b.) ModSAF: Modular Semi-automated Forces (ModSAF) version 2.1 hosted on a DEC Alpha Workstation was used.
- c.) Datalogger: The Distributed Interactive Simulation (DIS) Datalogger was used for network logging and playback of the exercises.
- d.) DIS Radios: ASTi and SINCGARS Radio Models were used to replicate tactical air-to-ground and ground-to-ground communications. Appendix A shows the tactical communications networks and layouts.
- e.) Stealth: The MetaVR DIS Stealth version 1.2 was utilized for viewing a three dimensional representation of the overall virtual environment during execution and during the interactive AAR playbacks.

3.2 Personnel

The following is a functional description of the key personnel involved in supporting the ATXs:

- a.) Exercise Director (ED): The Director, DOTDS served as the Exercise Director and had overall responsibility for the conduct of both exercises. The ED was responsible for coordinating the use of all Government facilities, equipment and personnel; developing the detailed schedules for preparation and execution; and for training plan and scenario development.
- b.) Battlemaster: The function of the Battlemaster during both ATX phases was to perform coordination activities. These activities included: verifying that all simulators were properly initialized, ensuring that all network equipment were operational, ensuring that the correct scenarios were loaded, and ensuring personnel were ready to begin the exercise.
- c.) ModSAF Operators: The ModSAF Operators directed the Red and Blue forces and provided field artillery fires when called upon.
- d.) Datalogger Operator: The Datalogger operator was responsible for starting the actual logging computers and insuring that all of the PDU traffic was being captured during the exercise runs. Also responsible for ensuring the VHS tapes were loaded into the proper VCR for Gun Camera recording for each RWA/FWA simulator. Acted as the Master Time Keeper during the exercise for synchronization of the logger data, timestamped VCR tapes, and OC note events. This individual was located in the Stealth 2 room for coordination with the OC's and Battlemaster.

e.) Field Engineers: Field Engineers were utilized to correct any hardware problems, transfer data files between sites, load software on the Local Area Network (LAN) equipment, provide maintenance support, and to coordinate the use of the Defense Simulation Internet (DSI) Wide Area Network (WAN) Gateway.

f.) Chief of the Exercise Control (EXCON) Group: The Chief of the EXCON Group served as the Senior exercise controller and commander of the higher headquarters for the player unit.

g.) Chief Observer/Controller (OC): The Chief OC provided observation and critiques to the player units, and conducted the mass interactive AARs.

3.3 Software

a.) ModSAF: ModSAF 2.1 compiled for the DEC using DIS protocol 2.04.

b.) Stealth: MetaVR Version 1.2 for ATX I and Version 1.3 for ATX II.

3.4 Databases

In the absence of a suitable database for the United States Sector in Bosnia, the Grafenfels Synthetic Theater Of War Exercise (STOWEX) database was used for both ATX I and II.

3.5 Schedules

<u>EVENT</u>	<u>ATX I</u>	<u>ATX II</u>
Integration & Dry Runs	Mar. 24 - 28, 1997	Aug. 18 - 22, 1997
Train Up	Mar. 31, 1997	Aug. 23 & 24, 1997
Execution	Apr. 1 - 4, 1997	Aug. 25 - 29, 1997

3.6 ModSAF Enhancements

None.

3.7 Exercise Scenarios

User-developed scenarios which emphasized the roles and missions of the SAFOR aviation forces were used during ATX I and II. Vignettes included:

Zone of Separation Reconnaissance
Weapon Storage Site Reconnaissance
VIP and critical cargo transportation
JAAT
Downed Aircraft Recovery Operations
Medical Evacuation
Truce violation Situations

3.8 Added Capabilities

None.

4.0 Network Testing

Prior to each iteration, testing was conducted to insure clarity of connection between the AVTB and the AWSC, and to examine network loading.

5.0 Data Collection

Data Collection was provided by two workstations. The AVTB was the only source of logging and utilized the DIS Datalogger to record all DIS network traffic (simulation and voice). The OC's performed manual data collection and output from "gun camera" VHS tapes to formulate comments and observations, which were presented at the AARs.

6.0 Lessons Learned/Problems

a.) Scheduling: The scheduling of ATX II was problematic at the outset. The execution dates were changed several times, with a final resolution not being reached until late June for a mid-July start-up. The result was a compressed preparation period and competing events (CPC-ARMS Integration Testing) for the AVTB.

LESSON LEARNED: Do not permit late schedule changes that may adversely impact on planned or on-going efforts.

b.) Planning: ATX II planning did not follow typical DO planning regimens. The ATX II was presented as "the same as ATX I" (but, in fact, there were many changes which caused ATX II to differ significantly from ATX I). Thus, the customer elected not to hold a Kick-off or Technical interchange Meeting to launch the planning cycle, and instead chose to commence planning with an In-Process Review.

LESSON LEARNED: Insist that all parties adhere to established Delivery Order planning procedures.

c.) DIS Communications: The communications setup for ATX II presented challenges during the integration period. Although it was first stated that the communications plan would

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mirror that of the first ATX, it was modified on at least two occasions. The communication plan was not finalized until the morning of the first scheduled mission.

LESSON LEARNED: Details of the communications scheme must be finalized prior to commencement of the integration period.

d.) Databases. Prior to ATX II, the customer made a unilateral attempt (no Simulation Training Instrumentation Command (STRICOM), Operational Support Facility (OSF) or AVTB involvement) to have the Topographic Engineering Center (TEC) add some cultural features (weapon storage site compounds) to the existing STOWEX database. The customer-provided database was determined to be faulty, and not the same version as that used for ATX I, and thus could not be used. This caused considerable delay and confusion to an already compressed integration period.

LESSON LEARNED: Use only databases that have been reviewed, approved, and provided by STRICOM and/or the OSF.

e.) Configuration Changes. The customer insisted that configuration changes be made during the integration period. This slowed the integration process and added to the already demanding workload.

LESSON LEARNED: Freeze the configuration prior to commencement of integration.

f.) SINCGARS Radio Problems. During ATX II, the SINCGARS Radios did not produce audible transmissions. The SINCGARS problems were eliminated after much investigation. This was done by modifying the ModSAF ".rdr" entity files in order to turn off the Transmitter PDUs. ModSAF entities generate Transmitter PDUs at a rate of 5 to 7 PDUs per second, which generates over 5000 PDUs per second for a scenario with only 100 ModSAF entities. Apparently, the SINCGARS platform Silicon Graphics Incorporated (SGI) Indy could not keep up with processing all of the ModSAF Transmitter PDUs and produce clear voice transmissions.

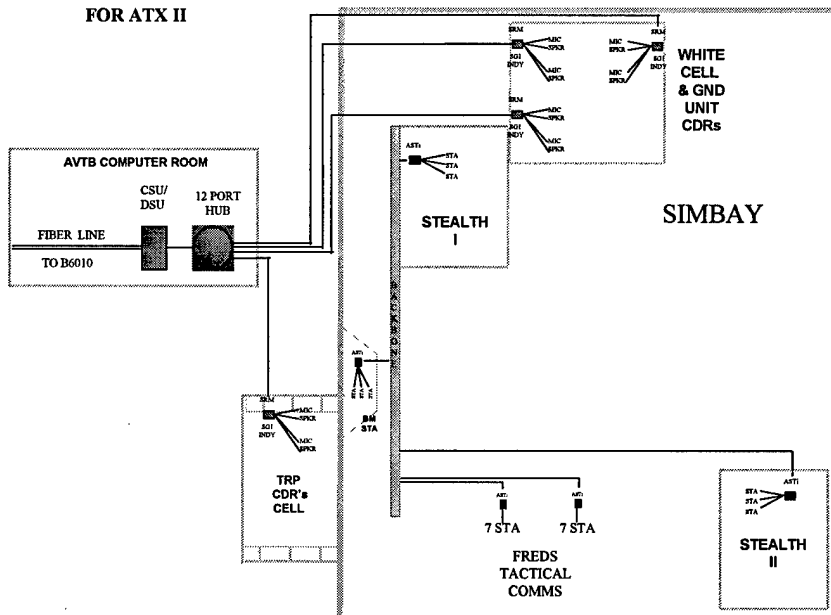
LESSON LEARNED: Anytime the baseline equipment configuration is changed or modified, time must be allocated for full-dress rehearsals or pilot trials. These must be conducted prior to exercise start in order to insure the configuration can support the conduct of the scenario/test design plan.

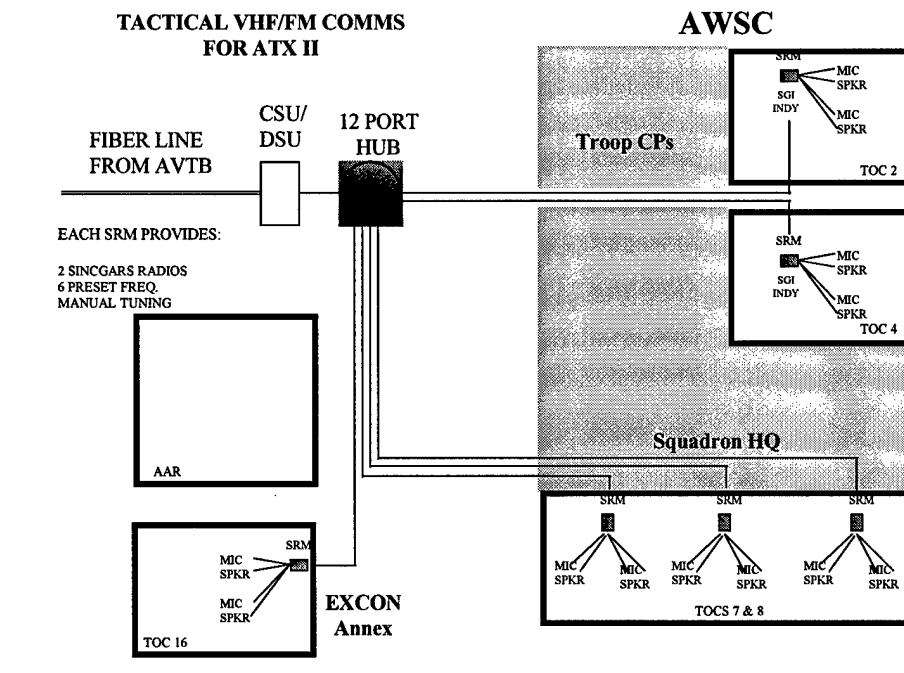
7.0 Results

ATX I and II were judged to have been very successful in enhancing the preparation of the two deploying units. Each of the two unit commanders indicated that their units had benefited greatly from the training they received at the AVTB. They were able to exercise their Bosnia specific Standard Operating Procedures (SOPs) and make necessary changes based upon the experience gained while conducting their anticipated Bosnia tactical missions in the virtual environment provided by the AVTB.

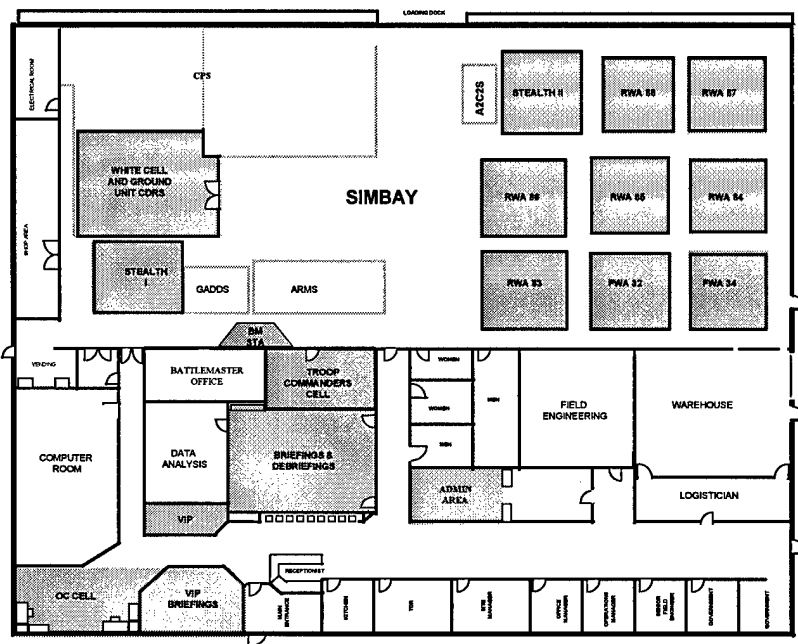
Appendix A Communications Layout Diagrams

AVTB TACTICAL VHF/FM
COMMS LAYOUT
FOR ATX II





Appendix B AVTB Layout



AVTB LAYOUT- ATX II