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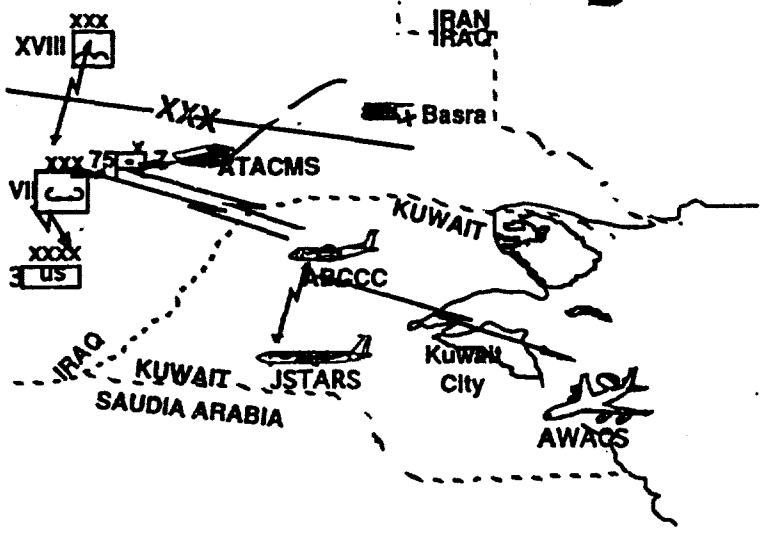
ADST/WDL/TR-93-003091

JAYHAWK THUNDER- Phase I Software Description Document

CDRL A007

Loral Systems Company
ADST Program Office
Orlando, Florida

22 March 1993



Prepared for

STRICOM
Simulation,
Training and
Instrumentatio
n Command
Naval Training Systems Center
12350 Research Parkway
Orlando, Florida 32826-3275

JAYHAWK THUNDER - PHASE I
Software Description Document

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Suite 303
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Orlando, Florida 32826

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Contract No. N61339-91-D-0001
CDRL A007

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REPORT DOCUMENTATION PAGE

Form approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	03/22/93	Version 0 07/92 - 03/93

4. TITLE AND SUBTITLE
JAYHAWK THUNDER - PHASE I
Software Description Document

5. FUNDING NUMBERS
Contract No.
N61339-91-D-0001

CDRL A007

6. AUTHOR(S)
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8. PERFORMING ORGANIZATION REPORT NUMBER
ADST/WDL/TR-93-003091
CRDL A007

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
STRICOM
Naval Training Systems Center
12350 Research Parkway
OrlandoFL 32826-3275

10. SPONSORING ORGANIZATION REPORT

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE
A

13. ABSTRACT (Maximum 200 words)

The Joint Operations Experiment (JOE) is an experiment using the Battlefield Distributed Simulation-Developmental (BDS-D) simulation to recreate an actual Desert Storm battle incident. The incident was an Army Tactical Missile System (ATACMS) attack on an Iraqi Surface-to-Air (SAM-2) installation at Kuwait City Airport. The attack was conducted by the 75th Artillery Brigade on 25 February 1991. The experiment uses BDS-D to recreate the actual battle which involved complex command, control, communications, and intelligence interactions between several service branches. This Phase 1 report details the the results of the initial experiment. It is anticipated a phase 2 effort will be conducted which will permit interactive training and experimentation using the BDS-D evaluate and refine alternative command and control structures, procedures, and policies. This document describes the software for the Stealth and the ACBM model used in the experiment

14. SUBJECT TERMS

15. NUMBER OF PAGES
150

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	17. SECURITY CLASSIFICATION OF THIS PAGE	17. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

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ABSTRACT

Phase I of JAYHAWK THUNDER portrays on the simulated electronic battlefield a historical combat mission that was actually accomplished during the Gulf War. That mission is the recreation of an Army Tactical Missile Systems (ATACMS) attack on an Iraqi Surface-to-Air (SA-2) missile site, located outside of Basra. JAYHAWK THUNDER breaks new ground in the simulation arena by replicating the command, control, communications, and Intelligence nodes that were necessary to successfully execute the original ATACMS mission. Phase I consisted of two stages: Stage 1, a videotape combining the historical research with the simulation recreation of the deep strike ATACMs mission and a preliminary report which outlined the efforts that went into creating the videotape Stage 2, completes the replication of the simulation in a Distributed Interactive Simulation (DIS) compliant Battlefield Distributed Simulation-Developmental (BDS-D) environment.

The purpose of JAYHAWK THUNDER was to develop an experiment which will use Battlefield Distributed Simulation-Developmental (BDS-D) assets to recreate an actual Desert Storm battle incident. The experiment demonstrated the utility of the BDS-D program in producing recreations of actual battles which involve complex joint command, control, communications and intelligence (C3I) interactions between the service branches.

This Software Description Document, used in conjunction with the enclosed software coded tapes and the proper hardware, permits the user to recreate the simulation that was demonstrated on 1 and 3 March 1993. This simulation is the "real time" replication in simulation of the ATACMs mission. The simulation is not interactive, however allows for out-the-window and planned view displays of the actual messages exchanged and the firing point and target effects from the mission. Instructions on use of the software and proper installation and running of the software are also included.

Jayhawk Thunder Phase 1 Demo

Operator Interface Software

By
Loral WDL
AcuSoft

1.0 Introduction.

This document provides a high level design view of the Jayhawk Thunder simulation phase-I software, its components, functions and set up procedures and requirements.

The ACBM simulation is only described in this document in its most elementary form, and only its interaction with the graphical viewer is described in any detail.

The multi-platform software components described here are parts of a system which interacts with the ACBM simulation through the DIS network protocol, and provides several interactive views of the scenarios provided by the ACBM.

The system is interactive in nature, incorporating an operator interface, a 2D map, 3D and a task organization viewers which al- low the end user to inspect and analyze the dynamic development of the battle simulation from several different perspectives simultaneously and in real-time.

2.0 System overview.

The Jayhawk Thunder graphical software is made up of four user interactive components and one supporting, non-interactive, networked process.

The non-interactive process is the entity manger. This process is normally of no concern to the end user since it is invisible its only function is to provide communication services to the interactive portions of the system.

The interactive components are the following:

- The operator interface. - The 2D map viewer. - The 3D database viewer. - The task organization viewer.

2.1 The Entity Manager.

The system link to the DIS network is the entity manager. This sub-system provides to all the viewers the information necessary to display and control all of the entities that are part of the Jayhawk Thunder simulation being played by the ACBM.

The entity manager 'listens' to the network for DIS protocol data units (PDUs) and unpacks and decodes them for all other processes. The Entity manager also provides entity dynamics extrapolation or dead-reckoning in order to ensure the continuity of entity dynamics during periods of time when no DIS entity up- date packets are received.

The entity manager takes the data from the DIS network and places the preprocessed ad sometimes extrapolated data in sections of shared memory that are available to the entity viewers (2D and 3D).

The entity manager does not only 'listens' to the network, but it also sends out to the network PDUs that notify any other process in the DIS network about the existence and state of stealth entities, including their attachments to other entities.

All of the geometry data transmitted across this shared memory is in geocentric coordinates, using a WGS84 earth model.

2.2 The 2D Map Viewer.

The 2D viewer provides a map-like view of the simulation scenario and the dynamics of the entities defined by the ACBM simulation, as well as the location and orientation of any stealth entities that may exist.

The 2D viewer provides the user with an unrestricted view of the gaming area that may be controlled by the operator by changing its location and display scale.

The symbols used to represent the entities in the 2D display were designed in accordance with the army topographic symbols menu (FM 21-31) and the army operation terms and symbols menu (FM 101-5- 1). The symbols are used for the display of lines of communication, waterways, power lines and pipelines as well as contour map data for the gaming area. The aircraft and missile symbols have been stylized for easier visual recognition.

Dynamic graphical effects are also used in the 2D viewer in order to display radio messages across entities, missile firings, entity trails, flight paths and impact detonations.

While changing the map scale, the 2D viewer will update the display of aggregated entities to show more detail as the user get closer to the entities themselves. As the user back away (or scales up) from the aggregations, the entities in the aggregated groups will be subsumed by a single symbol.

The 2D viewer communicates with the entity manager, from which it receives the entity state information required for the display.

The 2D viewer is also able to attach its position to any of the displayed entities in the map, as well as providing a free-flight mode that allows the operator to browse through the gaming area inspecting the state of the scenario.

The 2D viewer can also control the attachment and release of 3D viewer entities to any other scenario entities. By doing so, the user is able to follow any entity and effectively 'see' what the entity to which it is attached sees. This capability provides a more interactive inspection of an entity's surrounding area ad its interaction with other entities in real time.

The viewer send the attach/detach controls across the network through customized PDUs that are currently only understood by other viewers and have no effect on any other systems that may be attached to the DIS network. These communications are all funneled through the entity manager.

2.3 The 3D database Viewer.

This 3D viewer serves as a more interactive and more realistic display the simulated scenario. It may be used to inspect an entity's local surroundings by attaching it to any simulated entity from the 2D viewer. When this option is selected, the 3D display viewpoint will be attached to the location of the selected entity, moving around the database along with the selected entity. The 3D viewer may also be used in free flight mode in order to freely move about the database.

The 3D viewer display may be a Silicon Graphics workstation or an ESIG 2000 controlled through a real-time ScramNet interface from a Harris NighHawk system.

Much in the same way as the 2D viewer, the 3D viewer communicates with the DIS network through the entity manager, from which it gets the state of all entities in the scenario. the 3D viewer will also broadcast to the network its location and state for other viewers to display.

The 3D viewer will also control the special effects used in the ESIG for missile launches and target hits by translating between such entity states and their associated actions.

3.0 Hardware requirements.

The minimal hardware system needed to exercise the system is an integrated Silicon Graphics Iris workstation with the Performer option. It must be pointed out that even though the system will run on any IRIS/Performer workstation, performance will improve with the better hardware. More memory and higher end systems will yield better response. In essence the system will run on machines from an IRIS Indigo, to a Reality Engine machine.

Optionally, an ESIG 2000 and NighHawk host computer may be added to the system to provide a higher performance 3D display for the 3D viewer. The NighHawk system needs to be equipped with the appropriate ScramNet hardware to communicate with the ESIG 2000 as required by Evans and Sutherland.

With the ESIG configuration, additional processes are provided to run on the NightHawk in order to communicate with other viewers and the DIS network. The software included for the NighHawk includes HARRIS executable for the entity manager and the 3D viewer.

Whatever hardware option is selected needs to be networked with the machine running the ACBM simulation over ethernet, so that the entity manager may listen for DIS PDU from the ACBM.

The system needs to be set up so that the network broadcast masks are set equally across all the machines that need to communicate. Failure to do this will produce miscommunications between the multiple processes that send and receive data from the DIS net- work.

ESIG 2000 set up requirements.

As mentioned earlier, the ESIG 2000 must be connected to the HARRIS NightHawk system through a ScramNet interface.

The ESIG 2000 must have the Jayhawk Thunder database loaded on its disk, with all the scripts required for the loading of the database and the models used by the simulation. These files are provided in a separate tape to be loaded on the ESIG.

4.0 Installation procedures.

A tape containing all the software for the Silicon Graphics and the HARRIS NighHawk is provided. The contents of the tape must be downloaded by using the "tar xf tape_device" command, where the "tape_device" is the device name for the tape drive on the system.

The disk space requirements for the system is about 44 megabytes.

After downloading the contents of the tape a "src" and "in- stalled" directories should have been created. The user then needs to go to the installed directory and run the INSTALL script by typing "./INSTALL" from the unix % prompt. The script will create a "jhtrc" file that needs to be sourced whenever the system is to be run. This is done by typing "source ./jhtrc" from the unix % prompt. This sourcing of the "jhtrc" file sets up search path names and environment variables needed by the applications to load the appropriate data files used during the simulation.

Once the "jhtrc" file has been sourced, the user may run the system by typing "run_jht" from the unix prompt.

If the system is being run with the ESIG 2000 option, the last two steps in the procedure need to be done on both the SGI and the HARRIS NightHawk (sourcing of the jhtrc file and execution of the run_jht command).

When running the run_jht command for the first time, the user may want to use a "-h" option, to get a usage/help message describing all the options. These options include the definition of the port number used by the ACBM simulation, the network device name, the entity manager data update rate and whether or not a 3D viewer is to be started.

This last option (3D viewer disable) is usually exercised when the system is started on both an SGI and a NighHawk system. Normally this means that the 2D viewer will run on the SGI and the 3D viewer will run on the NighHawk. In this case the -3 option, which disables the 3D viewer, needs to be specified when executing the run_jht command on the SGI, so that only the 3D viewer on the NightHawk is started.

5.0 Starting the system:

Once the software has been properly installed and the run_jht command has been issued, up to four windows will come up, each one running a separate section of the system. One window will belong to the operator interface, another to the 2D viewer, another to the 3D viewer, and the last one to the task organization.

The user must keep in mind that these applications are geared at providing graphical representations and control interface to the ACBM simulation being run. Without a working, running simulation, the system is of little use, so the user must ensure that a simulation is either running or ready to run.

The JayHawk Thunder Phase I Operator Interface provides the following functions:

1) Log On. The log on procedure includes the following steps: (Currently, all the steps are to be followed but no actual information needs to be entered)

a. Sign In - In this step, a dialog window will pop up with name, rank and SSN (social security number) fields. Simply select the "Ok" button which will bring you to the next step.

b. Mode Select - In this step, a dialog window with five different mode selections will pop up. Simply select the "Controller Mode" button.

c. Enter mode password - A dialog window will pop up and prompt for a password. No password is required, simply click on the "RETURN/ENTER" key to pop down the window and proceed.

2) Operations. The Menu Bar at the top of the Operator Interface window includes the File, Display and Control pull-down menus.

The "File" pull-down menu has the "Load" and "Quit" options:

The "Load" option let you select an initialization file from file a selection window. Currently, the only selection available is "jayhawk.cgf".

the "Quit" option allows the user to quit the program and kill all of the other related processes (entity manager, 3D viewer, 2D viewer, etc.).

WARNING: SINCE THERE ARE MANY RELATED PROCESSES RUNNING IN THE BACKGROUND. YOU MUST USE THIS OPTION TO QUIT FROM THE PROGRAM PROPERLY.

Failure to do so may result in unpredictable and undesirable results during subsequent runs.

The "Display" pull-down menu has the following options:

- Map: Pop up/down the 2D map viewer - Out-the-Window View: Pop up/down the 3D OTW viewer - Task Organization: Pop up/down the task organization viewer - Message Log: Pop up/down the message log window

The "Control" pull-down menu has the following options: These options are used to setup the states of all the man-machine interface (MMI) related processes.

- Start: Start processing - Stop: Stop processing - Pause: NOT USED - Resume: NOT USED - Simulation Time: NOT USED

In order to correctly operate the CGF Stealth (CGF-UI: OTW View) software, the following steps must be taken in the correct order:

1) Startup the CGF MMI using the scripts specified at the be- ginning of this document (source ./jhtrc and execute the script "run_jht").

2) From the OTW View window main menu bar select the "OTW Display" menu bar and pick "SGI Performer" or "ESIG" depending on the desired and available IG.

3) From the CGF-UI window main menu bar select the "File" menu bar and pick the "Load" option. Next select the "jayhawk.cgf" file and click on the OK button. Right after that select the "Control" menu bar and pick the "Start" option. After this wait until the "OTW View window" shows a database over the ground plane.

At this point the Stealth is ready to start the simulation and to accept user commands.

6.0 Running the programs

6.1 The 2D viewer.

The 2D viewer provides a map-like view of the scenario being simulated, and at the same time, it gives the user the ability to control the size and location of the area being inspected. It also provides some of the basic 3D viewer attachment and detachment controls for ease of use.

When the viewer comes up, the default map scaling is 1:50,000. The user may change this default scaling interactively in one of two ways. The first is to bring up the map scale

selection menu by clicking the left mouse button over the "Map" label on the bar over the 2d viewer window, named "CGF-UI:Map". This action should bring up the master map control menu.

In this menu there is a "map scale" option (pull right menu). The user may change the scale of the map by picking the "map scale" option, and then selecting anyone of the pre-defined map scale settings listed.

A second, more interactive way of changing the scale of the map is to zoom in or out of the map by using the mouse. To do this, the user needs to use the middle mouse button in conjunction with the shift key. By clicking on different areas of the screen (Upper half or lower half) the scale of the map may be decreased or increased.

The further away from the center of the screen the sprite is when clicking the mouse button, the higher the value of the scaling factor, therefore for finer scale adjustments areas close to the center of the 2D display should be picked.

The user may move around the map in a similar fashion, except that instead of using the middle mouse button, the left mouse button is used. Also, the movement of the map will depend on lo- cation of the sprite on the display (as the scaling did) except that there are four directions in which one may want to move (left, right, up and down).

If the user clicks on the left mouse button while holding down the shift key on the left area of the map, the map will be relocated so that the data that is to the left of the current area is presented.

The same pattern applies to the other three directions.

On the same Map menu, the user may select to display a north pointing arrow and map sub-grid and rulers by simply selecting the desired on/off state.

Similarly, the user may select the "Contours" option by clicking on it and then clicking on the "Display contours" option on the pull-right menu. This will display the contour maps of the exercise area.

The user may also select other map features to be displayed. These features can be seen by selecting any of the following options under the "Features" menu found under the "Map" selections:

- Pipelines - Roads and rivers - Political boundaries.

The user may also control some of the attributes of the symbols used in the map. by clicking on the "Symbol" label in the bar over the 2d viewer window, named "CGF-UI:Map", a menu with all the available symbol manipulation options will pop up.

The first entry in this menu, labeled "scale value", controls the relative scaling of the symbols on the map.

The most useful options are the "increase by 25%" and "decrease by 25%" options, which have the effect of altering the size of the symbols on the display in order to make it easier for the user to tell them apart when symbols cluster in small areas.

The next implemented option if the "Show trails" option, which displays the path the vehicles take over the course of the simulation. the opposite of this is the "Hide trails" entry, which disables the graphical display of vehicle paths.

The heading of the entities may also be controlled. There are two menu entries for this, one forces all entities to face north (when only the placement of the entities matters) and the other enables the true heading of the entities to be graphically sho· ·n by the alignment of the symbols.

The user may also enable or disable the display of all stealth entities (2D, 3D and position entities) by clicking on the "Display" :ntry under the "Symbol" menu, and then selecting the desired setting for the entities.

One of the most useful feature of the 2D viewer is its ability to control the attachment and detachment of stealth entities to any other entities in the database. Either a 2D or a 3D stealth may be picked (selected for attachment) by clicking on the "Stealth" option under the "Symbol" menu, and then selecting the "Pick stealth entity" option.

The user must ensure that no other stealth are picked at that time. If this happens several stealth may end up attached to the same entity, which is not always desirable.

At this point the user may attach the select stealth entity to any other entity in the display by selecting the "Attach stealth entity" in the same menu, and then picking (with the same left mouse button) the entity to which the previously picked stealth is to be attached.

By picking a 2D stealth, (the arrow-like symbol enclosing a triangle), the map display will track the movements of the entity to which it is attached.

if a 3D stealth is selected and attached to another entity, the graphical display of the selected 3D stealth viewer will change to reflect the position and motion of the selected entity, thus allowing for a more detailed and realistic inspection of the immediate surroundings of the selected entity.

The user may also record significant positions during the simulation by creating position entities. Position entities are static stealth entities that are used as markers to which the user may return (by attaching a viewer to them) to further inspect the site at a later time.

All of the position entity manipulation options can be found under the "Position" option in the pop-up menu under the "Symbol" label.

In this menu, positions entities may be created, deleted, picked (selected) or un-picked for attachment.

6.2 The Task Organization Viewer.

The task organization viewer allows the user to browse the hierarchy of command being used by the simulation. The nodes in the hierarchy tree are correlated to the symbols used in the 2D map viewer by name.

All of the available selections are under the "Options" menu. To use them, the user needs to click on the "Options" label on the window bar, and then select the desired function.

The user may select any one of seven hierarchy depths to be displayed. These operations affect the complete hierarchy. How- ever, the user may expand or collapse any branch of the command hierarchy by selecting the command hierarchy node of interest, and then selecting the expand children or the collapse children option.

The expansion of children is limited to the selected depth or level, so in order to freely move about the hierarchy, the user must first select the highest available level.

Finally, the user can also select which organization hierarchy is to be examined, the blue forces (friendly forces) or the red forces (unfriendly). The hierarchy browsing capability behaves the same for either organization.

6.3 The 3D viewer.

To control the Stealth there are two basic methods:

- Using the mouse and the keyboard. - Using a SpaceBall (if available).

To control the Stealth using the mouse, hold down the shift key and position the cursor inside the "CGF-UI: OTW View" window. This will control the attitude and direction of motion of the Stealth. The roll motion is controlled using the "left/center/right" mouse buttons (normally not used). To move the Stealth to a new position use the "a", "s", "d" keys or "up- arrow", "left-arrow", "down-arrow" keys to accelerate, stop, and decelerate.

If the Stealth is attached to an entity in the simulation, the motion is relative to that entity and the "a", "s", "d" keys (or their arrow counterparts) are used to move closer or further away form the desired target. In this mode to place the stealth at the same location as the target press the "s" key.

To control the Stealth using the SpaceBall, select the menu bar "Instruments" option and pick the "SpaceBall Server" option. Pushing the ball forward moves the Stealth forward, pulling on the ball moves it backwards. The regular keys "a", "s", and "d" still work the same. Twisting the ball will induce equivalent motion on the Stealth. Use of the ball for Stealth control takes some training, and its use s discouraged until the next software release when a more advanced SpaceBall control algorithm will be used.

If the Stealth is attached to an entity in the simulation and the user manipulating the Stealth wishes to detach the Stealth from the entity, the Stealth can be released from the 2D Map Viewer using the "Unattach Stealth" option under the "Symbols" menu. Another

way to effectively do the same, is to force a release from the Stealth main menu by using the option "Detach" under the "Command" main menu option.

To look at the heading and orientation of the Stealth, select the menu bar "Instruments" option and pick the "HUD" option.

ACBM CGF Installation Instructions

The hardware platform necessary to run the ACBM CGF is a Sun 4 or Sparc station. Minimum recommended memory is 16 Megabytes.

Create the upper level directory which will be dedicated to ACBM (e.g., /acbm/cgf). Move to this directory (e.g., cd /acbm/cgf).

Put the tape containing ACBM into the tape drive. Identify the device name for that tape drive (i.e. /dev/rst0). tar the tape to the current directory (i.e. tar -xv /dev/rst0). This will create the needed sub-directories and fill them with the data, software, and executables for running the Jayhawk Thunder ACBM CGF.

After the tape has been loaded, change the cv file to reflect the environment on your machine. Edit the cv file (i.e. vi /acbm/cgf/procs/cv). Search for pl. Change the modver, version, and toplev strings to reflect your top level directory. (e.g., set modver to /acbm/cgf, set version to cgf, and set toplev to /acbm).

Set up your execution environment by executing the file procs/cv (i.e. /acbm/cgf/procs/cv). You will be prompted for the study to use (type "a<CR>"), and then the model to use (type "a<CR>"). As instructed, type "source initialize<CR>". At this point, your environment is set up. [Note: you will need to run "cv" each time you log on before using ACBM. Remember to "source initialize" after each time you run cv.]

To run the CGF for Jayhawk Thunder, enter "run_jtreal". This will run each phase of the Jayhawk Thunder processing steps. After generating the Type data and the Scenario, the simulation will run in stand-alone mode. The results are run through the post-processor, as well. Finally, all the the binary files are set up for networked operations with the AcuSoft man-machine interface. After these files are set up, ACBM uses them to run the scenario in stand-alone and local "networked operations" modes to confirm the integrity of the binary files.

To run the CGF with Acusoft's user interface, refer to Acusoft's instructions.

Detailed Run Procedures

The following sections describe how to modify any of the ACBM Jayhawk Thunder ata bases and run the ACBM CGF to incorporate the changes. The CGF is started oy a jog command with parameters defining the step to run, inputs, and outputs. Whenever the jog command is issued, each parameter may be entered separately. The system will prompt for any incorrect or missing parameters. The jog commands which follow are shown with all parameters entered at once for the sake of brevity.

To modify and pre-process the Type Data Base (tdb):

```
Enter:  tdbinp           [Go to the TDB input subdirectory and list the TDBs]
        gete jtreal.tdb  [Get the Jayhawk Thunder TDB out of sccs for editing]
        vi jtreal.tdb    [Edit the TDB]
        jog sdb jtreal tdb jtreal jtreal
```

To modify and pre-process the Scenario Data Base (sdb):

```
Enter:  sdbinp           [Go to the SDB input subdirectory and list the SDBs]
        gete jtreal.sdb  [Get the Jayhawk Thunder SDB out of sccs for editing]
        vi jtreal.sdb    [Edit the SDB]
        jog sdb jtreal tdb jtreal jtreal trn jtreal
```

To run the Scenario:

```
        jog mod jtreal sdb jtreal jtreal trn jtreal
```

To modify the Analysis Data Base (adb) and post-process with the adb:

```
Enter:  adbinp           [Go to the ADB input subdirectory and list the ADBs]
        gete jtreal.adb  [Get the Jayhawk Thunder ADB out of sccs for editing]
        vi jtreal.adb    [Edit the ADB]
        jog adb jtreal mod jtreal jtreal trn jtreal
```

To set up the binary files for Networked Operations:

```
        jog mod jt_bb    sdb jtreal jtrealbb trn jtreal [Runs scenario up to 1415]
        jog mod jt1636bb sdb jtreal jt1636bb trn jtreal [Runs scenario up to 1636]
        jog mod jt1704bb sdb jtreal jt1704bb trn jtreal [Runs scenario up to 1704]
```

To run the binary files through ACBM in stand-alone mode:

```
        jog mod jtreal mod jt____bb jt____bb trn jtreal
                where ____ is one of { real | 1636 | 1704 }
        Note:   These results may NOT be post-processed with the ADB.
```

To run the binary files through ACBM in local mode:

```
        jog mpm jtlocal mod jt____bb jt____bb trn jtreal
                where ____ is one of { real | 1636 | 1704 }
        Note:   These results may be post-processed with the ADB, as may the
                output from running in "true" networked operations mode.
```

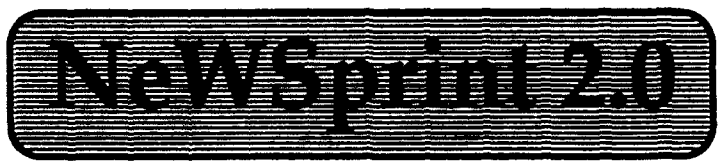
acbm@orl4

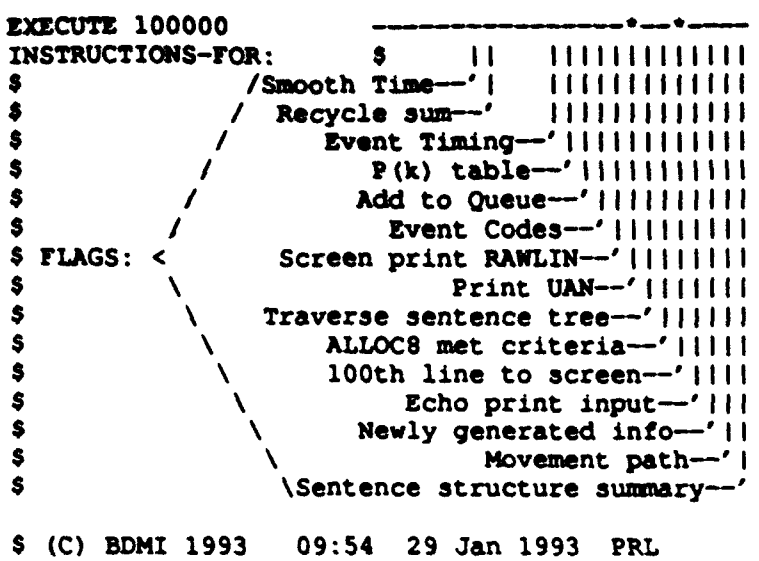
jtreal.tdb

sparc

Sun Feb 28 22:46:33 1993

NeWSprint 2.0 Rev C
Openwin library 3
NeWSprint interpreter 3.000





$ (C) BDMI 1993 09:54 29 Jan 1993 PRL

TDB

Definition of Players for Jayhawk Thunder (JOE: The Simulation)

INSERT-MODE

$> Table of Contents

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Chapter 2
corps_fse Fire Support Element

This player represents the FSE within the Corps Main HQ. It either requests clearance from or grants clearance to a sister FSE for cross boundary fire, depending on which unit it belongs to. It also attempts to issue a SEAD mission to an FA Brigade. If no communications exist, it will relay the message via an ABCCC. The FSE requests a JSTARS to confirm a target, and also gives launch authorization for the ATACMS shot once all other elements are in place. The FSE is composed of 4 M577s and 2 HMMWVs. It is equipped with a TIBS terminal, as well as VRC-92 radios. In order to get a VRC-92 radio to communicate with the ABCCC and JSTARS over distanced beyond 35KM, "enhanced" capabilities have been given to certain systems.
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PLAYER-STRUCTURE corps_fse
  TACTIC corps_fse_tactics
  PLATFORM 1 m577_van  REMAIN-AFTER-STOPPING
    ELEMENT 11 m577_ele  DISCRETE 1
      THINKER     111 fse_section       CAPABILITY fse_section_data
      COMM-RCVR   112 tibs_rcvr         CAPABILITY tibs_rcvr_data
      COMM-XMTR   113 tibs_xmit         CAPABILITY tibs_xmit_data
      MOVER       114 m577_chassis      CAPABILITY m577_chassis_data
  PLATFORM 2 m577_van  REMAIN-AFTER-STOPPING
    ELEMENT 21 m577_ele  DISCRETE 1
      COMM-RCVR   211 vrc-92_rcvr       CAPABILITY vrc-92_rcvr_data
                                        CAPABILITY bogus_vrc-92_rx_data
                                        CAPABILITY 500'_antenna
      COMM-XMTR   212 vrc-92_xmit       CAPABILITY vrc-92_xmit_data
                                        CAPABILITY true_vrc-92_tx_data
                                        CAPABILITY 500'_antenna
      MOVER       213 m577_chassis      CAPABILITY m577_chassis_data
  PLATFORM 3 m577_van  REMAIN-AFTER-STOPPING
    ELEMENT 31 m577_ele  DISCRETE 1
      MOVER       311 m577_chassis      CAPABILITY m577_chassis_data
      COMM-RCVR   312 vrc-92_rcvr       CAPABILITY vrc-92_rcvr_data
                                        CAPABILITY bogus_vrc-92_rx_data
                                        CAPABILITY 500'_antenna
      COMM-XMTR   313 vrc-92_xmit       CAPABILITY vrc-92_xmit_data
                                        CAPABILITY true_vrc-92_tx_data
                                        CAPABILITY 500'_antenna
  PLATFORM 4 m577_van  REMAIN-AFTER-STOPPING
    ELEMENT 41 m577_ele  DISCRETE 1
      MOVER       411 m577_chassis      CAPABILITY m577_chassis_data
      COMM-RCVR   412 vrc-92_rcvr       CAPABILITY vrc-92_rcvr_data
                                        CAPABILITY bogus_vrc-92_rx_data
                                        CAPABILITY 500'_antenna
      COMM-XMTR   413 vrc-92_xmit       CAPABILITY vrc-92_xmit_data
                                        CAPABILITY true_vrc-92_tx_data
                                        CAPABILITY 500'_antenna
  PLATFORM 5 hmmwv     REMAIN-AFTER-STOPPING
    ELEMENT 51 hmmwv_ele  DISCRETE 1
      COMM-RCVR   511 human_voice       CAPABILITY human_voice_data
      COMM-XMTR   512 human_ears        CAPABILITY human_ears_data
      SNR-RCVR    513 clearance_auth    CAPABILITY clearance_auth_data
      THINKER     514 fs_coord          CAPABILITY fs_coord_data
      MOVER       515 hmmwv_chassis     CAPABILITY hmmwv_chassis_data
  PLATFORM 6 hmmwv     REMAIN-AFTER-STOPPING
    ELEMENT 61 hmmwv_ele  DISCRETE 1
      MOVER       611 hmmwv_chassis     CAPABILITY hmmwv_chassis_data
  LINKAGES
    112 WITH 113    211 WITH 212    511 WITH 512    513 WITH 514
    312 WITH 313    412 WITH 413
END PLAYER-STRUCTURE
$
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$ These are the tactics which describe how the Corps FSE conducts operations.
$ This includes passing information to associated units, tasking other players
$ with requests and assigned targets, and issuing clearances and authorizations.

TACTIC corps_fse_tactics
  MAX-MSG-ATTEMPTS 3 (NO-UNITS)
  EVALUATION-RATES
    ASG-EVAL-RATE    0.01 (1/SEC)
    LAUNCH-EVAL-RATE 0.01 (1/SEC)
  END EVALUATION-RATES
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  coordination   arcent
      RPT-RATE (1/SEC)              0.0005       0.04
    END INTELL-REPORT-FREQ
  LAUNCH-CMD-CHAIN coordination  END LAUNCH-CMD-CHAIN
  MOVE-PLANS
      PLAN face_north
    END-PLAN
  END MOVE-PLANS
  SNR-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  coordination    arcent
      DIMENSION 2 SNR-TYPE      clearance_auth
        REPORT-RESPONSIBILITY        CMDR
      DIMENSION 2 SNR-TYPE                    clearance_auth
        REPORT-RESPONSIBILITY                       SUB
    END SNR-RPT-GUIDE
  ZONE-CHARACTERISTICS
    DIMENSION 1  ZONE-TYPE report_zone
      ZONE-PERMISSION      SNR-RPT-OK
    END ZONE-CHARACTERISTICS
  ASG-CMD-CHAIN arcent
  RESOURCE-ALLOCATION
    LETHAL-ASSIGNMENT-QUEUE-ADD
      TGT-TYPE ALL-OTHERS
        USE INPUT FOR FILTER 1
          SUB-TYPE corps_fse
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
            AND TOTAL-TARGETS NO-MORE-THAN 0 (TGTS)
                RE: TGT-TYPE clearance(cross_bndy_fire)
          SUB-TYPE jstars
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
            AND TOTAL-TARGETS NO-MORE-THAN 0 (TGTS)
                RE: TGT-TYPE sa-2
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM corps_fse jstars PICK-AT-MOST 99 NOW
      TGT-TYPE sa-2
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_bde
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
            AND TOTAL-TARGETS AT-LEAST 1 (TGTS)
                RE: TGT-TYPE clearance(cross_bndy_fire)
          SUB-TYPE abccc
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
            AND TOTAL-TARGETS AT-LEAST 1 (TGTS)
                RE: TGT-TYPE clearance(cross_bndy_fire)
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_bde abccc PICK-AT-MOST 99 NOW
      END LETHAL-ASSIGNMENT-QUEUE-ADD
    LETHAL-ASSIGNMENT-QUEUE-DROP
      TGT-TYPE ALL-OTHERS
        USE INPUT FOR FILTER 1
```

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    MAX-DIVE-RATE    1.0 (M/SEC)      MAX-CLIMB-RATE  1.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  0. (M/SEC)      MAX-SPD  1. (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY

PLAYER-STRUCTURE launch_request
  TACTIC issuance_tactics
  PLATFORM 1 clearance_site
    ELEMENT 11 req_ele  DISCRETE 1
      THINKER     111 corps_tgtg_cell   CAPABILITY corps_tgtg_cell_data
        FUTURE-PLAYER launch_auth DISCRETE 1 (COPIES)
      COMM-RCVR  112 human_voice       CAPABILITY human_voice_data
      COMM-XMTR  113 human_ears        CAPABILITY human_ears_data
  LINKAGES
    112 WITH 113
END PLAYER-STRUCTURE

CAPABILITY corps_tgtg_cell_data
  RESOURCE-DISAGGREGATION
    DIMENSION 1 RESOURCE-TYPE launch_auth
      CREATED-PLAYER launch_authorization
  END RESOURCE-DISAGGREGATION
  TIME-BEFORE-DROP            60. (SEC)
  TIME-TO-THINK
    CONSIDER-LAUNCH     30.12 (SEC)
    ASSIMILATE-INTELL   24.15 (SEC)
    RECOG-MSG           25.18 (SEC)
    RECOG-SNR-EVENT      0.11 (SEC)
    RECOG-PHYS-EVENT     0.13 (SEC)
    REVIEW-INFORMATION   0.08 (SEC)
  END TIME-TO-THINK
END CAPABILITY

PLAYER-STRUCTURE launch_authorization
  TACTIC clearance_tactics
  PLATFORM 1 clearance_site  DISAPPEAR-AFTER-STOPPING
    ELEMENT 11 clearance_ele DISCRETE 1  SUSCEPTIBILITY clearance_sig
      THINKER     111 clearance_thk     CAPABILITY clearance_thk_data
      MOVER       112 launch_body       CAPABILITY launch_body_data
      COMM-RCVR   113 human_voice       CAPABILITY human_voice_data
      COMM-XMTR   114 human_ears        CAPABILITY human_ears_data
  LINKAGES
    114 WITH 113
END PLAYER-STRUCTURE

CAPABILITY launch_body_data
  MAX-ACCELERATION                  4. (M/SEC/SEC)
  MIN-TURN-RADIUS                   1. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  1000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE    1.0 (M/SEC)      MAX-CLIMB-RATE  1.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  0. (M/SEC)      MAX-SPD  1. (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY

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Chapter 6
sa-2 SAM Site

This player represents the SA-2 site, with one central van with a radar and six surrounding launchers. It emits energy through its radar while attempting to lock on to the F/A-18.
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PLAYER-STRUCTURE sa-2
  TACTIC sa-2_engage_tactics
  PLATFORM 1 sa-2_van_site
    ELEMENT 11 sa-2_radar_van DISCRETE 1  SUSCEPTIBILITY sa-2_sig
      THINKER     111 sa-2_thk  CAPABILITY sa-2_thk_data
      THINKER     113 sa-2_thk  CAPABILITY sa-2_thk_data
      THINKER     115 sa-2_thk  CAPABILITY sa-2_thk_data
      SNR-RCVR    116 far_rdr_search_rx
                                CAPABILITY far_rdr_search_rx_data
      SNR-XMTR    117 far_rdr_search_tx
                                CAPABILITY far_rdr_search_tx_data
      SNR-RCVR    118 long_rdr_trk_rx CAPABILITY long_rdr_trk_rx_data
      SNR-XMTR    119 long_rdr_trk_tx CAPABILITY long_rdr_trk_tx_data
  PLATFORM 2 sa-2_launcher_site
    ELEMENT 21 sa-2_launcher DISCRETE 1
      WEAPON      211 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  PLATFORM 3 sa-2_launcher_site
    ELEMENT 31 sa-2_launcher DISCRETE 1
      WEAPON      311 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  PLATFORM 4 sa-2_launcher_site
    ELEMENT 41 sa-2_launcher DISCRETE 1
      WEAPON      411 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  PLATFORM 5 sa-2_launcher_site
    ELEMENT 51 sa-2_launcher DISCRETE 1
      WEAPON      511 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  PLATFORM 6 sa-2_launcher_site
    ELEMENT 61 sa-2_launcher DISCRETE 1
      WEAPON      611 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  PLATFORM 7 sa-2_launcher_site
    ELEMENT 71 sa-2_launcher DISCRETE 1
      WEAPON      711 sa-2_telar      CAPABILITY sa-2_telar_data
        ORDNANCE sa-2_msl DISCRETE 1 (ROUNDS)
  LINKAGES
    111 WITH 116    113 WITH 118    116 WITH 117    118 WITH 119
END PLAYER-STRUCTURE
$
```

```
$ These tactics allow the SA-2 to shoot at BLUFOR aircraft, should they come
$ within range.

TACTIC  sa-2_engage_tactics
  ASG-CMD-CHAIN sa-2_chain
  EVALUATION-RATES
      ENG-EVAL-RATE 0.05 (1/SEC)
    END EVALUATION-RATES
  RESOURCE-ALLOCATION
    LETHAL-ENGAGE-QUEUE-ADD
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE sa-2_telar
            IFF-STATUS IS-NOT FRIEND
            AND 3D-POSITION WITHIN sam_zone
              RE: PLATFORM/PT TARGET-LOC
              RE: REFERENCE-LOC YOUR-LOC
            AND WPN-STATUS IS-NOT WPN-NON/OP
            AND BELIEVED-ALIVE
        USE FILTER 1 SELECTIONS FOR FILTER 2
          WPN-TYPE sa-2_telar
            BEEN-ASSIGNED IS YES
                  OR
            ENG-CONTROL-MODE IS sa-2
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM sa-2_telar PICK-AT-MOST 1 NOW 5 TOTAL
    END LETHAL-ENGAGE-QUEUE-ADD
    LETHAL-ENGAGE-QUEUE-DROP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE sa-2_telar
            IFF-STATUS IS FRIEND
                  OR
            3D-POSITION OUTSIDE sam_zone
              RE: PLATFORM/PT TARGET-LOC
            AND ENG-CONTROL-MODE IS sa-2
                  OR
            BEEN-ASSIGNED IS NO
            AND ENG-CONTROL-MODE IS-NOT sa-2
                  OR
            WPN-STATUS IS WPN-NON/OP
                  OR
            BELIEVED-DEAD
                  OR
            AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
              RE: ORDNANCE sa-2_msl
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM sa-2_telar PICK-AT-MOST 1 NOW
    END LETHAL-ENGAGE-QUEUE-DROP
    LETHAL-ENGAGE-START
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE sa-2_telar
            TOTAL-ENG'S NO-MORE-THAN 1 (TGTS)
            AND WPN-STATUS IS-NOT WPN-NON/OP
        USE FILTER 1 SELECTIONS FOR FILTER 2
          WPN-TYPE sa-2_telar
            REL-TGT-ALT > -3. (ANGELS)
            AND REL-TGT-ALT < 36. (ANGELS)
            AND 2D-REL-TGT-OFFSET < 50. (KM)
            AND 2D-DIST < 60. (KM)
            AND REL-TGT-HDG < 102.77 (DEG)
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM sa-2_telar WITH-TRACKER long_rdr_trk_rx
            PICK-AT-MOST 1 NOW 1 TOTAL
```

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END LETHAL-ENGAGE-START
LETHAL-ENGAGE-STOP
  TGT-TYPE ANYONE
    USE INPUT FOR FILTER 1
      WPN-TYPE sa-2_telar
        REL-TGT-ALT < -4.9 (ANGELS)
              OR
        REL-TGT-ALT > 41. (ANGELS)
              OR
        2D-REL-TGT-OFFSET > 55. (KM)
              OR
        2D-DIST > 64. (KM)
              OR
        REL-TGT-HDG > 120. (DEG)
              OR
        AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
          RE: ORDNANCE sa-2_msl
              OR
        IFF-STATUS IS FRIEND
              OR
        3D-POSITION OUTSIDE sam_zone
          RE: PLATFORM/PT TARGET-LOC
        AND ENG-CONTROL-MODE IS sa-2
              OR
        BEEN-ASSIGNED IS NO
        AND ENG-CONTROL-MODE IS-NOT sa-2
              OR
        WPN-STATUS IS WPN-NON/OP
              OR
        BELIEVED-DEAD
              OR
        ROUNDS-FIRED-SO-FAR AT-LEAST 3 (ROUNDS)
    FROM FILTER 1 SELECTIONS
      CHOOSE-FROM sa-2_telar PICK-AT-MOST 1 NOW
END LETHAL-ENGAGE-STOP
LETHAL-ENGAGE-FIRING-START
  TGT-TYPE ANYONE
    USE INPUT FOR FILTER 1
      WPN-TYPE sa-2_telar
        2D-REL-TGT-OFFSET < 45. (KM)
        AND 2D-DIST < 50. (KM)
        AND REL-TGT-HDG < 141.23 (DEG)
        AND FIRING-NOW IS NO
        AND TRACKING-STATUS IS TRACKING
        AND ROUNDS-FIRED-SO-FAR NO-MORE-THAN 2 (ROUNDS)
        AND TIME-SINCE-LAST-INTERCEPT > 3. (SEC)
    USE FILTER 1 SELECTIONS FOR FILTER 2
      WPN-TYPE sa-2_telar
        AVAILABLE-RESOURCE AT-LEAST 1 (ROUNDS)
          RE: ORDNANCE sa-2_msl
    USE FILTER 2 SELECTIONS FOR FILTER 3
      WPN-TYPE sa-2_telar
        SALVOS-FIRED-SO-FAR NO-MORE-THAN 1 (SALVOS)
        AND ROUNDS-FIRED-SO-FAR NO-MORE-THAN 2 (ROUNDS)
    FROM FILTER 2 SELECTIONS
      CHOOSE-FROM sa-2_telar
        WITH-ORDNANCE sa-2_msl ROUNDS: 1
        WITH-ELEMENT ANYONE
      PICK-AT-MOST 1 NOW 2 TOTAL
    FROM FILTER 3 SELECTIONS
      CHOOSE-FROM sa-2_telar
        WITH-ORDNANCE sa-2_msl ROUNDS: 1
        WITH-ELEMENT ANYONE
      PICK-AT-MOST 1 NOW 2 TOTAL
END LETHAL-ENGAGE-FIRING-START
LETHAL-ENGAGE-FIRING-STOP
```

```
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE sa-2_telar
            2D-DIST > 65.25 (KM)
                  OR
            BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM sa-2_telar PICK-AT-MOST 1 NOW
    END LETHAL-ENGAGE-FIRING-STOP
  END RESOURCE-ALLOCATION
END TACTIC
$
```

```
$ This defines the signature of the SA-2.  It is presently detectable by the
$ F/A-18's RWR, the JSTARS SAR, and the ATACMS missile fuze.

SUSCEPTIBILITY sa-2_sig
  RCS-TABLE DIMENSION 1 AZ (DEG) 0. 180.
    DIMENSION 2 EL (DEG) -90. 90. RCS (M2) 100.0
  END RCS-TABLE
  SNR-ELE-INTERACTIONS
     f/a-18_emit_rx
     jstars_rx
     atacms_missile_rx
  END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
$
```

```
$ This data describes the SA-2 missile system.

CAPABILITY  sa-2_telar_data
  NUM-SIMULTANEOUS-ROUND 2 (NO-UNITS)
  PLATFORM-VEL-ATTEN 0. (NO-UNITS)
  WPN-CHARACTERISTICS
    3D-FLYOUT  LAUNCH-ENVELOPE-P(K)  IMPLICIT-FLYOUT
    CONTROLLED  NO-SELF-DESTRUCT
  END WPN-CHARACTERISTICS
  WPN-PK
    DIMENSION 1 ELEMENT-TYPES DEFAULT
      DIMENSION 2 ORDNANCE-TYPES sa-2_msl
        DIMENSION 3 VERTICAL-SPD (M/SEC) -1000.  -0.1  1000.
          DIMENSION 4 RNG (KM) -110. -85. -25. -5. 5.
              30. 65. 100. 110.
            PK (NO-UNITS) 0. .123 .235 .001 .356 .65 .41  0.
          DIMENSION 4 RNG (KM) -110. -80. -30. -7. 7.
              35. 75. 100. 110.
            PK (NO-UNITS) 0. .104 .215 .001 .376 .621 .367 0.
  END WPN-PK
  WPN-SPD-CAPABILITY
    DIMENSION 1  TIME (SEC) 0.  5.  20.  40.  60.
      AVG-SPD (M/SEC)  200.  1500.  2500.  1325.
  END WPN-SPD-CAPABILITY
  WPN-TIME-DELAYS
    SHOOT-TIME-DELAY  14.8 (SEC)      SALVO-FIRING-DELAY  19.7 (SEC)
  END WPN-TIME-DELAYS
END CAPABILITY


$ This next set of data is used to model the search and tracking radars of the
$ SA-2 radar van.

CAPABILITY  far_rdr_search_rx_data
  HITS-TO-ESTABLISH-TRACK 2 (NO-UNITS)
  ONE-M2-DETECT-RNG 125.E3 (M)
  EFFECTIVE-EARTH-RADIUS 8495.E3 (M)
  VERTICAL-OFFSET 30.0 (M)
  RCVR-BANDWIDTH 1.6E6 (HZ)
  SENSING-MODE-RATES
    SEARCH-SENSING-RATE  0.250 (1/SEC)
  END SENSING-MODE-RATES
  SNR-RCVR-FREQS
    SEARCH       1.97 (GHZ)
  END SNR-RCVR-FREQS
  RCVR-FREQ-LIMITS
    LOWER-FREQ-LIMIT  1.9  (GHZ)
    UPPER-FREQ-LIMIT  2.1  (GHZ)
  END RCVR-FREQ-LIMITS
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD 3.0 (DB)
    RECEIVER-NOISE -160.0 (DB)
    INTERNAL-LOSSES -10.0 (DB)
  END DETECTION-SENSITIVITIES
  MTI-ATTENUATION
    DIMENSION 1  FREQ (HZ) 0.  55.  130.  175.  205.  250.
      LOSS (NO-UNITS) 0.83  0.92  0.96  0.98  0.99
  END MTI-ATTENUATION
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.   180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB) 20.
  END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  SEARCH RADAR
```

```
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.0   150.E3
      MIN-ALT (M) MAX-ALT (M)
      0.0     10.E3
  END RNG-ALT-CAPABILITY
END CAPABILITY
CAPABILITY  far_rdr_search_tx_data
  INTERNAL-LOSS -10.0 (DB)
  PEAK-POWER-OUTPUT 1.E6 (WATTS)
  PULSE-REPETITION-FREQ 250.0 (HZ)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB) 20.
  END ANTENNA-PATTERN
  INTERCEPT-INTERACT
    f/a-18_emit_rx
  END INTERCEPT-INTERACT
END CAPABILITY

CAPABILITY  long_rdr_trk_rx_data
  MAX-PARALLEL-TRACKS 2 (NO-UNITS)
  ONE-M2-DETECT-RNG 100. (KM)
  HITS-TO-ESTABLISH-TRACK 3 (NO-UNITS)
  EFFECTIVE-EARTH-RADIUS 8495.E3 (M)
  VERTICAL-OFFSET 30.0 (M)
  RCVR-BANDWIDTH 1.6E6 (HZ)
  EFF-BURST-CM-PROB 0.95 (NO-UNITS)
  SNR-RCVR-FREQS
    SEARCH              0.98 (GHZ)
    ACQUISITION         1.09 (GHZ)
    TRACKING        1.04 (GHZ)
    GUIDANCE             0.93 (GHZ)
  END SNR-RCVR-FREQS
  RCVR-FREQ-LIMITS
    LOWER-FREQ-LIMIT   .90 (GHZ)
    UPPER-FREQ-LIMIT  1.10 (GHZ)
  END RCVR-FREQ-LIMITS
  SNR-TRACKING-PROBABILITIES
    INITIAL-LOCK-PROB    0.823 (NO-UNITS)
    CONTINUE-TRACK-PROB  0.983 (NO-UNITS)
  END SNR-TRACKING-PROBABILITIES
  SNR-TIME-DELAYS
    START-LOCKON-DELAY     8.0 (SEC)
    MAX-COAST-TIME        10.0 (SEC)
    POST-LOCKON-S/N-DELAY  3.0 (SEC)
  END SNR-TIME-DELAYS
  SNR-DOPPLER-LIMITS
    MIN-DOPPLER    20.0 (M/SEC)
    MAX-DOPPLER  4420.0 (M/SEC)
  END SNR-DOPPLER-LIMITS
  SENSING-MODE-RATES
    TRACK-SENSING-RATE   0.312 (1/SEC)
    GUIDANCE-SENSING-RATE  0.407 (1/SEC)
  END SENSING-MODE-RATES
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD       3.0 (DB)
    POST-LOCKON-THRESHOLD  -7.0 (DB)
    RECEIVER-NOISE       -160.0 (DB)
    INTERNAL-LOSSES       -10.0 (DB)
  END DETECTION-SENSITIVITIES
```

```
  IMPLICIT-CM-INTERACT
    chaff_dispenser
  END IMPLICIT-CM-INTERACT
  ANTENNA-PATTERN
    DIMENSION 1 FREQ (GHZ) 0.9  1.05  1.2  2.7  6.5
      DIMENSION 2 AZ (DEG) 0.  5.  180.
        DIMENSION 3 EL (DEG) -90. -2.  2.  90.
          GAIN (DB)  -30. 14. -30.
        DIMENSION 3 EL (DEG) -90.  90.   GAIN (DB) -20.
      DIMENSION 2 AZ (DEG) 0.  7.  180.
        DIMENSION 3 EL (DEG) -90. -4.  4.  90.
          GAIN (DB)  -20.  17.  -22.
        DIMENSION 3 EL (DEG) -90.  90.   GAIN (DB) -23.
      DIMENSION 2 AZ (DEG) 0.  9.  180.
        DIMENSION 3 EL (DEG) -90. -7.  7.  90.
          GAIN (DB)  -10.  12.  -16.
        DIMENSION 3 EL (DEG) -90.  90.   GAIN (DB) -26.
      DIMENSION 2 AZ (DEG) 0. 12.  180.
        DIMENSION 3 EL (DEG) -90. -9.  9.  90.
          GAIN (DB)    -6.  8.  -10.
        DIMENSION 3 EL (DEG) -90.  90.   GAIN (DB) -30.
  END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  TRK  RADAR
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M)  0.0   150.E3
      MIN-ALT (M) MAX-ALT (M)
        0.0     10.E3
  END RNG-ALT-CAPABILITY
END CAPABILITY
CAPABILITY  long_rdr_trk_tx_data
  INTERNAL-LOSS -10.0 (DB)
  PEAK-POWER-OUTPUT 1.E6 (WATTS)
  PULSE-REPETITION-FREQ 250.0 (HZ)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB) 20.
  END ANTENNA-PATTERN
  INTERCEPT-INTERACT
    f/a-18_emit_rx
  END INTERCEPT-INTERACT
END CAPABILITY
$
```

```
$ This capability is used to model the fire control officers and radars operators $ at the SA-

CAPABILITY  sa-2_thk_data
  TIME-BEFORE-DROP 60. (SEC)
  TIME-TO-THINK
    EVAL-ENGAGE-THREAT  0.05 (SEC)     EVAL-LETHAL-ENGAGE  0.05 (SEC)
    EVAL-FIRING         0.05 (SEC)     ASSIMILATE-INTELL   0.05 (SEC)
    RECOG-MSG           0.18 (SEC)     RECOG-SNR-EVENT     0.13 (SEC)
    RECOG-PHYS-EVENT    0.03 (SEC)     REVIEW-INFORMATION  0.08 (SEC)
    EVAL-ASSIGN-THREAT  0.09 (SEC)     CONSIDER-ASG/CANCEL 0.11 (SEC)
  END TIME-TO-THINK
END CAPABILITY

$
```

his player has a warning receiver which gets "lit up" by the SA-2's radar. It issues a TIBS report on the suspected threat, which starts the simulation.
<$

```
PLAYER-STRUCTURE f/a-18
  TACTIC f/a-18_tactics
  PLATFORM 1 f/a-18_a/c  REMAIN-AFTER-STOPPING
    ELEMENT 11 f/a-18_ele DISCRETE 1
      SUSCEPTIBILITY f/a-18_sig
      THINKER     111 f/a-18_thk       CAPABILITY f/a-18_thk_data
      COMM-RCVR   112 tibs_rcvr        CAPABILITY tibs_rcvr_data
      COMM-XMTR   114 tibs_xmit        CAPABILITY tibs_xmit_data
      SNR-RCVR    115 f/a-18_emit_rx   CAPABILITY f/a-18_emit_rx_data
      SNR-RCVR    116 f/a-18_rdr_rx    CAPABILITY f/a-18_rdr_rx_data
      SNR-XMTR    117 f/a-18_rdr_tx    CAPABILITY f/a-18_rdr_tx_data
      WEAPON     1110 air-gnd_lchr     CAPABILITY air-gnd_lchr_data
        ORDNANCE air-gnd_msl DISCRETE  4 (ROUNDS)
      MOVER      1111 f/a-18_body      CAPABILITY f/a-18_body_data
        FUEL jp-4 CONTINUOUS  5000. (KG)
      DISRUPTOR 2222 chaff_dispenser  CAPABILITY chaff_dispenser_data
        CM-EXPENDABLE chaff DISCRETE 20 (ROUNDS)
      DISRUPTOR 2223 flare_dispenser  CAPABILITY flare_dispenser_data
        CM-EXPENDABLE flare DISCRETE 20 (ROUNDS)
  LINKAGES
    111 WITH 116     116 WITH 1110     116 WITH 117
    111 WITH 115     112 WITH 114
END PLAYER-STRUCTURE
$
```

```
$ The following tactics allow the F/A-18 to maneuver (should it detect the SA-2
$ radar) and issue a TIBS report.

TACTIC f/a-18_tactics
  EVALUATION-RATES
    ENG-EVAL-RATE 0.08 1/SEC
  END EVALUATION-RATES
  LOOK-AHEAD-DISTANCE 6. (KM)
  MOVE-OPTIONS NONE END MOVE-OPTIONS
  ZONE-CHARACTERISTICS
    DIMENSION 1 ZONE-TYPE report_area
      ZONE-PERMISSION  SNR-RPT-OK       MSG-RPT-OK
  END ZONE-CHARACTERISTICS
  ATK-PRIORITIES
    DIMENSION 1 LIST-NAME ground_targets
      TGT-ELEMENTS
        sa-2_radar_van
  END ATK-PRIORITIES
  MOVE-PLANS
    PLAN attack ( priority )
      WHEN SNR-STATUS IS DETECT
        EXECUTE PLAN eval_target ( priority )
      OTHERWISE
        FOCUS-ON PRIORITY priority
      END-PLAN
    PLAN eval_target ( priority )
      WHEN TGT-TYPE IS sa-2_radar_van
        EXECUTE PLAN going_home
        AND GOTO POINT home_base
      OTHERWISE
        FOCUS-ON PRIORITY priority
      END-PLAN
    PLAN going_home
      END-PLAN
    END MOVE-PLANS
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  detect
      RPT-RATE (1/SEC) 0.0333
  END INTELL-REPORT-FREQ
  SNR-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  detect
      DIMENSION 2 SNR-TYPE  f/a-18_emit_rx
        REPORT-RESPONSIBILITY CMDR
  END SNR-RPT-GUIDE
  RESOURCE-ALLOCATION
    LETHAL-ENGAGE-QUEUE-ADD
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE air-gnd_lchr
            IFF-STATUS IS-NOT FRIEND
            AND 3D-POSITION WITHIN target_area
              RE: PLATFORM/PT TARGET-LOC
            AND WPN-STATUS IS-NOT WPN-NON/OP
            AND BELIEVED-ALIVE
        USE FILTER 1 SELECTIONS FOR FILTER 2
          WPN-TYPE air-gnd_lchr
            BEEN-ASSIGNED IS YES OR ENG-CONTROL-MODE IS f/a-18
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM air-gnd_lchr PICK-AT-MOST 1 NOW 6 TOTAL
    END LETHAL-ENGAGE-QUEUE-ADD
    LETHAL-ENGAGE-QUEUE-DROP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE air-gnd_lchr
            IFF-STATUS IS FRIEND OR
```

```
          3D-POSITION OUTSIDE target_area
            RE: PLATFORM/PT TARGET-LOC
          AND ENG-CONTROL-MODE IS f/a-18
          OR BEEN-ASSIGNED IS NO AND ENG-CONTROL-MODE IS-NOT f/a-18
          OR WPN-STATUS IS WPN-NON/OP
          OR BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM air-gnd_lchr PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-QUEUE-DROP
  LETHAL-ENGAGE-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE air-gnd_lchr
          REL-TGT-ALT > -11.1 (KM) AND REL-TGT-ALT < 1. (KM)
          AND 2D-REL-TGT-OFFSET < 6.6 (KM)
          AND 2D-DIST < 10995. (M) AND REL-TGT-HDG < 172. (DEG)
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM air-gnd_lchr WITH-TRACKER f/a-18_rdr_rx
          PICK-AT-MOST 1 NOW 3 TOTAL
  END LETHAL-ENGAGE-START
  LETHAL-ENGAGE-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE air-gnd_lchr
          REL-TGT-ALT < -11.5 (KM) OR REL-TGT-ALT > 1.5 (KM)
          OR 2D-REL-TGT-OFFSET > 6.9 (KM)
          OR 2D-DIST > 11492.5 (M)
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM air-gnd_lchr PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-STOP
  LETHAL-ENGAGE-FIRING-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE air-gnd_lchr
          REL-TGT-ALT > -8.5 (KM) AND REL-TGT-ALT < 1.1 (KM)
          AND 2D-REL-TGT-OFFSET < 6.1 (KM)
          AND 2D-DIST > 1242. (M) AND 2D-DIST < 8807.5 (M)
          AND REL-TGT-HDG < 141.23 (DEG)
          AND FIRING-NOW IS NO AND TRACKING-STATUS IS TRACKING
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM air-gnd_lchr
            WITH-ORDNANCE air-gnd_msl
              ROUNDS: 1
            WITH-ELEMENT ANYONE
          PICK-AT-MOST 1 NOW 3 TOTAL
  END LETHAL-ENGAGE-FIRING-START
  LETHAL-ENGAGE-FIRING-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE air-gnd_lchr
          REL-TGT-ALT < -9.5 (KM) OR REL-TGT-ALT > 0.5 (KM)
          OR 2D-REL-TGT-OFFSET > 6.4 (KM)
          OR 2D-DIST > 9502.5 (M)
          OR REL-TGT-HDG > 157.85 (DEG)
          OR BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM air-gnd_lchr PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-FIRING-STOP
END RESOURCE-ALLOCATION
ND TACTIC
```

```
$ This represents the RCS of an F/A-18.  It is detectable by the SA-2 radar site
$ and the AWACS.

:USCEPTIBILITY f/a-18_sig
  RCS-TABLE
    DIMENSION 1 AZ (DEG)  0.  20.  60.  135.  180.
      DIMENSION 2 EL (DEG) -90.  -5.  10.  90.
        RCS (M2)  5.0  0.5  8.0
      DIMENSION 2 EL (DEG) -90.  -35.  -15.  20.  90.
        RCS (M2)  6.0  3.5  3.0  9.0
      DIMENSION 2 EL (DEG) -90.  90.
        RCS (M2)  10.0
      DIMENSION 2 EL (DEG) -90.  90.
        RCS (M2)  6.5
  END RCS-TABLE
  SNR-ELE-INTERACTIONS
    long_rdr_trk_rx      far_rdr_search_rx    awacs_rx
  END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
$
```

```
$ This data describes the F/A-18's Radar Warning Receiver (RWR).  This allows the $ emissions

CAPABILITY  f/a-18_emit_rx_data
  EFFECTIVE-EARTH-RADIUS 8495.E3 (M)
  HITS-TO-ESTABLISH-TRACK 1 (NO-UNITS)
  MAX-PARALLEL-TRACKS 1 (NO-UNITS)
  RCVR-BANDWIDTH 1.6E6 (HZ)
  SNR-TRACKING-PROBABILITIES
    INITIAL-LOCK-PROB    0.999 (NO-UNITS)
    CONTINUE-TRACK-PROB  1.000 (NO-UNITS)
  END SNR-TRACKING-PROBABILITIES
  SNR-TIME-DELAYS
    MAX-COAST-TIME  15.0 (SEC)
  END SNR-TIME-DELAYS
  SNR-ANGULAR-LIMITS
    AZ-LIMIT  45. (DEG)
    EL-LIMIT  50. (DEG)
  END SNR-ANGULAR-LIMITS
  SENSING-MODE-RATES
    SEARCH-SENSING-RATE     0.143 (1/SEC)
    TRACK-SENSING-RATE   0.543 (1/SEC)
    GUIDANCE-SENSING-RATE  0.333 (1/SEC)
  END SENSING-MODE-RATES
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD    13.0 (DB)
    RECEIVER-NOISE     -190.0 (DB)
    INTERNAL-LOSSES     -10.0 (DB)
  END DETECTION-SENSITIVITIES
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)  20.
  END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  BOTH-SEARCH/TRK  WARNING-RCVR
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M)  0.0   75.E3
      MIN-ALT (M) MAX-ALT (M)
        -6000.     100.
  END RNG-ALT-CAPABILITY
END CAPABILITY
$
```

```
$ These inputs describe the performance of the F/A-18 ground attack radar.

CAPABILITY  f/a-18_rdr_rx_data
  HITS-TO-ESTABLISH-TRACK 4 (NO-UNITS)
  ONE-M2-DETECT-RNG 20.E3 (M)
  EFFECTIVE-EARTH-RADIUS 8495.E3 (M)
  VERTICAL-OFFSET 15.0 (M)
  MAX-PARALLEL-TRACKS 3 (NO-UNITS)
  RCVR-BANDWIDTH 1.6E6 (HZ)
  SNR-TRACKING-PROBABILITIES
    INITIAL-LOCK-PROB     0.600 (NO-UNITS)
    CONTINUE-TRACK-PROB   0.925 (NO-UNITS)
  END SNR-TRACKING-PROBABILITIES
  SNR-TIME-DELAYS
    START-LOCKON-DELAY       5.0 (SEC)
    MAX-COAST-TIME          10.0 (SEC)
    POST-LOCKON-S/N-DELAY    4.0 (SEC)
  END SNR-TIME-DELAYS
  SNR-DOPPLER-LIMITS
    MIN-DOPPLER  15.0 (M/SEC)
  END SNR-DOPPLER-LIMITS
  SENSING-MODE-RATES
    SEARCH-SENSING-RATE      0.125 (1/SEC)
    TRACK-SENSING-RATE    0.251 (1/SEC)
    GUIDANCE-SENSING-RATE  0.374 (1/SEC)
  END SENSING-MODE-RATES
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD         13.0 (DB)
    POST-LOCKON-THRESHOLD      3.0 (DB)
    RECEIVER-NOISE          -150.0 (DB)
    INTERNAL-LOSSES          -10.0 (DB)
  END DETECTION-SENSITIVITIES
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)  20.
  END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  BOTH-SEARCH/TRK  RADAR
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  SNR-RCVR-FREQS
    SEARCH      12.0  (GHZ)
    ACQUISITION   12.0  (GHZ)
    TRACKING       12.0  (GHZ)
    GUIDANCE             12.0  (GHZ)
  END SNR-RCVR-FREQS
  RCVR-FREQ-LIMITS
    LOWER-FREQ-LIMIT  11.90 (GHZ)
    UPPER-FREQ-LIMIT  12.10 (GHZ)
  END RCVR-FREQ-LIMITS
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.0   18.E3
      MIN-ALT (M) MAX-ALT (M)
        -10.0E3     10.E3
  END RNG-ALT-CAPABILITY
END CAPABILITY
CAPABILITY  f/a-18_rdr_tx_data
  INTERNAL-LOSS -10.0 (DB)
  PEAK-POWER-OUTPUT 5.E6 (WATTS)
  PULSE-REPETITION-FREQ 250.0 (HZ)
  ANTENNA-PATTERN
```

```
    DIMENSION 1 AZ (DEG) 0.       180.
      DIMENSION 2 EL (DEG) -90.   90.
        GAIN (DB)        30.
  END ANTENNA-PATTERN
END CAPABILITY
$
```

```
$ These capabilities are used to implicitly model chaff and flare dispensers of
$ the F/A-18.

CAPABILITY  chaff_dispenser_data
  DISRUPTOR-CHARACTERISTICS
    IMPLICIT-DETAIL
  END DISRUPTOR-CHARACTERISTICS
END CAPABILITY

CAPABILITY  flare_dispenser_data
  DISRUPTOR-CHARACTERISTICS
    IMPLICIT-DETAIL
  END DISRUPTOR-CHARACTERISTICS
END CAPABILITY


$ This data describes the lethality and performance of air-to-ground missiles
$ carried by the F/A-18.

CAPABILITY  air-gnd_lchr_data
  PLATFORM-VEL-ATTEN 0. (NO-UNITS)
  NUM-SIMULTANEOUS-ROUND 3 (NO-UNITS)
  WPN-TIME-DELAYS
    SHOOT-TIME-DELAY 0.75 (SEC)    SALVO-FIRING-DELAY 0.75 (SEC)
  END WPN-TIME-DELAYS
  WPN-CHARACTERISTICS
    3D-FLYOUT  LAUNCH-ENVELOPE-P(K)  IMPLICIT-FLYOUT
    CONTROLLED  NO-SELF-DESTRUCT
  END WPN-CHARACTERISTICS
  WPN-SPD-CAPABILITY
    DIMENSION 1  TIME (SEC) 0.0      12.5
      AVG-SPD (M/SEC)  800.
  END WPN-SPD-CAPABILITY
  WPN-PK
    DIMENSION 1 ELEMENT-TYPES DEFAULT
      DIMENSION 2 OFFSET (KM) -6.5 -6. -2.5  3. 6. 6.5
        DIMENSION 3 RNG (M) -20.E3  20.E3
          PK (NO-UNITS)  0.
        DIMENSION 3 RNG (M) -20.E3  -10.0E3   10.0E3   20.E3
          PK (NO-UNITS)  0.   .3477      0.
        DIMENSION 3 RNG (M) -20.E3  -10.0E3   10.0E3   20.E3
          PK (NO-UNITS)  0.   .412       0.
        DIMENSION 3 RNG (M) -20.E3  -10.0E3   10.0E3   20.E3
          PK (NO-UNITS)  0.   .2499      0.
        DIMENSION 3 RNG (M) -20.E3  20.E3
          PK (NO-UNITS)  0.
  END WPN-PK
END CAPABILITY
$
```

```
$ This data gives the movement capabilities of an F/A-18 aircraft.

CAPABILITY  f/a-18_body_data
  MAX-ACCELERATION 20. (M/SEC/SEC)
  MIN-TURN-RADIUS 1000. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  10000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE  95.0 (M/SEC)      MAX-CLIMB-RATE  80.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  100.0 (M/SEC)      MAX-SPD  670.0 (M/SEC)
  END MOVER-SPEED-LIMITS
  FUEL-USAGE
    DIMENSION 1 ALT (M)  0.  1000.  3000.  6000.
      DIMENSION 2 SPEED (M/SEC)  0.  100.  200.  260.  400.
        BURN-RATE (KG/SEC)  .35  .413  .598  .749
      DIMENSION 2 SPEED (M/SEC)  0.  110.  220.  270.  450.
        BURN-RATE (KG/SEC)  .241  .314  .426  .651
      DIMENSION 2 SPEED (M/SEC)  0.  125.  275.  310.  500.
        BURN-RATE (KG/SEC)  .222  .775  .887  .991
  END FUEL-USAGE
END CAPABILITY


$ The following capability is used to model the F/A-18 pilot.  The pilot may
$ notice communications traffic and sensor reports, use the radios, engage
$ targets, and maneuver.

CAPABILITY  f/a-18_thk_data
  TIME-BEFORE-DROP           60. (SEC)
  TIME-TO-THINK
    REVIEW-INFORMATION  0.08 (SEC)
    EVAL-ENGAGE-THREAT  0.25 (SEC)
    EVAL-LETHAL-ENGAGE  0.36 (SEC)
    EVAL-FIRING         0.38 (SEC)
    ASSIMILATE-INTELL   0.05 (SEC)
    RECOG-MSG           0.18 (SEC)
    RECOG-SNR-EVENT      0.13 (SEC)
    RECOG-PHYS-EVENT    0.03 (SEC)
    CONSIDER-MOVE       0.26 (SEC)
  END TIME-TO-THINK
END CAPABILITY
$
```

```
$ This data describes the performance of a Theater Intelligence Broadcast System  $ (TIBS).
$ sequence of events.

CAPABILITY tibs_rcvr_data
  VERTICAL-OFFSET 300.0 (M)
  RCVR-BANDWIDTH 4. (MHZ)
  RCVR-NOISE 1.E-11 (WATTS)
  RECOGNITION-THRESH                    8.0 (DB)
  POLARIZATION-EFFECTS
    HORIZONTAL      0.34 (NO-UNITS)     VERTICAL        0.87 (NO-UNITS)
    LEFT-CIRCULAR   0.77 (NO-UNITS)     RIGHT-CIRCULAR  0.46 (NO-UNITS)
  END POLARIZATION-EFFECTS
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)  3.
  END ANTENNA-PATTERN
END CAPABILITY

CAPABILITY tibs_xmit_data
  VERTICAL-OFFSET 300.0 (M)
  XMIT BANDWIDTH 2. (MHZ)
       2500.0 (WATTS)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)  15.
  END ANTENNA-PATTERN
  INTERCEPT-INTERACT emit_finder_rx END INTERCEPT-INTERACT
END CAPABILITY

$
```

```
$>                          Chapter 8
                    jstars Reconnaissance Aircraft

This player confirms the SA-2 site with its synthetic aperature radar when
tasked to do so by the Corps FSE.  It sends intelligence on the threat back to
the FSE.
<$

PLAYER-STRUCTURE jstars
  TACTIC jstars_tactics
  PLATFORM 1 jstars_a/c
    ELEMENT 11 jstars_ele DISCRETE 1  SUSCEPTIBILITY jstars_sig
      THINKER     111 jstars_thk      CAPABILITY jstars_thk_data
      COMM-RCVR   112 vrc-92_rcvr     CAPABILITY vrc-92_rcvr_data
                                      CAPABILITY bogus_vrc-92_rx_data
      COMM-XMTR   113 vrc-92_xmit     CAPABILITY vrc-92_xmit_data
                                      CAPABILITY true_vrc-92_tx_data
      MOVER       114 jstars_body     CAPABILITY jstars_body_data
      SNR-RCVR    115 jstars_rx       CAPABILITY jstars_rx_data
      SNR-XMTR    116 jstars_tx       CAPABILITY jstars_tx_data
  LINKAGES
    111 WITH 115    112 WITH 113    115 WITH 116
END PLAYER-STRUCTURE


$ These tactics define the maneuver logic for the JSTARS to fly a Figure 8 at
$ 30,000' and report any confirmed targets to the FSE.

TACTIC jstars_tactics
  ASG-CMD-CHAIN               detect
  ZONE-CHARACTERISTICS
    DIMENSION 1 ZONE-TYPE     warn_zone
      ZONE-PERMISSION        SNR-RPT-OK
  END ZONE-CHARACTERISTICS
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  detect
      RPT-RATE (1/SEC)          0.00136
  END INTELL-REPORT-FREQ
  SNR-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  detect
      DIMENSION 2 SNR-TYPE      jstars_rx
        REPORT-RESPONSIBILITY     CMDR
  END SNR-RPT-GUIDE
  MOVE-PLANS
    PLAN start_orbit
      NOW-USE PATTERN figure-8
    END-PLAN
  END MOVE-PLANS
  PLAN-PATTERNS
    DIMENSION 1 PATTERN-TYPE figure-8
      X (NM)   Y (NM)   Z (FT)   REF   SPD (KNOTS)   TURN-RADIUS (NM) DIR
      -90.      10.     30000.   MSL      360.          10.           LEFT
      -90.     -10.     30000.   MSL      360.          10.           LEFT
       90.      10.     30000.   MSL      360.          10.           RIGHT
       90.     -10.     30000.   MSL      360.          10.           RIGHT
    END PLAN-PATTERNS
  END TACTIC
$
```

```
$ This represents the RCS of JSTARS.  It is detectable by the AWACS so that the
$ AWACS can determine if the airspace is clear.

SUSCEPTIBILITY jstars_sig
  RCS-TABLE
    DIMENSION 1 AZ (DEG)  0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        RCS (M2)              100.
  END RCS-TABLE
  SNR-ELE-INTERACTIONS
    awacs_rx
  END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY


$ This input defines the JSTARS personnel, which may fly the aircraft, notice
$ communications traffic and radar updates, and form and discard perceptions.

CAPABILITY  jstars_thk_data
  TIME-BEFORE-DROP          2. (HR)
  TIME-TO-THINK
    CONSIDER-MOVE       145.00 (SEC)
    ASSIMILATE-INTELL    15.00 (SEC)
    RECOG-MSG             2.00 (SEC)
    RECOG-SNR-EVENT       1.50 (SEC)
    RECOG-PHYS-EVENT      1.00 (SEC)
    REVIEW-INFORMATION   10.00 (SEC)
  END TIME-TO-THINK
END CAPABILITY
$
```

```
$ This is the JSTARS SAR description, which is used to confirm the target.

CAPABILITY jstars_rx_data
  HITS-TO-ESTABLISH-TRACK      1 (NO-UNITS)
  ONE-M2-DETECT-RNG          200.E3 (M)
  EFFECTIVE-EARTH-RADIUS    8495.E3 (M)
  VERTICAL-OFFSET              5.0 (M)
  RCVR-BANDWIDTH               1.6E6 (HZ)
  MAX-PARALLEL-TRACKS 100 (NO-UNITS)
  SENSING-MODE-RATES
      SEARCH-SENSING-RATE  0.00833 (1/SEC)
    END SENSING-MODE-RATES
  DETECTION-SENSITIVITIES
      SENSING-THRESHOLD     3.0 (DB)
      RECEIVER-NOISE     -160.0 (DB)
      INTERNAL-LOSSES     -10.0 (DB)
    END DETECTION-SENSITIVITIES
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)              20.
    END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
      FREQ-DRIVEN  SEARCH  RADAR
    END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
      TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
      PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
    END QUALITY-OF-DATA
  SNR-RCVR-FREQS
      SEARCH          7.900 (GHZ)
      ACQUISITION     8.100 (GHZ)
      TRACKING        7.951 (GHZ)
      GUIDANCE        8.045 (GHZ)
    END SNR-RCVR-FREQS
  RCVR-FREQ-LIMITS
      LOWER-FREQ-LIMIT   7.9  (GHZ)
      UPPER-FREQ-LIMIT   8.1  (GHZ)
    END RCVR-FREQ-LIMITS
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.0   230.E3
      MIN-ALT (M) MAX-ALT (M)
        -10.0E3     10.E3
    END RNG-ALT-CAPABILITY
  END CAPABILITY

CAPABILITY  jstars_tx_data
  INTERNAL-LOSS             -10.0 (DB)
  PEAK-POWER-OUTPUT           1.E6 (WATTS)
  PULSE-REPETITION-FREQ    250.0 (HZ)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)      20.
  END ANTENNA-PATTERN
END CAPABILITY
$
```

```
$ This capability describes the movement capability of the JSTARS.

CAPABILITY  jstars_body_data
  MAX-ACCELERATION                20. (M/SEC/SEC)
  MIN-TURN-RADIUS               1000. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  20000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE  40.0 (M/SEC)      MAX-CLIMB-RATE  80.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  100.0 (M/SEC)      MAX-SPD  670.0 (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY

$
```

acbm@orl4 **jtresults.adb**

sparc

Sun Feb 28 23:27:33 1993

NeWSprint 2.0 Rev C
Openwin library 3
NeWSprint interpreter 3.000

NeWSprint 2.0

```
ACBM 2.2.1.0  Feb 15, 1993
(C) 1989 - 1992  BDM International
1801 Randolph Road, SE
Albuquerque, NM  87106
Execution Started:  Feb 28 1993  23:25:43

*+*  MODEL MESSAGE 81 (INFORMATIVE): Terrain Limits
   Tallest Elevation Point = 407.000000
   X Min = -97139.167749
   Y Min = -8727.577111
   X Max = 190803.936322
   Y Max = 214584.459049
*+*  MODEL MESSAGE 36 (INFORMATIVE): Terrain Previously Translated To X,Y
   Highest Terrain Elevation = 407.000000
TRN,1992   10:53:46
    Previous execution steps:



MOD, Feb 28 1993   22:04:51



MOD, Feb 28 1993   21:55:47


SDB, Feb 28 1993   21:51:07
     Jayhawk Thunder Phase 1 scenario 7 Dec 92 14:36 MST PRL

.DB, Feb 28 1993   21:50:02
     Definition of Players for Jayhawk Thunder (JOE: The Simulation)

LAN, Feb 25 1993   13:40:51
```

```
==> Begin Situation: Active_SAM_site_near_Basra_[1420]
 14:18:26.2 Day 0
       1 sa-2 (Loc 1) FIRST-DIRECTLY-SEES 1 f/a-18
             tgt (x,y,z): 198.0 km 55.7 km 5.000 km; time: 14:18:26.0 Day 0
             sensor (x,y,z): 159.7 km 146.4 km 0.023 km; 3-D dist: 98.6 km
 The end.
    Active_SAM_site_near_Basra_[1420]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          FIRST-DIRECTLY-SEES                    1
==> End Situation: Active_SAM_site_near_Basra_[1420]
```

```
==> Begin Situation: TIBS_Message_#1_[1420]
 14:20:06.6 Day 0
       1 f/a-18 IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
             re: intelligence, using net (ID) 7 at 52.299 MHz; signal level:
             -61.5 dB; interference: -110.0 dB; message quality good
 The end.
    TIBS_Message_#1_[1420]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
==> End Situation: TIBS_Message_#1_[1420]
```

```
==> Begin Situation: VII_Corps_Message_#1_[1430]
 14:27:47.7 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 18th_abn corps_fse
             re: wpn assignment, using net (ID) 1 at 65.399 MHz; signal level:
             -85.8 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#1_[1430]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#1_[1430]
```

```
==> Begin Situation: VII_Corps_Message_#2_[1430]
 14:27:47.7 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 jstars
             re: wpn assignment, using net (ID) 7 at 52.299 MHz; signal level:
             -58.5 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#2_[1430]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#2_[1430]
```

```
==> Begin Situation: JSTARS_Confirms_SA-2_site_[1445]
 14:45:19.4 Day 0
       1 jstars FIRST-DIRECTLY-SEES 1 sa-2 (Loc 1)
              tgt (x,y,z): 159.7 km 146.4 km 0.023 km; time: 14:45:02.9 Day 0
              sensor (x,y,z): -11.5 km -4.5 km 9.144 km; 3-D dist: 228.5 km
 The end.
    JSTARS_Confirms_SA-2_site_[1445]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          FIRST-DIRECTLY-SEES                          1
==> End Situation: JSTARS_Confirms_SA-2_site_[1445]
```

```
--> Begin Situation: JSTARS_Message_#2_[1500]
 14:59:19.7 Day 0
       1 jstars IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
              re: intelligence, using net (ID) 7 at 52.299 MHz; signal level:
              -88.1 dB; interference: -110.0 dB; message quality good
 The end.
    JSTARS_Message_#2_[1500]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
--> End Situation: JSTARS_Message_#2_[1500]
```

```
==> Begin Situation: XVIII_Abn_Corps_Message_#1_[1510]
 15:09:29.0 Day 0
       18th_abn corps_fse IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
             re: intelligence, using net (ID) 1 at 65.399 MHz; signal level:
             -85.8 dB; interference: -100.0 dB; message quality good
 The end.
    XVIII_Abn_Corps_Message_#1_[1510]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
==> End Situation: XVIII_Abn_Corps_Message_#1_[1510]
```

```
==> Begin Situation: VII_Corps_Message_#4_[1515]
 15:16:51.8 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -85.8 dB; interference: -100.0 dB; message quality bad
 15:17:05.4 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -85.8 dB; interference: -100.0 dB; message quality bad
 15:17:19.0 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -85.8 dB; interference: -100.0 dB; message quality bad
 15:17:32.6 Day 0
       7th corps_fse GIVES-UP-TRYING-TO-TALK-TO 75th fa_bde
             after 3rd attempt, re: wpn assignment
 The end.
    VII_Corps_Message_#4_[1515]: Total of 4
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              3
          GIVES-UP-TRYING-TO-TALK-TO              1
==> End Situation: VII_Corps_Message_#4_[1515]
```

```
==> Begin Situation: VII_Corps_Message_#5_[1540]
 15:39:27.8 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -77.2 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#5_[1540]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#5_[1540]
```

```
==> Begin Situation: ABCCC_Message_#4_[1552]
 15:50:35.8 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -69.6 dB; interference: -77.9 dB; message quality good
 The end.
    ABCCC_Message_#4_[1552]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#4_[1552]
```

```
==> Begin Situation: 75th_Message_#1_[1552:30]
 15:52:51.3 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO 1 abccc
            re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
            -86.1 dB; interference: -100.0 dB; message quality good
 The end.
    75th_Message_#1_[1552:30]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#1_[1552:30]
```

```
==> Begin Situation: ABCCC_Message_#5_[1556]
 15:53:09.1 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
             re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
             -61.5 dB; interference: -100.0 dB; message quality good
 The end.
    ABCCC_Message_#5_[1556]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#5_[1556]
```

```
==> Begin Situation: VII_Corps_Message_#11_[1605]
 16:13:51.8 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -77.2 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#11_[1605]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
         IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#11_[1605]
```

```
==> Begin Situation: ABCCC_Message_#13_[1621]
 16:21:45.8 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: wpn assignment, using net (ID) 7 at 44.699 MHz; signal level:
             -69.7 dB; interference: -77.9 dB; message quality good
 The end.
    ABCCC_Message_#13_[1621]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#13_[1621]
```

```
==> Begin Situation: 75th_Message_#13_[1631]
 16:31:00.9 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO a/6-27 fa_btry
            re: wpn assignment, using net (ID) 75 at 38.699 MHz; message
            quality fine
 The end.
    75th_Message_#13_[1631]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#13_[1631]
```

```
==> Begin Situation: A_Btry_Message_#1_[1634]
 16:31:45.1 Day 0
       a/6-27 fa_btry IS-TRANSMITTING-MESSAGE-TO a-32 spll
              re: wpn assignment, using net (ID) 6 at 41.999 MHz; message
              quality fine
 16:31:50.2 Day 0
       a/6-27 fa_btry IS-TRANSMITTING-MESSAGE-TO a-45 hemtt
              re: wpn assignment, using net (ID) 6 at 41.999 MHz; message
              quality fine
 The end.
    A_Btry_Message_#1_[1634]: Total of 2
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              2
==> End Situation: A_Btry_Message_#1_[1634]
```

```
==> Begin Situation: A-32_Pulls_Out_of_Column_[1636]
 16:36:22.6 Day 0
       a-32 spll WILL-START-PATTERN-MOVEMENT
              pattern name: move_to_reload; at later time 16:35:16.9 Day 0
 The end.
    A-32_Pulls_Out_of_Column_[1636]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          WILL-START-PATTERN-MOVEMENT                1
==> End Situation: A-32_Pulls_Out_of_Column_[1636]
```

```
==> Begin Situation: HEMTT_Pulls_Out_of_Column_[1636]
 16:36:30.4 Day 0
       a-45 hemtt WILL-START-PATTERN-MOVEMENT
              pattern name: move_to_reload; at later time 16:35:23.3 Day 0
 The end.
    HEMTT_Pulls_Out_of_Column_[1636]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          WILL-START-PATTERN-MOVEMENT                1
==> End Situation: HEMTT_Pulls_Out_of_Column_[1636]
```

```
==> Begin Situation: A-32_Downloads_MLRS_[1637-1641]
 16:37:12.7 Day 0
       2 mlrs_cannister ENTERS-THE-SCENARIO
 16:38:01.2 Day 0
       3 mlrs_cannister ENTERS-THE-SCENARIO
 16:38:50.9 Day 0
       4 mlrs_cannister ENTERS-THE-SCENARIO
 16:39:38.2 Day 0
       5 mlrs_cannister ENTERS-THE-SCENARIO
 16:40:26.6 Day 0
       6 mlrs_cannister ENTERS-THE-SCENARIO
 16:41:15.8 Day 0
       7 mlrs_cannister ENTERS-THE-SCENARIO
 The end.
    A-32_Downloads_MLRS_[1637-1641]: Total of 6
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          ENTERS-THE-SCENARIO                    6
==> End Situation: A-32_Downloads_MLRS_[1637-1641]
```

```
==> Begin Situation: HEMTT_Uploads_ATACMS_[1642-1645]
 16:42:52.1 Day 0
       8 atacms_cannister ENTERS-THE-SCENARIO
 16:43:40.5 Day 0
       9 atacms_cannister ENTERS-THE-SCENARIO
 The end.
    HEMTT_Uploads_ATACMS_[1642-1645]: Total of 2
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          ENTERS-THE-SCENARIO                    2
==> End Situation: HEMTT_Uploads_ATACMS_[1642-1645]
```

```
==> Begin Situation: A-32_Relocates_to_Firing_Position_[1646]
 16:45:47.5 Day 0
       a-32 spll STARTS-TRAVERSING-WEAPON-TO 1 sa-2 (Loc 1)
 The end.
    A-32_Relocates_to_Firing_Position_[1646]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          STARTS-TRAVERSING-WEAPON-TO              1
==> End Situation: A-32_Relocates_to_Firing_Position_[1646]
```

```
==> Begin Situation: VII_Corps_Message_#15_[1648:35]
 16:48:08.0 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: intelligence, using net (ID) 1 at 58.599 MHz; signal level:
             -79.5 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#15_[1648:35]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#15_[1648:35]
```

```
==> Begin Situation: VII_Corps_Message_#16_[1649]
 16:48:08.0 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: intelligence, using net (ID) 1 at 58.599 MHz; signal level:
             -79.5 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#16_[1649]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
==> End Situation: VII_Corps_Message_#16_[1649]
```

```
==> Begin Situation: 75th_Message_#20_[1650:45]
 16:50:28.0 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO 1 abccc
            re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
            -86.8 dB; interference: -100.0 dB; message quality good
 The end.
    75th_Message_#20_[1650:45]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#20_[1650:45]
```

```
==> Begin Situation: ABCCC_Message_#30_[1652]
 16:52:45.8 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 1 awacs
             re: wpn assignment, using net (ID) 1 at 82.099 MHz; signal level:
             -66.2 dB; interference: -100.0 dB; message quality good
 The end.
    ABCCC_Message_#30_[1652]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#30_[1652]
```

```
==> Begin Situation: ABCCC_Message_#33_[1655]
 16:54:40.0 Day 0
       75th fa_bde INTENDS-TO-INFORM 1 abccc about a-32 spll
 The end.
    ABCCC_Message_#33_[1655]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          INTENDS-TO-INFORM                          1
==> End Situation: ABCCC_Message_#33_[1655]
```

```
==> Begin Situation: 75th_Message_#21_[1655:15]
 16:54:40.0 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO 1 abccc
            re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
            -86.1 dB; interference: -100.0 dB; message quality good
 The end.
    75th_Message_#21_[1655:15]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#21_[1655:15]
```

```
==> Begin Situation: 75th_Message_#22_[1655:45]
 16:55:51.0 Day 0
       a/6-27 fa_btry INTENDS-TO-INFORM 75th fa_bde about a-32 spll
 The end.
    75th_Message_#22_[1655:45]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          INTENDS-TO-INFORM                    1
==> End Situation: 75th_Message_#22_[1655:45]
```

```
==> Begin Situation: A_Btry_Message_#5_[1656]
 16:55:51.0 Day 0
       a/6-27 fa_btry IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
              re: intelligence, using net (ID) 75 at 38.699 MHz; message quality
              fine
 The end.
    A_Btry_Message_#5_[1656]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
==> End Situation: A_Btry_Message_#5_[1656]
```

```
==> Begin Situation: AWACS_Message_#2_[1659:15]
 16:59:23.6 Day 0
       1 awacs IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: intelligence, using net (ID) 1 at 82.099 MHz; signal level:
             -73.6 dB; interference: -100.0 dB; message quality good
 The end.
    AWACS_Message_#2_[1659:15]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: AWACS_Message_#2_[1659:15]
```

```
==> Begin Situation: ABCCC_Message_#36_[1700]
 17:00:20.3 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
              re: asg/eng status, using net (ID) 1 at 58.599 MHz; signal level:
              -64.4 dB; interference: -100.0 dB; message quality good
 The end.
    ABCCC_Message_#36_[1700]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#36_[1700]
```

```
==> Begin Situation: ABCCC_Message_#41_[1705:30]
 17:04:00.3 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
             re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
             -70.6 dB; interference: -77.9 dB; message quality good
 The end.
    ABCCC_Message_#41_[1705:30]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#41_[1705:30]
```

```
==> Begin Situation: VII_Corps_Message_#20_[1700:30]
 17:04:59.6 Day 0
       7th corps_fse IS-TRANSMITTING-MESSAGE-TO 1 abccc
             re: intelligence, using net (ID) 1 at 58.599 MHz; signal level:
             -79.5 dB; interference: -100.0 dB; message quality good
 The end.
    VII_Corps_Message_#20_[1700:30]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: VII_Corps_Message_#20_[1700:30]
```

```
==> Begin Situation: 75th_Message_#27_[1706]
 17:05:49.0 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO a/6-27 fa_btry
            re: intelligence, using net (ID) 75 at 38.699 MHz; message quality
            fine
 The end.
    75th_Message_#27_[1706]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#27_[1706]
```

```
==> Begin Situation: A_Btry_Message_#6_[1707]
 17:06:11.9 Day 0
       a/6 27 fa_btry IS-TRANSMITTING-MESSAGE-TO a-32 spll
              re: intelligence, using net (ID) 6 at 41.999 MHz; message quality
              fine
 The end.
    A_Btry_Message_#6_[1707]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO                1
==> End Situation: A_Btry_Message_#6_[1707]
```

```
==> Begin Situation: Missile_Fly_Out_to_Target_[1709]
 17:06:59.0 Day 0
       a-32 spll FIRES-A-WEAPON-AT 1 sa-2 (Loc 1)
             weapon: 116 spll_lchr; ordnance: atacms_msl
 17:07:12.0 Day 0
       a-32 spll FIRES-A-WEAPON-AT 1 sa-2 (Loc 1)
             weapon: 116 spll_lchr; ordnance: atacms_msl
 The end.
    Missile_Fly_Out_to_Target_[1709]: Total of 2
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          FIRES-A-WEAPON-AT                          2
==> End Situation: Missile_Fly_Out_to_Target_[1709]
```

```
==> Begin Situation: A_Btry_Message_#7_[1709:05]
 17:07:07.9 Day 0
       a/6-27 fa_btry IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
              re: intelligence, using net (ID) 75 at 38.699 MHz; message quality
              fine
 The end.
    A_Btry_Message_#7_[1709:05]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: A_Btry_Message_#7_[1709:05]
```

```
==> Begin Situation: A_Btry_Message_#8_[1709:15]
 17:07:22.0 Day 0
       a/6-27 fa_btry IS-TRANSMITTING-MESSAGE-TO 75th fa_bde
              re: intelligence, using net (ID) 75 at 38.699 MHz; message quality
              fine
 The end.
    A_Btry_Message_#8_[1709:15]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: A_Btry_Message_#8_[1709:15]
```

```
==> Begin Situation: A-32_Return_to_Reload_Vicinity_[1710]
 17:08:11.2 Day 0
       a-32 spll WILL-START-PATTERN-MOVEMENT
              pattern name: return_to_reload; at later time 16:45:39.1 Day 0
 The end.
    A-32_Return_to_Reload_Vicinity_[1710]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          WILL-START-PATTERN-MOVEMENT              1
==> End Situation: A-32_Return_to_Reload_Vicinity_[1710]
```

```
==> Begin Situation: A-32_Downloads_ATACMS_[1711-1715]
 17:08:59.5 Day 0
       a-32 spll STOPS-MOVEMENT
             mover (x,y,z): 42.0 km 115.6 km 0.123 km; Spd: 0.0 m/s; Hdg: 269.9
             deg; Pitch: 0.1 deg and remains in scenario
 The end.
    A-32_Downloads_ATACMS_[1711-1715]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          STOPS-MOVEMENT                              1
==> End Situation: A-32_Downloads_ATACMS_[1711-1715]
```

```
==> Begin Situation: 75th_Message_#30_[1709:30]
 17:09:11.6 Day 0
       75th fa_bde IS-TRANSMITTING-MESSAGE-TO 1 abccc
            re: intelligence, using net (ID) 7 at 44.699 MHz; signal level:
            -86.5 dB; interference: -100.0 dB; message quality good
 The end.
    75th_Message_#30_[1709:30]: Total of 1
    *+* MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: 75th_Message_#30_[1709:30]
```

```
==> Begin Situation: ABCCC_Message_#43_[1710]
 17:09:29.4 Day 0
       1 abccc IS-TRANSMITTING-MESSAGE-TO 7th corps_fse
              re: intelligence, using net (ID) 1 at 58.599 MHz; signal level:
              -64.2 dB; interference: -100.0 dB; message quality good
 The end.
    ABCCC_Message_#43_[1710]: Total of 1
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          IS-TRANSMITTING-MESSAGE-TO              1
==> End Situation: ABCCC_Message_#43_[1710]
```

```
==> Begin Situation: SA-2_Site_Destruction_[1711]
 17:09:20.9 Day 0
       2 atacms_missile ,IN-ENVELOPE,-INTERCEPTS 1 sa-2 (Loc 1)
            with 114 atacms_missile_warhead; ordnance: tnt; tgt (x,y,z): 159.7
            km 146.4 km 0.023 km; hdg: 90.0 deg; wpn (x,y,z): 159.7 km 146.4
            km 0.025 km; az: 75.3 deg; 3-D dist: 2.0044E-2 km; P(k): 0.99000;
            launch time 17:09:20.0 Day 0
         and SUCCESSFULLY-HIT it
            target element: 11 sa-2_radar_van random draw: 0.55926 element
            hurt
 17:09:33.9 Day 0
       3 atacms_missile ,IN-ENVELOPE,-INTERCEPTS 1 sa-2 (Loc 1)
            with 114 atacms_missile_warhead; ordnance: tnt; tgt (x,y,z): 159.7
            km 146.4 km 0.023 km; hdg: 90.0 deg; wpn (x,y,z): 159.7 km 146.4
            km 0.025 km; az: 75.3 deg; 3-D dist: 2.0044E-2 km; P(k): 0.99000;
            launch time 17:09:33.0 Day 0
         and SUCCESSFULLY-HIT it
            target element: 11 sa-2_radar_van random draw: 0.00248 player
            destroyed due to critical platform destruction
 The end.
    SA-2_Site_Destruction_[1711]: Total of 4
    *+*  MODEL MESSAGE 80 (INFORMATIVE): Summary of Incidents
    Frequency of Occurrence for Situations:
          ,IN-ENVELOPE,-INTERCEPTS                2
          SUCCESSFULLY-HIT                        2
==> End Situation: SA-2_Site_Destruction_[1711]
```

acbm@orl4 jtreal.sc

sparc
Sun Feb 28 22:55:12 1993

NeWSprint 2.0 R
Openwin libr
NeWSprint interpreter 3

```
EXECUTE 1600000          ----------------*--*-**-
INSTRUCTIONS-FOR:       $      ||    ||||||||||||
$                /Smooth Time--'|    ||||||||||||
$               /  Recycle sum--'    ||||||||||||
                /       Event Timing--'||||||||||
$              /           P(k) table--'||||||||||
$             /           Add to Queue--'|||||||||
$            /              Event Codes--'||||||||
$ FLAGS: <          Screen print RAWLIN--'|||||||
$         \                    Print UAN--'||||||
$          \     Traverse sentence tree--'|||||
$           \        ALLOC8 met criteria--'||||
$            \       100th line to screen--'|||
$             \            Echo print input--'||
$              \         Newly generated info--'|
$               \                 Movement path--'
$                \Sentence structure summary--'

$ (C) BDMI 1989, 1992   10:58 5 June 1989  PJL
$>
TDB
Comment
REPLACE-MODE
END-TDB
<$
SDB

Jayhawk Thunder Phase 1 scenario  7 Dec 92  14:36 MST  PRL

RANDOM-NUMBER-SEED:  8345215
RADIUS OF SCENARIO: 200. (KM)   LOCATION RESOLUTION TIME: 0.1 (SEC)
GAME START TIME: 14.25 (HR)      GAME STOP TIME: 17.5 (HR)
CHECKPOINT TIME INCREMENT: 6. (HR)
CENTER OF SCENARIO  L/L: 29:05N  46E USE-TRANSLATED-TERRAIN
$ CENTER OF SCENARIO  L/L: 29:05N  46E DO-NOT-USE-TERRAIN

NET TYPE air_net   MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    CALCULATE-SIGNAL-LEVEL
  MSG ASGN-STAT     TRANSMIT-TIME:  1.3 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  2.5 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  1.3 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  3.1 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  3.2 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 13.3 (SEC) 1-WAY PRIORITY: 11
  MSG MOVE-ORDER    TRANSMIT-TIME:  3.1 (SEC) 1-WAY PRIORITY: 20

NET TYPE corps_intel   MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    CALCULATE-SIGNAL-LEVEL
  MSG ASGN-STAT     TRANSMIT-TIME:  1.0 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  2.4 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  1.0 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  3.6 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  6.5 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 15.1 (SEC) 1-WAY PRIORITY: 11

NET TYPE corps_cmd_ops MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    CALCULATE-SIGNAL-LEVEL
  MSG ASGN-STAT     TRANSMIT-TIME:  1.2 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  3.0 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  1.2 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  5.2 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  1.2 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 16.0 (SEC) 1-WAY PRIORITY: 11

NET TYPE corps_ops_fires MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    CALCULATE-SIGNAL-LEVEL
```

```
  MSG ASGN-STAT     TRANSMIT-TIME:  1.5 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  2.5 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  1.5 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  3.6 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  1.0 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 13.5 (SEC) 1-WAY PRIORITY: 11

NET TYPE bde_command MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    NO-SIGNAL-LEVEL-CALCULATION
  MSG ASGN-STAT     TRANSMIT-TIME:  0.8 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  1.3 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  0.8 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  2.6 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  1.4 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 14.1 (SEC) 1-WAY PRIORITY: 11

NET TYPE btry_command MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    NO-SIGNAL-LEVEL-CALCULATION
  MSG ASGN-STAT     TRANSMIT-TIME:  2.7 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  3.6 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  2.7 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME:  5.1 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  2.2 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 10.8 (SEC) 1-WAY PRIORITY: 11
  MSG MOVE-ORDER    TRANSMIT-TIME:  2.1 (SEC) 1-WAY PRIORITY: 20

NET TYPE voice  MODE: INTERMITTENT CHANGE FREQ DELAY: .5 (SEC)
    CALCULATE-SIGNAL-LEVEL
  MSG ASGN-STAT     TRANSMIT-TIME:  1.0 (SEC) 1-WAY PRIORITY: 68
  MSG ENG-STAT      TRANSMIT-TIME:  1.0 (SEC) 1-WAY PRIORITY: 54
  MSG INTELL        TRANSMIT-TIME: 14.9 (SEC) 1-WAY PRIORITY: 11
  MSG MOVE-ORDER    TRANSMIT-TIME: 30.0 (SEC) 1-WAY PRIORITY: 20

NET TYPE air_con_req  MODE: INTERMITTENT
    CHANGE FREQ DELAY: .5 (SEC)  CALCULATE-SIGNAL-LEVEL
  MSG ASGN-STAT     TRANSMIT-TIME:  1.2 (SEC) 1-WAY PRIORITY: 68
  MSG CNCL-ASGN     TRANSMIT-TIME:  4.2 (SEC) 1-WAY PRIORITY: 76
  MSG ENG-STAT      TRANSMIT-TIME:  1.2 (SEC) 1-WAY PRIORITY: 54
  MSG WPN-ASGN      TRANSMIT-TIME: 10.1 (SEC) 1-WAY PRIORITY: 82
  MSG DEATH         TRANSMIT-TIME:  4.2 (SEC) 1-WAY PRIORITY: 35
  MSG INTELL        TRANSMIT-TIME: 15.1 (SEC) 1-WAY PRIORITY: 11

DEFINE-SHARED-ZONES
  ZONE 1 sam_zone  RELATIVE
    MIN/MAX ALT: 0.0 (M)  MSL  40. (KM)  MSL
    X,Y:     0.0     60.0 (KM)     X,Y:    52.0     30.0 (KM)
    X,Y:    52.0    -30.0 (KM)     X,Y:     0.0    -60.0 (KM)
    X,Y:   -52.0    -30.0 (KM)     X,Y:   -52.0     30.0 (KM)
$ For reporting Launch Authorization
  ZONE 6 report_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  2. (KM) AGL
    L/L:  29:03N    45:49E    L/L:  29:03N    45:51E
    L/L:  29:01N    45:51E    L/L:  29:01N    45:49E
$ For reporting Airspace Clearance
  ZONE 7 report_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  2. (KM) AGL
    L/L:  29:07N    46:39E    L/L:  29:07N    46:41E
    L/L:  29:04N    46:41E    L/L:  29:04N    46:39E
$ For reporting ATACMS shot and SPLL firing position
  ZONE 8 report_zone  STATIONARY
  MIN/MAX ALT:  0. (M)  AGL  5.0 (KM)  MSL
    L/L: 31N  46:26E      L/L: 31N 48E
    L/L: 30N  48E         L/L: 30N 46:26E
END DEFINE-SHARED-ZONES

SIDE red
COMMAND CHAIN sa-2_chain
PLAYER: 1 sa-2  LEVEL: 1
```

```
    PLATFORM: 1 sa-2_van_site  L/L,Z:  30:23:25N  47:39:58E  1. (M) AGL
      CRITICAL
      ELEMENT: 11 sa-2_radar_van  DISCRETE  QUANTITY: 2
        SNR-RCVR 118 long_rdr_trk_rx   OFF
      END ELEMENT
    END PLATFORM
    PLATFORM: 2 sa-2_launcher_site
      L/L,Z:  30:23:26.62N  47:39:58E  1. (M) AGL
    END PLATFORM
    PLATFORM: 3 sa-2_launcher_site
      L/L,Z:  30:23:25.81N  47:39:59.6E  1. (M) AGL
    END PLATFORM
    PLATFORM: 4 sa-2_launcher_site
      L/L,Z:  30:23:24.19N  47:39:59.6E  1. (M) AGL
    END PLATFORM
    PLATFORM: 5 sa-2_launcher_site
      L/L,Z:  30:23:23.38N  47:39:58E  1. (M) AGL
    END PLATFORM
    PLATFORM: 4 sa-2_launcher_site
      L/L,Z:  30:23:24.19N  47:39:56.4E  1. (M) AGL
    END PLATFORM
    PLATFORM: 6 sa-2_launcher_site
      L/L,Z:  30:23:25.81N  47:39:56.4E  1. (M) AGL
    END PLATFORM
    MODES-OF-CONTROL: ENGAGE sa-2
    USE-SHARED-ZONE 1 sam_zone
  END PLAYER
  END COMMAND CHAIN
  END SIDE

  SIDE blue
  COMMAND CHAIN detect
   LAYER: 7th corps_fse  LEVEL: 1  END PLAYER

  PLAYER: 1 jstars  LEVEL: 2
    PLATFORM: 1 jstars_a/c  L/L,Z: 29:02N 46:24E  30000. (FT) MSL
      ELEMENT: 11 jstars_ele  DISCRETE QUANTITY: 1
        COMM-RCVR 112 vrc-92_rcvr ON FREQ: 52.3 (MHZ) NET: 7 corps_intel
        SNR-RCVR  115 jstars_rx   OFF  TURN ON  AT TIME: 14.52 (HR)
                                       TURN OFF AT TIME: 15.1  (HR)
      END ELEMENT
     PATH  START TIME: 14.15 (HR)  ALT: MSL  MODE: 3-D WITH-TURNS
      PLAN start_orbit
      L/L,Z: 29:02N 46:24E  30000. (FT)
        SPD: 360. (KNOTS)  TURN-RADIUS: 10. (NM)
      L/L,Z: 29:05N 46:00E  30000. (FT)
    END PLATFORM
    MODES-OF-CONTROL: ENGAGE  jstars
    ZONE 2 warn_zone  STATIONARY
    MIN/MAX ALT: 0.0 (M)  MSL  1500.0 (M)  MSL
      L/L: 31N  43E          L/L: 31N 49E
      L/L: 28N  49E          L/L: 28N 43E
  END PLAYER

  PLAYER: 1 f/a-18 LEVEL: 2
    PLATFORM: 1 f/a-18_a/c  L/L,Z: 29:10N  48:20E 5000.0 (M)   MSL
      ELEMENT: 11  f/a-18_ele DISCRETE QUANTITY: 2
        COMM-RCVR 112 tibs_rcvr ON FREQ: 52.3 (MHZ) NET: 7 corps_intel
      END ELEMENT
      PATH  START TIME: 14.25 (HR)  ALT: MSL  MODE: 3-D WITH-TURNS
      PLAN attack ( ground_targets )
      L/L,Z: 29:10N  48:20E 5000.0 (M)
        SPD: 255. (M/SEC)  TURN-RADIUS: 1750. (M)
      L/L,Z: 30:20N  47:30E 5000.0 (M)
      CHECKPOINT home_base
      L/L,Z: 28:30N  48:20E 5000.0 (M)
```

```
  END PLATFORM
  MODES-OF-CONTROL: ENGAGE f/a-18
  ZONE 1 report_area  STATIONARY
  MIN/MAX ALT:  0.0 (KM)  MSL  5.0 (KM)  MSL
    L/L: 31N  47E          L/L: 31N 48E
    L/L: 30N  48E          L/L: 30N 47E
  ZONE 2 target_area  STATIONARY
  MIN/MAX ALT:  0.0 (KM)  MSL  5.0 (KM)  MSL
    L/L: 31N  47E          L/L: 31N 48E
    L/L: 30N  48E          L/L: 30N 47E
END PLAYER
END COMMAND CHAIN

COMMAND CHAIN arcent
PLAYER: 7th corps_fse  LEVEL: 1
$ Actual location:         L/L,Z: 28:29N  45:50E  1. (M)  AGL
  PLATFORM: 1 m577_van     L/L,Z: 29:01N  45:49:59.926E  1. (M) AGL
    ELEMENT: 11 m577_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 112 tibs_rcvr ON FREQ: 52.3 (MHZ) NET: 7 corps_intel
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:01N          45:49:59.926E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:01:0.097N  45:49:59.926E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 2 m577_van     L/L,Z: 29:01N  45:50:0.074E  1. (M) AGL
    ELEMENT: 21 m577_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 211 vrc-92_rcvr ON FREQ: 65.4 (MHZ) NET: 1 corps_cmd_ops
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:01N          45:50:0.074E   1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:01:0.097N  45:50:0.074E   1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 3 m577_van   L/L,Z: 29:00:59.803N  45:49:59.926E  1. (M) AGL
    ELEMENT: 31 m577_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 312 vrc-92_rcvr ON FREQ: 58.6 (MHZ) NET: 1 air_con_req
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:00:59.803N 45:49:59.926E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:00:59.903N 45:49:59.926E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 4 m577_van   L/L,Z: 29:00:59.803N  45:50:0.074E  1. (M) AGL
    ELEMENT: 41 m577_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 412 vrc-92_rcvr ON FREQ: 44.7 (MHZ)
                                    NET: 7 corps_ops_fires
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:00:59.803N 45:50:0.074E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:00:59.903N 45:50:0.074E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 5 hmmwv      L/L,Z: 29:00:59.9N  45:49:59.778E  1. (M) AGL
    ELEMENT: 51 hmmwv_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 511 human_voice ON  FREQ: 7. (KHZ) NET: 7 voice
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:00:59.9N   45:49:59.778E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:01N          45:49:59.778E  1. (M) SPD: 0. (M/SEC)
```

```
  END PLATFORM
  PLATFORM: 6 hmmwv       L/L,Z: 29:00:59.9N  45:50:0.222E  1. (M) AGL
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:00:59.9N   45:50:0.222E   1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:01N        45:50:0.222E   1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  MODES-OF-CONTROL: ENGAGE corps_fse
  ZONE 1 sead_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL   10. (M) AGL
    L/L:  28:10N    43:41E
    L/L:  30:17N    45:42E
    L/L:  30:16N    47:52E
    L/L:  29:40N    47:53E
    L/L:  29:45N    46:59E
    L/L:  28:53N    46:16E
    L/L:  28:26N    46:24E
    L/L:  28:17N    46:11E
  ZONE 1 report_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  9. (KM) AGL
    L/L:  29:03N    45:45E     L/L:  29:03N    46E
    L/L:  29N       46E        L/L:  29N       45:45E
  KNOWS 1 launch_request OP
$     L/L,Z: 28:30N  45:50E  1. (M)  AGL
      L/L,Z: 29:02N  45:50E  100. (M)  AGL
    HAS 1 launch_auth
  END PLAYER

PLAYER: 75th fa_bde  LEVEL: 2
  PLATFORM: 1 hmmwv  L/L,Z: 30:13:50N  46:11:35E  1. (M)  AGL
    ELEMENT: 11 hmmwv_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 vrc-92_rcvr ON FREQ: 44.7 (MHZ)
                                    NET: 7 corps_ops_fires
      COMM-RCVR 116 vrc-92_rcvr ON FREQ: 38.7 (MHZ) NET: 75 bde_command
      SNR-RCVR  115 human_eyes  OFF  TURN ON  AT TIME: 15.872 (HR)
                                     TURN OFF AT TIME: 15.93 (HR)
                                     TURN ON  AT TIME: 16.84 (HR)
                                     TURN OFF AT TIME: 16.88 (HR)
                                     TURN ON  AT TIME: 16.91 (HR)
                                     TURN OFF AT TIME: 16.94 (HR)
    END ELEMENT
    PATH  START TIME: 14.01833 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50N    46:11:35E    1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N  46:26:34E    1. (M)
     L/L,Z: 30:07:19.9N  46:26:34.4E  1. (M)   SPD: 1. (M/SEC)
     L/L,Z: 30:07:19.9N  46:26:34.8E  1. (M)   SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 2 hmmwv  L/L,Z: 30:13:49.27N 46:11:34.583E  1. (M)  AGL
    PATH  START TIME: 14.01833 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.27N 46:11:34.583E 1. (M)  SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.1N  46:26:34E     1. (M)
     L/L,Z: 30:07:19.1N  46:26:34.4E   1. (M)
     L/L,Z: 30:07:19.1N  46:26:34.8E   1. (M)  SPD: 0. (M/SEC)
  END PLATFORM
  ZONE 1 report_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  200. (M) AGL
    L/L:  30:10N    46:22:59E L/L:  30:10N    46:23:01E
    L/L:  30:00N    46:23:01E L/L:  30:00N    46:22:59E
  ZONE 1 setup_area  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  200. (M) AGL
    L/L:  30:10N    46:25:40E L/L:  30:10N    46:30E
    L/L:  30:00N    46:30E    L/L:  30:00N    46:25:40E
  USE-SHARED-ZONE 6 report_zone
  USE-SHARED-ZONE 8 report_zone
END PLAYER

PLAYER: 1 abccc  LEVEL: 2
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  PLATFORM: 1 abccc_a/c  L/L,Z: 29:10N 45:13:29E  26000. (FT) MSL
    ELEMENT: 11 abccc_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 vrc-92_rcvr ON FREQ: 44.7 (MHZ)
                                NET: 7 corps_ops_fires
      COMM-RCVR 116 vrc-92_rcvr ON FREQ: 58.6 (MHZ) NET: 1 air_con_req
      COMM-RCVR 118 vrc-92_rcvr ON FREQ: 82.1 (MHZ) NET: 1 air_net
    END ELEMENT
   PATH  START TIME: 14.0 (HR)  ALT: MSL  MODE: 3-D WITH-TURNS
    PLAN start_orbit
    L/L,Z: 29:10N 45:13:29E  26000. (FT)
      SPD: 160. (KNOTS)  TURN-RADIUS: 1.325 (NM)
    L/L,Z: 29:20N 45:13:29E  26000. (FT)
  END PLATFORM
  ZONE 1 report_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL  200. (M) AGL
    L/L:  30:10N    46:20E    L/L:  30:10N    46:30E
    L/L:  30:00N    46:30E    L/L:  30:00N    46:20E
  USE-SHARED-ZONE 6 report_zone
  USE-SHARED-ZONE 7 report_zone
  USE-SHARED-ZONE 8 report_zone
END PLAYER

PLAYER: 75th fa_bde  LEVEL: 3  END PLAYER

PLAYER: a/6-27 fa_btry  LEVEL: 4
  PLATFORM: 100 hmmwv
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    ELEMENT: 100 hmmwv_ele  DISCRETE  QUANTITY: 1
     SNR-RCVR  116 human_eyes  OFF  TURN ON  AT TIME: 16.93 (HR)
                                    TURN OFF AT TIME: 16.94 (HR)
                                    TURN ON  AT TIME: 17. (HR)
     COMM-RCVR 117 vrc-46_rcvr ON FREQ: 42. (MHZ) NET: 6 btry_command
    END ELEMENT
    PATH  START TIME: 14.1348 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:06.06E  1. (M)
     L/L,Z: 30:07:19.9N   46:26:16.06E  1. (M)   SPD: 2.52 (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:16.11E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 101 spll_veh
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    PATH  START TIME: 14.137115 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:05.1E   1. (M)
     L/L,Z: 30:07:19.9N   46:26:15.1E   1. (M)   SPD: 2.52 (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:15.15E  1. (M)   SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 103 spll_veh
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    PATH  START TIME: 14.141745 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:03.25E  1. (M)
     L/L,Z: 30:07:19.9N   46:26:13.25E  1. (M)   SPD: 2.52 (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:13.3E   1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 104 hemtt_veh
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    PATH  START TIME: 14.14406  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:02.3E   1. (M)
     L/L,Z: 30:07:19.9N   46:26:12.3E   1. (M)   SPD: 2.52 (M/SEC)
     L/L,Z: 30:07:19.9N   46:26:12.35E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
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PLATFORM: 105 hemtt_veh
    L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
  PATH  START TIME: 14.146375 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:01.4E   1. (M)
   L/L,Z: 30:07:19.9N   46:26:11.4E   1. (M)   SPD: 2.52 (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:11.45E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 106 hemtt_veh
    L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
  PATH  START TIME: 14.14869  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:00.44E  1. (M)
   L/L,Z: 30:07:19.9N   46:26:10.44E  1. (M)   SPD: 2.52 (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:10.49E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 107 hemtt_veh
    L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
  PATH  START TIME: 14.151005 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.9N   46:25:59.5E   1. (M)
   L/L,Z: 30:07:19.9N   46:26:09.5E   1. (M)   SPD: 2.52 (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:09.55E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 108 hemtt_veh
    L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
  PATH  START TIME: 14.15332  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.9N   46:25:58.57E  1. (M)
   L/L,Z: 30:07:19.9N   46:26:08.57E  1. (M)   SPD: 2.52 (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:08.62E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 110 hmmwv
    L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
  PATH  START TIME: 14.15795  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.9N   46:25:56.7E   1. (M)
   L/L,Z: 30:07:19.9N   46:26:06.7E   1. (M)   SPD: 2.52 (M/SEC)
   L/L,Z: 30:07:19.9N   46:26:06.75E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 200 hmmwv
    L/L,Z: 30:13:50N  46:11:35E  1. (M)  AGL
  ELEMENT: 200 hmmwv_ele  DISCRETE  QUANTITY: 1
   COMM-RCVR 2114 vrc-46_rcvr ON FREQ: 38.7 (MHZ) NET: 75 bde_command
  END ELEMENT
  PATH  START TIME: 14.1348 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N    46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N  46:26:06.06E  1. (M)
   L/L,Z: 30:07:19.1N  46:26:16.06E  1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N  46:26:16.11E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 201 spll_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.137115 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:05.1E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:15.1E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:15.15E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
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PLATFORM: 202 spll_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.13943  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:04.2E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:14.2E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:14.25E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 203 spll_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.141745 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:03.25E  1. (M)
   L/L,Z: 30:07:19.1N   46:26:13.25E  1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:13.3E   1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 204 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.14406  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:02.3E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:12.3E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:12.35E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 205 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.146375 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:01.4E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:11.4E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:11.45E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 206 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.14869  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:00.44E  1. (M)
   L/L,Z: 30:07:19.1N   46:26:10.44E  1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:10.49E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 207 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.151005 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:25:59.5E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:09.5E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:09.55E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 208 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.15332  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:25:58.57E  1. (M)
   L/L,Z: 30:07:19.1N   46:26:08.57E  1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:08.62E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 209 hemtt_veh
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.155635 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
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  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:25:57.63E  1. (M)
   L/L,Z: 30:07:19.1N   46:26:07.63E  1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:07.68E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 210 hmmwv
    L/L,Z: 30:13:50N     46:11:35E     1. (M) AGL
  PATH  START TIME: 14.15795  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:50N     46:11:35E     1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:19.1N   46:25:56.7E   1. (M)
   L/L,Z: 30:07:19.1N   46:26:06.7E   1. (M)   SPD: 2.74 (M/SEC)
   L/L,Z: 30:07:19.1N   46:26:06.75E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 300 hmmwv
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.1348 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:06.06E  1. (M)
   L/L,Z: 30:07:18.3N   46:26:16.06E  1. (M)
   L/L,Z: 30:07:18.3N   46:26:16.11E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 301 spll_veh
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.137115 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:05.1E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:15.1E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:15.15E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 302 spll_veh
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.13943  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:04.2E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:14.2E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:14.25E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 303 spll_veh
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.141745 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:03.25E  1. (M)
   L/L,Z: 30:07:18.3N   46:26:13.25E  1. (M)
   L/L,Z: 30:07:18.3N   46:26:13.3E   1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 304 hemtt_veh
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.14406  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:02.3E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:12.3E   1. (M)
   L/L,Z: 30:07:18.3N   46:26:12.35E  1. (M)   SPD: 0.   (M/SEC)
END PLATFORM
PLATFORM: 305 hemtt_veh
    L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
  PATH  START TIME: 14.146375 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
  PLAN on_the_road
   L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
   L/L,Z: 30:07:18.3N   46:26:01.4E   1. (M)
```

```
    L/L,Z: 30:07:18.3N   46:26:11.4E   1. (M)
    L/L,Z: 30:07:18.3N   46:26:11.45E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 306 hemtt_veh
      L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
    PATH  START TIME: 14.14869  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:18.3N   46:26:00.44E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:10.44E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:10.49E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 307 hemtt_veh
      L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
    PATH  START TIME: 14.151005 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:18.3N   46:25:59.5E   1. (M)
     L/L,Z: 30:07:18.3N   46:26:09.5E   1. (M)
     L/L,Z: 30:07:18.3N   46:26:09.55E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 308 hemtt_veh
      L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
    PATH  START TIME: 14.15332  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:18.3N   46:25:58.57E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:08.57E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:08.62E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 309 hemtt_veh
      L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
    PATH  START TIME: 14.155635 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:18.3N   46:25:57.63E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:07.63E  1. (M)
     L/L,Z: 30:07:18.3N   46:26:07.68E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  PLATFORM: 310 hmmwv
      L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M) AGL
    PATH  START TIME: 14.15795  (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:49.28N  46:11:34.57E  1. (M)   SPD: 3. (M/SEC)
     L/L,Z: 30:07:18.3N   46:25:56.7E   1. (M)
     L/L,Z: 30:07:18.3N   46:26:06.7E   1. (M)
     L/L,Z: 30:07:18.3N   46:26:06.75E  1. (M)   SPD: 0.   (M/SEC)
  END PLATFORM
  USE-SHARED-ZONE 6 report_zone
  USE-SHARED-ZONE 8 report_zone
  KNOWS a-32 spll OP
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    HAS 6 mlrs_pod
  KNOWS a-45 hemtt OP
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    HAS 2 atacms_pod
END PLAYER

PLAYER: a-32 spll  LEVEL: 5
  PLATFORM: 1 spll_veh
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    ELEMENT: 11 spll_ele  DISCRETE  QUANTITY: 1
     COMM-RCVR 114 vrc-92_rcvr ON FREQ: 42. (MHZ) NET: 6 btry_command
    END ELEMENT
    PATH  START TIME: 14.13943 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
```

```
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)    SPD: 3. (M/SEC)
      L/L,Z: 30:07:19.9N   46:26:04.1E   1. (M)
      L/L,Z: 30:07:19.9N   46:26:14.1E   1. (M)    SPD: 2.53 (M/SEC)
     PLAN wait_for_orders
      L/L,Z: 30:07:19.9N   46:26:14.2E   1. (M)    SPD: 0.0  (M/SEC)
   END PLATFORM
   ZONE 1 firing_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL - 10. (M) AGL
     L/L:  30:08N  46:26:16E   L/L:  30:08N  46:27E
     L/L:  30:07N  46:27E      L/L:  30:07N  46:26:16E
END PLAYER

PLAYER: 1 atacms_missile LEVEL: 6 (FOR DISAGGREGATION ONLY)
  PLATFORM: 1 atacms_msl  L/L,Z: 30:07:23N  46:26:17E  1. (M) AGL
    ELEMENT: 11 atacms_missile_ele DISCRETE QUANTITY: 1
      COMM-RCVR 112 comm_rcvr ON  FREQ: 42. (MHZ) NET: 6 btry_command
      SNR-RCVR  116 atacms_missile_rx OFF
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN post_launch
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER

PLAYER: 1 mlrs_cannister  LEVEL: 6 (FOR DISAGGREGATION ONLY)
  PLATFORM: 1 mlrs_can  L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    ELEMENT: 11 cannister_ele DISCRETE QUANTITY: 1
      COMM-RCVR 112 comm_rcvr ON  FREQ: 42. (MHZ) NET: 6 btry_command
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN offload_mlrs
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER

PLAYER: a-45 hemtt  LEVEL: 5
  PLATFORM: 1 hemtt_veh
      L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    ELEMENT: 11 hemtt_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 114 vrc-92_rcvr  ON  FREQ: 42. (MHZ) NET: 6 btry_command
    END ELEMENT
    PATH  START TIME: 14.155635 (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN on_the_road
     L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M)    SPD: 3. (M/SEC)
     L/L,Z: 30:07:19.9N   46:25:57.5E   1. (M)
     L/L,Z: 30:07:19.9N   46:26:07.5E   1. (M)    SPD: 2.52 (M/SEC)
    PLAN wait_for_orders
     L/L,Z: 30:07:19.9N   46:26:07.6E   1. (M)    SPD: 0.0  (M/SEC)
  END PLATFORM
END PLAYER

PLAYER: 7 atacms_cannister  LEVEL: 6 (FOR DISAGGREGATION ONLY)
  PLATFORM: 1 atacms_can  L/L,Z: 30:13:50.72N  46:11:35.43E  1. (M) AGL
    ELEMENT: 11 cannister_ele DISCRETE QUANTITY: 1
      COMM-RCVR 112 comm_rcvr ON  FREQ: 42. (MHZ) NET: 6 btry_command
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN offload_atacms
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER
END COMMAND CHAIN

COMMAND CHAIN coordination
PLAYER: 7th corps_fse  LEVEL: 1  END PLAYER

PLAYER: 18th_abn corps_fse  LEVEL: 2
```

```
$ Actual location:          L/L,Z: 29:38N  43:30E   . (M)  AGL
  PLATFORM: 1 m577_van      L/L,Z: 29:38N  45:03:59.926E  1. (M) AGL
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:38N          45:03:59.926E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:38:0.097N  45:03:59.926E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 2 m577_van     L/L,Z: 29:38N  45:04:0.074E  1. (M) AGL
    ELEMENT: 21 m577_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 211 vrc-92_rcvr ON FREQ: 65.4 (MHZ) NET: 1 corps_cmd_ops
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:38N          45:04:0.074E   1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:38:0.097N  45:04:0.074E   1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 3 m577_van   L/L,Z: 29:37:59.803N  45:03:59.926E  1. (M) AGL
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:37:59.803N 45:03:59.926E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:37:59.903N 45:03:59.926E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 4 m577_van   L/L,Z: 29:37:59.803N  45:04:0.074E  1. (M) AGL
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:37:59.803N 45:04:0.074E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:37:59.903N 45:04:0.074E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 5 hmmwv       L/L,Z: 29:37:59.9N  45:03:59.778E  1. (M) AGL
    ELEMENT: 51 hmmwv_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 511 human_voice ON  FREQ: 8. (KHZ) NET: 18 voice
      SNR-RCVR  513 clearance_auth  OFF  TURN ON AT TIME: 15.1 (HR)
    END ELEMENT
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:37:59.9N   45:03:59.778E  1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:38N          45:03:59.778E  1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  PLATFORM: 6 hmmwv       L/L,Z: 29:37:59.9N  45:04:0.222E  1. (M) AGL
    PATH  START TIME: 14. (HR)  ALT: AGL  MODE: SURFACE PT-TO-PT
    PLAN face_north
    L/L,Z: 29:37:59.9N   45:04:0.222E   1. (M)
      SPD: 1. (M/SEC)
    L/L,Z: 29:38N          45:04:0.222E   1. (M) SPD: 0. (M/SEC)
  END PLATFORM
  ZONE 1 sead_zone  STATIONARY  MIN/MAX ALT: 0.0 (M) AGL   10. (M) AGL
    L/L:  29:02N    42:25E
    L/L:  31:15N    44:33E
    L/L:  31:04N    47:17E
    L/L:  30:46N    47:20E
    L/L:  30:37N    47:46E
    L/L:  30:16N    47:52E
    L/L:  30:17N    45:42E
    L/L:  28:10N    43:41E
   ZONE 1 report_zone  RELATIVE  MIN/MAX ALT: 0.0 (M) AGL 200. (M) AGL
    X,Y: -3.  3. (KM)   X,Y:  3.  3. (KM)
    X,Y:  3. -3. (KM)   X,Y: -3. -3. (KM)
   KNOWS 1 clearance_request OP
$     L/L,Z: 29:39N  43:30E  1. (M)  AGL
      L/L,Z: 29:39N  45:04E  100. (M)  AGL
    HAS 1 clearance
```

```
END PLAYER

PLAYER: 1 clearance_request  LEVEL: 3
$ PLATFORM: 1 clearance_site  L/L,Z: 29:39N  43:30E  1. (M)  AGL
  PLATFORM: 1 clearance_site  L/L,Z: 29:39N  45:04E  100. (M)  AGL
    ELEMENT: 11 req_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 112 human_voice  ON  FREQ: 8. (KHZ) NET: 18 voice
    END ELEMENT
  END PLATFORM
END PLAYER

PLAYER: 1 clearance(cross_bndy_fire)  LEVEL: 4 (FOR DISAGGREGATION ONLY)
$ PLATFORM: 1 clearance_site  L/L,Z: 29:39N  43:30E  1. (M)  AGL
  PLATFORM: 1 clearance_site  L/L,Z: 29:39N  45:04E  100. (M)  AGL
    ELEMENT: 11 clearance_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 human_voice  ON  FREQ: 8. (KHZ) NET: 18 voice
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN issue_order
$      L/L,Z: 29:39N  43:30E  1. (M)
$      L/L,Z: 29:39N  45:04E  477. (M)
$       SPD: 1. (M/SEC)  TURN-RADIUS: 10. (M)
      CHECKPOINT charlie
$      L/L,Z: 29:40N  43:30E  1. (M)
       L/L,Z: 29:40N  45:04E  477. (M)
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER

PLAYER: 1 launch_request  LEVEL: 2
$ PLATFORM: 1 clearance_site  L/L,Z: 28:30N  45:50E  1. (M)  AGL
  PLATFORM: 1 clearance_site  L/L,Z: 29:02N  45:50E  100. (M)  AGL
    ELEMENT: 11 req_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 112 human_voice  ON  FREQ: 7. (KHZ) NET: 7 voice
    END ELEMENT
  END PLATFORM
END PLAYER

PLAYER: 1 launch_authorization  LEVEL: 3 (FOR DISAGGREGATION ONLY)
$ PLATFORM: 1 clearance_site  L/L,Z: 28:30N  45:50E  1. (M)  AGL
  PLATFORM: 1 clearance_site  L/L,Z: 29:02N  45:50E  100. (M)  AGL
    ELEMENT: 11 clearance_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 human_voice  ON  FREQ: 7. (KHZ) NET: 7 voice
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN issue_order
      CHECKPOINT charlie
$      L/L,Z: 28:30N     45:50E  1. (M)
       L/L,Z: 29:01:50N  45:50E  477. (M)
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER

PLAYER:    1 abccc   LEVEL: 1  END PLAYER
PLAYER: 75th fa_bde  LEVEL: 2  END PLAYER

PLAYER: 1 awacs  LEVEL: 2
  PLATFORM: 1 awacs_a/c  L/L,Z: 29:06:39N 45:45E  35000. (FT) MSL
    ELEMENT: 11 awacs_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 vrc-92_rcvr ON FREQ: 82.1 (MHZ) NET: 1 air_net
    END ELEMENT
   PATH  START TIME: 14.0 (HR)  ALT: MSL  MODE: 3-D WITH-TURNS
    PLAN start_orbit
    L/L,Z: 29:06:39N 45:45E  35000. (FT)
      SPD: 360. (KNOTS)  TURN-RADIUS: 1.65 (NM)
    L/L,Z: 29:06:39N 46E     35000. (FT)
```

```
  END PLATFORM
  USE-SHARED-ZONE 7 report_zone
  ZONE 1 corridor   STATIONARY
  MIN/MAX ALT: 0. (M)  MSL  50000. (FT) MSL
    L/L: 30:08N  46:25E   L/L: 30:25N  47:40E
    L/L: 30:23N  47:41E   L/L: 30:06N  46:26E
  KNOWS 1 clearance_for_air OP
      L/L,Z: 29:06N  46:40E  100. (M)  AGL
    HAS 1 airspace_clearance
END PLAYER

PLAYER: 1 clearance_for_air  LEVEL: 3
  PLATFORM: 1 clearance_site  L/L,Z: 29:06N  46:40E  100. (M)  AGL
    ELEMENT: 11 req_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 112 human_voice  ON  FREQ: 82.1 (MHZ) NET: 1 air_net
    END ELEMENT
  END PLATFORM
END PLAYER

PLAYER: 1 clear_airspace  LEVEL: 4 (FOR DISAGGREGATION ONLY)
  PLATFORM: 1 clearance_site  L/L,Z: 29:06N  46:40E  100. (M)  AGL
    ELEMENT: 11 clear_air_ele  DISCRETE  QUANTITY: 1
      COMM-RCVR 113 human_voice  ON  FREQ: 82.1 (MHZ) NET: 1 air_net
    END ELEMENT
    PLANS-FOR-MOVEMENT
      PLAN issue_order
      CHECKPOINT charlie
       L/L,Z: 29:05:50N  46:40E  500. (M)
    END PLANS-FOR-MOVEMENT
  END PLATFORM
END PLAYER
END COMMAND CHAIN

COMMAND CHAIN features
PLAYER: 1 grid_pos  LEVEL: 1 $ 30:07:25N 46:26:21E?
  PLATFORM: 1 grid_loc L/L,Z: 30:08:30N  46:23E    100. (M)  AGL
  END PLATFORM
END PLAYER

PLAYER: 1 target_alt/2_missiles  LEVEL: 1
$ PLATFORM: 1 alt/num_msl_obj  L/L,Z: 28:30N  45E  3. (KM) AGL
  PLATFORM: 1 alt/num_msl_obj  L/L,Z: 29:02N  45E  3. (KM) AGL
   PATH  START TIME: 16.4 (HR)  ALT: AGL  MODE: 3-D PT-TO-PT
    L/L,Z: 29:02N  45E      3. (KM)   SPD: 100. (KNOTS)
    L/L,Z: 29:02N  45:49E   3. (KM)
  END PLATFORM
END PLAYER
END COMMAND CHAIN
END SIDE
END SCENARIO COMPLETE
END-INSTRUCTIONS SAVE-DATA
```

$>

Chapter 9
ABCCC Relay Aircraft

This player coordinates the SEAD mission with the Corps FSE, 75th FA Brigade, and AWACS. It passes the mission on to the 75th, tells it when launch authorization has been granted, and passes the unit's position back to the 7th Corps FSE. It also requests the AWACS to clear airspace for the shot.
<$

```
PLAYER-STRUCTURE abccc
  TACTIC abccc_tactics
  PLATFORM 1 abccc_a/c
    ELEMENT 11 abccc_ele  DISCRETE  1  SUSCEPTIBILITY abccc_sig
      THINKER     111 abccc_thk          CAPABILITY abccc_thk_data
      MOVER       112 abccc_body         CAPABILITY abccc_body_data
      COMM-RCVR   113 vrc-92_rcvr        CAPABILITY vrc-92_rcvr_data
                                         CAPABILITY bogus_vrc-92_rx_data
      COMM-XMTR   114 vrc-92_xmit        CAPABILITY vrc-92_xmit_data
                                         CAPABILITY bogus_vrc-92_tx_data
      THINKER     115 message_thk        CAPABILITY message_thk_data
      COMM-RCVR   116 vrc-92_rcvr        CAPABILITY vrc-92_rcvr_data
                                         CAPABILITY bogus_vrc-92_rx_data
      COMM-XMTR   117 vrc-92_xmit        CAPABILITY vrc-92_xmit_data
                                         CAPABILITY bogus_vrc-92_tx_data
      COMM-RCVR   118 vrc-92_rcvr        CAPABILITY vrc-92_rcvr_data
                                         CAPABILITY bogus_vrc-92_rx_data
      COMM-XMTR   119 vrc-92_xmit        CAPABILITY vrc-92_xmit_data
                                         CAPABILITY bogus_vrc-92_tx_data
  LINKAGES
    113 WITH 114    116 WITH 117    118 WITH 119
END PLAYER-STRUCTURE
;
```

```
$ These tactics describe how the ABCCC is to coordinate with other units, pass
$ along assignments to an FA Brigade, task the AWACS to clear airspace, and
$ fly its racetrack orbit at 26,000'.

TACTIC abccc_tactics
  EVALUATION-RATES
      ASG-EVAL-RATE 0.02 (1/SEC)
    END EVALUATION-RATES
  ASG-CMD-CHAIN  arcent
  MAX-MSG-ATTEMPTS 20 (NO-UNITS)
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  arcent
      RPT-RATE (1/SEC)            0.005
    END INTELL-REPORT-FREQ
  MSG-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  arcent
      REPORT-RESPONSIBILITY       BOTH
  END MSG-RPT-GUIDE
  ZONE-CHARACTERISTICS
    DIMENSION 1  ZONE-TYPE report_zone
      ZONE-PERMISSION       MSG-RPT-OK
    END ZONE-CHARACTERISTICS
  RESOURCE-ALLOCATION
    LETHAL-ASSIGNMENT-QUEUE-ADD
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_bde
            IFF-STATUS IS-NOT FRIEND
            AND SUB-STATUS IS SUB-OP
            AND BELIEVED-ALIVE
          SUB-TYPE awacs
            TOTAL-TARGETS AT-LEAST 1 (TGTS)
                RE: TGT-TYPE target_alt/2_missiles
        USE FILTER 1 SELECTIONS FOR FILTER 2
          SUB-TYPE fa_bde
            BEEN-ASSIGNED IS YES
          SUB-TYPE awacs
            BEEN-ASSIGNED IS YES
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM fa_bde awacs PICK-AT-MOST 4 NOW
      END LETHAL-ASSIGNMENT-QUEUE-ADD
    LETHAL-ASSIGNMENT-QUEUE-DROP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_bde
            IFF-STATUS IS FRIEND
                  OR
            BEEN-ASSIGNED IS NO
                  OR
            BELIEVED-DEAD
          SUB-TYPE awacs
            BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_bde awacs PICK-AT-MOST 99 NOW
      END LETHAL-ASSIGNMENT-QUEUE-DROP
    LETHAL-ASSIGNMENT-START
      TGT-TYPE sa-2
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_bde
            BEEN-ASSIGNED IS YES
            AND TOTAL-ASGS NO-MORE-THAN 1 (TGTS)
          SUB-TYPE awacs
            BEEN-ASSIGNED IS YES
        USE FILTER 1 SELECTIONS FOR FILTER 2
          SUB-TYPE fa_bde
```

```
            LAST-SENSED > 51. (MIN)
            AND TOTAL-TARGETS NO-MORE-THAN 0 (TGTS)
                RE: TGT-TYPE grid_pos
                     OR
            LAST-SENSED > 80. (MIN)
            AND TOTAL-TARGETS AT-LEAST 1 (TGTS)
                RE: TGT-TYPE grid_pos
          SUB-TYPE awacs
            TOTAL-TARGETS AT-LEAST 1 (TGTS)
                RE: TGT-TYPE spll
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM fa_bde awacs
            PICK-AT-MOST 1 NOW 2 TOTAL
      END LETHAL-ASSIGNMENT-START
    LETHAL-ASSIGNMENT-STOP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_bde
            BEEN-ASSIGNED IS NO
          SUB-TYPE awacs
            BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_bde awacs
          PICK-AT-MOST 2 NOW
    END LETHAL-ASSIGNMENT-STOP
  END RESOURCE-ALLOCATION
  MOVE-PLANS
    PLAN start_orbit
      NOW-USE PATTERN racetrack
    END-PLAN
  END MOVE-PLANS
  PLAN-PATTERNS
    DIMENSION 1 PATTERN-TYPE racetrack
      X (NM)   Y (NM)   Z (FT)   REF   SPD (KNOTS)   TURN-RADIUS (NM) DIR
        0.      10.     26000.   MSL      160.          1.325          RIGHT
        2.65   -10.     26000.   MSL      160.          1.325          RIGHT
  END PLAN-PATTERNS
END TACTIC
$
```

```
$ This represents the RCS of the ABCCC.  It is detectable by the AWACS so that the
$ AWACS can determine if the airspace is clear.

SUSCEPTIBILITY abccc_sig
  RCS-TABLE
    DIMENSION 1 AZ (DEG)  0.      180.
      DIMENSION 2 EL (DEG) -90.  90.
        RCS (M2)              100.
  END RCS-TABLE
  SNR-ELE-INTERACTIONS
    awacs_rx
  END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
$
```

```
$ These next two capabilities represent ABCCC personnel.  They allow the ABCCC
$ to recognize communications traffic, form and delete perceptions, pass orders
$ on to the FA Brigade, and task the AWACS.  The "message_thk_data" is used
$ to unburden the other personnel when the communcations traffic gets heavy.

CAPABILITY abccc_thk_data
  TIME-BEFORE-DROP          2. (HR)
  TIME-TO-THINK
    CONSIDER-MOVE         2.45 (SEC)
    ASSIMILATE-INTELL     3.15 (SEC)
    CONSIDER-ASG/CANCEL   30.  (SEC)
    EVAL-ASSIGN-THREAT    40.  (SEC)
    RECOG-MSG             1.18 (SEC)
    RECOG-PHYS-EVENT      1.13 (SEC)
    REVIEW-INFORMATION    5.08 (SEC)
  END TIME-TO-THINK
END CAPABILITY

CAPABILITY message_thk_data
  TIME-BEFORE-DROP          2. (HR)
  TIME-TO-THINK
    ASSIMILATE-INTELL     3.15 (SEC)
    RECOG-MSG             1.18 (SEC)
    RECOG-PHYS-EVENT      1.13 (SEC)
    REVIEW-INFORMATION    5.08 (SEC)
  END TIME-TO-THINK
END CAPABILITY


$ This capability describes the performance of the ABCCC airframe.

CAPABILITY  abccc_body_data
  MAX-ACCELERATION                20. (M/SEC/SEC)
  MIN-TURN-RADIUS                  1. (KM)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  20000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE  40.0 (M/SEC)      MAX-CLIMB-RATE  80.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  100.0 (M/SEC)      MAX-SPD  670.0 (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY

$
```

$>

Chapter 10
fa_bde Field Artillery Brigade Commander

This player represents the commander of a Field Artillery Brigade. It receives the ATACMS SEAD mission from the ABCCC, and passes it on to one of its batteries. It also reports its position back to the ABCCC, and lets the ABCCC know when the ATACMS shots occur. The Brigade also passes the launch authorization to the A/6-27 battery. The Brigade has two HMMWVs.
<$

```
PLAYER-STRUCTURE fa_bde
  TACTIC fa_bde_tactics
  PLATFORM 1 hmmwv  RESET-AFTER-STOPPING
    ELEMENT 11 hmmwv_fie DISCRETE 1
      THINKER     111 bde_cdr          CAPABILITY bde_cdr_data
      MOVER       112 hmmwv_chassis    CAPABILITY hmmwv_chassis_data
      COMM-RCVR   113 vrc-92_rcvr      CAPABILITY vrc-92_rcvr_data
                                       CAPABILITY true_vrc-92_rx_data
                                       CAPABILITY 3m_whip_antenna
      COMM-XMTR   114 vrc-92_xmit      CAPABILITY vrc-92_xmit_data
                                       CAPABILITY true_vrc-92_tx_data
                                       CAPABILITY 3m_whip_antenna
      SNR-RCVR    115 human_eyes       CAPABILITY human_eyes_data
      COMM-RCVR   116 vrc-92_rcvr      CAPABILITY vrc-92_rcvr_data
                                       CAPABILITY true_vrc-92_rx_data
                                       CAPABILITY 3m_whip_antenna
      COMM-XMTR   117 vrc-92_xmit      CAPABILITY vrc-92_xmit_data
                                       CAPABILITY true_vrc-92_tx_data
                                       CAPABILITY 3m_whip_antenna
    PLATFORM 2 hmmwv  RESET-AFTER-STOPPING
      ELEMENT 21 hmmwv_fie DISCRETE 1
        MOVER     212 hmmwv_chassis    CAPABILITY hmmwv_chassis_data
    LINKAGES
      114 WITH 113     115 WITH 115     116 WITH 117
END PLAYER-STRUCTURE
$
```

```
$ These tactics allow the FA Brigae to pass information along to the ABCCC and
$ FA Battery, move down the road, and assign the SEAD mission to one of its
$ batteries.

TACTIC fa_bde_tactics
  MAX-MSG-ATTEMPTS 20 (NO-UNITS)
  EVALUATION-RATES
    ASG-EVAL-RATE 0.015 (1/SEC)
  END EVALUATION-RATES
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  coordination  arcent
      RPT-RATE (1/SEC)              0.0667      0.001
    END INTELL-REPORT-FREQ
  MSG-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  coordination  arcent
      REPORT-RESPONSIBILITY       CMDR          SUB
  END MSG-RPT-GUIDE
  SNR-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  coordination
      DIMENSION 2 SNR-TYPE        human_eyes
        REPORT-RESPONSIBILITY        CMDR
    END SNR-RPT-GUIDE
  ZONE-CHARACTERISTICS
    DIMENSION 1  ZONE-TYPE report_zone
      ZONE-PERMISSION       SNR-RPT-OK    MSG-RPT-OK
    END ZONE-CHARACTERISTICS
  ASG-CMD-CHAIN arcent
  MOVE-PLANS
    PLAN on_the_road
      END-PLAN
    END MOVE-PLANS
  RESOURCE-ALLOCATION
    LETHAL-ASSIGNMENT-QUEUE-ADD
      TGT-TYPE ALL-OTHERS
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_btry
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
        USE FILTER 1 SELECTIONS FOR FILTER 2
          SUB-TYPE fa_btry
            BEEN-ASSIGNED IS YES
                 OR
            ENG-CONTROL-MODE IS fa_bde
        FROM FILTER 2 SELECTIONS
          CHOOSE-FROM fa_btry PICK-AT-MOST 1 NOW 5 TOTAL
      END LETHAL-ASSIGNMENT-QUEUE-ADD
    LETHAL-ASSIGNMENT-QUEUE-DROP
      TGT-TYPE ALL-OTHERS
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_btry
            IFF-STATUS IS FRIEND
                 OR
            BEEN-ASSIGNED IS NO
            AND ENG-CONTROL-MODE IS-NOT fa_bde
                 OR
            BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_btry PICK-AT-MOST 1 NOW
      END LETHAL-ASSIGNMENT-QUEUE-DROP
    LETHAL-ASSIGNMENT-START
      TGT-TYPE ALL-OTHERS
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_btry
            BELIEVED-ALIVE
            AND 3D-POSITION WITHIN setup_area
```

```
            RE: PLATFORM/PT RESOURCE-LOC
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_btry PICK-AT-MOST 1 NOW 1 TOTAL
      END LETHAL-ASSIGNMENT-START
    LETHAL-ASSIGNMENT-STOP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE fa_btry
            SUB-STATUS IS-NOT SUB-OP
            OR BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM fa_btry PICK-AT-MOST 1 NOW
      END LETHAL-ASSIGNMENT-STOP
    END RESOURCE-ALLOCATION
  END TACTIC
$
```

```
$ This represents the Brigade commander, and allows him to recognize
$ communications traffic, observe his surroundings, think about maneuvering,
$ and make assignments.

CAPABILITY bde_cdr_data
  TIME-BEFORE-DROP 2. (HR)
  TIME-TO-THINK
      RECOG-MSG              5. (SEC)
      RECOG-SNR-EVENT        1. (SEC)
      RECOG-PHYS-EVENT       1. (SEC)
      ASSIMILATE-INTELL      3. (SEC)
      CONSIDER-ASG/CANCEL 15. (SEC)
      EVAL-ASSIGN-THREAT  15. (SEC)
      CONSIDER-MOVE          5. (SEC)
      REVIEW-INFORMATION     5. (SEC)
    END TIME-TO-THINK
  END CAPABILITY


$ This describes the movement capability of the HMMWV.

CAPABILITY hmmwv_chassis_data
  MAX-ACCELERATION                2. (M/SEC/SEC)
  MIN-TURN-RADIUS                10. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  5000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE  10.0 (M/SEC)      MAX-CLIMB-RATE   5.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD    0.0 (M/SEC)      MAX-SPD   30.0 (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY
$
```

```
$ This defines a sensor system which represents the human eye.  It allows a
$ simulated player to sense its surroundings.

CAPABILITY human_eyes_data
  HITS-TO-ESTABLISH-TRACK       1 (NO-UNITS)
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD      3.0 (DB)
    RECEIVER-NOISE      -160.0 (DB)
  END DETECTION-SENSITIVITIES
  SENSING-MODE-RATES
    SEARCH-SENSING-RATE  0.005 (1/SEC)
  END SENSING-MODE-RATES
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  SEARCH  OPTICAL
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT       TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.0  4.E3
      MIN-ALT (M) MAX-ALT (M)
        -10.0E3      10.E3
  END RNG-ALT-CAPABILITY
  SNR-RCVR-FREQS
    SEARCH       1.E14 (GHZ)
  END SNR-RCVR-FREQS
  VERTICAL-OFFSET            20. (M)
END CAPABILITY

$
```

$>

Chapter 11
fa_btry Field Artillery Company

This player represents a Field Artillery Company. Each vehicle of the battery is included here, except for the A-32 SPLL and A-45 HEMTT. The company commander receives the ATACMS SEAD mission from its commander, and orders its SPLL and HEMTT to execute the fire mission. The battery passes the launch authorization to the SPLL, and also reports back to the FA Brigade once the shots have been fired. It also tasks the A-32 SPLL and A-45 HEMTT to unload their MLRS pods and ATACMS cannisters, respectively.

<$

```
PLAYER-STRUCTURE fa_btry
  TACTIC fa_btry_tactics
  PLATFORM 100 hmmwv  REMAIN-AFTER-STOPPING
    ELEMENT 100 hmmwv_ele  DISCRETE 1
      MOVER       100 hmmwv_chassis     CAPABILITY hmmwv_chassis_data
      THINKER     115 btry_s-3          CAPABILITY btry_s-3_data
      SNR-RCVR    116 human_eyes        CAPABILITY s-3_eyes_data
      COMM-RCVR   117 vrc-46_rcvr       CAPABILITY vrc-46_rcvr_data
      COMM-XMTR   118 vrc-46_xmit       CAPABILITY vrc-46_xmit_data
  PLATFORM 101 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 101 spll_ele  DISCRETE 1
      MOVER       101 spll_chassis      CAPABILITY m2_chassis_data
  PLATFORM 103 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 103 spll_ele  DISCRETE 1
      MOVER       103 spll_chassis      CAPABILITY m2_chassis_data
  PLATFORM 104 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 104 hemtt_ele  DISCRETE 1
      MOVER       104 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 105 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 105 hemtt_ele  DISCRETE 1
      MOVER       105 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 106 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 106 hemtt_ele  DISCRETE 1
      MOVER       106 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 107 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 107 hemtt_ele  DISCRETE 1
      MOVER       107 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 108 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 108 hemtt_ele  DISCRETE 1
      MOVER       108 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 110 hmmwv  REMAIN-AFTER-STOPPING
    ELEMENT 110 hmmwv_ele  DISCRETE 1
      MOVER       110 hmmwv_chassis     CAPABILITY hmmwv_chassis_data
  PLATFORM 200 hmmwv  REMAIN-AFTER-STOPPING
    ELEMENT 200 hmmwv_ele  DISCRETE 1
      THINKER    2111 btry_cdr          CAPABILITY btry_cdr_data
      MOVER      2112 hmmwv_chassis     CAPABILITY hmmwv_chassis_data
      COMM-RCVR  2114 vrc-46_rcvr       CAPABILITY vrc-46_rcvr_data
      COMM-XMTR  2115 vrc-46_xmit       CAPABILITY vrc-46_xmit_data
  PLATFORM 201 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 201 spll_ele  DISCRETE 1
      MOVER       201 spll_chassis      CAPABILITY m2_chassis_data
  PLATFORM 202 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 202 spll_ele  DISCRETE 1
      MOVER       202 spll_chassis      CAPABILITY m2_chassis_data
  PLATFORM 203 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 203 spll_ele  DISCRETE 1
      MOVER ,     203 spll_chassis      CAPABILITY m2_chassis_data
  PLATFORM 204 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 204 hemtt_ele  DISCRETE 1
      MOVER       204 hemtt_chassis     CAPABILITY hemtt_chassis_data
  PLATFORM 205 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 205 hemtt_ele  DISCRETE 1
```

```
    MOVER       205 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 206 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 206 hemtt_ele  DISCRETE 1
     MOVER       206 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 207 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 207 hemtt_ele  DISCRETE 1
     MOVER       207 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 208 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 208 hemtt_ele  DISCRETE 1
     MOVER       208 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 209 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 209 hemtt_ele  DISCRETE 1
     MOVER       209 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 210 hmmwv  REMAIN-AFTER-STOPPING
   ELEMENT 210 hmmwv_ele  DISCRETE 1
     MOVER       210 hmmwv_chassis      CAPABILITY hmmwv_chassis_data
 PLATFORM 300 hmmwv  REMAIN-AFTER-STOPPING
   ELEMENT 300 hmmwv_ele  DISCRETE 1
     MOVER       300 hmmwv_chassis      CAPABILITY hmmwv_chassis_data
 PLATFORM 301 spll_veh  REMAIN-AFTER-STOPPING
   ELEMENT 301 spll_ele  DISCRETE 1
     MOVER       301 spll_chassis       CAPABILITY m2_chassis_data
 PLATFORM 302 spll_veh  REMAIN-AFTER-STOPPING
   ELEMENT 302 spll_ele  DISCRETE 1
     MOVER       302 spll_chassis       CAPABILITY m2_chassis_data
 PLATFORM 303 spll_veh  REMAIN-AFTER-STOPPING
   ELEMENT 303 spll_ele  DISCRETE 1
     MOVER       303 spll_chassis       CAPABILITY m2_chassis_data
 PLATFORM 304 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 304 hemtt_ele  DISCRETE 1
     MOVER       304 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 305 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 305 hemtt_ele  DISCRETE 1
     MOVER       305 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 306 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 306 hemtt_ele  DISCRETE 1
     MOVER       306 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 307 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 307 hemtt_ele  DISCRETE 1
     MOVER       307 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 308 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 308 hemtt_ele  DISCRETE 1
     MOVER       308 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 309 hemtt_veh  REMAIN-AFTER-STOPPING
   ELEMENT 309 hemtt_ele  DISCRETE 1
     MOVER       309 hemtt_chassis      CAPABILITY hemtt_chassis_data
 PLATFORM 310 hmmwv  REMAIN-AFTER-STOPPING
   ELEMENT 310 hmmwv_ele  DISCRETE 1
     MOVER       310 hmmwv_chassis      CAPABILITY hmmwv_chassis_data
 LINKAGES
    2114 WITH 2115    115 WITH 116    117 WITH 118
END PLAYER-STRUCTURE
$
```

```
$ These tactics allow an FA Battery to coordinate with associated units, move
$ down the road, task the SPLL with unloading its MLRS and executing an ATACMS
$ mission, and have the HEMTT download ATACMS for the SPLL.

TACTIC fa_btry_tactics
  MAX-MSG-ATTEMPTS 2 (NO-UNITS)
  EVALUATION-RATES
    ASG-EVAL-RATE    0.015 (1/SEC)
    LAUNCH-EVAL-RATE 0.023 (1/SEC)
  END EVALUATION-RATES
  INTELL-REPORT-FREQ
    DIMENSION 1 CMD-CHAIN-TYPES  arcent
      RPT-RATE (1/SEC)           0.003
    END INTELL-REPORT-FREQ
  LAUNCH-CMD-CHAIN arcent  END LAUNCH-CMD-CHAIN
  MSG-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES  arcent
      REPORT-RESPONSIBILITY      SUB
  END MSG-RPT-GUIDE
  SNR-RPT-GUIDE
    DIMENSION 1 CMD-CHAIN-TYPES     arcent
      DIMENSION 2 SNR-TYPE         human_eyes
        REPORT-RESPONSIBILITY        CMDR
    END SNR-RPT-GUIDE
  ZONE-CHARACTERISTICS
    DIMENSION 1  ZONE-TYPE report_zone
      ZONE-PERMISSION      SNR-RPT-OK    MSG-RPT-OK
    END ZONE-CHARACTERISTICS
  ASG-CMD-CHAIN arcent
  MOVE-PLANS
      PLAN on_the_road
    END-PLAN
  END MOVE-PLANS
  RESOURCE-ALLOCATION
    LETHAL-ASSIGNMENT-QUEUE-ADD
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE spll
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
          SUB-TYPE hemtt
            IFF-STATUS IS-NOT FRIEND
            AND BELIEVED-ALIVE
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM spll hemtt PICK-AT-MOST 99 NOW
      END LETHAL-ASSIGNMENT-QUEUE-ADD
    LETHAL-ASSIGNMENT-QUEUE-DROP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE spll
            IFF-STATUS IS FRIEND
                  OR
            BELIEVED-DEAD
          SUB-TYPE hemtt
            IFF-STATUS IS FRIEND
                  OR
            BELIEVED-DEAD
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM hemtt spll PICK-AT-MOST 1 NOW
      END LETHAL-ASSIGNMENT-QUEUE-DROP
    LETHAL-ASSIGNMENT-START
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          SUB-TYPE spll
            BEEN-ASSIGNED IS YES
```

```
        SUB-TYPE hemtt
          BEEN-ASSIGNED IS YES
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM spll hemtt PICK-AT-MOST 2 NOW 2 TOTAL
    END LETHAL-ASSIGNMENT-START
  LETHAL-ASSIGNMENT-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        SUB-TYPE spll
          BELIEVED-DEAD
          OR BEEN-ASSIGNED IS NO
        SUB-TYPE hemtt
          BELIEVED-DEAD
          OR BEEN-ASSIGNED IS NO
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM spll hemtt PICK-AT-MOST 1 NOW
    END LETHAL-ASSIGNMENT-STOP
  LAUNCH-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        SUB-TYPE hemtt
          VEHICLES-LEFT AT-LEAST 1 (VEHICLES)
            RE: RESOURCE atacms_pod
          AND LAST-SENSED > 103. (MIN)
          AND BEEN-ASSIGNED IS YES
      USE INPUT FOR FILTER 2
        SUB-TYPE spll
          VEHICLES-LEFT AT-LEAST 1 (VEHICLES)
            RE: RESOURCE mlrs_pod
          AND LAST-SENSED > 97.5 (MIN)
          AND BEEN-ASSIGNED IS YES
      FROM FILTER 2 SELECTIONS
        CHOOSE-FROM spll  WITH-PLAN offload_mlrs
                          WITH-VEHICLE mlrs_pod
          PICK-AT-MOST 1 NOW
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM hemtt WITH-PLAN offload_atacms
                          WITH-VEHICLE atacms_pod
          PICK-AT-MOST 1 NOW
    END LAUNCH-START
  END RESOURCE-ALLOCATION
END TACTIC
$
```

```
$ These capabilities model the cognitive processes of the Battery commander and
$ his S-3.  These processes include noticing communications and the ATACMS shot,
$ perceiving this data, tasking subordinate units, and issuing download orders.

CAPABILITY btry_cdr_data
  TIME-BEFORE-DROP 2. (HR)
  TIME-TO-THINK
      RECOG-MSG              5. (SEC)
      RECOG-PHYS-EVENT       1. (SEC)
      ASSIMILATE-INTELL      2. (SEC)
      CONSIDER-ASG/CANCEL    1. (MIN)
      EVAL-ASSIGN-THREAT     1. (MIN)
      CONSIDER-MOVE          5. (SEC)
      REVIEW-INFORMATION     5. (SEC)
    END TIME-TO-THINK
  END CAPABILITY

CAPABILITY btry_s-3_data
  TIME-BEFORE-DROP 2. (HR)
  TIME-TO-THINK
      RECOG-MSG              5. (SEC)
      RECOG-SNR-EVENT        1. (SEC)
      RECOG-PHYS-EVENT       1. (SEC)
      ASSIMILATE-INTELL      2. (SEC)
      CONSIDER-LAUNCH        5. (SEC)
      REVIEW-INFORMATION     5. (SEC)
    END TIME-TO-THINK
  END CAPABILITY


$ This represents the visual capability of the S-3 to see and report on the SPLL
$ firing position, as well as the ATACMS as they go down range.

CAPABILITY s-3_eyes_data
  HITS-TO-ESTABLISH-TRACK       1 (NO-UNITS)
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD      3.0 (DB)
    RECEIVER-NOISE      -160.0 (DB)
  END DETECTION-SENSITIVITIES
  SENSING-MODE-RATES
    SEARCH-SENSING-RATE  0.3 (1/SEC)
  END SENSING-MODE-RATES
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  SEARCH  OPTICAL
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.  17.E3
      MIN-ALT (M) MAX-ALT (M)
        -10.0E3     10.E3
  END RNG-ALT-CAPABILITY
  SNR-RCVR-FREQS
    SEARCH      1.E14 (GHZ)
  END SNR-RCVR-FREQS
  VERTICAL-OFFSET           20. (M)
END CAPABILITY
$
```

```
$ This describes the performance of the VRC-46 radio, which is calibrated to
$ 8 KM max range at 73 MHz.

CAPABILITY vrc-46_rcvr_data
  EFFECTIVE-EARTH-RADIUS  8495. (KM)
  VERTICAL-OFFSET            3.05 (M)
  RCVR-BANDWIDTH            10. (KHZ)
  RCVR-NOISE           2.63E-8 (WATTS)
  RECOGNITION-THRESH         3. (DB)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.        180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)              3.
    END ANTENNA-PATTERN
  END CAPABILITY

CAPABILITY vrc-46_xmit_data
  VERTICAL-OFFSET            3.05 (M)
  XMTR-BANDWIDTH            10. (KHZ)
  XMTR-POWER                 8. (WATTS)
  ANTENNA-PATTERN
    DIMENSION 1 AZ (DEG) 0.        180.
      DIMENSION 2 EL (DEG) -90.  90.
        GAIN (DB)              3.
    END ANTENNA-PATTERN
  END CAPABILITY

$
```

$>

Chapter 12
spll Self-Propelled Launcher Loader

This player represents a SPLL, which is armed with MLRS rockets. It offloads chem once the SEAD mission has been received, loads up with ATACMS, moves to the firing point, articulates its launcher on the target, fires the mission, and returns to the reload point.
<$

```
PLAYER-STRUCTURE spll
  TACTIC spll_tactics
  PLATFORM 1 spll_veh  REMAIN-AFTER-STOPPING
    ELEMENT 11 spll_ele  DISCRETE 1  SUSCEPTIBILITY spll_sig
      THINKER     111 launch_nco      CAPABILITY launch_nco_data
      MOVER       112 spll_chassis    CAPABILITY m2_chassis_data
      WEAPON      113 spll_lchr     CAPABILITY spll_lchr_data
        FUTURE-PLAYER mlrs_pod  DISCRETE  6 (COPIES)
      COMM-RCVR   114 vrc-92_rcvr     CAPABILITY vrc-92_rcvr_data
                                      CAPABILITY true_vrc-92_rx_data
                                      CAPABILITY 3m_whip_antenna
      COMM-XMTR   115 vrc-92_xmit     CAPABILITY vrc-92_xmit_data
                                      CAPABILITY true_vrc-92_tx_data
                                      CAPABILITY 3m_whip_antenna
      WEAPON      116 spll_lchr       CAPABILITY spll_lchr_data
        FUTURE-PLAYER atacms_msl  DISCRETE  2 (COPIES)
      SNR-RCVR    117 nco_eyes        CAPABILITY human_eyes_data
  LINKAGES
    114 WITH 115     111 WITH 117
END PLAYER-STRUCTURE
$
```

```
$ These tactics allow the SPLL to maneuver and fire its ATACMS missiles.  It
$ also offloads its MLRS rocket pods.

TACTIC spll_tactics
  MAX-MSG-ATTEMPTS 2 (NO-UNITS)
  EVALUATION-RATES
    ENG-EVAL-RATE 0.015 (1/SEC)
  END EVALUATION-RATES
  ASG-CMD-CHAIN arcent
  LAUNCH-CMD-CHAIN arcent  END LAUNCH-CMD-CHAIN
  ATK-PRIORITIES
    DIMENSION 1 LIST-NAME sead_targets
      TGT-ELEMENTS        sa-2_radar_van
    END ATK-PRIORITIES
  MOVE-PLANS
    PLAN on_the_road
      END-PLAN
    PLAN wait_for_orders
      WHEN SNR-STATUS IS DETECT
        NOW-USE PATTERN move_to_reload
        AND EXECUTE PLAN get_loaded
      OTHERWISE
        FOCUS-ON PRIORITY sead_targets
      END-PLAN
    PLAN get_loaded
      WHEN SNR-STATUS IS LOSE-DETECT
        EXECUTE PLAN await_reload
      OTHERWISE
        FOCUS-ON PRIORITY sead_targets
      END-PLAN
    PLAN await_reload
      WHEN SNR-STATUS IS DETECT
        NOW-USE PATTERN move_to_shoot
        AND EXECUTE PLAN execute_fires
      OTHERWISE
        FOCUS-ON PRIORITY sead_targets
      END-PLAN
    PLAN execute_fires
      WHEN SNR-STATUS IS LOSE-DETECT
        NOW-USE PATTERN return_to_reload
        AND EXECUTE PLAN remove_atacms
      OTHERWISE
        FOCUS-ON PRIORITY sead_targets
      END-PLAN
    PLAN remove_atacms
      END-PLAN
    END MOVE-PLANS
  PLAN-PATTERNS
    DIMENSION 1 PATTERN-TYPE
        move_to_reload  move_to_shoot  return_to_reload
      X (M)   Y (M)   Z (M)   REF   SPD (M/SEC)   TURN-RADIUS (M) DIR
        0.      10.      1.   AGL      3.             1.          RIGHT
        0.      45.      1.   AGL      2.             1.          RIGHT
        1.      47.      1.   AGL      1.             1.          RIGHT
        3.      49.      1.   AGL      0.001          1.          RIGHT
        5.      50.      1.   AGL      0.             1.          STOP
      X (M)   Y (M)   Z (M)   REF   SPD (M/SEC)   TURN-RADIUS (M) DIR
        5.       0.      1.   AGL      1.             1.         SHORTER
       70.       0.      1.   AGL      2.             1.         SHORTER
       73.8      1.      1.   AGL      0.001          1.         SHORTER
       77.6      2.      1.   AGL      0.             1.          STOP
      X (M)   Y (M)   Z (M)   REF   SPD (M/SEC)   TURN-RADIUS (M) DIR
        2.       3.      1.   AGL      1.             1.          LEFT
       -1.       5.      1.   AGL      3.             1.          LEFT
      -70.       0.      1.   AGL      2.             1.          LEFT
```

```
    -75.      0.     1.  AGL     0.            1.          STOP
END PLAN-PATTERNS
RESOURCE-ALLOCATION
  LETHAL-ENGAGE-QUEUE-ADD
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          IFF-STATUS IS-NOT FRIEND
          AND BELIEVED-ALIVE
          AND BEEN-ASSIGNED IS YES
      USE FILTER 1 SELECTIONS FOR FILTER 2
        WPN-TYPE spll_lchr
          AVAILABLE-RESOURCE AT-LEAST 1 (ROUNDS)
              RE: ORDNANCE mlrs_pod
      USE FILTER 1 SELECTIONS FOR FILTER 3
        WPN-TYPE spll_lchr
          AVAILABLE-RESOURCE AT-LEAST 1 (ROUNDS)
              RE: ORDNANCE atacms_msl
      FROM FILTER 2 SELECTIONS
        CHOOSE-FROM spll_lchr PICK-AT-MOST 1 NOW 1 TOTAL
      FROM FILTER 3 SELECTIONS
        CHOOSE-FROM spll_lchr PICK-AT-MOST 1 NOW 1 TOTAL
    END LETHAL-ENGAGE-QUEUE-ADD
  LETHAL-ENGAGE-QUEUE-DROP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          IFF-STATUS IS FRIEND
                OR
          BEEN-ASSIGNED IS NO
                OR
          BELIEVED-DEAD
                OR
          AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
              RE: ORDNANCE mlrs_pod
          AND AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
              RE: ORDNANCE atacms_msl
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM spll_lchr PICK-AT-MOST 1 NOW
    END LETHAL-ENGAGE-QUEUE-DROP
  LETHAL-ENGAGE-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          TOTAL-ENG'S NO-MORE-THAN 1 (TGTS)
          AND WPN-STATUS IS-NOT WPN-NON/OP
      USE FILTER 1 SELECTIONS FOR FILTER 2
        WPN-TYPE spll_lchr
          2D-DIST < 150. (KM)
          AND AVAILABLE-RESOURCE AT-LEAST 1 (ROUNDS)
              RE: ORDNANCE atacms_msl
          AND 3D-POSITION WITHIN firing_zone
              RE: PLATFORM/PT RESOURCE-LOC
          AND 2D-CLOSING-SPD < .1 (M/SEC)
      USE FILTER 1 SELECTIONS FOR FILTER 3
        WPN-TYPE spll_lchr
          AVAILABLE-RESOURCE AT-LEAST 6 (ROUNDS)
              RE: ORDNANCE mlrs_pod
      FROM FILTER 3 SELECTIONS
        CHOOSE-FROM spll_lchr
          PICK-AT-MOST 1 NOW 1 TOTAL
      FROM FILTER 2 SELECTIONS
        CHOOSE-FROM spll_lchr POINTING-AT INTERCEPT
          PICK-AT-MOST 1 NOW 1 TOTAL
    END LETHAL-ENGAGE-START
  LETHAL-ENGAGE-STOP
```

```
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          IFF-STATUS IS FRIEND
                OR
          BEEN-ASSIGNED IS NO
                OR
          WPN-STATUS IS WPN-NON/OP
                OR
          BELIEVED-DEAD
                OR
          ROUNDS-FIRED-SO-FAR AT-LEAST 2 (ROUNDS)
                OR
          AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
              RE: ORDNANCE mlrs_pod
          AND AVAILABLE-RESOURCE NO-MORE-THAN 0 (ROUNDS)
              RE: ORDNANCE atacms_msl
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM spll_lchr PICK-AT-MOST 1 NOW
    END LETHAL-ENGAGE-STOP
  LETHAL-ENGAGE-FIRING-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          2D-DIST < 150. (KM)
          AND FIRING-NOW IS NO
          AND ROUNDS-FIRED-SO-FAR NO-MORE-THAN 2 (ROUNDS)
      USE FILTER 1 SELECTIONS FOR FILTER 2
        WPN-TYPE spll_lchr
          AVAILABLE-RESOURCE AT-LEAST 2 (ROUNDS)
              RE: ORDNANCE atacms_msl
          AND TOTAL-TARGETS AT-LEAST 1 (TGTS)
              RE: TGT-TYPE launch_authorization
          AND WEAPON IS POINTING
      USE FILTER 1 SELECTIONS FOR FILTER 3
        WPN-TYPE spll_lchr
          AVAILABLE-RESOURCE AT-LEAST 6 (ROUNDS)
              RE: ORDNANCE mlrs_pod
          AND 2D-DIST < 35. (KM)
      FROM FILTER 2 SELECTIONS
        CHOOSE-FROM spll_lchr
          WITH-ORDNANCE atacms_msl ROUNDS: 2
          WITH-ELEMENT ANYONE
            WITH-PLAN post_launch
        PICK-AT-MOST 1 NOW 1 TOTAL
      FROM FILTER 3 SELECTIONS
        CHOOSE-FROM spll_lchr
          WITH-ORDNANCE mlrs_pod ROUNDS: 1
          WITH-ELEMENT ANYONE
            WITH-PLAN post_launch
        PICK-AT-MOST 1 NOW 2 TOTAL
    END LETHAL-ENGAGE-FIRING-START
  LETHAL-ENGAGE-FIRING-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE spll_lchr
          BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM spll_lchr PICK-AT-MOST 1 NOW
    END LETHAL-ENGAGE-FIRING-STOP
  END RESOURCE-ALLOCATION
END TACTIC
$
```

```
$ This represents the optical signature of the SPLL vehicle.  It can been seen
$ by the human eye.

SUSCEPTIBILITY spll_sig
  OPT-CS
    DIMENSION 1 AZ (DEG)  0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        OCS (M2)              10.
    END OPT-CS
  SNR-ELE-INTERACTIONS
      human_eyes
    END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY


$ The Functional Specification stated that the SPLL chassis is an M-2 derivative.
$ The movement capability of an M-2 is given here.

CAPABILITY m2_chassis_data
  MAX-ACCELERATION                  5. (M/SEC/SEC)
  MIN-TURN-RADIUS                   1. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  1000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE    1.0 (M/SEC)      MAX-CLIMB-RATE  1.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  0. (M/SEC)      MAX-SPD  16.67 (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY


$ This represents the NCO that actually fired the ATACMS.  The NCO is capable
$ of noticing communications messages as well as visual detections, perceiving
$ this information, driving the vehicle, and executing the mission.

CAPABILITY launch_nco_data
  TIME-BEFORE-DROP 2. (HR)
  TIME-TO-THINK
      RECOG-MSG             5. (SEC)
      RECOG-SNR-EVENT       5. (SEC)
      RECOG-PHYS-EVENT      1. (SEC)
      ASSIMILATE-INTELL     2. (SEC)
      EVAL-ENGAGE-THREAT    4. (SEC)
      EVAL-LETHAL-ENGAGE    8. (SEC)
      EVAL-FIRING           3. (SEC)
      CONSIDER-MOVE         5. (SEC)
      REVIEW-INFORMATION    5. (SEC)
    END TIME-TO-THINK
  END CAPABILITY
$
```

```
$ This data describes the capability of the SPLL launcher, such as the type of
$ player that it creates (an ATACMS missile) as well as its articulation
$ capability.

CAPABILITY spll_lchr_data
  NUM-SIMULTANEOUS-ROUND 1 (NO-UNITS)
  RESOURCE-DISAGGREGATION
    DIMENSION 1 RESOURCE-TYPE atacms_msl      mlrs_pod
      CREATED-PLAYER        atacms_missile mlrs_cannister
    END RESOURCE-DISAGGREGATION
  WPN-CHARACTERISTICS
      3D-FLYOUT  LAUNCH-ENVELOPE-P(K)  IMPLICIT-FLYOUT
      UNCONTROLLED  NO-SELF-DESTRUCT
    END WPN-CHARACTERISTICS
  WPN-PK
    DIMENSION 1 ELEMENT-TYPES DEFAULT
      PK (NO-UNITS) 0.
    END WPN-PK
  WPN-SPD-CAPABILITY
    DIMENSION 1  TIME (SEC) 0.  150.
      AVG-SPD (M/SEC)         912.
    END WPN-SPD-CAPABILITY
  WPN-TIME-DELAYS
      SHOOT-TIME-DELAY  0.5 (SEC)     SALVO-FIRING-DELAY  13. (SEC)
    END WPN-TIME-DELAYS
  TURRET-ANGULAR-LIMITS
     AZ-CCW-LIMIT     90. (DEG)
     AZ-CW-LIMIT      90. (DEG)
     AZ-SLEW-RATE     20. (DEG/SEC)
     EL-UP-LIMIT      60. (DEG)
     EL-DOWN-LIMIT     0. (DEG)
     EL-SLEW-RATE     10. (DEG/SEC)
     LEAD-ANGLE-LIMIT  0. (DEG)
     SUPER-EL-LIMIT   40. (DEG)
    END TURRET-ANGULAR-LIMITS
  END CAPABILITY

$
```

```
$>                                  Chapter 13
                                 atacms Missile

This player represents a missile that is disaggregated and flown out explicitly
after being launched by the spll.  Also included in this chapter are the
ordnance cannisters which are downloaded and uploaded during resupply.
<$

PLAYER-STRUCTURE atacms_missile
  TACTIC atacms_missile_tactics
  PLATFORM 1 atacms_msl  DISAPPEAR-AFTER-STOPPING
    ELEMENT 11 atacms_missile_ele  DISCRETE 1  SUSCEPTIBILITY atacms_sig
      THINKER     111 atacms_missile_thk
        CAPABILITY atacms_missile_thk_data
      SNR-RCVR    116 atacms_missile_rx
        CAPABILITY atacms_missile_rx_data
      SNR-XMTR    117 atacms_missile_tx
        CAPABILITY atacms_missile_tx_data
      WEAPON      114 atacms_missile_warhead
        CAPABILITY atacms_missile_warhead_data
        ORDNANCE tnt DISCRETE  1 (ROUNDS)
      MOVER       115 atacms_missile_body
        CAPABILITY atacms_missile_body_data
      COMM-RCVR   112 comm_rcvr                CAPABILITY vrc-46_rcvr_data
      COMM-XMTR   113 comm_xmit                CAPABILITY vrc-46_xmit_data
  LINKAGES
    111 WITH 116    112 WITH 113    116 WITH 114    116 WITH 117
END PLAYER-STRUCTURE

PLAYER-STRUCTURE atacms_cannister
  TACTIC cannister_tactics
  PLATFORM 1 atacms_can  REMAIN-AFTER-STOPPING
    ELEMENT 11 cannister_ele  DISCRETE 1  SUSCEPTIBILITY cannister_sig
      THINKER     111 cannister_thk
        CAPABILITY atacms_missile_thk_data
      MOVER       115 cannister_body
        CAPABILITY atacms_missile_body_data
      COMM-RCVR   112 comm_rcvr                CAPABILITY vrc-46_rcvr_data
      COMM-XMTR   113 comm_xmit                CAPABILITY vrc-46_xmit_data
  LINKAGES
    112 WITH 113
END PLAYER-STRUCTURE

PLAYER-STRUCTURE mlrs_cannister
  TACTIC cannister_tactics
  PLATFORM 1 mlrs_can  REMAIN-AFTER-STOPPING
    ELEMENT 11 cannister_ele DISCRETE 1
      THINKER     111 cannister_thk
        CAPABILITY atacms_missile_thk_data
      MOVER       115 cannister_body
        CAPABILITY atacms_missile_body_data
      COMM-RCVR   112 comm_rcvr                CAPABILITY vrc-46_rcvr_data
      COMM-XMTR   113 comm_xmit                CAPABILITY vrc-46_xmit_data
  LINKAGES
    112 WITH 113
END PLAYER-STRUCTURE
$
```

```
$ These tactics describe how the ATACMS maneuvers while flying towards a target
$ and the logic it uses for attacking a target.

TACTIC atacms_missile_tactics
  ASG-CMD-CHAIN arcent
  EVALUATION-RATES
    ENG-EVAL-RATE 0.2 (1/SEC)
  END EVALUATION-RATES
  REVECTOR-DIST-THRESH
    DIMENSION 1 2D-DIST-REL-INT (KM) 0. 3. 10. 30. 100. 300. 1000. 3000.
      INTERCEPT-CHANGE (M) 50. 100. 750. 2000. 6000. 15000.  50000.
  END REVECTOR-DIST-THRESH
  ATK-PRIORITIES
    DIMENSION 1 LIST-NAME sead_targets
      TGT-ELEMENTS        sa-2_radar_van
    END ATK-PRIORITIES
  MOVE-PLANS
    PLAN post_launch
        NOW-USE PROFILE sead_intercept
        AND GOTO POSITION TGT
        AND FOCUS-ON PRIORITY sead_targets
        AND EXECUTE PLAN post_launch
      END-PLAN
    END MOVE-PLANS
  PLAN-PROFILE
    DIMENSION 1 PROFILE-NAME sead_intercept
      DIMENSION 2  2D-DIST-REL-TGT (KM)
          0.  100.  110.  120.  130.  140.  150.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
             85.          1.         912.     REL/MOVER  6900.
             50.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
             95.          1.         912.     REL/MOVER  6900.
             55.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
            105.          1.         912.     REL/MOVER  6900.
             60.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
            115.          1.         912.     REL/MOVER  6900.
             65.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
            125.          1.         912.     REL/MOVER  6900.
             70.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
        DIMENSION 3  ALT-REL-TGT (KM)  -50.  50.
          DIST (KM)  ALTITUDE (KM)  SPD (M/SEC) REF TURN-RADIUS (M)
            135.          1.         912.     REL/MOVER  6900.
             75.         10.         912.      REL/TGT   6900.
              0.          0.         912.      REL/TGT   6900.
             -9.          0.         912.      REL/TGT   6900.
  END PLAN-PROFILE
```

```
RESOURCE-ALLOCATION
  LETHAL-ENGAGE-QUEUE-ADD
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS YES
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead
          PICK-AT-MOST 1 NOW 1 TOTAL
  END LETHAL-ENGAGE-QUEUE-ADD
  LETHAL-ENGAGE-QUEUE-DROP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS NO
                OR
          BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-QUEUE-DROP
  LETHAL-ENGAGE-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          TOTAL-ENG'S NO-MORE-THAN 1 (TGTS)
      USE FILTER 1 SELECTIONS FOR FILTER 2
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS YES
          AND 3D-DIST < 35. (KM)
      FROM FILTER 2 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead
          WITH-TRACKER atacms_missile_rx
          PICK-AT-MOST 1 NOW 1 TOTAL
  END LETHAL-ENGAGE-START
  LETHAL-ENGAGE-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS NO
                OR
          BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-STOP
  LETHAL-ENGAGE-FIRING-START
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS YES
          AND 3D-DIST < 1500. (M)
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead
            WITH-ORDNANCE tnt
              ROUNDS: 1
            WITH-ELEMENT ANYONE
          PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-FIRING-START
  LETHAL-ENGAGE-FIRING-STOP
    TGT-TYPE ANYONE
      USE INPUT FOR FILTER 1
        WPN-TYPE atacms_missile_warhead
          BEEN-ASSIGNED IS NO OR BELIEVED-DEAD
      FROM FILTER 1 SELECTIONS
        CHOOSE-FROM atacms_missile_warhead PICK-AT-MOST 1 NOW
  END LETHAL-ENGAGE-FIRING-STOP
END RESOURCE-ALLOCATION
```

```
END TACTIC
$
```

```
$ This is the (simple) logic required for an ordnance cannister to stay put.

TACTIC cannister_tactics
  ASG-CMD-CHAIN arcent
  LAUNCH-CMD-CHAIN arcent  END LAUNCH-CMD-CHAIN
  MOVE-PLANS
    PLAN offload_atacms
        NOW-USE PATTERN rest_on_ground
      END-PLAN
    PLAN offload_mlrs
        NOW-USE PATTERN rest_on_ground
      END-PLAN
    END MOVE-PLANS
  PLAN-PATTERNS
    DIMENSION 1 PATTERN-TYPE  rest_on_ground
      X (M)   Y (M)   Z (M)   REF   SPD (M/SEC)   TURN-RADIUS (M) DIR
        0.      2.      0.   AGL      0.              1.           STOP
    END PLAN-PATTERNS
END TACTIC
$
```

```
$ These signatures allow the ATACMS missile and ordnance cannisters to be seen.

SUSCEPTIBILITY atacms_sig
  OPT-CS
    DIMENSION 1 AZ (DEG)  0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        OCS (M2)              3.5
    END OPT-CS
  SNR-ELE-INTERACTIONS
      human_eyes
    END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY

SUSCEPTIBILITY cannister_sig
  OPT-CS
    DIMENSION 1 AZ (DEG)  0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        OCS (M2)              3.5
    END OPT-CS
  SNR-ELE-INTERACTIONS
      nco_eyes
    END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
$
```

```
$ This represents the ATACMS missile terminal guidance and fuzing systems.

CAPABILITY atacms_missile_rx_data
  HITS-TO-ESTABLISH-TRACK 3 (NO-UNITS)
  ONE-M2-DETECT-RNG 5.E3 (M)
  EFFECTIVE-EARTH-RADIUS 8495.E3 (M)
  MAX-PARALLEL-TRACKS 1 (NO-UNITS)
  RCVR-BANDWIDTH 1.6E6 (HZ)
  SNR-TRACKING-PROBABILITIES
    INITIAL-LOCK-PROB    0.850 (NO-UNITS)
    CONTINUE-TRACK-PROB  0.998 (NO-UNITS)
  END SNR-TRACKING-PROBABILITIES
  SNR-RCVR-FREQS
    SEARCH       2.938 (GHZ)
    ACQUISITION    2.961 (GHZ)
    TRACKING        2.982 (GHZ)
    GUIDANCE              3.077 (GHZ)
  END SNR-RCVR-FREQS
  RCVR-FREQ-LIMITS
    LOWER-FREQ-LIMIT  2.9  (GHZ)
    UPPER-FREQ-LIMIT  3.1  (GHZ)
  END RCVR-FREQ-LIMITS
  SNR-TIME-DELAYS
    START-LOCKON-DELAY   1.0 (SEC)
    MAX-COAST-TIME      15.0 (SEC)
  END SNR-TIME-DELAYS
  SNR-ANGULAR-LIMITS
    AZ-LIMIT  2.967 (RADIANS)
    EL-LIMIT  0.262 (RADIANS)
  END SNR-ANGULAR-LIMITS
  SENSING-MODE-RATES
    TRACK-SENSING-RATE   0.66 (1/SEC)
    GUIDANCE-SENSING-RATE  0.68 (1/SEC)
  END SENSING-MODE-RATES
  DETECTION-SENSITIVITIES
    SENSING-THRESHOLD     3.0 (DB)
    RECEIVER-NOISE     -160.0 (DB)
    INTERNAL-LOSSES     -10.0 (DB)
  END DETECTION-SENSITIVITIES
  ANTENNA-PATTERN DIMENSION 1 AZ (DEG) 0. 180.
    DIMENSION 2 EL (DEG) -90. 90. GAIN (DB) 20.
  END ANTENNA-PATTERN
  SNR-CHARACTERISTICS
    FREQ-DRIVEN  BOTH-SEARCH/TRK  RADAR
  END SNR-CHARACTERISTICS
  QUALITY-OF-DATA
    TYPE-OF-ELEMENT  AZ   ALT      TYPE-OF-PLAYER
    PLANAR-LOCATION  SPD  HEADING  NO-OF-ELEMENTS
  END QUALITY-OF-DATA
  RNG-ALT-CAPABILITY
    DIMENSION 1 RNG (M) 0.0   7.E3
      MIN-ALT (M) MAX-ALT (M)
        -5.0E3     5.E3
  END RNG-ALT-CAPABILITY
END CAPABILITY

CAPABILITY atacms_missile_tx_data
  ANTENNA-PATTERN DIMENSION 1 AZ (DEG) 0. 180.
    DIMENSION 2 EL (DEG) -90. 90. GAIN (DB) 20.
  END ANTENNA-PATTERN
  PEAK-POWER-OUTPUT 1.E3 (WATTS)
  PULSE-REPETITION-FREQ 250.0 (HZ)
  INTERNAL-LOSS -10.0 (DB)
END CAPABILITY
$
```

```
$ This data is used to model the weapons effects of the ATACMS warhead.

CAPABILITY atacms_missile_warhead_data
  NUM-SIMULTANEOUS-ROUND 1 (NO-UNITS)
  WPN-TIME-DELAYS
    SHOOT-TIME-DELAY  .034 (SEC)
  END WPN-TIME-DELAYS
  WPN-CHARACTERISTICS
    3D-FLYOUT  INTERCEPT-ENVELOPE-P(K)  IMPLICIT-FLYOUT
    CONTROLLED  SELF-DESTRUCTION
  END WPN-CHARACTERISTICS
  WPN-SPD-CAPABILITY
    DIMENSION 1  TIME (SEC) 0.0      5.
      AVG-SPD (M/SEC)  1000.
  END WPN-SPD-CAPABILITY
  WPN-PK
    DIMENSION 1 ELEMENT-TYPES   DEFAULT
      DIMENSION 2 RNG (M) -5500. -5000. 5000. 5500.
        PK (NO-UNITS)          0.    .99     0.
  END WPN-PK
END CAPABILITY


$ This input describes the flight performance of the ATACMS missile.

CAPABILITY atacms_missile_body_data
  MAX-ACCELERATION 100. (FT/SEC/SEC)
  MIN-TURN-RADIUS 1000. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)     MAX-ALT  10000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE  560.0 (MPH)   MAX-CLIMB-RATE 285.0 (MPH)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  225.0 (MPH)     MAX-SPD  600.0 (MPH)
  END MOVER-SPEED-LIMITS
  START-MOVE-DELAY  3.  (SEC)
END CAPABILITY


$ This capability is for the guidance and fuze processor onboard the ATACMS.
$ Note that its processing times are quite small, as it represents the
$ processing speeds of an integrated circuit.

CAPABILITY atacms_missile_thk_data
  TIME-BEFORE-DROP 18. (SEC)
  TIME-TO-THINK
    REVIEW-INFORMATION  .008 (SEC)
    RECOG-MSG           .008 (SEC)   RECOG-SNR-EVENT     .003 (SEC)
    RECOG-PHYS-EVENT    .003 (SEC)   ASSIMILATE-INTELL   .005 (SEC)
    CONSIDER-MOVE       .005 (SEC)   EVAL-ENGAGE-THREAT  .002 (SEC)
    EVAL-LETHAL-ENGAGE  .003 (SEC)   EVAL-FIRING         .009 (SEC)
  END TIME-TO-THINK
END CAPABILITY


$>
```

Chapter 14
hemtt Reloader

This player represents a reloader vehicle that provides ATACMS to the SPLL. It contains a dummy weapon system so that it can execute the reload maneuver required.

```
<$
```

```
PLAYER-STRUCTURE hemtt
  TACTIC hemtt_tactics
  PLATFORM 1 hemtt_veh  REMAIN-AFTER-STOPPING
    ELEMENT 11 hemtt_ele  DISCRETE 1
      THINKER     111 reload_nco      CAPABILITY reload_nco_data
        FUTURE-PLAYER atacms_pod  DISCRETE 2 (COPIES)
      MOVER       112 hemtt_chassis   CAPABILITY hemtt_chassis_data
      WEAPON      113 dummy_weapon    CAPABILITY spll_lchr_data
        ORDNANCE dummy_round DISCRETE  1 (ROUNDS)
      COMM-RCVR   114 vrc-92_rcvr     CAPABILITY vrc-92_rcvr_data
                                      CAPABILITY true_vrc-92_rx_data
                                      CAPABILITY 3m_whip_antenna
      COMM-XMTR   115 vrc-92_xmit     CAPABILITY vrc-92_xmit_data
                                      CAPABILITY true_vrc-92_tx_data
                                      CAPABILITY 3m_whip_antenna
  LINKAGES
    114 WITH 115
END PLAYER-STRUCTURE
$
```

```
$ This set of tactics allow the HEMTT to maneuver.

TACTIC hemtt_tactics
  MAX-MSG-ATTEMPTS 2 (NO-UNITS)
  EVALUATION-RATES
    ENG-EVAL-RATE 0.015 (1/SEC)
  END EVALUATION-RATES
  ASG-CMD-CHAIN arcent
  LAUNCH-CMD-CHAIN arcent  END LAUNCH-CMD-CHAIN
  ATK-PRIORITIES
    DIMENSION 1 LIST-NAME sead_targets
      TGT-ELEMENTS        sa-2_radar_van
    END ATK-PRIORITIES
  MOVE-PLANS
    PLAN on_the_road
      END-PLAN
    PLAN wait_for_orders
      WHEN SNR-STATUS IS DETECT
        NOW-USE PATTERN move_to_reload
        AND EXECUTE PLAN perform_loading
      OTHERWISE
        FOCUS-ON PRIORITY sead_targets
      END-PLAN
    PLAN perform_loading
      END-PLAN
    END MOVE-PLANS
  PLAN-PATTERNS
    DIMENSION 1 PATTERN-TYPE  move_to_reload
      X (M)   Y (M)   Z (M)   REF   SPD (M/SEC)   TURN-RADIUS (M) DIR
        0.      10.      1.   AGL      3.              1.          RIGHT
      175.      39.      1.   AGL      2.              1.          RIGHT
      176.      41.      1.   AGL      1.              1.          RIGHT
      179.      43.      1.   AGL      0.001           1.          RIGHT
      180.      44.      1.   AGL      0.              1.          STOP
  END PLAN-PATTERNS
  RESOURCE-ALLOCATION
    LETHAL-ENGAGE-QUEUE-ADD
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE dummy_weapon
            BEEN-ASSIGNED IS YES
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM dummy_weapon PICK-AT-MOST 1 NOW 5 TOTAL
      END LETHAL-ENGAGE-QUEUE-ADD
    LETHAL-ENGAGE-QUEUE-DROP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE dummy_weapon
            BEEN-ASSIGNED IS NO
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM dummy_weapon PICK-AT-MOST 1 NOW
      END LETHAL-ENGAGE-QUEUE-DROP
    LETHAL-ENGAGE-START
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE dummy_weapon
            2D-DIST < -1. (KM)
        FROM FILTER 1 SELECTIONS
          CHOOSE-FROM dummy_weapon
            PICK-AT-MOST 1 NOW
      END LETHAL-ENGAGE-START
    LETHAL-ENGAGE-STOP
      TGT-TYPE ANYONE
        USE INPUT FOR FILTER 1
          WPN-TYPE dummy_weapon
```

```
            BELIEVED-DEAD
          FROM FILTER 1 SELECTIONS
            CHOOSE-FROM dummy_weapon PICK-AT-MOST 1 NOW
        END LETHAL-ENGAGE-STOP
      LETHAL-ENGAGE-FIRING-START
        TGT-TYPE ANYONE
          USE INPUT FOR FILTER 1
            WPN-TYPE dummy_weapon
              2D-DIST < -1. (KM)
          FROM FILTER 1 SELECTIONS
            CHOOSE-FROM dummy_weapon
              WITH-ORDNANCE dummy_round
              WITH-ELEMFNT ANYONE
            PICK-AT-MOST 1 NOW 1 TOTAL
        END LETHAL-ENGAGE-FIRING-START
      LETHAL-ENGAGE-FIRING-STOP
        TGT-TYPE ANYONE
          USE INPUT FOR FILTER 1
            WPN-TYPE dummy_weapon
              BELIEVED-DEAD
          FROM FILTER 1 SELECTIONS
            CHOOSE-FROM dummy_weapon PICK-AT-MOST 1 NOW
        END LETHAL-ENGAGE-FIRING-STOP
      END RESOURCE-ALLOCATION
    END TACTIC
$
```

```
$ This describes the movement performance data for the HEMTT truck chassis.

CAPABILITY hemtt_chassis_data
  MAX-ACCELERATION                  2. (M/SEC/SEC)
  MIN-TURN-RADIUS                   1. (M)
  MOVER-ALTITUDE-LIMITS
    MIN-ALT  0.0 (M)      MAX-ALT  1000.0 (M)
  END MOVER-ALTITUDE-LIMITS
  MOVER-CLIMB/DIVE-LIMITS
    MAX-DIVE-RATE    1.0 (M/SEC)      MAX-CLIMB-RATE  1.0 (M/SEC)
  END MOVER-CLIMB/DIVE-LIMITS
  MOVER-SPEED-LIMITS
    MIN-SPD  0. (M/SEC)      MAX-SPD  6.67 (M/SEC)
  END MOVER-SPEED-LIMITS
END CAPABILITY


$ This data is used to model the cognitive processes of the NCO who supervises
$ the reload operation.  Noticing and digesting of perceptual data is allowed,
$ along with maneuver decisions.

CAPABILITY reload_nco_data
  RESOURCE-DISAGGREGATION
    DIMENSION 1 RESOURCE-TYPE atacms_pod
      CREATED-PLAYER atacms_cannister
    END RESOURCE-DISAGGREGATION
  TIME-BEFORE-DROP 2. (HR)
  TIME-TO-THINK
      RECOG-MSG             5. (SEC)
      RECOG-SNR-EVENT       5. (SEC)
      RECOG-PHYS-EVENT      1. (SEC)
      ASSIMILATE-INTELL     2. (SEC)
      EVAL-ENGAGE-THREAT    4. (SEC)
      EVAL-LETHAL-ENGAGE    8. (SEC)
      EVAL-FIRING           3. (SEC)
      CONSIDER-MOVE         5. (SEC)
      REVIEW-INFORMATION    5. (SEC)
    END TIME-TO-THINK
  END CAPABILITY


$>                              Chapter 15
                              Terrain Objects

These players represent special objects within the scenario which are presently
required due to the lack of user-defined communications within ACBM.
<$

PLAYER-STRUCTURE grid_pos
  PLATFORM 1 grid_loc
    ELEMENT 11 grid_ele  DISCRETE 1  SUSCEPTIBILITY grid_sig
END PLAYER-STRUCTURE

SUSCEPTIBILITY grid_sig
  OPT-CS
    DIMENSION 1 AZ (DEG)  0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        OCS (M2)                3.5
    END OPT-CS
  SNR-ELE-INTERACTIONS
      human_eyes
    END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
```

```
PLAYER-STRUCTURE target_alt/2_missiles
  PLATFORM 1 alt/num_msl_obj
    ELEMENT 11 alt/num_ele  DISCRETE 1  SUSCEPTIBILITY alt/num_sig
      MOVER      111 clearance_body    CAPABILITY clearance_body_data
END PLAYER-STRUCTURE

SUSCEPTIBILITY alt/num_sig
  OPT-CS
    DIMENSION 1 AZ (DEG)  0.  180.
      DIMENSION 2 EL (DEG) -90.  90.
        OCS (M2)              3.5
    END OPT-CS
  SNR-ELE-INTERACTIONS
      clearance_auth
    END SNR-ELE-INTERACTIONS
END SUSCEPTIBILITY
END-TDB
END-INSTRUCTIONS SAVE-DATA
```