

JTLS-2007-2072 Allow Attach/Detach Targets

Ellen F Roland, John Hertz

1.0 Summary of Model Change Request

Users who detach a unit cannot detach the targets. Detaching 30 percent of a unit removes 30 percent of its Combat Systems. Users cannot detach some or all targets owned by the unit from which the detachment is being taken. Modify the Detach order to allow this capability.

2.0 Design Summary

This Design Plan describes how JTLS-GO will be enhanced to:

- Allow individual targets to be detached from a unit as part of the detachment process.
- Allow a target to be transferred from one unit to another.
- Allow a target to be moved from an owned status to an unowned status and vice versa,

There will be no change to the attachment process. It will continue to result in a unit transferring all of its combat systems, supplies, owned targets, and associated targets to the receiving unit.

3.0 Detailed Design

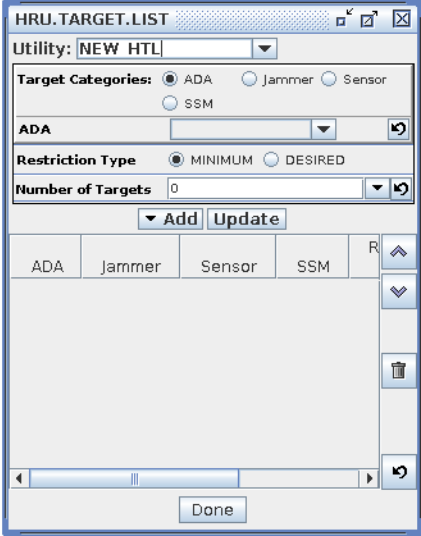
3.1 Current Detach Capabilities

Currently, JTLS-GO players can create detachments of ground units that include targets, depending on the detachment option selected in the Detach order. [Table 1](#) summarizes how targets are moved to a detached unit based on the Detachment Type.

Table 1. Summary Of Current Target Movement By Detachment Type

DETACHMENT TYPE	CURRENT TARGET CAPABILITY
Detach Tactical Unit Prototype (TUP)	If there are any prototype owned targets that are part of the Tactical Unit Prototype (TUP), the detached unit take the targets from the providing unit. If the TUP targets are not available, the detached unit is created without all necessary targets.
Detach Unit Identification Code (UIC)	This type of detachment is translated into a "Detach by TUP" order; therefore, it follows all of the same rules specified above.

Table 1. Summary Of Current Target Movement By Detachment Type

DETACHMENT TYPE	CURRENT TARGET CAPABILITY
Detach Fraction Of Unit	No targets are moved as a result of this detachment type.
Detach By Specific Combat Systems	No targets are moved as a result of this detachment type.
Detach Previously Attached Unit	The targets that were previously attached and originally owned by unit are given back to the unit.
Create High Resolution Unit (HRU) (Detach HRU)	<p>If there are any Highres Unit Prototype (HUP) owned targets, the detached HRU takes the targets from the providing unit. Unlike aggregate units, if the HUP targets are not available, the detachment (creation) is rejected.</p> <p>It is also possible for the user to detach a modified HUP in which the user can specify a list of types of targets required or desired. If required is specified, then the HRU creation is rejected if the targets are not available. Alternatively, if “Desired” is selected, then the creation executes whether the targets are or are not available. See Figure 1.</p>  <p style="text-align: center;">Figure 1. HRU Creation Target Specification List</p>

3.2 Design Approach

This Design Plan envisions implementing the following new capabilities:

- Allow individual targets to be detached from a unit as part of the detachment process.
- Allow a target to be transferred from one unit to another.

- Allow a target to be moved from an owned status to an unowned status and vice versa,

Each of these capabilities are discussed in the following sections

3.3 Expand Detachment Capability to Detach Additional Targets

Figure 2 contains the current DETACH Order. The Detachment Type field is a Group field which means that selecting an option results in displaying a set of new fields that need to be filled out.

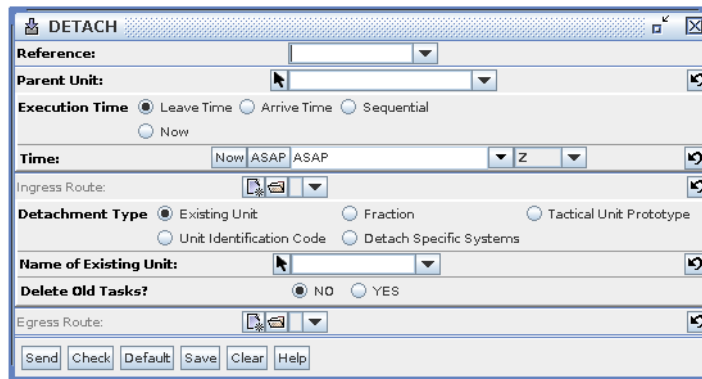


Figure 2. Current JTLS Detach Order

3.3.1 Details On Implementation Plan

We are proposing that for the two options: “Detach by Fraction” and “Detach Specific Systems” an additional utility field, similar to the HRU Additional Target list (See Figure 1) be added to the Group’s displayed fields. The new utility directive will have the fields described in Table 2.

Table 2. New Detach Target Utility List

FIELD NAME	FIELD OPTIONS	DESCRIPTION
Target Category Group	All Target Categories that can be owned by a unit.	Unlike the HRU version of this Utility Directive, all target categories that can be either owned by a unit will be included at possible option. These target categories include: SAM/AAA, BRIDGE, SENSOR.SITE, RUNWAY, SUPPLY.STORAGE, SSM. FACILITY, EQUIPMENT.SHELTER, MHE, PUMPING.STATION, JAMMER, COMM.SITE, and COMBAT.ARMS,
	Target Subcategory	Drop down list of the target subcategories for the select target category.
Minimum Number	Integer Field	The minimum number of these targets that should be detached. If these targets are not available, then the detachment will be rejected.

Table 2. New Detach Target Utility List

FIELD NAME	FIELD OPTIONS	DESCRIPTION
Desired Number	Integer Field	The desired number of these targets. If the targets are available they will be moved to the detachment. If not, the detachment still occurs.

Unlike the current HRU Target Utility List, both the “Minimum Number” and the “Desired Number” can be filled in on this order. The Design Team feels that this construct is more flexible than the existing HRU construct and for consistency purposes, the HRU Creation Order will be altered to also allow both fields to be entered.

3.3.2 Reasons For Limitations

The above explanation referred to some limitations and the purpose of this section is to inform the reader for the reasons behind these limitations.

3.3.2.1 Why Does The Design Not Change Other Detachment Options

The other detachment options: “Detach Existing Unit”, “Detach By TUP”, and “Detach by UIC” already take targets. The Design team felt that adding an additional field describing what type of additional targets should be detached would be confusing to the user and unnecessarily complicated the code. If additional targets should be moved, this can be done after the completion of the detachment using the capability describe in [Transfer Target From One Unit To Another, Section 3.4](#).

3.3.2.2 Why Does The Order Not Allow Detachment Of Specific Targets

The Design Team felt that the capability described in [Transfer Target From One Unit To Another, Section 3.4](#) provided this exact capability and mixing the two method would cause user confusion and make the code difficult to maintain.

3.4 Transfer Target From One Unit To Another

This new capability will be implemented with a new order called the “TRANSFER TARGET” Order. The purpose of the order is two-fold.

- “Give” a target to another unit. With this option, the unit that owns the target will move to the receiving unit and turn the target over to the receiving unit. Movement will only be necessary if the radius of the giving unit does not overlap the radius of the receiving unit.
- “Take” a target from another unit. With this option, the taking unit will move to the target’s currently owned unit. The target transfer will then take place. Again, movement will only be necessary if there is no overlap between the radii of the two units.

Table 3 describes the new Transfer Target Order

Table 3. New Transfer Target Order

GROUP / FIELD	OPTIONS	FIELD DESCRIPTION
Type Order	Give Target Option	Unit giving the target - This order results in this unit getting a task added to its task list. The placement of the task on the task list depends on the Time Option selected. The user must have command authority over the unit, The unit can be any Aggregate Resolution Unit (ARU) or HRU. Although the Design Team cannot think of any realistic real-world example, naval unit can be given this order.
		Unit receiving the target. The unit must be on a Force Side that is either Friendly or Neutral to the giving unit. The unit can be any ARU or HRU. Again the Design Team has decided to allow the receiving unit to be a naval unit.
	Take Target Option	Unit taking the target - This order results in this unit getting a task added to its task list. The placement of the task on the task list depends on the Time Option selected. The user must have command authority over the unit. The unit can be any ARU or HRU. Although the Design Team cannot think of any realistic real-world example, naval unit can be given this order.
		Unit providing the target. The unit must be on the same Force Side as the taking unit. The unit can be any ARU or HRU, and as with the other options naval unit are legal.
Target To Transfer	Target Field	This is the Configuration Control Facility (CCF) Number of the Target to be transferred from one unit to another. Only owned targets can be transferred.
	Target List	List of CCF Targets to be transferred from one unit to another.
Time Option	Specific Time	This is the specific time that the task should START
	Task Sequence Number	This is the sequence number that should be given to the task that is being placed on the tasking unit's task list.
	Now	This indicates that the tasking unit should postpone its current task and accomplish the target transfer immediately.

When the order arrives in the model, if a list of targets has been specified, then each target on the list will become an individual task.

- In the Give Target Option, it is implied that the specified giving unit owns the target that is to be transferred. This is not checked when the order arrives in the game, but it is checked immediately prior to deciding whether movement is needed to accomplish the task. If the giving unit does not own the target, then the task is canceled without the unit accomplishing any move.
- In the Take Target Option, it is implied that the unit from which the target is to be taken owns the specified target. This too is not checked when the order arrives in the game, but it is checked just prior to accomplishing the instantaneous transfer of the target. This means that the taking unit will move to the providing unit and then ask whether the providing unit owns the specified target. Obviously if the providing unit does not own the target, then the task will be canceled.

Just prior to transferring the target, the model will ensure that the relationship and ownership restrictions defined in [Table 3](#) are still met. If these restrictions are met, the actual transfer of target is instantaneous and the task is considered complete.

3.5 Change Ownership and Associated Status Of A Target

This is the most complicated of the options being presented in this design. Currently there are some built in capabilities that allow targets to go from an unowned status to an owned status and vice versa. These include:

- Engineering unit being told to emplace a bridge (goes from owned to unowned) or pickup a mobile bridge (unowned to owned status)
- Airbase movement. When an airbase leaves, it leaves its runways behind (goes from owned to unowned status) and when an airbase arrives in an area it gathers all unowned runways (goes from unowned to owned).
- Pumping Stations. When a unit is told to support a pipeline, the unit takes ownership of the pumping station setting the pumping stations from an unowned state to an owned state. When the unit is told to stop supporting the pipeline, the pumping stations associated with the pipeline go from an owned or associated status to an unowned status.
- A stationary target will go from an owned status to an associated status automatically if the unit moves away from the stationary target.

Thus the issue is what capability should be built that does not interfere with the needs of each of these specialized target changes. [Table 4](#) summarizes what new capabilities will be supported as a result of this design.

Table 4. Summary Of Target Ownership Changes

OLD STATUS	NEW STATUS		
	OWNED	ASSOCIATED	UNOWNED
OWNED	This capability is already provide for with the Transfer Target Order described on Figure 3.4 .	This option and the order to support it are part of this design and discussed in this section.	Only the specialized situations described above will be supported.
ASSOCIATED	This option and the order to support it are part of this design and discussed in this section.	This option and the order to support it are part of this design and discussed in this section.	There is no known use to this capability. Nothing will be change with respect to supporting this cell.
UNOWNED	This option and the order to support it are part of this design and discussed in this section.	The design team cannot envision any situation where this is needed. Nothing will change with respect to this cell.	Of no use. Nothing will change with respect to this cell.

Each of the four options highlighted in Green will be supported by this design and the Transfer Target Order already described. [Table 5](#) expands on the New Transfer Target Order previously described in [Table 3](#). The cells highlighted in Green were explained in detail in [Table 3](#). The cells highlighted in Yellow are new to support the newly proposed changes to a target’s ownership status.

Table 5. Expanded New Transfer Target Order

GROUP / FIELD	OPTIONS	FIELD DESCRIPTION
Type Order	Give Target Option	Unit giving the target - This order results in this unit getting a task added to its task list. The placement of the task on the task list depends on the Time Option selected. The user must have command authority over the unit, The unit can be any Aggregate Resolution Unit (ARU) or HRU. Although the Design Team cannot think of any realistic real-world example, naval unit can be given this order.
		Unit receiving the target. The unit must be on a Force Side that is either Friendly or Neutral to the giving unit. The unit can be any ARU or HRU. Again the Design Team has decided to allow the receiving unit to be a naval unit.

Table 5. Expanded New Transfer Target Order

GROUP / FIELD	OPTIONS	FIELD DESCRIPTION
Type Order (Con't)	Take Target Option	Unit taking the target - This order results in this unit getting a task added to its task list. The placement of the task on the task list depends on the Time Option selected. The user must have command authority over the unit. The unit can be any ARU or HRU. Although the Design Team cannot think of any realistic real-world example, naval unit can be given this order.
		Unit providing the target. The unit must be on the same Force Side as the taking unit. The unit can be any ARU or HRU, and as with the other options naval unit are legal.
	Relinquish Ownership Option	Unit that should relinquish ownership of the specified target. The user must have command authority over the unit. When the order is submitted, the unit does not need to own the specified target. This check is accomplished when the task is executed and before any required move is accomplished. The unit will move if its unit radius does not cover the specified location. When the unit is at an appropriate location, the target will be placed at the specified location and the unit will relinquish ownership of the target, but maintain its associated status. There is one except to this rule. If the target is a runway, the runway will go to an unowned status
		Location at which the target should be placed.
	Accept Ownership Option	Unit that should accept ownership of the specified target. The unit will move to the location of the target. When the unit is at an appropriate location, the task will be canceled if the target is already owned by some unit. The target must be on the same side as this unit with one exception. If the target is a non-owned runway, this unit will accept ownership of the target. Accepting ownership of the target will also change the associated unit for the target. This is only an important rule for SAM/AAA targets.
	Change Associated Unit Option	Unit Accepting Associated Status for the target - This is an instantaneous task. No movement is needed. When it is time to execute the task, this unit will take associated control over the target. The task will not execute unless the non-owned target is on the same side as the unit taking control of the target. Only certain target types can be in the associated mode.

Table 5. Expanded New Transfer Target Order

GROUP / FIELD	OPTIONS	FIELD DESCRIPTION
Target To Transfer	Target Field	This is the Configuration Control Facility (CCF) Number of the Target to be transferred from one unit to another. Only owned targets can be transferred.
	Target List	List of CCF Targets to be transferred from one unit to another.
Time Option	Specific Time	This is the specific time that the task should START
	Task Sequence Number	This is the sequence number that should be given to the task that is being placed on the tasking unit's task list.
	Now	This indicates that the tasking unit should postpone its current task and accomplish the target transfer immediately.

Table 6. Summary Target Type Versus New Target Transfer Capabilities

TARGET TYPE	STARTING SITUATION		
	OWNED	ASSOCIATED	UNOWNED
SAM/AAA	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
BRIDGE	<ul style="list-style-type: none"> • Give • Take 		
TUNNEL			
SENSOR SITE	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
RUNWAY	<ul style="list-style-type: none"> • Give • Take • Relinquish (Goes to unowned) 		<ul style="list-style-type: none"> • Accept (Goes to owned)
INTERDICTION POINT			
SUPPLY STORAGE		<ul style="list-style-type: none"> • Change 	

Table 6. Summary Target Type Versus New Target Transfer Capabilities

TARGET TYPE	STARTING SITUATION		
	OWNED	ASSOCIATED	UNOWNED
SSM	<ul style="list-style-type: none"> • Give • Take 		
FACILITY	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
EQUIPMENT SHELTER	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
MHE	<ul style="list-style-type: none"> • Give • Take 		
MINEFIELD			
PUMPING STATIONS			
JAMMER	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
COMM SITE	<ul style="list-style-type: none"> • Give • Take • Relinquish 	<ul style="list-style-type: none"> • Accept • Change 	
SHIP			
COMBAT ARMS	<ul style="list-style-type: none"> • Give • Take 		
VEHICLES			
AIRCRAFT			
SMALL BOAT			
SUPPLY TYPE			

3.6 Supply Implications For Target Transfer Process

SAM/AAA Targets and SSM targets have supply needs to properly operate. As part of the target movement process these requirements need to be considered. SAM/AAA sites own their own

supplies and the supplies that are currently owned by the target will automatically move with the target. On the other hand, SSM targets do not have any inherently owned supplies. To fire, the sites take the supplies directly from the owning unit.

Table 7 outlines the supply considerations that will be made after control for a target is moved from one unit to another.

Table 7. Supply Considerations

TRANSFER TYPE	SAM/AAA TARGET	SSM TARGET
Detach	If no AD TARGETABLE WEAPON and no AD ADVANCED TARGETABLE WEAPON supplies are owned by the detached unit, a message is generated warning the user of the situation.	If the detached unit does not have supplies to support even one allowable weapon to be fired by the detached SSM Target, a message is generated warning the user of the situation.
Give Take	If no AD TARGETABLE WEAPON and no AD ADVANCED TARGETABLE WEAPON supplies are assigned to the SAM/AAA site's new owning unit, a message is generated warning the user of the situation. If the new owning unit does have supplies, the SAM/AAA site will immediately start a resupply procedure. This is only done if the target is below its assigned stockage objective.	If the new owning unit does not have supplies to support even one allowable weapon to be fired by the detached SSM Target, a message is generated warning the user of the situation.
Relinquish	No checks are necessary. The owning unit is now the associated unit.	This transfer type does not apply to SSM Targets
Accept	If no AD TARGETABLE WEAPON and no AD ADVANCED TARGETABLE WEAPON supplies are assigned to the SAM/AAA site's new owning unit, a message is generated warning the user of the situation. If the new owning unit does have supplies, the SAM/AAA site will immediately start a resupply procedure. This is only done if the target is below its assigned stockage objective.	

Table 7. Supply Considerations

TRANSFER TYPE	SAM/AAA TARGET	SSM TARGET
Change	<p>If no AD TARGETABLE WEAPON and no AD ADVANCED TARGETABLE WEAPON supplies are assigned to the SAM/AAA site's new associated unit, a message is generated warning the user of the situation.</p> <p>If the new associated unit does have supplies, the SAM/AAA site will immediately start a resupply procedure. This is only done if the target is below its assigned stockage objective.</p>	<p>This transfer type does not apply to SSM Targets</p>

4.0 Data Changes

No data changes are required to implement this design.

5.0 Order Changes

The Detach Unit Order will change as described in [Table 2](#).

The new Transfer Target Order will be created using the specifications described in

6.0 JODA Changes

No JODA Data System parameter, structure, or protocol changes are required to implement this design.

7.0 Test Plan

To accomplish these tests, all of the setup can be accomplished by the Controller. This will not only test this new capability, but also server as some regression testing for this version of JTLS.

7.1 Test New Detach By Fraction Capabilities

Purpose: The purpose of this test is to ensure that detaching by fraction works when extra targets are specified.

Step 1: Select a fairly large unit that has 3 different SAM Site Type Targets, SAM A, SAM B, and SAM C, and two different Sensor Type Targets, SENSOR 1, and SENSOR 2. Each

of the SAM target should have five elements. Each of the SENSOR targets should have 1 element.

Step 2: Detach 10% of the unit and as part of the order, indicate that minimum of 2 SAM B targets and a desired number of 4 SAM B targets should be moved as part of the detachment.

Expected Results: The detachment should work and the newly detached unit should end up with a 4 element SAM B target, leaving a 1 element SAM B target at the parent unit.

Step 3: Now detach 20% of the what remains of the original unit and indicate that a minimum of 2 SAM B targets and a desired of 4 SAM B targets.

Expected Results: The detachment should be canceled.

Step 4: Resubmit the same detachment order, but specify that of minimum value of 1 SAM B target and a desired number of 4 SAM B targets.

Expected Results: The detachment should work and the newly detached unit should now own the 1 remaining SAM B element and the original unit

Step 5: Now detach 30% of the remains of the original unit and specify a minimum number of SAM B targets and a desired number of 2 SAM B targets.

Expected Results: The detachment should work and the newly detached unit should not own any SAM B targets.

Step 6: Now detach 40% of the remains of the original unit and specify the following targets should be moved:

- a. Minimum 2, Desired 2 SAM A
- b. Minimum 0, Desired 1 SAM B
- c. Minimum 2, Desired 4 SAM C
- d. Minimum 1, Desired 1 SENSOR 1

Expected Results: The detachment should work and the newly detached unit should have 2 SAM A elements, 4 SAM C elements, and 1 Sensor 1 target.

7.2 Test New Detach By TUP Capabilities

Purpose: The purpose of this test is to ensure that detaching by TUP works when extra targets are specified.

Step 1: Select a fairly large unit that has 3 different SAM Site Type Targets, SAM A, SAM B, and SAM C, and two different Sensor Type Targets, SENSOR 1, and SENSOR 2. Each of the SAM target should have five elements. Each of the SENSOR targets should have 1 element.

Step 2: Select a TUP, called TUP X, that has 1 Sensor 1 Target as a prototype owned target.

Step 3: Detach a unit by TUP and indicate that the detachment should also take:

- a. Minimum 2, Desired 4 SAM A
- b. Minimum 1, Desired 1 SENSOR 1
- c. Minimum 1, Desired 2 SENSOR 2

Expected Results: The detachment should be rejected because of a lack of SENSOR 1 Targets.

Step 4: Repeat the Detach a unit by TUP, but only specify the following extra targets to take:

- a. Minimum 2, Desired 4 SAM A
- b. Minimum 1, Desired 2 SENSOR 2

Expected Results: The detachment should occur. The newly detached unit should have the TUP Sensor 1 target, a SAM A target with 4 elements, and a SENSOR 2 target with 1 element.

7.3 Test New Detach By UIC Capabilities

Purpose: The purpose of this test is to ensure that detaching by UIC works when extra targets are specified.

Step 1: Select a fairly large unit that has 3 different SAM Site Type Targets, SAM A, SAM B, and SAM C, and two different Sensor Type Targets, SENSOR 1, and SENSOR 2. Each of the SAM target should have five elements. Each of the SENSOR targets should have 1 element.

Step 2: Build a UIC Unit that is subordinate to the selected unit and uses the same TUP that was selected for [Test 7.2](#).

Step 3: Repeat [Test 7.2](#), Steps 3 and 4.

Expected Results: The results should be identical to the results indicated for [Test 7.2](#).

7.4 Test New Transfer Target Order

Purpose: The purpose of this test is to ensure that the new Transfer Target order works as specified in this design.

Step 1: Submit a Transfer Target Order for the following [Table 6](#) cells.

- a. Owned SAM/AAA - Give Target Option
- b. Owned Bridge - Take Target Option
- c. Owned Equipment Shelter - Relinquish Target Option
- d. Associated Jammer - Accept Target Option
- e. Associated Comm Site - Change Target Option
- f. Owned Runway Target - Relinquish Target Option
- g. Unowned Runway Target - Accept Target Option
- h. Associated Supply Storage - Change Target Option

Expected Results: Each option should work as indicated.

Step 2: Attempt the following Transfer Target Options from [Table 6](#) cells.

- a. Owned Bridge Target - Relinquish Target Option
- b. Associated Supply Storage Target - Accept Target Option
- c. Owned SSM Target - Relinquish Target Option
- d. Owned Combat Arms Target - Relinquish Target Option

Expected Results: Each option should be rejected.

7.5 Test Supply Warning Message

Purpose: The purpose of this test is to ensure that when the newly responsible unit for a target does not have the required supplies, that a message is generated warning the user of the situation.

Step 1: Give a non-air defense unit, that has no air defense weapon supplies as order to Take a SAM/AAA target from an existing air defense unit that has an abundance of weapon supplies.

Expected Results: The non-air defense unit should move to the location of the SAM/AAA target, take the target, and generate a message for the user that the site does not have any needed supplies.

Step 2: Move the unit that now owns the SAM/AAA target to an area that has no other air defense coverage.

Step 3: Fly some enemy air missions over the area.

Expected Results: The SAM/AAA site should fire, but eventually run out of supplies and no longer fire at the enemy air missions

Step 4: Submit a Give Order to the non-air defense unit that will give the empty SAM/AAA target back to its original unit.

Expected Results: The non-air defense unit should move back to the original unit that owned the SAM/AAA target and give the target back. The target should immediately be resupplied by its new owning unit.

Step 5: Submit a Give target order to a unit that owns an SSM target. The specified receiving unit should not have any supplies that can be used by the SSM target.

Expected Results: The unit that owns the SSM target should move to the location of the new receiving unit. The transfer should occur and a message should be generated which informs the user that the new owning unit does not have the needed supplied.

Step 6: Give the new owning unit an order to fire a missile from the SSM Target.

Expected Results: The order should be accepted but go into a wait state due to a lack of supplies.

Step 7: Given the original owner of the SSM target and order to Replenish the new owner of the SSM target with some appropriate weapon supplies.

Step 8: Give the new owning unit an order to fire a missile from the SSM Target.

Expected Results: The order should be accepted and be fired.