Surface Training Manual

Decision and Information Sciences Division
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Surface Training Manual

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Contents

1 Creating Commodities .............................................................................................................. 1
2 Viewing Asset Pools on the Map............................................................................................ 12
3 Updating Asset Pools .............................................................................................................. 13
4 Theater Parameters .................................................................................................................. 16
   4.1 Theater Name ................................................................................................................. 16
   4.2 General Parameters ........................................................................................................ 16
   4.3 Serials Required ............................................................................................................. 16
   4.4 Serial Travel Parameters ............................................................................................. 17
   4.5 Cost Modeling Parameters ........................................................................................... 17
   4.6 Rail Travel Parameters ................................................................................................. 18
   4.7 Road Travel Parameters ............................................................................................... 19
5 Routes ..................................................................................................................................... 21
   5.1 Viewing a Route ............................................................................................................ 21
   5.2 Adding a Route .............................................................................................................. 23
6 Viewing Route Information .................................................................................................... 25
7 Reception, Staging, Onward Movement, and Integration User Case ...................................... 27
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1 Creating Commodities

1. From the Analysis of Mobility Platform (AMP) Help menu, select Load TDX (Expanded Tunisia Demo Scenario).

2. Navigate to the Setup tab and select the Deployment: Cargo Commodities editor.

3. Highlight the commodity that is named TEU UE (TEU=Twenty Foot Equivalent Units, UE=Unit Equipment).

4. Click the + (plus sign) button above the table to add a new commodity. This will bring up a dialog box that is populated with information about TEU UE.

5. Make the Commodity Name Ammo UE.

6. Set the Assignment Rule Priority to 14.

7. Set the Hot Cargo value to Yes. The dialog form should be filled in like the following example:

8. Click the OK button.

9. You should see Ammo UE in the commodities table. Order the table by Assignment Priority by double clicking on the column.
10. Highlight the Ammo UE record and make sure that the Assignment Rule tab is selected in the lower half of the panel.

11. Click the + (plus sign) button above the Assignment Rule table to bring up the Add dialog box.

12. Click in the Advanced Mode checkbox. The dialog box should look like this:

13. In the lower panel, highlight the word Conditions in the tree.

14. Click on the AND button to add an item to the condition.

15. Click on the + (plus sign) next to Conditions to expand the item. You should see the AND that was just added.

16. Click on the AND to highlight it.
17. In the upper left area of the dialog box, in the Keys tree, under the Cargo item, click to highlight key CCC1 (Cargo Category Code 1).

18. Leave Operator and Comparison Type as is.

19. For the User Value, choose M: AMMUNITION.

20. Click the + (plus sign) button above the Conditions tree to add the item to the Conditions tree.

21. In the lower area, expand the AND item. You will see that an item has been added: CCC1=M.

22. Highlight the AND in the Conditions tree.

23. In the upper left area of the dialog box, in the Keys tree, under the Unit Info item, click to highlight Key Description Record Type.

24. Leave Operator and Comparison Type as they are.

25. For the User Value, choose U: ULN.
26. Click the + (plus sign) button above the Conditions tree to add the item to the Conditions tree. Your Conditions tree should look like the following:

```
- Conditions
  - AND
    - CCC1=M
    - RecordType=U
```

27. Click the OK button in the dialog box. In the Cargo Commodities tab, you will now see that the condition has been added to the Ammo UE item. It will read as:

```
If
  ( CCC1=M && RecordType=U
  )
Then
  Commodity=Ammo UE
```

28. Make sure that the Ammo UE item is highlighted, and select the Carry Preferences tab in the lower portion of the window.
29. Ensure that the **Theater** name selected is **CONUS**.

30. Click the + (plus sign) button above the **Carry Preference Groups** table. This will bring up a small dialog box labeled **Add Carry Preference Group**.

31. Type **ROAD 1** as the name.

32. Click the **OK** button. This will add a **ROAD 1** item to the **Carry Preference Groups** table.

33. Highlight the **ROAD 1** item.

34. In the **Carry Permissions** table (This is a different table, below the **Carry Preference Groups** table.), click on the + (plus sign) button.
35. For the **Means of Transportation** item, select **M1075 PLS**.

36. Click on the **OK** button.

37. Change the **Theater** to **Tunisia**.

38. Repeat steps 30 through 36 for the **Tunisia** theater.

39. **Save** and **Run** the scenario.

40. Once the run is finished, click on **Run tab → Results→ RLN Results**.

41. Sort the table twice by the **STons: Undelivered** (STons = Short tons) column (last column at right), so that the largest numbers will be at the top.
42. Highlight the first record (row) in the table, right click on it, and choose **Analyze Selected RLNs**.

43. In the **RLN Causal Checks** tab that comes up, double click on the **Details** cell (last column at right) for the item whose **Check** (third column) value is **Theater: Move Feasibility** (bottom row).
44. In the dialog box that pops up, sort the table by the Status column. The items that have a status of FAILED will be at the top of the list.

45. Double click on the Details cell for the first FAILED item. Note that the Details Report will state that there are no vehicles that can move the item in the theater.
46. Close the pop-up dialog boxes.

47. Return to the Setup tab, Deployment → Cargo Commodities.

48. Select the Ammo UE item.

49. On the Carry Preferences tab in the lower portion of the screen, select the CONUS theater.

50. Select ROAD 1 in the Carry Preference Groups table.

51. In the Carry Permissions table, click on the + (plus sign) button.

52. In the Add Carry Permissions window, select M1074 PLS.

53. Click the OK button.

54. Repeat steps 50 through 53 for the Tunisia theater. Both the CONUS theater’s and the Tunisia theater’s ROAD 1 Carry Permissions will list the following two items:

55. Save and Run the scenario.

56. Once the run is finished, click on the Report tab, Events → Error Log.
57. You will see the following errors:

![Error Log](image)

These errors indicate that there is no mode of transportation to carry the cargo. One or more asset pools will need to be changed to include the carry types that can carry the cargo created.

58. Another way to look at this is to click on the **Run tab ➔ Results ➔ RLN Results**.

59. Sort the table twice by the **STons: Undelivered** column, so that the largest numbers will be at the top.

![Sorted Table](image)

60. Select the first record in the table by left clicking on row number 1, right click on it, and choose **Analyze Selected RLNs**.
61. In the tab that comes up, double click on the Details cell for the item whose Check value is Theater: Move Feasibility.

62. In the dialog box that pops up, sort the table by Status. The remaining item with a status of FAILED will be at the top.

63. Double click on the Details for that item and you will see the following Details Report error:

To fix the current issue, the asset pools will need to be updated.
2 Viewing Asset Pools on the Map

1. To view an asset pool on the map, click on the Setup tab and turn on the Asset Pools layer.

2. If you zoom to look at the United States, you will see something like the following:

![Map of the United States with Asset Pools highlighted]

3. This information can be used by the analyst to identify which asset pools may be serving the erroring locations.
3 Updating Asset Pools

1. Navigate to the **Setup** tab, *Vehicles ➔ Asset Pools*.

2. Click on the **Show All Pool Locations** at the top of the panel. This will bring up a tab that will display which asset pool serves which locations. This can be used to match the erroring locations with the asset pool that needs to be used. For now, close this tab.

3. Return to the **Setup** tab, *Vehicles ➔ Asset Pools* tab.
4. Select Asset Pool one.

5. In the lower half of the panel, make sure that the Vehicles tab is selected.

6. Click the + (plus sign) button over the Vehicles table.

7. Add 10 Vehicle Type M1075 PLS to the pool.

8. Click the OK button.

9. The vehicles table for the selected asset pool will show ten M1075 PLS.
10. Repeat steps 4 through 9 for asset pool two.

11. Repeat steps 4 through 9 for asset pool five.

12. Repeat steps 4 through 9 for asset pool twelve.
   The additional vehicles in asset pools one, two, five, and twelve will provide sufficient capacity to prevent the errors seen in the previous run.

13. Save and Run the scenario.

14. After the scenario runs, revisit the Run tab Events → Error Log. Errors should no longer be listed:

15. Revisit the Run tab Results → RLN Results page.

16. Sort the table twice by the STons Undelivered column. Note that there are no longer items that are undelivered.
4 Theater Parameters

You can choose to set various theater parameters by selecting the **Theaters** option from the **Setup** tab **Scenarios → Theater** section. These parameters can be set differently for each theater in the simulation.

4.1 Theater Name

**Include in Simulation**: Make sure that the theater you want to run in the simulation is indicated as **YES** in the **Included?** column.

<table>
<thead>
<tr>
<th>Theater Name</th>
<th>Included?</th>
<th>Activation Schedule</th>
<th>Make Missing Available?</th>
<th>Countries/States</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONUS</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>51</td>
</tr>
<tr>
<td>Tunisia</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>2</td>
</tr>
</tbody>
</table>

4.2 General Parameters

One or more of four general parameters can be chosen by selecting the corresponding checkbox(es):

- Make UE High Priority
- Project Mode Throughput for Estimating Travel Times
- Project Asset Use for Estimating Travel Times
- Project Location Throughput for Estimating Travel Times

4.3 Serials Required

The user may manage surface operations by requiring ground travel in serials (convoys). Convoys may be required for all types of movements or only for specific subsets of movements.

- Military Self Deployed
- Military Direct Delivery
- Line Haul
- Commercial Direct Delivery
4.4 Serial Travel Parameters

These five parameters regulate how serials are formed in the theater:

- Minimum Vehicles/Serial: Enter a number for the minimum number of vehicles in the group.
- Maximum Vehicles/Serial: Enter a number for the maximum number of vehicles in the group.
- Maximum Serial Wait: Enter the amount of time that a number of vehicles that is fewer than the minimum number of vehicles in a serial will wait for additional vehicles before departing.
- Serial Rate of March: Enter the maximum speed at which all otherwise unconstrained serials will travel. (If there is a slower vehicle in the serial, the serial will travel at that rate.)
- Serial Spacing: Enter the distance that is required between serials on the same route.

4.5 Cost Modeling Parameters

These two parameters set the default cost per mile, if they are not set specifically by the user:
- Default Cost per Organic Vehicle Mile: Enter a number for the cost of military vehicle travel.
- Default Cost per BBL: Enter a number for the cost of barrels (BBLs) of fluid over a pipeline.
4.6 Rail Travel Parameters

These seven parameters detail the railcar requirements:

- **Adequate Railcar Load**: Enter the percent of a railcar cargo capacity that defines an adequate load. A railcar with at least an adequate load can depart as soon as all waiting cargo has been onloaded.

- **Maximum Railcar Wait**: Enter the maximum time that a partially loaded railcar (with less than an adequate load) will wait for additional cargo before departing.

- **Minimum Railcars/Train**: Enter a number for the minimum number of railcars in a train.

- **Maximum Railcars/Train**: Enter a number for the maximum number of railcars in a train.

- **Maximum Train Wait**: Enter the amount of time that a number of railcars that is fewer than the minimum for a train will wait for additional loaded railcars before departing.

- **Rail Rate of March**: Enter the speed of travel for a train.

- **Train Travel Schedule**: Select **Continuous** or one of the series of hourly intervals that represents travel/standby schedules for rail travel.
4.7 Road Travel Parameters

These parameters detail the road travel requirements:

- **Adequate Truck Load**: Enter the percent of a truck (or other road vehicle) cargo capacity that defines an adequate load. A truck with at least an adequate load can depart as soon as all waiting cargo has been onloaded.

- **Maximum Truck Wait**: Enter the maximum amount of time that a partially loaded truck (with less than an adequate load) will wait for additional cargo before departing.

- **Line Haul Transition Time**: Enter the amount of time allowed for switching tractors and for any other operations required at a line haul transition point.

- **Military Self Deployed Rate of March**: Enter the speed of travel of organic or unit vehicles.

- **Military Self Deployed Schedule**: Select *Continuous* or one of the series of hourly intervals that represents travel/standby schedules for organic military travel, whether carried out individually or in serials.

- **Commercial Schedule**: Select *Continuous* or one of the series of hourly intervals that represents travel/standby schedules for commercial road travel, whether carried out individually or in serials.

- **Military Schedule**: Select *Continuous* or one of the series of hourly intervals that represents travel/standby schedules for nonorganic military travel, whether carried out individually or in serials.

- **MSR Route Finding Factor**: Enter the weight factor of this type of road for the main supply route (MSR).

- **Road Type 1 Route Finding Factor**: Enter the weight factor of this type of road.

- **Road Type 2 Route Finding Factor**: Enter the weight factor of this type of road.

- **Road Type 3 Route Finding Factor**: Enter the weight factor of this type of road.
### Road Travel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate Truck Load</td>
<td>50 %</td>
</tr>
<tr>
<td>Maximum Truck Wait</td>
<td>0.5 days</td>
</tr>
<tr>
<td>Line Haul Transition Time</td>
<td>0.3 hrs</td>
</tr>
<tr>
<td>Military Self Deployed Rate of March</td>
<td>40.0 mi/hr</td>
</tr>
<tr>
<td>Military Self Deployed Schedule</td>
<td>Continuous hrs</td>
</tr>
<tr>
<td>Commercial Schedule</td>
<td>Continuous hrs</td>
</tr>
<tr>
<td>Military Schedule</td>
<td>Continuous hrs</td>
</tr>
<tr>
<td>MSR Route Finding Factor</td>
<td>0.75</td>
</tr>
<tr>
<td>Road Type 1 Route Finding Factor</td>
<td>1.0</td>
</tr>
<tr>
<td>Road Type 2 Route Finding Factor</td>
<td>1.4</td>
</tr>
<tr>
<td>Road Type 3 Route Finding Factor</td>
<td>3.0</td>
</tr>
</tbody>
</table>
5 Routes

5.1 Viewing a Route

1. In the Setup tab, click on the Theater Network → Routes option.

2. Move the map to its own window by clicking on the arrow in the Setup Map tab.

3. Click on the globe icons next to all of the routes in the Theater Network section of the editors panel.

4. Open the Routes Table. Check the Show On Map checkboxes for the first 15 CONUS routes.

5. Click on a visible route in the Routes table to highlight it on the map.
6. Right click on either the highlighted route in the map or on the route in the table.

7. Hover over the option listing the route that you have selected. This will bring up a submenu.

8. Click on the **Show Links** option. A new table will appear in the main workspace showing the transportation links used in the selected route. In the case of the example above, the Railways table will appear, filtered to the links included in the selected route.
5.2 Adding a Route

1. In the Setup tab, click on the Theater Network → Routes option. From the Routes table, you can change the source, priority, and preferences or you can mark a route as a user route. To edit the links in the route, continue through the steps that follow.

2. Open the map in a new window by clicking on the arrow on the Setup Map tab. Zoom to the area that interests

3. Check the Show On Map checkboxes for the first 15 CONUS routes.

4. Click on the globe icons next to all of the routes in the Theater Network section of the editors panel.

Also click on the globe icon next to the Nodes option in the same area.
5. On the Routes panel, select the + (plus sign) button to create a new route. The Add Routes dialog box will appear.

6. Ensure that the correct Criteria and Mode are selected; keep the Criteria option as Distance and the Mode option as Road.

7. Select the origin of the route (for example, DRIGGS –FLUP-CTY).

8. Select either a node, an intersection, or a link that is going in the direction.

9. Repeat step 8 until the complete route is highlighted.

8. Select OK.

9. The new route will be included in the routes panel. Note that the source is now User (Distance).

10. Click on the new route in the routes table. The route will be highlighted in the map.
6 Viewing Route Information

After a run has completed, it can be useful to look at the movement along the routes. To view a specific day’s activity, follow these steps:

1. After a run has finished, navigate to the Run tab.

2. At the bottom of the page, there is a box with a drop-down arrow. Select **Scenario Replay**.

3. Then in the box nearby, select to show a day earlier in the run (for example, Day 55).

4. The map will then display the movement activities for the selected day.
5. Click on one of the routes. This will create a pop-up a window displaying the route type and quantity of activity.

![Map Selection](image)

6. Double click on the activity type (for example, AirMissionLeg) to view the associated movement data. For the example, the AirMissionLeg Viewer identifies the aircraft type, start location mission time, end location and number of RLNs, full or partial included in the movement.

![AirMissionLeg Viewer](image)

7. Zoom into the eastern portion of the United States. Different types of routes will be shown. Routes shown by lines consisting of shorter dashes are rail routes; lines with longer dashes are road routes. The color of each line represents the color assigned to the asset pool that is traveling on the route. Wider lines indicate that the object traveling has cargo, while narrower lines mean it is being repositioned. Solid black lines are air routes.
7 Reception, Staging, Onward Movement, and Integration

User Case

Reception, staging, onward movement, and integration are the functions that allow ULNs that are split into cargo and personnel to move between theaters on multiple modes, then consolidate or “marry-up” in the destination theater before intratheater deployment.

1. Load the TDX scenario from the Help menu.
2. Navigate to Setup ➔ Deployment ➔ Requirements.
3. Click on the Run Actions button and choose Default Theater Marry Up view. Click OK when prompted with “This option creates parent ULNs for Theater Marry-up. Continue?”
4. Find RLNs 1:0KGBP and 1:0KGB, select the rows and filter to selected. In the Views ribbon at the top of the Requirements table, click on the Extended Schedule button.
5. Scroll to the right in the Requirements table to view the Staging Area Required and Theater Staging Base Required fields.

6. Double click in the Staging Area Required field for ReqID 1:0KGB to change from the default “NO” to “YES.”

7. Enter the GEOLOC code HNTM in the Staging Area field, change SA Mode/Source to PA - Mode Source Optional and enter 2.0 for SA Delay. This tells the model to stage inbound cargo for this movement requirement at a specific location (in this case, Gabes City), to move it to the Staging Area by any means (model defined), and to hold the cargo there for two days after either more than 90% or 100% of the cargo has arrived.
8. Double click in the **Theater Staging Base Required** field and select **YES** for both ReqID 1:0KGBP and ReqID 1:0KGBC.

9. For both ReqIDs, enter the GEOLOC NWXN for the **Theater Staging Base** field and **PA** for the **TSB Mode/Source** field (TSB = Theater Staging Base).

10. Set the delay for the **TSB Delay** field for 1:0KGBC at **2.0** days, and set the **TSB Delay** field for 1:0KGBP at **10.0** days.

11. In the views ribbon, click the **Marry Up** button.

12. In the **Marry Up** editor, double click in the **Marry Up Flag** field for both ReqIDs so that they read **YES**.

13. For **DST Marry Up**, select **NO** for both ReqIDs.
14. Click in the TSB Marry Up field and select BEFORE DELAY for 1:0KGBP and AFTER DELAY for 1:0KGBC. This simulates cargo arriving and receiving a PM (preventive maintenance) check before marrying up with unit personnel, and it simulates the unit conducting training operations with its equipment before intra-theater deployment.

15. Run the scenario. Once it is done, navigate to RLN results and select ReqIds 1:0KGBC and 1:0KGBP. Click on the Display RLN History button above the table to display the RLN History for 1:0KGBC (first screen that follows) and the RLN History for 1:0KGBP (second screen). Note that upon its arrival at the POD, cargo moves to the Staging Area (SA) and Theater Staging Base (TSB). Note also that passengers move through the TSB.