

# JTLS-2013-11722 Non-Circular Sensor And Air Defense Ranges

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## 1.0 Summary of Model Change Request

All sensors have a range and are assumed to cover a circular area. JTLS does not have the ability to represent coverage areas other than circles, such as side looking radars or SAM/AAA sites that can only fire within a specific sector. This means we need to represent off-set areas and partial sectors for a circle for both sensors and SAM/AAA sites.

## 2.0 Design Summary

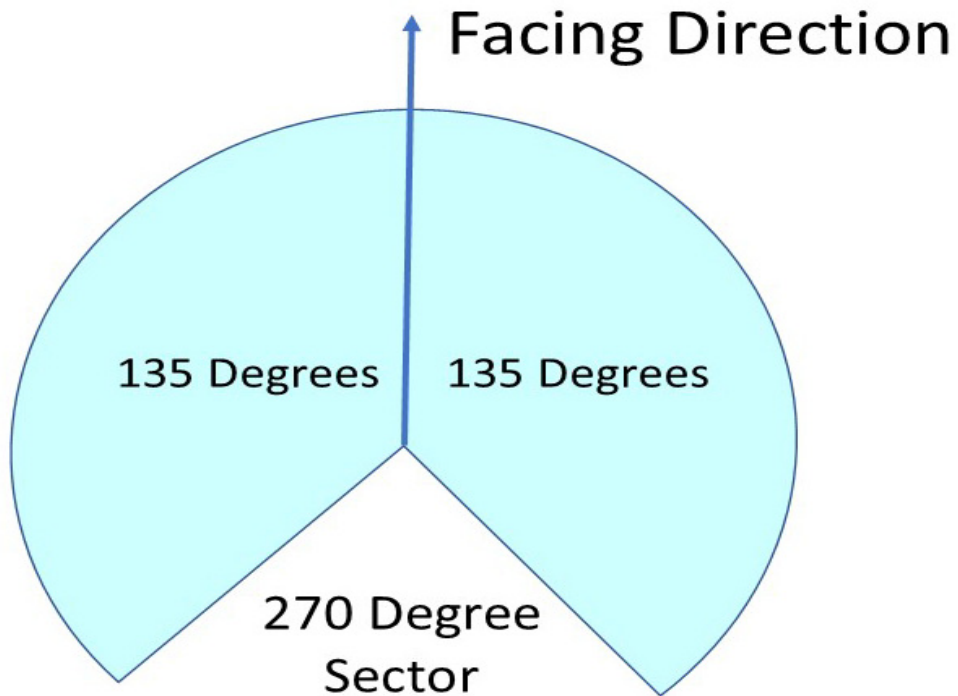
The Sensor Type target prototype and the Air Defense target prototype will each have an additional attribute call the coverage sector. ST COVERAGE SECTOR will be added to the Senor Type target prototype and AD COVERAGE SECTOR will be added to the Air Defense target prototype. This attribute will default to 360 degrees, which will result in the model operating exactly as it does now.

The difficult aspect of this design is to keep the work load of managing the direction of the various sensors and air defense sites to a minimum. The user will be able to set a specific target's direction by a new user order.

## 3.0 Detailed Design

The concept of the design is fairly straight forward. The database will be changed to hold data that indicates the coverage sector for each Sensor Type and Air Defense Type. When a Sensor Target is created using the Sensor Type target prototype or a Surface to Air / Anti-Air Artillery (SAM.AAA) Target is created using the Air Defense target prototype, it will be given the specified sector coverage value. The target will only be allowed to operate within its assigned sector.

As shown in [Figure 1](#), the sector of coverage will be centered on the facing direction of the target. For sensor targets, the target will only be allowed to detect objects within the light blue area. For air defense targets, it will only be allowed to interdict aircraft within the light blue area subject to the assigned Rules Of Engagement (ROE).



**FIGURE 1. Depiction Of Target Sector Coverage**

Obviously the facing direction will be an important aspect of the targets that have a sector size less than 360 degrees. All Sensor Targets and Air Defense Targets must either be owned or associated with a unit. When the target arrives in the game, the following initial target direction will be assigned:

- Owned targets will start out by facing the direction of the owning unit as specified in the database.
- Associated targets will start out facing north or 000 degrees.

The player will be able to change the facing direction of the target using a new order called SET TARGET DIRECTION. The order panel will be fairly simple. Besides the Order Reference field, the order will include the name of the target and the new desired Facing Direction. The target will immediately assume the ordered direction, no time will need to pass to change the direction. This direction will be maintained, no matter whether the target is moving or not until a new direction is specified.

The implication of this rule is summarized in [Table 1](#).

**Table 1. Implication Of**

TARGET MOBILITY TYPE	IMPLICATION
STATIONARY	
MOBILE	
DEPLOY ON THE MOVE	

The WHIP will be changed to

## 4.0 Data Changes

The following variables will be added to the database to support this design.

### ST COVERAGE SECTOR

- Dimension: Attribute of Sensor Type permanent entity
- Mode: Real
- Unit of Measure: Degrees
- Range: 1.0 to 360.0
- Definition: The sector over which the sensor can detect objects..
- Relationships: This parameter is related to the direction the Sensor Target is facing which can either be the direction that the sensor's owing unit is facing or as set by the user.

During database conversion, this database parameter will be set to 360.0 degrees.

### AD COVERAGE SECTOR

- Dimension: Attribute of Air Defense Type permanent entity
- Mode: Real
- Unit of Measure: Degrees
- Range: 1.0 to 360.0
- Definition: The sector over which the sensor can detect objects..
- Relationships: This parameter is related to the direction the Sensor Target is facing which can either be the direction that the sensor's owing unit is facing or as set by the user.

During database conversion, this database parameter will be set to 360.0 degrees.

## 5.0 Order Changes

The SET SENSOR TYPE Order and SET AIR DEFENSE TYPE Order will need to be changed, to allow the Controller to change the coverage sector size.

A new order named SET TARGET DIRECTION will be implemented. The user can select the direction that the target should face. This order will be available to the Player.

## 6.0 JODA Changes

The JODA Target Object will have two new attributes:

- tg\_facing\_direction
- tg\_coverage\_sector

These attributes are needed to properly display the coverage area when displaying the range rings for Sensor Targets and SAM.AAA Targets.

## 7.0 Test Plan

Text *[Describe the basic test objectives and procedures. This Test Plan section may be published as a separate document.]*

### 7.1 Test 1 Title

Purpose: *[Describe the specific feature, function, or behavior to be tested or measured.]*

Step 1: Text

Step 2: Text

**Expected Results:** *[Describe the specific model behavior to be observed.]*

### 7.2 Test 2 Title

Purpose: *[Describe the specific feature, function, or behavior to be tested or measured.]*

Step 1: Text

Step 2: Text

*[Describe the specific model behavior to be observed.]*

