



# CAD-to-CAD Interoperability

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## 1 Introduction

This document is intended for developers who want to write a module to interact with a CAD to CAD interface. It describes how the integration works, its communication protocol, the functionality and data packet definition. This document is divided into the following sessions:

1. What is CAD to CAD?
2. Communication Method
3. CAD to CAD Features
4. Data Packet Definition
5. Cross Reference Setup

## 2 What is a CAD to CAD Interface?

The CAD to CAD Interface is designed to allow the bi-directional transfer of specific incident information between two or more CAD systems as well as providing a messaging tool between multiple CAD systems by using text message functionality.

### *How does it work?*

A connection between a remote CAD system and local CAD system is established when initializing the CAD to CAD interface. Typically, this connection is via a TCP/IP socket connection. Once the connection is made between a local CAD system and a remote CAD system, the CAD to CAD interface will listen to all local CAD system activity messages (NP message.) If certain NP messages are received (such as the creation of a new incident, incident status changes, incident edits, etc.), and the CAD to CAD interface has been configured to trigger the transfer of an incident or other incident updates, then the CAD to CAD interface will validate the trigger criteria and send the data to the remote CAD.

Some specific messages require an acknowledgement message from the remote CAD. Those messages are:

[Heartbeat reply](#)  
[Sending a new incident to a remote CAD](#)  
[New Incident Acknowledgement](#)  
[Receiving a new Incident from a Remote vendor](#)  
[Updating an existing incident](#)  
[Cancelling an incident](#)  
[Unit Status updates](#)  
[CAD to CAD Text Messaging<sup>1</sup>](#)

<sup>1</sup> The CAD Messaging System is required to be toggled on in order for messages to be sent.

### 3 Communication Method:

There are two types of communication protocols that can be configured to transfer the data between two systems.

1. TCP/IP network communication
2. Serial Communication

#### 3.1 *TCP/IP network communication*

The IP network communication protocol is strongly recommended for implementing a CAD to CAD system. The performance of this type of communication is faster than the serial communication. The CAD to CAD interface can be configured as a "Server" which listens to the incoming connection on a configurable port. Or it can be configured as a "Client", which initializes the connection to a Server application on a specified port. All the data will be sent via a TCP/IP socket if this type of communication method is selected. The interface can be configured to listen to a port range of 49,152 to 65,535. Other configurable ports can be assigned as requested.

#### 3.2 *Serial communication*

Use this type of connection method only if an IP network connection is not available between two CAD systems. A serial cable is required between the two CAD to CAD interfaces (remote and local) if this type of communication is selected.

### 4 CAD to CAD Functionality:

The primary object of the CAD to CAD interface is to transfer or receive incident data between two CAD systems. Once an incident is initially transferred from one CAD system to another, the incidents are the linked between the two CAD systems. This section describes how the functionality works and how to interact with them.

Please refer to Addendum A: Data Packet Definition for the message format and sample data package for each function.

#### 4.1 *Heartbeat*

A Heartbeat is an optional feature, implemented to monitor the connectivity of two CAD systems and if necessary, notify select CAD administrative personnel that a CAD to CAD connection has been broken.

##### 4.1.1 Heartbeat Initiate

**Function:**

The interface can be configured to send a heartbeat package at periodic intervals to the remote CAD system to test the connectivity. Heartbeat packets require a reply from the remote CAD interface. If a heartbeat acknowledgment is not received from the remote CAD system, the interface will resend the heartbeat message. When the number of retries is attempted and still no acknowledgment received, the interface will consider the connection to be lost, and the interface will send out notification message via the CAD Messaging system to pre-defined users on the CAD system.

The default periodic interval of sending heartbeat is 10 seconds. The default wait time for the interface to reply is 10 seconds and the default number of retries is 3 times.

**Interacting with this function:**

The Remote CAD interface must send a heartbeat acknowledgment (reply) message in response to a “Heartbeat” message.

**Remark:**

The Heartbeat feature is configurable. By default this feature is on.

[Refer to Table 1 for the heartbeat initiate package](#)

## 4.1.2 Heartbeat Reply

The Remote CAD is expected to reply to a Heartbeat Initiate message from local CAD system.

**Function:**

Upon receipt of a heartbeat initiate message package, the remote CAD will reply within a configurable time period with a heartbeat reply message.

**Interface with this function:**

No Acknowledgment is required for heartbeat reply.

**Remark:**

Heartbeat configuration settings are performed by a Systems Engineer at system installation and setup.

[Refer to Table 2 for the Heartbeat Reply package definition and sample package.](#)

## 4.2 New Incidents

### 4.2.1 Sending New Incidents

The interface provides functionality to allow the transfer of a new incident data to a remote CAD system.

**Function:**

The CAD to CAD interface provides manually configurable switches<sup>2</sup> which define the CAD dispatch triggering event that cause the CAD to CAD interface to initiate the transfer of a new incident package to be sent to a remote CAD interface. Those event settings are:

A new incident is created in CAD. This is defined as the moment the initial incident is sent to the waiting incident queue. It is very important to point out that some incidents may be sent to the waiting incident queue early, with very minimal incident information (i.e., only and address and a problem/nature.)

A dispatcher manually requests a transfer of incident via the CAD command line or via a button on Incident display screen.

Initial Assignment

<sup>2</sup> Manually configurable option switches are set during the administrative configuration & setup of the interface. These settings are not modifiable on-the-fly.

Once a single triggering event is received by the CAD interface, the interface will validate a set of pre-defined criteria to determine if the incident should be sent. (The incident send criteria are predefined in the interface setup.) The interface may be configured to validate additional criteria (i.e., all incidents are sent or by meeting a one or more criteria (from the list below.) The following is a list of incident criteria that the interface can use to validate the sending of a new incident:

- Matching Response Area
- Matching Problem/Nature
- Matching Response Plan
- Matching Response Priority
- Matching Agency or Jurisdiction
- Response Area Match In conjunction with a Problem/Nature
- Matching a User Data field value match

Note: The CAD interface provides cross-reference lists to be configured, via a setup utility, for each of the criteria types shown. (Please refer to [Addendum Section 6](#) for a cross-reference listing.) When the CAD interface sends (or receives) a new incident package and cross references have been configured, the interface will match the CAD cross-reference field value with the corresponding value for the remote site and will substitute the remote sites configured value for the CAD field value (on outbound messages.) The reverse if this is true with inbound incidents from a remote site, in which case the remotes sites field value will be substituted with the CAD cross-reference value.

In the case that no-match is found in the cross-reference, the field will be left blank.

If one or more of the specified criteria are met, the interface will compose the incident data packet ([as defined in Table 3](#)) and will send it to the remote CAD system. The interface will then wait for an acknowledgment from remote CAD system as defined in [Table 4](#).

Upon the completion of a new incident transfer, the interface will perform the following actions:

- Add an entry to CAD Activity Log
- Add an entry to incident comments
- Add an entry to the interface log table<sup>3</sup>

**Interaction with this function:**

Upon receipt of the incident packet, the remote CAD system will send back an incident acknowledgment. The acknowledgment must include the remote CAD incident number or other defined identification/reference number as defined in [Table 4](#). This is the number that the interface will use to link subsequent incident updates and unit status changes.

**Remark:**

A cross-reference setup maybe required if the incident field description is different than the remote CAD's system. Please refer to the "Cross Reference Setup" for list of cross reference table

Here is the list of Incident data elements that are sent to a remote CAD:

- CAD Master Incident Number
- Problem/Nature
- Incident Type
- Priority\_Number
- Priority\_Description

<sup>3</sup> The Interface Log table keeps track of the incident and units assigned to the incident that have been sent and received.

- Address
- House Number
- House Number Suffix
- Prefix Directional
- Name Component
- Street Type
- Post Directional
- Apartment
- Building
- City
- State
- Postal Code
- Location Name
- Cross Street
- Map Info
- Caller Name
- Call Back phone
- Response Area
- Response Plan
- Longitude
- Latitude
- Time\_Phone Pickup
- Response\_Date (record creation)
- Current Date & Time
- Primary TAC Channel
- Agency Name
- ProQA Determinant (if available)
- Incident Comments (most recent first, to oldest last)
- Caution Notes
- Hazmat

#### 4.2.2 New Incident Acknowledgment

The remote CAD sends back an Acknowledgment to the sending CAD system to confirm the receipt of the incident.

**Function:**

Upon the receipt of the incident acknowledgment, the interface will log the remote CAD incident number to the local CAD system as a key to link other incident information updates between two CAD systems. It will also write the remote CAD incident number to the incident comments field. The format of the incident acknowledgement package is defined in [Table 4](#).

**Interact with this function:**

No Acknowledgment is required for incident acknowledgment.

**Remark:**

If an acknowledgment is not received within a specified waiting period (10 second wait period with 3 retries), the interface will send a "Failed to Send Incident" notification message via the CAD Messaging system to a predefined CAD notification group.

In addition, all subsequent incident updates for unacknowledged incidents from the remote CAD system will be ignored due to the lack of a remote CAD incident

number/reference. Remember, the remote CAD incident number is the key to performing all subsequent incident updates from the remote CAD.

## 4.3 Incident Updates

### 4.3.1 Sending Incident Update information

If an incident has been transferred to a remote CAD system, then subsequent updates of specific fields of the incident in CAD will trigger an incident update message to the remote CAD system to update the remote incident.

**Function:**

When the CAD interface receives an incident update from the local CAD, the interface will check to see if the changed incident field matches one of the following (configurable) CAD fields:

- Problem/Nature
- Address
- City
- Apartment
- Location Name
- Priority
- Primary TAC Channel
- Comments
- Building
- Call Back Phone
- Caller Name
- Zip Code
- Cross Street

If the interface sees that the data has been changed in one or more of these fields and the configurable field switch (as listed above) is turned on, the interface will send an Incident Update Package as defined in [Table 5](#).<sup>4</sup> The message format is the same as incident package defined in [Table 3](#).

In the event that any of the following incident fields are changed:

- Problem/Nature
- Address
- City
- Apartment
- Location Name
- Priority
- Primary TAC Channel
- Comments
- Building
- Call Back Phone
- Caller Name
- Zip Code
- Cross Street

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<sup>4</sup> The interface can also be configured to send the complete set of incident information to the other CAD when an update is triggered by one of the above fields, however this practice is **not recommended**.



The interface will resend the following fields:

- Problem/Nature
- Priority
- Address
- Primary TAC Channel
- Apartment
- City
- Postal Code
- Location Name
- Caution Notes
- Hazmat
- Comments
- Call Back Phone
- Caller Name
- Zip Code
- Cross Street

**Interacting with this function:**

No acknowledgment is needed for incident update.

**Remarks:**

A cross-reference setup is required for the following CAD fields if the remote CAD's description is different than the one in local CAD system.

- Problem nature
- Priority

## 4.4 Incident Cancellation

If an incident that has been sent from CAD to a remote CAD system or an incident received from a remote CAD system is cancelled within CAD, the cancellation event will trigger the sending of an incident cancellation packet to the remote CAD system.

**Function:**

When the CAD interface receives a CAD Incident cancellation message, the interface will validate that the incident is a previously transferred or received incident. If it is, the interface will compose an incident cancellation packet and send it to remote CAD system.

**Interact with this function:**

No acknowledgment is required for incident cancellation.

**Remark:**

A cancellation packet includes the cancellation reason and the disposition. Please refer to [Table 6](#) for package layout.

## 4.5 Unit Sharing Concepts and Actions

Two CAD systems may be configured to allow one or more of its vehicles to be monitored (i.e., status changes, assignments, etc.) and assigned to incidents in a 2<sup>nd</sup>/remote CAD system. *(Please note that both systems must be configured for this to work.)*

The **vehicle name cross reference table** provides a means to map a vehicle's radio name on one system with the corresponding name on another system. i.e., CAD "A" has an engine whose radio name is "E101" (CAD "A" owns E101) E101 happens to be a vehicle that is also watched by CAD "B" and receives periodic status and location updates from CAD "A" CAD "B" names E101 as xE101 so it is easily distinguishable as a shared CAD "A" vehicle.

Thus in the cross reference table of CAD "A" would show the following:

<u>CADUnit → OtherCADUnit</u>	
E101	→ xE101

...and in the cross reference table of CAD "B" would show the following:

<u>CADUnit → OtherCADUnit</u>	
xE101	→ E101

This requires the System Administrator of the remote CAD to create the vehicle using its Vehicle Manager Utility, to name it appropriately (i.e., xE101) and to configure the vehicle with the respective hierarchy, station assignments, resource and capabilities assignments.

Once the vehicle cross reference has been created, the originating vehicle's CAD interface will provide status updates of shared vehicles to the remote CAD. The same will hold true if the remote CAD has shared one or more of its vehicles with the other CAD.

The interface of an originating CAD who has one or more units shared with another CAD will send a vehicle status update package each time that vehicle's status changes. The update data package will include the following:

- unit name
- status code
- longitude (v1.1)
- latitude (v1.1)
- Time of the status event.

The receiving/remote CAD interface will update that vehicle's position and status in the remote CAD.

Shared units, whose vehicle information is properly developed in the Vehicle Utility, will acquire the same attributes of a native unit and will be evaluated in the initial assign process.

Should the originating CAD assign a shared vehicle to a local incident, the originating CAD interface will send the remote CAD an Out of Service (OOS) status update. During the time the vehicle is in an OOS status, the originating CAD interface will still send vehicle location/position updates. When the vehicle becomes available (completes its incident assignment), the originating message will send an "Available" status change packet to the remote CAD.

#### 4.5.1 Unit Status Updates (Incident Status Changes)

When a unit's status changes and that unit is assigned to an incident which has been transferred to a remote CAD, the interface will compose and send a unit status change packet to the remote CAD system.

##### Function:

The interface will validate that the unit is associated with an incident that has been transferred to a remote CAD system. If the unit and incident are matched, the interface will check to see if the status event is a configured triggering event for the remote CAD. Configurable triggering status events are as follows:

- Unit en-route to the incident
- Unit arrives at incident scene
- Unit departs scene (transport)
- Unit arrives at transport destination
- Unit clear (completes) the incident

If the current status change matches the configured trigger, a unit status change (including the unit's current position) packet will be composed and sent to the remote CAD.

**Interact with this function:**

No acknowledgment is required for unit status update

**Remark:**

The packet contains the unit name, status code, longitude, latitude [\(v1.1\)](#) and time of the status event.

Please refer to [Table 8](#) for package layout.

The interface can also be configured to include a packet for incident cancellation based on the last unit clearing from the incident. Please refer to [Table 7](#) for package layout. This is used only if CAD wants to receive a warning message that the incident is closed on the receiving CAD.

## 4.5.2 Shared Unit Incident Assignment

One of the advantages of Unit sharing is that it provides the opportunity for a remote CAD dispatcher to assign a remote/shared unit to one of its own incidents, just as if it were its own native units.

When a vehicle is assigned to an incident, the CAD to CAD interface will evaluate if the unit assigned is a shared unit from a remote CAD. If it is, the interface will send a message packet to the unit's native CAD. The interface at the unit's native CAD will place the vehicle in an Out of Service status, which will indicate that the vehicle has been assigned to an incident on a remote CAD.

When the vehicle completes the incident, the remote CAD interface will send a message packet to the unit's native CAD to place the unit in an available status at its last known position.

**Interact with this function:**

No acknowledgment is required for unit status update

**Remark:**

The packet contains the unit name, status code, longitude, latitude [\(v1.1\)](#) and time of the status event.

## 4.6 Incident Completion (call closing)

When a linked CAD Incident closes, the Interface shall generate and send a Call Closed message to the Remote CAD System. The message will provide the CAD and linked Remote CAD incident numbers for reference, and the Cancel Reason and Disposition, if available.

## 4.7 CAD to CAD Text Message:

The CAD to CAD interface provides a means for a CAD Dispatcher to send and receive messages to or from a specific Remote CAD machine or to broadcast a message to or from a Remote CAD system.

This is the only functionality that is non-incident related.

### **Function:**

The Interface has the ability to send a text message to a remote CAD user. A message will be sent via the CAD PowerLine feature using the CAD messaging system. The CAD user will be required to enter a valid remote user as a destination.

The interface will have the ability to receive a message from a remote CAD system which can be delivered to the following:

- A specific CAD workstation (by workstation name)
- A specific CAD user
- A CAD vehicle

### **Interact with this function:**

No acknowledgment is required for Text Message.

### **Remark:**

The remote CAD system will be required to provide the proper destination address. The CAD client's administrator will be able to provide the remote CAD with the proper addresses.

See [Table 9](#) for the package layout.

## 4.8 Receiving a new Incident from a Remote vendor

This scenario involves new incidents being sent from a Remote CAD system to the local CAD system.

### **Function:**

The interface maintains a local table of incidents received from a remote CAD vendor. The vendor's incident/tracking/reference number will be the key to future incident matches.

The interface will receive a new incident data pack as defined in [table 3](#).

The Interface will search the local temporary table of incidents received from a remote CAD vendor on the incident number to determine if the incident already exists in the local CAD system. If the incident has a match in the local temp table (indicating that the incident has already been received), the new incident packet will be ignored.

Otherwise, the interface performs the following tasks:

- It logs the entry to the incident log table for tracking.
- it creates a new incident in local CAD system
- It writes the incident number of the remote CAD incident to user data field in local CAD system.

- The interface contains an automatic geo-validation switch. If the switch is off, the interface will use the default hierarchy settings (Agency, Jurisdiction, Division & Battalion), other wise...
- It geo-validates the address. If it finds a match, the associated response area hierarchy will be assigned to the incident. If the address is an intersection, the interface will geo-validate the intersection. If geo-validate do not find match, interface will assign the default hierarchy (if one has been set up) to the unmatched address.
- A Point-in-Polygon (PIP) switch has been implemented. If this switch is toggled on, the interface will perform a PIP lookup and record the polygon information into the CAD incident. (v1.1)
- If the vendor's problem/nature does not have a match in the problem/nature cross-reference table, the interface will use the "DefaultCADProblem" configuration setting.
- create an entry to CAD activity log
- Broadcast an IPC message to all CAD workstations.

**Interact with this function:**

The local CAD system will send back an acknowledgment which will include the local CAD incident number and the remote CAD incident number. Refer to [table 4](#).

**Remark:**

A cross reference setup is required if some of the incident fields do not match the description in local CAD system. Please refer to the "Cross Reference Setup" for list of setup.

The packet layout for incident information from remote CAD is the same as the new incident packet layout from local CAD. See [Table 3](#) for packet layout.

## ***4.9 Receiving an Incident Update from a Remote vendor***

This scenario involves incident updates being sent from a Remote CAD system to the local CAD system.

The following incident field updates are supported in local CAD system. All other updates should be sent as a Comment update.

- Problem/Nature
- Address
- City
- Apartment
- Location name
- Priority
- Primary TAC Channel
- Comments
- Call Back Phone
- Caller Name
- Zip Code
- Building

Comments (CAD to CAD allows multiple comments in the data packet. However, an update packet should only include the new comment)

**Function:**

When the interface receives an update packet from the remote CAD system, the interface will search the local temporary table of incidents received from a remote CAD vendor on the incident number to determine if the incident has already be received from the remote CAD vendor.

If the incident has a match in the local temp table (indicating that the incident has already been received), the interface will perform the following:

The interface will check to see if the local CAD incident is closed. If it is closed, the remote incident updater record will be discarded, as closed incidents may not be updated.

If not closed, the proper incident fields will be updated

If the vendor's problem/nature has been changed and the new problem/nature does not have a match in the problem/nature cross-reference table, the interface will not change the problem nature.

The local CAD workstations will be updated.

**Interacting with this function:**

No acknowledgment is required for incident update.

**Remark:**

The packet layout for Incident update from remote CAD is the same as the packet layout for incident update from Local CAD.

See [Table 5](#) for packet layout

## ***4.10 Receiving Incident Cancellation Information***

This scenario involves the notification of the cancellation of an incident from a Remote CAD system to the local CAD system.

**Function:**

When interface receives a cancellation of incident from the remote CAD system, it validates if the incident is a previous transferred or received call base on the incident number in the data packet. Then it writes a comment to the associated incident to notify the dispatcher.

In addition, the interface can be configured to cancel the incident.

**Interact with this function:**

No acknowledgment is required for incident cancellation.

**Remark:**

The interface will not close an incident in the local system. The decision to close the incident is always the dispatcher's responsibility. The interface will only send out a notification upon receiving of the cancellation request from remote CAD system.

See [Table 6](#) for packet layout

## ***4.11 Receiving Unit Status Update:***

This scenario involves the sending of a unit status update from a Remote CAD system to the local CAD system.

There are two levels of functionality available:

1. Adding an incident comment indicating a unit status change:

**Function:**

Upon receipt the unit status update, the interface validates the incident that is associated with the unit status. If the incident is not closed and is still active, then interface will create a comment to the incident. The comment includes the status action change, the unit/vehicle and the time the status change was received from the remote CAD.

**Interact with this function:**

No acknowledgment is required for Unit Status Update.

**Remark:**

A cross reference for unit name and status code may be required if the descriptions are different from the CAD system.

See [Table 7](#) for packet layout

## 2. Changing the CAD Unit's incident status:

Upon receipt of the unit status update packet from a remote CAD, the CAD Interface shall perform a cross reference lookup of the reported unit. If the unit is not matched, an incident comment entry shall occur.

If the unit cross-reference is matched, the CAD interface will attempt to match a cross-reference to the remote CAD status received. If the status is not matched, an incident comment entry shall occur.

The status change process shall adhere to the CAD status change rules as configured on the local CAD system. This means that the status change sent with the unit must be allowable as a configured status change in CAD. If the status change is not allowed by CAD, an incident comment entry shall occur.

For received Updated Unit Status where the status clears the unit from the CAD incident, and the unit is the last unit on the call, the interface process shall result in closing the CAD incident. The Cancel Reason and Disposition for the incident closure shall be based on the data received in the Updated Unit Status message, or if valid Cancel Reason and/or Disposition are not supplied, the CAD configured defaults shall be used.

## 4.12 Receive Call Closed Message

When the Interface receives a packet from the Remote CAD System indicating the call has been closed on the Remote CAD System, the Interface shall create an incident comment in the linked CAD incident. The comment will state the Remote CAD System incident has been closed, and include the Cancel Reason and Disposition, if provided. Receipt of a Call Closed Message will not close the linked CAD Incident.

## 5 Advanced CAD to CAD Functionality

**NOTE: The following Advanced CAD to CAD Functionality (all of Section 5) is a separately-purchased option and is not configured or available as part of the Standard CAD to CAD functionality.**

The Advanced CAD-to-CAD functionality provides enhancement to the existing functionality of the standard CAD to CAD interface. It now supports incident linking and unit sharing between multiple CAD systems. The following is a list of enhanced and new features.

- Unit Sharing,
- Send/Receive Position Updates for Shared Units,
- Send/Receive Unit Status Changes for Shared Units,
- New Incident Acknowledgment,
- Incident Notify messages.
- Mirror Unit Activity Logs for shared Units
- CAD-to-CAD Multi-agency Cross-References
- Send/Receive Incidents with Specific Agency

CAD to CAD connectivity has now been expanded beyond just single set of CAD to CADs to included 2 or more CAD to CAD connections.

### 5.1 Unit sharing

Advanced CAD to CAD unit sharing allows one or more of a CAD systems units to be monitored (i.e., status changes, assignments, etc.) and assigned to incidents in multiple remote CAD systems. *(Please note that local CAD and the remote CAD systems must be configured for this to work.)*

In a local CAD system, there can be two types of shared units, local and remote. Local shared units are owned by an agency in the local CAD and are shared with one or more remote CAD systems. Remote shared units are owned by an agency in a remote CAD system and shared with the local CAD. Units are configured for sharing by unit name. A unit will be configured as a remote or local share using the interface's Shared Unit Cross Reference form. Both remote and local shared units must be created with Vehicle Manager and configured in the interface. The unit's jurisdiction, capabilities, resources and resource groups need to be set in vehicle manager in order for them to be use by CAD's initial assign feature.



### 5.1.1 Shared Unit Cross Reference Form

ID	Unit Name (local)	Home CAD	Remote CAD	Unit Name (Remote)
104	101	METROPOLI:		METROPOLIS_101
107	103		GOTHAM	SHANGRILA_103
135	104		METROPOLI:	SHANGRILA_104
138	M10		GOTHAM	GOTHAM_M10
139			GOTHAM	SHANGRILA_102
141	102		METROPOLI:	SHANGRILA_102
142	105	METROPOLI:		METROPOLIS_105
145	M001	METROPOLI:		METROPOLIS_001
146	M002	METROPOLI:		METROPOLIS_002
147	M003	METROPOLI:		METROPOLIS_003

Unit Name (local): M001    Home CAD: METROPOLIS    Remote CAD:    Unit Name (Remote): METROPOLIS\_001

Buttons: Add, Edit, Delete, Save, Cancel, Exit

This form has drop down fields to allow the selection of the unit name, home CAD or Remote CAD, and the remote unit name. The form allows users to sort by column. The information is stored in the shared unit cross reference table virtual table

The **shared unit cross reference table** provides a means to map a vehicle's unit name on the local CAD system with the corresponding name use to communicate the unit's status to the remote CAD system(s). It also provides the means to specify whether a unit is a local shared or remote shared unit.

Local shared units can set a one-to-many relationship by using multiple rows pairing the unit with remote CAD systems. All local shared units may have multiple rows. They must have their HomeCAD set to blank and their RemoteCAD set to a remote CAD system. Each unique local shared unit to RemoteCAD pairing must be listed only once.

Remote shared units must maintain a one-to-one relationship having one row pairing the unit with its home CAD system. All remote shared units must have their RemoteCAD set to blank and their HomeCAD set to the remote share's home CAD.

In the following example unit E51 is a local shared unit. Unit MetroT12 is configured as a remote shared unit. By setting E51's RemoteCAD to METRO and GOTHAM we are allowing our unit, E51, to be monitored by and assigned to incidents in the GOTHAM and METRO remote CAD systems. Thus local initiated status changes and related incident data for E51 are automatically shared with GOTHAM and METRO.

LocalUnitName	HomeCAD	RemoteCAD	RemoteUnitName
E51		METRO	MYFD_E51
MetroT12	METRO		METRO_T12
E51		GOTHAM	MYFD_E51

Because we have shared E51 to two remote CAD systems, the System Administrators of those remote CAD systems need to create a vehicle and unit to represent our unit and vehicle. They should create the vehicle like any normal vehicle using the CAD Vehicle

Manager Utility to configure the respective hierarchy, station assignments, resources and capabilities. They should name it appropriately to identify it as your unit.

In the example above, unit MetroT12 is configured as a remote shared unit. MetroT12 is owned by the METRO remote CAD system. It has been built in our local CAD system as a representative of METRO's T12 unit. Remote shared units, whose vehicle information is properly developed in the Vehicle Utility, will acquire the same attributes of a native unit and will be evaluated in the initial assign process.

The RemoteUnitName is used to uniquely identify a unit when sending and receiving status updates. The use of a remote unit name allows multi-CAD-to-CAD systems to establish a globally unique name for communicating unit data amongst themselves.

## 5.1.2 Exchange Position Updates for Shared Units

### 5.1.2.1 Send updates for Shared Units

#### 5.1.2.1.1 *Local Shared*

The interface can be configured to send batched AVL information for local shared units to the remote CAD(s) the unit is shared with. The data and format of the batched AVL unit data can be configured using the AVL Data Template String. This string is the format used to create AVL data for one unit. The interface will use the format string to create a string for each unit. These unit strings are concatenated (batched) together and passed to the falcon composer. The composer can then nest this data string into a data packet for sending.

The AVL Data Template String is comprised of tokens, delimiters, a starting delimiter and an ending delimiter. The Data Template String must have a starting delimiter and delimiters between the tokens. Below are two examples of data template strings

```
<vehicle unitname="[REMOTEUNITNAME]" Current_Lat="[LATITUDE]"
Current_Lon="[LONGITUDE]" LastAVLUpdate="[LASTUPDATE]"/>
```

```
*; [LATITUDE]; [HEADING]; [LONGITUDE]; [LASTUPDATE]; [SPEED]; [REMOTE
UNITNAME];
```

#### **Tokens**

The AVL Data Template String may contain any combination of tokens in any order. Tokens must be separated by delimiters. When the interface forms the AVL data string for each unit, it replaces the tokens with the corresponding unit data. The interface will insert unit data for the following 8 tokens.

- **[REMOTEUNITNAME]**  
The **RemoteUnitName** as configured in the Shared Unit Cross Reference form.
- **[LOCALUNITNAME]**  
The **LocalUnitName** as configured in the Shared Unit Cross Reference form.
- **[LATITUDE]**  
Current latitude of unit from MSOS. Formatted in signed degree decimal format to six decimal places. (i.e. 33.022486 )

- **[LONGITUDE]**  
Current longitude of unit from MSOS. Formatted in signed degree decimal format to six decimal places. (i.e. -171.179225)
- **[SPEED]**  
Current speed of unit from MSOS. Integer data from 0 through 255.
- **[HEADING]**  
Current unit heading data from MSOS. Variable-length non-Unicode data with a maximum of 3 characters.
- **[ALTITUDE]**  
Current unit altitude data from MSOS. Integer (whole number) data. (-2,147,483,648 through 2,147,483,647).
- **[LASTUPDATE]**  
Last unit AVL update data from MSOS. In General Date format: format specified in your computer's regional settings. Display a date and/or time. If there is a date part, display it as a short date. If there is a time part, display it as a long time. If present, both parts are displayed.

### Starting Delimiter

The starting delimiter is any characters left of the first token. The format string must start with a delimiter that is different than subsequent delimiters. The starting delimiter must be distinct so the receiver can separate the batched data into individual unit data strings. The format string below has a starting delimiter of asterisk semicolon.

**\*:[REMOTEUNITNAME];[ LASTUPDATE];**

### Delimiter

Tokens must be separated by delimiters. Delimiters are the text between the tokens. The delimiting text acts as recognizable field separators. The delimiters can each be different. The delimiters must not be similar to unit data. Avoid colons, hyphens and slashes as delimiters. These can be confused with dates and times. Avoid delimiting text similar to unit names. Delimiters can be any text from simple field separators to XML.

### Ending Delimiter

The ending delimiter is any text right of the last token. Any text after the last token is optional.

### Ending Delimiter

All AVL data template strings follow the same pattern of starting delimiter, field, delimiter, field, delimiter, etc.

### Example Template String

```
<vehicle unitname="[REMOTEUNITNAME]" Current_Lat="[LATITUDE]"
Current_Lon="[LONGITUDE]" LastAVLUpdate="[LASTUPDATE]" />
```

The table below shows a dissection of the example template string above.

<b>Starting Delimiter</b>	<b>&lt;vehicle unitname="</b>
<b>Field 1</b>	<b>[REMOTEUNITNAME]</b>
<b>Delimiter 2</b>	<b>" Current_Lat="</b>

<b>Field 2</b>	<b>[LATITUDE]</b>
<b>Delimiter 3</b>	<b>" Current_Lon=</b>
<b>Field 3</b>	<b>[LONGITUDE]</b>
<b>Delimiter 4</b>	<b>" LastAVLUpdate=</b>
<b>Field 4</b>	<b>[LASTUPDATE]</b>
<b>Ending Delimiter (optional)</b>	<b>" /&gt;</b>

Using the example template string above the interface would yield a string of unit data like the following.

```
<vehicle unitname="MYFD_E51" Current_Lat="33.022486"
Current_Lon="-116.1044" LastAVLUpdate="02/10/2008 01:31:39" />
```

Similar strings are created for all the local shared units. These unit strings are concatenated (batched) together and passed to the falcon composer. The composer can then nest this data string into a data packet for sending.

The interface will use a timer event to send the batch updates at regular intervals. The send batch interval can be configurable in the interface. A minimum and maximum value set in IHsetup.exe prevents the interval from being too fast or slow. The default minimum time is set at 10 seconds. There is no IH default maximum set. Maximum allowable interval is 2147483 seconds (24 days). Latitude and longitude data is sent in standard signed degree decimal format up to six decimal places. (i.e. 33.022486, -116.1044, -116.104432, 33.02)

#### 5.1.2.1.2 Remote Shared Units

Remote shared units are owned by their Home CAD systems and receive their AVL data from their Home CAD. The interface will send AVL and location information for a remote shared unit when unit status update packages are sent. The interface will send the location information of the last geo-validated address of the unit in the unit status update package. A status update package for a remote shared unit is sent to the unit's home CAD.

### 5.1.2.2 Receive position updates for Shared Units

#### 5.1.1.1.1 Local Shared Units

The interface will receive location information updates with every status update package received from a remote CAD. The receiving CAD interface can be configured to ignore the station or location information for their local shared units by setting the option switch **UnitSharing\IgnoreLocalSharedUnitInboundAVL=True**.

#### 5.1.1.1.2 Remote Shared Units

The interface will receive batched update packages for remote shared units from the remote unit's home CAD, provided they have AVL data. The interval between batch updates should not be less than 10 seconds. The interface will receive these packages and pass the AVL data to the MSOS module for processing and updating. Only AVL unit data with a timestamp newer than MSOS's cached unit AVL timestamp will be passed to MSOS. MSOS can be configured to govern the frequency at which the AVL data will enter the local CAD system.

## 5.1.3 Unit Status Updates for Shared Units

### 5.1.3.1 Rules for Status updates

When a local or remote shared unit's status is changed by local events the interface will transmit a unit status update package to every remote CAD system matched to the shared unit in the Share Unit Cross Reference table. This list of remote CAD systems is called the unit's shared list.

Advanced CAD-to-CAD update packages require two new fields. These fields are the shared list and the IncidentGUID. The shared list will allow the status update package to traverse the interlinked CAD systems. When a status update package is received the shared list in the package is compared to the local shared list for the unit. If there are remote CAD systems in the local shared list that are not in the package's shared list then the interface knows there are remote CAD systems using the unit that have not yet received a status update package. If the status update package indicates a change in the unit's current status then the interface will re-transmit the update status package to the remote CAD systems that have not yet received it. The IncidentGUID is a globally unique ID created by the Advanced CAD-to-CAD interface that creates the incident. The IncidentGUID is necessary for status changes for multilinked incidents. The advanced CAD-to-CAD update package will contain the unit status even if the incident is not linked. It is the job of the receiving interface to determine if the incident is linked and to attempt to apply the appropriate status.

When the interface detects a locally initiated status change or unit assignment for a local shared unit, a unit status update will be sent to only the remote CAD systems configured in the shared unit cross reference table for that local shared unit.

When the interface detects a locally initiated status change for a remote shared unit, the unit status update will be sent to the home CAD system configured in the shared unit cross reference table for that remote shared unit. When the interface detects a locally initiated incident assignment for a remote shared unit, the local interface will link the incident to the unit's home CAD system prior to sending the status change update. This allows the remote CAD system to relay incident assignment information to its unit.

Whether a shared unit is a remote shared or local shared unit, the interface will send a vehicle status update package each time that vehicle's status changes. The update data [package](#) will include the following:

- Remote unit name
- Status code
  - Vendor status code cross references can be configured for each remote CAD in the StatusXRef virtual table. StatusXRef virtual table contains the status codes from the code column of the status table in the system database matched with the equivalent vendor status.
- Longitude (v1.1)
- Latitude (v1.1)
- Disposition
- Time of the status event.
- Incident GUID
- Shared list.

The receiving CAD interface will cross reference the remote unit name and status code to determine if the unit exists and if the status is incident related. Incident GUID is used to determine if the status change is for an existing local incident. If the local incident does not exist (not linked) and the status change is incident related (i.e. Dispatch, en-route, etc.), the interface will attempt to set the unit's status to Out of Service (OOS),

Otherwise it will attempt to apply the received status code to the unit. The receiving CAD will update that vehicle's position if it is a remote shared unit. The receiving CAD can be configured to update or ignore unit position updates for local shared units.

### 5.1.3.2 Receive status Updates for Remote Shared Units from Remote CAD

When the interface receives an update status package from a remote CAD it uses the shared unit cross-reference table to translate the remote unit name. The interface can be configured to use [status cross reference](#) table to determine status. The interface will examine the CADNumber, OtherCadNumber and IncidentGUID items in the unit status update package to determine whether the incident is linked to the local CAD system. For incident related status changes, if the incident is not linked to the local CAD system then the interface will set the unit's status to out of service. The OOS type can be configured for each local agency. The OOS type for remote shares on remote calls for each local agency will be stored in a virtual table. If the incident is linked then the interface can be configured to record a status change in the incident comments or update the unit's status. If the interface is configured to update the unit status then the interface will attempt to apply the status change. All status changes will generate CAD (update) NP messages. A status change to dispatch will generate the usual alerts in the CAD system.

### 5.1.3.3 Receive status Updates for local Non-Shared Units from local CAD

The interface can be configured so all status changes for non-shared units that are assigned to linked incidents will be added to the comment of the incident. To enable this feature set the TssIntGenSetup main option 'UnitSharing\CommentNonSharedStatusChangeEnable' =True. The default format of the comment update follows the format below

**<SITE> Unit <UNIT> Status=<STATUS>:<MESS>**

Each token is replaced by the corresponding status update information. The default comment will look like the example below

**METROPOLIS Unit E51 Status=DSP:E51 Is Now DSP At 1325 Island Ave**

#### Tokens

- **<SITE>**  
This is the name of the local CAD. This value set in the TssIntGenSet option setting 'Options\Local Site Name'
- **<UNIT>**  
This is the local unit name of the vehicle
- **<STATUS>**  
This the status description from the system database status table
- **<MESS>**  
Message provided in local NP message. This message follows a basic who, what, where format containing the unit name, status and location.(i.e 114 Is Now EH At N Burma Rd.)

The default comment format can be replaced with your own. A custom format string can use the tokens. Set your own format string in TssIntGenSetup main options 'UnitSharing\CommentNonSharedStatusChangeMsg'

## 5.1.4 Mirror Unit Activity Logs for Shared Units

### 5.1.4.1 Remote shared units

Because all incident assignment and activity for a remote shared unit is predicated on the incident being linked to the unit's home CAD, the interface will not have to mirror the activity log for remote shared units.

### 5.1.4.2 Local Shared Units

The interface will send unit status updates to all CAD systems the unit is shared with. If the incident is not linked, the receiving interface will use the information in the status update package to update the unit activity. Below is an example of a mirrored activity log entry.

```
Mirror activity log of SHANGRI_LA via
C2C: Disposition=DSP; SHANGRI_LA; RMI . MIN=20080121-
0002165; Address=7421 Guthrie Way; Problem=Traffic Accident
EMS; Priority=Life Threatening Emergency; Multi-Agency
Links=[EMS]20080121-0002165, [Police] -20080121-00038
```

The mirrored activity log entry contains the unit status, remote CAD name, master incident number, address, problem, priority, and any multi-agency links in the remote CAD.

## 5.2 Incident Linking

### 5.2.1 Rules for Incident updates

The interface will compare the data in the incident update package with the data that the interface currently has on the incident. If it detects a change in incident information it will update the local copy of the incident. If the incident is associated in the InterfaceCallRefNum table with CAD systems other than the sender of the incident update package then the interface will re-transmit the information to those systems. We avoid the potential for looping by checking if the update has already been made before re-transmission.

#### 5.2.1.1 Enable Approve or Deny acknowledgement for a new incident link request.

If the remote CAD does not acknowledge or denies the link request then the interface will not cross reference the incident. The absence of a remote incident number in the acknowledgement package indicates the link request was denied. The interface will record the remote incident reference ID in the InterfaceCallRefNum table when a positive acknowledgement is received from the remote CAD. If the incident is successfully linked to the remote CAD, the remote CAD dispatch can deny the link by cancelling the incident. If the linked incident is denied by the remote CAD a comment will be added to the incident in the local CAD. The comment will contain the cancel reason and disposition chosen by the remote CAD. The PacketCloseCall package must be configured correctly for this comment to appear.



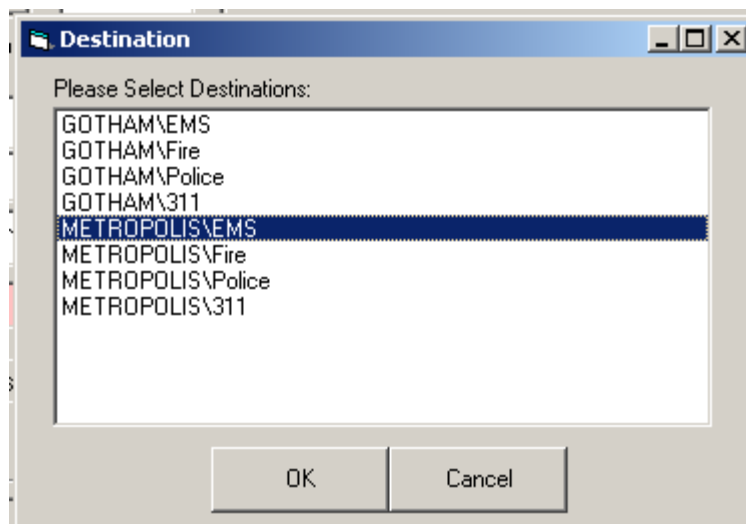
### 5.1.2 Incident Notify Messages

The interface can be configured to listen for local CAD Notify inter-process messages. When a message is detected for a linked incident the interface will distribute a notification package to the linked remote CAD systems. When the interface receives a notification package it will generate a Notify inter-process message in the local CAD system and record the notification in the activity log.

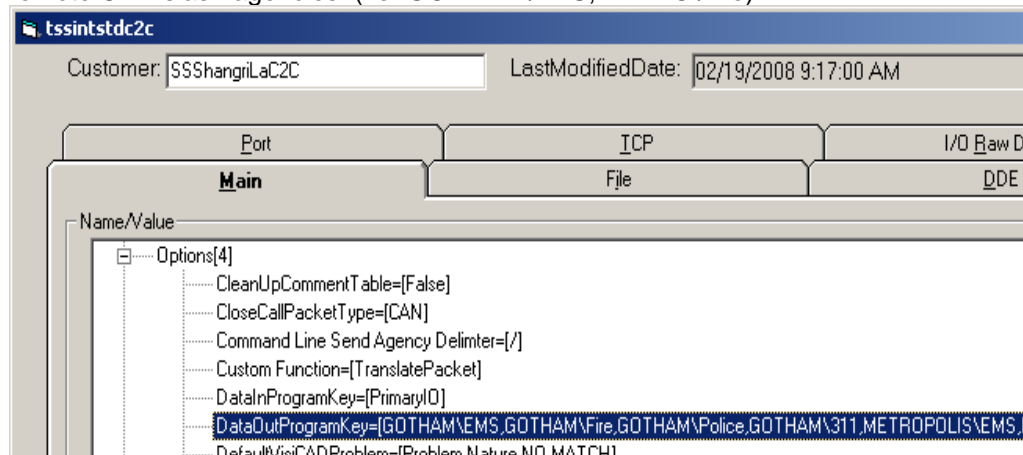
### 5.1.3 Send/Receive Incidents with Specific Agency

#### 5.2.1.2 Send Manual Incident Linking Request with Specific Agency

For manual incident linking the CAD Emergency Calltaking Screen can be configured with a manual send button. When the user clicks the button, a remote CAD destination selection form will open



Users can multi-select remote CADs to link the call with. The list of remote CAD agencies is configured in TssIntGenSetup.exe for your advance CAD to CAD profile. Under the main tab set Options\DataOutProgramKey equal to a comma delimited list of remote CAD slash agencies. (i.e. GOTHAM\EMS,METRO\Fire)





### 5.1.3.1 Send Automatic Incident Linking Request with Specific Agency

Currently a call can be automatically linked to a specific remote site using either the RemoteSiteXRefByAgency or ESNAgencyXRef. To configure these tables to auto link an incident with a specific local agency or local ESN to a specific remote agency use the Remote CAD slash Agency format when configuring the local agency/ESN cross reference.(i.e. METROPOLIS\Fire)

**Search Results:**

ID	Agency	RemoteSite	DateTime	
258130	EMS	METROPOLIS\EMS	01/13/2008	

### 5.1.3.2 Receive Incident Linking Request with Specific Agency

The incident linking request package will contain the [specific agency](#) requested by the remote CAD. The incident will be created in the agency specified by the remote CAD system. The interface will support a remote CAD based cross reference. This new cross reference table will be called InboundAgencyRequested\_RemoteCADXRef. This cross reference will be used to match a local agency with the agency requested by the remote CAD system.

If a cross reference match is not found or if an agency is not specified, then a default hierarchy will be used. This default hierarchy is configured locally for each remote CAD system using TSSIntGenVirtualTable.exe. This remote CAD based default hierarchy will be stored in a virtual table. This virtual table will be called InboundDefaultHierarchy\_RemoteCADXRef. The virtual table will have columns for the hierarchy and the remote CAD. If a default is not configured for the sending CAD then the interface will use a local default agency.

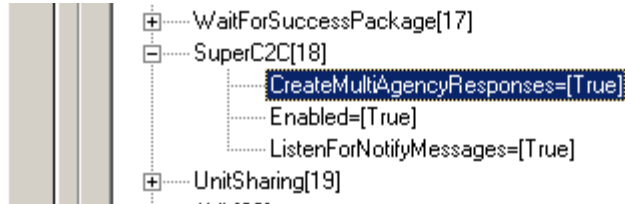
If a cross reference match is not found or agency is not specified and a default is not configured then the incident can not be created and the incident link request will be denied and the remote CAD will be sent an incident acknowledgement without a local incident number.

Once the local agency for the linking request is known the interface will attempt to geo-verify the address. Each local agency will have configurable hierarchy default values for incidents that fail to geo-verify. This local agency based default hierarchy for non-geo-validated addresses will be stored in a virtual table. This virtual table will be called InBoundNonGeoValidHeirarchy\_LocalAgencyXRef. The virtual table will have columns for the hierarchy and the local agency.

A default problem nature will be configurable for each remote agency. This remote agency default problem nature will be stored in a virtual table. This virtual table will be called DefaultProblemNature\_RemoteAgencyXRef. The virtual table will have columns for the problem nature and remote agency. A secondary catch-all default problem nature can be configured for the local CAD that would apply to any remote agency not configured in the DefaultProblemNature\_RemoteAgencyXRef table. The interface will utilize the existing default problem nature option switch Options\DefaultCADProblem for the local CAD default problem nature. The local CAD default problem nature will only be used if the remote agency default problem nature is not configured.

### 5.3 CAD-to-CAD Multi-agency Cross-References

When the interface receives an incident from a remote CAD it will determine the problem nature and apply any multi-agency cross references rule set up in the local CAD system. This will create new incidents in other local agencies automatically if the problem nature has been configured to do so. This feature can be enabled/disabled with a configuration switch in TssIntGenSetup.



## 6 Addendum A: Package Definitions

All CAD to CAD message packages begin with hex 02 (STX) and end with hex 03 (ETX) with the exception of packages utilizing XML.

ASCII 124 "|" is used as a field delimiter. ASCII 126 "~" is used as a delimiter of multiple values within the same field.

All date/time fields will be formatted to the regional date/time format provided by the O/S settings.

The message types are included in the data packet specification of this document:

- Heartbeat
- Heartbeat Acknowledgment
- Incident Creation
- Incident Creation Acknowledgment
- Incident Update
- Incident Cancellation (Incident cancellation due to last unit clearing from the incident)
- Incident Close
- Unit Status Update
- Text Message

### 6.1 Heartbeat Package

#### Packet Type: Heartbeat Initiate

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	constant	H
Time/Stamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
Agency Name	String	Name of the sending CAD
End Character	constant	ETX

Table 1: Heart beat initiate

**Example:** *H|09/11/2003 12:14:48|vendor name|\_\_\_\_\_*

#### **XML Format**

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	H
TimeStamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
AgencyName	String	Name of the sending CAD
End Root	constant	DOC

#### **Example:**

```
<?xml version="1.0"?>
<DOC>
  <Type>H</Type>
  <TimeStamp>05/11/2006 15:57:35</TimeStamp>
```

```
<AgencyName>agency name</AgencyName>
</DOC>
```

## 6.2 Heartbeat Acknowledgement Package

### Packet Type: Heartbeat Reply

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	constant	HR
Time/Stamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
Agency Name	String	Name of the sending CAD
End Character	constant	ETX

Table 2: Heart beat Reply

**Example:** HR|09/11/2003 12:15:03|vendor name|\_\_\_\_\_

### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	HR
TimeStamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
AgencyName	String	Name of the sending CAD
End Root	constant	DOC

### Example:

```
<?xml version="1.0"?>
<DOC>
  <Type>HR</Type>
  <TimeStamp>05/11/2006 15:57:35</TimeStamp>
  <AgencyName>agency name</AgencyName>
</DOC>
```

## 6.3 New Incident Package

**Note:** If at the time the incident is sent to the waiting incident queue, it does not have a hierarchy; it will not have a Master Incident Number. Without a Master Incident Number, the remote CAD will not be able to link the incident.

### Packet Type: New Incident

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	constant	I
CAD Number	string	This field can be a CAD incident ID or up to 20 characters of Incident Number. This field is used as an identifier for the incident package.
Problem	string	Incident Problem Nature
Address	string	Incident Address
House Number	string	House or Street Number for address
House Number Suffix	string	House or Street Suffix
Prefix directional	string	Directional prefix (i.e., N, E, S, W)

Name Component	string	Street name of address
Street Type	string	Street type. Ex: St, Ave or Blvd
Post Directional	string	Post directional (i.e., SW, NE, SE, etc.)
Apartment	string	Apartment number
City	string	City in full description
State	string	State in State Abbreviation
Location Name	string	Name of the location if address is a premise
Time/Stamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
Response Date	string	Date and Time of Incident Response Date
Incident Type	string	Incident Type in full description
Cross Street	string	Cross Street of Incident Address
Call Taking Performed By	string	Call Taker's Name
CAD Incident Number	string	Up to 20 characters of Incident Number.
Postal Code	string	Zip code
Primary TAC Channel	string	Radio Channel of incident
Comments	string	Incident comment. If multiple comments, then use the "~" as delimiter.
Agency Name	String	Name of the Sending CAD
Status Code	String	If it is an reopen incident, then put "Reopen", otherwise leave it blank
Caller_Name	String	Name of the caller
Call_Back_Phone	String	Call back phone number
Transport_Priority	String	Transport Priority
Transport_Code	String	Transport code
Transport_Odometer	String	Depart scene or arrive at destination. Odometer reading
Transport_Destination_Name	String	Transport destination Name
Transport_Dest_Latitude	String	Transport destination latitude
Transport_Dest_Longitude	String	Transport destination longitude
Transport_NmbrTransported	String	Number of people transported
End Character	constant	ETX

Table 3: New Incident

**Example:**

```
|04-0073295|29- Traffic accident|225 Fairwood Av|||||CHARLOTTE|NC|225
FAIRWOOD|09/05/2003 19:46:19|9/5/2003 7:46:06 PM|Still Alarm|S Tryon St/Youngblood
St| Software Systems|04-0073295|||1A|comment1~comment 2~comment 3|vendor
name|John Smith|888-9008767|
```

**XML Format**

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	I
CADNumber	string	This field can be a CAD incident ID or up to 20 characters of Incident Number. This field is used as an identifier for the incident package.
Problem	string	Problem Nature
Address	string	Address of incident
House_Number	string	House number
House_Number_Suffix	string	House or Street Suffix
Prefix_directional	string	Directional prefix
Name_Component	string	Name portion of address

Street_Type	String	Street designation
Post_Directional	String	Directional data
Apartment	String	Apartment of incident
City	String	City
State	String	State
Location_Name	String	Common location name
TimeStamp	String	Current Date/Time (MM/DD/YYYY HH:MM:SS)
Response_Date	String	Timestamp of incident
Incident_Type	String	Incident type
Cross_Street	String	Cross_Street
CallTaking_Performed_By	String	Name of person taking call
CADIncidentNumber	String	Incident number
Postal_Code	String	Zip code
Primary_TAC_Channel	String	Radio Channel of incident
Caller_Name	String	Reporting party
Call_Back_Phone	String	Reporting party phone number
Comment	String	Comments of call
Agency	String	Agency name
StatusCode	String	If it is an reopen incident, then put "Reopen", otherwise leave it blank
Transport_Priority	String	Transport Priority
Transport_Code	String	Transport code
Transport_Odometer	String	Depart scene or arrive at dest. Odometer reading
Transport_Destination_Name	String	Transport destination Name
Transport_Dest_Latitude	String	Transport destination latitude
Transport_Dest_Longitude	String	Transport destination longitude
Transport_NmbrTransported	String	Number of people transported
End Root	Constant	DOC

**Example:**

```

<?xml version="1.0"?>
  <DOC>
    <Type>I</Type>
    <CADNumber>FD061397</CADNumber>
    <Problem>Carbon Monoxide Alarm</Problem>
    <Address>123 N Main St</Address>
    <House_Number>123</House_Number>
    <House_Number_Suffix></House_Number_Suffix>
    <Prefix_directional>N</Prefix_directional>
    <Name_Component>MAIN</Name_Component>
    <Street_Type>ST</Street_Type>
    <Post_Directional></Post_Directional>
    <Apartment></Apartment>
    <City>MILPITAS</City>
    <State>1</State>
    <Location_Name></Location_Name>
    <TimeStamp>05/19/2006 17:02:06</TimeStamp>
    <Response_Date>05/19/2006 17:02:04</Response_Date>
    <Incident_Type>Single Engine</Incident_Type>
    <Cross_Street>WB WCB TO N MAIN ST&WELLER LN</Cross_Street>
    <CallTaking_Performed_By> FIRE</CallTaking_Performed_By>
    <CADIncidentNumber>FD061397</CADIncidentNumber>
    <Postal_Code>11</Postal_Code>
    <Primary_TAC_Channel></Primary_TAC_Channel>

```

```

<Caller_Name></Caller_Name>
<Call_Back_Phone></Call_Back_Phone>
<Comment>Duplicate call of incident number  FD061392üDuplicate call of
incident number  FD061390üDuplicate call of incident number
FD06138994üDuplicate call of incident number  FD06138992</Comment>
<Agency>EPSO</Agency>
<Transport_Priority>Emergency</Transport_Priority>
<Transport_Code>2</Transport_Code>
<Transport_Odometer>123.4</Transport_Odometer"
<Transport_Destination_Name>Lockup</Transport_Destination_Name>
<Transport_Dest_Latitude>1234567</Transport_Dest_Latitude>
<Transport_Dest_Longitude>1234567</Transport_Dest_Longitude>
<Transport_NmbrTransported>1</Transport_NmbrTransported>
<StatusCode></StatusCode>
</DOC>

```

## 6.4 New Incident Acknowledgement Package

**Note: If at the time the incident is sent to the waiting incident queue, it does not have a hierarchy; it will not have a Master Incident Number. Without a Master Incident Number, the remote CAD will not be able to link the incident.**

### Packet Type: New Incident Acknowledgment

Field Key	Field Type	Field Value
Begin Character	Constant	STX
Package Type	constant	IR
Other CAD Incident Number	string	Incident Number of Receiving CAD
CAD Incident Number	string	Incident Number of Sending CAD
Agency Name	String	Name of the Receiving CAD
End Character	Constant	ETX

Table 4: New Incident Acknowledgment

**Example:** *IR|123-22345|04-0073295|*

### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	IR
OtherCADIncidentNumber	string	Incident number of receiving CAD
CADNumber	string	Incident number of Sending CAD
AgencyName	String	Name of the receiving CAD
End Root	constant	DOC

### Example:

```

<?xml version="1.0"?>
<DOC>
  <Type>IR</Type>
  <OtherCADIncidentNumber></OtherCADIncidentNumber>
  <CADNumber>FD061397</CADNumber>
  <Agency>EPSO</Agency>
</DOC>

```

## 6.5 Incident Update Package

### Packet Type: Incident Update

Field Key	Field Type	Field Value
Package Type	Constant	UA (This is example for address update, refer to the package type in below for different updates)
Other CAD		
Incident Number	String	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sending CAD.
CAD Incident Number	String	This identifier must match the one in incident package. Please refer to <a href="#">table 3</a>
Update Value	String	Update Value
Perform By	String	Person who perform update
Agency Name	String	Name of the Receiving CAD Original Agency (Sending site). This is used if there are more than two CAD systems
OrigAgency	String	

Table 5

### List of Package Types for different update (for Table 5)

Package Type	Value
Problem/Nature	UP
Address	UA
City	UY
Apartment	UAPT
Location Name	UL
Priority	UR
Primary TAC Channel	UT
Comments	UC
Call Back Phone	UB
Caller Name	UN
Building	UBLD
Cross Street	UXST

Table 5a

**Example:** UA/04-0073306/439665/315 Hunter Ln/Paul Green/Vendor name|El Paso Sheriff|\_\_\_\_\_

### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	See above
OtherCADIncidentNumber	string	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sending CAD. This identifier must match the one in incident package.
CADNumber	String	Please refer to <a href="#">table 3</a>
UpdateValue	String	Updated value
Performed_By	constant	DOC
Agency	String	Name of the Receiving CAD
OrigAgency	String	Original Agency(Sending site) . This is used if there are more than two CAD systems



End Root

Constant

DOC

**Example:**

```
<?xml version="1.0"?>
<DOC>
  <Type>UP</Type>
  <OtherCADNumber>04-0073306</OtherCADNumber>
  <CADNumber>439665</CADNumber>
  <UpdateValue>315 Hunter Ln </UpdateValue>
  <Performed_By>Paul Green</Performed_By>
  <Agency>Vendor name</Agency>
  <OrigAgency>El Paso</OrigAgency>
</DOC>
```

## 6.6 Incident Close Package

**Packet Type: Incident Close**

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	Constant	CC
Other CAD Incident Number	String	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sending CAD This identifier must match the CAD number/ID in incident package
CAD Incident Number	String	Please refer to <a href="#">table 3</a>
Cancel Reason	String	Cancel Reason for closed incident
Disposition	String	Disposition for closed incident
Agency Name	String	Name of the Receiving CAD
End Character	constant	ETX

Table 6

**Example:**

```
CC|09052003-41494|04-0073294|Duplicate Call|09-Cardiac/Resp Arrest|Vendor  
name|_____
```

XML Format			
Tag Name	Field Type	Field Value	
Header	constant	?xml version="1.0"?	
Begin Root	constant	DOC	
Type	constant	CC	
OtherCADIncidentNumber	string	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sen This identifier must match the CAD number/ID in incident	
CADNumber	String	Please refer to <a href="#">table 3</a>	
CancelReason	String	Cancellation reason	
Disposition	String	Disposition for closed incident	
AgencyName	String	Name of the Receiving CAD	
End Root	Constant	DOC	

**Example:**

```
<?xml version="1.0"?>
<DOC>
  <Type>CC</Type>
  <OtherCADNumber>09052003-41494</OtherCADNumber>
```

```

<CADNumber>04-0073294</CADNumber>
<CancelReason>Duplicate Call </CancelReason>
<Disposition>09-Cardiac/Resp Arrest</Disposition>
<AgencyName>Vendor Name</AgencyName>
</DOC>

```

## 6.7 Incident Cancellation Package

### Packet Type: Incident Cancellation

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	Constant	CAN
Other CAD Incident Number	String	Incident Number of Receiving CAD
CAD Incident Number	String	Incident Number of Sending CAD
Cancel Reason	String	Cancel Reason for closed incident
Disposition	String	Disposition for closed incident
Agency Name	String	Name of the Receiving CAD
End Character	constant	ETX

Table 7

#### Example:

CAN|09052003-41494|04-0073294|Duplicate Call|09-Cardiac/Resp Arrest| Vendor  
name|\_\_\_\_\_

#### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	CAN
OtherCADIncidentNumber	string	Incident Number of Receiving CAD
CADNumber	String	Incident Number of Sending CAD
CancelReason	String	Cancellation reason
Disposition	String	Disposition for closed incident
AgencyName	String	Name of the Receiving CAD
End Root	Constant	DOC

#### Example:

```

<?xml version="1.0"?>
<DOC>
  <Type>CAN</Type>
  <OtherCADNumber>09052003-41494</OtherCADNumber>
  <CADNumber>04-0073294</CADNumber>
  <CancelReason>Duplicate Call</CancelReason>
  <Disposition>09-Cardiac/Resp Arrest</Disposition>
  <AgencyName>Vendor Name</AgencyName>
</DOC>

```

## 6.8 Unit Status Update Package

### Packet Type: Unit Status Update

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	constant	USTAT

Other CAD Incident Number	string	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sending CAD. This identifier must match the one in incident package.
CAD Incident Number	string	Please refer to <a href="#">table 3</a>
Status Code	string	Unit Status in 5 characters Code
Unit Name	string	Name of the Unit
Station	string	Current Location
Cancel Reason	string	Cancel Reason for clearing unit from incident. This is use only when unit clear from the incident
Disposition	string	Disposition for clearing unit from incident. This is use only when unit clears from the incident
Time/Stamp	string	Current Data and Time (MM/DD/YYYY HH:MM:SS)
Radio Name	string	Unit's Radio Name in CAD
TransportPriorityCode	string	A Priority code to transport a patient or other transportation request (i.e. Emergency or non-Emergency). This field is used only for "Depart Scene" unit status. A cross reference for the priority code is required. Please refer to cross reference setup for detail <a href="#">(v1.2)</a>
TransportProtocolCode	string	This is a protocol code that use in "Depart Scene" status. This field is required only when the unit status is "Depart Scene". A cross reference for the Protocol code is required. Please refer to cross reference setup for detail <a href="#">(v1.2)</a>
StationOrLocation	string	This is the destination location. This field is used only for "Depart Scene" unit status.
OOSReasonCode	string	This is the out of service reason code. This field is used only when the unit status is "Out of Service". Since there is no cross-reference table setup for this value, the reason code must exist in both CAD systems.
Agency Name	String	Name of the Receiving CAD
OrigAgency	String	Original Agency(Sending site)
End Character	Constant	ETX

Table 8

**Example:**

USTAT|04-0073302|439661|ENR|M28-9417||||09/05/2003 20:26:42|M28|Vendor name| EI  
Paso Sheriff|\_\_\_\_\_

**XML Format**

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	See above
OtherCADIncidentNumber	string	Incident Number of Receiving CAD This field can be an incident id or Incident Number of Sen This identifier must match the one in incident package.
CADNumber	String	Please refer to <a href="#">table 3</a>
StatusCode	String	Unit Status in 5 characters Code

<i>UnitName</i>	constant	Name of unit
<i>StationOrLocation</i>	String	Current Location
<i>CancelReason</i>	String	Cancel Reason for clearing unit from incident. This is use only when unit clear from the incident
<i>Disposition</i>	String	Disposition for clearing unit from incident. This is use only when unit clears from the incident
<i>TimeStamp</i>	Constant	Current Data and Time (MM/DD/YYYY HH:MM:SS)
<i>RadioName</i>		Unit's Radio Name in CAD
TransportPriorityCode	string	A Priority code to transport a patient or other transportation
TransportProtocolCode	string	This is a protocol code that use in "Depart Scene" status.
StationOrLocation	string	This is the destination location. This field is used only for
OOSReasonCode	string	This is the out of service reason code. This field is used o

**Example:**

```
<?xml version="1.0"?>
<DOC>
  <Type>IR</Type>
  <OtherCADNumber>04-0073302</OtherCADNumber>
  <CADNumber>439661</CADNumber>
  <StatusCode>ENR</StatusCode>
  <UnitName>M28-9417</UnitName>
  <StationOrLocation></StationOrLocation>
  <CancelReason></CancelReason>
  <Disposition></Disposition>
  <TimeStamp>09/05/2003 20:26:42</TimeStamp>
  <RadioName>M28</RadioName>
  <TransportPriorityCode></TransportPriorityCode>
  <TransportProtocolCode></TransportProtocolCode>
  <StationOrLocation></StationOrLocation>
  <Agency>EPSO</Agency>
  <OrigAgency></OrigAgency>
</DOC>
```

## 6.9 Text Message Package

### Packet Type: Text Message

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	Constant	*see below
From	String	Name of the sending party. If it is CAD to CAD, then it is the Originator CAD Mailbox name
To	String	Name of the recipient. If it is CAD to CAD, then it is the destination CAD Mailbox name
Subject	String	Message title
Priority	String	Indicate if the message is a priority. "True" or "False" (see bellow)
Message	String	Message Body
AgencyName	String	Name of the Sending CAD.
End Character	constant	ETX

Table 9

Message types:

```
MESSAGE_TO_VEHICLE
MESSAGE_TO_EMPLOYEE
MESSAGE_TO_MACHINE
```

Example:

*MESSAGE\_TO\_EMPLOYEE|Originator Name|Recipient Name|Subject: Sample  
Message|True|This is a sample text message|El Paso  
Sheriff|\_\_\_\_\_*

#### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	<DOC>
Type	string	*see below
From	string	Name of the sending party. If it is CAD to CAD, then it is the Originator CAD Mailbox name
To	String	Name of the recipient. If it is CAD to CAD, then it is the destination CAD Mailbox name
Subject	String	Text subject
Priority	string	Indicate if the message is a priority. "True" or "False" (see bellow)
Message	string	Text message

Message types:

MESSAGE\_TO\_VEHICLE  
MESSAGE\_TO\_EMPLOYEE  
MESSAGE\_TO\_MACHINE

#### Example:

```
<?xml version="1.0"?>
<DOC>
  <Type>MESSAGE_TO_EMPLOYEE</Type>
  <From>Originator Name</From>
  <To>Recipient Name</To>
  <Subject>Sample Text Testing</Subject>
  <Priority>True</Priority>
  <Message>Sample text.</Message>
</DOC>
```

## 7.0 Advanced CAD to CAD Packages

**NOTE: The following Advanced CAD to CAD Functionality (all of Section 7) is a separately-purchased option and is not configured or available as part of the Standard CAD to CAD functionality.**

Advanced CAD to CAD functionality requires some existing packages to contain new data as well as the creation of some new packages.

### 7.1 USTAT packets

The unit status update package is the same except for the new IncidentGUID field.

#### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	See above
OtherCADIncidentNumber	string	Incident Number of Receiving CAD
CADNumber	String	This field can be an incident id or Incident Number of Sending CAD. This identifier must match the one in incident package.
StatusCode	String	Unit Status in 5 characters Code
UnitName	constant	Name of unit
StationOrLocation	String	Current Location
CancelReason	String	Cancel Reason for clearing unit from incident. This is use only when unit clear from the incident
Disposition	String	Disposition for clearing unit from incident. This is also used for unit activity log mirroring.
TimeStamp	Constant	Current Data and Time (MM/DD/YYYY HH:MM:SS)
RadioName		Unit's Radio Name in CAD
Agency		Name of the Receiving CAD
OrigAgency		Original Agency(Sending site)
SendList	String	List of sender and remote sites packet was sent to. Semicolon delimited.
IncidentGUID	String	GUID to identify status change.
End Root	Constant	DOC

### 7.2 Notification Package

Sending notification comments from CAD to CAD requires a notification package be created for parsing and composing in local and remote CAD systems.

**XML Format**

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	NotifyMessage
OtherCADIncidentNumber	string	Incident Number of Receiving CAD
CADNumber	String	This field can be an incident ID or Incident Number of Sending CAD. This identifier must match the one in incident package.
Message	String	Notification message
TimeStamp	String	Current Date and Time (MM/DD/YYYY HH:MM:SS)
Performed By	String	Personnel ID
Agency	String	Name of the Receiving Agency
OrigAgency	String	Original Agency(Sending site)
End Root	Constant	DOC

**7.3 Incident Packet**

There are three needed changes to the incident packet. The RequestedAgency is required to send an incident to a specific agency within a remote CAD system. The RemoteAgency is required information for the enhanced RemoteSiteXRefByAgency virtual table. The IncidentGUID will allow unit status updates to work in a multi-CAD environment where incidents can be linked in a daisy chain fashion

Packet Type: New Incident

Field Key	Field Type	Field Value
Begin Character	constant	STX
Package Type	constant	I
CAD Number	string	This field can be a CAD incident ID or up to 20 characters of Incident Number. This field is used as an identifier for the incident package.
Problem	string	Incident Problem Nature
Address	string	Incident Address
House Number	string	House or Street Number for address
House Number Suffix	string	House or Street Suffix
Prefix directional	string	Directional prefix (i.e., N, E, S, W)
Name Component	string	Street name of address
Street Type	string	Street type. Ex: St, Ave or Blvd
Post Directional	string	Post directional (i.e., SW, NE, SE, etc.)
Apartment	string	Apartment number
City	string	City in full description
State	string	State in State Abbreviation
Location Name	string	Name of the location if address is a premise
Time/Stamp	string	Current Date/Time (MM/DD/YYYY HH:MM:SS)
Response Date	string	Date and Time of Incident Response Date
Incident Type	string	Incident Type in full description

Cross Street	string	Cross Street of Incident Address
Call Taking Performed By	string	Call Taker's Name
CAD Incident Number	string	Up to 20 characters of Incident Number.
Postal Code	string	Zip code
Primary TAC Channel	string	Radio Channel of incident
Comments	string	Incident comment. If multiple comments, then use the "~" as delimiter.
Agency Name	String	Name of the Sending CAD
Status Code	String	If it is an reopen incident, then put "Reopen", otherwise leave it blank
Caller_Name	String	Name of the caller
Call_Back_Phone	String	Call back phone number
Transport_Priority	String	Transport Priority
Transport_Code	String	Transport code
Transport_Odometer	String	Depart scene or arrive at destination. Odometer reading
Transport_Destination_Name	String	Transport destination Name
Transport_Dest_Latitude	String	Transport destination latitude
Transport_Dest_Longitude	String	Transport destination longitude
Transport_NmbrTransported	String	Number of people transported
RequestedAgency	String	Agency in receiving CAD to create incident in
SendingAgency	String	Name of the Sending Agency
IncidentGUID	String	GUID to allow messages such as status update to be associated with this incident in a multi-CAD environment. Remove limitations of other_cad_number-cad_number pairs.
End Character	constant	ETX

## 7.4 New Incident Acknowledgement Package

### Packet Type: New Incident Acknowledgment

Field Key	Field Type	Field Value
Begin Character	Constant	STX
Package Type	constant	IR
Other CAD Incident Number	string	Incident Number of Receiving CAD
CAD Incident Number	string	Incident Number of Sending CAD
Agency	String	Name of the Receiving CAD
RequestedAgency	String	Name of agency sender requested.
End Character	Constant	ETX

Table 4: New Incident Acknowledgment

**Example:** *IR|123-22345|04-0073295|METROPOLIS|EMS*

### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	IR



OtherCADIncidentNumber	string	Incident number of receiving CAD
CADNumber	string	Incident number of Sending CAD
Agency	String	Name of the receiving CAD
RequestedAgency	String	Name of agency sender requested
End Root	constant	DOC

**Example:**

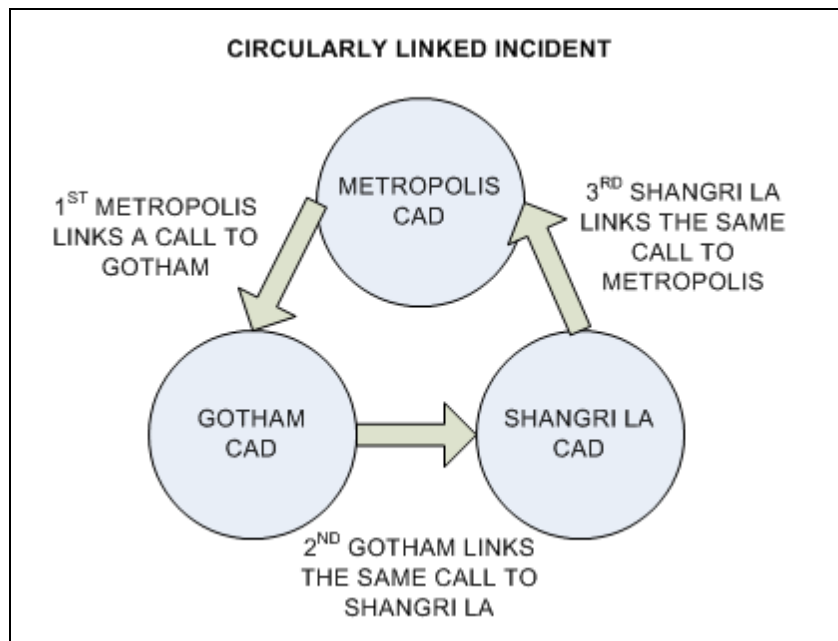
```

<?xml version="1.0"?>
<DOC>
  <Type>IR</Type>
  <OtherCADIncidentNumber>-20080224-00003</OtherCADIncidentNumber>
  <CADNumber>20080224-0002324</CADNumber>
  <Agency>GOTHAM</Agency>
  <RequestedAgency>POLICE</RequestedAgency>
</DOC>

```

## 7.5 Incident Update Package

In the advanced CAD to CAD an incident update package needs to have a transaction ID. The transaction ID will prevent an update from looping when an incident is circularly linked. A circularly linked incident is when a call gets linked from one CAD to another until it eventually gets linked back to the original CAD. The diagram below shows how an incident can be circularly linked.



### Packet Type: Incident Update

Field Key	Field Type	Field Value
Type	Constant	UA (This is example for address update, refer to 6.5 <a href="#">package type for different updates</a> )
OtherCADNumber	String	Incident Number of Receiving CAD
CADNumber	String	This field can be an incident id or Incident Number of Sending CAD.

		This identifier must match the one in incident package. Please refer to <a href="#">table 3</a>
UpdateValue	String	Update Value
Performed_By	String	Person who perform update
Agency	String	Name of the Receiving CAD
OrigAgency	String	Original Agency (Sending site) . This is used if there are more than two CAD systems
TransactionID	String	A GUID used to track incident updates & prevent looping.

Table 5

**Example:** UA|04-0073306|439665|315 Hunter Ln|Paul Green|Vendor name|El Paso Sheriff|{CA906B37-C640-473D-A99D-EE43607BEAF7}|\_\_\_\_\_

### XML Format

Tag Name	Field Type	Field Value
Header	constant	?xml version="1.0"?
Begin Root	constant	DOC
Type	constant	See above
OtherCADIncidentNumber	string	Incident Number of Receiving CAD
CADNumber	String	This field can be an incident id or Incident Number of Sending CAD. This identifier must match the one in incident package. Please refer to <a href="#">table 3</a>
UpdateValue	String	Updated value
Performed_By	constant	DOC
Agency	String	Name of the Receiving CAD
OrigAgency	String	Original Agency (Sending site). This is used if there are more than two CAD systems
TransactionID	String	GUID to prevent update looping between multiple CAD systems.
End Root	Constant	DOC

### Example:

```
<?xml version="1.0"?>
<DOC>
  <Type>UP</Type>
  <OtherCADNumber>04-0073306</OtherCADNumber>
  <CADNumber>439665</CADNumber>
  <UpdateValue>315 Hunter Ln </UpdateValue>
  <Performed_By>Paul Green</Performed_By>
  <Agency>Vendor name</Agency>
  <OrigAgency>El Paso</OrigAgency>
  <TransactionID>{CA906B37-C640-473D-A99D-EE43607BEAF7}</TransactionID>
</DOC>
```

## 8 Cross Reference Setup

The following provide a list of cross reference setup table. Not all the cross reference setups are required. Cross reference is used when data in the remote CAD system is different from the local CAD system.

## 8.1 Vehicle-related Cross-References

### Vehicle Name Cross Reference:

The vehicle name cross reference provides a means to map a vehicle's radio name on one system with the corresponding name on another system. i.e., CAD "A" has an engine whose radio name is "E101" (CAD "A" owns E101) E101 happens to be a vehicle that is also watched by CAD "B" and receives periodic status and location updates from CAD "A" CAD "B" names E101 as xE101 so it is easily distinguishable as a shared CAD "A" vehicle.

Field Name	Description
CADUnit	Name of the Local CAD (CAD) unit (This is the radio name in CAD system)
OtherCADUnit	Name of the Remote CAD unit

Thus in the cross reference table of CAD "A" would show the following:

CADUnit → OtherCADUnit  
 E101 → xE101

...and in the cross reference table of CAD "B" would show the following:

CADUnit → OtherCADUnit  
 xE101 → E101

### Unit Type Cross Reference:

Field Name	Description
CAD_UnitType	CAD Unit Type
OtherCAD_UnitType	Remote CAD Unit Type

## 8.2 Incident Data Cross-References

### Problem Nature Cross Reference:

Field Name	Description
CADProblem	CAD problem nature description
OtherCADProblem	Remote CAD problem nature description

### Priority Cross Reference:

Field Name	Description
CADPriority	CAD priority description
OtherCADPriority	Remote CAD priority description

### City Cross Reference:

Field Name	Description
CADCity	CAD City name
OtherCADCity	Remote CAD City name

### Street Type Cross Reference:

Field Name	Description
CADStreetType	CAD Street Type
OtherCADStreetType	Remote CAD Street Type

**Transport Priority Cross Reference:**

Field Name	Description
CADTransPriority	CAD Transport Priority
OtherCAD_UnitType	Remote CAD Transport Priority

**Transport Protocol:**

Field Name	Description
CADTransProtocol	CAD Transport Protocol
OtherCADTransProtocol	Remote Transport Protocol

## 8.3 Incident Status-related Cross References

**Unit Status Cross Reference:**

Field Name	Description
CADStatus	CAD unit status code
OtherCADStatus	Remote CAD unit status code

## 8.4 Advanced CAD to CAD Cross references

**NOTE: The following Advanced CAD to CAD Functionality is a separately-purchased option and is not configured or available as part of the Standard CAD to CAD functionality.**

### 8.4.1 SharedUnitXRef

This new virtual table will be used to set a unit as either a remote shared unit or a local shared unit. Local shared units can set a one-to-many relationship by using multiple rows pairing the unit with remote CAD systems. Remote shared units must maintain a one-to-one relationship having one row pairing the unit with its home CAD system.

LocalUnitName	HomeCAD	RemoteCAD	RemoteUnitName
E51		METRO	3J34564GL345670A
MetroT12	METRO		6P54367HL235699C
E51		GOTHAM	RemoteE51

### 8.4.2 InboundAgencyRequested\_RemoteCADXRef

This virtual table will cross reference the destination agency in the inbound incident package with the agencies in the local CAD system.

Local Agency	Requested Agency	Requesting Remote CAD
LocalEMS	RemoteEMS	METRO
LocalFire	RemoteFire	METRO
LocalEMS	Ambulance	GOTHAM
LocalFire	Fire	GOTHAM

### 8.4.3 InboundDefaultHierarchy\_RemoteCADXRef

Table will be used to determine the local agency to create the new incident in for the inbound incident package based on the sending remote site.

Remote CAD	Local Agency	Local Jurisdiction	Local Division	Local Battalion
METRO	MyFire	City	East	Dog Patch
GOTHAM	MyEMS	County	North	

#### 8.4.4 InBoundNonGeoValidHierarchy\_LocalAgencyXRef

The virtual table will hold a default hierarchy for each local agency. when a newly received inbound incident fails to geovaildate we will use the default hierarchy for the local agency the incident is created in.

Local Agency	Local Jurisdiction	Local Division	Local Battalion
MyFire	City	Central	Old Town
MyEMS	Core	DownTown	

#### 8.4.5 DefaultProblemNature\_RemoteAgencyXRef

If a problem nature cross reference can not be found we will use this table. Problem nature will be set depending on the sending remote site & remote agency.

Remote CAD	Remote Agency	Default Problem Nature
METRO	MetroFire	Animal Attack
METRO	Metro Ambulance	Heart Attack
GOTHAM	GFD	Structure Fire
GOTHAM	EMS	Back Pain

#### 8.4.6 RemoteSharedUnitOOSType\_LocalAgencyXRef

This virtual table allows a different OOS type for each local agency when a remote shared unit is in use by another CAD system. When a remote shared unit is utilized by a remote CAD the OOS type is set according to what local agency the remote shared unit was built in and the remote CAD-Agency using it.

Local Agency	Remote CAD	Remote Agency	OOS Code
MyFire	METRO	MetroFire	MFC2C
MyFire	GOTHAM	GFD	GFC2C
MyEMS	METRO	Metro Ambulance	MAC2C
MyEMS	GOTHAM	EMS	GEC2C

#### 8.4.7 Incident Status-related Cross References

The StatusXRef table has been enhanced. A column for remote CADs has been added. Advance CAD to CAD uses the remote CAD when finding status cross references.

##### Unit Status Cross Reference:

Field Name	Description
CADStatus	CAD unit status code
OtherCADStatus	Remote CAD unit status code
RemoteCAD	Remote CAD IO program key

## 9.0 Latitude and Longitude Format

The Latitude and Longitude format in CAD is an 8 digit numeric value. It is the degree in decimal multiplied by the  $10^6$ . For example:  $328.11771 \times 10^6 = 32811771$ .

**\*Note: This format is always in positive value. Therefore, the number is incorrect if both Lat/Lon are in negative quadrant. It requires further manipulation to transform them to negative.**

For batched AVL updates in Advanced CAD to CAD, Latitude and longitude data is sent in standard degree with decimal format and sign.

End of Document