

# OTAR Check List

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## OTAR CHECK LIST

### Radio Configuration

Configuration set with the Radio Editor:

1. Enable OTAR in Global Setting/Security.
2. Enable OTAR for channel under test.
3. Set P25 Unit ID (Data Unit ID) under Global Data.
4. Set digital mode for Transmit and Receive for channel under test.
5. Set the correct NAC for Transmit and Receive.

Configuration set with the Keyloader:

1. Set and load TGTRSI to match the value set for P25 Unit ID (Data Unit ID).
2. Set and load KMFRSI.
3. Set and load MNP (not used by Registration or Unencrypted Hello).
4. Clear all Keys
5. Load KEK keys (not used by Registration or Unencrypted Hello).
6. Turn Radio off.

Radio has now been initialized for OTAR operation.

### KMF Configuration

Configuration set with the KMF user interface:

1. Unit ID entered in WNG database (used for radio registration).
2. Radio RSI and Data Unit ID are the same value.
3. The KEK keys match the KEK keys loaded into the radio with the Keyloader.
4. Select TEK keys for the radio to use.
5. Save the information.
6. Select the unit and Select the "Make Current" button.

KMF is now ready to communicate with radio.

### Other Important Information

The repeater must be in communication with the KMF.

The radio must be able to access the repeater (Frequency and NAC). The ability to access the repeater can be tested by a "Talk Test" (can the radio under test send and receive audio through the repeater).

## OTAR CHECK LIST

### Initial Process

#### Step 1

Radio Registration on the System.

1. Power up the radio under test and select the correct channel.
2. The radio will attempt to register with the system.
3. The registration process is 4 events so 4 flashes of the LEDs will be seen (See Note this step).

LED: TX, RX, RX, TX – Best registration.

The following are acceptable, however; additional investigation as to why the radio under test requests for registration are repeated.

LED: TX, TX, RX, RX, TX – Acceptable registration.

LED: TX, TX, TX, RX, RX, TX – Acceptable registration.

LED: TX, TX, TX, TX, RX, RX, TX – Acceptable registration.

Note: The LED flash sequence can be the same for a rejected registration. The result is that a successful data exchange happened, however; the KMF needs to be set to accept the Unit ID registration (See Step 1 in KMF Configuration).

## OTAR CHECK LIST

### Step 2

Send Unencrypted Hello to Unit (Radio under test P25 Unit ID).

1. Select Unit ID of the radio under test in the KMF interface.
2. Select Unencrypted Hello Button.
3. View Success/Failure results on KMF unit communication status display.

#### Step 2 Success

Move on to Step 3.

#### Step 2 Failure

Check Radio registration status in KMF. The KMF should show an error message for an attempt to send a message to an un-registered unit.

#### Not Registered

Check that the Radio P25 Unit ID, Radio TGTRSI, and KMFRSI match KMF settings for the Unit.

Or

Check radio for high TX or RX distortion.

## **Re-Key Unit (Full)**

The radio under test does not have any TEK keys loaded so the radio under test can not decrypt the messages from the KMF. The KMF has a method to load an initial TEK key into the radio under test. The message that loads the initial TEK key is the "Warmstart" message which loads a Temporary TEK key to decrypt the messages. The Warmstart TEK key is encrypted with the KEK key that is loaded in the radio under test (if the KEK does not have the correct Algorithm ID, Key ID, or the correct Key then the decryption of the TEK key will fail and so will the re-key process since the radio under test can not decrypt the messages).

The KMF can determine that the radio under test does not have the TEK keys to decrypt the messages and will send a Warmstart message.

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### Step 3

Send a Full Update to Unit (radio under test).

1. Select Unit ID of the radio under test in the KMF interface.
2. Select Full Update Button.
3. View Success/Failure results on KMF unit communication status display (the full update process can take more than a minute to complete).

### Observed Radio Operation

The radio under test will acknowledge the messages were received from the KMF (if the KMF requested acknowledgement), however; the radio under test will not respond to the message if it can not decrypt the message. If you watch the LEDs on the radio under test you will see RX, TX for a failure (if the KMF requested acknowledgement).

The LEDs for a successful message exchange between the radio under test and KMF will flash RX, TX, TX, RX

Note for DPHxe operation: After the initial exchange between the KMF and the DPHxe (the LEDs flash RX, TX) there can be up to a 30 – 60 second delay before the KMF sends the Warmstart message.

### Step 3 Success

Setup Complete.

### Step 3 Failure

Move on to Troubleshooting.

## Troubleshooting

### Registration:

For registration to operate correctly; only the TX and RX frequency, TX and RX NAC, and P25 Unit ID information need be correct and OTAR enabled for the current channel (Radio Editor).

### Hello:

For hello to work, the radio TGTRSI and KMFRSI (Keyloader) should be set. If correct, an unencrypted hello should work. Radio TGTRSI must match the P25 Unit ID.

### Rekey:

If an unencrypted hello works, and the KEK keys in the KMF match those in the radio, a rekey should work. If the unit entry in the KMF is not new (being used to match a new or zeroized unit), the Last Message Number recorded for that unit will not match the new unit and the KMF will reject messages. The simplest solution is to delete and recreate the unit entry in the KMF.

### Notes:

1. If possible. Check WNG logs when unit registers, this will reveal radio P25 Unit ID, verify it is as expected.
2. Note that setting the Radio TGTRSI with the keyloader will reset the Last Message Number for that unit to zero. This may require recreating the unit entry in the KMF database (to reset the KMFs record of the LMN). Note at end of document.
3. If user requested Rekey received by KMF, Note the Unit Name is displayed in KMF activity window, verify that RSI (and Unit ID) for that unit is as expected.
4. If an unencrypted HELLO is not answered, but a User requested Rekey is heard by the KMF, then it is possible that the RSI and the P25 Unit ID are not the same. Otherwise, if the User Requested Rekey is not heard (seen on the KMF display); it is likely that the radio's programmed KMF RSI is incorrect.
5. Verify that another subscriber is not programmed with same Unit ID/RSI. Turn off radio and send unencrypted HELLO and verify that no response is received.

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### Resetting Last Message Number:

To correct message number synchronization, delete and recreate unit entry in KMF. On the radio, use keyloader to reset the radio Individual RSI (TGTRSI), this will reset the radio Individual RSI message number.