

If this is the first time-use of **MAPS™ ED137 Radio** application, then it is recommended to follow all the steps explained in [MAPS-ED137-Radio-Quick-Install-Guide](#) to install **MAPS™ ED137 Radio** application before proceeding with the steps below.

Quick Check-out Procedure

For **self-test** of **MAPS™ ED137 Radio** application, you may prepare a **single PC with 2 NIC cards**, one as source and other as destination. Ensure that both NIC cards are within the same subnet, assigned proper free IP addresses available in the subnet, and connected to a switch. If the system is connected to a LAN, contact your system administrator to avoid IP address conflicts before you perform the steps below.

If the PC has only one NIC card, then the **MAPS™ ED137 Radio** can be tested against any DUT in the network in a similar manner, with destination IP address and port set to that of the DUT's.

For illustration purposes, the following IP address for the NIC cards are configured.

- NIC1 IP address is 192.168.1.156, and configured as **CWP**
- NIC2 IP address is 192.168.1.157, and configured as **GRS**

Invoke two instances of the **MAPS™ ED137 Radio** application on the test PC. Configure the first instance to use **NIC1 IP** address as **CWP** (Controller Working Position) and the **NIC2 IP** address as the **GRS** (Ground Radio Station) endpoint. Similarly, configure the second instance to use **NIC2 IP** address as the source and the **NIC1 IP** address as the destination endpoint for emulating **Radio** calls.

 **Note:**

- **ED137** call generator can be any real CWP device supporting ED137 signaling and traffic. In this test scenario, we have configured **MAPS™ ED137 Radio** as **CWP** and **GRS** to generate and receive calls, respectively.
- Ensure that latest warranty license (**GLSupportWarrantyLicenseInstaller.exe**) is installed and also confirm that **PKS118 (MAPS™ ED137 Radio)** is listed in **Warranty Application List**. Refer to [MAPS- ED137-Radio -Quick-Install-Guide](#).

Configuring MAPS™ ED137 Radio as CWP



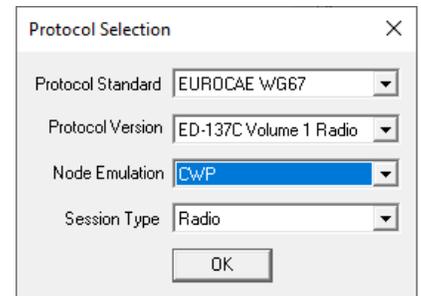
- Click on **MAPSED137Radio** shortcut icon created on the desktop and invoke the application. This instance of **MAPS™** is configured for **Call Generation**. By default, **Protocol Selection** window appears.

- Configure the following in the **Protocol Selection** window:

- Select **Protocol Standard** as **EUROCAE WG67**
- Select **Protocol Version** as **ED-137C Volume 1 Radio**

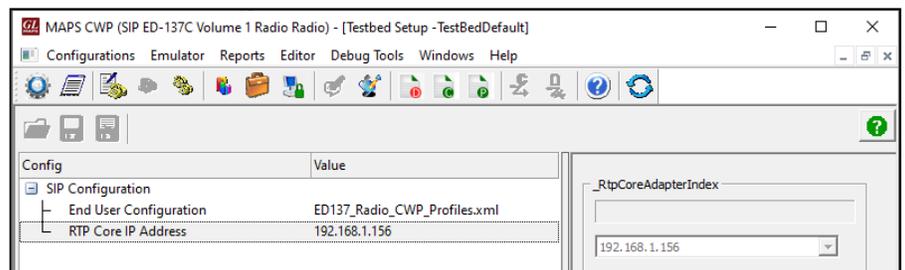
Note: **MAPS™ ED137 Radio** supports both **ED137_1B** and **ED137_1C** versions. Select appropriate version from the drop-down for respective version call simulation.

- Select **Node Emulation** as **CWP**
- Session Type as **Radio**. Click **OK**



- By default, **Testbed Setup** window is displayed loaded with **TestBedDefault** configuration. Check for the following default parameter values:

- **ED137_Radio_CWP_Profiles.xml** profile is loaded for **End User Configuration**
- The **RTP Core IP** address automatically displays the IP Address for the available NIC. Users can select the required IP Address for the NIC in use from the drop-down list, for this test select **NIC1**

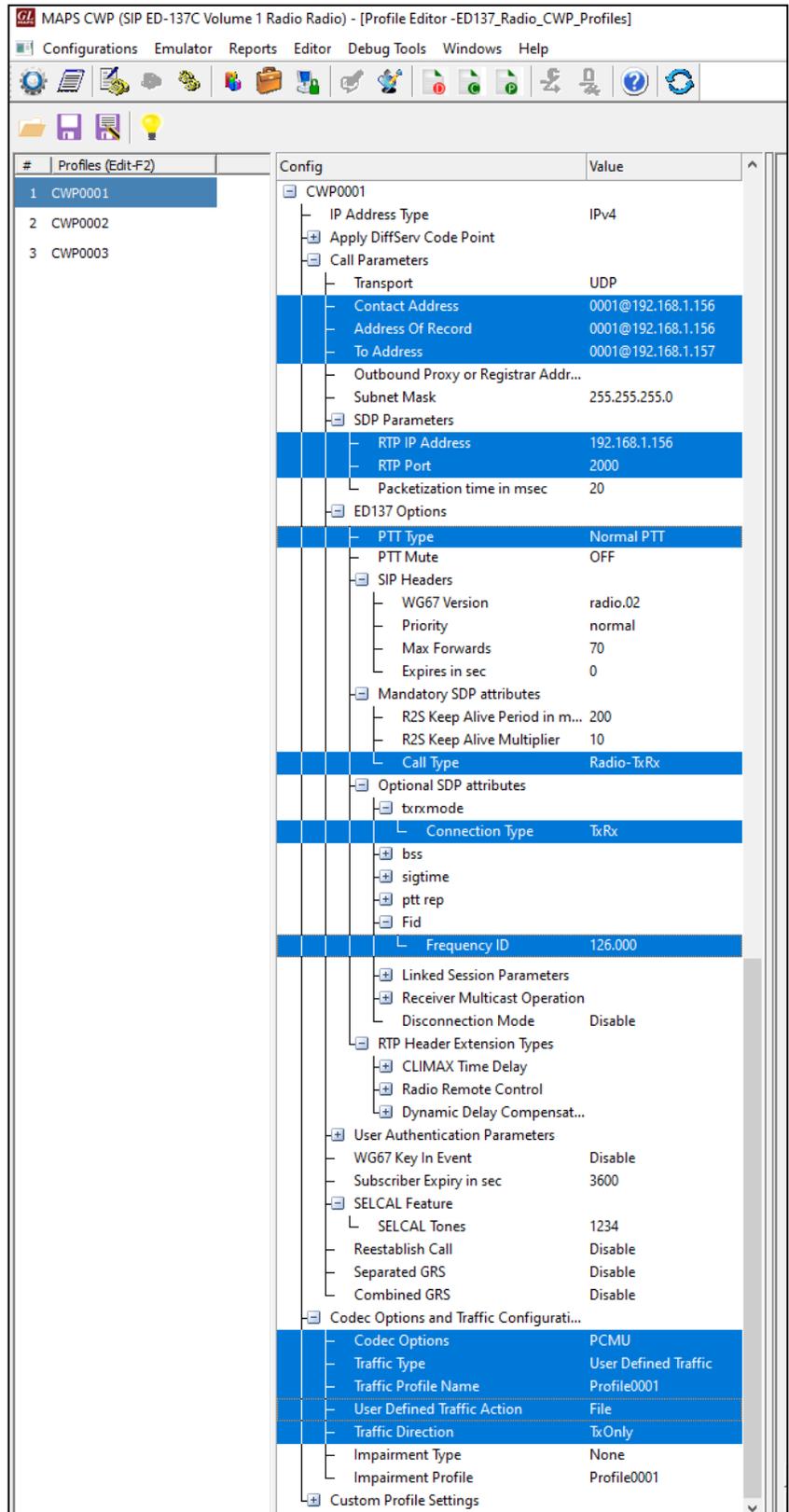


IP address. Click **Save** icon .

- From **MAPSED137Radio** (CWP) main window, select **Editor** → **Profile Editor** to open the Profile Editor window. By default, **ED137_Radio_CWP_Profiles** is loaded in the window. Select **CWP0001** profile from left pane and edit the following parameters as per the test requirement:

- Edit **Contact Address** → 0001@192.168.1.156 (Enter the NIC1 IP address in SIP URI here)
- Edit **Address of Record** → 0001@192.168.1.156 (Enter the NIC1 IP address in SIP URI here)
- Edit **To Address** → 0001@192.168.1.157 (Enter the NIC2 IP address in SIP URI here)
- Edit **RTP IP Address** → **192.168.1.156** (Enter the NIC1 IP address here)
- Set **RTP Port** → **2000**
- Set **PTT Type** → **Normal PTT**
- Set **Call Type** → **Radio-TxRx**
- Set **Connection Type** → **TxRx**
- Set **Frequency ID** → **126.000** (FID at CWP should match with FID of GRS to which it intends to place call)
- Scroll down to **Codec Options and Traffic Configurations**, and set **Codec Options** as **PCMU** from the Codec list
- Set **Traffic Type** to **User Defined Traffic** type, **Traffic Profile Name** to **Profile0001**, and **User Defined Traffic Action** to **File**.
- Set **Traffic Direction** to **Tx Only**.
- Click **Save** icon . Exit from the **Profile Editor** window.

Refer to [MAPS™ ED137-Radio Reference User's Manual](#) for step-by-step procedure to configure multiple CWPs.



The screenshot shows the 'Profile Editor - ED137_Radio_CWP_Profiles' window. The left pane lists profiles: 1 CWP0001, 2 CWP0002, and 3 CWP0003. The main area shows the configuration for CWP0001. Key parameters are highlighted in blue:

- IP Address Type:** IPv4
- Apply DiffServ Code Point:** (unchecked)
- Call Parameters:**
 - Transport:** UDP
 - Contact Address:** 0001@192.168.1.156
 - Address Of Record:** 0001@192.168.1.156
 - To Address:** 0001@192.168.1.157
 - Outbound Proxy or Registrar Addr...:** (empty)
 - Subnet Mask:** 255.255.255.0
- SDP Parameters:**
 - RTP IP Address:** 192.168.1.156
 - RTP Port:** 2000
 - Packetization time in msec:** 20
- ED137 Options:**
 - PTT Type:** Normal PTT
 - PTT Mute:** OFF
- SIP Headers:**
 - WG67 Version:** radio.02
 - Priority:** normal
 - Max Forwards:** 70
 - Expires in sec:** 0
- Mandatory SDP attributes:**
 - R2S Keep Alive Period in m...:** 200
 - R2S Keep Alive Multiplier:** 10
- Call Type:** Radio-TxRx
- Optional SDP attributes:**
 - trxmode:** (unchecked)
 - Connection Type:** TxRx
 - bss:** (unchecked)
 - sigtime:** (unchecked)
 - ptt rep:** (unchecked)
 - Fid:** (unchecked)
 - Frequency ID:** 126.000
- Linked Session Parameters:**
 - Receiver Multicast Operation:** (unchecked)
 - Disconnection Mode:** Disable
- RTP Header Extension Types:**
 - CLIMAX Time Delay:** (unchecked)
 - Radio Remote Control:** (unchecked)
 - Dynamic Delay Compensat...:** (unchecked)
- User Authentication Parameters:**
 - WG67 Key In Event:** Disable
 - Subscriber Expiry in sec:** 3600
- SELCAL Feature:**
 - SELCAL Tones:** 1234
 - Reestablish Call:** Disable
 - Separated GRS:** Disable
 - Combined GRS:** Disable
- Codec Options and Traffic Configurati...:**
 - Codec Options:** PCMU
 - Traffic Type:** User Defined Traffic
 - Traffic Profile Name:** Profile0001
 - User Defined Traffic Action:** File
 - Traffic Direction:** TxOnly
 - Impairment Type:** None
 - Impairment Profile:** Profile0001
- Custom Profile Settings:** (empty)

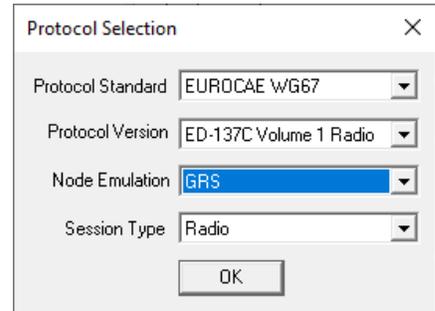
Configuring MAPS™-ED137 Radio as GRS



- Click on **MAPSED137Radio** shortcut icon created on the desktop and invoke the application. This instance of MAPS™ is configured for **Call Reception**. By default, **Protocol Selection** window appears.

- Configure the following in the **Protocol Selection** window:

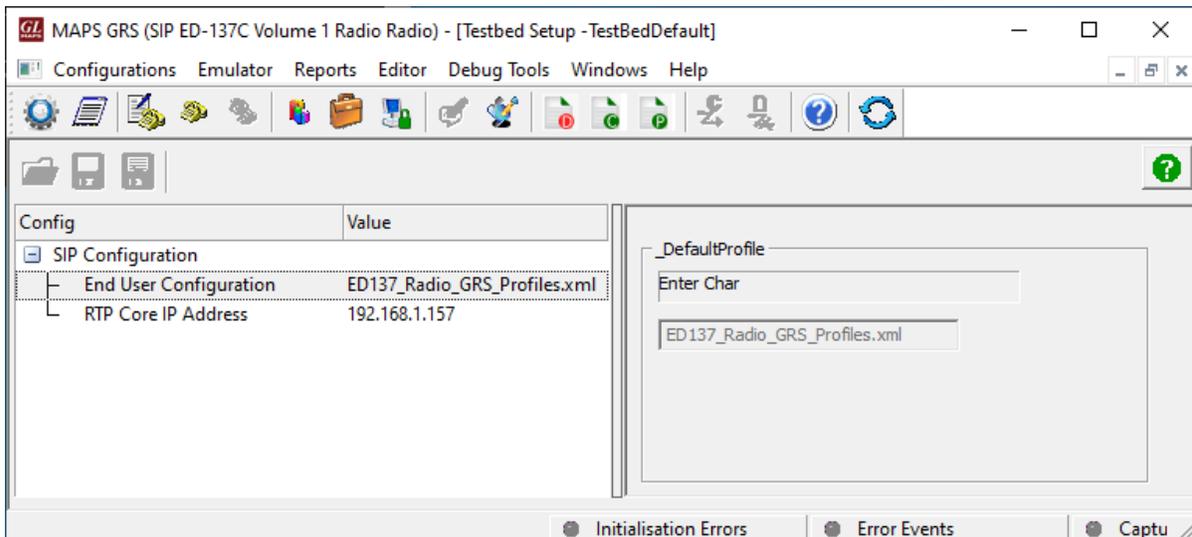
- Select **Protocol Standard** as **EUROCAE WG67**
- Select **Protocol Version** as **ED-137C Volume 1 Radio**
Note: MAPS™ ED137 Radio supports both ED137_1B and ED137_1C versions. Select appropriate version from the dropdown for respective version call simulation.
- Select **Node Emulation** as **GRS**
- Select **Session Type** as **Radio**. Click **OK**



- By default, **Testbed Setup** window is displayed, loaded with **TestBedDefault** configuration. Check for the default parameter values:

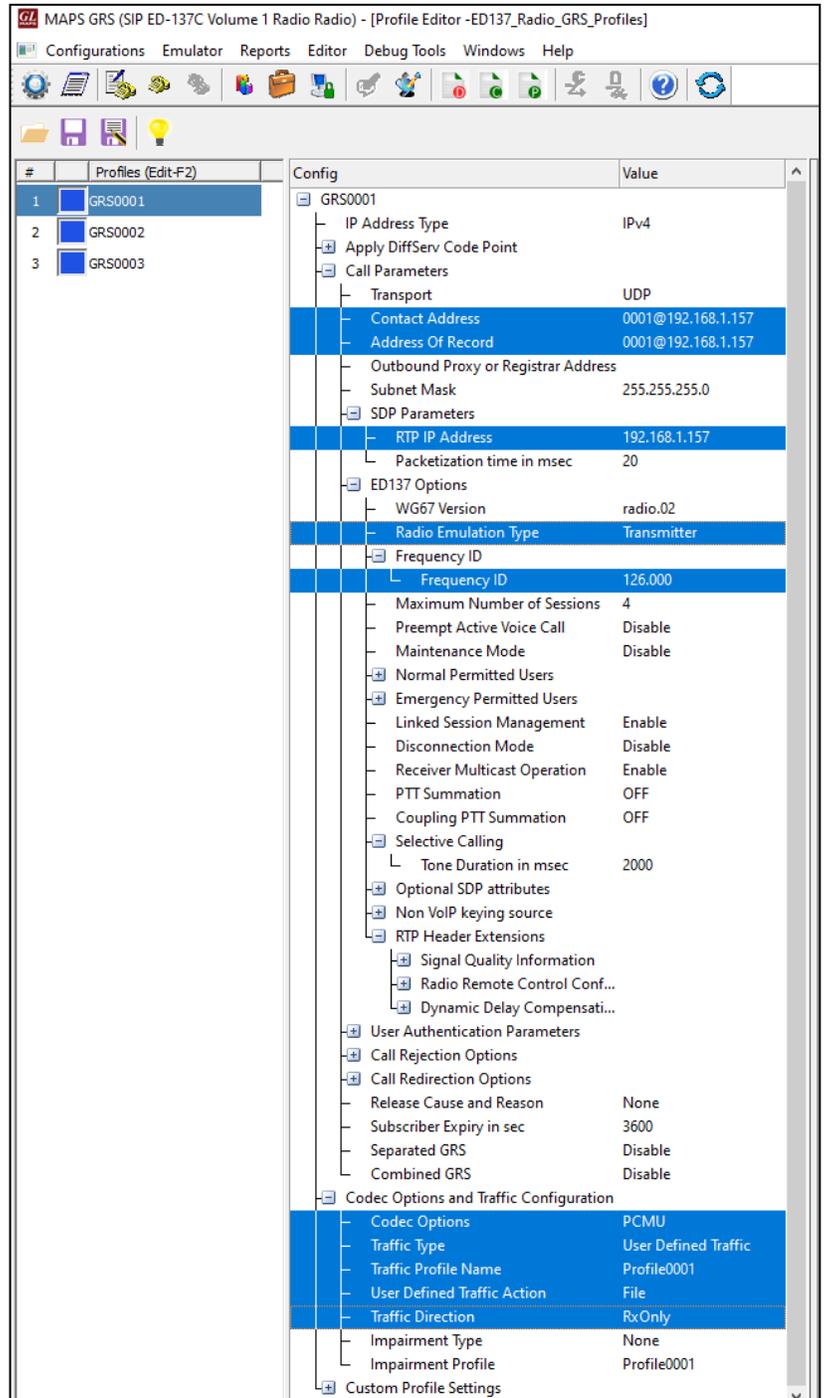
- **ED137_Radio_GRS_Profiles.xml** profile is loaded as the end-user configuration
- The RTP Core IP Address automatically displays the IP Address for the available NIC. User can select the required IP Address for the NIC in use from the drop-down list, for this test select **NIC2** IP address.

- Click **Save** icon .



- From **MAPSED137Radio (GRS)** main window, select **Editor → Profile Editor**. By default, **ED137_Radio_GRS_Profiles** is loaded in the window. Select **GRS0001** profile from left pane and edit the following parameters as per the test requirement:
 - Edit **Contact Address** → 0001@192.168.1.157 (Enter the NIC2 IP Address in SIP URI here)
 - Edit **Address of Record** → 0001@192.168.1.157 (Enter the NIC2 IP Address in SIP URI here)
 - Edit **RTP IP Address** → **192.168.1.157** (Enter the NIC2 IP Address. **RTP IP Address** should be same as **IP address** used in **Contact IP Address** above)
 - Select the **Radio Emulation Type** → **Transmitter**
 - By default, **Frequency ID** → **126.000**
 - Scroll down to **Codec Options and Traffic Configurations**, and set **Codec Options** as **PCMU** from the Codec list
 - Set **Traffic Type** to **User Defined Traffic**, **Traffic Profile Name** to **Profile0001**, and **User Defined Traffic Action** to **File**
 - Set **Traffic Direction** to **RxOnly**
 - Color coding for each profile (seen at beginning of profile name) on the left pane can be changed. Color code is used to identify calls associated to individual radio in the **Call Reception** window display.
 - Click **Save** icon . Exit from the **Profile Editor** window.

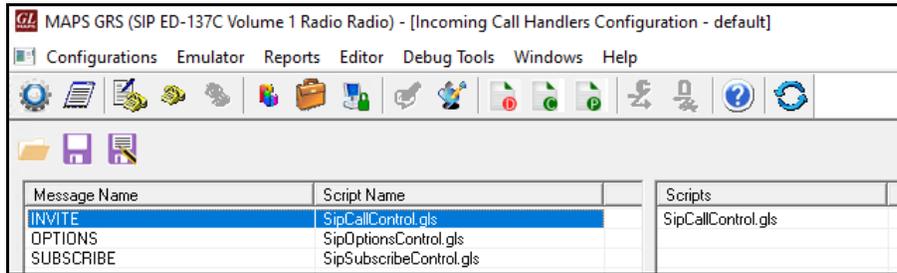
Refer to [MAPS™ ED137-Radio Reference User's Manual](#) for step-by-step procedure to configure multiple GRSs.



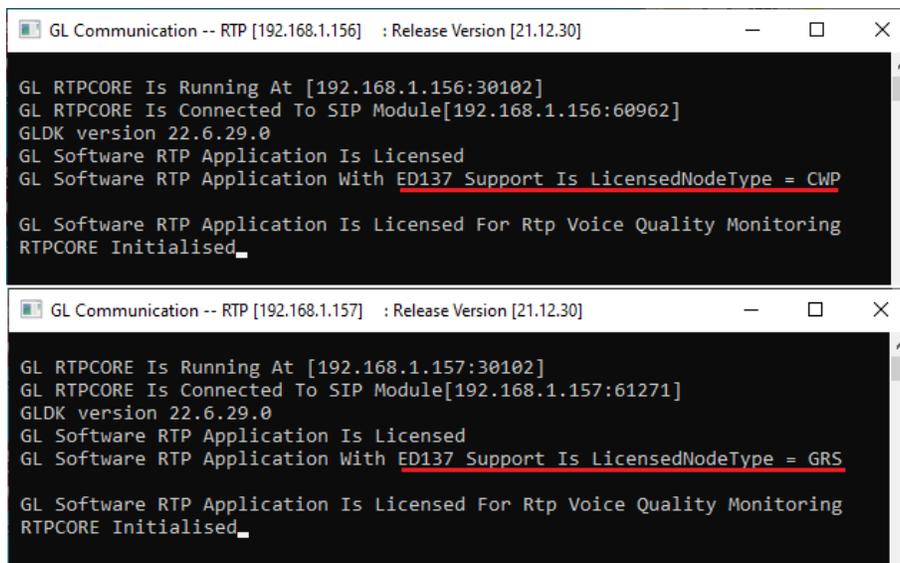
The screenshot shows the MAPS GRS Profile Editor window. The left pane lists profiles: GRS0001 (blue), GRS0002 (green), and GRS0003 (yellow). The right pane shows the configuration for GRS0001. The configuration is as follows:

Parameter	Value
IP Address Type	IPv4
Apply DiffServ Code Point	
Call Parameters	
Transport	UDP
Contact Address	0001@192.168.1.157
Address Of Record	0001@192.168.1.157
Outbound Proxy or Registrar Address	
Subnet Mask	255.255.255.0
SDP Parameters	
RTP IP Address	192.168.1.157
Packetization time in msec	20
ED137 Options	
WG67 Version	radio.02
Radio Emulation Type	Transmitter
Frequency ID	
Frequency ID	126.000
Maximum Number of Sessions	4
Preempt Active Voice Call	Disable
Maintenance Mode	Disable
Normal Permitted Users	
Emergency Permitted Users	
Linked Session Management	Enable
Disconnection Mode	Disable
Receiver Multicast Operation	Enable
PTT Summation	OFF
Coupling PTT Summation	OFF
Selective Calling	
Tone Duration in msec	2000
Optional SDP attributes	
Non VoIP keying source	
RTP Header Extensions	
Signal Quality Information	
Radio Remote Control Conf...	
Dynamic Delay Compensati...	
User Authentication Parameters	
Call Rejection Options	
Call Redirection Options	
Release Cause and Reason	None
Subscriber Expiry in sec	3600
Separated GRS	Disable
Combined GRS	Disable
Codec Options and Traffic Configuration	
Codec Options	PCMU
Traffic Type	User Defined Traffic
Traffic Profile Name	Profile0001
User Defined Traffic Action	File
Traffic Direction	RxOnly
Impairment Type	None
Impairment Profile	Profile0001
Custom Profile Settings	

- On the **MAPSED137Radio** (GRS) main window, select **Configuration → Incoming Call Handler** to invoke the **Incoming Call Handlers Configuration** window. Verify that **SipCallControl.gls** script is loaded against the **INVITE** message. Close the window.



- Start both the MAPS™ Testbed setup and wait for **RTP-Core** console window to appear in the taskbar. If the SIP/RTP Core console does not invoke with the MAPS™ TestBed start-up, refer to [MAPS-ED137-Radio-Quick-Install-Guide](#) for troubleshooting.



Note:

- When the user tries to start the testbed, if the "Warranty Error" as shown is prompted, then user needs to ensure that latest warranty license is installed. For more details, refer to [MAPS-ED137-Radio-Quick-Install-Guide](#).



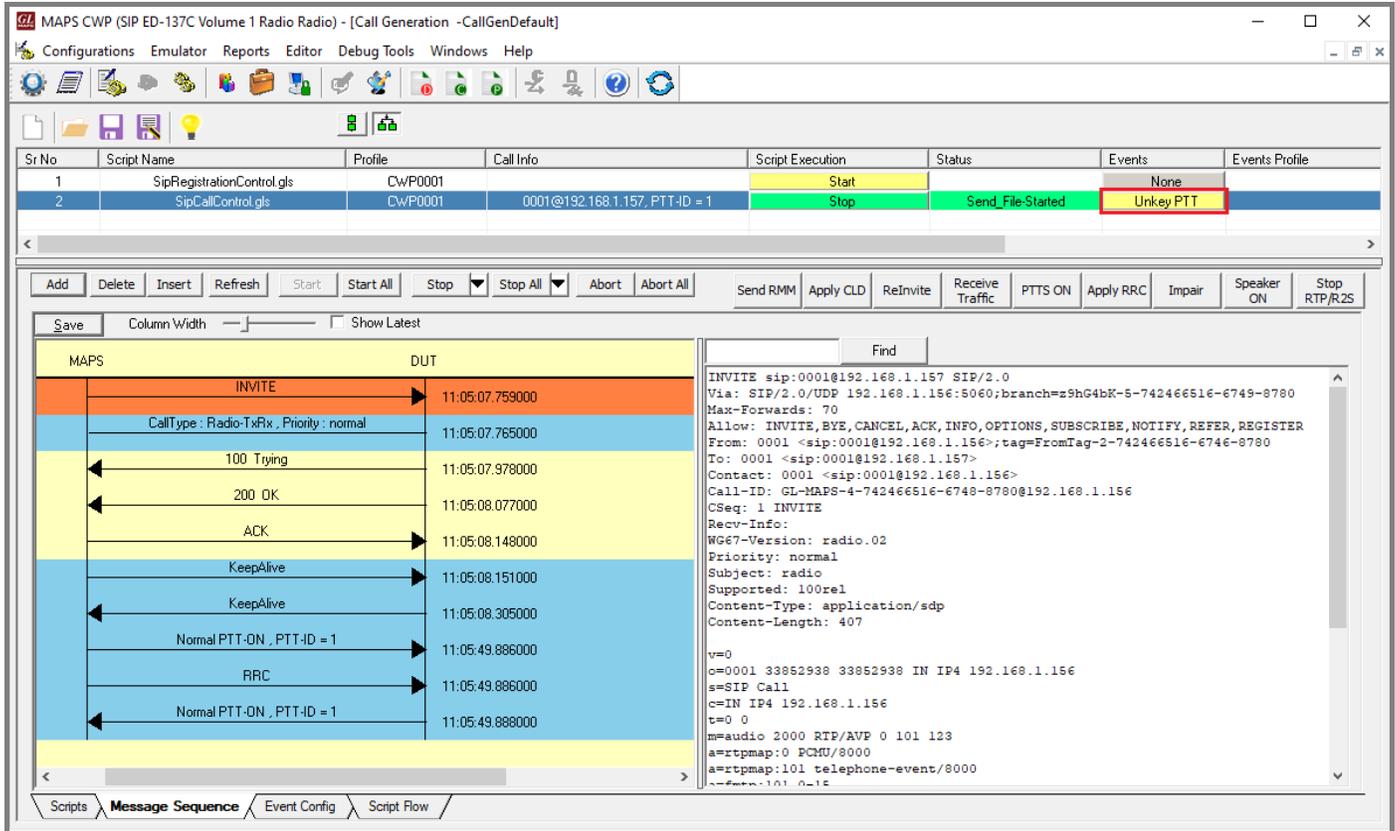
- On **MAPSED137Radio** (CWP) main window, click the **Call Generation** icon , and invoke the **Call Generation** window.
- By default, observe two entries in **Call Generation** window. The first one is loaded with the **SipRegistrationControl.gls** script for **CWP0001**, which registers **CWP0001** if the **Registrar Address** is configured in the profile. The second entry is loaded with the **SipCallControl.gls** script, which places a call to another end radio using **CWP0001**.



Note:

- If the profile **CWP0001** does not appear then, double click under the **Profile** column, select the required profile from the **Profile** dropdown list.

- Click on the **Start** button on the second entry to place a call to **GRS0001** on another MAPS™ instance. Observe that the call is established, and the message sequence displays the **SIP** message flows for this call. Users can select any **SIP** message to view the message decoded on the right side.
- During the established call, click on **Key PTT** button under the **Events** column to initiate **PTT** and observe the Message sequence updating to indicate **PTT** and its confirmation from the radio. Click **Unkey PTT** to stop.



The screenshot shows the MAPS CWP (SIP ED-137C Volume 1 Radio Radio) - [Call Generation - CallGenDefault] interface. The main window displays a table of call events:

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Events Profile
1	SipRegistrationControl.gls	CwP0001		Start		None	
2	SipCallControl.gls	CwP0001	0001@192.168.1.157, PTT-ID = 1	Stop	Send_File-Started	Unkey PTT	

Below the table is a toolbar with buttons: Add, Delete, Insert, Refresh, Start, Start All, Stop, Stop All, Abort, Abort All, Send RMM, Apply CLD, ReInvite, Receive Traffic, PTTs ON, Apply RRC, Impair, Speaker ON, Stop RTP/R2S.

The Message Sequence window is open, showing a sequence of messages between MAPS and DUT:

- 11:05:07.759000: INVITE
- 11:05:07.765000: CallType: Radio-TxRx, Priority: normal
- 11:05:07.978000: 100 Trying
- 11:05:08.077000: 200 OK
- 11:05:08.148000: ACK
- 11:05:08.151000: KeepAlive
- 11:05:08.305000: KeepAlive
- 11:05:49.886000: Normal PTT-ON, PTT-ID = 1
- 11:05:49.886000: RRC
- 11:05:49.888000: Normal PTT-ON, PTT-ID = 1

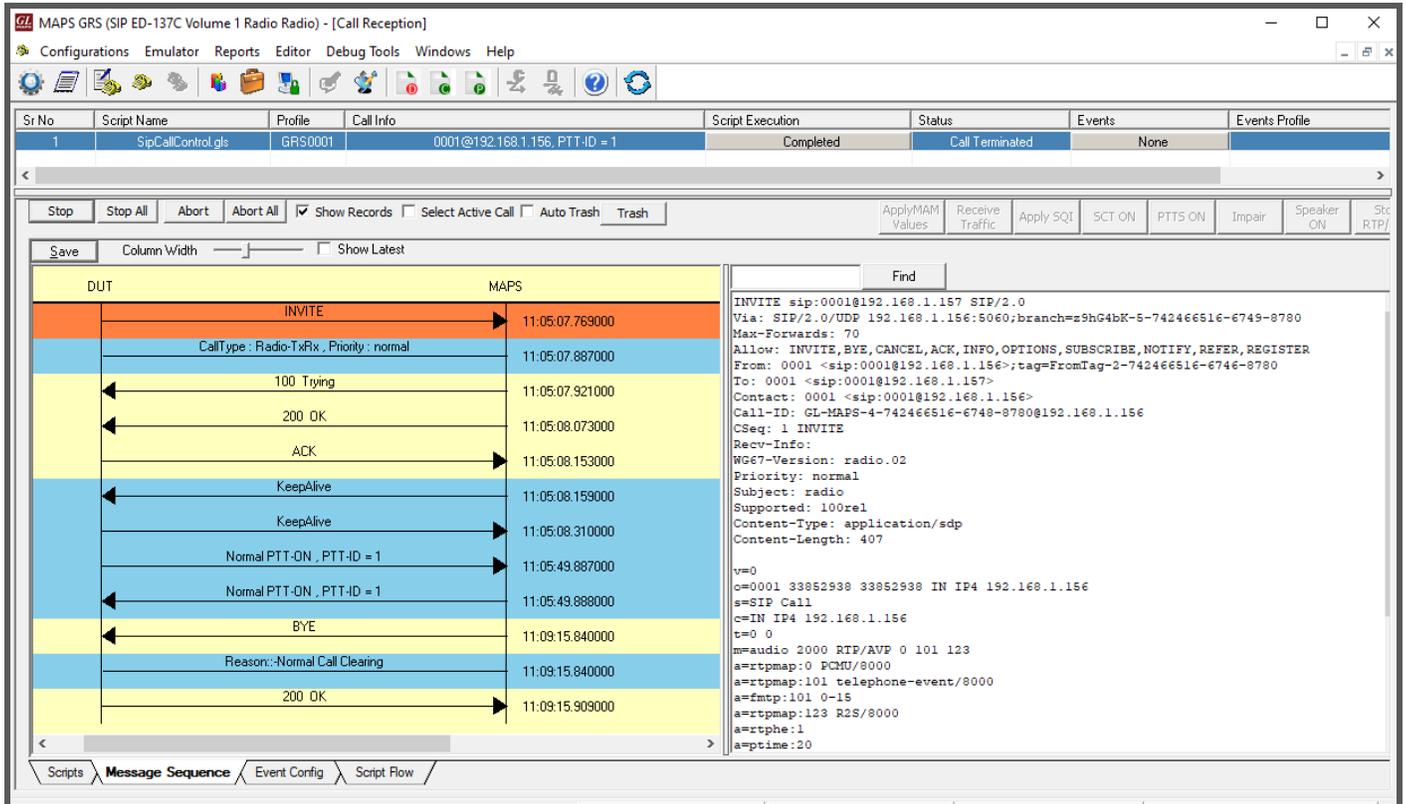
The right pane shows the decoded SIP message:

```

INVITE sip:0001@192.168.1.157 SIP/2.0
Via: SIP/2.0/UDP 192.168.1.156:5060;branch=z9hG4bK-5-742466516-6749-8780
Max-Forwards: 70
Allow: INVITE, BYE, CANCEL, ACK, INFO, OPTIONS, SUBSCRIBE, NOTIFY, REFER, REGISTER
From: 0001 <sip:0001@192.168.1.156>;tag=FromTag-2-742466516-6746-8780
To: 0001 <sip:0001@192.168.1.157>
Contact: 0001 <sip:0001@192.168.1.156>
Call-ID: GL-MAPS-4-742466516-6748-8780@192.168.1.156
CSeq: 1 INVITE
Recv-Info:
WG67-Version: radio.02
Priority: normal
Subject: radio
Supported: 100rel
Content-Type: application/sdp
Content-Length: 407

v=0
o=0001 33852938 33852938 IN IP4 192.168.1.156
s=SIP Call
c=IN IP4 192.168.1.156
t=0 0
m=audio 2000 RTP/AVP 0 101 123
a=rtpmap:0 PCMU/8000
a=rtpmap:101 telephone-event/8000
--from:101 0-15
    
```

- Return to **MAPSED137Radio** (GRS) main window. Click on **Call Reception** icon  and observe the call being received and answered automatically. Now, click on the **Start Squelch** button under the **Events** column to send **Squelch** on this call. Observe the **Squelch** event indication displayed in the Message Sequence.
- Click on the **Stop** button under **Script Execution** to terminate the call either from **CWP** or **GRS** side.



The screenshot shows the MAPS GRS interface with a message sequence window open. The message sequence shows a call from DUT to MAPS. The SIP logs on the right show the following details:

```

INVITE sip:0001@192.168.1.157 SIP/2.0
Via: SIP/2.0/UDP 192.168.1.156:5060;branch=z9hG4bK-5-742466516-6745-8780
Max-Forwards: 70
Allow: INVITE, BYE, CANCEL, ACK, INFO, OPTIONS, SUBSCRIBE, NOTIFY, REFER, REGISTER
From: 0001 <sip:0001@192.168.1.156>;tag=FromTag-2-742466516-6746-8780
To: 0001 <sip:0001@192.168.1.157>
Contact: 0001 <sip:0001@192.168.1.156>
Call-ID: GL-MAPS-4-742466516-6748-8780@192.168.1.156
CSeq: 1 INVITE
Recv-Info:
WG67-Version: radio.02
Priority: normal
Subject: radio
Supported: 100rel
Content-Type: application/sdp
Content-Length: 407

v=0
o=0001 33852938 33852938 IN IP4 192.168.1.156
s=SIP Call
c=IN IP4 192.168.1.156
t=0 0
m=audio 2000 RTP/AVP 0 101 123
a=rtpmap:0 PCMU/8000
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-15
a=rtpmap:123 R2S/8000
a=rtphe:1
a=rtpptime:20
  
```

- This completes the functional verification of **MAPS™ ED137 Radio** application.
- For any technical issues, contact **GL Communications Inc.**