



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for Configuring the Multi-Tech CallFinder GSM Cellular Gateway with Avaya Communication Manager - Issue 1.0**

### **Abstract**

These Application Notes describe the procedures for configuring the Multi-Tech CallFinder GSM Cellular Gateway to interoperate with Avaya Communication Manager.

The Multi-Tech CallFinder GSM Cellular Gateway enables small to medium sized businesses to take advantage of potentially lower cost wireless networks to provide savings in the overall telephone bill of the business. The CallFinder connects to Avaya Communication Manager via an analog trunk. The CallFinder then provides access to the GSM cellular network for all calls routed to and from this analog trunk.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

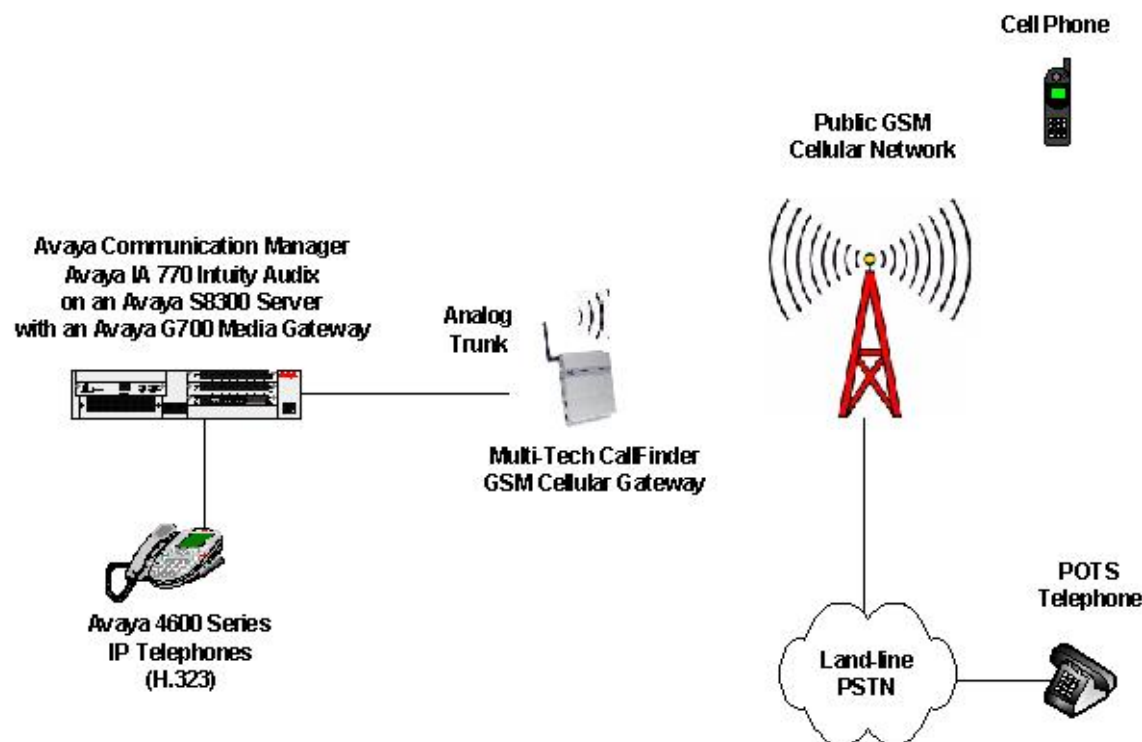
# 1. Introduction

These Application Notes describe the procedures for configuring the Multi-Tech CallFinder GSM Cellular Gateway to interoperate with Avaya Communication Manager.

The Multi-Tech CallFinder GSM Cellular Gateway connects to Avaya Communication Manager via an analog trunk. The CallFinder then provides access between the GSM cellular network and this analog trunk.

## 1.1. Configuration

**Figure 1** illustrates the test configuration. The test configuration is comprised of an Avaya Communication Manager and Avaya IA 770 Intuity Audix running on an Avaya S8300 Server with an Avaya G700 Media Gateway. The CallFinder is connected to an analog FXO trunk port of the Avaya G700 Media Gateway. The CallFinder in turn provides access to the public GSM network. Through the GSM network, both cellular and land-line phones were accessed. Endpoints on Avaya Communication Manager were Avaya 4600 Series IP Telephones.



**Figure 1: Test Configuration**

## 2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration:

Equipment	Software/Firmware
Avaya S8300 Server with Avaya G700 Media Gateway Avaya IA 770 Intuity Audix	Avaya Communication Manager 5.0 Service Pack (R015x.00.0.825.4-15467)
Avaya 4612 IP Telephones (H.323)	H.323 version 1.8.3
Avaya 4620 IP Telephones (H.323) Avaya 4624 IP Telephones (H.323)	H.323 version 2.3
Analog Telephone	-
Cellular Phone	-
Multi-Tech CallFinder GSM Cellular Gateway	3.01

## 3. Configure Avaya Communication Manager

This section describes the Avaya Communication Manager configuration required to connect to the CallFinder as shown in **Figure 1**.

The configuration of Avaya Communication Manager was performed using the System Access Terminal (SAT). After the completion of the configuration, perform a **save translation** command to make the changes permanent.

Step	Description
1.	<p><b>System Parameters</b></p> <p>In order to receive Caller ID information for incoming calls on the analog trunk, use the <b>display system-parameters customer-options</b> command to verify that the <b>Analog Trunk Incoming Call ID</b> field is set to <b>y</b>. If not, contact an authorized Avaya representative to make the necessary changes.</p> <pre> display system-parameters customer-options                                 Page 3 of 11                                 OPTIONAL FEATURES  Abbreviated Dialing Enhanced List? n      Audible Message Waiting? n Access Security Gateway (ASG)? n          Authorization Codes? n <b>Analog Trunk Incoming Call ID? y</b>        CAS Branch? n A/D Grp/Sys List Dialing Start at 01? n   CAS Main? n Answer Supervision by Call Classifier? n   Change COR by FAC? n ARS? y Computer Telephony Adjunct Links? n ARS/AAR Partitioning? y                   Cvg Of Calls Redirected Off-net? n ARS/AAR Dialing without FAC? n            DCS (Basic)? n ASAI Link Core Capabilities? y            DCS Call Coverage? n ASAI Link Plus Capabilities? y            DCS with Rerouting? n Async. Transfer Mode (ATM) PNC? n Async. Transfer Mode (ATM) Trunking? n    Digital Loss Plan Modification? n ATM WAN Spare Processor? n                DS1 MSP? n ATMS? n                                   DS1 Echo Cancellation? n Attendant Vectoring? n </pre>
2.	<p><b>Trunk Group</b></p> <p>An analog FXO trunk is used to connect to the CallFinder. Create a trunk group for the analog trunk by using the <b>add trunk-group</b> command. The example below shows the values used for the compliance test.</p> <ul style="list-style-type: none"> <li>• <b>Group Type:</b> <i>co</i></li> <li>• <b>Group Name:</b> Any descriptive name</li> <li>• <b>TAC:</b> A trunk access code consistent with the existing dial plan.</li> <li>• <b>Comm Type:</b> <i>voice</i></li> <li>• <b>Incoming Destination:</b> The extension that should be rung when an incoming call is received on this trunk. In the case of the compliance test, this was the extension of an automated attendant.</li> <li>• <b>Trunk Type:</b> <i>loop-start</i></li> </ul> <pre> add trunk-group 3                                 Page 1 of 21                                 TRUNK GROUP  Group Number: 3                  Group Type: co          CDR Reports: y Group Name: CO Local LS          COR: 2              TN: 1              TAC: *003 Direction: two-way              Outgoing Display? n Dial Access? y                  Busy Threshold: 255 Night Service: Queue Length: 0                  Country: 1          Incoming Destination: 3310 Comm Type: voice                 Auth Code? n        Digit Absorption List: Prefix-1? y                      Trunk Flash? n      Toll Restricted? y  Trunk Type: loop-start </pre>

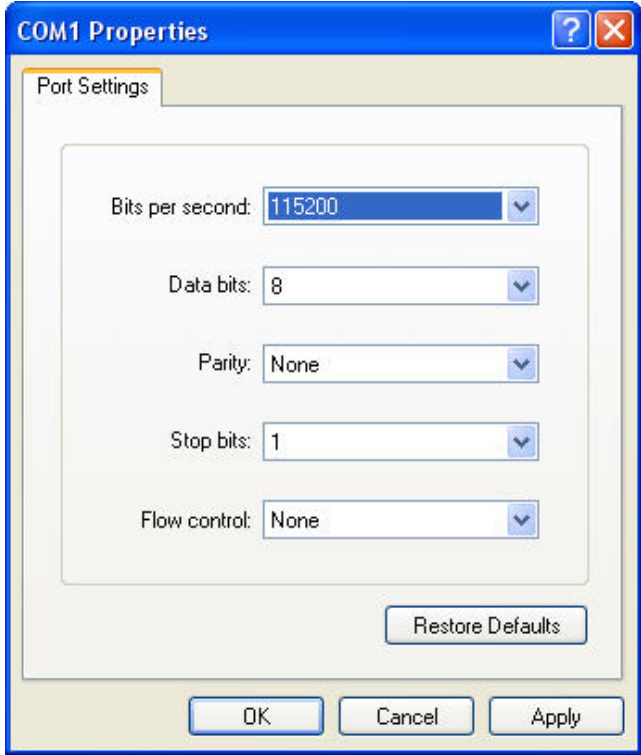
Step	Description
3.	<p><b>Trunk Group – Page 3</b>  On <b>Page 3</b>, in order to support Caller ID, set the <b>Receive Analog Incoming Call ID</b> field to <b>Bellcore</b>.</p> <div> <pre> add trunk-group 3 TRUNK FEATURES     ACA Assignment? n          Measured: none                                 Maintenance Tests? y                                 Data Restriction? n     Abandoned Call Search? n     Suppress # Outpulsing? n     Charge Conversion: 1     Decimal Point: none     Currency Symbol:     Charge Type: units                                 Replace Restricted Numbers? n                                 Replace Unavailable Numbers? n                                 <b>Receive Analog Incoming Call ID: Bellcore</b>                                 Per Call CPN Blocking Code:                                 Per Call CPN Unblocking Code:     Outgoing ANI:                                 Dsl Echo Cancellation? y </pre> </div>
4.	<p><b>Trunk Group – Page 5</b>  On <b>Page 5</b>, under GROUP MEMBER ASSIGNMENTS, enter the port number of the analog trunk that connects to the CallFinder in the <b>Port</b> column. All other columns are populated automatically.</p> <div> <pre> add trunk-group 3 TRUNK GROUP     Administered Members (min/max): 1/1     Total Administered Members: 1 GROUP MEMBER ASSIGNMENTS     Port    Code Sfx Name      Night      Mode      Type      Ans Delay 1: 001V408 MM711      CO Trunk 2: </pre> </div>

Step	Description
5.	<p><b>Route Pattern</b></p> <p>Create a route pattern that points to the trunk group created in <b>Steps 2 – 4</b>. This route pattern will be used by Automatic Route Selection (ARS) to route calls to the CallFinder trunk group. The example below shows the values used for the compliance test.</p> <ul style="list-style-type: none"> <li>▪ <b>Pattern Name:</b> Any descriptive name.</li> <li>▪ <b>Grp No: 3</b> This field is set to the trunk group number defined in <b>Step 2</b>.</li> <li>▪ <b>FRL: 0</b> This field is the Facility Restriction Level of the trunk. It must be set to an appropriate level to allow authorized users to access the trunk. The level of 0 is the least restrictive.</li> </ul> <pre> change route-pattern 7 Pattern Number: 7    Pattern Name: Avaya Test RP SCCAN? n    Secure SIP? n Grp FRL NPA Pfx Hop Toll No. Inserted DCS/ IXC No      Mrk Lmt List Del Digits      QSIG Intw 1: 3      0 2: 3: 4: 5: 6: n user n user n user n user n user n user  BCC VALUE TSC CA-TSC ITC BCIE Service/Feature PARM No. Numbering LAR 0 1 2 M 4 W Request Dgts Format Subaddress 1: y y y y y n n rest none 2: y y y y y n n rest none 3: y y y y y n n rest none 4: y y y y y n n rest none 5: y y y y y n n rest none 6: y y y y y n n rest none </pre>
6.	<p><b>Automatic Route Selection (ARS)</b></p> <p>ARS was used to route calls to the CallFinder. Outbound calls to area code 732 were used for the compliance test and reached the CallFinder via route pattern 7. Thus, in the highlighted example below, a dialed string beginning with 1732, and 11 digits long is mapped to route pattern 7. The <b>Call Type</b> field is set to <i>fnpa</i>.</p> <pre> display ars analysis 1732 ARS DIGIT ANALYSIS TABLE Location: all    Percent Full: 0 Dialed Total Route Call Node ANI String Min Max Pattern Type Num Reqd 1732 11 11 7 fnpa n 1800 11 11 3 fnpa n 1809 11 11 deny fnpa n 1866 11 11 3 fnpa n </pre>

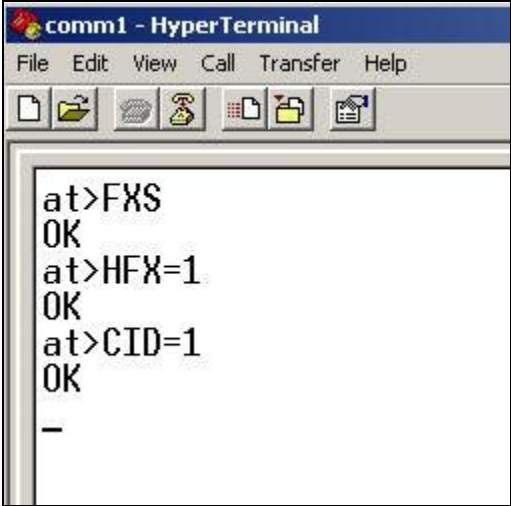
Step	Description
7.	<p><b>Automated Attendant Extension</b></p> <p>The incoming extension on the CallFinder analog trunk (see <b>Step 2</b>) can be any valid extension. In the case of the compliance test, the extension was set to a vector directory number (VDN) (x3310) that was mapped to vector 1 which provided a simple automated attendant function for incoming calls. To create a vdn, use the <b>add vdn</b> command. Enter any descriptive name for the <b>Name*</b> field. In the <b>Vector Number</b> field, enter the vector number providing the automated attendant function (see <b>Step 8</b>).</p> <div data-bbox="349 474 1398 810"> <pre> add vdn 3310                                 VECTOR DIRECTORY NUMBER                                 Page 1 of 2                                  Extension: 3310                                 Name*: FXO Trunk                                 Vector Number: 1                                 Attendant Vectoring? y                                  COR: 1                                 TN*: 1                                 Measured: none </pre> </div>
8.	<p><b>Automated Attendant Vector</b></p> <p>Vector 1 was used to provide an automated attendant for incoming calls. The configuration of vector 1 is shown below. A vector can be created with the <b>add vector</b> command.</p> <ul style="list-style-type: none"> <li>• <b>Name:</b> Any descriptive name</li> <li>• <b>Step 01:</b> Collect 4 digits after playing an announcement prompting the caller to enter the extension where they wish to be connected.</li> <li>• <b>Step 02:</b> Route the calls to the extension collected in vector step 01 and if necessary proceed to coverage.</li> </ul> <div data-bbox="315 1232 1416 1514"> <pre> add vector 1                                 CALL VECTOR                                 Page 1 of 6                                  Number: 1                                 Name: CF Trunk                                 Attendant Vectoring? n                                 Lock? n                                 Basic? y   EAS? n   G3V4 Enhanced? y   ANI/II-Digits? y   ASAI Routing? y                                 Prompting? y   LAI? n   G3V4 Adv Route? y   CINFO? y   BSR? y   Holidays? y                                 Variables? y   3.0 Enhanced? n                                 01 collect      4 digits after announcement 4010 for none                                 02 route-to     digits with coverage y                                 03 </pre> </div>

## 4. Configure the Multi-Tech CallFinder GSM Cellular Gateway

This section describes the analog port configuration of the CallFinder. It assumes the CallFinder has already been configured for the GSM service provider as documented in [4] or [5].

Step	Description
1.	<p><b>Connect to the CallFinder</b></p> <p>Establish a connection to the CallFinder serial port from a PC using a terminal emulation program with the following settings.</p> 



Step	Description
2.	<p><b>Analog Port Settings</b></p> <p>The CallFinder is configured using the command line interface shown below. The following commands configure the analog port for connecting to the analog trunk of the Avaya Media Gateway.</p> <p>Commands:</p> <ul style="list-style-type: none"> <li>• FXS – Set the analog port to FXS mode.</li> <li>• HFX=1 – Enable FXS loop-break disconnect for 4 seconds when the cellular side hangs up.</li> <li>• CID=1 – Enable Caller ID.</li> </ul> 

## 5. Interoperability Compliance Testing

This section describes the compliance testing used to verify the interoperability of the Multi-Tech CallFinder GSM Cellular Gateway with Avaya Communication Manager. This section covers the general test approach and the test results.

### 5.1. General Test Approach

The general test approach was to make inbound/outbound calls and exercise common PBX features.

### 5.2. Test Results

The CallFinder passed compliance testing. The following features and functionality were verified. Any observations related to these tests are listed at the end of this section.

- Outbound calls from Avaya Communication Manager to the cellular network.
- Inbound calls from the cellular network to Avaya Communication Manager.
- Ability to leave voicemail messages and activate the message waiting indicator (MWI) on the Avaya Communication Manager endpoints.
- PBX features including Hold, Transfer, Call Forwarding and Conference.
- Proper DTMF tone detection by Avaya Communication Manager call vectors.
- Proper system recovery after a CallFinder restart and loss of analog trunk connection.

The following was observed during the compliance testing:

- External callers could not access voicemail to retrieve messages by dialing the CallFinder and transferring to Audix. Audix did not recognize the DTMF tones sent by the CallFinder to enter user extension and password. Thus, to access voicemail, external callers would need to call Audix directly without using the CallFinder. This assumes that Avaya Communication Manager has trunks directly to the PSTN. These trunks are not shown in **Figure 1**.

## 6. Verification Steps

The following steps may be used to verify the configuration:

- From the Avaya Communication Manager SAT, use the **status trunk-group** command to verify that the analog trunk group is in-service.
- Verify that calls can be placed between Avaya Communication Manager endpoints and the cellular network.

## 7. Support

For technical support on the CallFinder, contact Multi-Tech via the support link at [www.multitech.com](http://www.multitech.com).

## 8. Conclusion

The Multi-Tech CallFinder passed compliance testing. These Application Notes describe the procedures required to configure the Multi-Tech CallFinder GSM Cellular Gateway to interoperate with Avaya Communication Manager as shown in **Figure 1**.

## 9. Additional References

Product documentation for Avaya products may be found at <http://support.avaya.com>.

Product documentation for the CallFinder may be found at <http://www.multitech.com>.

- [1] *Feature Description and Implementation For Avaya Communication Manager*, Doc # 555-245-205, Issue 6.0, January 2008.
- [2] *Administrator Guide for Avaya Communication Manager*, Doc # 03-300509, Issue 4, January 2008.
- [3] *Avaya IA 770 INTUITY AUDIX Messaging Application Release 5.0, Administering Communication Manager Servers to Work with IA 770*, January 2008.
- [4] *CallFinder Quick Start Guide for GSM and CDMA CF100FX2 Models*.
- [5] *CallFinder User Guide for Model CF100FX2-C/G*.

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