



Avaya Solution & Interoperability Test Lab

Application Notes for MultiTech CallFinder CF220 with Avaya IP Office - Issue 0.1

Abstract

These Application Notes describe the configuration steps required for the MultiTech CallFinder (CF220) DID-to-Analog Adapter to successfully interoperate with the Avaya IP Office for Analog DID support. MultiTech CallFinder is a DID-to-analog adapter that allows PBX systems to support analog DID services through standard analog station or analog trunk port connections. Features and functionality were validated. Information in these Application Notes has been obtained through interoperability compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

These Application Notes describe the compliance-tested configurations utilizing Avaya IP Office 3.0(40) and MultiTech CallFinder (CF220) DID-to-Analog Adapter 1.03 for routing incoming analog DID calls utilizing IP Office trunks or stations. DID services from the central office do not support CallerID. If the use of CallerID is required for incoming calls, DID services and this solution should not be used.

MultiTech CallFinder is a DID-to-analog adapter that allows PBX systems to support analog DID services through standard analog station or analog trunk port connections. It enables the phone system to directly route incoming calls to end-user extensions. The CallFinder DID-to-analog adapter has two DID ports and two programmable FXS/FXO ports and offers a web interface for system configuration and management.

These Application Notes address the two configuration scenarios that are possible between the Avaya IP Office and MultiTech CallFinder for analog DID support. The first configuration involves connecting the MultiTech CallFinder to analog trunk ports on the Avaya IP Office and is henceforth referred to as Trunk Configuration. The second configuration involves connecting the MultiTech CallFinder to analog station ports on the Avaya IP Office and is henceforth referred to as Station Configuration.

1.1. Trunk Configuration

The tested trunk configuration scenario is shown in **Figure 1**¹. Two DID trunks from the central office are connected to the two DID ports on the CallFinder. Each DID port has a corresponding FXS/FXO port in the CallFinder. In the trunk configuration, these ports are configured as FXS ports and are connected to analog trunk ports on the IP Office that are configured as Loop Start in the IP Office. In the trunk configuration scenario, an incoming call route is defined in the IP Office to route all calls from the CallFinder to a locally defined automated attendant module in Voicemail Pro.

¹ In the absence of Analog DID facilities at Avaya Labs, Empirix Hammer IT was used to simulate inbound analog DID trunk calls from the central office. MultiTech verified the solution in-house using analog DID facilities to the central office.

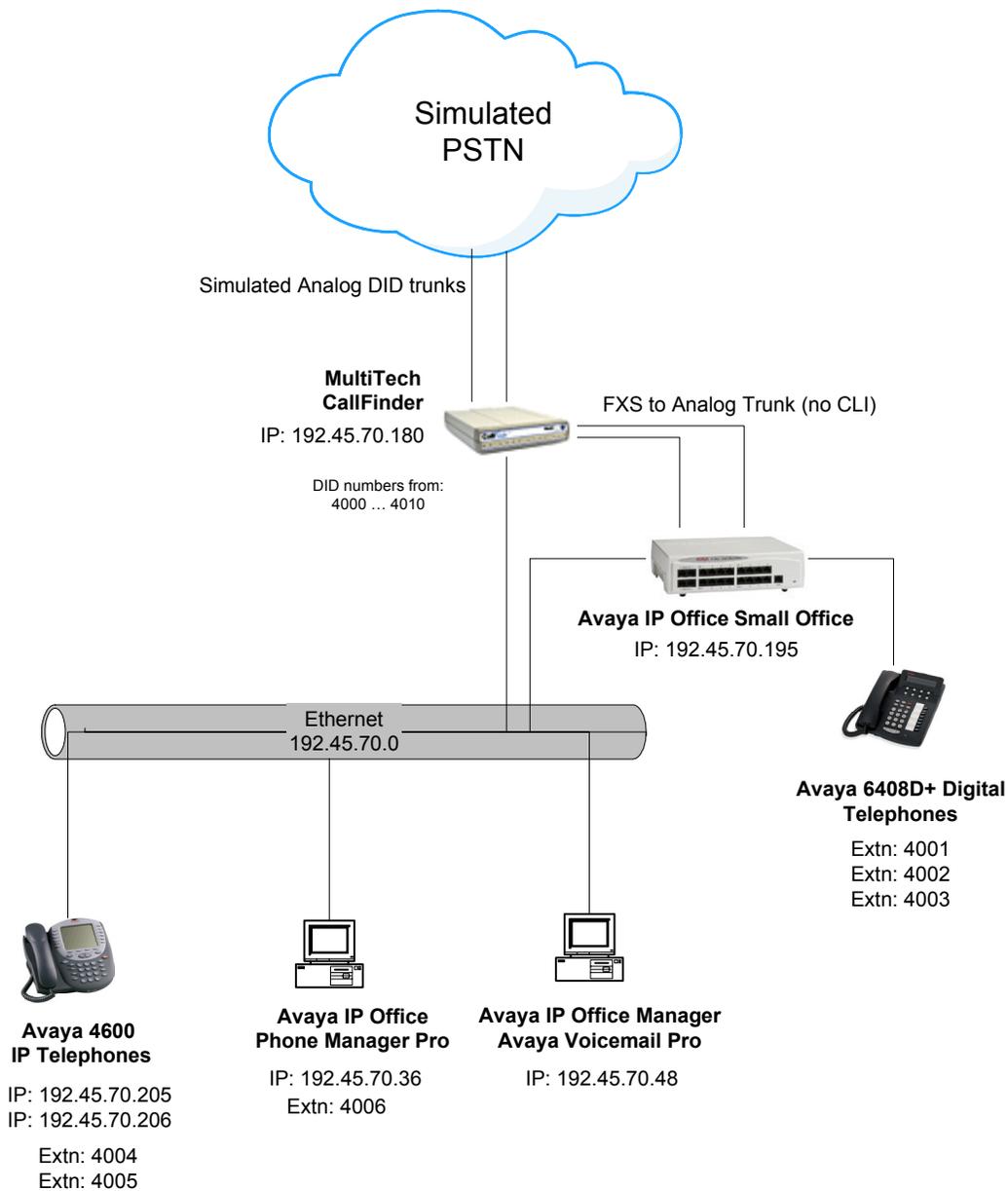


Figure 1: MultiTech CallFinder CF220 and Avaya IP Office Trunk Configuration

When the CallFinder receives an incoming DID call from the central office, e.g., “4000”, its status changes from *‘Waiting for Ring’* to *‘Waiting for Connect’* as depicted in **Figure 1-1**. The CallFinder rings the IP Office and waits for the call to be answered. When the automated attendant in Voicemail Pro answers the call, the CallFinder pauses for a predefined interval, default is 2 seconds, then transmits the DTMF of the DID digits it received from the central office, e.g., “4000”. At this point, the CallFinder status changes from *‘Waiting for Connect’* to *‘Connected’* and it connects its DID port to its FXS port. In the meantime, the Voicemail Pro automated attendant blind transfers the call to the extension corresponding to the DTMF

sequence it received. The Outside Caller is connected and hears ring back from the IP Office as it rings “4000”.

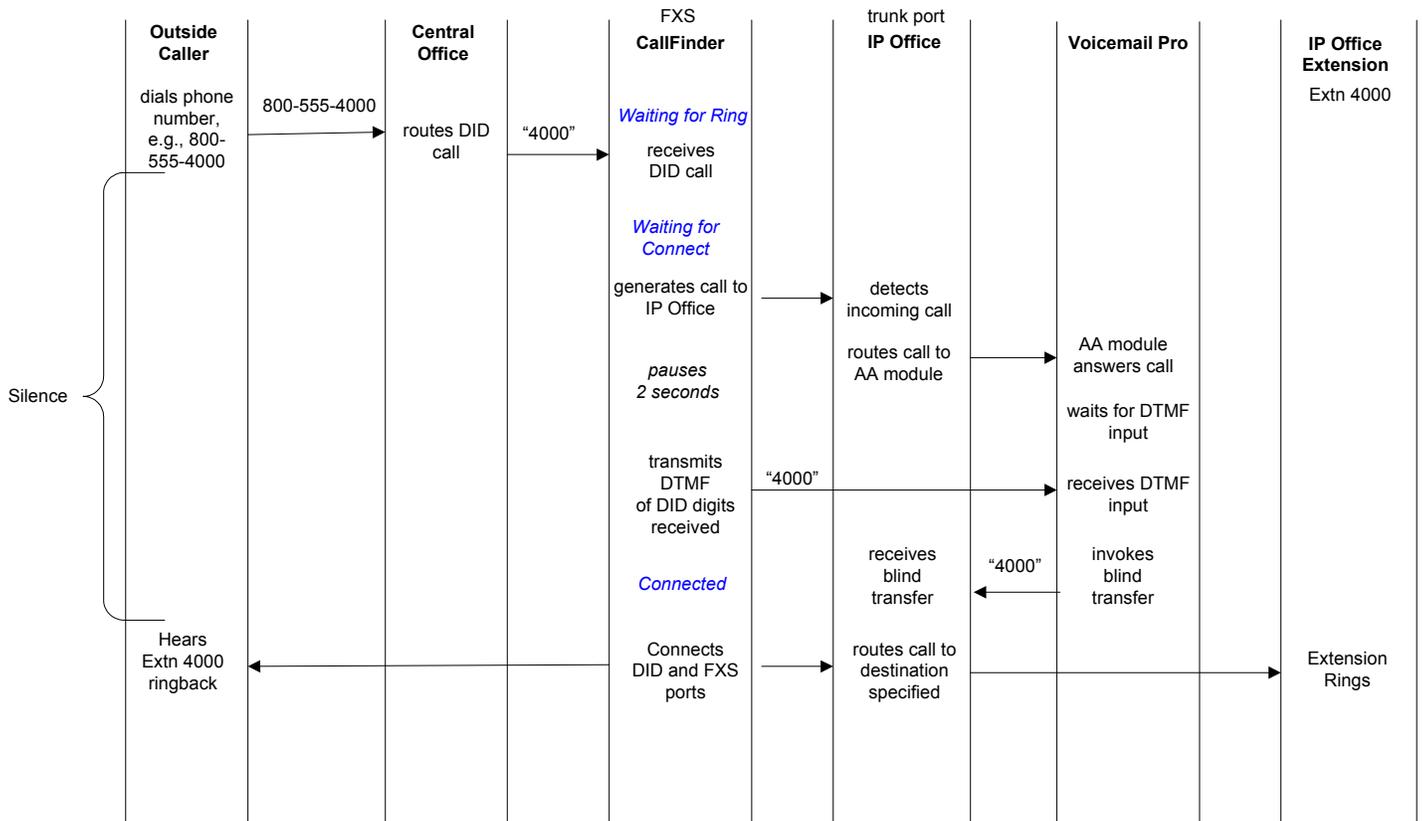


Figure 1-1: Trunk Configuration Call Flow

1.2. Station Configuration

The tested trunk configuration scenario is shown in **Figure 2¹**. Two DID trunks from the central office are connected to the two DID ports on the CallFinder. Each DID port has a corresponding FXS/FXO port in the CallFinder. In the station configuration, these ports are configured as FXO ports and are connected to analog station ports on the IP Office.

Users of the station configuration solution are advised of the following regarding use of this solution:

- Lose ability for call accounting of incoming DID calls in the station configuration.
- Lose ability to use distinctive ringing for incoming DID calls in the station configuration

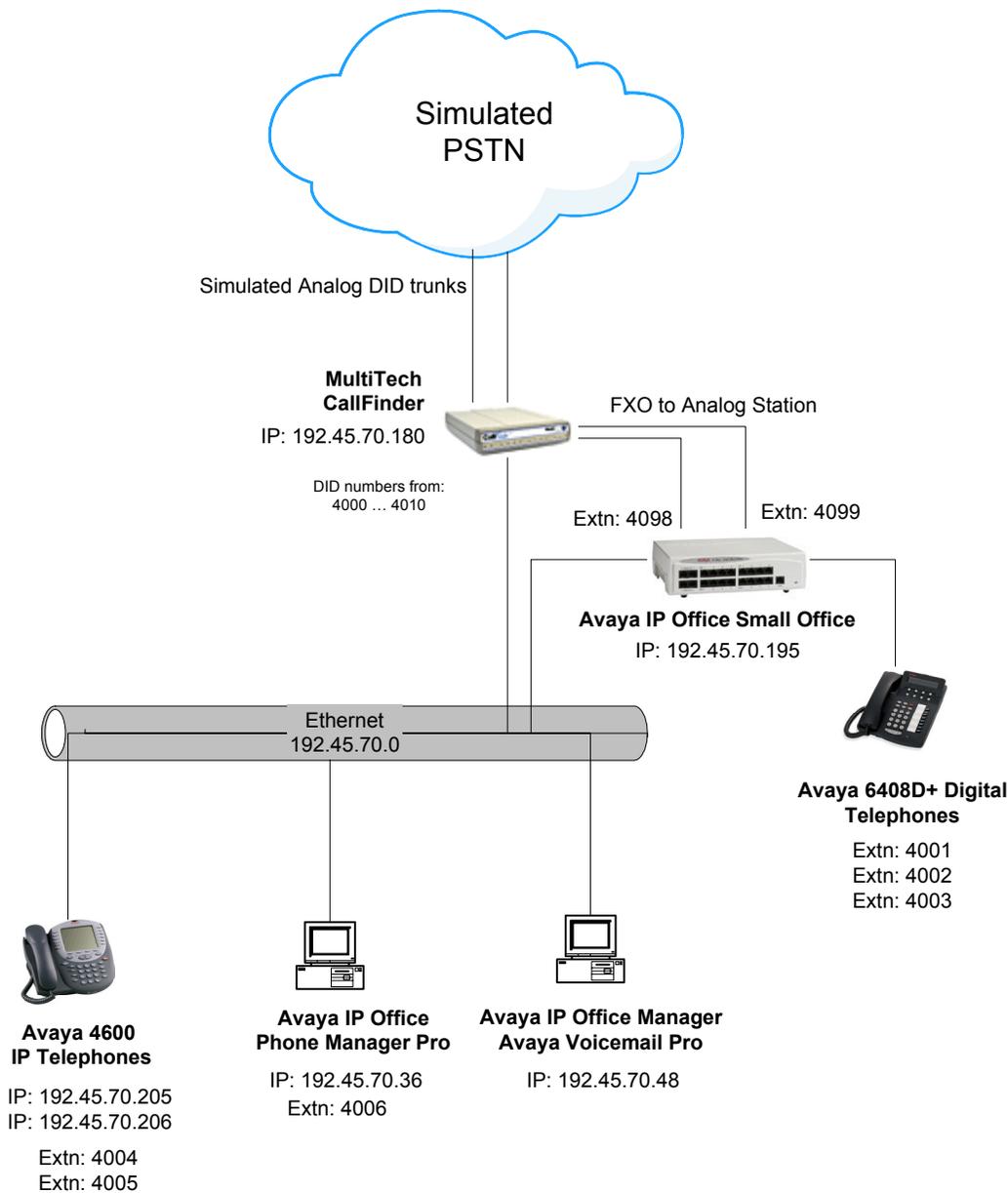


Figure 2: MultiTech CallFinder CF220 and Avaya IP Office Station Configuration

When the CallFinder receives an incoming DID call from the central office, e.g., “4000”, its status changes from *‘Waiting for Ring’* to *‘Waiting for Connect’* as depicted in **Figure 2-1**. The CallFinder goes off-hook on its FXO port and waits for dial tone. Upon detecting dial tone, the CallFinder pauses for a predefined interval, default is 2 seconds, then transmits the DTMF of the DID digits it received from the central office, e.g., “4000”. At this point, the CallFinder status changes from *‘Waiting for Connect’* to *‘Connected’* and it connects its DID port to its FXO port. In the meantime, the IP Office rings the extension corresponding to the DTMF sequence it received. The Outside Caller hears ring back from the IP Office as it rings “4000”.

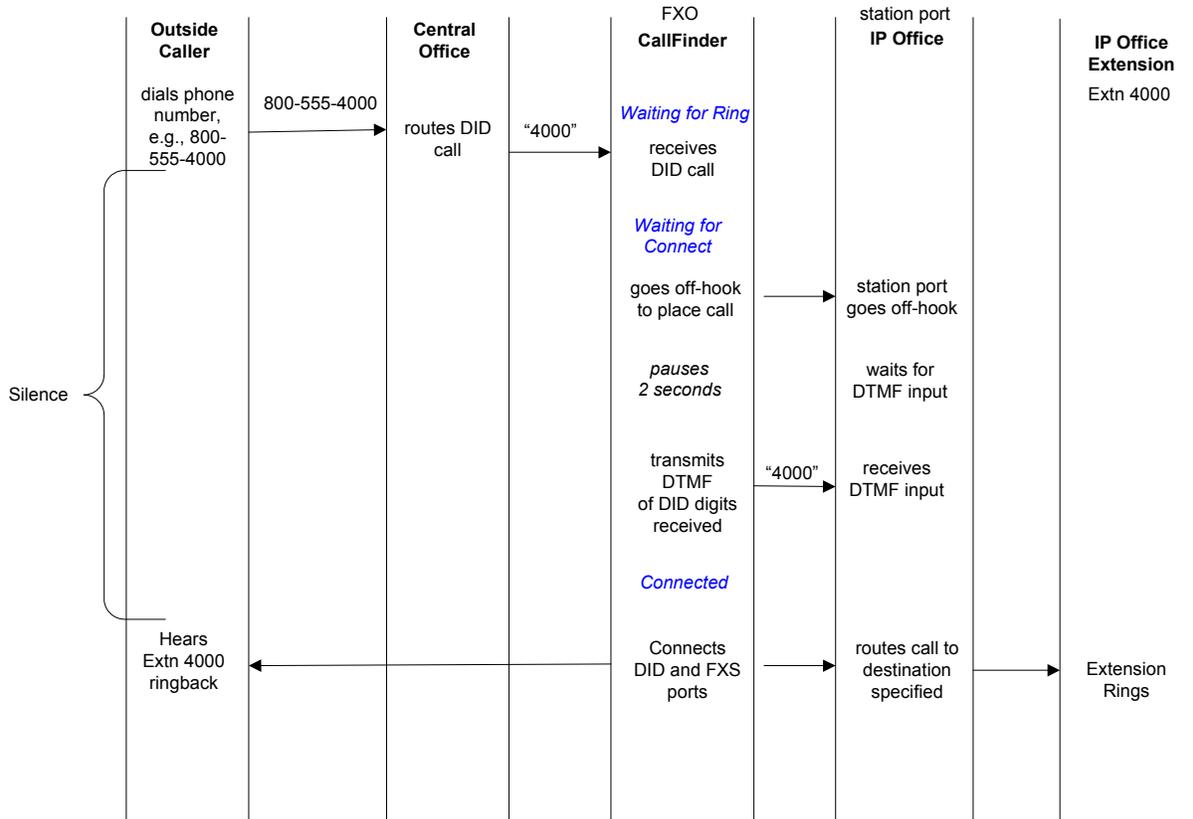


Figure 2-1: Station Configuration Call Flow

2. Equipment and Software Validated

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

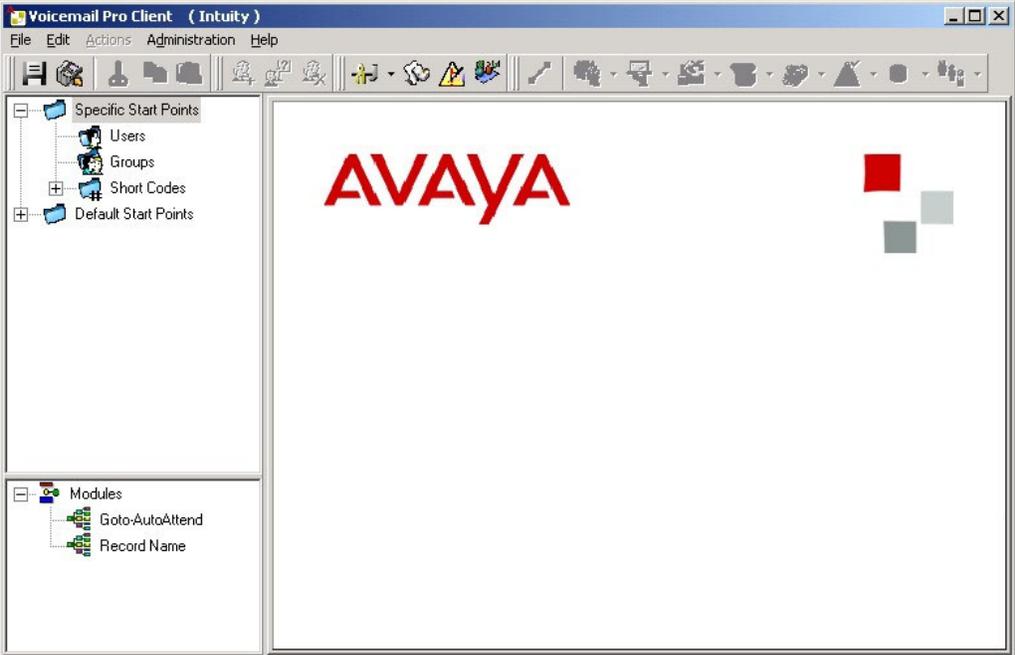
Equipment	Software
Avaya IP Office Small Office System	3.0(40)
Avaya IP Office Manager	5.0(40)
Avaya IP Office Phone Manager Pro	3.0(12)
Avaya IP Office Voicemail Pro	3.0(13)
Avaya 4602SW IP Telephones	4602sape1_82.bin
Avaya 6408D+ Telephones	-
MultiTech CallFinder CF220	1.03
MultiTech FaxFinder/CallFinder Manager	1.04
Empirix HammerIT	2.8.18.1
PC for Avaya IP Office Manager and Avaya Voicemail Pro and MultiTech FaxFinder/CallFinder Manager	Windows 2000 professional w/Service Pack 4
PC for Avaya IP Office Phone Manager Pro	Windows 2000 professional w/Service Pack 4

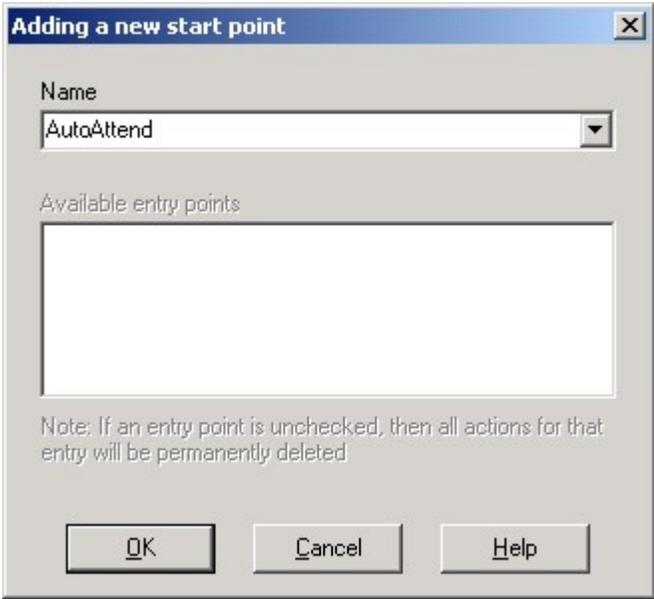
3. Trunk Configuration

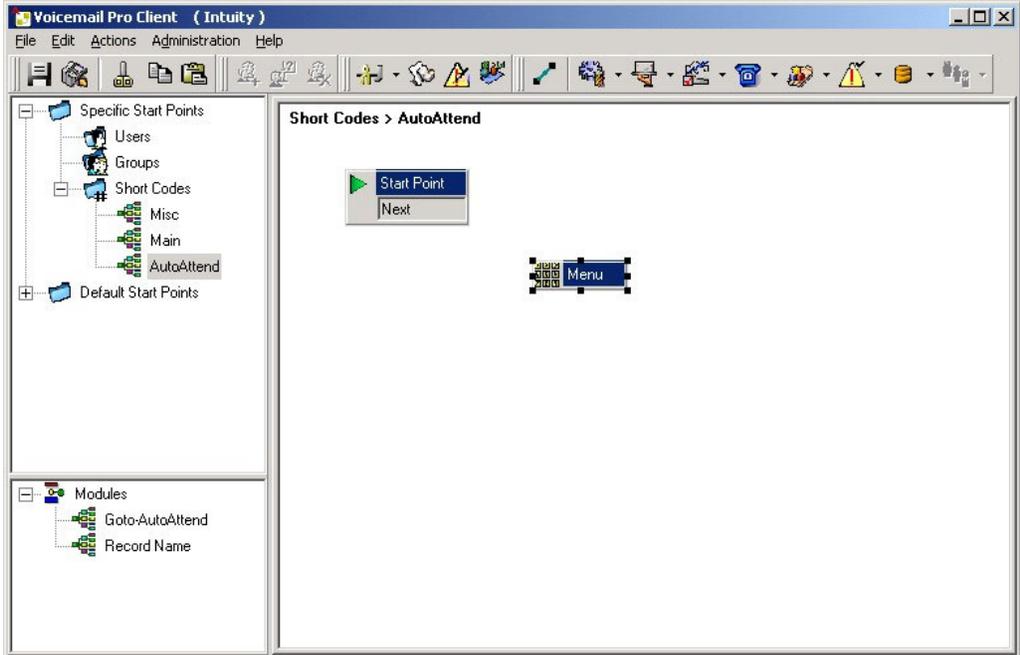
This section addresses provisioning of the IP Office, Voicemail Pro and CallFinder for the Trunk configuration depicted in **Figure 1**. For all other provisioning information, such as initial installation and configuration of the IP Office, Voicemail Pro and CallFinder, please refer to the product documentation.

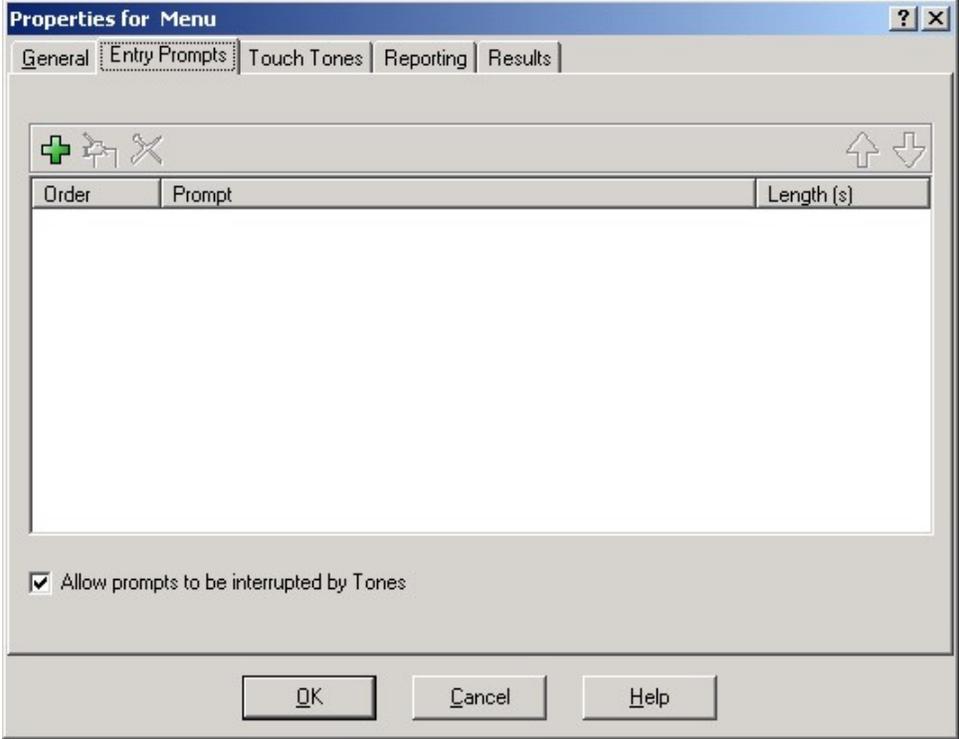
3.1. Configure Avaya IP Office Voicemail Pro

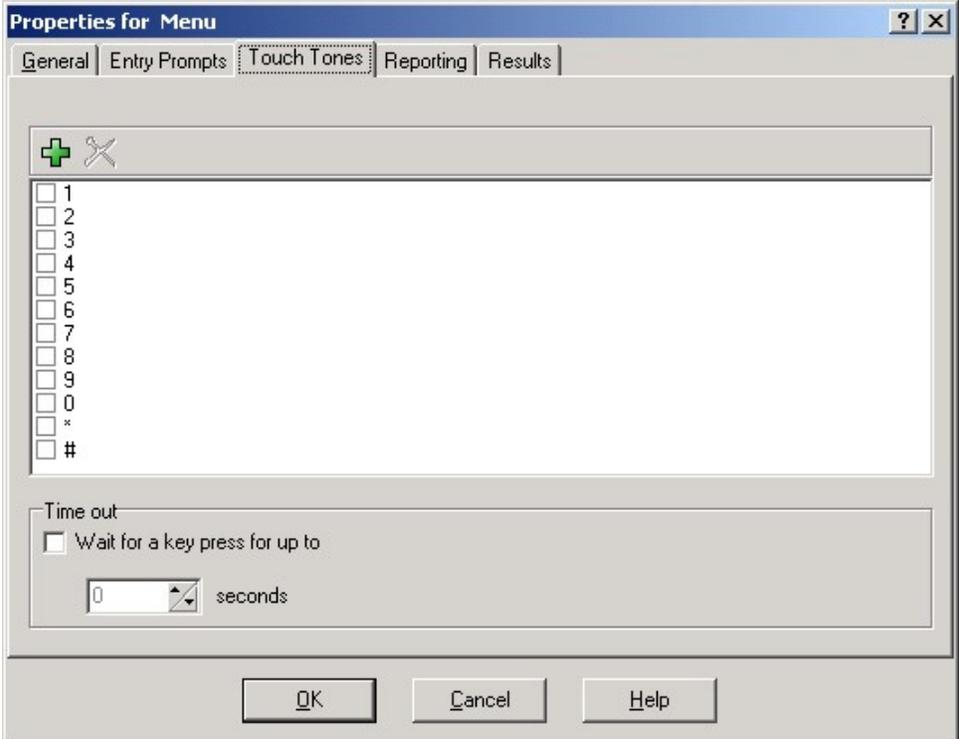
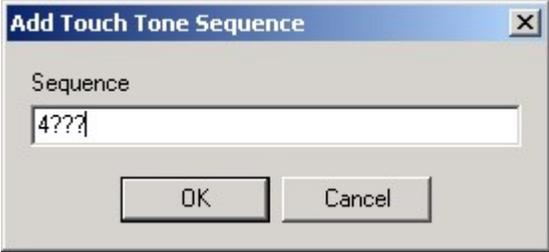
For the purpose of these Application Notes, a single Automated Attendant module was defined for transferring calls received from the CallFinder as well as for internal and other inbound trunk calls. Only the configuration relevant to the CallFinder is discussed in the steps that follow.

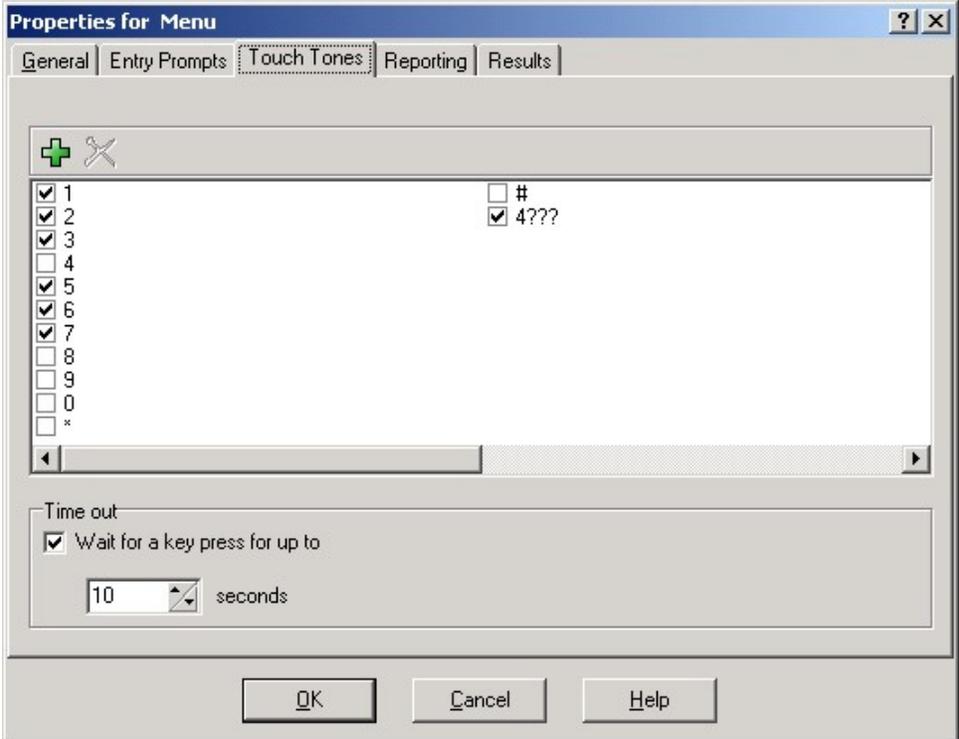
Step	Description
1.	<p data-bbox="362 699 721 730">Launch Voicemail Pro client</p> <p data-bbox="362 735 1333 800">Log in to the IP Office Manager PC and go to Start → Programs → IP Office → Voicemail Pro to launch the Voicemail Pro Client application.</p> 

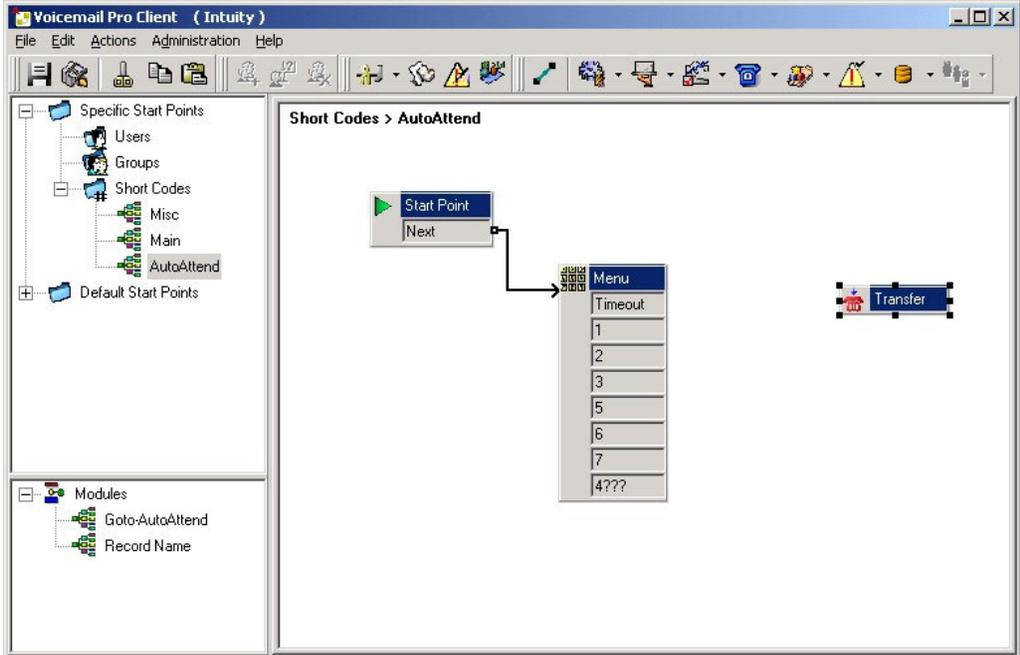
Step	Description
Create the Auto Attendant Module	
2.	<p>Create the module that incoming calls will be routed to. In the Voicemail Pro Client window, right click the Short Codes Start Point and select Add.</p> 
3.	<p>In the Adding a new start point popup that appears, type AutoAttend in the Name field and click OK.</p> 

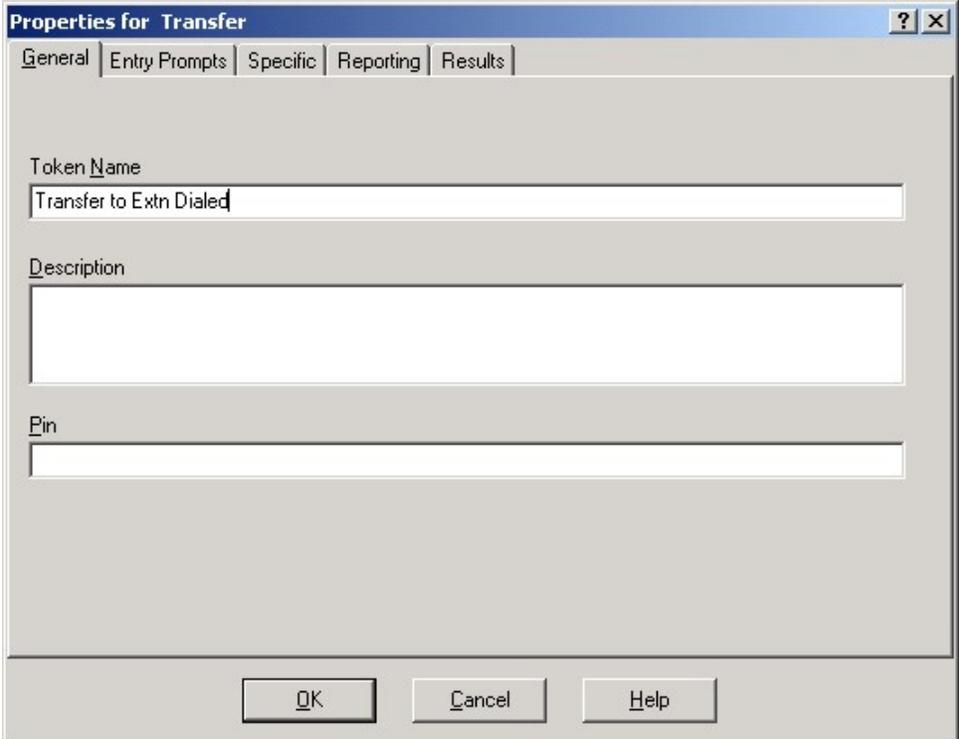
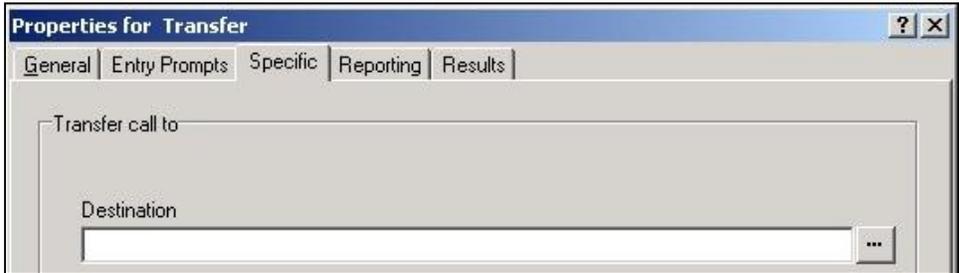
Step	Description
4.	<p>In the Voicemail Pro Client window, select Actions → Basic Actions → Menu to add a Menu object.</p> 

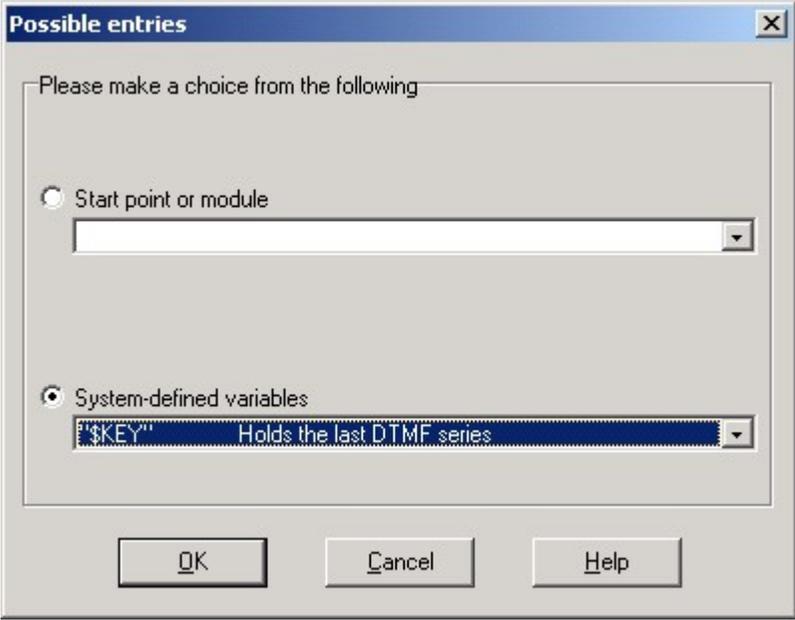
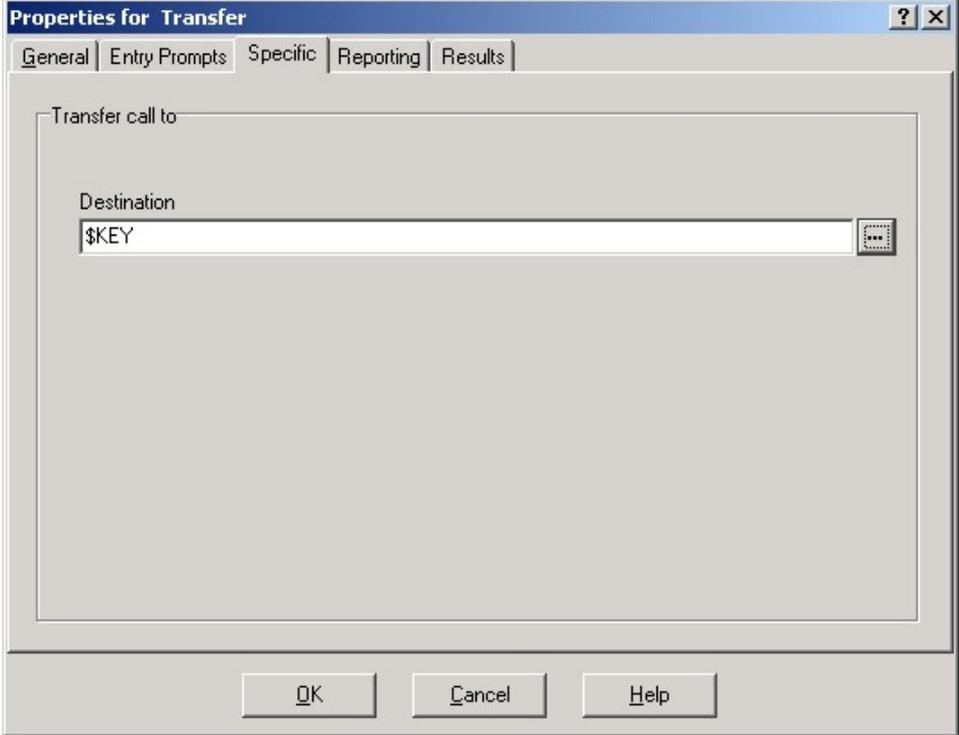
Step	Description
5.	<p>Double click the Menu object. In the Properties for Menu popup that appears, select the Entry Prompts tab, check Allow prompts to be interrupted by Tones and click the Green plus sign to add a menu prompt. While adding and recording the menu prompt is unnecessary for calls from the CallFinder since DID callers will not hear the prompt, it would still be useful to have a menu recording in the event that some troubleshooting is necessary or if this module is used for internal and inbound trunk calls as well.</p>  <p>The screenshot shows a window titled "Properties for Menu" with a tabbed interface. The "Entry Prompts" tab is selected. At the top of the main area are icons for adding (+), deleting (trash), and editing (wrench). Below these is a table with three columns: "Order", "Prompt", and "Length (s)". The table is currently empty. At the bottom of the window, there is a checked checkbox labeled "Allow prompts to be interrupted by Tones" and three buttons: "OK", "Cancel", and "Help".</p>

Step	Description
6.	<p>In the Touch Tones tab of the Properties for Menu popup, click the Green plus sign to add a touch-tone sequence.</p> 
7.	<p>In the Add Touch Tone Sequence popup that appears, enter the touch-tone sequence that will be received from the CallFinder in the Sequence field, e.g., 4???? and click OK.</p> 

Step	Description
8.	<p>In the Touch Tones tab of the Properties for Menu popup, check Wait for a key press for up to and set the time out field to the desired time out, e.g., 10 seconds. Click OK.</p>  <p>The screenshot shows the 'Properties for Menu' dialog box with the 'Touch Tones' tab selected. The 'Time out' section is checked and set to 10 seconds. The list of touch tones includes 1-7 checked, 8-0 and * unchecked, and 4??? checked.</p>

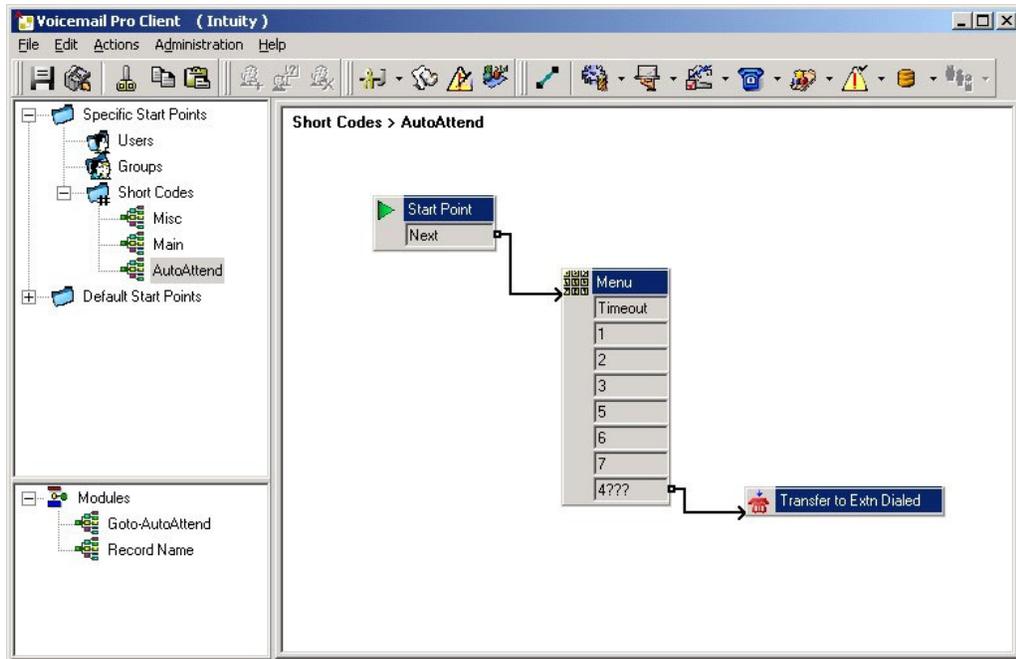
Step	Description
9.	<p>In the Voicemail Pro Client window, connect the Start Point object to the Menu object. Then select ACTIONS → Telephony Actions → Transfer to add a Transfer object.</p>  <p>The screenshot shows the 'Voicemail Pro Client (Intuity)' window. On the left, there is a tree view under 'Specific Start Points' containing 'Users', 'Groups', 'Short Codes', 'Misc', 'Main', and 'AutoAttend', and 'Default Start Points'. Below that is a 'Modules' section with 'Goto-AutoAttend' and 'Record Name'. The main workspace is titled 'Short Codes > AutoAttend' and contains a flow diagram. A 'Start Point' object with a 'Next' label is connected to a 'Menu' object. The 'Menu' object has a list of options: 1, 2, 3, 5, 6, 7, and 4???. To the right of the 'Menu' object is a 'Transfer' object.</p>

Step	Description
10.	<p>Double click the Transfer object. In the General tab of the Properties for Transfer popup that appears, set <i>Token Name</i> to Transfer to Extn Dialed.</p>  <p>The screenshot shows a dialog box titled "Properties for Transfer" with a blue title bar and standard window controls. It has five tabs: "General", "Entry Prompts", "Specific", "Reporting", and "Results". The "General" tab is selected. It contains three text input fields: "Token Name" (with the value "Transfer to Extn Dialed"), "Description" (empty), and "Pin" (empty). At the bottom are "OK", "Cancel", and "Help" buttons.</p>
11.	<p>In the Specific tab of the Properties for Transfer popup, click the '...' button.</p>  <p>The screenshot shows the same "Properties for Transfer" dialog box, but with the "Specific" tab selected. The "General" tab is now disabled. The main area is labeled "Transfer call to" and contains a "Destination" text input field. A button with three dots (the ellipsis button) is located at the end of the "Destination" field.</p>

Step	Description
12.	<p>In the Possible entries popup that appears, select radio button System-defined variables then select “\$KEY” from the pull-down menu. Click OK.</p> 
13.	<p>In the Properties for Transfer popup, click OK.</p> 

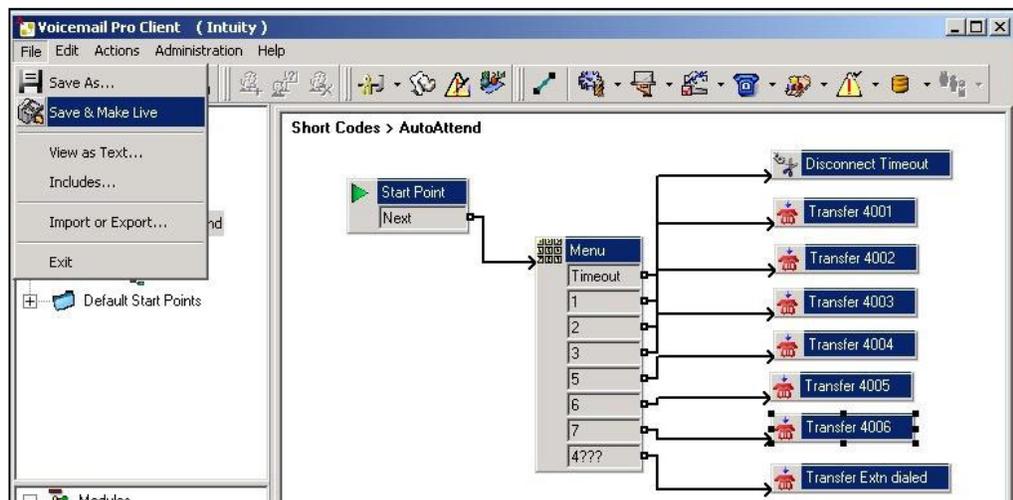
Step	Description
------	-------------

- | | |
|-----|--|
| 14. | In the Voicemail Pro Client window, connect the Menu object to the Transfer to Extn Dialed object. |
|-----|--|



Save and Make Live

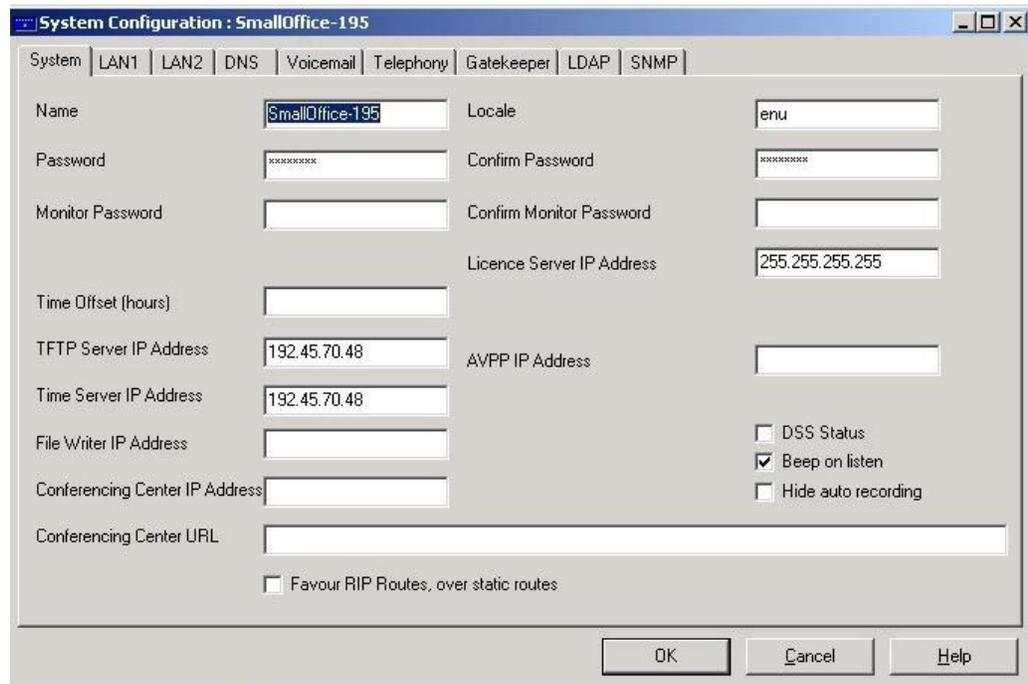
- | | |
|-----|--|
| 15. | In the Voicemail Pro Client window, select File → Save & Make Live to save the configuration and have it used by the Voicemail Server for calls received from the IP Office. |
|-----|--|

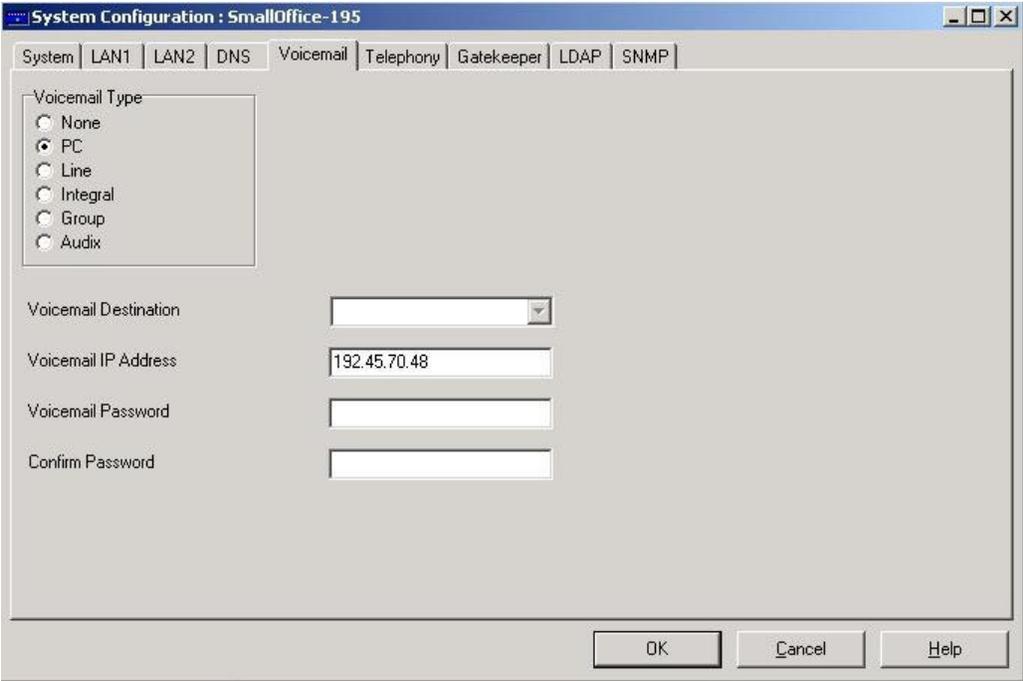


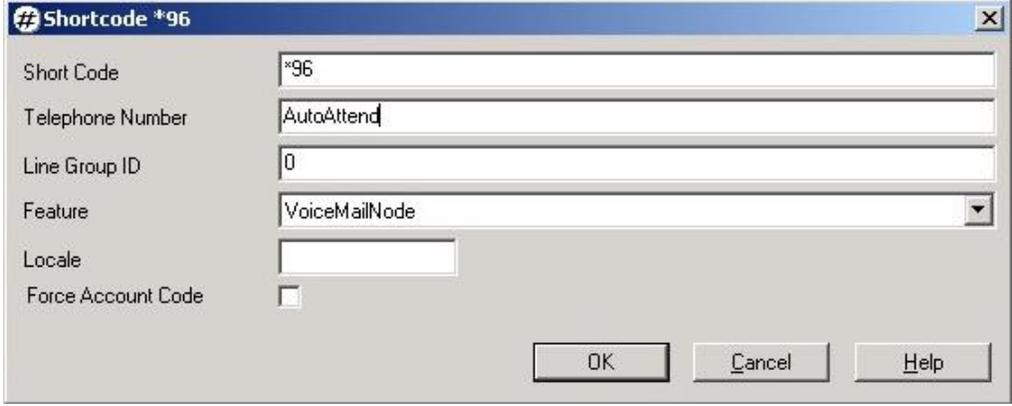
3.2. Configure Avaya IP Office

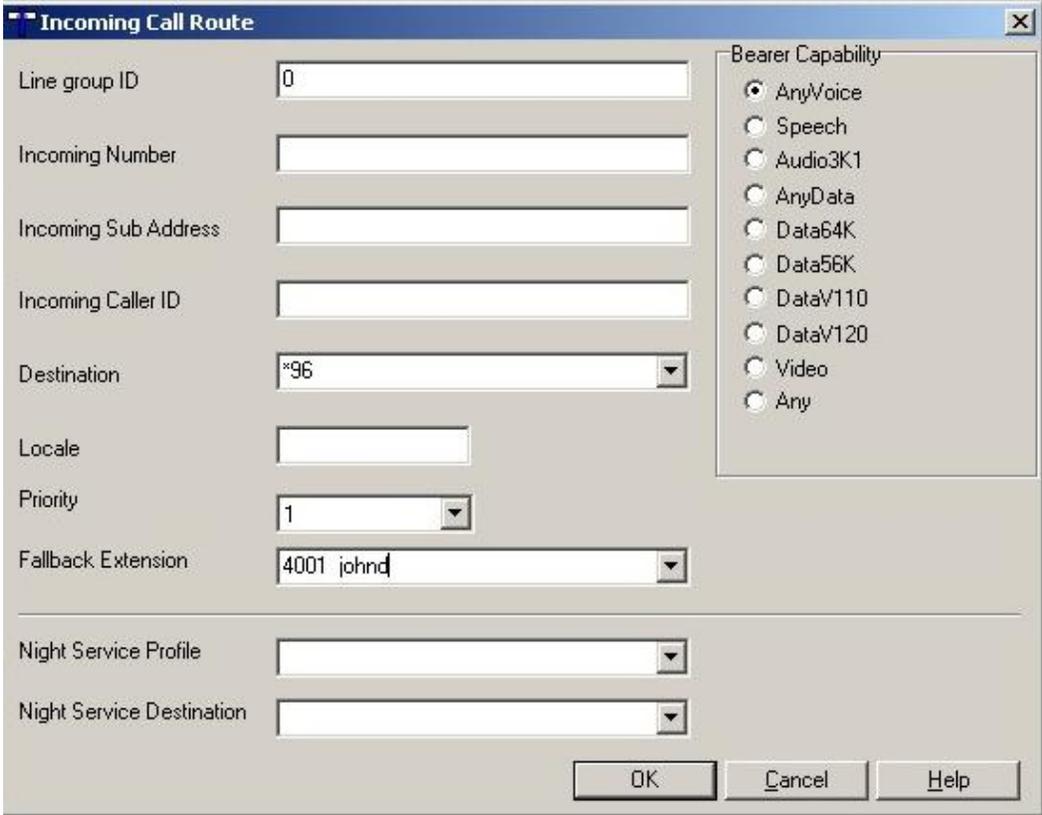
This section addresses provisioning of the IP Office as it relates to integration of the CallFinder. For all other provisioning information, such as provisioning of the trunks for regular inbound and outbound dialing, call coverage, extensions, etc., please refer to the IP Office documentation.

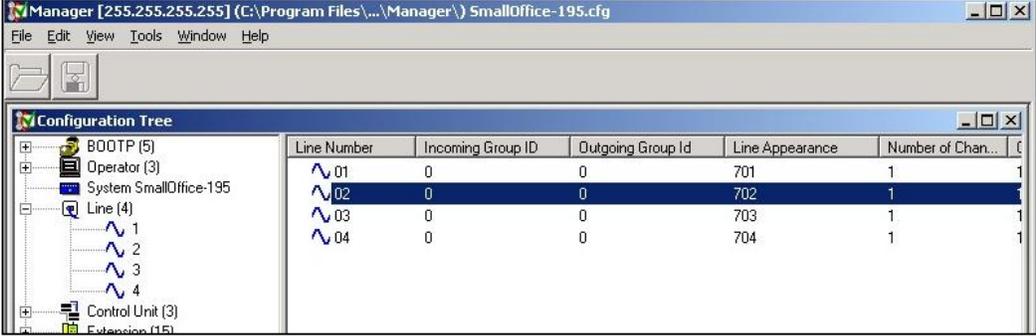
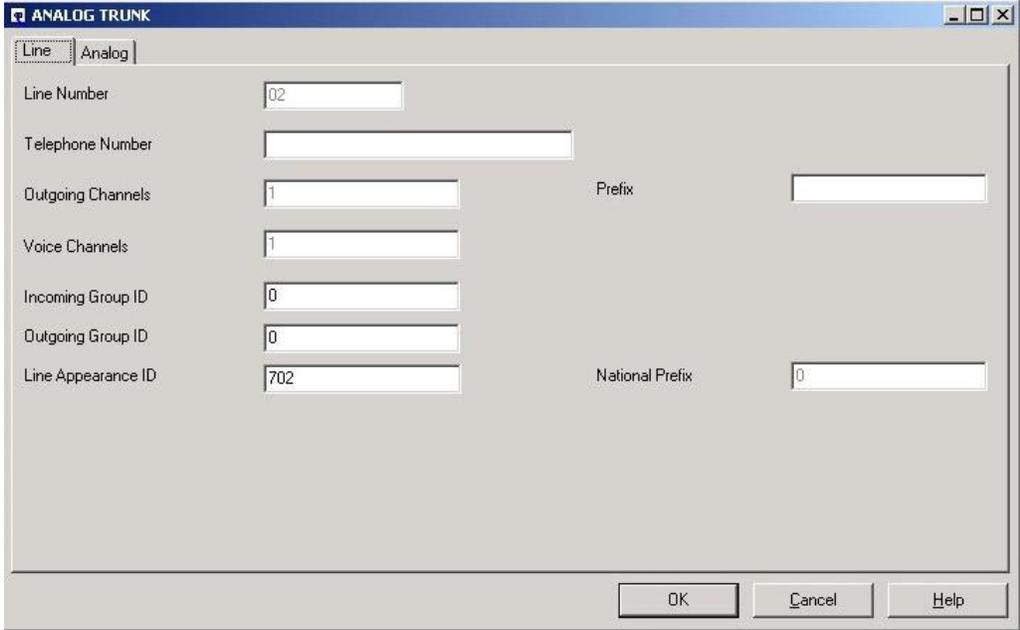
Step	Description
Physical connection	
1.	Physically connect CallFinder <i>FXS/FXO port 1</i> to the desired analog trunk port on the IP Office, e.g., Line 2 . Physically connect CallFinder <i>FXS/FXO port 2</i> to the desired analog trunk port on the IP Office, e.g., Line 3 .
Login	
2.	Log in to the IP Office Manager PC and go to Start → Programs → IP Office → Manager to launch the Manager application. Log in to the Manager application using the appropriate credentials.
3.	In the Manager window that appears, select File → Open to search for the IP Office system in the network.
4.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.
Configure License Server IP Address	
5.	In the Manager window, go to the Configuration Tree and double-click System . In the System tab of the System Configuration window that appears, verify the <i>License Server IP Address</i> field is set to properly, e.g., if Small Office Feature Key is connected to a PC, the License Server IP Address should be set to the IP address of the PC. However, in this instance, the Feature Key is directly connected to the Small Office so the License server IP Address should be set to 255.255.255.255 .

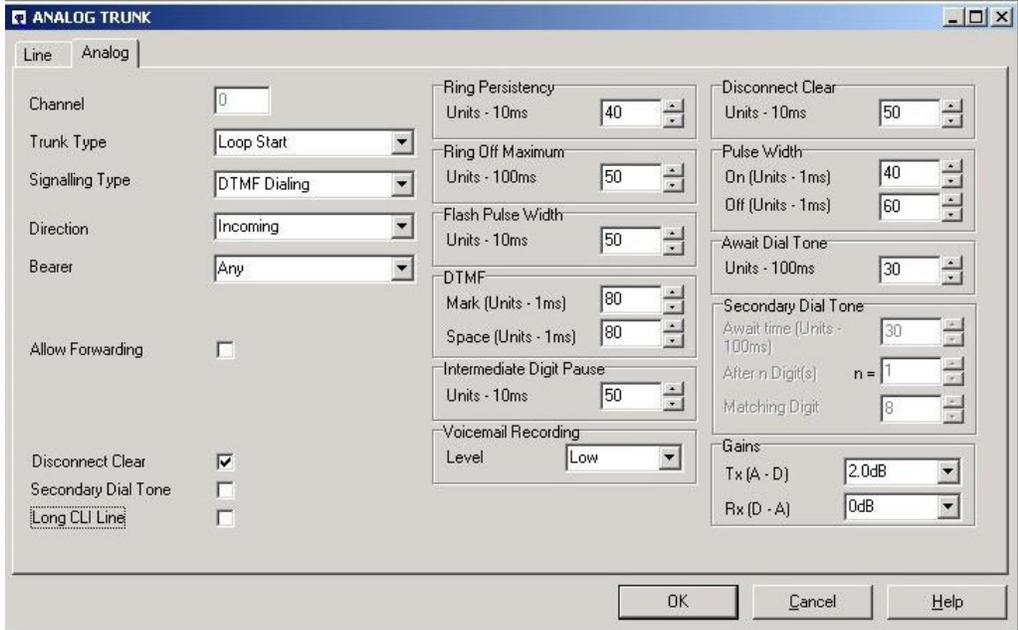


Step	Description
Configure Voicemail IP Address	
6.	<p>In the Voicemail tab of the System Configuration window, select PC for Voicemail Type and set <i>Voicemail IP Address</i> to the IP address of the Voicemail Server, e.g., 192.45.70.48. Click OK.</p> 
Install licenses	
7.	In the Manager window, go to the Configuration Tree and double-click License to open the list of licenses installed in the IP Office system.
8.	<p>Right click in the license list window and select New. In the License window that appears, enter the Voicemail Pro License Key and click OK.</p> 
9.	In the Manager window, select File → Save to save the licenses to the IP Office system and wait for the system to update. The system reload validates the new license.
Configure Short code to Voicemail Pro AutoAttend Module	
10.	In the Manager window, select File → Open to search for the IP Office system in the network.
11.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.

Step	Description
12.	In the Manager window, go to the Configuration Tree and double-click Shortcode to open the list of short codes on the IP Office.
13.	<p>Right click in the short code list window and select New. In the Shortcode window that appears, set <i>Short Code</i> to the desired short code, e.g. *96, <i>Telephone Number</i> to the name of the Automated Attendant module defined in the previous section, e.g., AutoAttend, <i>Line Group ID</i> to the line group number used for the trunks connected to the CallFinder, e.g. 0, <i>Feature</i> to VoiceMailNode and click OK.</p> 
Configure Incoming Call Route for trunks connected to CallFinder	
14.	In the Manager window, go to the Configuration Tree and double-click Incoming Call Route to open the list of incoming call routes on the IP Office.
15.	Right click in the incoming call route window and select New .

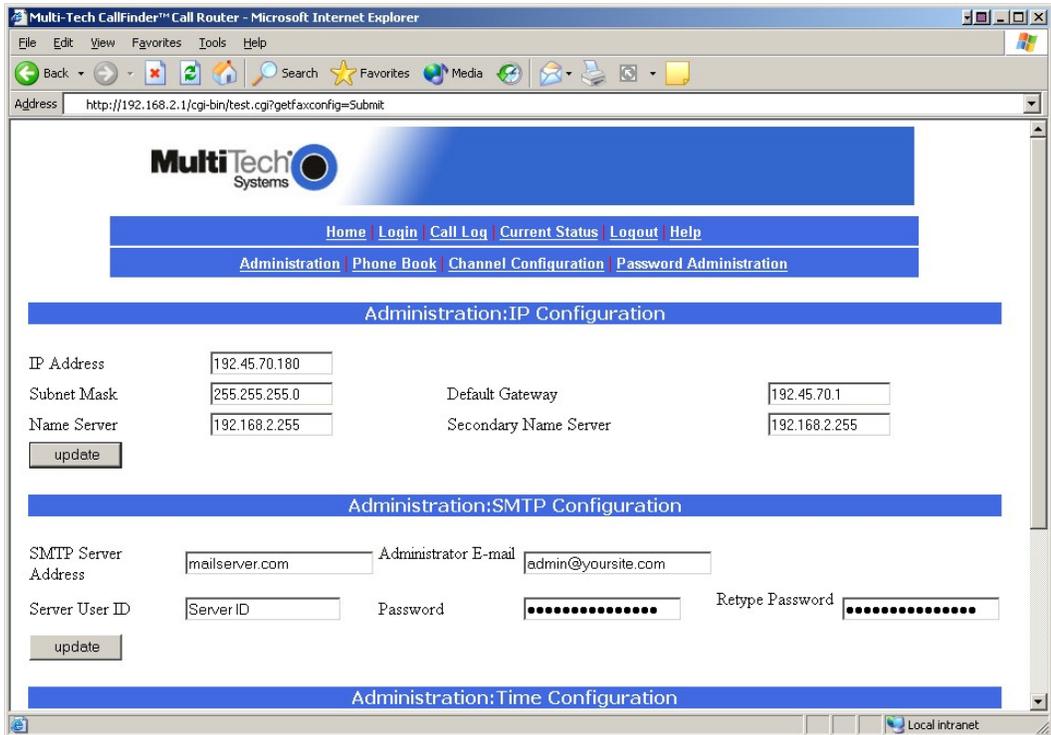
Step	Description
16.	<p>In the Incoming Call Route window that appears, set the <i>Line Group ID</i> to the line group number used for the trunks connected to the CallFinder, e.g., 0 (should be same as that used in Step 12), <i>Destination</i> to *96, <i>Fallback Extension</i> to the extension designated to answer incoming calls should the defined destination fail to answer the call, e.g., extension 4001, and click OK.</p>  <p>NOTE: It is always good practice to designate a Fallback extension in the event that the Voicemail Pro system becomes unavailable.</p>
Configure Analog Trunks connected to CallFinder	
17.	<p>In the Manager window, go to the Configuration Tree and double-click Line to open the list of lines (trunks) available on the IP Office.</p>

Step	Description																									
18.	<p>Double-click the Line connected to CallFinder Channel 1, e.g., Line 02.</p>  <p>The screenshot shows the Manager application window with the Configuration Tree on the left and a table of lines on the right. The table has the following data:</p> <table border="1" data-bbox="662 436 1409 554"> <thead> <tr> <th>Line Number</th> <th>Incoming Group ID</th> <th>Outgoing Group Id</th> <th>Line Appearance</th> <th>Number of Chan...</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>0</td> <td>0</td> <td>701</td> <td>1</td> </tr> <tr> <td>02</td> <td>0</td> <td>0</td> <td>702</td> <td>1</td> </tr> <tr> <td>03</td> <td>0</td> <td>0</td> <td>703</td> <td>1</td> </tr> <tr> <td>04</td> <td>0</td> <td>0</td> <td>704</td> <td>1</td> </tr> </tbody> </table>	Line Number	Incoming Group ID	Outgoing Group Id	Line Appearance	Number of Chan...	01	0	0	701	1	02	0	0	702	1	03	0	0	703	1	04	0	0	704	1
Line Number	Incoming Group ID	Outgoing Group Id	Line Appearance	Number of Chan...																						
01	0	0	701	1																						
02	0	0	702	1																						
03	0	0	703	1																						
04	0	0	704	1																						
19.	<p>In the Line tab of the ANALOG TRUNK window that appears, set <i>Incoming Group ID</i> to the incoming call route to be used for the CallFinder trunks, e.g., 0 (should be the same as the line group number used in Steps 12 and 15).</p>  <p>The screenshot shows the ANALOG TRUNK configuration window with the Line tab selected. The fields are as follows:</p> <ul style="list-style-type: none"> Line Number: 02 Telephone Number: (empty) Outgoing Channels: 1 Voice Channels: 1 Incoming Group ID: 0 Outgoing Group ID: 0 Line Appearance ID: 702 Prefix: (empty) National Prefix: 0 																									

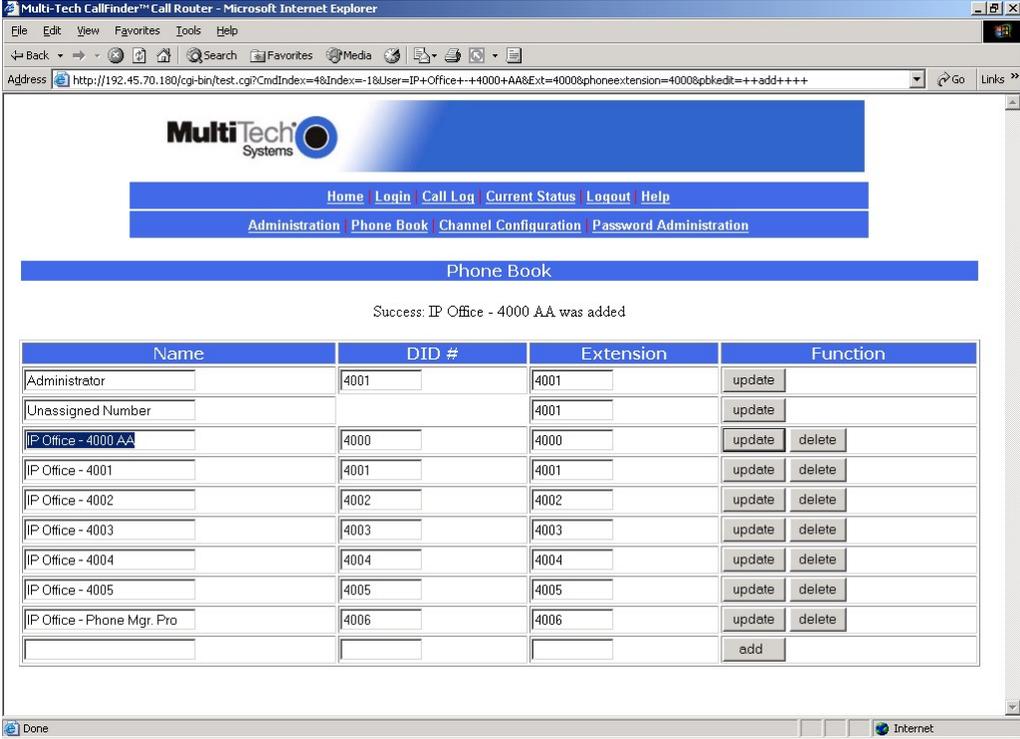
Step	Description
20.	<p>In the Analog tab of the ANALOG TRUNK window, set <i>Trunk Type</i> to Loop Start, <i>Direction</i> to Incoming, and click OK.</p>  <p>Note: During testing, audio on the IP Office side of the call was perceived as too low. Increasing the Tx Gain showed improvement. Modifying the Tx Gain should only be done if appropriate to the configuration being used.</p>
21.	Repeat Steps 17 – 19 for the line connected to CallFinder Channel 2, e.g., Line 03 . For the purposes of these Application Notes, two IP Office trunk lines were connected to the 2-port CallFinder.

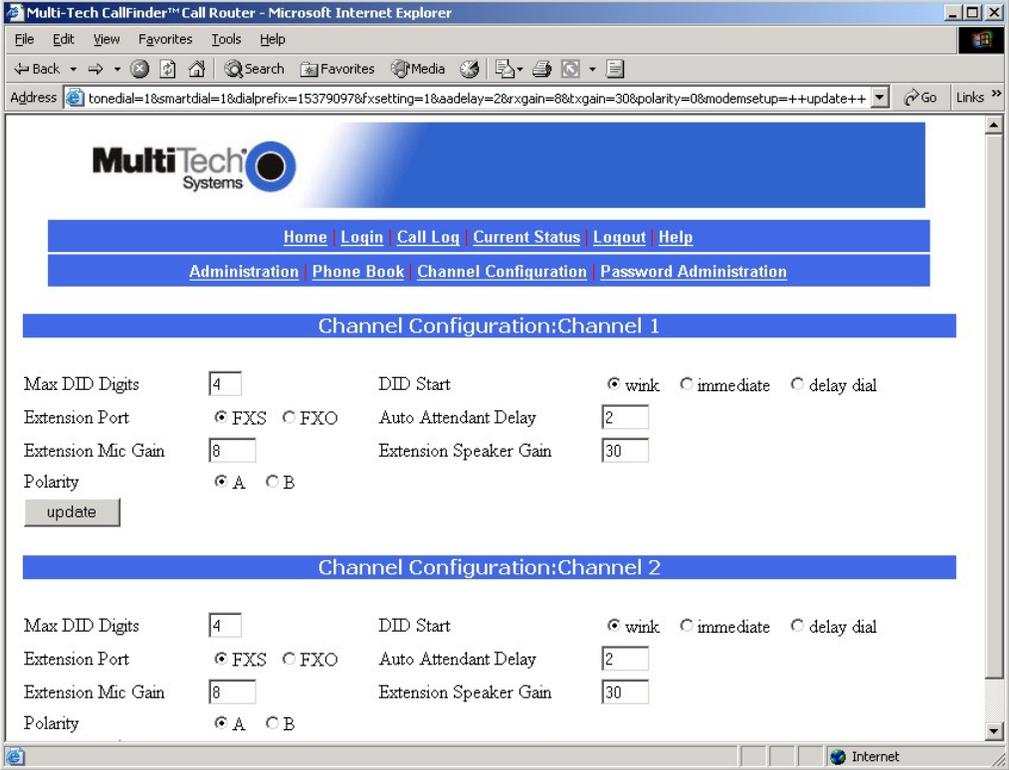
3.3. Configure MultiTech CallFinder CF220

This section addresses provisioning of the CallFinder for the Trunk Configuration Scenario with the Avaya IP Office. For all other provisioning information, such as initial installation and configuration of MultiTech CallFinder, please refer to the product documentation.

Step	Description
	Configure IP Address
1.	Physically connect the IP Office Manager PC to the CallFinder Ethernet port using a crossover cable.
2.	Log in to the IP Office Manager PC and modify its IP address to be 192.168.2.5 with subnet mask 255.255.255.0. Go to Start → Programs → Internet Explorer to launch the browser, browse to the default IP address of the CallFinder, e.g., 192.168.2.1 , and log in using the appropriate credentials, e.g., admin/admin .
3.	In the CallFinder Home page that appears, click Password Administration . In the Password Administration page that appears, set <i>Password</i> to the new desired password, <i>Confirm Password</i> to the new desired password. Click update .
4.	In the CallFinder page, click Administration . In the Administration page that appears, set <i>IP Address</i> to the desired IP address, e.g., 192.45.70.180 , <i>Subnet Mask</i> to the desired subnet mask, e.g., 255.255.255.0 , and <i>Default Gateway</i> to the desired gateway, e.g., 192.45.70.1 . Click update .
	
5.	Disconnect the IP Office Manager from the CallFinder and connect it to the network. Physically connect the CallFinder to the network using a crossover cable.

Step	Description
6.	<p>Modify the IP Office Manager PC's IP address to its original settings, e.g., 192.45.70.48/255.255.255.0. Browse to the new IP address of the CallFinder, e.g., 192.45.70.180, and log in using the appropriate credentials.</p> 
Configure Phone Book (DID to Extension mapping)	
7.	<p>In the CallFinder Home page that appears, click Phone Book to configure the DID number to Extension number mapping.</p>

Step	Description
8.	<p>In the Phone Book page that appears, enter Name, DID # and Extension in the appropriate fields and click add to enter the information into the Phone Book. Repeat the data entry for each DID number that will be arriving from the Central Office. Additionally, make sure to define an extension number that unknown DID numbers should be routed to by the CallFinder in the Unassigned Number field.</p>  <p>NOTE: DID does not support CallerID, the information listed in the Phone Book page is used to map the DID number arriving from the Central Office to an Extension number in the locally configured IP Office.</p>
Configure Channel Configuration	
9.	<p>In the CallFinder page, click Channel Configuration to configure the CallFinder ports connected to the IP Office as well as the DID ports connected to the Central Office.</p>

Step	Description
10.	<p>In the Channel Configuration page that appears, set <i>Max DID Digits</i> to the number of digits that will be arriving from the central office, e.g., 4, <i>DID Start</i> to the type of DID connection setup with the central office, e.g., wink, <i>Extension Port</i> to FXS for Analog Loop Start trunk connection to the IP Office, <i>Auto Attendant Delay</i> to the desired delay in seconds that the CallFinder should pause for between the time the call goes off-hook at the FXS port and transmitting the DID to DTMF digits, e.g., 2. Click update.</p>  <p>NOTE 1: MultiTech reports that at present CallFinder can support up to 7 DID digits. NOTE 2: Polarity enables one to switch Tip and Ring on the Loop Start side if necessary.</p>
11.	Repeat Step 10 for Channel 2 of the CallFinder.

4. Station Configuration

This section addresses provisioning of the IP Office, Voicemail Pro and CallFinder for the Station configuration depicted in **Figure 2**. For all other provisioning information, such as initial installation and configuration of the IP Office, Voicemail Pro and CallFinder, please refer to the product documentation.

4.1. Configure Avaya IP Office Voicemail Pro

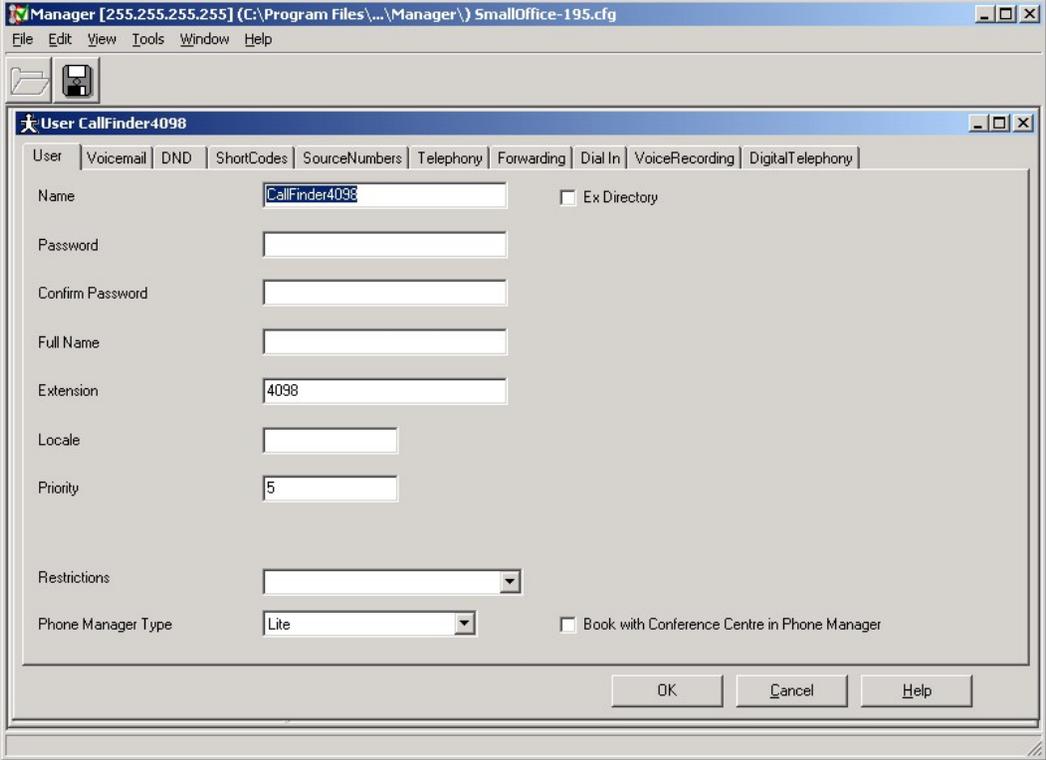
No special configuration is required for the Station Scenario.

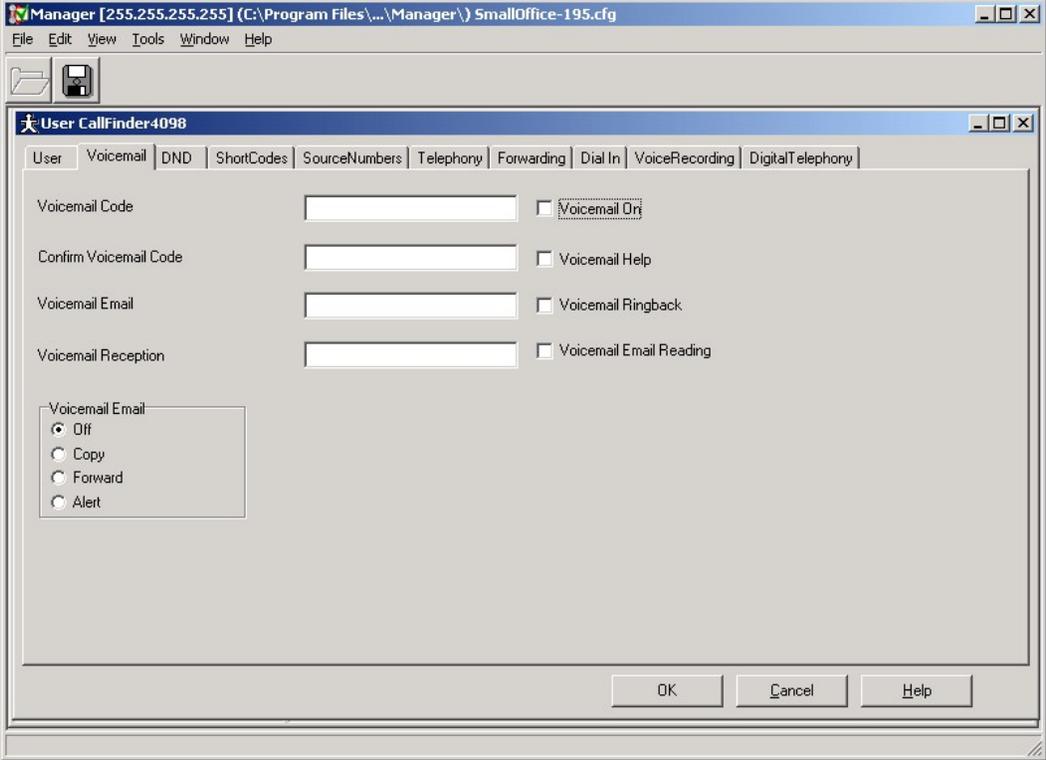
4.2. Configure Avaya IP Office

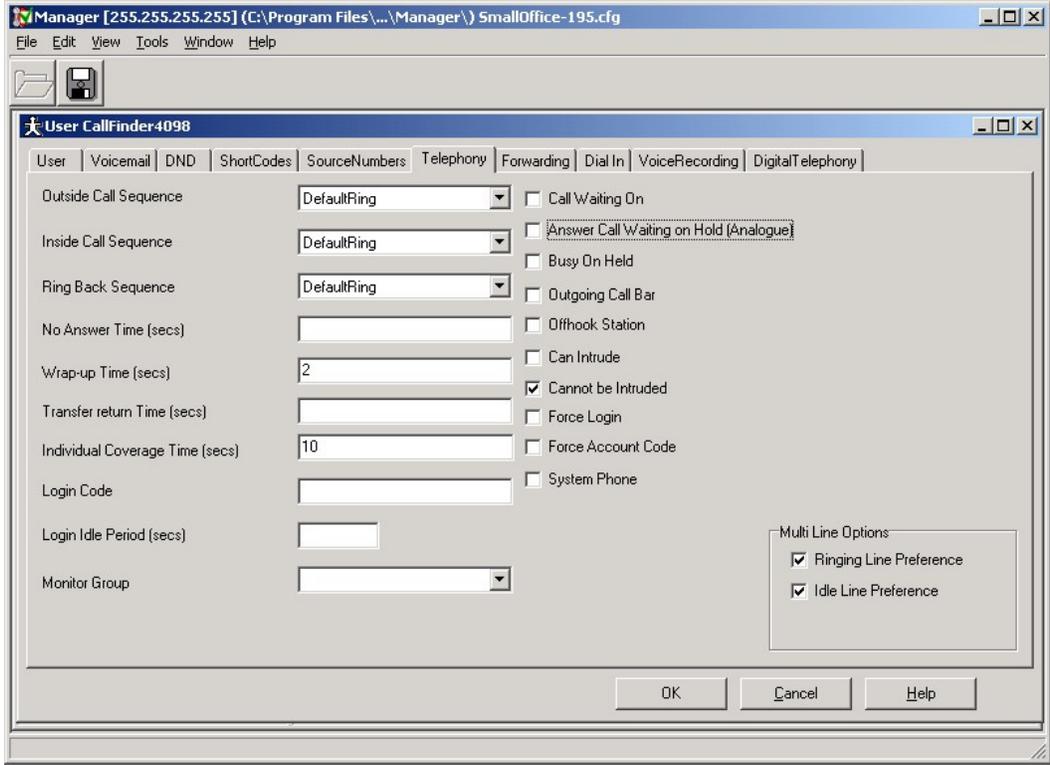
This section addresses provisioning of the IP Office for the Station Configuration Scenario with the CallFinder. For all other provisioning information, please refer to the product documentation.

Step	Description
	Physical connection
1.	Physically connect CallFinder <i>FXS/FXO port 1</i> to the desired analog station port on the IP Office, e.g., Extension ID 09 . Physically connect CallFinder <i>FXS/FXO port 2</i> to the desired analog station port on the IP Office, e.g., Extension ID 10 .
	Login
2.	Log in to the IP Office Manager PC and go to Start → Programs → IP Office → Manager to launch the Manager application. Log in to the Manager application using the appropriate credentials.
3.	In the Manager window that appears, select File → Open to search for the IP Office system in the network.
4.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.
	Configure Analog Station ports connected to CallFinder
5.	In the Manager window, go to the Configuration Tree and double-click Extension to open the list of extensions available on the IP Office.
6.	Double-click the Extension ID connected to CallFinder Channel 1, e.g., 09 . Set <i>Extension</i> to the desired extension number, e.g., 4098 and click OK .

The screenshot shows the 'Extension 4098' configuration window. The 'Extn' tab is active. The 'Extension ID' field contains '09' and the 'Extension' field contains '4098'. The 'Caller Display Type' is set to 'Off'. Under 'Equipment Classification', 'Standard Telephone' is selected. The 'Flash Hook Pulse Width' section has 'Use System Defaults' checked, with 'Minimum Width' set to 2 and 'Maximum Width' set to 50, both in units of 10ms. 'Message Waiting Lamp Indication Type' is set to 'None'. 'Reset Volume After Calls' is unchecked. 'Hook Persistency' is set to 100 units (1ms). The window has 'OK', 'Cancel', and 'Help' buttons at the bottom.

Step	Description
7.	In the Manager window, go to the Configuration Tree and double-click User to open the list of Users on the IP Office.
8.	<p>Right-click in the User list window to add a new user. In the User tab of the User window that appears, set <i>Name</i> to the desired name for the CallFinder extension, e.g., CallFinder4098, <i>Extension</i> to the extension number defined in the Extension list, e.g., 4098.</p> 

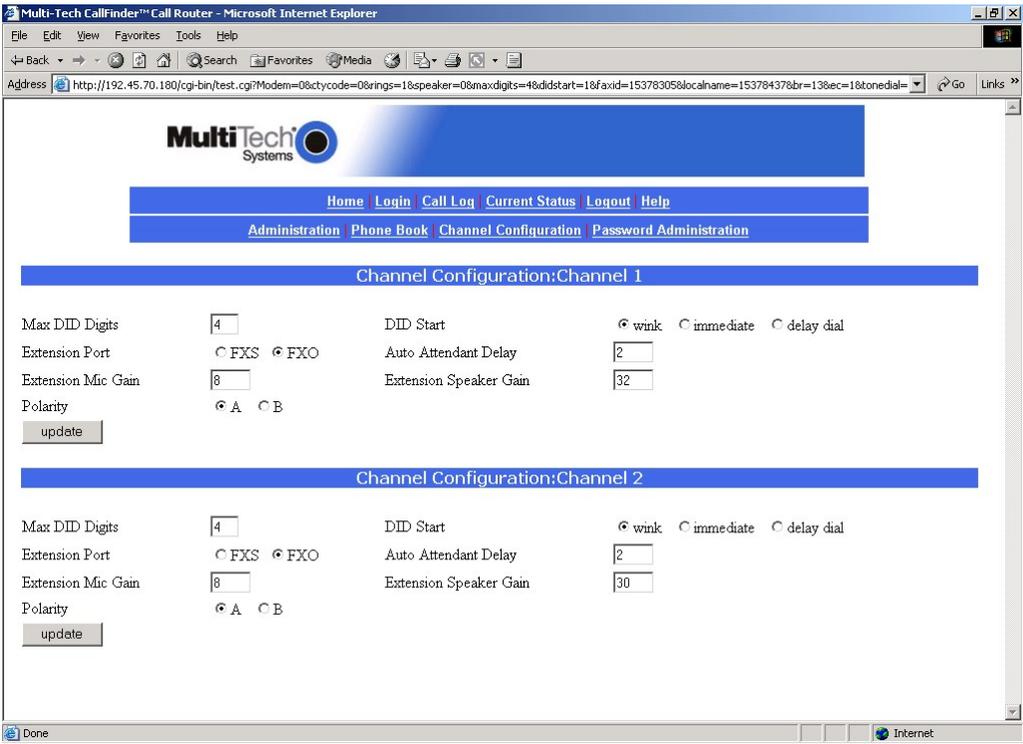
Step	Description
9.	<p>In the Voicemail tab of the User window, uncheck Voicemail On.</p>  <p>The screenshot shows a window titled 'Manager [255.255.255.255] (C:\Program Files\...\Manager\ SmallOffice-195.cfg)'. Below it is a sub-window titled 'User CallFinder4098' with tabs for 'User', 'Voicemail', 'DND', 'ShortCodes', 'SourceNumbers', 'Telephony', 'Forwarding', 'Dial In', 'VoiceRecording', and 'DigitalTelephony'. The 'Voicemail' tab is active. It contains several input fields and checkboxes: 'Voicemail Code' (empty), 'Confirm Voicemail Code' (empty), 'Voicemail Email' (empty), and 'Voicemail Reception' (empty). To the right of these fields are checkboxes for 'Voicemail On' (unchecked), 'Voicemail Help' (unchecked), 'Voicemail Ringback' (unchecked), and 'Voicemail Email Reading' (unchecked). Below these is a 'Voicemail Email' section with radio buttons for 'Off' (selected), 'Copy', 'Forward', and 'Alert'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.</p>

Step	Description
10.	In the Telephony tab of the User window, uncheck Call Waiting On , uncheck Answer Call Waiting on Hold (Analogue) , and click OK .
	 <p>The screenshot shows the 'Manager' application window with the 'User CallFinder4098' dialog box open. The 'Telephony' tab is selected. The following settings are visible:</p> <ul style="list-style-type: none"> Outside Call Sequence: DefaultRing Inside Call Sequence: DefaultRing Ring Back Sequence: DefaultRing No Answer Time (secs): [Empty] Wrap-up Time (secs): 2 Transfer return Time (secs): [Empty] Individual Coverage Time (secs): 10 Login Code: [Empty] Login Idle Period (secs): [Empty] Monitor Group: [Empty] Call Waiting On: <input type="checkbox"/> Answer Call Waiting on Hold (Analogue): <input type="checkbox"/> Busy On Held: <input type="checkbox"/> Outgoing Call Bar: <input type="checkbox"/> Offhook Station: <input type="checkbox"/> Can Intrude: <input type="checkbox"/> Cannot be Intruded: <input checked="" type="checkbox"/> Force Login: <input type="checkbox"/> Force Account Code: <input type="checkbox"/> System Phone: <input type="checkbox"/> Multi Line Options: <ul style="list-style-type: none"> Ringing Line Preference: <input checked="" type="checkbox"/> Idle Line Preference: <input checked="" type="checkbox"/>
11.	Repeat Steps 5 – 10 for the station port connected to CallFinder Channel 2, e.g., Extension ID 10 . For the purposes of these Application Notes, two IP Office station ports were connected to the 2-port CallFinder.

4.3. Configure MultiTech CallFinder CF220

This section addresses provisioning of the CallFinder for the Station Configuration Scenario with the Avaya IP Office. For all other provisioning information, please refer to the product documentation.

Step	Description
	Configure IP Address
1.	Steps are the same as those described in Steps 1 – 6 of the CallFinder configuration in the Trunk Configuration Scenario.
	Configure Phone Book (DID to Extension mapping)
2.	Steps are the same as those described in Steps 7 – 8 of the CallFinder configuration in the Trunk Configuration Scenario.
	Configure Channel Configuration
3.	In the CallFinder page, click Channel Configuration to configure the CallFinder ports connected to the IP Office as well as the DID ports connected to the Central Office.

Step	Description
4.	<p>In the Channel Configuration page that appears, set <i>Max DID Digits</i> to the number of digits that will be arriving from the central office, e.g., 4, <i>DID Start</i> to the type of DID connection setup with the central office, e.g., wink, <i>Extension Port</i> to FXO for Analog Station connection to the IP Office, <i>Auto Attendant Delay</i> to the desired delay in seconds that the CallFinder should pause for between the time the call goes off-hook at the FXO port and transmitting the DID to DTMF digits, e.g., 2. Click update.</p>  <p>NOTE 1: The audio on the IP Office side of the call was too low. The audio gain cannot be adjusted for stations on the IP Office. However, the Extension Speaker Gain field on the CallFinder can be modified to increase the audio. The Extension Speaker Gain was modified from 30 dB to 32 dB and there was a perceptible improvement. This parameter should only be modified if necessary.</p> <p>NOTE 2: MultiTech reports that at present CallFinder can support up to 7 DID digits.</p> <p>NOTE 3: Polarity enables one to switch Tip and Ring on the Loop Start side if necessary.</p>
5.	Repeat Step 4 for Channel 2 of the CallFinder.

5. Interoperability Compliance Testing

This Interoperability Compliance Test included feature and functionality testing which examined MultiTech CallFinder CF220's ability to work with Avaya IP Office in the configuration described in these Application Notes. The following features were verified: inbound calls routed to Digital extensions, IP Telephone extensions, Phone Manager Pro VoIP extensions and Voicemail Pro modules. Additionally, inbound calls that were routed to an extension's voicemail or a forwarded extension were verified.

5.1. General Test Approach

Feature and functionality testing were performed manually. Individual calls were made to the IP Office from a call generator connected to the CallFinder. The call generator analog station ports were setup to simulate Analog DID trunks from the central office and were connected to the DID trunk side of the CallFinder. The FXS/FXO ports of the CallFinder were connected to either trunk or station ports on the IP Office. The IP Office and CallFinder configurations were modified to support either the trunk configuration solution scenario or the station configuration solution scenario.

5.2. Test Results

Feature and functionality test cases passed with the following solution configuration observations noted below.

- **CallFinder must provide ring back for incoming DID calls until answered by IP Office:** At present, the Outside caller will hear from 7 to 11 seconds of silence for trunk configuration and 6 to 7 seconds of silence for station configuration from the moment of dialing until the IP Office provides ring back following blind transfer to the desired extension. MultiTech has been asked to provide ring back during the interval when it receives the call from the central office till the IP Office provides ring back when it transfers the call to the destination extension.
- **CallFinder must provide Answer Supervision to central office when calls are connected:** MultiTech needs to confirm the CallFinder gives Answer Supervision to the central office when it knows its connected to the IP Office, e.g., when it's in its Connected state.
- **CallFinder must provide Forward Disconnect to IP Office trunk when it resets its FXS port upon 'Waiting for Connect' timeout (trunk configuration only):** In the event that IP Office does not answer the incoming call within this timeout interval, the CallFinder resets its FXS port; however, it doesn't send a Forward Disconnect to the connected IP Office trunk port, as it should in this scenario. Additionally, we have no indication that the CallFinder gives an indication to the central office that the call did not go through. If necessary, the CallFinder should give an audible indication to the Outside caller that the call did not complete.
- **CallFinder 'Waiting for Connect' timeout needs to be adjusted or made configurable:** The current 'Waiting for Connect' timeout is fixed at between 60 – 70 seconds. The central office time-out for answer supervision is somewhere between 15 – 20 seconds. MultiTech should either modify this parameter to match the central office time-out or make this parameter user configurable.

6. Verification Steps

The following steps can be used to verify system operation after a field installation:

- Launch the IP Office System Monitor; make sure all boxes are checked in the ATM tab, Call tab, and the System tab. Connect to the IP Office system to verify the IP Office receives calls from the CallFinder.
- Log in to the CallFinder web interface and click **Current Status** to monitor the status of the CallFinder as it processes calls.
- Connect a Tip Ring telephone to the DID port on the CallFinder, go off hook, and dial a DID sequence defined in the CallFinder phonebook, e.g., 4000. Verify the CallFinder routes the call to the IP Office and transmits this DTMF sequence. Verify the corresponding IP Office extension rings and there is end-to-end connectivity.
- In the CallFinder web interface, click **Call Log**, verify the DID sequence dialed in the previous bullet, e.g., 4000, appears in the call log.

7. Support

MultiTech Systems Support Services provides free technical support, which can be reached at 800-972-2439 or 763-785-3500. Alternatively, they can be reached by sending email to support@multitech.com.

8. Conclusion

These Application Notes describe the required configuration steps for MultiTech CallFinder CF220 to successfully interoperate with Avaya IP Office in both trunk and station configuration scenarios. Features and functionality of this solution are considered passed provided the following conditions are agreed upon and met by MultiTech:

- CallFinder will provide ring back for incoming DID calls until answered by IP Office.
- CallFinder will provide audible indication to outside caller if call fails to go through on IP Office.
- CallFinder will provide forward disconnect to connected IP Office trunk when CallFinder resets its FXS port following 'Waiting for Connect' timeout.
- CallFinder will provide Answer Supervision to central office when it detects a call to IP Office is connected.

9. Additional References

- Avaya IP Office 3.0 Installation Manual, 40DHB0002UKCL, Issue 12e (24th March 2005)
- Avaya Voicemail Pro 3.0 Installation & Maintenance, 40DHB0002USAW, Issue 131 (14th March 2005)
- Avaya IP Office 3.0 Voicemail Pro Examples & Exercises, Issue 5b (15th February 2005)

- MultiTech CallFinder CF220 CF220 DID-to-Analog Telephony Adapter User Guide, Rev. A, Published 12/23/04 (PN: S000350A)

9.1. Glossary

DID	Direct Inward Dial
FXO	MultiTech port setting to use when connected to Analog Station port on PBX.
FXS	MultiTech port setting to use when connected to Analog Trunk port on PBX.

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