



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

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# **Application Notes for MultiTech CallFinder CF220 with Avaya IP Office - Issue 1.0**

### **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 *DeveloperConnection* Program at the Avaya Solution and Interoperability Test Lab.

## Table of Contents

<b>1. INTRODUCTION.....</b>	<b>3</b>
1.1. TRUNK CONFIGURATION.....	3
1.2. STATION CONFIGURATION .....	5
<b>2. EQUIPMENT AND SOFTWARE VALIDATED .....</b>	<b>7</b>
<b>3. TRUNK CONFIGURATION .....</b>	<b>8</b>
3.1. CONFIGURE AVAYA IP OFFICE VOICEMAIL PRO.....	8
3.2. CONFIGURE AVAYA IP OFFICE .....	19
3.3. CONFIGURE MULTITECH CALLFINDER CF220 .....	25
<b>4. STATION CONFIGURATION.....</b>	<b>28</b>
4.1. CONFIGURE AVAYA IP OFFICE VOICEMAIL PRO.....	28
4.2. CONFIGURE AVAYA IP OFFICE .....	29
4.3. CONFIGURE MULTITECH CALLFINDER CF220 .....	32
<b>5. INTEROPERABILITY COMPLIANCE TESTING .....</b>	<b>33</b>
5.1. GENERAL TEST APPROACH .....	34
5.2. TEST RESULTS .....	34
<b>6. VERIFICATION STEPS .....</b>	<b>34</b>
<b>7. SUPPORT.....</b>	<b>35</b>
<b>8. CONCLUSION .....</b>	<b>35</b>
<b>9. ADDITIONAL REFERENCES.....</b>	<b>35</b>
9.1. GLOSSARY .....	36

# 1. Introduction

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

The Trunk Configuration provides users with the following advantages:

- Call accounting of all incoming DID calls.<sup>1</sup>
- Distinctive ringing for incoming DID calls.

The Station Configuration provides the advantage of not requiring an Automated Attendant for handling incoming DID calls. However, incoming DID calls are, in effect, considered internal calls on the IP Office. Therefore,

- Call accounting of incoming DID calls is not provided.
- Distinctive ringing for an incoming DID call is not provided.
- Other possible effects on incoming DID calls, which are classified as internal in this configuration, include: displays, coverage treatment, etc.

## 1.1. Trunk Configuration

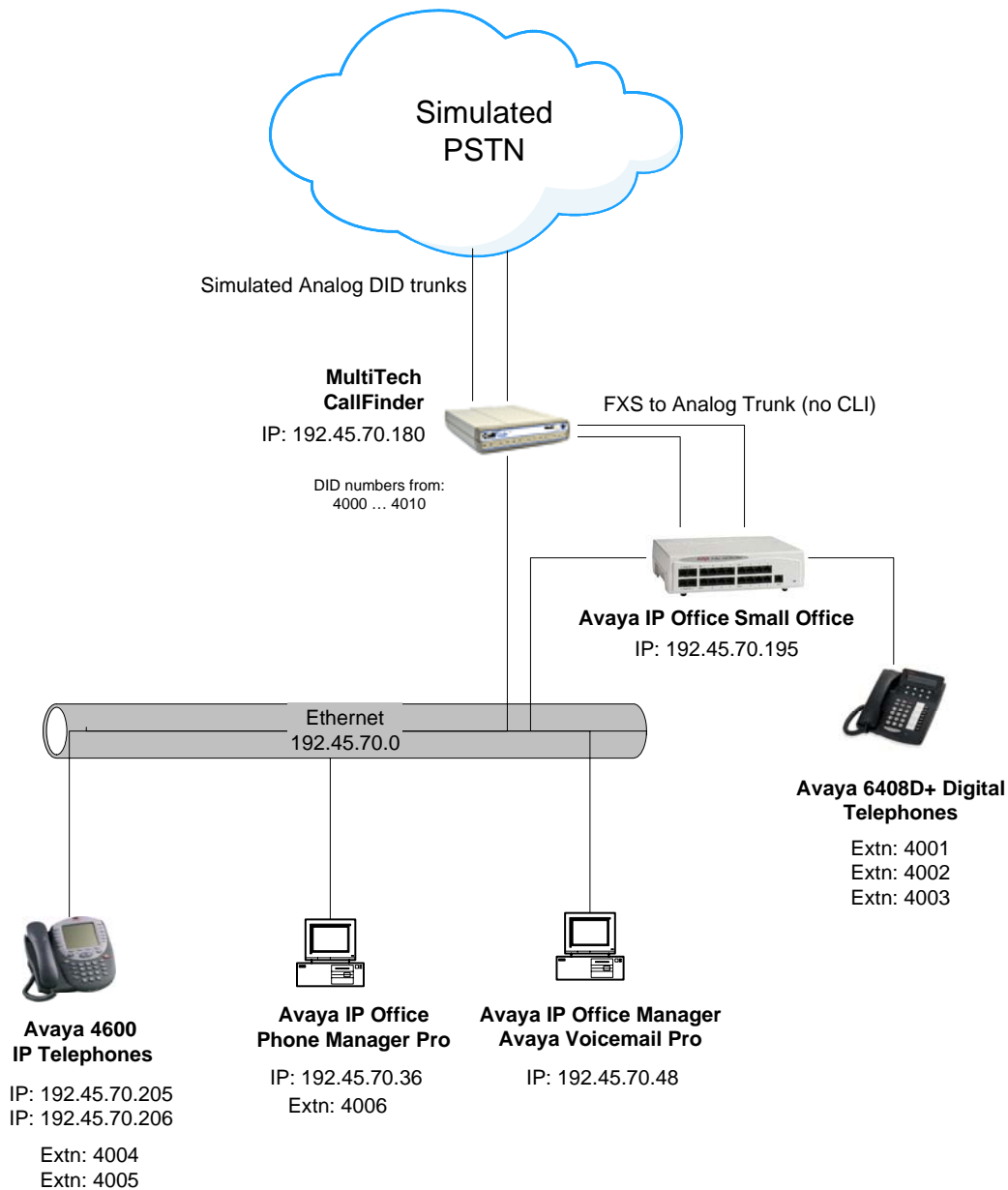
The tested trunk configuration scenario is shown in **Figure 1**<sup>2</sup>. Two DID trunks from the central office are connected to the two DID ports on the CallFinder. Each DID port has a corresponding FXS/FXO port in the CallFinder. In the trunk configuration, these ports are configured as FXS ports and are connected to analog trunk ports on the IP Office that are configured as Loop Start.

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<sup>1</sup> Inaccuracies will exist due to CallFinder performing answer supervision to central office before it is confirmed that the end-user has actually answered the call.

<sup>2</sup> Inbound DID service was simulated on lab test equipment. MultiTech verified the solution with analog DID facilities from a central office.

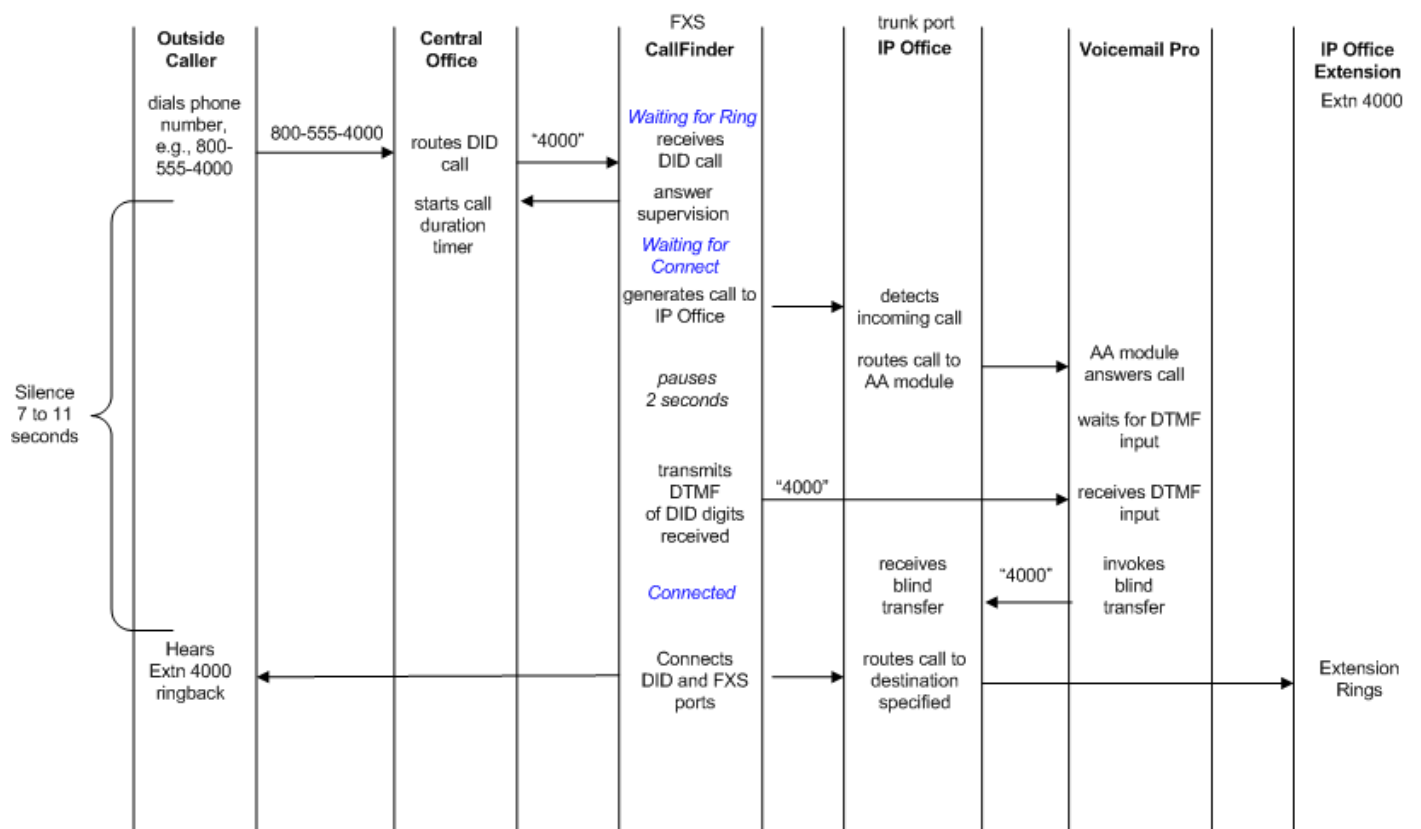
In the trunk configuration scenario, an incoming call route is defined in the IP Office to route all calls from the CallFinder to a locally defined automated attendant module in Voicemail Pro. The automated attendant collects the DID digits from the CallFinder and transfers the call to the matching extension.



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

When the CallFinder receives an incoming DID call and corresponding DTMF digits from the central office, it provides answer supervision to the central office and its status changes from

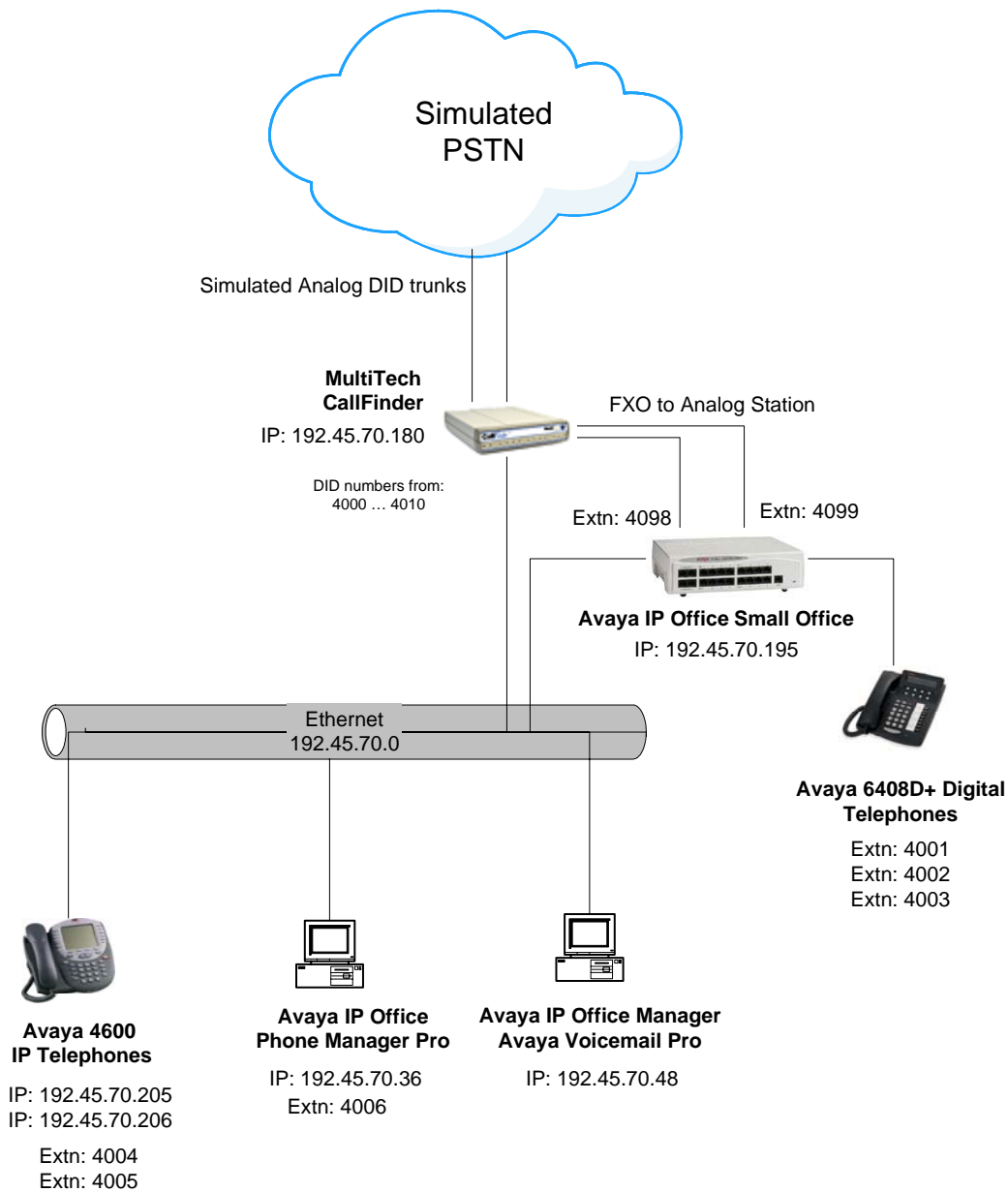
‘Waiting for Ring’ to ‘Waiting for Connect’ as depicted in **Figure 1-1**. The CallFinder rings the IP Office and waits for the call to be answered. When the automated attendant in Voicemail Pro answers the call, the CallFinder pauses for a predefined interval, then transmits the DTMF of the DID digits 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. 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 station configuration is shown in **Figure 2<sup>1</sup>**. 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 POT ports on the IP Office.



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

When the CallFinder receives an incoming DID call and corresponding DTMF digits from the central office, it provides answer supervision to the central office and 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<sup>3</sup>, the CallFinder then transmits the DTMF of the DID digits it received from the central office, e.g., "4000". Then,

<sup>3</sup> The CallFinder has a configurable parameter called **Automated Attendant Delay**. If this parameter is set to **0**, the CallFinder goes off-hook, detects dial tone and then transmits the DTMF of the DID digits. If the Automated Attendant Delay is greater than zero, then the CallFinder skips Dial Tone detection and transmits the DTMF after the delay period has elapsed.

CallFinder status changes from 'Waiting for Connect' to 'Connected' and it connects its DID port to its FXO port. 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".

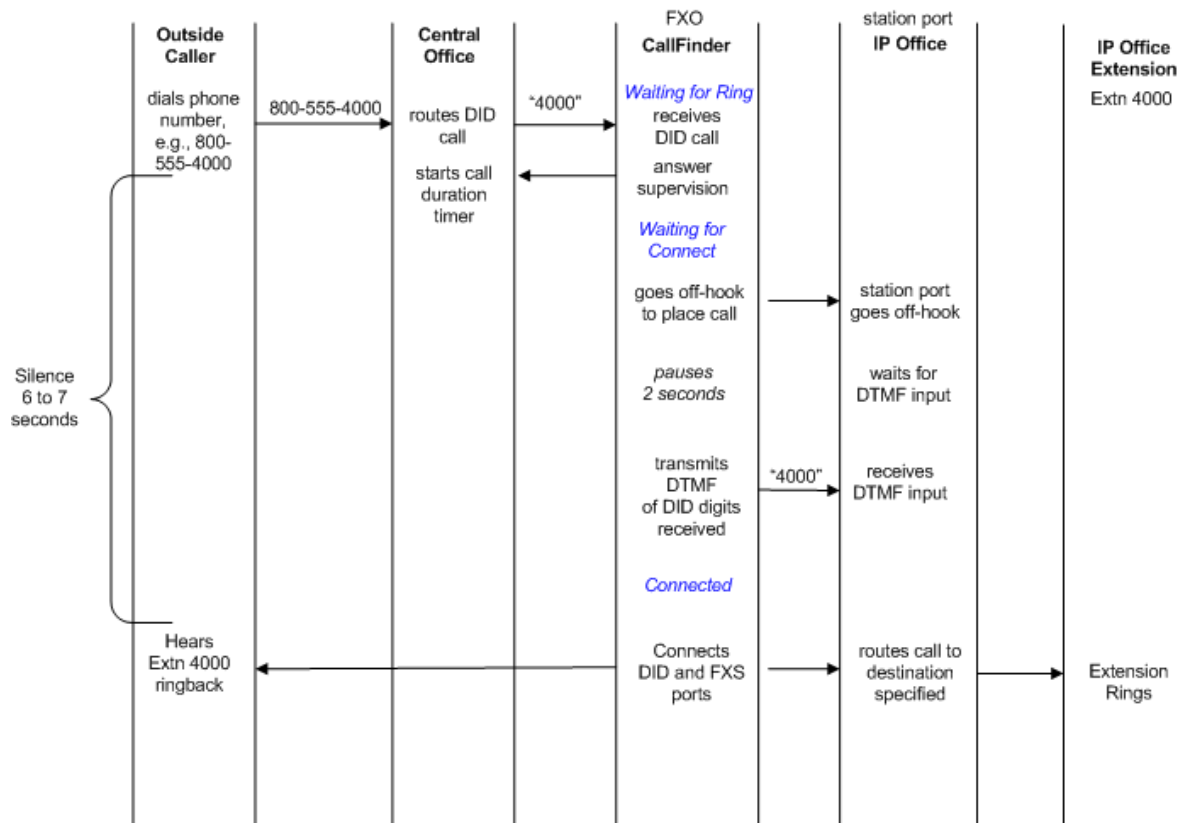


Figure 2-1: Station Configuration Call Flow

## 2. Equipment and Software Validated

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

Equipment	Software
Avaya IP Office Small Office Edition	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	1.82
Avaya 6408D+ Telephones	-
MultiTech CallFinder CF220	1.03
MultiTech FaxFinder/CallFinder Manager	1.04
PC for Avaya IP Office Manager and Avaya Voicemail Pro and MultiTech FaxFinder/CallFinder Manager	Windows 2000 professional w/Service Pack 4

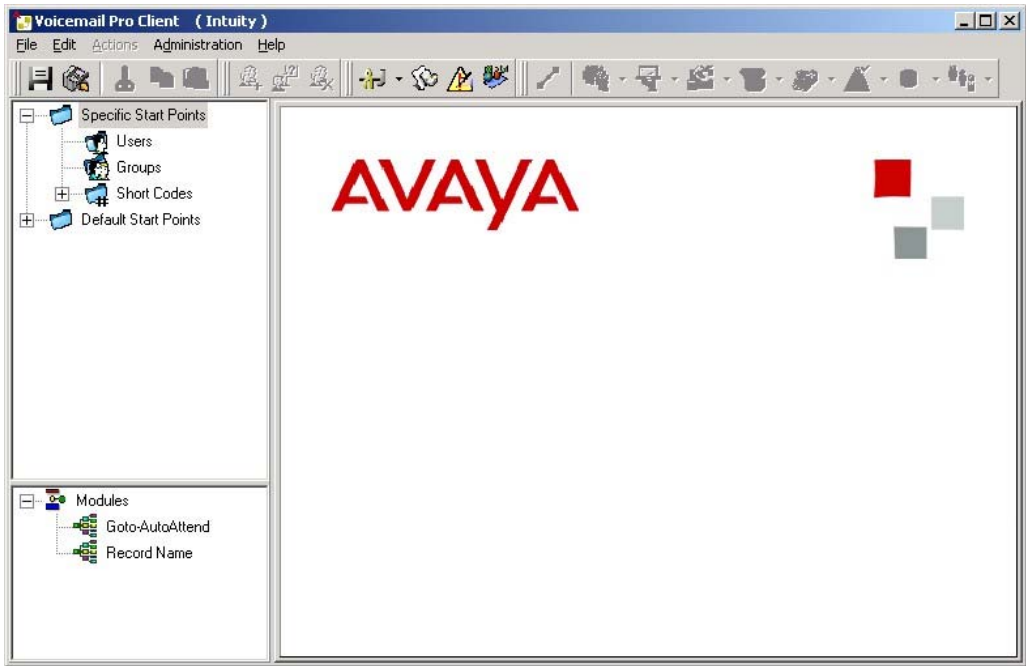
Equipment	Software
PC for Avaya IP Office Phone Manager Pro	Windows 2000 professional w/Service Pack 4

### 3. Trunk Configuration

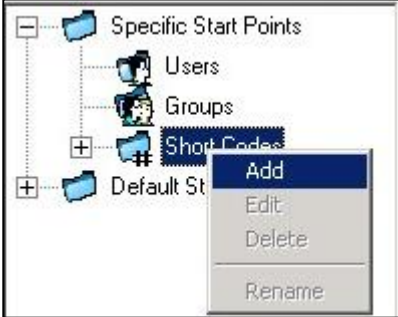
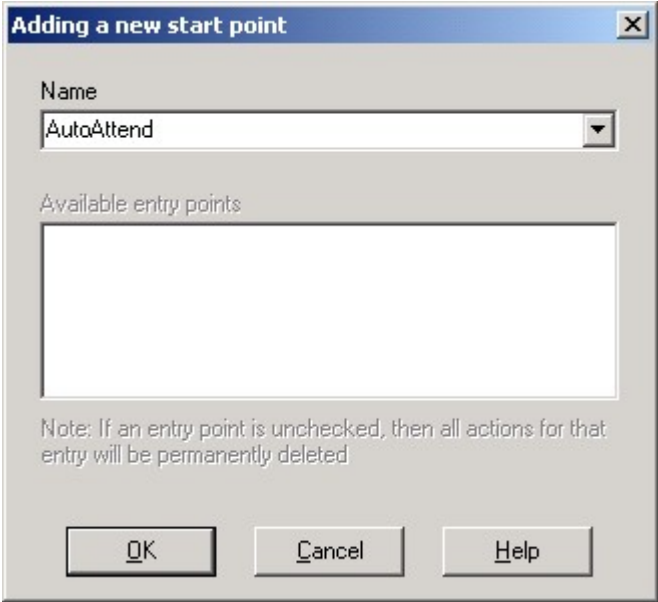
This section addresses provisioning of the IP Office, Voicemail Pro and CallFinder for the Trunk configuration depicted in **Figure 1**. For all other provisioning information, such as initial installation and configuration of the IP Office, Voicemail Pro and CallFinder, please refer to the product documentation.

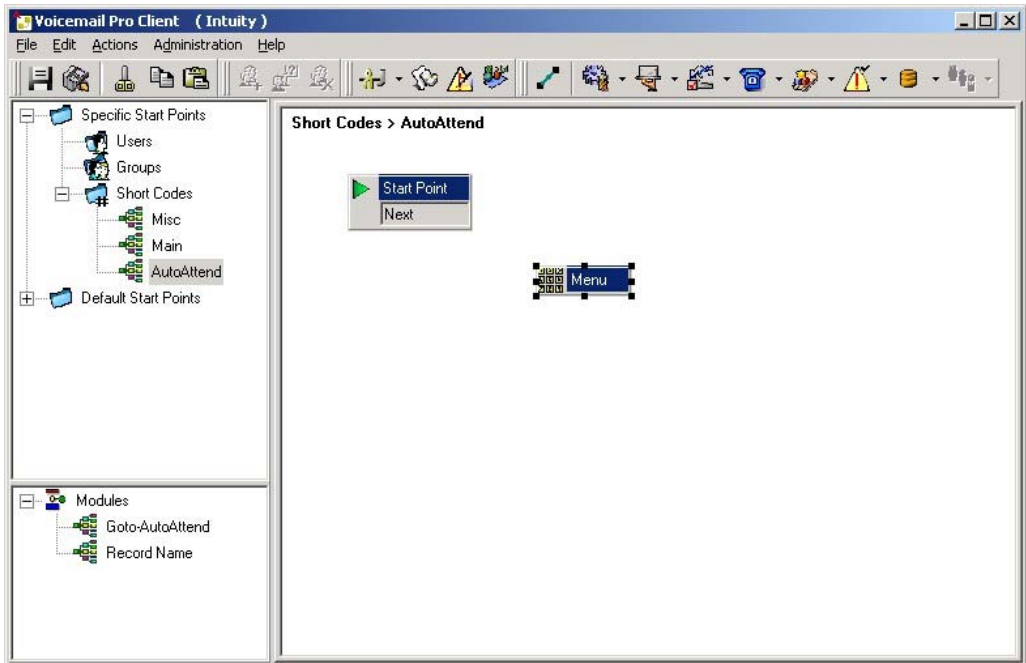
#### 3.1. Configure Avaya IP Office Voicemail Pro

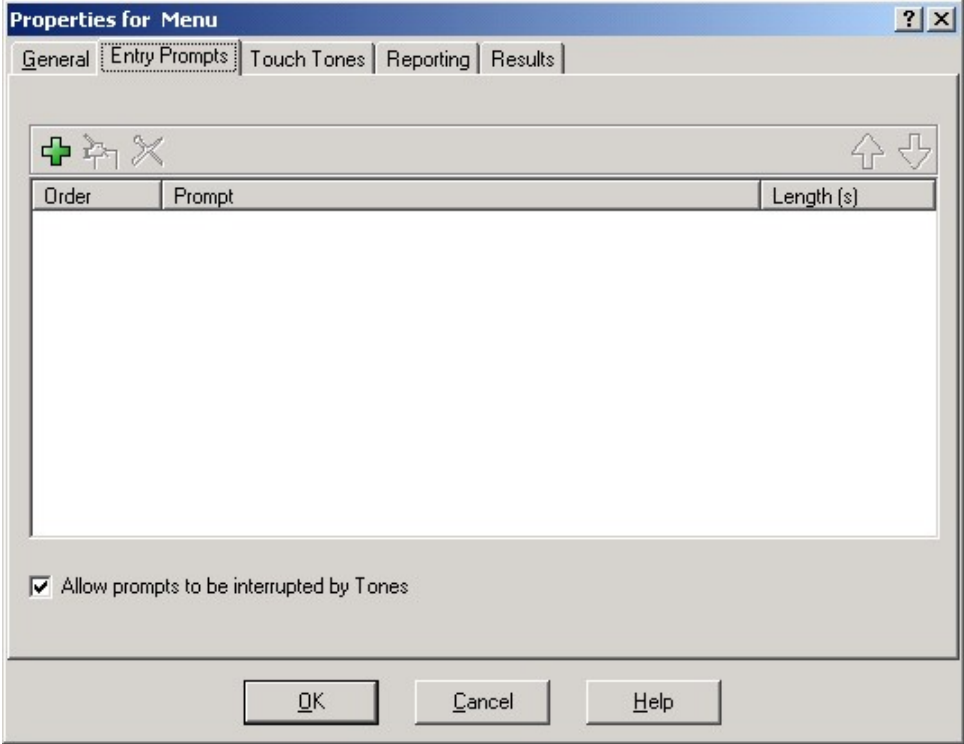
A single Automated Attendant module was defined for transferring calls received from the CallFinder as well as for internal and other inbound trunk calls. Only the configuration relevant to the CallFinder is discussed in the steps that follow.

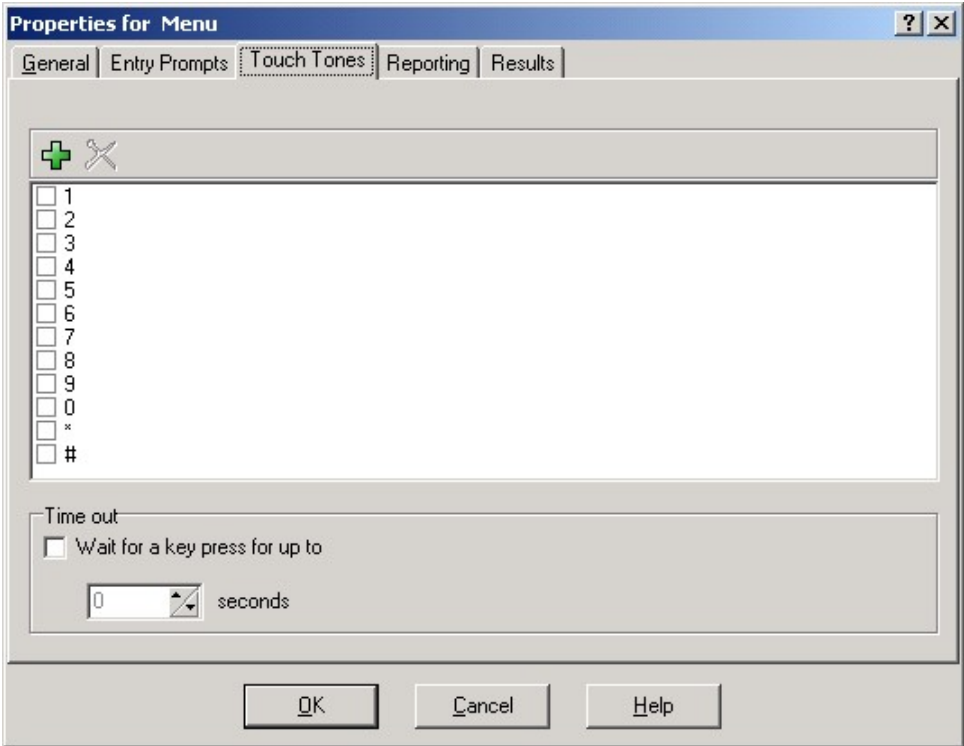
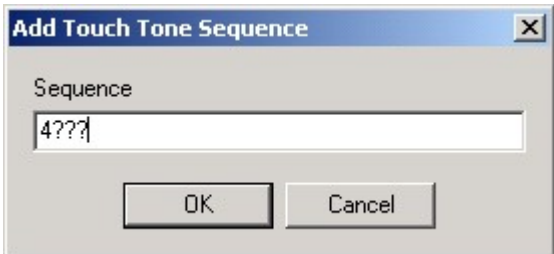
Step	Description
<b>Launch Voicemail Pro client</b>	
1.	<p>Log in to the IP Office Manager PC and go to <b>Start → Programs → IP Office → Voicemail Pro</b> to launch the Voicemail Pro Client application.</p> 

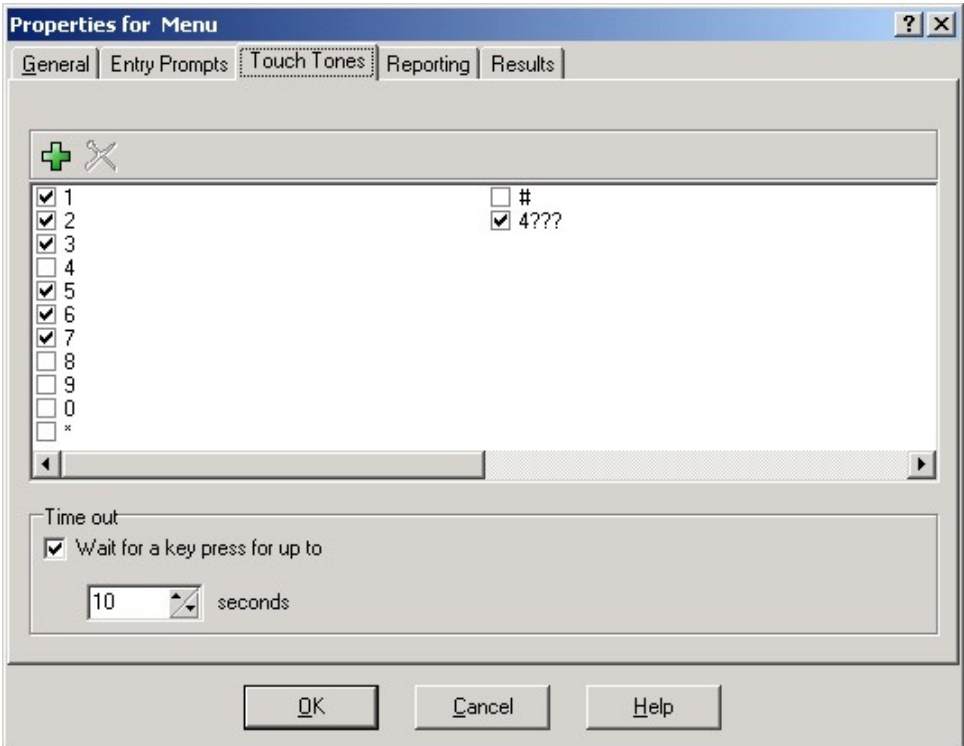


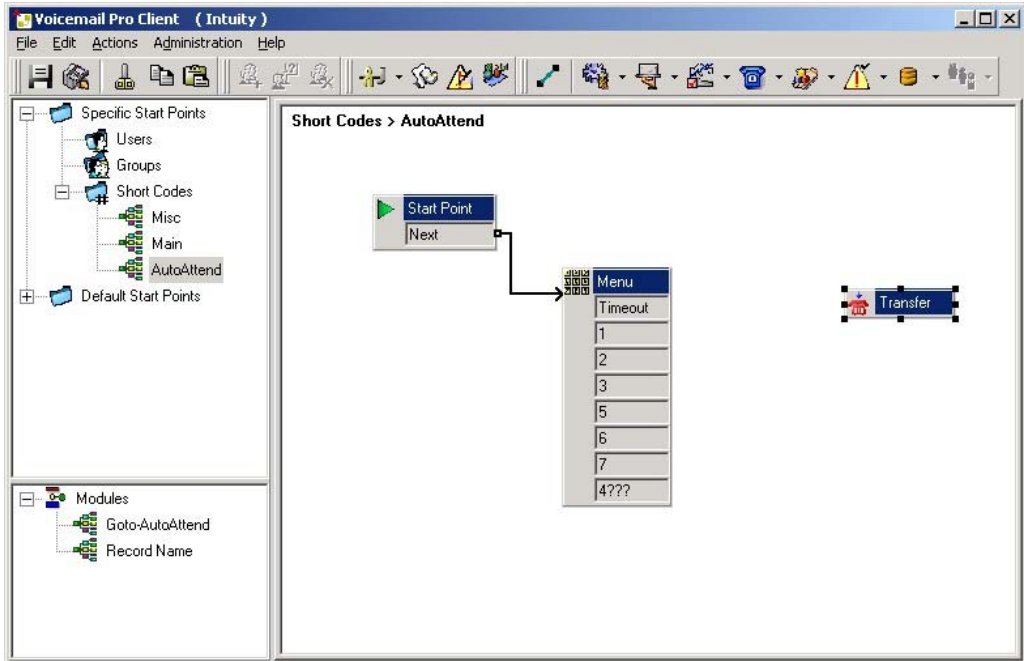
Step	Description
<b>Create the Auto Attendant Module</b>	
2.	<p>Create the module to be used for incoming calls. In the Voicemail Pro Client window, right click the Short Codes Start Point and select <b>Add</b>.</p> 
3.	<p>In the <b>Adding a new start point</b> popup that appears, type <b>AutoAttend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

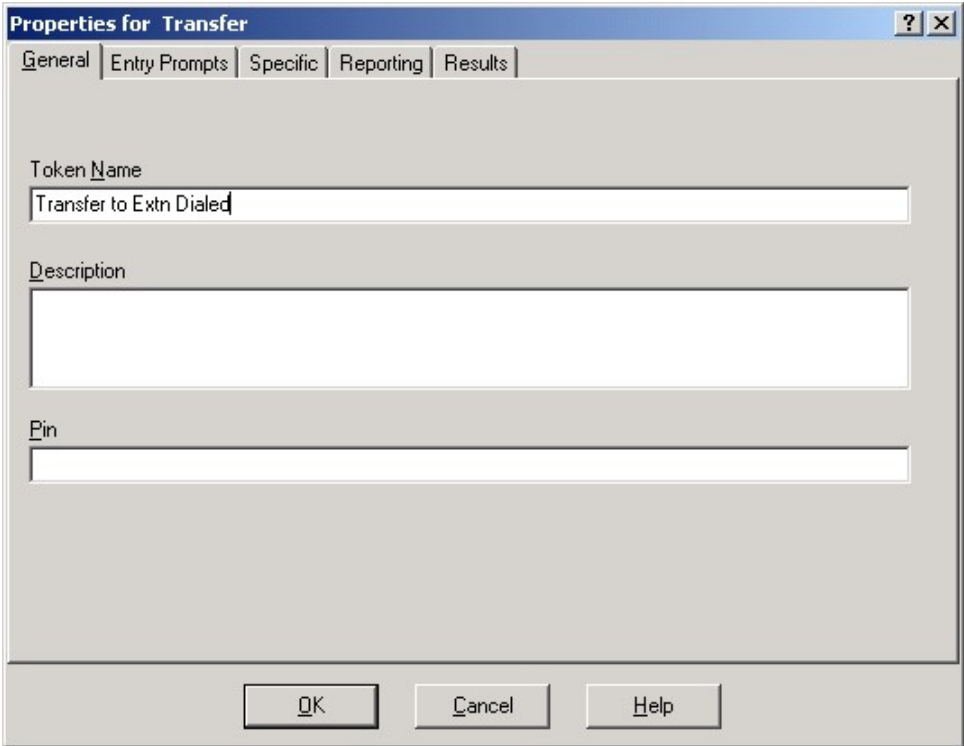

Step	Description
4.	<p>In the <b>Voicemail Pro Client</b> window, select <b>Actions</b> → <b>Basic Actions</b> → <b>Menu</b> to add a Menu object.</p>  <p>The screenshot shows the <b>Voicemail Pro Client (Intuity)</b> window. The menu bar includes <b>File</b>, <b>Edit</b>, <b>Actions</b>, <b>Administration</b>, and <b>Help</b>. The left sidebar contains a tree view with the following structure:</p> <ul style="list-style-type: none"> <li>Specific Start Points       <ul style="list-style-type: none"> <li>Users</li> <li>Groups</li> <li>Short Codes           <ul style="list-style-type: none"> <li>Misc</li> <li>Main</li> <li>AutoAttend</li> </ul> </li> </ul> </li> <li>Default Start Points</li> </ul> <p>Below the tree view is a <b>Modules</b> section with the following items:</p> <ul style="list-style-type: none"> <li>Goto-AutoAttend</li> <li>Record Name</li> </ul> <p>The main workspace is titled <b>Short Codes &gt; AutoAttend</b>. It contains a <b>Start Point</b> block with a <b>Next</b> button and a <b>Menu</b> block.</p>

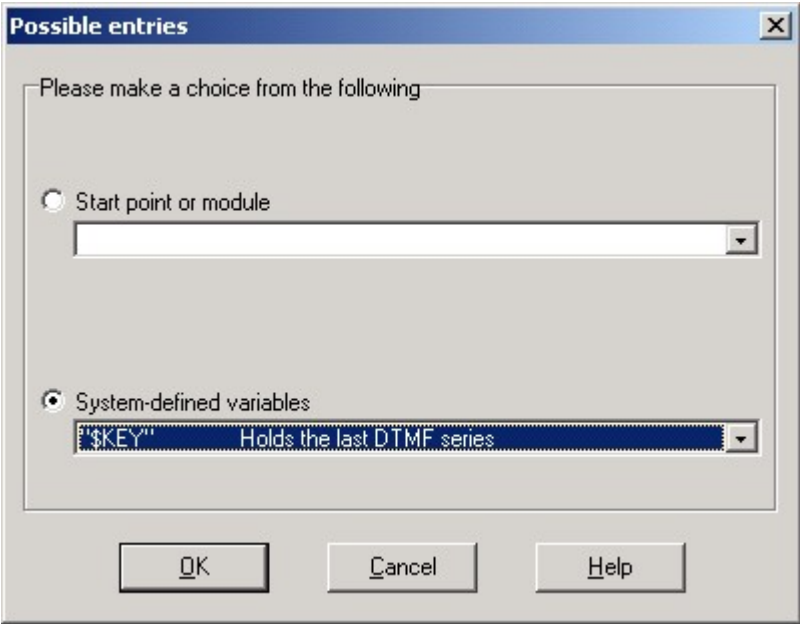
Step	Description
5.	<p>Double click the Menu object. In the <b>Properties for Menu</b> popup that appears, select the Entry Prompts tab, check <b>Allow prompts to be interrupted by Tones</b> and click the green plus sign to add a menu prompt. Adding and recording the menu prompt is unnecessary for calls from the CallFinder since DID callers will not hear the prompt. It would 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 the 'Properties for Menu' dialog box with the 'Entry Prompts' tab selected. The dialog contains a table with three columns: 'Order', 'Prompt', and 'Length (s)'. Below the table is a checkbox labeled 'Allow prompts to be interrupted by Tones' which is checked. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.</p>

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

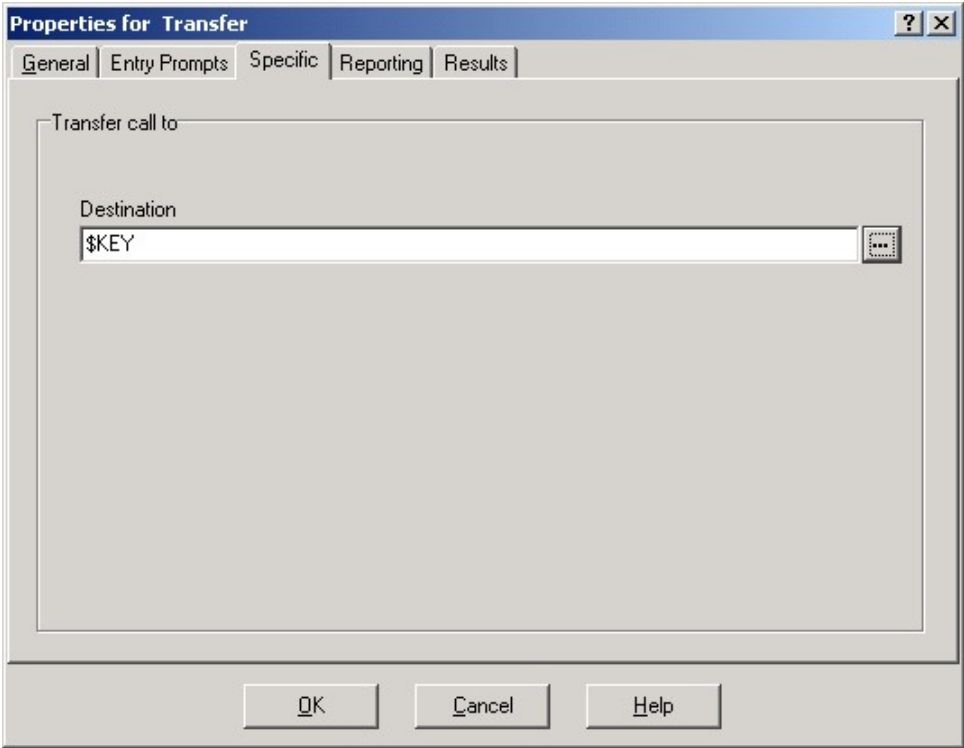
Step	Description
8.	<p>In the <b>Touch Tones</b> tab of the Properties for Menu popup, check <b>Wait for a key press for up to</b> and set the time out field to the desired time out, e.g., <b>10</b> seconds. Click <b>OK</b>.</p>  <p>The screenshot shows the 'Properties for Menu' dialog box with the 'Touch Tones' tab selected. The 'Time out' section is checked and set to 10 seconds. The 'Wait for a key press for up to' checkbox is checked. The 'Touch Tones' list shows digits 1-9, 0, and *, with 1-7 checked. The '4???' option is also checked.</p>

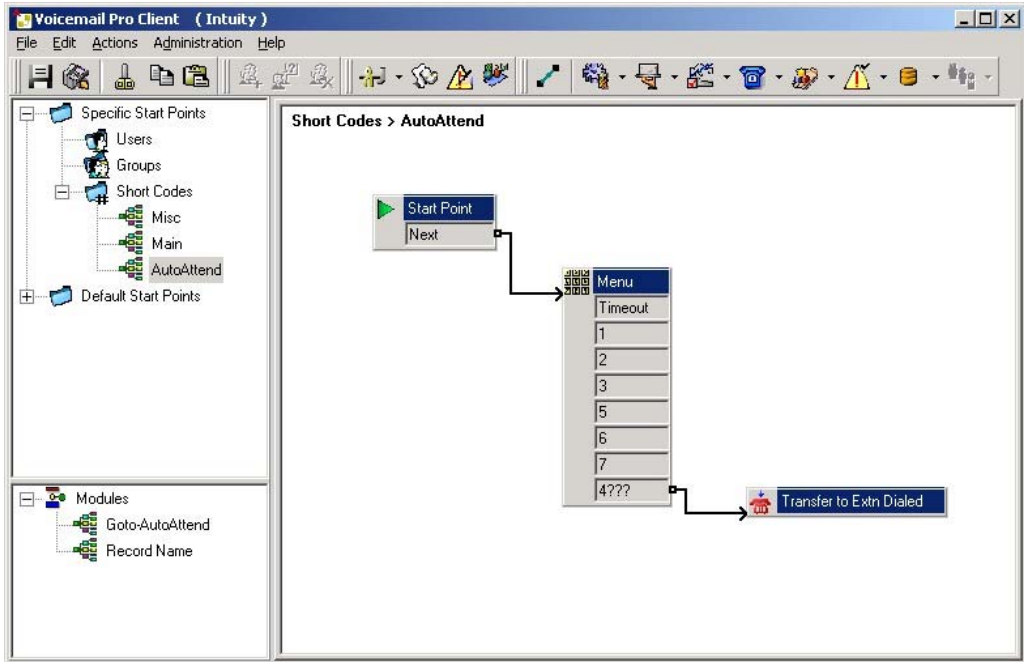
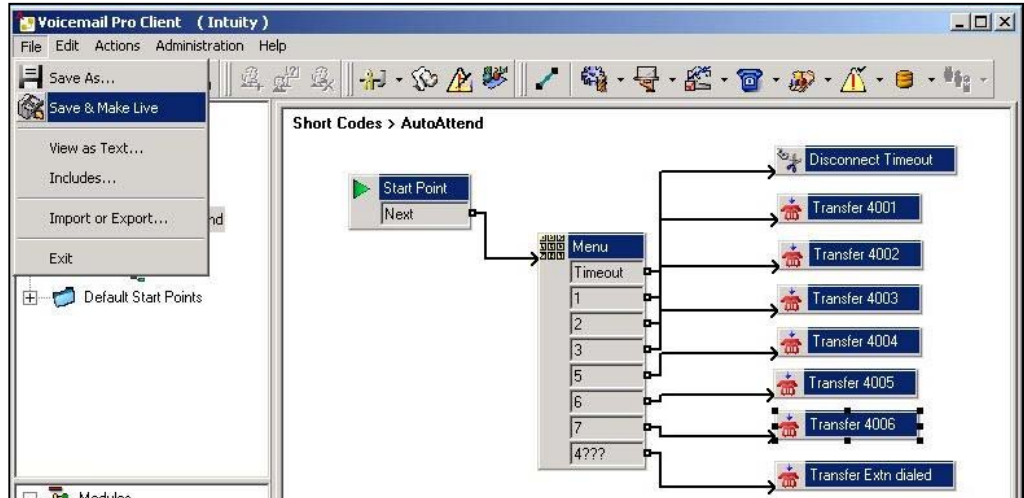
Step	Description
9.	<p>In the <b>Voicemail Pro Client</b> window, connect the <b>Start Point</b> object to the <b>Menu</b> object. Then select <b>Actions</b> → <b>Telephony Actions</b> → <b>Transfer</b> to add a <b>Transfer</b> object.</p>  <p>The screenshot displays the Voicemail Pro Client (Intuity) window. The left sidebar shows a tree view with 'Specific Start Points' expanded, containing 'Users', 'Groups', 'Short Codes', 'Misc', 'Main', and 'AutoAttend'. Below this is the 'Modules' section with 'Goto-AutoAttend' and 'Record Name'. The main workspace is titled 'Short Codes &gt; AutoAttend' and shows a 'Start Point' object with a 'Next' button connected to a 'Menu' object. The 'Menu' object has a list of options: 'Timeout', '1', '2', '3', '5', '6', '7', and '4???'. A 'Transfer' object is shown in the bottom right corner of the workspace.</p>

Step	Description
10.	<p>Double click the <b>Transfer</b> object. In the <b>General</b> tab of the Properties for Transfer popup that appears, set <i>Token Name</i> to <b>Transfer to Extn Dialed</b>.</p> 
11.	<p>In the <b>Specific</b> tab of the Properties for Transfer popup, click the '...' button.</p> 

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

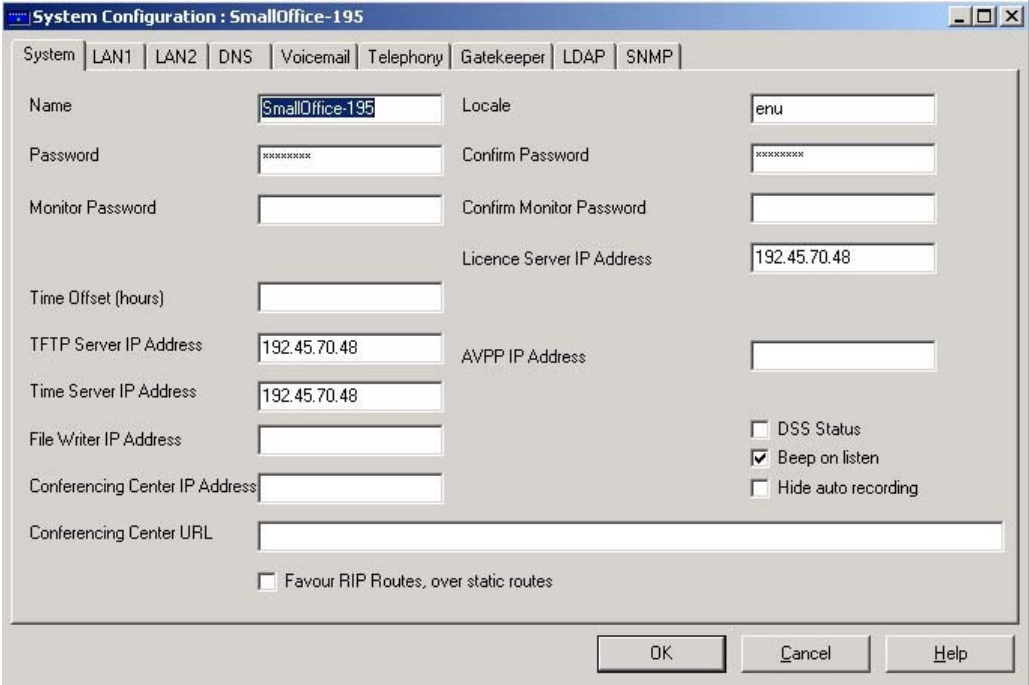


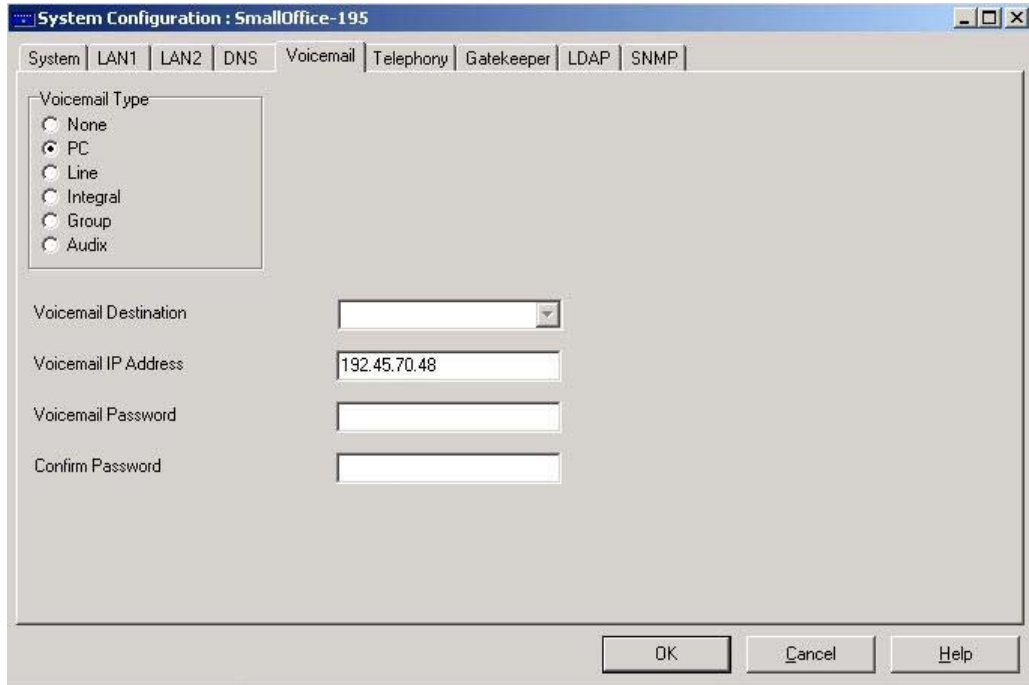

Step	Description
13.	<p>In the <b>Properties for Transfer</b> popup, click <b>OK</b>. NOTE: The Destination field will be populated with the \$KEY system-defined variable selected in the previous step. This variable holds the last DTMF series entered by the caller.</p> 

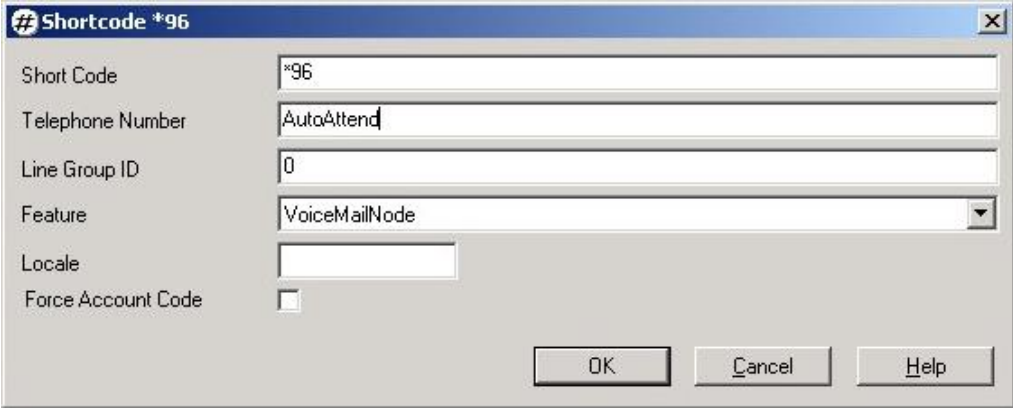
Step	Description
14.	<p>In the <b>Voicemail Pro Client</b> window, connect the <b>Menu</b> object to the <b>Transfer to Extn Dialed</b> object.</p> 
	<p><b>Save and Make Live</b></p>
15.	<p>In the <b>Voicemail Pro Client</b> window, select <b>File</b> → <b>Save &amp; Make Live</b> to save the configuration and have it used by the Voicemail Server for calls received from the IP Office. The steps used to create the additional Transfer modules shown in this screenshot are similar to those used for Steps 9 through 14.</p> 

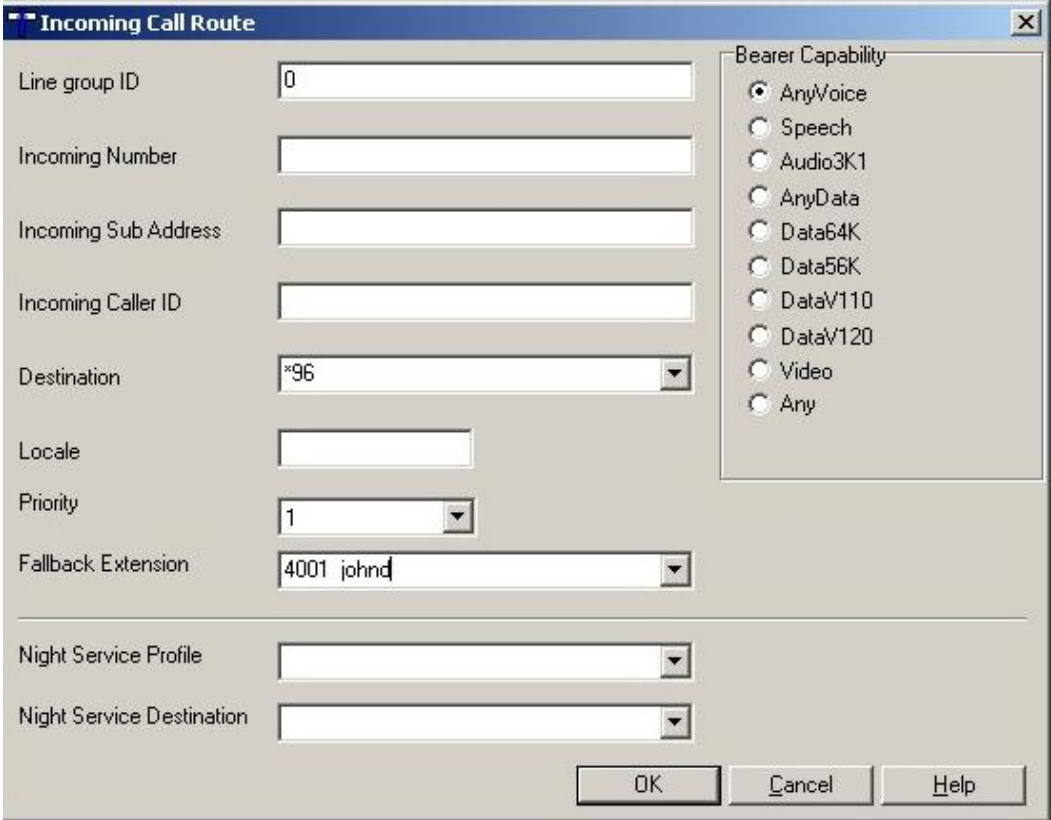
## 3.2. Configure Avaya IP Office

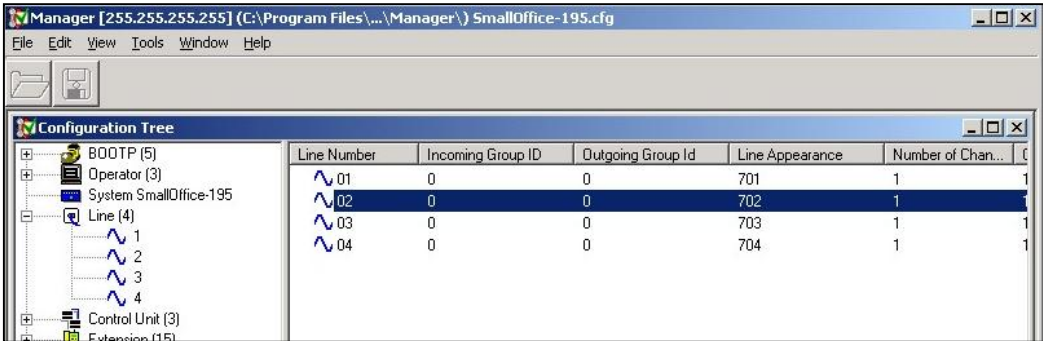
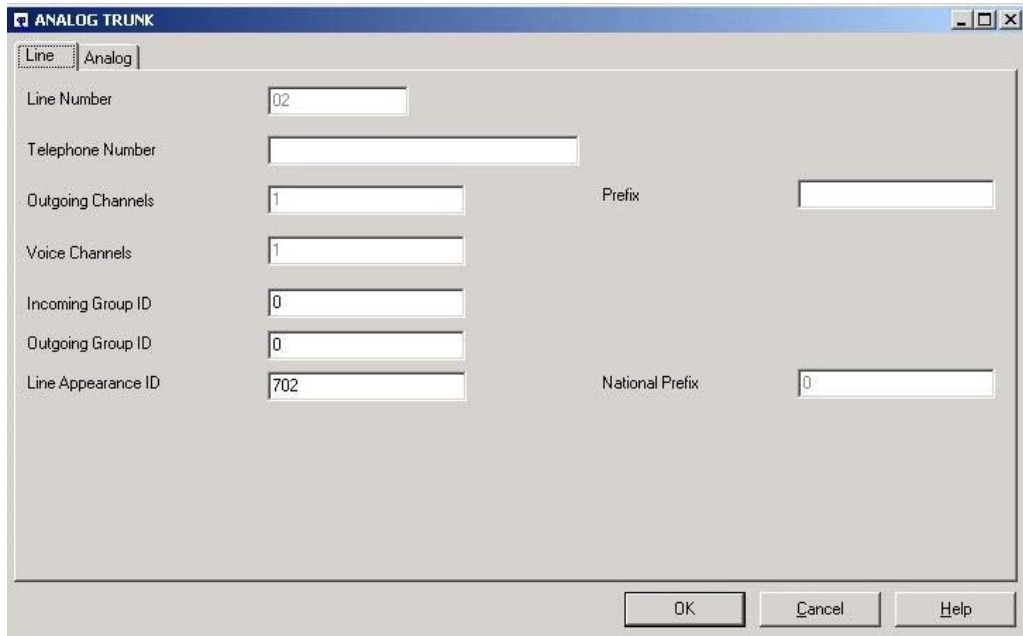
This section addresses provisioning of the IP Office as it relates to integration of the CallFinder. For all other provisioning information, such as provisioning of the trunks for regular inbound and outbound dialing, call coverage, extensions, etc., please refer to the IP Office documentation.

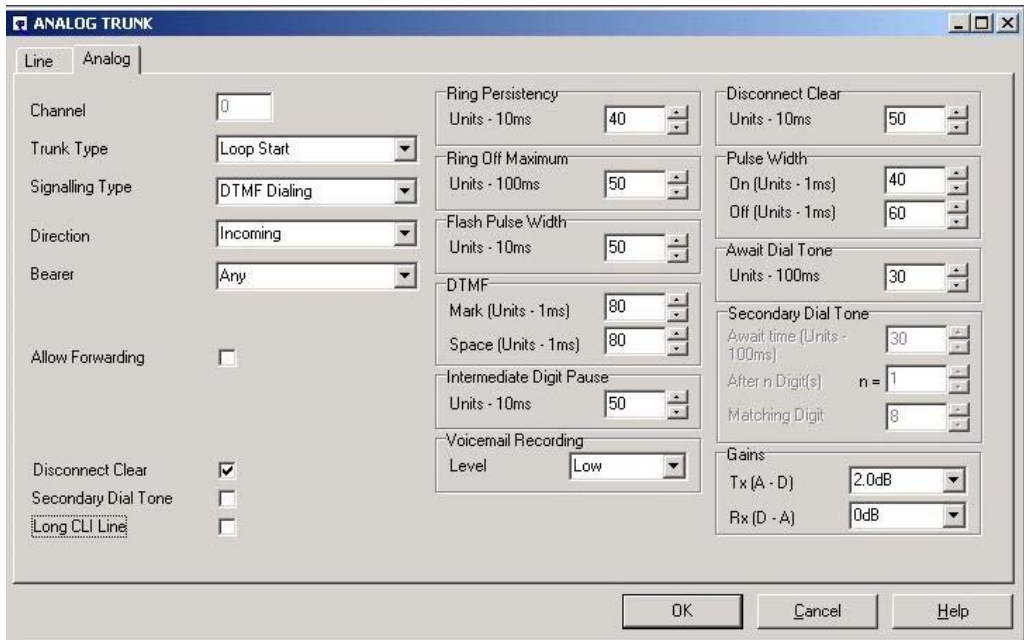
Step	Description
<b>Physical connection</b>	
1.	Physically connect CallFinder <i>FXS/FXO port 1</i> to the desired analog trunk port on the IP Office, e.g., <b>Line 2</b> . Physically connect CallFinder <i>FXS/FXO port 2</i> to the desired analog trunk port on the IP Office, e.g., <b>Line 3</b> .
<b>Login</b>	
2.	Log in to the IP Office Manager PC and go to <b>Start → Programs → IP Office → Manager</b> to launch the Manager application. Log in to the Manager application using the appropriate credentials.
3.	In the Manager window that appears, select <b>File → Open</b> 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.
<b>Configure License Server IP Address</b>	
5.	In the <b>Manager</b> window, go to the Configuration Tree and double-click <b>System</b> . In the <b>System</b> tab of the System Configuration window that appears, verify the <i>License Server IP Address</i> field is set properly. For example, if the Feature Key is connected to a PC, the License Server IP Address should be set to the IP address of the PC.
	
<b>Configure Voicemail IP Address</b>	

Step	Description
6.	<p>In the <b>Voicemail</b> tab of the System Configuration window, select <b>PC</b> for Voicemail Type and set <i>Voicemail IP Address</i> to the IP address of the Voicemail Server, e.g., <b>192.45.70.48</b>. Click <b>OK</b>.</p> 
<b>Install licenses</b>	
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 <b>New</b>. In the License window that appears, enter the Voicemail Pro License Key and click <b>OK</b>. The screen shows a fictitious license.</p> 
9.	In the Manager window, select <b>File</b> → <b>Save</b> to save the licenses to the IP Office system and wait for the system to update. The system reload validates the new license.
<b>Configure Short code to Voicemail Pro AutoAttend Module</b>	
10.	In the Manager window, select <b>File</b> → <b>Open</b> 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.
12.	In the Manager window, go to the Configuration Tree and double-click <b>Shortcode</b> to open the list of short codes on the IP Office.

Step	Description
13.	<p>Right click in the short code list window and select <b>New</b>. In the Shortcode window that appears, set <i>Short Code</i> to the desired short code, e.g. <b>*96</b>, <i>Telephone Number</i> to the name of the Automated Attendant module defined in Step 3 of Section 3.1, e.g., <b>AutoAttend</b>, <i>Feature</i> to <b>VoiceMailNode</b> and click <b>OK</b>.</p> 
	<p><b>Configure Incoming Call Route for trunks connected to CallFinder</b></p>
14.	<p>In the Manager window, go to the Configuration Tree and double-click <b>Incoming Call Route</b> to open the list of incoming call routes on the IP Office.</p>
15.	<p>Right click in the incoming call route window and select <b>New</b>.</p>

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., <b>0</b>, <i>Destination</i> to <b>*96</b>, <i>Fallback Extension</i> to the extension designated to answer incoming calls should the defined destination fail to the answer the call, e.g., extension <b>4001</b>, and click <b>OK</b>.</p>  <p>It is always good practice to designate a Fallback extension in the event that the Voicemail Pro system becomes unavailable. In such a scenario, the call from the CallFinder is routed to the Fallback extension. The caller can then ask the person answering the call at the Fallback extension to transfer the call to the desired extension.</p>
	<p><b>Configure Analog Trunks connected to CallFinder</b></p>
17.	<p>In the Manager window, go to the Configuration Tree and double-click <b>Line</b> to open the list of lines (trunks) available on the IP Office.</p>

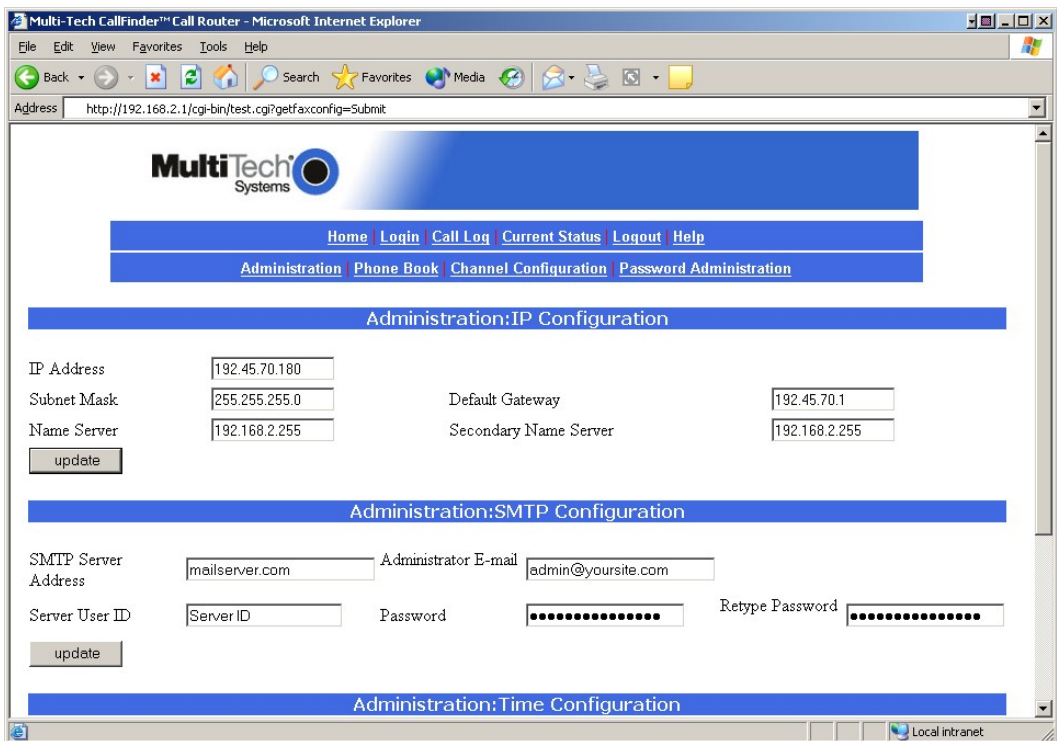
Step	Description																									
18.	<p>Double-click the Line connected to CallFinder Channel 1, e.g., <b>Line 02</b>.</p>  <table><thead><tr><th>Line Number</th><th>Incoming Group ID</th><th>Outgoing Group Id</th><th>Line Appearance</th><th>Number of Chan...</th></tr></thead><tbody><tr><td>01</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., <b>0</b> (should be the same as the line group number used in Steps 13 and 16).</p> 																									


Step	Description
20.	<p>In the Analog tab of the ANALOG TRUNK window, set <i>Trunk Type</i> to <b>Loop Start</b>, <i>Direction</i> to <b>Incoming</b>, and click <b>OK</b>.</p>  <p><b>Note:</b> During testing, audio from 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.	<p>Repeat Steps 17 – 20 for the line connected to CallFinder Channel 2, e.g., <b>Line 03</b>. For the purposes of these Application Notes, two IP Office trunk lines were connected to the 2-port CallFinder.</p>

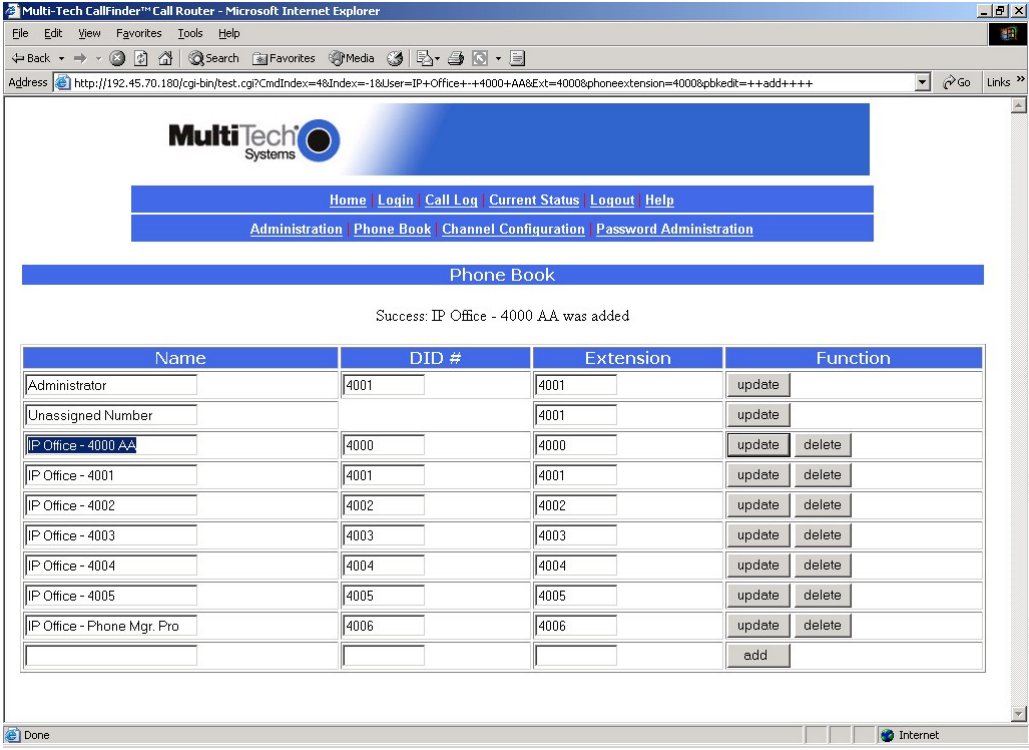


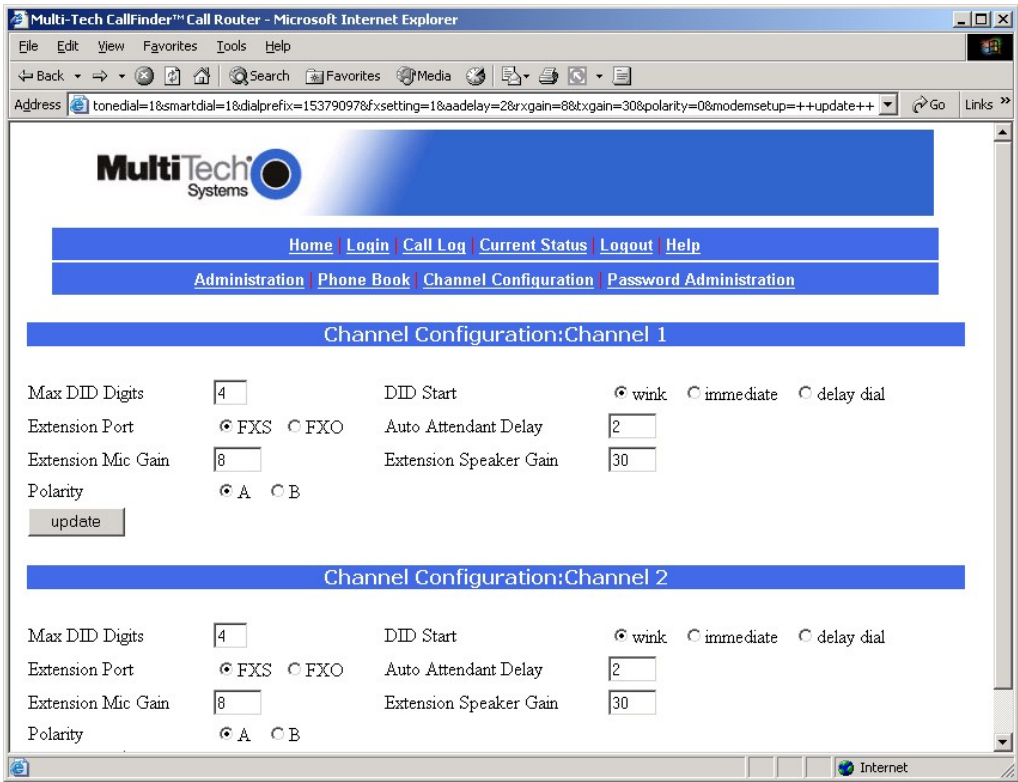
### 3.3. Configure MultiTech CallFinder CF220

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
	<b>Configure IP Address</b>
1.	Physically connect a PC to the CallFinder Ethernet port using a crossover cable.
2.	Log in to the PC and modify its IP address to be 192.168.2.5 with subnet mask 255.255.255.0. Go to <b>Start</b> → <b>Programs</b> → <b>Internet Explorer</b> to launch the browser, browse to the default IP address of the CallFinder, e.g., <b>192.168.2.1</b> , and log in using the appropriate credentials, e.g., <b>admin/admin</b> .
3.	In the CallFinder Home page that appears, click <b>Password Administration</b> . 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 <b>update</b> .
4.	In the CallFinder page, click <b>Administration</b> . In the Administration page that appears, set <i>IP Address</i> to the desired IP address, e.g., <b>192.45.70.180</b> , <i>Subnet Mask</i> to the desired subnet mask, e.g., <b>255.255.255.0</b> , and <i>Default Gateway</i> to the desired gateway, e.g., <b>192.45.70.1</b> . Click <b>update</b> .
	
5.	Disconnect the PC 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 PC's IP address to its original settings, e.g., <b>192.45.70.33/255.255.255.0</b>. Browse to the new IP address of the CallFinder, e.g., <b>192.45.70.180</b>, and log in using the appropriate credentials.</p> 
<b>Configure Phone Book (DID to Extension mapping)</b>	
7.	<p>In the CallFinder Home page that appears, click <b>Phone Book</b> to configure the DID number to Extension number mapping.</p>

Step	Description
8.	<p>In the Phone Book page that appears, enter <b>Name</b>, <b>DID #</b> and <b>Extension</b> in the appropriate fields and click <b>add</b> 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><b>NOTE:</b> Analog 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>
	<b>Configure Channel Configuration</b>
9.	<p>In the CallFinder page, click <b>Channel Configuration</b> 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., <b>4</b>, <i>DID Start</i> to the type of DID connection setup with the central office, e.g., <b>wink</b>, <i>Extension Port</i> to <b>FXS</b> 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 between the time the call goes off-hook at the FXS port and transmitting the DTMF digits, e.g., <b>2</b>. Click <b>update</b>.</p>  <p><b>NOTE:</b> MultiTech reports that at present CallFinder can support up to 7 DID digits.</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 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
<b>Physical connection</b>	
1.	Physically connect CallFinder <i>FXS/FXO port 1</i> to the desired analog station port on the IP Office, e.g., <b>Extension ID 09</b> . Physically connect CallFinder <i>FXS/FXO port 2</i> to the desired analog station port on the IP Office, e.g., <b>Extension ID 10</b> .
<b>Login</b>	
2.	Log in to the IP Office Manager PC and go to <b>Start → Programs → IP Office → Manager</b> to launch the Manager application. Log in to the Manager application using the appropriate credentials.
3.	In the <b>Manager</b> window that appears, select <b>File → Open</b> 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.
<b>Configure Analog Station ports connected to CallFinder</b>	
5.	In the <b>Manager</b> window, go to the Configuration Tree and double-click <b>Extension</b> to open the list of extensions available on the IP Office.
6.	Double-click the Extension ID connected to CallFinder Channel 1, e.g., <b>09</b> . Set <i>Extension</i> to the desired extension number, e.g., <b>4098</b> and click <b>OK</b> .

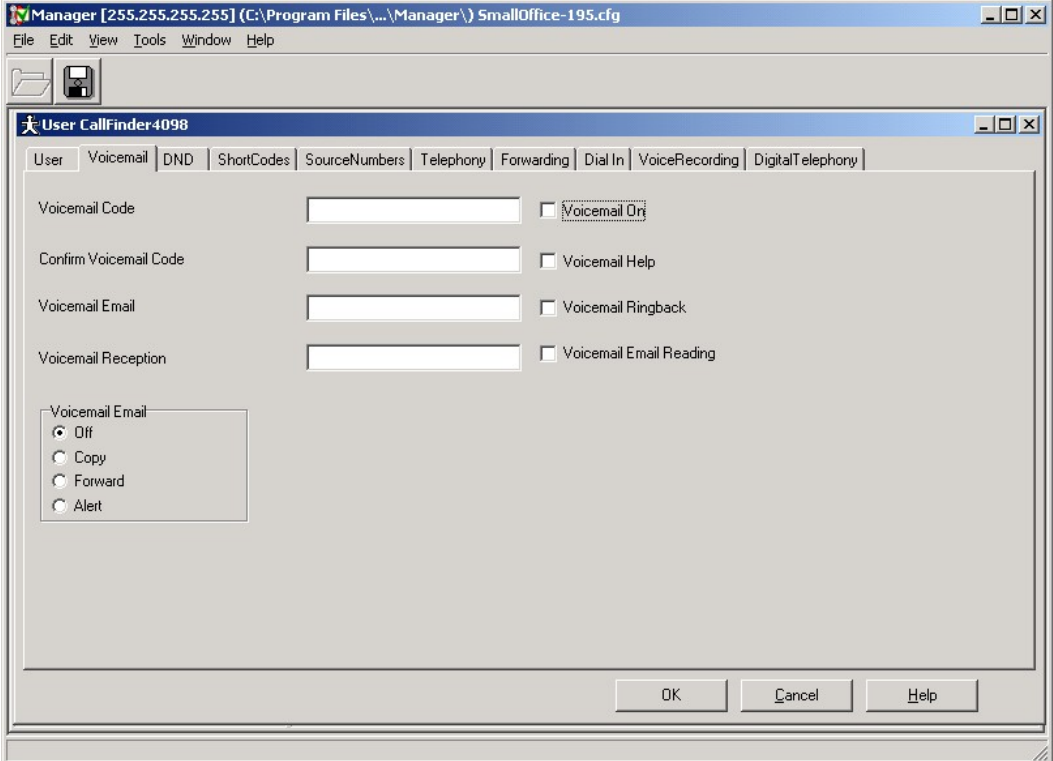
The screenshot shows the 'Extension 4098' configuration window. The 'Extn' tab is active. The 'Extension ID' field contains '09' and the 'Extension' field contains '4098'. The 'Caller Display Type' is set to 'Off'. Under 'Equipment Classification', 'Standard Telephone' is selected. The 'Flash Hook Pulse Width' section has 'Use System Defaults' checked. The 'Message Waiting Lamp Indication Type' is set to 'None'. The 'Hook Persistency' is set to '100' units. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

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

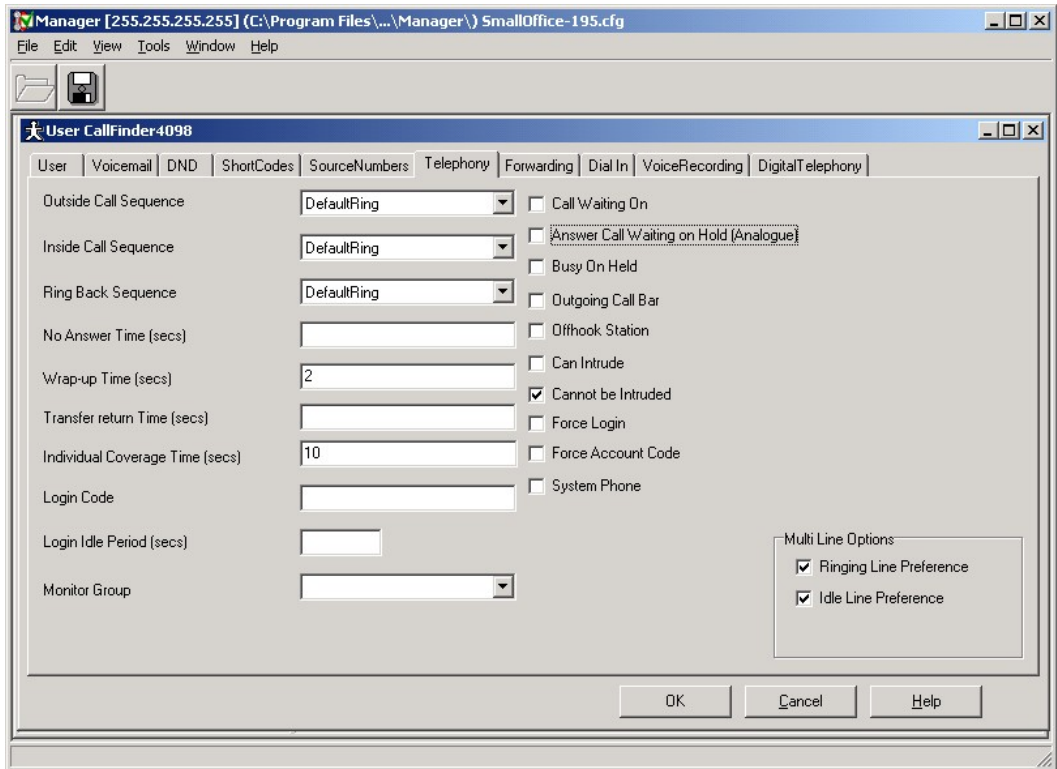
The screenshot shows the 'Manager' application window with the title bar 'Manager [255.255.255.255] (C:\Program Files\...\Manager\) SmallOffice-195.cfg'. The menu bar includes 'File', 'Edit', 'View', 'Tools', 'Window', and 'Help'. Below the menu bar is a toolbar with icons for file operations. The main window displays the 'User CallFinder4098' dialog box, which has a tabbed interface with the 'User' tab selected. The 'User' tab contains the following fields and controls:

- Name:** A text box containing 'CallFinder4098'.
- Ex Directory:** An unchecked checkbox.
- Password:** An empty text box.
- Confirm Password:** An empty text box.
- Full Name:** An empty text box.
- Extension:** A text box containing '4098'.
- Locale:** An empty text box.
- Priority:** A text box containing '5'.
- Restrictions:** A dropdown menu.
- Phone Manager Type:** A dropdown menu set to 'Lite'.
- Book with Conference Centre in Phone Manager:** An unchecked checkbox.

At the bottom of the dialog box are three buttons: 'OK', 'Cancel', and 'Help'.

Step	Description
9.	<p>In the <b>Voicemail</b> tab of the User window, uncheck <b>Voicemail On</b>.</p> 



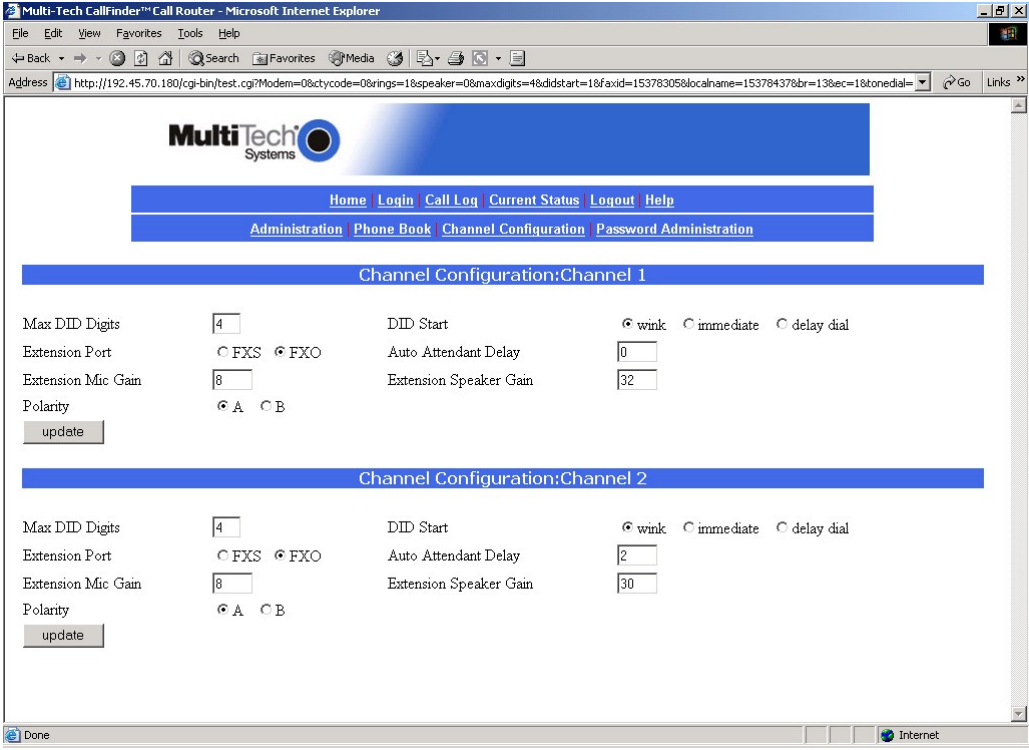
Step	Description
10.	<p>In the <b>Telephony</b> tab of the User window, uncheck <b>Call Waiting On</b>, uncheck <b>Answer Call Waiting on Hold (Analogue)</b>, and click <b>OK</b>.</p> 
11.	<p>Repeat Steps 5 – 10 for the station port connected to CallFinder Channel 2, e.g., <b>Extension ID 10</b>. For the purposes of these Application Notes, two IP Office station ports were connected to the 2-port CallFinder.</p>

### 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
	<b>Configure IP Address</b>
1.	Steps are the same as those described in Steps 1 – 6 of the CallFinder configuration in the Trunk Configuration Scenario.
	<b>Configure Phone Book (DID to Extension mapping)</b>
2.	Steps are the same as those described in Steps 7 – 8 of the CallFinder configuration in the Trunk Configuration Scenario in Section 3.3
	<b>Configure Channel Configuration</b>
3.	In the CallFinder page, click <b>Channel Configuration</b> 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., <b>4</b>, <i>DID Start</i> to the type of DID connection setup with the central office, e.g., <b>wink</b>, <i>Extension Port</i> to <b>FXO</b> for Analog Station connection to the IP Office, <i>Auto Attendant Delay</i> to <b>0</b> for the CallFinder to detect dial-tone from the IP Office when the port goes off-hook and click <b>update</b>.</p>  <p><b>NOTE 1:</b> Initially, the audio from the IP Office side of the call was too low. The audio gain cannot be adjusted for stations on the IP Office. The <b>Extension Speaker Gain</b> on the CallFinder can be modified to increase the audio. The <b>Extension Speaker Gain</b> was modified from 30 dB to 32 dB and there was a perceptible improvement. This parameter should only be modified if necessary.</p> <p><b>NOTE 2:</b> MultiTech reports that at present CallFinder can support up to 7 DID digits.</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 configured 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 should provide Answer Supervision to central office later in call:** Current implementation of CallFinder provides answer supervision to central office as soon as DTMF digits are received from the central office. This will start billing for the call before the call is actually answered by the end-user. Additionally, in the event that the call does not go through, the caller will wind up billed for an uncompleted call. MultiTech has agreed to investigate providing answer supervision further along during the call while still conforming to FCC Guidelines in the next release.
- **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.
- **CallFinder must provide indication to central office when call did not go through.** We have no indication that the CallFinder signals to the central office that the call did not go through. The CallFinder should give an audible indication that conforms to FCC guidelines to the Outside caller that the call did not complete.

## 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 can be reached at 800-972-2439 or 763-785-3500. Alternatively, Technical Support can be reached by sending email to [support@multitech.com](mailto: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 met by MultiTech in their next release:

- 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 as well as properly release DID line.

## 9. Additional References

From [www.avaya.com](http://www.avaya.com):

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

From [www.multitech.com](http://www.multitech.com):

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

## 9.1. Glossary

<b>DID</b>	Direct Inward Dial
<b>FXO</b>	Foreign Exchange Office
<b>FXS</b>	Foreign Exchange Station

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