CHAPTER

7

Using an Analog Telephone with Cisco 700 Series Routers

This chapter describes how to configure an analog telephone that is connected to a Cisco 700 series router through the analog telephone port. Models that have the analog telephone ports are the Cisco 753 (one telephone port), Cisco 765 (two telephone ports), and the Cisco 766 (two telephone ports).



Caution If you want to use an ISDN telephone connected to the ISDN line through the router, we recommend that you use the Cisco 752 or Cisco 762. If you connect an ISDN telephone to a Cisco 753 or Cisco 766, voice calls intended for the ISDN telephone might be routed to the analog telephone port(s), even if no device is connected to the analog telephone port(s). If this happens, the voice call might go unanswered.

Note This chapter describes example configurations. For complete information on the software commands used in this chapter, including syntax, keywords, and arguments, refer to the *Cisco 750 Series and Cisco 760 Series Command Reference* publication.

This chapter contains the following sections:

- Configuring Directory Numbers
- Data Over Voice Bearer Service
- Automatic Data Call Disconnect
- Supplementary Services
- Country-Specific Dialing Instructions

Configuring Directory Numbers

This section describes how to associate ISDN directory numbers with the Service Profile Identifiers (SPIDs) and the router's analog telephone port(s). The Cisco 750 series routers support up to two directory numbers and two SPIDS. The Cisco 760 series routers support up to four directory numbers and up to two SPIDs.

Associating Directory Numbers with SPIDs

If you are using ISDN Basic Rate Interface (BRI) service in North America, your telephone service provider might assign one or two SPIDs to your BRI line. For 5ESS Custom switches, no SPIDs or one SPID are usually assigned. For NI-1 and NI-1-compliant switches, two SPIDs are usually assigned.

If your BRI line is assigned SPIDs, each SPID is associated to one or more directory numbers by the service provider. The association between the directory numbers and the SPIDs must be configured in the router with the **set directory number** command. Each SPID can have multiple directory numbers associated with it.

Note If your line is not assigned SPIDs, use the **set directory number** command without the *<spid_id>* argument to configure the router with the directory numbers.

Example

Following is an example of the **set directory number** command. In this example, directory number 5551234 is associated with the first SPID, and 5551235 is associated with the second SPID:

766> set 1 di 5551234 766> set 2 di 5551235

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SPIDs and Voice Calls

If your BRI line has been assigned two SPIDs, you might want to use the second SPID's directory number to receive most of the incoming voice calls. Data calls are usually assigned the first SPID. Using the second SPID's directory number for incoming voice calls reduces the chance that a data call will be disconnected when the router receives incoming voice calls.

Analog Telephone Ports and Number of SPIDs

Note This section applies only to Cisco 765 and Cisco 766 routers used in the United States.

The Cisco 765 and Cisco 766 have two analog telephone ports; however, if your BRI line is assigned zero or one SPID, only one analog port can be used at one time. If your BRI line is assigned two SPIDs, both analog telephone ports can be used simultaneously.

Associating Directory Numbers with the Analog Telephone Ports

After you configure the router with the directory numbers, use the **set phone** command to associate one or more directory numbers with the analog telephone port(s) that you plan to use for voice calls. This enables the router to direct a voice call from the ISDN line to the correct analog port on the router.

Following is an example of the **set phone** command. In this example, a different directory number is associated with each of the router's two analog telephone ports:

```
766> set phone1 5551234
766> set phone2 5551235
```

Note The number(s) entered with this command must be a subset of the number(s) entered with the **set directory number** command in the preceding section, "Configuring Directory Numbers."

Confirming the Directory Number-Analog Telephone Port Association

Use the **show voicerouting** command to confirm that the directory numbers are correctly associated with the analog telephone ports.

The **show voicerouting** command displays the configuration for each analog telephone port, including data over voice (DOV), call waiting, voice priority mode, and directory number association.

For more information about the **show voicerouting** command, including example output, refer to the *Cisco 750 Series and Cisco 760 Series Command Reference* publication.

No Directory Number-Analog Telephone Port Association

If no directory numbers are associated with the analog telephone port(s), the analog telephone port operation is dependent on the number of SPIDs assigned to the BRI line.

Table 7-1 describes the different behaviors of the analog ports based on assigned SPIDs when no directory numbers are assigned to your ISDN line by the service provider.

Table 7-1 Analog Telephone Port Operation—No Directory Numbers Associated Associated

Analog Telephone Port Operation	No SPIDs or One SPID	Two SPIDs	Non-U.S. ¹
All incoming calls ring Phone 1 only.	2		
Phone 1 cannot call Phone 2.	Does not apply		
Two data calls are connected and voice priority is configured to <i>always</i> . If calls on the Phone 1 and Phone 2 ports are at the same time, only one data call will be disconnected.	Does not apply		

1. SPIDs are generally assigned only in the United States. This column applies to the behavior of the analog telephone ports outside the United States when no directory numbers are associated with the analog telephone ports.

2. A check indicates that the behavior applies for this configuration.

Data Over Voice Bearer Service

Note This section applies only to U.S. analog telephone services.

In some tariff areas, voice calls are less expensive than data calls. If this is the case in your tariff area, the Cisco 700 series routers support incoming and outgoing data over voice (DOV) calls. DOV calls are data calls made over the BRI line using Voice Bearer Capability (VBC).

The router recognizes the difference between a data call and a voice call. Incoming data calls are routed to the LAN over the Ethernet port. If a directory number has been configured for DOV, incoming data calls made with VBC are routed to the LAN over the Ethernet port. Figure 7-1 illustrates the process of a data call being routed to the LAN.

Incoming voice calls are forwarded to the analog device over the analog telephone port, as shown in Figure 7-2.



Figure 7-1 Data Call over VBC Line

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Note When the router is configured for DOV, ISDN BRI calls are made with VBC, which has a data rate of 56 kbps, instead of the usual ISDN BRI data rate of 64 kbps.

Incoming DOV Calls

Use the set phone command to configure the router to accept incoming DOV calls.

Note Before using the **set phone** command to configure DOV, you must set the directory number with the correct SPID, as described in the section "Configuring Directory Numbers," earlier in this chapter.

Following is an example of the **set phone** command. In this example, the analog telephone port with the directory number entered is configured to treat incoming calls as data calls:

766> set dov 5551234

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Note The set dov command is a part of the set phone command.

Any call received on the port that has been associated with this directory number will be treated as DOV and will be forwarded to the LAN. One or two directory numbers can be configured for DOV with the **set phone** command.

Outgoing DOV Calls

Use the **set speed** command with the **voice** keyword to configure the router to make outgoing DOV calls.

Following is an example of using the **set speed** command to configure outgoing calls to be made with VBC:

766> set speed voice

Automatic Data Call Disconnect

This section describes how to configure the router to automatically disconnect a data call. Use this configuration to receive or make voice calls when the router has two data calls in progress. You can also use this configuration to disconnect a data call under certain operating conditions.

Use the **set voicepriority** command to configure whether a data call will be disconnected when the router receives a voice call. Following is an example of the **set voicepriority mode** command:

766> set voicepriority conditional

The voice priority mode is dependent on several factors, including the following:

- The keyword entered with the set voicepriority command
- Whether one or two ISDN B channels have data calls in progress
- If two ISDN B channels have data calls in progress, whether the B channels are connected to the same destination or to two different destinations

For a complete description of how each of the preceding factors affects the voice priority mode, refer to the **set voicepriority** command in the *Cisco 750 Series and Cisco 760 Series Command Reference* publication.

Supplementary Services

This section describes how to configure the Cisco 765 and the Cisco 766 for supported supplementary services. These are the only two models that support supplementary services.

These services include the following:

- Call Waiting
- Call Holding and Call Retrieving

Note The Cisco 700 series routers do not support Open Service Intervals or Battery Reversals because these supplementary services could disable certain models of telephone answering machines.

Call Waiting

This section describes how to use call waiting.

If an incoming call is routed to an analog telephone interface that has a call in progress, a tone will be heard on the call in progress.

In this chapter, the term *on-hook* means to hang up the telephone.

To retrieve the new call, perform a short on-hook (quickly press the telephone receiver button, one time) to answer the new call and place the call in progress on hold. If your analog telephone offers the option, you can also press the **Flash** key to put the call on hold to answer the new call.

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You can toggle between calls on the same analog telephone interface by performing the short on-hook or by using the **Flash** key. After pushing the **Flash** key, you will hear a dial tone. In order to be connected to the call that has been placed on hold (without making a new call), return the receiver to the hook. When the telephone rings, pick up the receiver to be connected to the call on hold.

The number of calls supported on one analog telephone interface depends on the number of additional calls offerings (ACOs) supported by the BRI line. For more information on ACO, refer to the appendix "Provisioning the ISDN BRI Line for Cisco 700 Series Routers."

Disabling Call Waiting

Depending on the devices you have connected to the router's analog telephone ports, you might need to disable call waiting. The tone generated by the call waiting service interrupts data transfer when using an analog facsimile or modem connected to the router.

Use the **set callwaiting** command to disable call waiting for the analog port. Following is an example of the **set callwaiting** command:

766> set callwaiting interface phone1 off

Disabling Call Waiting on a Per-Call Basis

When making an outgoing voice call over one of the router's analog telephone ports, you might want to disable the call waiting feature on a per-call basis. This is done with the following dual tone multifrequency (DTMF) command:

**99#

After the voice call is completed, call waiting is automatically enabled again. You must re-enter the ****99**# command for each individual voice call.

Note DTMF commands are entered on the analog telephone device keypad. For more information on these commands, refer to the chapter "DTMF Commands" in the *Cisco* 750 *Series and Cisco* 760 *Series Command Reference* publication.

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Call Holding and Call Retrieving

This section describes how to place an analog voice call on hold and how to retrieve a call that has been placed on hold.

To place a call on hold, perform a short on-hook (quickly press the telephone receiver button one time). If your analog telephone device offers the option, you can also press the **Flash** key to put the call on hold. After you put the call on hold, a dial tone will sound on the line. You can make a second call on the same line.

To retrieve the call that has been placed on hold, perform the short on-hook or press the **Flash** key again.

Call Hold Notification

If you have a call on hold, and you hang up on a second call (instead of performing a short on-hook to transfer back to the first call), the telephone will ring indicating that a call is still on hold. Picking up the telephone receiver will connect you to the caller on hold.

Country-Specific Dialing Instructions

This section describes analog telephone dialing instructions for specific countries.

Dialing with INS ISDN Lines for Japan

Integrated Network Service (INS) ISDN lines are used in Japan. To make an analog telephone call from a telephone connected to the Cisco 700 series routers, take the following steps:

Step 1 On the telephone keypad, enter each individual number (called a dialing digit) of the telephone number.

Note You must enter each successive dialing digit within 6 seconds of entering the previous digit. If you wait longer than 6 seconds, an incomplete set of dialing digits will be sent to the switch.

- **Step 2** Send the entire set of dialing digits to the switch in one of the following ways:
 - Press the **pound** (#) key on the telephone keypad.
 - Wait 6 seconds without entering any dialing digits on the telephone keypad. After 6 seconds, the set of dialing digits will automatically be sent to the switch.

Disabling the Pound Key's End-of-Call Function

If the **pound** (#) key is used as one of the dialing digits for a specific telephone number, you can disable the key's end-of-call function on a per-call basis. This is done with the following dual-tone multifrequency (DTMF) command:

**98#

Note This command applies only to INS router software.

After entering the ****98**# command, wait for the dial tone and enter the dialing digits (including the **pound** (#) key). The call is sent 6 seconds after the last dialing digit is entered.

The **pound** key's end-of-call function is automatically enabled for the next call.

Internal Tones for NET3 and 1TR6 ISDN Lines for Europe

NET3 and 1TR6 ISDN lines are used throughout Europe. Depending on the ISDN service provider, certain internal tones, such as dial, ringback, and busy tones, might not be provided by the telephone switch. If this is the case with the ISDN line you are using, you can configure the Cisco 700 series routers to provide just the dial tone or all tones.

Use the **set internaltones** command to configure the router to provide just the dial tone or to provide all internal tones. The default setting is the router provides all internal tones.

Note This command applies only to NET3 router software and to 1TR6 router software.

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Country-Specific Dialing Instructions

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