



Preface

The Sweden country feature package supports the tone plan as stated in [Chapter 2, “Sweden Tone Plan.”](#)

Except where otherwise noted, this supplement describes the installation, configuration, operation and general functionality of the Sweden country feature package as used with the following Virtual Central Office (VCO) and Specialty Digital Switch (SDS) platforms:

- VCO/4K running system software V5.x FSR00 PUN00 or higher
- VCO/20 running system software V4.0 FSR00 PUN00* or higher
- VCO/80 running system software V3.3 FSR00 PUN00** or higher
- SDS-1000 running system software V3.3 FSR00 PUN00** or higher
- SDS-500 running system software V3.3 FSR00 PUN00** or higher

* The PUN number was included as part of the V4.x system software numbering scheme at V4.0 FSR02 PUN00.

** The PUN number was included as part of the V3.x system software numbering scheme at V3.3 FSR05 PUN00.



Note

Within any given country, there may be more than one tone plan in use by the various telecommunication service providers who operate privately and/or publicly within the country in question. Thoroughly review the tone plan listed in [Chapter 2, “Sweden Tone Plan,”](#) to verify that this is the country feature package that you ordered.

Audience

This document is intended for all personnel using the Sweden country feature package.

Document Organization

This document is organized as follows:

[Chapter 1, “System Requirements”](#) lists the system requirements for running the Sweden country feature package.

[Chapter 2, “Sweden Tone Plan”](#) describes the tone plan itself.

Documentation Conventions

This document uses the following conventions:



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Related Documentation

The *Cisco VCO/4K Sweden Supplement* provides important information about running the Sweden country feature package on the SDS VCO platforms. If a topic is discussed in both the SDS/VCO documentation set and this supplement, refer to the information in this document.

You should have a working knowledge of R2 signaling.

Network signaling requirements appear in the following specifications:

- International Telecommunications Union (ITU, formerly Comité Consultatif International Téléphonique et Télégraphique, CCITT) Q.421 Digital Line Signaling Code
- ITU Q.440 Interregister Signaling

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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Cisco Systems
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170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

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You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

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Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.



System Requirements

Installation and Configuration

This chapter lists system requirements for running the Sweden country feature package on SDS and VCO platforms operating with system software V3.3 through 5.x. These requirements are categorized by hardware, firmware, and software. For any site-specific concerns, contact Cisco as described in the preface.

The Sweden country feature package consists of the following components:

- Digital Tone Generator (DTG) card or DTG-2 card
- Call Progress Analyzer (CPA)
- Multi-frequency Compelled R2 (MFCR2) card
- Diskette for the CPA



Note

Service circuit cards must occupy only one resource group in the Resource Group Summary screen; further, different card types cannot share the same resource group. Use the CPA card if your system requires CPA service circuit functionality.

Hardware Requirements

Refer to the *Cisco VCO/4K Tone Plan Release Notes* for the A-law and Mu-law rules and timing rules governing the hardware configurations of cards with jumpers/DIPs, and the software configurations of cards without jumpers/DIPs.

Refer to the *Cisco VCO/4K Card Technical Descriptions* for each service circuit card and for each network card for jumper and DIP switch settings.

Firmware Requirements

Refer to the *Cisco VCO/4K Tone Plan Release Notes* for information regarding system firmware requirements particular to the Sweden country feature package.

Refer to your system release notes for step-by-step instructions to install firmware on either the DTG-2 mezzanine card or DTG card, and to install firmware on the MFCR2 card.

Software Requirements

Refer to the *Cisco VCO/4K Tone Plan Release Notes* for information regarding system software requirements particular to the Sweden country feature package.

Call Progress Analyzer Download File

Your country feature package includes a 3.5-inch diskette containing the cpa.dwn file. Copy the file to your system's C:/BOOT directory if you are using system software that is at least V5.0, but not greater than V5.1 FSR00 PUN23. Copy the file to your system's C:/BOOT directory if you are using system software V5.1 FSR00 PUN24, and higher.

Refer to the *Cisco VCO/4K System Administrator's Guide* for step-by-step instructions to copy the above file to your system's C:/BOOT directory.

**Note**

Always wear a wrist strap when installing software and handling system components.

The file is now loaded onto your hard disk. Complete the installation by loading the files from the hard disk to the cards. The method of loading depends on whether or not it is for a new installation, or for an existing installation. For new installations, refer to the [“Loading the Software onto Cards—New Installations” section on page 1-2](#); for existing installations, refer to the [“Loading the Software onto Cards—Existing Installations” section on page 1-3](#). Refer to the *Cisco VCO/4K System Administrator's Guide* as you complete this installation procedure.

Loading the Software onto Cards—New Installations

To load the cpa.dwn file from the hard disk to cards in a new installation, follow these steps:

Step 1 Access the Card Maintenance screen from the Maintenance Menu screen, and add the CPA (the console displays this choice as Call Progress Analyzer) to the database by using the A command, if you have not already done so.

Step 2 Insert the CPA into the appropriate slot. The card automatically runs internal diagnostics.

**Caution**

Do not unseat or otherwise disturb the card while running internal diagnostics.

The CPA LEDs display the transition from off (all LEDs unlighted) to on (the red and yellow unlighted and the green lighted).

Step 3 Activate the card using the C command from the Card Maintenance screen. The card takes the download. The service circuit spans are active, as can be seen from the Card Maintenance screen.

**Caution**

Do not unseat or otherwise disturb the card while it is downloading.

Step 4 Verify the received FRM225, FRM226, FRM241, and FRM242 messages in your log file to ensure that the card has taken the download.

Step 5 Create a resource group for the CPA service circuits.

You have completed the software installation.

Loading the Software onto Cards—Existing Installations

To load the cpa.dwn file from the hard disk to cards in an existing installation, follow these steps.



Caution

This process disrupts in-progress calls and removes service circuits from operation for a few minutes.

- Step 1** Access the Card Maintenance screen from the Maintenance Menu screen, and take the CPA card service circuits out of service (OOS), if you have not already done so.
- Step 2** Unseat the CPA card, wait 15 seconds, then insert the card into its slot.
- Step 3** Activate the CPA service circuits using the C command from the Card Maintenance screen.



Caution

Do not unseat or otherwise disturb the card while it is downloading.

- Step 4** Verify the following received download messages in your log file to ensure that the card has taken the download:
- FRM225
 - FRM226
 - FRM241
 - FRM242

You have completed the software installation.

Typical System Software Configurations

This section lists typical system software configurations used with the Sweden country feature package. For more information on how to use and configure the various system software screens and menus, refer to the *Cisco VCO/4K System Administrator's Guide*.

Database Administration

Special considerations pertain to the following Database Administration menus and screens.

Card Summary Menu

The Card Summary menu displays the status and port availability of E1, 4xE1, and ICC cards. To assign operating characteristics to E1 spans, access the Configuration screen for that card from the Card Summary menu.

**Note**

The term “E1 span” designates E1, 4xE1, and ICC cards with associated ICC-E1-I/O module.

Resource Group Summary Menu

You must define all CPA and MFCR2 service circuits in a single resource group in the Resource Group Summary menu and Resource Group Configuration screen. To optimize outgoing call system performance, group E1 span outgoing ports into one or more resource groups.

Inpulse Rule and Outpulse Rule Screen

Typical inpulse and outpulse rule tokens used to support R2 signaling are listed in Table 1-1.

Table 1-1 Typical Inpulse and Outpulse Rule Tokens Used to Support R2 Signaling

Inpulse Tokens		Outpulse Tokens	
REP NEXT	CLR CHAR1 [xx]	REP END	OP ANI
MFCR2	WINK ENAB	REP NEXT	OP MFCR2
DIGITS [xx]	IP ANI [xx]	OP FIELD [xx]	
END CHAR1 [xx]	IP FIELD [xx]	OP CAT [xx]	

For more information about these and other inpulse and outpulse rule tokens, refer to the *Cisco VCO/4K System Administrator's Guide*.

Answer Supervision Template Screen

Refer to the [“Tone Detection” section on page 2-2](#) for information on the answer supervision template function.

System Configuration

Special considerations pertain to the following System Configuration screen.

System Features Screen

The Enable MFCR2 Supervised Clear feature flag supports automatic call release on outgoing ports in response to backward MFCR2 supervision tones. When the Enable MFCR2 Supervised Clear feature flag is set to **Y**, an outgoing port is released when a B2, B4, A4, or C4 backward tone is detected during R2 signaling. The system performs disconnect processing appropriate to the port, and generates an Outgoing Port Change of State (\$DA) report that indicates a supervision error and specifies the backward tone. The \$DA report is discussed in the *Cisco VCO/4K Standard Programming Reference* and the *Cisco VCO/4K Extended Programming Reference*.

**Note**

This feature flag enables/disables automatic call release on a system-wide basis. When the feature is enabled (set to **Y**), any outgoing port receiving the backward tones specified above is automatically released. If the feature flag is disabled (set to **N**), the outgoing port remains in SETUP unless out-of-band supervision or a host command changes the port state.

Maintenance

Special considerations pertain to the following Maintenance screen.

Card Maintenance Screen

Use the Card Maintenance screen to add, delete, and change the card/port status for MFCR2 and CPA service circuits. When an E1 span is added to the Card Maintenance screen, its span type is set to CAS/R2 by default.

For E1 spans set to CAS/R2, ports 1 and 17 of the card's 32 ports are reserved. Port 1 (Channel 0) carries the frame alignment pattern, remote alarm indication bit, and national-use bits. Port 17 (Channel 16) carries the multiframe alignment pattern, extra bits, and channel-associated signaling bits.

For 4xE1 and ICC cards, set the span type to CCS/31B from the Card Summary menu in order to use port 17 as a bearer port. Use E1-31B firmware on single span E1 cards in order to use port 17 as a bearer port.

Diagnostics

Special considerations pertain to the following Diagnostics screens.

Card Display Screen

The Card Display screen lists the operating status of E1 spans. Information on the Card Display screen varies according to card type.

Port Display Screen

The Port Display screen lists the processing states, rule processing, links, paths, and digit collection activity of E1 spans.

Test Port Card Screen

The Test Port Card screen tests individual E1 channels. A path is set up between three elements—the selected E1 channel(s), MFCR2 circuits, and a Digital Tone Generator (DTG) channel. The system compares the signals sent with the signals received by the MFCR2 and reports discrepancies. You can test all channels on E1 spans with one command. You can select the E1-CAS card for port card diagnostic tests. The E1 span enters a local loopback mode during the test and sends out an all 1s (ones) pattern.

Test Service Circuit Screen

The Test Service Circuit function tests MFCR2 cards.

Host Commands and Reports

The host commands and reports are documented in the *Cisco VCO/4K Standard Programming Reference* and the *Cisco VCO/4K Extended Programming Reference*.



Sweden Tone Plan

This chapter details the modifications to the Digital Tone Generator (DTG or DTG-2) and Call Progress Analyzer (CPA) cards to support the following features:

- Supervision tones specific to the Sweden telephone network
- Additional tones used with the conferencing capabilities of the VCO

The information in this chapter supersedes the information in the following manuals:

- *Cisco VCO/4K System Administrator's Guide*
- *Cisco VCO/4K Standard Programming Reference*
- *Cisco VCO/4K Extended Programming Reference*
- *Cisco VCO/4K Supervision and Call Progress Tone Detection*

Tone Characteristics

Table 2-1 summarizes the characteristics of the most frequently used supervision tones in the Sweden network.

Table 2-1 Supervision Tones

Tone	Frequencies (Hz)	Amplitude (dBm)	Cadence
Dial	425	–10	Continuous
Ring	425	–10	1 sec on 5 sec off Repeated
Busy	425	–10	250 ms on 250 ms off Repeated
Reorder	425	–10	250 ms on 750 ms off Repeated

Table 2-1 *Supervision Tones (continued)*

Tone	Frequencies (Hz)	Amplitude (dBm)	Cadence
Special Dial	425	-10	320 ms on 40 ms off Repeated
SIT	950 1400 1800	-20	330 ms on 1.0 sec off Repeated
Recorder Warning	1400	-30	500 ms on 15 sec off Repeated
Operator Warning	1400	-30	100 ms on 1.5 sec off Repeated

Tone Detection

CPA processing is modified to support the Sweden network requirements. Use the system administration answer supervision templates function to control tone detection for the tones listed in Table 2-1. Supervision template processing is described in the *Cisco VCO/4K System Administrator's Guide*.

Answer Supervision Template Screen Terminology

The supervision events and tones listed in the Answer Supervision Template screen use standard North American network terminology. Table 2-2 shows the Answer Supervision Template screen terms to use with the Sweden country feature package.

Because the conference tones are used only in conference structures and are not transmitted or received over the network, no detection functions are required.

Table 2-2 *Answer Supervision Template Screen Terminology for Sweden*

Answer Supervision Template Event and Tone Name	Sweden Tone Name
Dial Tone	Dial
Ringback	Ringback
Busy	Busy
Reorder	Reorder
SIT Tones	SIT
Ring Cess. ¹	—
Voice Det. ¹	—
Voice Cess. ¹	—

Table 2-2 Answer Supervision Template Screen Terminology for Sweden (continued)

Answer Supervision Template Event and Tone Name	Sweden Tone Name
Wink ¹	—
Answer ¹	—
Time ¹	—
Hook Flash ¹	—
Pager Cue	—
ISUP Tone	—
ISUP Cess.	Fax

1. Not a tone.

Tone Generation

Tone generation is performed through DTG outpulse and static tone channels. The allocation of these tones is controlled via inpulse rules, Voice Path Control (\$66) commands, and DTMF Collection Control (\$67) commands.

The tone generation information affects the *Cisco VCO/4K Standard Programming Reference* and the *Cisco VCO/4K Extended Programming Reference*. It also supersedes the tone output level specifications found in the *Cisco VCO/4K Card Technical Descriptions*. For more information on generating tones, refer to the *Cisco VCO/4K System Administrator's Guide*.

The tones and their corresponding output levels, decimal values, hexadecimal values, and port addresses are summarized in Table 2-3.

Table 2-3 Tone Levels, Values, and Port Addresses

Tone	Amplitude/Output Level	Decimal Value	Hex Value	Port Address
Beep	—	0	00	None
Quiet (PCM idle pattern 01010100)	—	1	01	04C0
1 KHz Test Tone	0 dBm	2	02	04C1
Dial Tone 425 Hz	–10 dBm	3	03	04C2
380 Hz Digit Trip	–10 dBm	4	04	04C3
440 Hz	–13 dBm	5	05	04C4
480 Hz High Tone	–17 dBm	6	06	04C5
1400 Hz	–12 dBm	7	07	04C6
1000 Hz @max CODEC output	5.79 dBm	8	08	04C7
Reserved	—	9	09	04C8
404 Hz Test Tone	0 dBm	10	0A	04C9
Reserved	—	11	0B	04CA
2804 Hz Test Tone	0 dBm	12	0C	04CB

Table 2-3 Tone Levels, Values, and Port Addresses (continued)

Tone	Amplitude/Output Level	Decimal Value	Hex Value	Port Address
440+480 Hz Steady Ringback	–19 dBm/freq	13	0D	04CC
425 Hz + 400 Hz	–13 dBm/freq	14	0E	04CD
Digital Test Pattern	—	15	0F	04CE
425 Hz	–10 dBm	16	10	04CF
Ring 425 Hz	–10 dBm	17	11	04D0
Busy Tone 425 Hz	–10 dBm	17	11	04D1
Reorder Tone 425 Hz	–10 dBm	19	13	04D2
Reserved	—	20	14	04D3
Reserved	—	21	15	04D4
Reserved	—	22	16	04D5
Reserved	—	23	17	04D6
SIT	–20 dBm	24	18	04D7
Special Dial 425 Hz	–10 dBm	25	19	04D8
Reserved	—	26	1A	04D9
Recorder Warning 1400 Hz	–30 dBm	27	1B	04DA
Operator Warning 1400 Hz	–30 dBm	28	1C	04DB
Reserved	—	29	1D	04DC
Reserved	—	30	1E	04DD
Reserved	—	31	1F	04DE
Reserved	—	32	20	04DF
DTMF digit 0 (steady)	–10 and –9 dBm/freq	33	21	04E0
DTMF digit 1 (steady)	–10 and –9 dBm/freq	34	22	04E1
DTMF digit 2 (steady)	–10 and –9 dBm/freq	35	23	04E2
DTMF digit 3 (steady)	–10 and –9 dBm/freq	36	24	04E3
DTMF digit 4 (steady)	–10 and –9 dBm/freq	37	25	04E4
DTMF digit 5 (steady)	–10 and –9 dBm/freq	38	26	04E5
DTMF digit 6 (steady)	–10 and –9 dBm/freq	39	27	04E6
DTMF digit 7 (steady)	–10 and –9 dBm/freq	40	28	04E7
DTMF digit 8 (steady)	–10 and –9 dBm/freq	41	29	04E8
DTMF digit 9 (steady)	–10 and –9 dBm/freq	42	2A	04E9
DTMF digit A (steady)	–10 and –9 dBm/freq	43	2B	04EA
DTMF digit B (steady)	–10 and –9 dBm/freq	44	2C	04EB
DTMF digit C (steady)	–10 and –9 dBm/freq	45	2D	04EC
DTMF digit D (steady)	–10 and –9 dBm/freq	46	2E	04ED
DTMF digit * (steady)	–10 and –9 dBm/freq	47	2F	04EE

Table 2-3 Tone Levels, Values, and Port Addresses (continued)

Tone	Amplitude/Output Level	Decimal Value	Hex Value	Port Address
DTMF digit # (steady)	-10 and -9 dBm/freq	48	30	04EF
MF digit 0 (steady)	-7 dBm/freq	49	31	04F0
MF digit 1 (steady)	-7 dBm/freq	50	32	04F1
MF digit 2 (steady)	-7 dBm/freq	51	33	04F2
MF digit 3 (steady)	-7 dBm/freq	52	34	04F3
MF digit 4 (steady)	-7 dBm/freq	53	35	04F4
MF digit 5 (steady)	-7 dBm/freq	54	36	04F5
MF digit 6 (steady)	-7 dBm/freq	55	37	04F6
MF digit 7 (steady)	-7 dBm/freq	56	38	04F7
MF digit 7 (steady)	-7 dBm/freq	56	38	04F7
MF digit 8 (steady)	-7 dBm/freq	57	39	04F8
MF digit 9 (steady)	-7 dBm/freq	58	3A	04F9
MF digit KP (steady)	-7 dBm/freq	59	3B	04FA
MF digit ST (steady)	-7 dBm/freq	60	3C	04FB
MF digit ST3P	-7 dBm/freq	61	3D	04FC
MF digit STP	-7 dBm/freq	62	3E	04FD
MF digit ST2P	-7 dBm/freq	63	3F	04FE

