Preface

Objective

The Taiwan country feature package supports the tone plan as stated in Chapter 2, "Taiwan Tone Plan".

Except where otherwise noted, this supplement describes the installation, configuration, operation and general functionality of the Taiwan 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, "Taiwan Tone Plan" to verify that this is the country feature package that you ordered.

Audience

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

Document Organization

This document is organized as follows:

Chapter 1, "System Requirements" lists the system requirements for running the Taiwan country feature package.

Chapter 2, "Taiwan Tone Plan" details the modifications to the Digital Tone Generator (DTG or DTG-2) and Call Progress Analyzer (CPA) cards, and the SPC–CPA service cards.

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

Network signaling requirements appear in the following specifications:

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

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

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

*   http://www.cisco.com
*   http://www-china.cisco.com
*   http://www-europe.cisco.com

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships 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 as an annual subscription.

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  http://www.cisco.com/cgi-bin/order/order_root.pl

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To access Cisco.com, go to the following website:

http://www.cisco.com

Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

http://www.cisco.com/tac

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

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

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

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

Contacting TAC by Telephone

If you have a priority level 1(P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

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

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not recovered quickly. No workaround is available.

- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

System Requirements

Installation and Configuration

This chapter lists system requirements for running the Taiwan country feature package on SDS and VCO platforms operating with system V3.3 through V5.x. These requirements are categorized by hardware, firmware, and software. For site-specific concerns, contact Cisco Systems as described in the preface.

The Taiwan country feature package consists of the following components:

- Digital Tone Generator (DTG) card or DTG-2 card
- Call Progress Analyzer (CPA) or Service Platform (SPC) cards, software-configured for CPA (displayed as SPC-CPA)
- SPC card software-configured for DTMF (displayed as SPC-DTMF)
- Diskette for the CPA and SPC cards containing the download files

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 either the SPC or the CPA card (but not both) 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 Taiwan 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 the DTG card.

Software Requirements

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

System software V5.1 FSR00 PUN24, or higher, is required to operate the Taiwan SPC software on the SPC.

Call Progress Analyzer and Service Platform Card Downloads

Your country feature package contains a 3.5-inch diskette containing the POST-P24 directory. This directory contains Call Progress Analyzer (CPA) and Service Platform Card (SPC) download files. The POST-P24 directory contains the following files:

cpa.dwn
cpa.nor
cpa.spc
cpa.sit
cpa.ctg
dtmf.spc
mf.spc

Copy the POST-P24 directory contents to your system's C:/BOOT directory. You must be using system software V5.1 FSR00 PUN24, or higher, in conjunction with this directory.

In addition, if you are using system software V5.1 FSR00 PUN23 and lower, copy only the cpa.dwn file to the C:/BOOT directory.

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

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

The files are 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 files from the hard disk onto cards in a new installation, follow these steps:

Step 1   If you have not already done so, access the Card Maintenance screen from the Maintenance Menu screen, and use the A command to add the CPA (displayed as Call Progress Analyzer) or the SPC (displayed as either SPC-CPA or SPC-DTMF) to the database.

Step 2   Insert your card, either the CPA or the SPC, into the appropriate slot. The card automatically runs internal diagnostics. One of two results follow, dependent upon which card you have inserted.

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

- For the CPA, the three LEDs display the transition from off (all LEDs unlighted) to on (red and yellow unlighted, and the green lighted).

- For the SPC, the LED matrix display goes from off (all LEDs unlighted) to on. When on, the LED matrix display lights the letters S, P, and C, one at a time repeatedly, and the lower right LED of the matrix display changes from unlighted to lighted repeatedly.

Step 3   Use the C command from the Card Maintenance screen to activate the card. 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.

For the SPC, verify two additional messages in the log file: "Begin downloading spec file C:/boot/xxx.xxx" and "End downloading spec file C:/boot/xxx.xxx." The CPA does not have these, or any other, additional log file messages.

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

You have completed the software installation.

Loading the Software onto Cards—Existing Installations

To load files from the hard disk to cards on 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   If you have not already done so, access the Card Maintenance screen from the Maintenance Menu screen, and take either the CPA card or the SPC service circuits out of service (OOS).

If you have a CPA, unseat it, wait 15 seconds, and then insert the card into its slot.

Step 2   Use the C command from the Card Maintenance screen to activate the CPA or the various SPC service circuits.

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

Step 3   Verify received download messages in your log file to ensure that the card has taken the download. The messages you need to verify are dependent upon which card type you are using.

- For the CPA, verify the received FRM225, FRM226, FRM241, and FRM242 messages.

- For the SPC, verify the following two messages: "Begin downloading spec file C:/boot/xxx.xxx" and "End downloading spec file C:/boot/xxx.xxx."

✎
Note   The SPC does not take a redownloading of the spc.dwn file.

You have completed the software installation.

Typical System Software Configurations

This section lists typical system software configurations used with the Taiwan 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 consideration pertains 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 and 4xE1 cards, or ICC cards with associated ICC-E1-I/O module.

Resource Group Summary Menu

To optimize outgoing call system performance, group E1 span outgoing ports into one or more resource groups.

Inpulse Rule and Outpulse Rule Screen

For information about 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.

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 E1 spans. 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 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 and span 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), the Service Platform Card-Dual Tone Multifrequency (SPC-DTMF) card or DTMF Receiver Card (DRC), and a Digital Tone Generator (DTG) channel. The system compares the signals sent by the DRC with the signals received by the SPC-DTMF or DRC and reports discrepancies. You can test all channels on E1 spans with one command. You can select the E1 span 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 screen tests DRC and SPC-DTMF service circuits.

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*.

CHAPTER **2**

Taiwan Tone Plan

This chapter details the modifications to the Digital Tone Generator (DTG or DTG-2) and Call Progress Analyzer (CPA), and SPC-CPA service circuits to support the supervision tones specific to the Taiwan telephone network.

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 Taiwan network.

Table 2-1   Taiwan Digital Tone Generator Supervision Tones

Tone	Frequencies (Hz)	Amplitude (dBm)	Cadence	Detected by CPA?
Dial	350 + 440	–16	Continuous	Yes
Ringback	440 + 480	–22	1 second on, 2 seconds off, REPEATED	Yes
Busy	440 + 480	–27	0.5 seconds on, 0.5 seconds off, REPEATED	Yes
Fast Busy	440 + 480	–27	0.25 seconds on, 0.25 seconds off, REPEATED	Yes

Table 2-1   Taiwan Digital Tone Generator Supervision Tones (continued)

Tone	Frequencies (Hz)	Amplitude (dBm)	Cadence	Detected by CPA?
Call Wait A	440 + 480	–22	0.25 seconds on, 0.25 seconds off, 0.25 seconds on, 3.25 seconds off, REPEATED	No
Call Wait B	350 + 440	–16	0.25 seconds on, 0.25 seconds off, 0.25 seconds on, 3.25 seconds off, REPEATED	No

Tone Detection

CPA processing is modified to support the Taiwan 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 Taiwan country feature package.

Table 2-2   Answer Supervision Template Screen Terminology for Taiwan

Answer Supervision Template Event and Tone Names	Taiwan Tone Names
Dial	Dial
Ringback	Ringback
Busy	Busy
Reorder	Fast Busy
SIT Tones	Not Available
Ring Cess.[1]	Not Applicable
Voice Det.[1]	Not Applicable
Voice Cess.[1]	Not Applicable
Wink[1]	Not Applicable
Answer[1]	Not Applicable
Time[1]	Not Applicable
Hook Flash[1]	Not Applicable
Pager Cue	Not Available

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

Answer Supervision Template Event and Tone Names	Taiwan Tone Names
ISUP Tone	Not Applicable
ISUP Cess.[1]	Not Applicable

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, the Voice Path Control ($66) commands, and DTMF Collection Control ($67) commands.

Table 2-3 supersedes the tone generation table listed in 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	Output Level	Decimal Value	Hex Value	Port Addresses
Beep	—	0	00	None
Quiet (PCM idle pattern 01010100)	—	1	01	04C0
1 KHz	0 dBm	2	02	04C1
Dial	**–16 dBm**	**3**	**03**	**04C2**
380 Hz	–10 dBm	4	04	04C3
Beep (425 Hz)	–13 dBm	5	05	04C4
480 Hz	–17 dBm	6	06	04C5
1400 Hz	–10 dBm	7	07	04C6
1000 Hz @max CODEC output	—	8	08	04C7
920 Hz	–13 dBm	9	09	04C8
404 Hz	0 dBm	10	0A	04C9
1004 Hz	0 dBm	11	0B	04CA
2804 Hz	0 dBm	12	0C	04CB
Steady Ringback	–10 dBm	13	0D	04CC
1760 Hz	–10 dBm	14	0E	04CD
Digital Test Pattern	—	15	0F	04CE
425 Hz	–10 dBm	16	10	04CF
Ringback	**–22 dBm**	**17**	**11**	**04D0**

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

Tone	Output Level	Decimal Value	Hex Value	Port Addresses
Busy	**–27 dBm**	**18**	**12**	**04D1**
Fast Busy	**–27 dBm**	**19**	**13**	**04D2**
380 Hz	–10 dBm	20	14	04D3
Reserved	—	21	15	04D4
Call Wait A	**–22 dBm**	**22**	**16**	**04D5**
Call Wait B	**–16 dBm**	**23**	**17**	**04D6**
Reserved	—	24	18	04D7
Reserved	—	25 to 32	19 to 20	04D8 to 04DF
DTMF digit 0 (steady)	–9/–11 dBm/freq	33	21	04E0
DTMF digit 1 (steady)	–9/–11 dBm/freq	34	22	04E1
DTMF digit 2 (steady)	–9/–11 dBm/freq	35	23	04E2
DTMF digit 3 (steady)	–9/–11 dBm/freq	36	24	04E3
DTMF digit 4 (steady)	–9/–11 dBm/freq	37	25	04E4
DTMF digit 5 (steady)	–9/–11 dBm/freq	38	26	04E5
DTMF digit 6 (steady)	–9/–11 dBm/freq	39	27	04E6
DTMF digit 7 (steady)	–9/–11 dBm/freq	40	28	04E7
DTMF digit 8 (steady)	–9/–11 dBm/freq	41	29	04E8
DTMF digit 9 (steady)	–9/–11 dBm/freq	42	2A	04E9
DTMF digit A (steady)	–9/–11 dBm/freq	43	2B	04EA
DTMF digit B (steady)	–9/–11 dBm/freq	44	2C	04EB
DTMF digit C (steady)	–9/–11 dBm/freq	45	2D	04EC
DTMF digit D (steady)	–9/–11 dBm/freq	46	2E	04ED
DTMF digit * (steady)	–9/–11 dBm/freq	47	2F	04EE
DTMF digit # (steady)	–9/–11 dBm/freq	48	30	04EF
MF digit 0 (steady) (1300 + 1500 Hz)	–7 dBm/freq	49	31	04F0
MF digit 1 (steady) (700 + 900 Hz)	–7 dBm/freq	50	32	04F1
MF digit 2 (steady) (700 + 1100 Hz)	–7 dBm/freq	51	33	04F2
MF digit 3 (steady) (900 + 1100 Hz)	–7 dBm/freq	52	34	04F3
MF digit 4 (steady) (700 + 1300 Hz)	–7 dBm/freq	53	35	04F4
MF digit 5 (steady) (900 + 1300 Hz)	–7 dBm/freq	54	36	04F5

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

Tone	Output Level	Decimal Value	Hex Value	Port Addresses
MF digit 6 (steady) (1100 + 1300 Hz)	–7 dBm/freq	55	37	04F6
MF digit 7 (steady) (700 + 1500 Hz)	–7 dBm/freq	56	38	04F7
MF digit 8 (steady) (900 + 1500 Hz)	–7 dBm/freq	57	39	04F8
MF digit 9 (steady) (1100 + 1500 Hz)	–7 dBm/freq	58	3A	04F9
MF digit KP (steady) (1100 + 1700 Hz)	–7 dBm/freq	59	3B	04FA
MF digit ST (steady) (1500 + 1700 Hz)	–7 dBm/freq	60	3C	04FB
MF digit ST3P (700 + 1700 Hz)	–7 dBm/freq	61	3D	04FC
MF digit STP[1] (900 + 1700 Hz)	–7 dBm/freq	62	3E	04FD
MF digit ST2P (1300 + 1700 Hz)	–7 dBm/freq	63	3F	04FE

1. Taiwan network needs to use the MF digit STP at port address 04FD as its ST frequency code in order to obtain the tone frequency desired.

DTMF and MF Outpulsing

The Taiwan network's DTMF and MF outpulsing varies from standard outpulse timing and cadence.

DTMF pulses are transmitted at 10 digits per second, with the tone's cadence set to 50 milliseconds on, 50 milliseconds off. In addition, MF(R1) pulses are transmitted at 10 digits per second, with the tone's cadence set to 67 milliseconds on, 33 milliseconds off.

Tone Generation