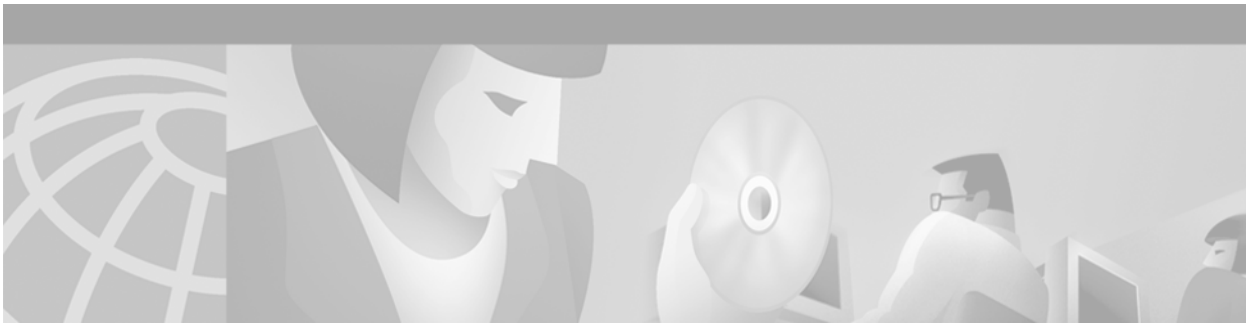

Preface

Objectives

The *Cisco VCO/4K Netherlands Supplement* is a comprehensive guide to operating the Netherlands tone plan in a Virtual Central Office (VCO) or Specialty Digital Switch (SDS) environment. This supplement helps you configure and use the Netherlands tone plan. It describes system requirements, system configuration, and the tone plan's components.

Audience

This supplement is intended for all personnel using the Netherlands country feature package.

Document Organization

This document is organized as follows:

Chapter 1, "System Administration Support," describes the installation and configuration of the tone plan.

Chapter 2, "ALS70D Signaling," provides additional details pertinent to ALS70D signaling required for the Netherlands tone plan.

Chapter 3, "Netherlands Tone Plan," includes tabular data and specifications for the Netherlands tone plan.

Chapter 4, "E1 ALS70D Signaling Examples," provides call flow examples that show how the VCO/4K supervision and signaling interoperates with the Netherlands tone plan.

Conventions

This document uses the following conventions:

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

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

Related Documentation

The *Cisco VCO/4K Netherlands Supplement* provides important information about running the Netherlands 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.

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-T Q.440 Interregister Signaling

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

CHAPTER 1

System Administration Support

This chapter lists special considerations for running the system software in the Netherlands. The following information supersedes the information in the *Cisco VCO/4K System Administrator's Guide*.

Database Administration

The following special considerations pertain to database administration:

- The database table functions on the Database Administration menu support the E1-CAS card.
- The system software software displays the TeleRouter Routing Table Summary, ISDN Supervision Templates, and ISDN Message Templates menu options regardless of whether the optional packages are installed. If you choose an option that is not installed, a message reports this fact.
- The Card Summary menu displays the status and port availability of the E1 cards. To assign operating characteristics to individual E1 cards, access the Trunk Card Configuration screen from the Card Summary menu.
- To optimize system performance, group E1 ports into one or more resource groups.

Wink Functionality

The ALS70D signaling states Send Number and Number Sent are implemented through the VCO/4K Wink functionality. The inpulse rule tokens WINK ENAB and WINK NOW, and the outpulse rule token WAIT SUP W, are used to support these states in ALS70D signaling.

Firmware and Software Requirements

ALS70D was developed for the Single Span E1-CAS interface card and requires the appropriate firmware. Table 1-1 and Table 1-2 list the firmware and software requirements that are specific to the Netherlands. For a list of hardware and firmware requirements that are common to all systems, refer to your system software release notes.

Table 1-1 V3.3 Netherlands—Software Requirements

Part Number	Option	Generic	File Name	Chk. Sum	Version
42008150133	Country Feature Package	3.3 FSR 01	CPA.DWN	316AD6	8.82

Table 1-2 V3.3 Netherlands Configurator—Firmware

Card Part No.	Card Type	FW Part #	FW Rev.	Chk. Sum	FW Vers.	Loc.	Description
50119080222	DTG	40020900033	OAR	F683	1.01	U2	DTG FW
		40020800033	OAR	87EF	1.00	U54	Tone Odd
			OAR	8452	1.00	U53	Tone Even
		60001700000	OCR	E3CC	LP87	U36	Map PROM 0
		60001800000	OCR	CCE8	LP88	U37	Map PROM 1
50156080222	DRC (8)	40006600000	0AR	C852	5.21	U2	DRC FW
50207080833	E1-CAS/ ALS70D	40020700033	OAR	151C	2.05	U23	E1-CAS ALS70D
		40014400024	0CR	1E78	1.04	U85	CAS PROC
		40012000000	0AR	CDDE	1.00	U113	32 Chan setup
		40012500000	0DR	11D2	1.02	U45/ U53	Gain/Law PROM

Maintenance

From the Card Maintenance menu, you can add, delete, and change the card/port status for E1 cards. When an E1 card is displayed, ports 1 and 17 of the card's 32 ports are deactivated. 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.

Note Special E1 cards are required to reactivate Port 17 for 31B support.

From the Master Timing Link Selection screen, you can select the system digital trunk timing source. Additionally, you can select the Rack, Level and Slot (R-L-S) hardware address of either a T1, ISDN or E1 card to provide incoming synchronization clocking. The T1 Synchronization Control ($C0 02) command provides the same functionality. All digital cards (regardless of type) synchronize to the same timing source.

Diagnostics

The Card Display and Port Display screens list the operating status of E1 cards; information on the Card Display screen varies according to card type. The Port Display screen lists the processing states, rule processing, links, paths, and digit collection activity of E1 cards.

The Test Port Card function tests individual E1 channels. The system compares the signals sent with the signals received and reports discrepancies. You can test all channels on an E1 card with one command.

You can select the E1 card for port card diagnostic tests. The E1 card enters a local loopback mode during the test and sends out a pattern consisting of all 1s (ones).

CHAPTER 2

ALS70D Signaling

This chapter describes the ALS70D outgoing and incoming call states and procedures under normal signaling conditions. Table 2-1 shows which features the ALS70D software supports.

Table 2-1 E1-ALS70D Features

Feature	Supported
DDI with tone detection	Yes
Dial-pulsing	No
Non-DDI calls	No

Incoming Call States

Table 2-2 provides PCM signaling information for incoming call states for the E1 card as it applies specifically to the Netherlands public switched telephone network.

Table 2-2 PCM Signaling Codes—Incoming

		Received Code ($a_f b_f$)			
Incoming Call State	**Sent Code ($a_b b_b$)**	**00**	**01**	**10**	**11**
Idle	10	Seizure Acknowledge	Fault	No Change	Blocked Out
Seizure Acknowledged	11	No Change	Fault	Clear Forward	Fault
Send Number	01	No Change	Fault	Clear Forward	Fault
Number Sent	11	No Change	Fault	Clear Forward	Fault
Answered	01	No Change	Fault	Clear Forward	Fault
Clear Forward	01 or 11	Fault	Fault	No Change	Fault
Clear Back	11	No Change	Fault	Clear Forward	Fault
Clear to Idle	10	Seizure Acknowledged	Fault	No Change	Blocked Out

Table 2-2 PCM Signaling Codes—Incoming (continued)

Incoming Call State	Sent Code ($a_b b_b$)	Received Code ($a_f b_f$)			
		00	01	10	11
Blocked In	11	Abnormal Seizure	Fault	No Change	Blocking Collision
Blocked to Idle	10	Seizure Acknowledge	Fault	No Change	Blocked Out

Outgoing Call States

Table 2-2 provides signaling information for outgoing call states for the E1 card as it applies specifically to the Netherlands public switched telephone network.

Table 2-3 PCM Signaling Codes—Outgoing

Outgoing Call State	Forward Signals		Backward Signals		Next State
	Send Code ($a_f b_f$)	Send Signal	Received Code ($a_b b_b$)	Received Signal	
Idle	10	Idle	10	Idle	NC
Seized	00	Seizure	10 11	Idle Seizure Acknowledged	NC Seizure Acknowledged
Seizure Acknowledge	00	Seizure	11	Seizure Acknowledged	Dial Tone: Send Number
Send Number	Not Supported	Seizure	11 01	Seizure Acknowledged Number Sent	NC[1] Number Sent
Number Sent	00	Seizure	00 pulse 01 11	Metering Number Sent Clear Back	Answered[2] Clear Back
Answered	00	Seizure	01 00 pulse 11	Number Sent Metering Clear Back	NC NC Clear Back
Clear Forward	10	Clear Forward	01 10	Number Sent Idle	NC Clear to Idle
Clear Back	00	Seizure	10 11	Clear Forward Clear Back	Clear Forward NC
Clear to Idle	10	Clear to Idle	10	Idle	Idle

1. Transition to Send Number state is controlled by dial tone detection.
2. Call completion is controlled by progress tone detection.

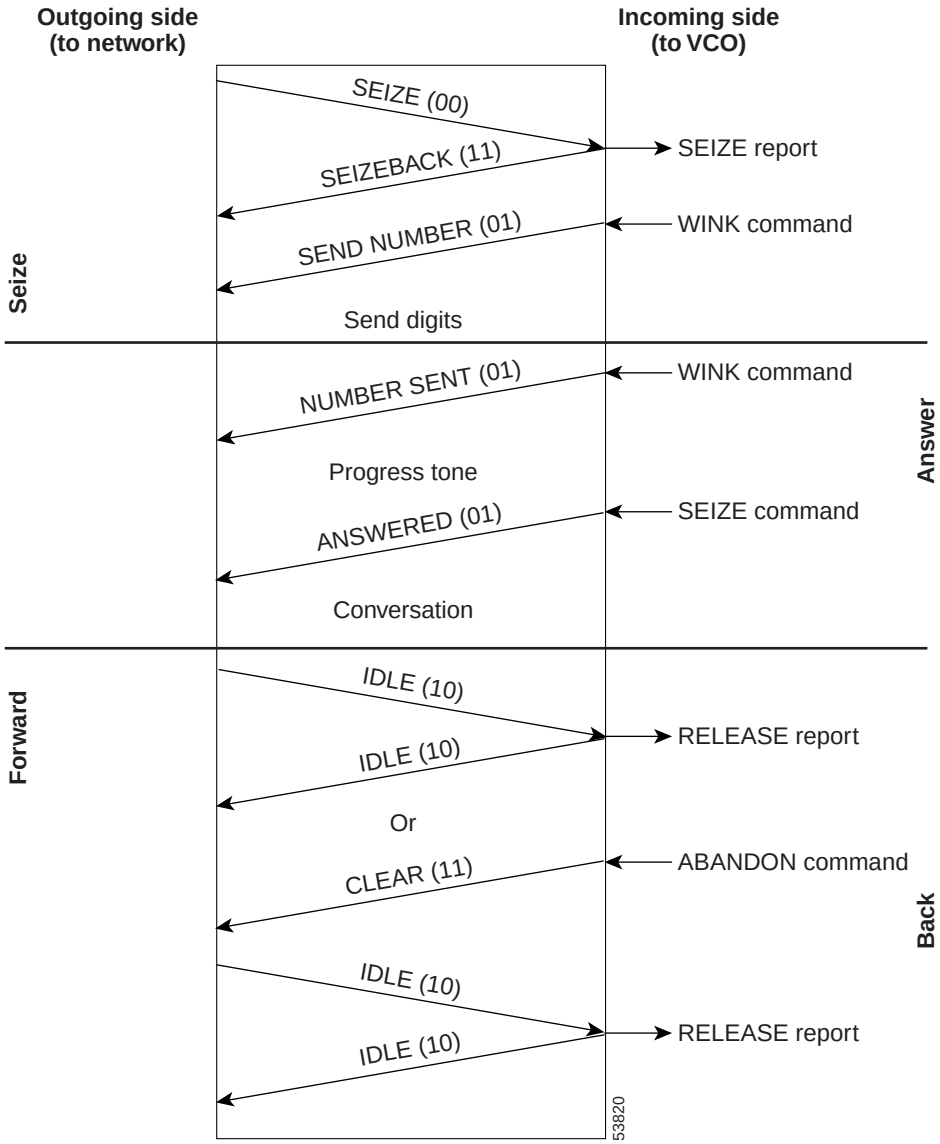
ALS70D Typical Conversation

Typical ALS70D conversations on the VCO are illustrated in the following two sections. Commands to the E1 card are generated either from rule processing or host commands. The terms “incoming” and “outgoing” are relative to the VCO. For example, incoming conversation means incoming to the VCO.

Incoming Conversation

Figure 2-1 shows a typical incoming conversation.

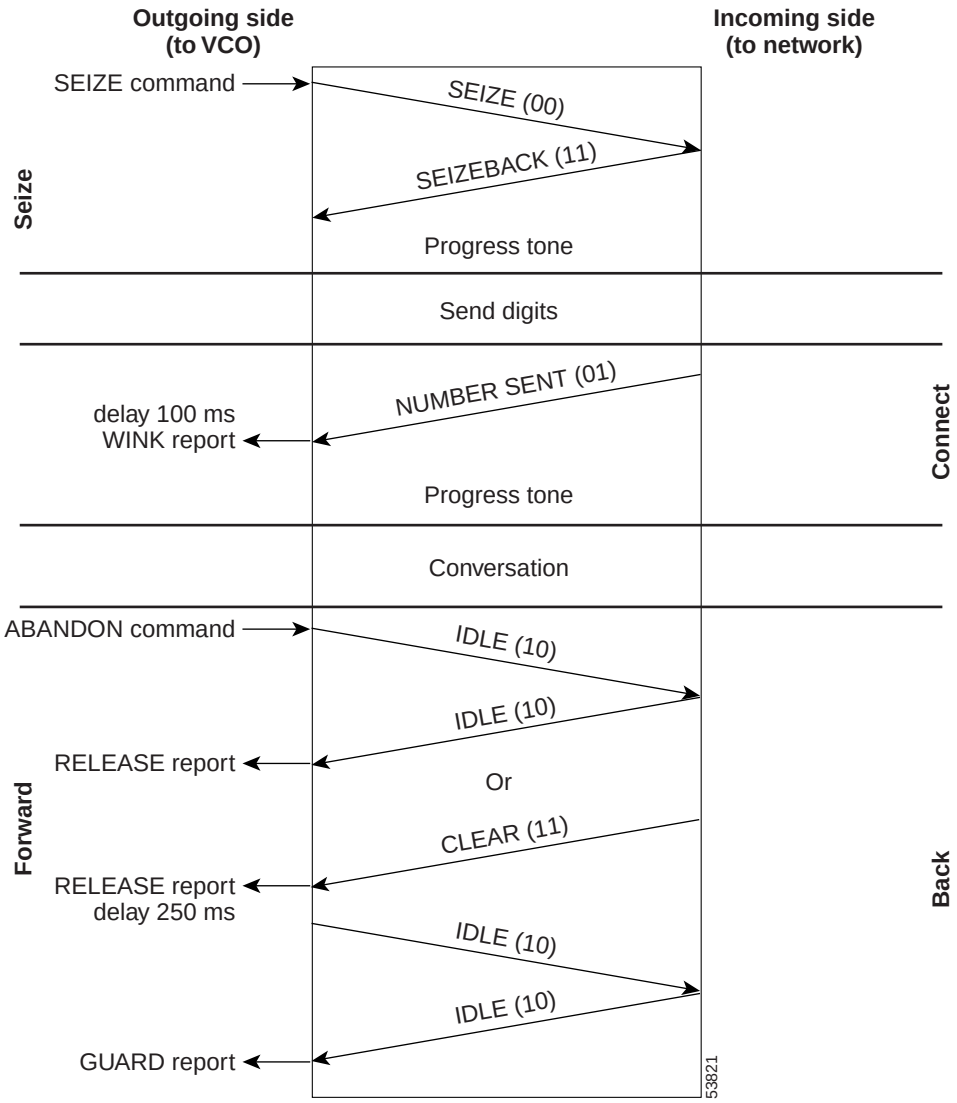
Figure 2-1 Typical Incoming Conversation—PTT Telecom ALS70D Protocol



Outgoing Conversation

Figure 2-2 show a typical outgoing conversation.

Figure 2-2 Typical Outgoing Conversation—PTT Telecom ALS70D Protocol



CHAPTER 3

Netherlands Tone Plan

This chapter describes the changes to the Digital Tone Generator (DTG) and Call Progress Analyzer (CPA) cards to support the supervision tones specific to the Netherlands public switched 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 Process Tone Detection*

Note Make certain that you have installed the proper DTG firmware and are running the correct version of the CPA download. Refer to Table 1-1 and Table 1-2 in Chapter 1, "System Administration Support" for this information.

Tone Characteristics

Table 3-1 lists the characteristics of the supervision tones used in the Netherlands network.

Table 3-1 Netherlands Supervision Tones

Tone	Frequencies (Hz)	Cadence
Dial Tone	425	Continuous
Ringing Tone	425	1 second on, 1 second off
Busy Tone	425	500 ms on, 500 ms off
Reorder Tone	425	250 ms on, 250 ms off
SIT[1]	425	75 ms on, 75 ms off, 33%
Pager Cue[1]	1600	Continuous

1. The CPA will detect the presence of SIT and Pager Cue but the DTG does not generate these tones.

Tone Detection

CPA processing was modified to support the Netherlands network requirements. Use the answer supervision templates function to control tone detection for busy tone, ringing tone, dial tone, reorder, SIT, and pager cue. Supervision template processing is described in the *Cisco VCO/4K System Administrator's Guide*.

Tone Generation

Tone generation is performed using DTG outpulse and static tone channels. Allocate these tones using 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 *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 about generating tones, refer to the *Cisco VCO/4K System Administrator's Guide.*

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

Table 3-2 Tone Levels, Values & 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 Tone (425 Hz)	**–10 dBm**	**3**	**03**	**04C2**
380 Hz	–10 dBm	4	04	04C3

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

Tone	Output Level	Decimal Value	Hex Value	Port Addresses
Beep (440 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
Ringing tone (425 Hz)	**–10 dBm**	**17**	**11**	**04D0**
Busy tone (425 Hz)	**–10 dBm**	**18**	**12**	**04D1**
Reorder Tone (425 Hz)	**–10 dBm**	**19**	**13**	**04D2**
Reserved	—	20 to 32	14 to 20	04D3 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)	–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

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

Tone	Output Level	Decimal Value	Hex Value	Port Addresses
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 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

CHAPTER 4

E1 ALS70D Signaling Examples

This chapter shows examples of E1 ALS70D signaling that use the following call control elements:

- Inpulse rules
- Outpulse rules
- Host commands and reports

Each example begins with a brief explanation of the call, followed by a graphic representation of the call flow. These diagrams illustrate system processing and information flow between the VCO and the host, and between the VCO and the connected equipment. The direction of the information flow is indicated by arrows under the message data.

Example #1—Incoming Call Using Inpulse Rules

Example #1 illustrates a simple DTMF digit collection process after an incoming seize on the SDS E1 ALS70D circuit at port address $00 A9. A default inpulse rule is executed to perform DTMF digit collection on this circuit.

The following actions are performed in this inpulse rule example:

- WINK ENAB changes the E1 to the Send Number state after the DTMF receiver port is enabled.
- DTMF digits are collected and stored in Field 1 and ANI.
- WINK NOW indicates that all digits have been received, and the call makes the transition to Number Sent state.
- TONE NOW places a progress tone (ringing tone) on the port for 10 seconds.
- The incoming call is answered.

This rule is shown below.

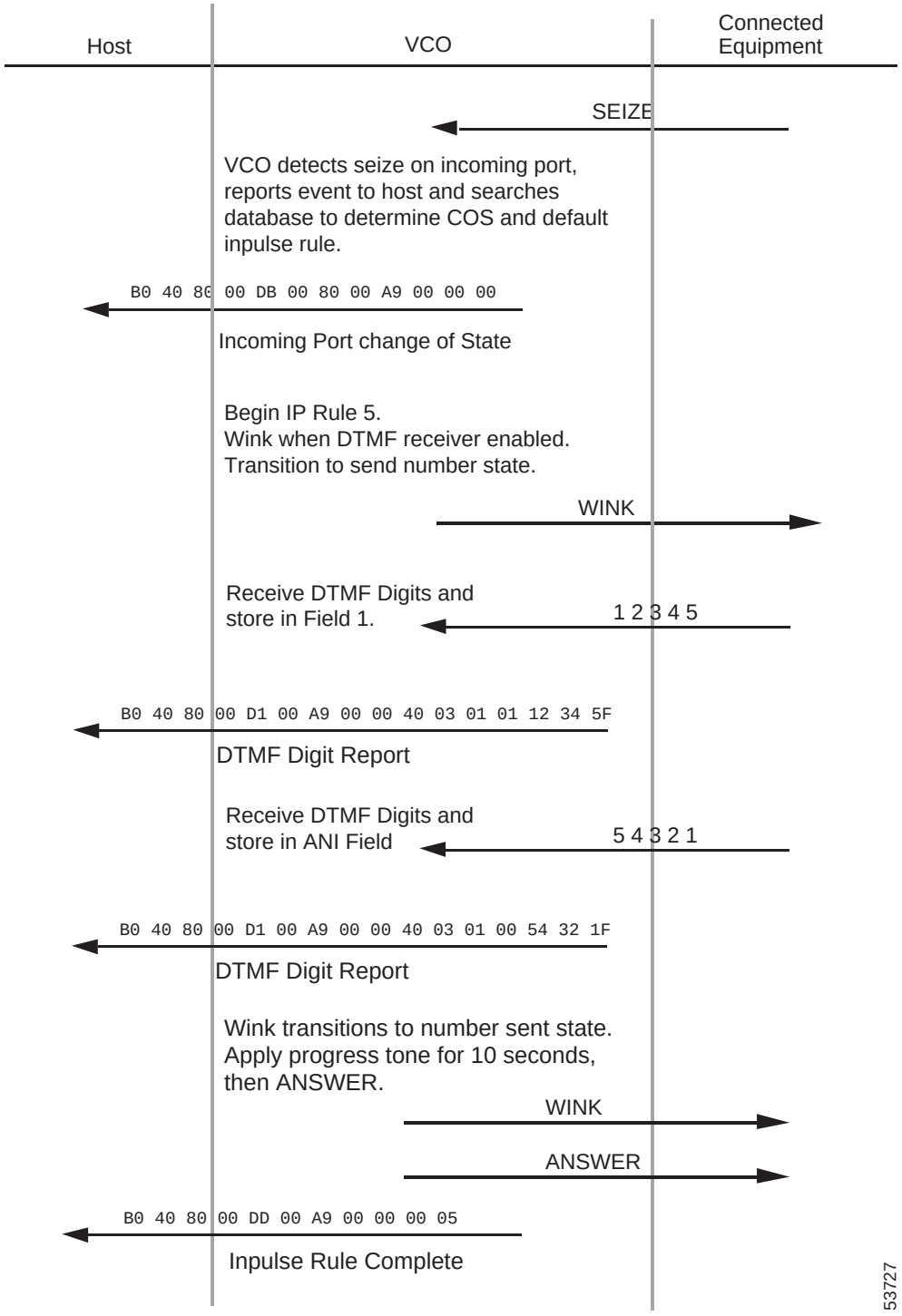
Inpulse Rule #5

- REP EACH
- DTMF
- WINK ENAB
- DIGITS 5
- IP FIELD 1
- IP ANI 5
- WINK NOW
- TONE NOW 17
- WAIT TIME 5
- WAIT TIME 5
- ANSWER

Refer to the *Cisco VCO/4K System Administrator's Guide* for more information about specific DTMF inpulse rule tokens.

Figure 4-1 shows the process flow for the incoming call in Example #1.

Figure 4-1 Process Flow for Example #1



Example #2—Outgoing Call Using Outpulse Rules

Example #2 describes DTMF digit outpulsing on an E1 circuit at port address $00 89. This process involves both host command and outpulse rule processing. The host initiates the outpulsing using the Outgoing Port Control ($69) command, and specifies the outpulse rule to execute. Refer to the *Cisco VCO/4K Standard Programming Reference* and the *Cisco VCO/4K Extended Programming Reference* for the command description.

The outpulse rule performs the following actions:

- Seizes out on the E1 trunk 1 using the Answer Supervision Template 1 to detect at port address $00 89 and waits for a dial tone executing the WAIT SUP 1.
- Once the dial tone is detected, which indicates a transition to a Send Number state, DTMF digits are outpulsed.
- After outpulsing is complete, a WAIT SUP W token is used to detect the transition to number sent state.
- The WAIT SUP 3 token uses Answer Supervision Template 3 to detect the progress tone (ringing tone).
- FINAL SUP A (Final Supervision) is Answer.

This rule is shown below.

Outpulse Rule #4

- REP END
- SEIZE
- OP DTMF
- WAIT SUP 1
- OP FIELD 1
- OP ANI
- WAIT SUP W
- WAIT SUP 3
- FINAL SUP A

Figure 4-2 shows the process flow for the outgoing call in Example #2.

Figure 4-2 Process Flow for Example #2