

Power, Configuration, and Testing

This chapter describes system initialization procedures from either the hard disk or a floppy disk.

Power-On Procedures

Power on refers to the process of supplying input power to the power subsystem.

**Caution**

Do not supply power to the system without first reading the procedures described in this section. Serious damage to the system components can result if the sequence of procedures is not carefully followed or is interrupted. Do not attempt to operate the VCO system until the system enclosure is mounted in a wall rack or installed and leveled.

Power-On Checklist

Use the following checklist before powering on the system. Verify that all items on the list are completed before turning on the power.

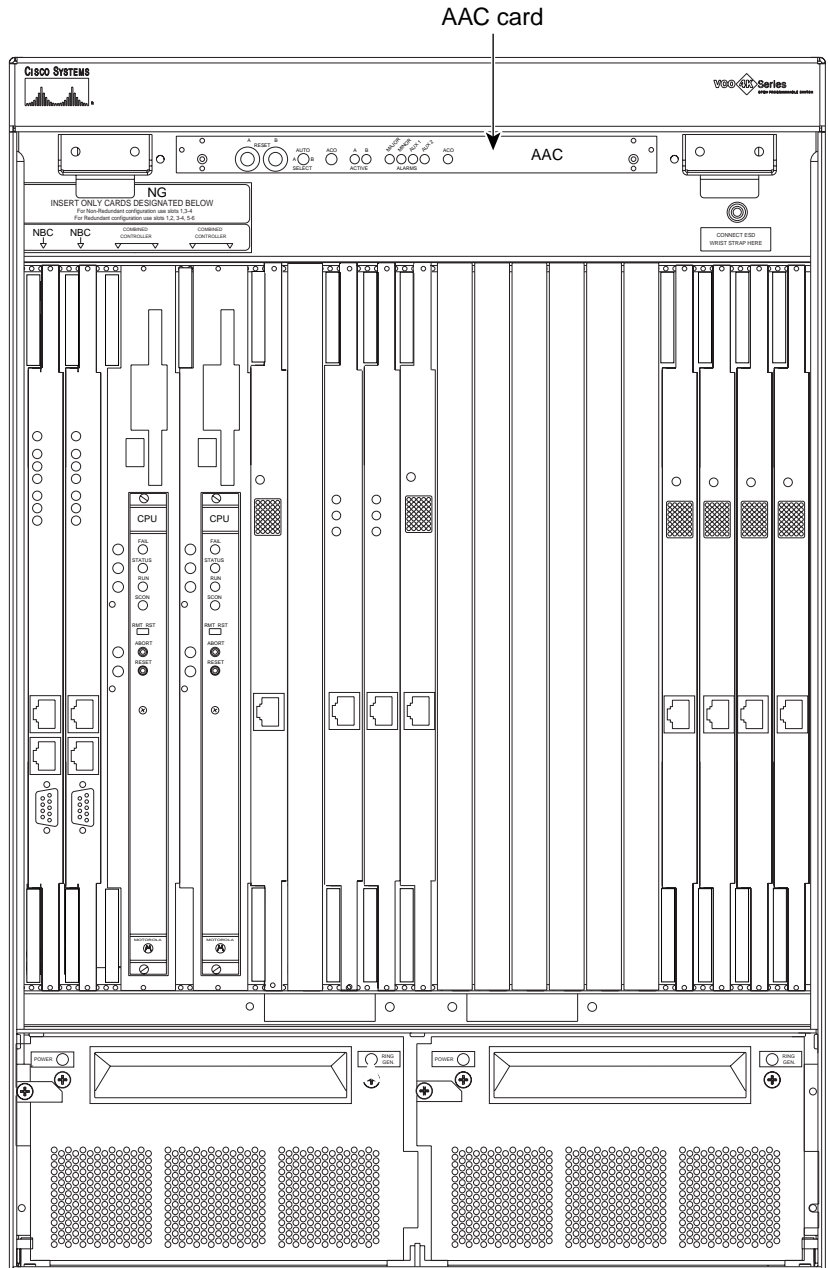
1. ___ Environmental control system in equipment room is activated and set for 24-hour operation if applicable.
2. ___ System is installed and secured as required.
3. ___ System is connected to isolated ground facility.
4. ___ -48 VDC output of DC power plant to VCO/4K measures between -48V and -53V (DC models only).
5. ___ Input connections are completed to power subsystem. System main breaker/switch is OFF.
6. ___ Power subsystem is connected.
7. ___ System console is connected to Storage/Control I/O Module and powered on.
8. ___ System printer is connected to Storage/Control I/O Module and powered on.
9. ___ Remote maintenance modem is connected to Storage/Control I/O Module and powered on.
10. ___ Data communications links between the VCO and host computer are completed.
11. ___ Host computer is powered on and initialized with communication and application software.

Alarm Arbiter Card Settings

The Alarm Arbiter Card (AAC) is located at the top of the system enclosure. It serves as a control point for system resets. Use the switches on the front panel to reset the system controller, and to select which system controller is to be the master controller (in redundant systems). Status LEDs show which system controller is currently active, in addition to alarm conditions and power supply failures.

Figure 3-1 shows the location of the AAC.

Figure 3-1 Alarm Arbiter Card Location



Before turning the power on, verify that the AAC switches are set as follows:

- AAC SELECT is set to AUTO (middle position)
 - AUTO — The AUTO setting works for both nonredundant and redundant systems as follows:
 - In a nonredundant system, AUTO always chooses side-A.
 - In a redundant system, AUTO chooses side-A as the default. If there is a problem with side-A, it switches to side-B.
 - A — Selecting A (side-A) has the same result in a redundant and a nonredundant system. Side-A is always active.
 - B — Selecting B (side-B) results in the following:
 - In a nonredundant system, the system does not initialize.
 - In a redundant system, side-B is activated.
- ALARM CUT OFF (ACO) enabled (left – ACO LED illuminated)

When the system is powered on, the LED for the Active system controller illuminates.



Note

If your VCO is equipped with Automatic Switching Units, moving the Select switch on the AAC from Side A to Side B after the system is powered on transfers control of the peripheral equipment from one Combined Controller card to the other.

System Power-On Procedures

To provide power to a VCO/4K system:

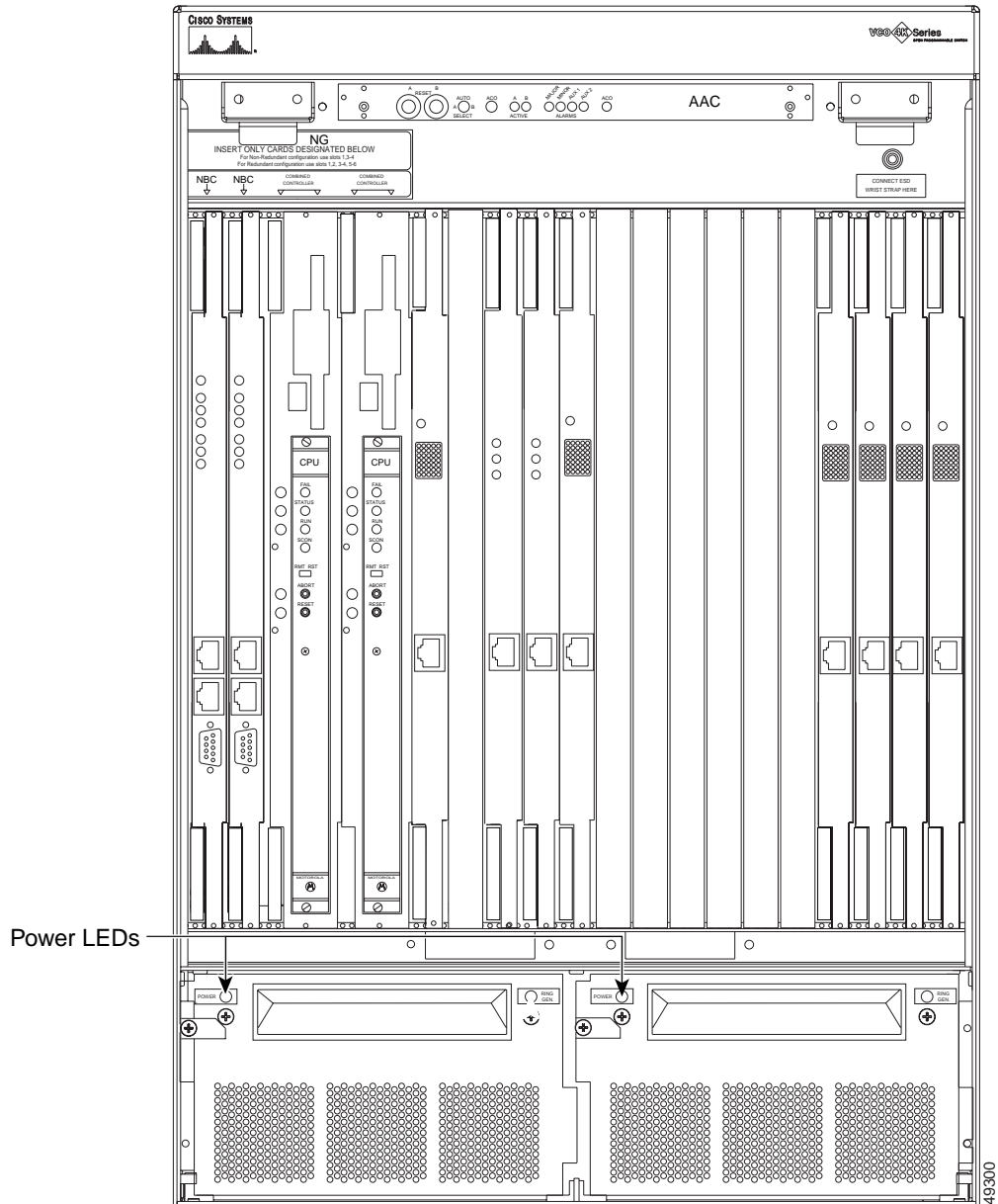
-
- Step 1** Turn off the main power switch (down).
The VCO's main power switch is in the rear of the VCO on the power entry module. Ensure that the power switch is down. See Figure 1-4 or Figure 1-5 to identify the main power switch.
 - Step 2** Connect or plug in the input power cable at the source.
 - Step 3** Turn the main power switch on (up position).
 - Step 4** Check the power LED on the power supply module. If you have a redundant system, check the power LEDs on each of the power supply modules. Refer to Figure 3-2 for the location of the power LED(s).
Ensure that the LED labeled **POWER** on each power supply module is illuminated green.



Note

If any of the power LEDs fail to illuminate, or if any LED illuminates red, turn the main power switch off and on.

Figure 3-2 Location of Power LEDs



Power LEDs

The power supply LEDs are on the left side of each power supply module, which are located on the bottom front of the VCO as shown in Figure 3-2.

- When there is no power to the power supply module, the LED is not illuminated.
- A green LED indicates that the operation is normal.

- A red LED warns that there are voltages in the power supply module that are over or under the requirements. (Refer to the *Cisco VCO/4K Mechanical Assemblies* or call Cisco Systems for support.)

Combined Controller and NBC3 Initialization

After the Combined Controller and the NBC3 are initialized and self-tests are completed, the active system controller always tries to initialize the system from the boot device specified by the File System Configuration utility (refer to the *Cisco VCO/4K System Administrator's Guide* for more information). In new systems, the hard disk drive is factory-specified as the boot device and the sequence of events automatically occurs (see the "System Initialization" section on page 3-5.)

If the system fails to initialize, a message on the master console requests a floppy disk in floppy drive A. For more information about booting from a floppy disk, refer to the *Cisco VCO/4K System Administrator's Guide*.



Note

The system console is configured after the initial power is supplied to the VCO/4K and the checks are complete. The default console configuration is 9600 baud, 8 bits/char, 1 stop bit and no parity. These defaults should enable you to view any messages displayed on the console during the initial power-on phase of the install.

System Initialization

When power is supplied to the system, the system firsts checks to determine if a floppy disk is inserted into the drive. If a disk is there, the system checks for the files necessary to boot the system from the floppy disk. If no disk is present or the boot files are not on the floppy, the system tries to read the boot files from the hard disk. If the boot files are on the hard drive, the system begins the tasks necessary for normal system operation.



Note

The hard disk(s) is initialized and the generic software is loaded at the factory. Although initializing the hard disk should not be necessary, you can reinitialize the hard disk using the Generic Installation floppy diskettes supplied with the system (refer to the *Cisco VCO/4K System Administrator's Guide* for more information).

LED States During System Initialization

The green hard disk drive access LED on the front of the combined controller blinks ON and OFF, indicating that files are being read.

The MAJOR alarm LED on the AAC remains illuminated during most of the initialization process. Interface and service circuit cards in the subracks illuminate all three LEDs on their front panels. As card self-tests are completed, the red and yellow (major, minor alarm) LEDs are extinguished, leaving the green LED on the AAC illuminated. The green LED on each subrack card is extinguished as each card is brought into active service.

Failure of a card self-test causes the red LED or a combination of LEDs to illuminate on its front panel, indicating a major alarm. The card does not attempt to bring itself back into active service. Refer to the *Cisco VCO/4K Card Technical Descriptions* for complete descriptions about LED states for each card type.

The three LEDs on NBC3 cards remain illuminated for a much longer period of time. Their All-LEDs-ON state lasts from system reset until all self-tests and program download sequences are complete. When the system is successfully booted, all the LEDs on the master NBC3 are extinguished. VCO/4K systems with redundant system control have two NBC3s and at least one DTG-2. The green LED on the Standby NBC3 and DTG-2 remain illuminated. Note that the DTG-2s are mezzanine cards attached to each respective NBC3 card.

For additional details about LED states and troubleshooting information, refer to the *Cisco VCO/4K System Maintenance Manual*.

The master console displays the System Login screen as the controller initialization process continues. However, full system initialization (including downloading of application software to various cards) is not complete until the following message appears on the system message line, in the lower left portion of the master console screen:

```
FRM001 PHASE 3 - SYSTEM INITIALIZATION COMPLETE
```

This information is also written to the system log files.

When all files are transferred to system memory from the hard disk, all LEDs on the port rack circuits cards are extinguished with the exception of standby (redundant) NBC3s and DTG-2s. The green LED on these cards remains illuminated to indicate the standby status.

For more information about LED patterns, refer to the *Cisco VCO/4K Card Technical Descriptions*.

If any of the circuit cards in the Port Subracks fail to activate during the initialization process, an error message identifying the Rack-Level-Slot address of the failed card appears in the bottom left corner of the master console display screen. You can trace card failure to a mismatch between the port subrack and the system database.

If the card fails the self-test, the red LED illuminates. If the card passed the self-test but is not brought into service by the NBC3, the green LED illuminates. The green LED remains illuminated for all cards that are set to Standby status (NBC3 and DTG-2).

Cisco VCO/4K System Messages defines other error messages that may appear. Corrective maintenance procedures appear in the *Cisco VCO/4K System Maintenance Manual*.

System Console Operating Parameters

This section reviews setup parameters for the following video display terminals (VDTs) used as Master Consoles in VCO/4K systems.

- VT220/320
- WYSE Technology WY-185
- WYSE Technology WY-185ES

Setting the Keyboard Type

To use the console, enter a password and access the screens to identify the type of keyboard to be used. To select the keyboard type, do the following:

-
- Step 1** At the Login screen, press CONTROL-K. The following message appears in the bottom right corner of the screen:
- ```
Keybrd: VT220 (V), Sun (S), Xview (X), Univ (U)
```
- Step 2** Press the appropriate letter (in parentheses) to select the keyboard type.
- 

## Entering a Password

After you establish the keyboard type, at the System Login screen type **admin** (all lowercase characters) in the Username field. Press the **Enter** key twice to bypass the Password field. The Main menu appears after initial power is supplied to the VCO. The system administrator should enter appropriate usernames, passwords, and access levels on the Password Configuration screen.

For more information about entering system passwords, refer to the *Cisco VCO/4K System Administrator's Guide*.

## Setting the System Console Parameters

System console operating parameters are defined in the system database through the Peripheral Configuration screen (refer to the *Cisco VCO/4K System Administrator's Guide* for more information). These operating parameters must match the setup parameters defined for the console. You can set the options, such as display type (normal/reverse video) and key click ON/OFF, to your preference.

This section reviews setup parameters for the following VDTs used as Master Consoles in VCO/4K systems.

Identify the console type and refer to the appropriate section to set up the operating parameters. The following will help you locate the appropriate section:

- VT220 (“VT220 Setup Parameters” section on page 3-8) VT320 (“VT320 Setup Parameters” section on page 3-9)
- WYSE Technology WY-185 (“WYSE Technology WY-185 and 185ES” section on page 3-10)
- WYSE Technology WY-185ES (“WYSE Technology WY-185 and 185ES” section on page 3-10)

Refer to the OEM instructions supplied with the VDT for entering and moving through the setup menus. Compare and, if necessary, change the information in the menu displays to correspond with the VCO requirements contained in the following sections.



### Note

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VDT communication setup parameters (Baud Rate, Stop Bits, Bits per Character and Parity) must match the values defined in the system database through the Peripheral Configuration screen. Refer to the *Cisco VCO/4K System Administrator's Guide* for more information.

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## VT220 Setup Parameters

To set up VT220 parameters, do the following:

- 
- Step 1** To enter the Set-Up Menus on most VT220 type terminals, press the **Set-Up** key (**F3**) on the keyboard.
- Step 2** The Set-Up Directory menu is displayed. Verify that the following parameters are displayed:
- ```
On Line
Set-Up English
North American Keyboard
```
- Commands available under this menu include: **Clear Display**, **Clear Comm**, **Reset Terminal**, **Recall**, **Save**, **Default** and **Exit**.
- Step 3** Select the Display Set-Up menu and verify that the following parameters are displayed:
- ```
80 Columns
Interpret Controls
No Auto Wrap
Jump Scroll
Light Text, Dark Screen
Cursor
Block Cursor Style
```
- Step 4** Select the General Set-Up menu and verify that the following parameters are displayed:
- ```
VT200 Mode, 7 Bit Controls (Default)
User Defined Keys Unlocked (Default)
User Feature Keys Unlocked (Default)
Numeric Keypad is the default. Change to Application Keypad.
Normal Cursor Keys is the default. Change to Application Cursor Keys.
No New Line (Default)
```
- Step 5** Select the Communications Set-Up menu and verify that the following parameters are displayed:
- ```
Transmit = 300, 1200, 2400, 4800, 9600 (Default) or 19200
Receive = Transmit (Default)
No XOFF, XOFF at 64
[7 or 8] Bits (8 = Default); [Odd, Even or No] Parity (No = Default); No Check or BLANK
(see note below)
[1 or 2] Stop Bit (see note below) (1 Stop = Default)
No Local Echo (Default)
EIA Port, Data Leads Only (Default)
Disconnect, 2 s Delay (Default)
Limited Transmit (Default)
```
- Step 6** Select the Keyboard Set-Up menu and verify that the following parameters are displayed:
- ```
Typewriter keys (Default)
Caps Lock (Default)
Auto Repeat (Default)
Key Click (User Option) (Default)
Margin Bell is the default. Change to No Margin Bell.
Warning Bell (Default)
Break (Default)
No Auto Answerback (Default)
Answerback= (blank) (Default)
Not Concealed (Default)
```


- Step 7** Select the Tab Set-Up menu and verify that the following parameters are displayed.
- ```
Clear All Tabs (Default)
Set 8 Column Tabs (Default)
```
- Step 8** Return to the Set-Up Directory menu and select the **Save** command. The **Done** message appears at the bottom of the display when the parameters are saved.
- Step 9** Press the **Set-Up** key on the keyboard to exit the terminal Set-Up mode.
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## VT320 Setup Parameters

To set up VT320 parameters, do the following:

- Step 1** To enter the Set-Up Menus on most VT320 type terminals, press the **Set-Up** key (**F3**) on the keyboard.
- Step 2** When the Set-Up Directory menu is displayed, verify that the following parameters are displayed:
- ```
On Line
```
- Commands available under this menu include: **Clear Display, Clear Comm, Reset Terminal, Recall, Save, Default** and **Exit**.
- Step 3** Select the Display Set-Up menu and verify that the following parameters are displayed:
- ```
80 Columns
Interpret Controls
No Auto Wrap
Jump Scroll
Light Text, Dark Screen
Cursor
Block Cursor Style
No Status Display
```
- Step 4** Select the General Set-Up menu and verify that the following parameters are displayed:
- ```
VT300 Mode, 7 Bit Controls
VT220 Terminal ID
User Defined Keys Unlocked
User Feature Keys Unlocked
Application Keypad
Application Cursor Keys
No New Line
UPSS DEC Supplemental
```
- Step 5** Select the Communications Set-Up menu and verify that the following parameters are displayed:
- ```
Transmit = 300, 1200, 2400, 4800, 9600 or 19200
Receive = Transmit
No XOFF
[7 or 8] Bits, [Odd, Even or No] Parity, No Check or BLANK
[1or 2] Stop Bit
No Local Echo
EIA Port, Data Leads Only
Disconnect, 2 s Delay
Limited Transmit
```

**Step 6** Select the Keyboard Set-Up menu and verify that the following parameters are displayed:

```
Caps Lock
Auto Repeat
Key Click (User Option)
Margin Bell
Warning Bell
Break
Compose
<x> DEL
" and . Keys
< > Key
' ~ Key
```

**Step 7** Select the Tab Set-Up menu and verify that the following parameters are displayed:

```
Clear All Tabs
Set 8 Column Tabs
Tab Fields and Ruler = Default
```

**Step 8** Return to the Set-Up Directory menu and select the **Save** command. The **Done** message appears at the bottom of the display when the parameters are saved.

**Step 9** Press the **Set-Up** key on the keyboard to exit the terminal Set-Up mode.

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## WYSE Technology WY-185 and 185ES

To setup the WY-185 and 185ES parameters, do the following:

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- Step 1** To enter the Set-Up menus on the WYSE terminals, press the **Set-Up** key (**F3**) on the keyboard.
  - Step 2** Press the right arrow key on the middle keypad to highlight the **Restore Defaults** field.
  - Step 3** Press the **Enter** key on the right keypad to restore the defaults.
  - Step 4** Press the **F11** key to enter the Kbd2 menus.
  - Step 5** The first field should be highlighted on that screen. Press the **Enter** key on the right keypad until Keypad=Application is displayed in the first field.
  - Step 6** Press the **F4** key to save and exit the Set-Up menus.
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## Setting the Clock/Calendar

To set the current date and time and date, use the Clock/Calendar Configuration utility on the System Configuration menu.

For more information about the Clock/Calendar Configuration utility, refer to the *Cisco VCO/4K System Administrator's Guide*.

# Configuring Peripheral Devices

This section explains how to configure the system printer and the remote maintenance modem.

## Configuring the System Printer

The end-of-line (EOL) terminator for the printer interface must be defined in the system database and match the printer setup configuration before using the printer. The EOL terminator is defined in the Peripheral Configuration screen.

Refer to the *Cisco VCO/4K System Administrator's Guide* for more information. Refer to the documentation supplied with the printer to configure the EOL terminator for the printer.

## Configuring the Remote Maintenance Modem

Define the modem operating parameters in the system database and match them with the modem operating parameters set in the modem. Modem operating parameters are defined in the Peripheral Configuration screen.

Refer to the *Cisco VCO/4K System Administrator's Guide* for more information on defining the parameters and the Peripheral Configuration screen. Refer to the documentation supplied with the printer to set the modem operating parameters.

## Synchronizing to a Timing Source

There are three options on the Maintenance menu's Master Timing Link Selection screen for choosing the timing source.

- **Internal**—Specifies clocking by the NBC3.
- **External**—Specifies clocking by external network synchronization.
- **Incoming**—Specifies clocking from an incoming digital stream.

If not using the default, internal, NBC3 timing source, use the following:

- **Incoming**—An incoming T1/E1 timing source.
- **External**—A central office composite clock (BITS, Building Integrated Timing Supply).

Refer to the *Cisco VCO/4K System Administrator's Guide* for more information.

## Using the Internal NBC3 Clock

The internal clocking source on the NBC3 is the default clocking source.

To change the clocking source from a External or Primary/Secondary source to the internal NBC3 clock, choose Internal from the Master Timing Link Selection screen.

Refer to the *Cisco VCO/4K Card Technical Descriptions* for more information on the NBC3 clock.

## Synchronizing to a T1 or E1 Timing Source

The VCO/4K systems support T1 synchronization timing source connections with the data stream on a selected port. The synchronization frequency must be 1.544 MHz, 75 Hz. You can select one span for the primary timing link and a different span for the secondary timing link. Use only digital ports (T1 or E1).

The conversion from the PCM waveform to logic level signals and from 2.048 MHz (E1) to 1.544 MHz is done on the port card.

Select the spans from the Master Timing Link Selection screen. Refer to the *Cisco VCO/4K System Administrator's Guide* for more information.

## Synchronizing to an External Composite Clock

The VCO/4K system supports synchronization timing source connections through a front panel jack on the Network Bus Controller 3 (NBC3) card. Connection to the external synchronization timing source must comply with the specifications in Table 3-1.

**Table 3-1 External Timing Synchronization**

| Specifications            | Value                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------|
| Synchronization Frequency | 64.0 kHz, 3.0 Hz                                                                                         |
| Signal Level              | Composite clock, 60% duty cycle<br>Zero, -0.5 to +0.5V<br>One, <-2.5 or > +2.5V                          |
| Signal Characteristics    | Rise/fall — 20 ns maximum<br>Optional 130-ohm termination in NBC3<br>Connector shield is floated at NBC3 |
| Mating Connector          | 9-pin, D-sub                                                                                             |

## Connecting to the Timing Source

The BITS clock connector on the faceplate of the NBC3 card is inaccessible in installations where the front door is installed on the chassis in compliance with EMI requirements. Full EMI compliance can be maintained with an available BITS Clock Cable Kit (one for each NBC3 card) that routes the BITS clock signals to a DB-9 connector on a rear faceplate.

Two external cable assemblies are required for systems equipped with redundant NBC3 cards. Cisco Systems does not provide mating cables or connectors.



### Note

If the NBC3 is the last connection in a routing of composite clock, insert the J3 jumper to provide a 130-ohm termination to the signal.

After connecting the external timing source, choose **External** from the Master Timing Link Selection screen. For more information about the Master Timing Link Selection screen, refer to the *Cisco VCO/4K System Administrator's Guide*.

## Reconnecting to the External Timing Source

If the external timing source is lost, the system uses its internal NBC3 timing source. When the external timing source is restored, manually reset the Master Timing Link selection to **External** if the external timing source is to be used again.

Refer to the *Cisco VCO/4K System Administrator's Guide* for more information.

## Creating the Initial System Database

When the VCO/4K is initially booted from the hard disk, generic software and database tables are loaded into system memory. The generic software includes system administration menus that enable system configuration. Some of the hardware configuration information is preloaded at the factory.

Using the system database, the system administrator defines the connection between system components and the telecommunication environment in which the VCO/4K operates.



### Caution

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In a redundant configuration, both system controllers must be booted from the hard disk before configuring the system.

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During system initialization, configuration data is loaded from the hard disk into RAM. The system controller refers to the database tables as it processes calls and monitors system performance.

When the system is booted from hard disk, any changes made to the database are simultaneously written to RAM and the hard disk and are immediately used to process calls.

Each system is shipped with software that includes generic operating and application software. Installation utilities format the hard disk and create blank lookup tables. The VCO/4K database contains two NBC3 cards and one DTG-2 card in its card table.

## Initializing Redundant System Controllers

In redundant system configurations, both controllers must be initialized from the hard disk before you enter configuration information into the system. To initialize redundant system controllers, follow these steps:

- 
- Step 1** Power on the system.
  - Step 2** Simultaneously press **Reset A** and **Reset B** on the AAC to boot both controllers from the hard disk. The VCO/4K automatically initiates file synchronization. Depending on the size of the database, this process can take up to 10 minutes. When the process is complete, the following messages are written to the log file. They also appear on the console.  

```
ACT File Sync Complete
STBY File Sync Complete
```
  - Step 3** You can now enter configuration information into the system database. Ensure that any changes you make are on the active system controller. For information about entering configuration information into the system database, refer to the *Cisco VCO/4K System Administrator's Guide*.



**Note** Portions of the VCO/4K system database are not redundant (automatically updated on the standby controller). Before operating the VCO/4K with the updated configuration, enter the configuration information on the standby controller for the following screens:

Host Configuration  
Peripheral Configuration  
File System Configuration  
System Trace Configuration

**Step 4** When all the configuration information is entered into the system database, back up the hard disk from the Disk Utilities menu. For more information about backing up the hard disk from the Disk Utilities menu, refer to the *Cisco VCO/4K System Administrator's Guide*.



**Note** If either controller fails to boot from the hard disk, press the **Reset** button on the AAC for the failed controller. If the controller still fails to boot after file synchronization completes, boot the failed controller from floppy disk. For more information about booting a controller from floppy disk, refer to the *Cisco VCO/4K System Administrator's Guide*.

## Host Communication Links

When you power on the VCO, configure and send test messages from the host computer through the communication links between the VCO and the host computer to verify the link is up and running. To configure these messages, define data communication operating parameters from the Host Configuration screen.

For information about defining data communication operating parameters from the Host Configuration screen, refer to the *Cisco VCO/4K System Administrator's Guide*.

Testing these messages requires that the host computer is operating with communication software and enabled I/O ports.



**Note** The host communication ports must match the interface requirements of the host computer and all configuration data must be entered before testing the host communication links.

Test host communication links by enabling the VCO/4K System Trace Configuration utility and echoing host messages back to the host terminal. This type of testing requires that the application and communications software be running on the host computer.

For information about enabling trace and message return facilities, refer to the *Cisco VCO/4K System Administrator's Guide*, *Cisco VCO/4K Standard Programming Reference*, and *Cisco VCO/4K Extended Programming Reference*. Enabling the trace facility causes host messages to be printed on the VCO/4K printer and/or trace files to be printed on the system hard disk. The message return facility loops any host messages back to the host computer.

If the trace and message return facilities fail to communicate with the VCO/4K, a protocol analyzer or other such device may need to be inserted in the communication link(s) to determine where the fault is occurring.

Typical communication link problems during system startup include:

- Incorrect configuration settings in either the host computer or VCO/4K.
- Incorrect pinout connections in the cabling used between the host computer and the VCO/4K.

To verify cabling and configuration settings, refer to the *Cisco VCO/4K Site Preparation Guide* and the *Cisco VCO/4K Ethernet Guide*.

