

## Preventive Maintenance Procedures

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A VCO/4K Open Programmable Switch requires a minimum of preventive maintenance. Peripheral equipment, such as a system console and printer, needs routine inspection, cleaning, and replacement of expendable parts.

Good preventive maintenance includes regular visual inspections of the system and daily reviews of traffic reports. Reviewing traffic reports helps identify faulty stations, lines, trunks, VCO/4K circuits, and VCO/4K subsystems, which may require corrective maintenance.

### General Exterior Cleaning

This section details the cleaning requirements for the exterior surfaces of the system cabinet and peripheral equipment. Routine cleaning of components is not a requirement.



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Observe antistatic precautions near VCO/4K circuit cards. Wear an ESD wrist strap connected to the VCO/4K equipment frame whenever servicing or cleaning circuit cards.

Never spray cleaning solution on the surfaces of any VCO/4K component. Overspray can penetrate into the device and promote electrical problems and corrosion.

Do not use a cleaning solution containing a solvent which might attack plastic components (such as circuit card handles, trim fittings, and PC boards) or dissolve panel labels.

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### System Cabinets

You can clean the front door of the cabinet and the front panels of circuit cards with window cleaner and a soft rag. Dampen a lint-free rag with the window cleaner and gently wipe the door to remove fingerprints, dust, and so on.



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Do not spray the window cleaner directly onto the door.

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## Video Display Terminal

Clean the CRT screen of the system console with a lint-free cloth and a cleaning solution recommended by the OEM supplier. Most CRT cleaning solutions are ammonia-based and formulated not to attack plastic housings.



**Caution**

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Do not spray cleaning solution directly onto the screen. Dampen the cloth and wipe away fingerprints and dust.

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Clean the VDT housing with a mild soap solution on a damp cloth. Do not soak the cloth with solution so that moisture drips onto, or lingers on, external surfaces.

Dust keyboards with a soft bristle brush, or vacuum them. Some keyboards have mechanical (not membrane) key-switches that can be sprayed with a fluorocarbon-based contact cleaner that removes dust and dirt, which can contribute to intermittent key contact.

Check the OEM manual supplied with the VDT for additional cleaning recommendations.

## Printer

Clean external surfaces of the printer with a mild soap solution on a damp cloth. Remove ribbon smudges with isopropyl (rubbing) alcohol. Vacuum the interior of the printer to remove loose bits of paper, hair, and dust.

## Modems

Clean external surfaces of modems with a mild soap solution on a damp cloth.

## System

Preventive maintenance of the VCO/4K system requires:

- Verifying free air flow around and through subracks and subsystems
- Cleaning air filters in the cabinet door
- Visually inspecting cables and connectors
- Backing up database files

The VCO/4K has a locking front door to prevent unauthorized modifications to circuit card arrangements and cable connections. Although the front door is removable, Cisco Systems recommends that you keep it on the system and locked for security measures.



**Caution**

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**The front door must remain on during system operation for NEBS EMI compliance.**

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In addition, you can protect the system console by using a password to restrict unauthorized changes to database files (refer to the *Cisco VCO/4K System Administrator's Guide* for more information).

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## Checking Air Flow

You should periodically check the Fan Fail LED on the fan unit. This LED lights up when one or more of the fans fails.

Periodically check the air filter and clean when necessary (see below). The frequency of cleaning depends on the environment.

## Cleaning Air Filters

The front door of the system cabinet is equipped with an air filter made of UL 94 HF-1 foam. This filter and its holder fit into channels on the inside of the door. Examine this filter periodically to check for a buildup of dirt and dust. Use a vacuum cleaner to clean this filter. Replacement filters are available.

If your door has a baffle (aluminum plate) attached to the filter assembly (see Figure 2-1), complete the following steps for cleaning the door filter:

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- Step 1** Remove the front door from your VCO/4K system as follows:
- Unlock the door (if necessary).
  - Lift up on the two latches at the top.
  - Lift the door up and out.
- Step 2** With the filter assembly still in place, vacuum the entire faceplate of your door *from the front only*.
- Step 3** Replace the front door on your VCO/4K system.

**Caution**

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The front door must remain on during system operation for NEBS compliance and air filtration.

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## Replacing the Air Filter Assembly

If your door has a baffle (aluminum plate) attached to the filter assembly (see Figure 2-1), complete the following steps for replacing the door filter:

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- Step 1** Remove the front door from your VCO/4K system as follows:
- Unlock the door.
  - Lift up on the two latches at the top.
  - Lift the door up and out.
- Step 2** Carefully push the two snap latches on the inside of the door assembly entirely up (refer to Figure 2-1).

**Caution**

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Watch your fingers when opening or closing snap latches. The latches are tightly spring loaded.

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- Step 3** Lift the filter assembly up and out, then set it aside.

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- Step 4** Grasp the new filter assembly by the sides with the baffle at the top and facing you (see arrows in Figure 2-1).
- Step 5** Set the bottom of the filter into the door's bottom brackets.
- Step 6** Push back on the top of the filter until it fits firmly into place.



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**Note** The filter assembly is keyed so it will only fit into the door's polarizing key when the baffle is facing up and out.

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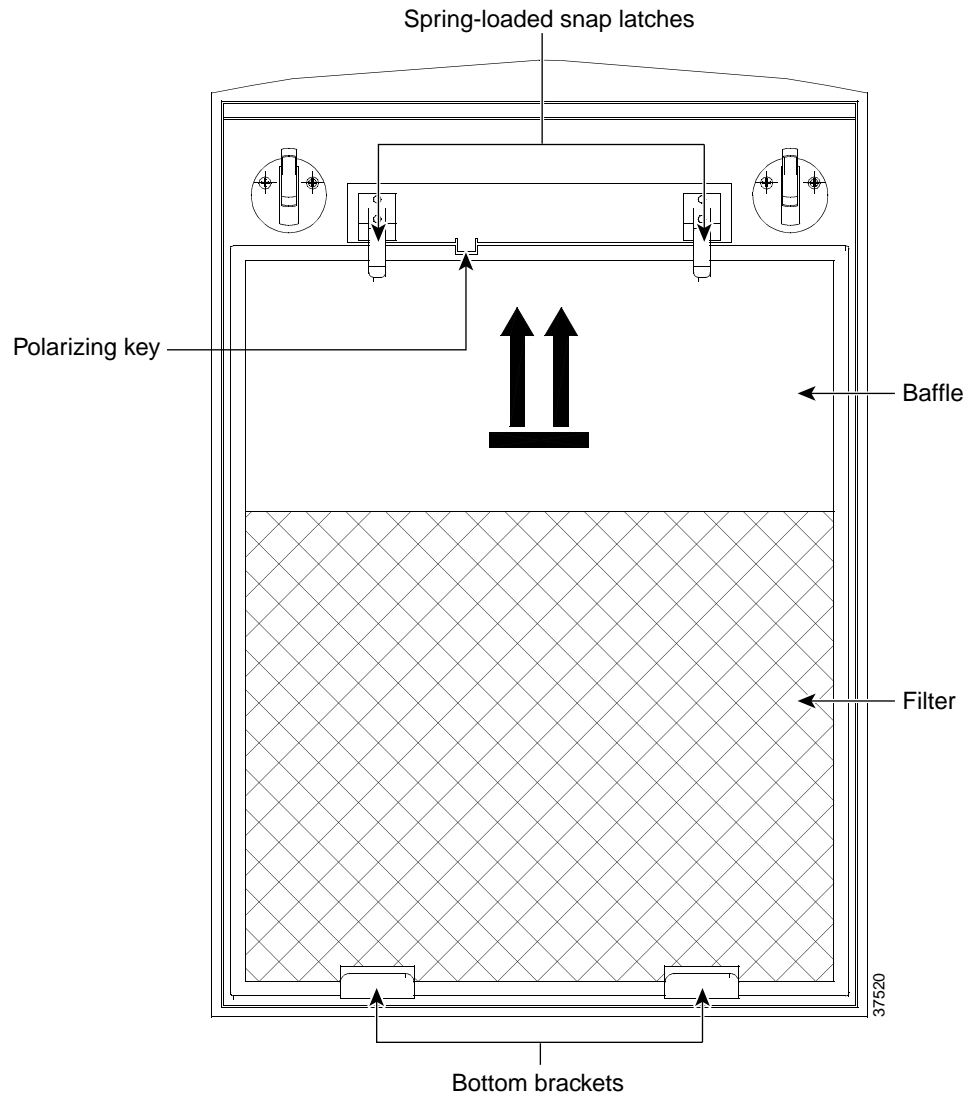
- Step 7** Carefully push the two snap latches on the inside assembly entirely down.
- Step 8** Replace the front door on your VCO/4K system.



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**Caution** The front door must remain on during system operation for NEBS compliance and air filtration.

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*(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Figure 2-1 Inside View of VCO/4K Door with Baffle*

## Inspecting Cables and Connectors

Inspect cables and connectors to and from VCO/4K system components periodically to see if they are worn out or loose. Check the cards, power subsystem, and peripheral equipment.

## Modules

*I/O Modules*—Check the connections on the I/O modules. Be sure they are secured to the midplane and have not been jarred loose or mechanically damaged.

*Storage/Control I/O Modules*—Examine the cable connections to the Storage/Control I/O modules. Check that the cables have not been pinched or jerked loose from peripheral equipment.

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## Power Subsystem

Examine the input connection to the power entry module. Check that the connection is tight and the cable has not been mechanically damaged. Verify input connections back to the external DC power plant, including the earth ground on the return side of the input loop. Earth ground connections should be checked from the VCO/4K to the earth ground.

Seven cables run from the power backplane to the system backplane, the fan unit, and the Alarm Interface Card (AIC):

- One power cable to the system backplane
- Two 5-volt cables to the system backplane
- Two 5-volt return cables to the system backplane
- One cable to the fan unit
- One 20-pin ribbon cable to the AIC

Checking these cables requires access to the back of the VCO/4K. Remove appropriate cards and blank panels to check the cable connections to the midplane, fan unit, and the AIC.

## Peripheral Equipment

Check the peripheral cables and connections to the system console, system printer, and modems. Look for signs of looseness or mechanical damage. Replace damaged cables immediately.

Check all input and output connections to controllers from automatic transfer switches, if you are using these switches. Also examine the cables between the transfer switches and the AAC for signs of looseness or mechanical damage. Replace a damaged cable immediately.

## Backing Up Database Files

You should regularly make backup copies of the system database to protect the system against accidental data loss. You can access disk utilities for database backup via the system administration Maintenance Menu. You can also find the utilities on the Installation Utilities diskette. Both utilities copy the system database onto a formatted High Density (HD) 3.5-inch floppy disk.

Use the Database Store function on the Disk Utilities menu (located under the Maintenance Menu) to back up the database on a live system during off-peak call processing hours. Refer to the *Cisco VCO/4K System Administrator's Guide* for complete instructions on backing up data files.

Do not confuse loading software with regular maintenance, for example, database backup. When you load software, use the backup functions provided by the Installation Utilities diskette.

## Peripheral Equipment

This section describes general preventive maintenance for VDTs, printers, and modems. Refer to the OEM manuals supplied with the equipment for specific information on preventive maintenance.

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## Video Display Terminal

A VDT requires little or no preventive maintenance other than routine cleaning of the CRT screen and keyboard. Visual inspection of the EIA cable and keyboard and VDT connections will help spot potential problems caused by damaged cabling.

Self-tests performed on power-up of the terminal indicate the readiness of the VDT for operation. Failure to complete the self-test indicates a need for corrective maintenance.

## System Printer

System printers consume ribbons and paper during normal operation. Inspect ribbons for signs of wear and replace as necessary. Replacement ribbons are available from computer supply stores and OEM suppliers. Refer to the OEM manual for ribbon replacement procedures.

Replace paper as necessary. Refer to the OEM manual for details on feeding the paper and setting top of form.

Continuous printer use tends to wear the platen. Platen cleaners are available from computer supply stores. The cleaners restore the rubber surface and help prevent paper slippage. Replace a severely worn platen.



Note

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Running the printer without a ribbon and/or paper speeds up the wear on the platen.

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Moving printer components may require cleaning and lubrication. Components requiring inspection and cleaning or replacement include: home position and out-of-ribbon sensors, print heads and ribbon guides. Refer to the OEM manual for recommended procedures and intervals for cleaning, replacement, and lubrication.

## Diagnostics Menu

VCO/4K system software includes a Diagnostics Menu with options for isolating problems and selectively checking the status of individual cards in the system. Details on using the features supported under the Diagnostics Menu are contained in Chapter 3, “Corrective Maintenance” and the *Cisco VCO/4K System Administrator's Guide*.

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