



## NBC-3 BITS Clock Cable Kit Installation

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Use these instructions to add the BITS (Building Integrated Timing Supply) Clock Cable Kit to a VCO/4K or VCO/20 chassis.

The NBC-3 BITS Clock Cable Kit makes it possible for you to connect a BITS clock (external clock) cable to the system without having to operate the system with the front door removed. In previous designs, the BITS clock input receptacle, located on the face plate of the NBC-3 card, was inaccessible in installations where the front door was installed on the chassis. Operating the system with the front door closed is required with VCO/4K systems in order to comply with EMI requirements.

### Before You Start



Caution

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The following procedures are intended for VCO-qualified technicians only.

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### Estimated System Downtime

The system must be shut down during the installation, and will be out of service for 15 to 30 minutes. This installation procedure should be performed during off peak hours to minimize service disruption.

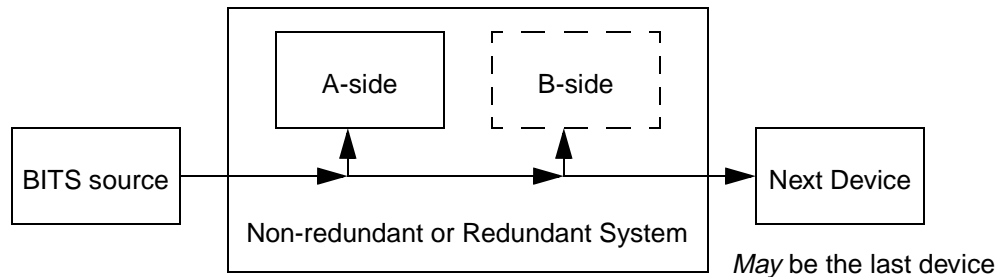
### Determine the BITS Clock System Configuration at Your Site

Verify with your system engineer which of the following BITS configurations (A or B) has been implemented at your site and make a note of that configuration. This will be important later, when you will be instructed to set a jumper on the NBC-3 card.



If your site has been configured as shown below, it is in Configuration A.

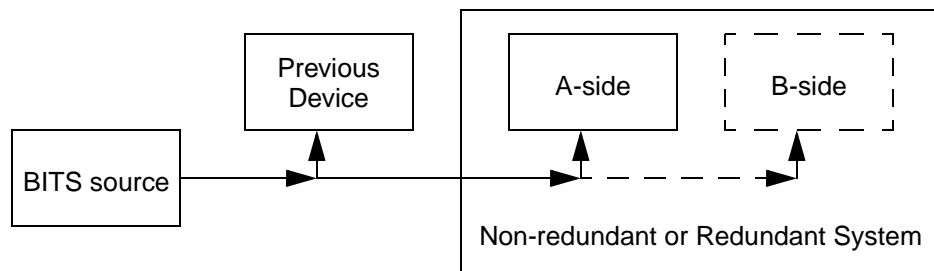
**Figure 1 Configuration A**



Neither A- nor B-side are the last device

If your site has been configured as shown below, it is in Configuration B.

**Figure 2 Configuration B**



The A- or B-side is the last device

## Kit Contents

The NBC-3 BITS Clock Cable Kit includes the following components:



**Note**

Non-redundant systems require one kit. Redundant systems require two kits.

- These instructions.
- NBC-3 Clock I/O Panel, 1-ea. - that you install at the rear of the chassis. (This I/O panel will replace the existing blank panel.)
- Clock Cable assembly consisting of two components joined by a small in-line connector:
  - a cable section that connects to the front of the NBC-3 card, 1-ea.
  - a cable section that becomes permanently connected to a rear connector panel, 1-ea.
- Jumper for NBC3 card, 1-ea.- to be used if your BITS clock system is configured as in Figure 2, Configuration B.

## Required Tools

In order to install the VCO BITS Clock Cable Kit(s) you will need the following tools:

- 1/4-inch bladed screwdriver - to remove and re-install rear blank panels and I/O cards.
- 1/8-inch bladed screwdriver - to attach the cable to the front of the NBC-3 card.
- #1 Phillips-head screwdriver - to remove and replace card retainer bars located on the front of the chassis.

(If you have a VCO/20 system, or a VCO/4K with Serial Number less than MHT03400016, the #1 Phillips-head screwdriver must have a 10-inch blade and a magnetized head.)

- 3/16-inch hex driver - to attach the connector on the short cable to the rear panel.
- ESD ground strap with banana plug (at least 2 m., 6 ft., long to allow free movement).
- Standard 16" x 18" anti-static bags, 16-ea. min. – to store circuit cards and I/O modules while performing this procedure.
- Cable labels, 1/2" H x 3/4" L writing-area and 2" in overall length, 6-ea. min. – if you are retrofitting a redundant system.



### Note

If your system is configured for “clear channel” operation (SS7 and ISDN NFAS applications), you will also need a protocol analyzer.

## Required Additional Documents

- *VCO/4K Card Technical Descriptions* – NBC3 card
- *VCO/4K System Administrator's Guide*
- *VCO/4K Integrated SS7 System Supplement* (if you have an SS7 subsystem)

## Connector Pinouts

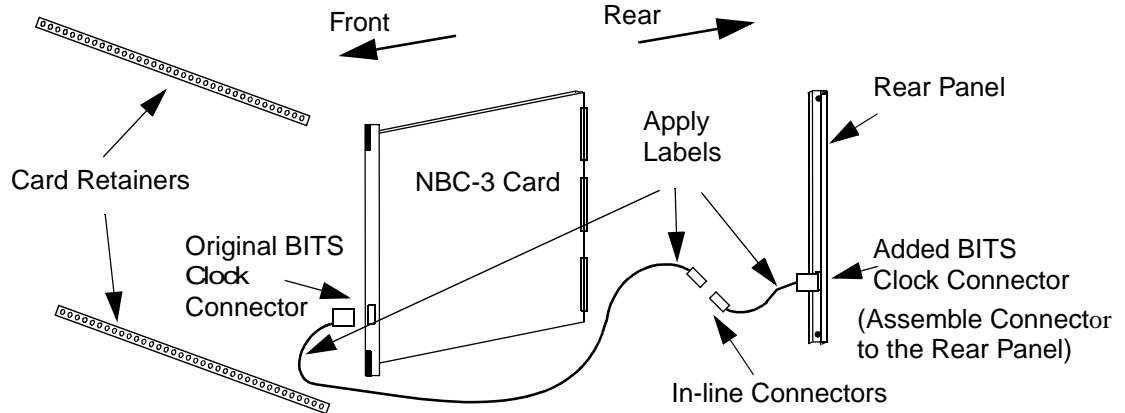
The pinouts for the connector on the rear panel are the same as the pinouts on the NBC-3 card. If you already had a cable connected to the NBC-3 card, you can still use this cable (connected to the rear panel) after this cable kit has been installed. See the *NBC-3 Technical Description* for details.

## Installation

### Kit Preparation

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- Step 1** Label each of the cable assemblies in three places as shown in Figure 3 using the supplied labels. Then separate the two sections of the BITS Clock cable. Label the cables with a “1” for slot 1 and a “2” for slot 2.
- Step 2** For each cable installation, use the hex driver to assemble the connector on the short cable onto the rear panel with the hex standoffs. See Figure 3.

Figure 3 Exploded Installation Kit



## Shutting Down Your System

### System Redundancy Check and AAC Selector Switch

#### Redundant Systems

Before powering down a redundant system, ensure that the AAC card selector switch is in the AUTO (default) position and that there are no ALM08x Update Channel Failure alarms as seen from the SYSTEM ALARMS/Minor or Major screen (log in to both the ACT side and the SBY side to verify this). (Upon restoring power, the A side will come into the active state and the B side will come up as standby.)

In the unlikely event that there is an ALM08x Update Channel Failure alarm present on the system, then manually select the side that is currently active. Manual selection is made at the AAC card with the selector switch. (Upon restoring power the selected side will come into the active state and the other side will come up as standby.)

#### Non-redundant Systems

Before powering down a non-redundant system, ensure that the AAC card selector switch is in the A (default) position, not in the AUTO or B position. A non-redundant system has no cards installed in slots 2, 5, or 6 (i.e. there is no B side). These slots will have only the required blank panels.

## System Shut Down

Gracefully prevent new traffic from entering your system.

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- Step 1** Place all VCO/4K interface spans to Maintenance state from the System Administration Maintenance Menu – Card Maintenance. Use the Diagnostic Card Display screen, “On(0) / Off(1) Hook” field, or protocol analyzer to monitor the span until all voice traffic ceases. Once all voice traffic ceases, transition the state of each interface span to “Out-of-Service.” Next, transition all service circuit cards to “Out-of-Service.” Do NOT transition the state of the NBC3 or DTG-2 cards.



**Note** Refer to the *VCO/4K System Administrator's Guide* for detailed information on system administration.

The “On(0) / Off(1) Hook” field does not function with interface spans configured as “clear channel (used in SS7 and ISDN NFAS applications) so you must use a protocol analyzer for these systems.

Also, if there are calls on any given interface span, the system will give you no warning prompt if you transition that span to “Out-of-Service.”

For information on the “no warning prompt” issue see issue CSCdp23008 online at [www.cisco.com/tac](http://www.cisco.com/tac), Bug Toolkit. Note that viewing this (or any other issue) requires login access. If you do not have this access, send E-mail to [cco-team@cisco.com](mailto:cco-team@cisco.com).

- Step 2** Wait for all call traffic to cease.
- Step 3** If you have a hosted system, shut down and power off your system host.
- Step 4** If you also have an SS7 subsystem, first shut down the cktint, (or sept), and EBS stack using the stop-ss7.sh command. Then power it off (Refer to your *Integrated SS7 System Supplement* for detailed instructions).
- Step 5** Power off your VCO system from the black circuit breaker at the rear of the chassis.

## Card, Blank Panel, and I/O Removal



**Caution** Observe local, regional, and national safety codes, as well as your company's safety rules and regulations.

- Step 1** Remove the front door of your system and set it aside.
- Step 2** Verify proper cable labeling so that the cards and any associated cables are re-installed into their original positions. Cards and cables will be removed during the installation of the cable kit.



**Caution** If your existing system arrived with blank card assemblies (blank faceplate and blank metal blade) installed, these assemblies must be replaced in the same locations on your replacement chassis, unless you replace them with a functional system card. These blank card assemblies are carefully configured to compartmentalize the system and are critical to maintaining NEBS GR-63-CORE compliance.



**Caution** Make certain you are properly ESD grounded. Use a wrist strap, attached to the ground connector located in the front, inside of the chassis. The ground connector can be identified by the label: **CONNECT ESD WRIST STRAP HERE**.

- Step 3** If your system has circuit card retainer bars, use a #1 Phillips-head screwdriver to remove the mounting screws/washers. Remove the bars and keep them and the screws together in a safe place for replacement later.

- Step 4** To allow access for the cable installation, remove the cards and panels in slots 1 through 6 from the front of your system. This is the NBC-3 card(s), the Combined Controller card(s), and any blank panels. Place the cards in anti-static bags.




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**Note** Refer to the *VCO/4K Card Technical Descriptions* for detailed instructions on card removal and replacement.

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- Step 5** If your system is configured as in Figure 1, Configuration A, verify that no jumpers are installed on the NBC-s card(s). This is jumper JP3 on your Rev. E0AR or higher NBC-3 card or Jumper JP7 on your Rev. C0GR or higher NBC-3 card. This default setting is appropriate for both of your NBC-3 cards (side A and side B) since neither one of the sides is the ‘last device’ on the BITS clock daisy-chain cable.

- Step 6** If your system is configured as in Figure 2, Configuration B, verify that you have installed Jumper JP3 on your Rev. E0AR or higher NBC-3 card or Jumper JP7 on your Rev. C0GR or higher NBC-3 card. This ‘closed’ (jumpered) option is required since the card (A-side if non-redundant, B-side if redundant) is the ‘last device’ on the BITS clock daisy-chain cable.

In redundant systems the Jumper JP3 (or JP7) on the A-side NBC-3 must be set to ‘open’ (un-jumpered), the default setting, since it is not the ‘last device’ on the BITS clock cable.

- Step 7** From the rear of your system, disconnect all cables connected to I/O modules in slots 1 through 10 and remove any I/O modules and blank panels that are installed in slots 1 through 10. Place the I/O modules in anti-static bags.
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## Install BITS Cables and Rear BITS Connector Panel

- Step 1** From the front of the system thread the small connector end of the longer cable section under the card cage along the left side of the chassis and through the 1/4 in. gap between the chassis wall and the midplane. Do this for each NBC-3 card.




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**Note** If you have a VCO/20 system, or a VCO/4K with Serial Number less than MHT03400016, you must first remove the blank plate at the center of chassis below the midplane. See Figure 5. Use the 10-inch, #1 Phillips-head screwdriver to access the plate mounting screws from the rear of the chassis.

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See Figure 4 for installation in a VCO/4K chassis (with Serial Number MHT03400016 and higher)

See Figure 5 for installation in a VCO/20 chassis (and VCO/4K chassis with Serial Number less than MHT03400016).

**Figure 4** Long Cable Section Installation (VCO/4K with Serial Number MHT03400016 and Higher)



**Figure 5** Long Cable Section Installation (VCO/20 and VCO/4K with Serial Number less than MHT03400016)



- Step 2** Reinstall the NBC-3 card(s) and attach the cables as shown in Figure 5.
- Step 3** From the rear of the system, connect the long and short cable sections together at the small, in-line connectors. Start with the card and rear panel in slot 1.



**Note** In redundant systems be sure that you do not cross-connect the NBC-3 cards and the rear panels. Check the labels.

- Step 4** Install the rear connector panel. Note the routing of the cable(s).  
 See Figure 6 for installation in a VCO/4K chassis (with Serial Number MHT03400016 and higher).  
 See Figure 7 for installation in a VCO/20 chassis (and VCO/4K chassis. with Serial Number less than MHT03400016).

**Figure 6** *Rear Chassis Cable Routing (VCO/4K with Serial Number MHT03400016 and Higher)*



**Figure 7** *Rear Chassis Cable Routing (VCO/20 and VCO/4K with Serial Number less than MHT03400016)*





- Step 5** At the front of the system ensure that the cable is properly positioned to allow a service loop at the front side of the NBC-3 Card so that the connector can be removed easily to allow card replacement. See Figure 8.

**Figure 8** Service Loop at the NBC-3 Card



**Caution** Make certain you are still properly ESD grounded.

- Step 6** Replace all the cards removed at the beginning of the procedure.
- Step 7** Re-cable the I/O connections that were removed.
- Step 8** Reinstall all blank panels and the front card retainer brackets. (You will be left with the blank rear panel(s) that the NBC-3 Clock I/O panel(s) replaced.)
- Step 9** Reinstall the front door.

## Restore Your System

- Step 1** Power up your VCO and SS7 systems.  
All the cards in the system will return to service automatically after they have received their download.
- Step 2** Ensure that call traffic resumes properly.

## Verify System operation with the New Hardware

Continue to use incoming timing and verify that your system behaves normally with the addition of the changes you made.

Connect the external BITS clock site cable(s) to the new BITS connector on the new rear panel(s). From the MASTER TIMING LINK SELECTION screen, select “External” rather than “Incoming.” Verify that your system continues to behave normally when running on BITS clock (external) timing.

