

# 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

## Installing and Auto Discovering a Digital Line Card)

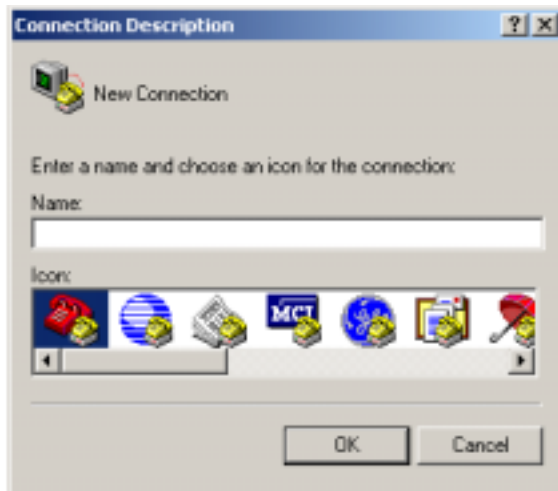
( Standard T1 Applications Only, Non PRI)  
3C10116 Board  
3C10116B Board ( R2.6 code or higher )

### Requirements:

1. 3Com recommends and ONLY supports a CSU installed in T1 applications. Your CSU MUST be Connected and working at this time !
2. Hyper-Terminal or similar terminal emulation software et , al VT 100
3. A straight through DB 9 Male to Female cable.
4. A network connection for your laptop that has been tested and working allowing you to connect to netset
5. A loop back plug for the T1 board .

### Preparing to install Digital Line Card:

1. Make sure that you have a HyperTerminal or similar terminal emulation software set up and ready. You will need to create a new connection, when running Hyper-Terminal you will be prompted with the following screen:



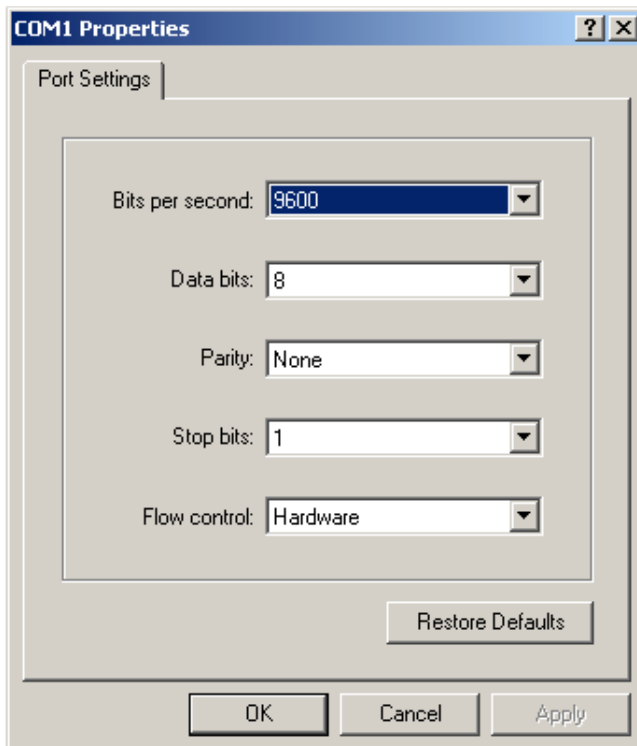
Enter a name for the Connection (Ex: T-1 Monitor) , pick an icon , and then click the 'OK' button.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Next you will see the “Connect To” dialog screen, you will need to pull down the menu next to the “Connect Using” field and select “Com 1” as seen below:



- Click the ‘OK’ button and proceed.
- Setting up the “Com 1” properties will be next, The correct list of settings are below , and you will need to setup the up configuration as follows :

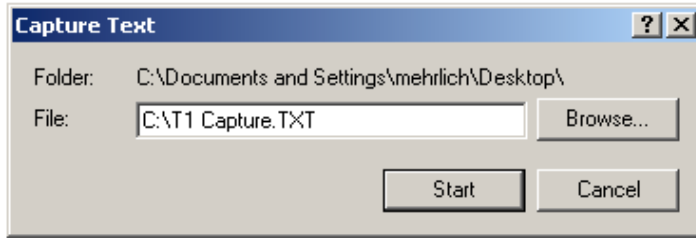


**Make sure the Flow Control is set to None**

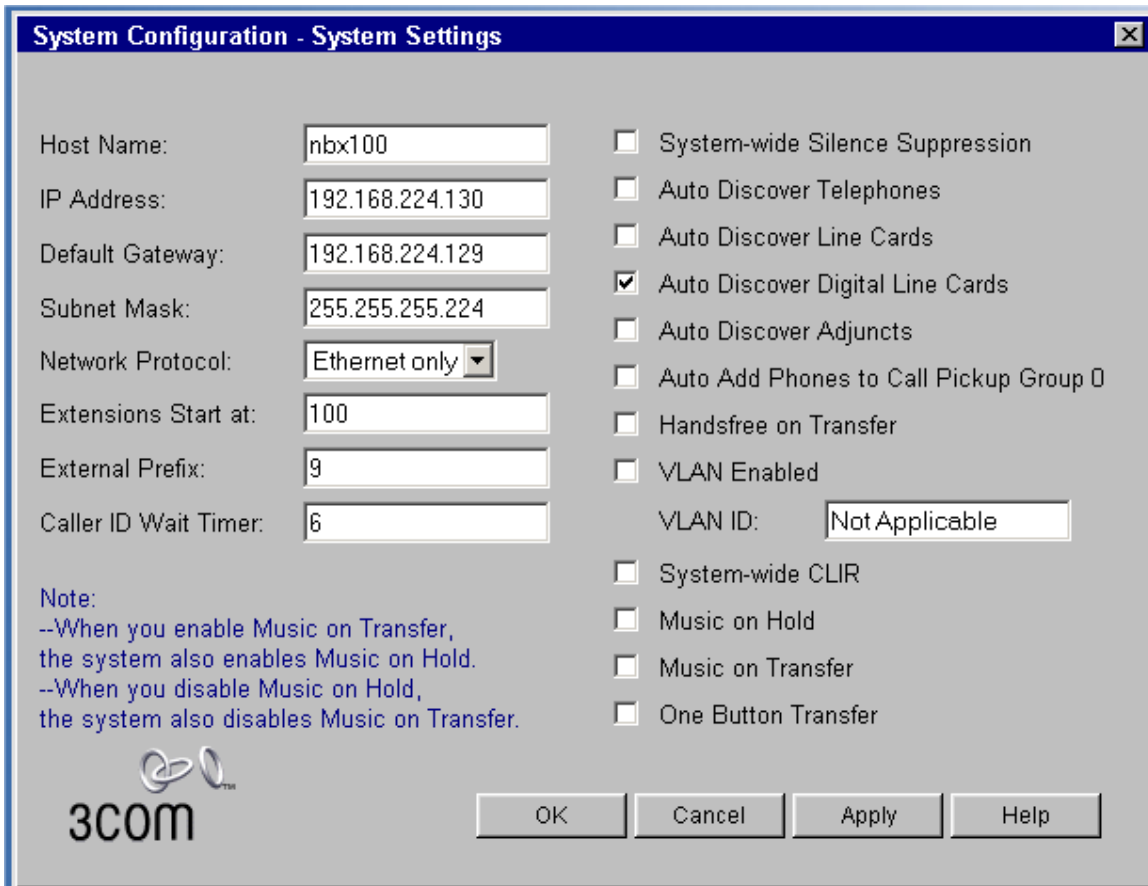
- Press the ‘OK’ button and proceed.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Next, you will need to select the “Transfer” button at the top of the screen and select “Capture Text”. This is where you will name your saved file .



- Select a location click the ‘Start’ button. .
- Plug the Cable into the console port of the T1 card but **DO NOT PLUG THE BOARD IN YET** .
- Open up your web browser and access NetSet.
- Click on ‘System Configuration’, then select ‘System Wide’ and check the box next to ‘Auto Discover Digital Line Cards’ , But **DO NOT PLUG IN** your card yet . Make sure that **ONLY** autodiscover digital line card is checked !



- Click ‘Apply’ and then click ‘OK’.
- Remove the network uplink cable from the NCP and the T1 card
- Slide the Digital Line Card into the Chassis Slot.
- The card should start booting and you should see this on the Hyper-Terminal display. The card will actually boot up twice, first as a load and second as a boot up. This process can take up to 5 to 10 minutes.

**T1 CARD BOOT SEQUENCE**

**Madrid Diagnostics X1.0.0**

**Creation Date: Mar 24 2000**

**Bank 0 is enabled as:**

**32 bits wide**

**4 Mbits deep**

**Size: 16777216 bytes**

**Bank 1 is disabled (On production cards, only bank 0 is populated)**

**Bank 2 is disabled**

**Bank 3 is disabled**

**Total DRAM memory detected: 16777216 bytes**

**Initializing Interrupts**

**Initializing memory allocation subsystem**

**Initializing Timers**

**RTC and CMOS RAM are invalid This is due to no Real Time Clock present**

**Time: 22:38:28**

**On the boardDate: Wednesday, January 8, '97**

**Initializing Ethernet Controller**

**Crystal CS8900 Ethernet Controller (Real Time Clock (RTC) is not set on card)**

**Starting Memory Cell Test ... PASSED**

**Two sets of 8 DSP tests check the interface to the DSP's. Note that on depop T1 boards, ( 3C10116B) there are only 6 DSP's (numbers 0,1,2, 4,5,6). DSP's 3 & 7 will either show as 'failed/not present', or may not be shown at all. This is normal. Failure of other DSP's indicates a hardware failure. When running this portion of the boot tests , you will see this occur .**

	<b>3C10116</b>	<b>3C10116B</b>
<b>HPI Memory Test for DSP 0:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 1:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 2:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 3:</b>	<b>PASSED</b>	<b>FAILED see note above</b>
<b>HPI Memory Test for DSP 4:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 5:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 6:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 7:</b>	<b>PASSED</b>	<b>FAILED see note above</b>
<b>0000008368: HPI DSP Init Msg, DSP0 OK</b>	<b>DSP0 OK</b>	<b>DSP0 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP1 OK</b>	<b>DSP1 OK</b>	<b>DSP1 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP2 OK</b>	<b>DSP2 OK</b>	<b>DSP2 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP3 OK</b>	<b>FAILED see note above</b>	<b>FAILED see note above</b>
<b>0000008368: HPI DSP Init Msg, DSP4 OK</b>	<b>DSP4 OK</b>	<b>DSP4 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP5 OK</b>	<b>DSP5 OK</b>	<b>DSP5 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP6 OK</b>	<b>DSP6 OK</b>	<b>DSP6 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP7 OK</b>	<b>FAILED see note above</b>	<b>FAILED see note above</b>

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**The sequence of dots appear below, one by one. This is normal activity , as the board will pass thru this test and continue .**

**If the boot sequence reaches this point, then the system hardware is functioning correctly. If not, then there is a problem either with the hardware, or the image in flash. On rare occasions, a DSP may fail, but will recover on subsequent reboot. Try to load the board again , and if it fails , Please contact 3Com Technical Support .**

**During this phase, the flash contents may be upgraded according to the following sequence:**

- \* TEP Bootloader requests runtime image, with old version number.**
- \* NCP sends 'intermediate' image run by the TEP card (T1 card).**
- \* 'Intermediate' image requests new flash code from NCP.**
- \* NCP sends new flash image which is installed by the T1 card.**
- \* T1 card reboots and requests runtime image with new version number.**
- \* NCP sends runtime image which is run by the T1 card.**

**The messages seen for a typical boot (No flash upgrade) are shown below:**

**ROM0MapSpaceAddrStart = 0011e000  
ROM0MapSpaceAddrStop = 0019d000  
ROM0MapSpaceAddrOffset = fff62000  
Starting copy from 0011e000 to 0019ea48**

**VxWorks System Boot**

**Copyright 1984-1998 Wind River Systems, Inc.**

**CPU: PC 486  
Version: 5.4  
BSP version: 1.2/0  
Creation date: Mar 24 2000, 17:10:22**

**(Countdown will appear on screen, either 1-0 or 7-0, depending on bootcode version.**

**1  
0**

**auto-booting.....**

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

boot device : cs  
unit number : 0  
processor number : 0  
host name : T1Board  
file name : vxworks  
inet on ethernet (e) : 192.168.1.192 (Used for BOOTING only)  
user (u) : target  
ftp password (pw) : target  
flags (f) : 0x1008  
target name (tn) : vxworks\_T1Board

Attached TCP/IP interface to cs0. (Network connection OK)

**NOTE :** On your laptop that you are running , make sure that the IP address is above 192.168.1.195 or not the same as the nbx because the nbx uses 192.168.1.190 and a few others in this range . This could pose a problem if the ncp detects one of these being used on a laptop or computer on your network .

(Bootloader version is not the same as runtime release version, e.g. the line below is NOT indicating R2.0.0.)

**Current Bootloader Version:**

**Boot Release Type = 2, Boot Major Revision = 0**

**Boot Minor Revision = 0, Boot Point Revision = 0**

**It is at this point that any flash upgrades will occur. If the image size is approx. 800k (left hand figure) then this is the intermediate code version that is being sent. This will then request the new flash code from the NCP (size -500k). When the T1 card reboots with the new flash code, the version shown in the line above will be different to the one given at first bootup.**

**The numbers below indicate image size being downloaded. They will appear approx. 20 seconds after the boot version above. If they do not appear, then there is a problem communicating with the NCP card. Check the network connections, and that the NCP is functioning.**

**(Note that E&M image size is approx. 1,490,000 bytes, PRI image is approx. 1,427,000 bytes)**

**1485272 + 50784 + 72988  
Starting at 0x108000...**

<p style="text-align: center;"><b>3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide</b></p>
---

The runtime image has now been loaded successfully,. Failures during this process are likely to be:

- \* a faulty network connection.
- \* running an R1.x version of NBX code which doesn't support T1 and has no software.
- \* flash upgrade fails and causes continual reboots - if version data on NCP and image on NCP do not match.

The boot code running from flash has now finished it's task. Code now being run is the image downloaded from the NCP, and problems are now likely to be related to configuration issues.

**(Runtime code must reattach to the network)**

Attached TCP/IP interface to cs unit 0

Attaching network interface lo0... done.

NFS client support not included.

**The next line is not an error- the software looks for this file which is used to aid debugging, if present. If not present, as is the usual case , this is not a problem.**

Loading symbol table from T1Board:vxworks.sym ...Login failed.  
Error opening T1Board:vxworks.sym: status = 0x212





**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

```
RTS debug: -> Task 0 detached
Task 3 detached
objectime: external layer not enabled
0xb85988 (nbxH3initialization):
NBX H3 Started, H3 Version: 0x202 Date: 11/11/1999 9:00am
FALC-LH Version 1.3 is detected
it__ I Initializing the Device Interface Layer
0108:223907 DIL      W DeviceILInit: spawn H3 Errors
0108:223907 DIL      W DeviceILInit: spawn H3 Router
0108:223907 DIL      W DeviceILInit: spawn H3 Protocol
```

**If a non-zero IP address is printed below, this indicates that the board has been previously configured with an IP address in NetSet. This is only needed when using standard IP across the system.**

```
0108:223907 __TaskInit__ I Setting IP Hostname = T1Board, IP Address = 0.0.0.0
0108:223908 __TaskInit__ I Deleting old address for IP Hostname = T1Board, Old
IP Address = , status = 0
0108:223908 __TaskInit__ I hostAdd() returned 0
0108:223908 __TaskInit__ I Setting Subnet mask = 0.0.0.0, network-order
0x00000000, host-order 0x00000000
0108:223908 __TaskInit__ I ifAddrSet() returned 0
0108:223908 __TaskInit__ I sethostname() returned 0
0108:223908 __TaskInit__ I routeNetAdd() returned 0
0108:223909 __TaskInit__ I Got TEPH3Router initialization
0108:223909 __TaskInit__ I Got nbxH3errorHandler initialization
0108:223909 __TaskInit__ I Got nbxH3initialization initialization
0108:223909 __TaskInit__ I Got tH3Input initialization
0108:223909 __TaskInit__ I Got tH3LoSend initialization
0108:223909 __TaskInit__ I Putting non-ROOM tasks into run mode
```

**The Network configuration is complete.**

The message below means that your card is bound to the ncp :

```
0101:000527 DIL      E Found valid NCP MAC Address in EEPROM:
00e0:bb00:1e38
```

```
0108:223909 CSSpan    I Span Logger init
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
```

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**Instead the following line should appear (value irrelevant), indicating that the NCP has been found. There will then follow a pause of 10 seconds to make sure that a second NCP isn't present. Providing it isn't, the boot sequence will continue. If there are two or more NCP's, the card will not bind to any one card, but will wait.**

**0108:223910 DIL        E mac 0x284140**

**10 second pause**

**0108:223910 \_\_TaskInit\_\_ E Write to ROOM pipe failed  
0108:223929 T1Interface E InitT1Interface() Logger init for module**

**0108:223929 DSPRcvT    I Task initialized  
0108:223929 DSPMGR    W DSP Download process started  
0108:223929 BoardMGR   W Board Manager initialized 0xb80dcc**

**If Autodiscover is enabled, and this is the first time that the NCP has seen this card, then the card will reboot here, or very soon after, as this is the point at which the NCP receives a SLAVE\_STATUS message from the T1 card. The next time through the boot sequence, the boot sequence should continue further, though how far will depend on whether the span has been configured.**

**0108:223932 DSPMGR    E DSP 0 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 1 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 2 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 3 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 4 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 5 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 6 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 7 prev status 1 - new status 2 - no action taken**

**The Boot Process will stop here if:**

- a) Autodiscover is off and board hasn't been configured already.**
- b) The board has been discovered, but span hasn't been configured.**

**IMPORTANT !!!! The BOOT SEQUENCE will only continue once the board and span have been configured ! Read on to the next steps in Programming your T1**

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**board as this is a sample configuration report ! After you finish configuring the board , These are the actions taken to finish the sequence . You will continue to run your Hyperterminal session !**

**AT THIS TIME , PLEASE PROCEED BY CONFIGURING YOUR SPAN AND GROUPS ! AS YOU FINISH YOUR CONFIGURATION , YOU CAN COME BACK TO THIS STEP AND VIEW YOUR HYPERTERMINAL SESSION AS A REFERENCE TO MAKE SURE THAT THE SPAN LOADED CORRECTLY !**

**Note : You will not see this action below until the span , and groups programming has been completed !**

**0101:000548 BoardMGR W All span(s) configured.**

**The above line indicates receipt of SPAN\_CONFIG message. As a result, the DSP's are initialized, as indicated by the text below.**

**The following lines below show that the span has been configured and the channels are ready.**

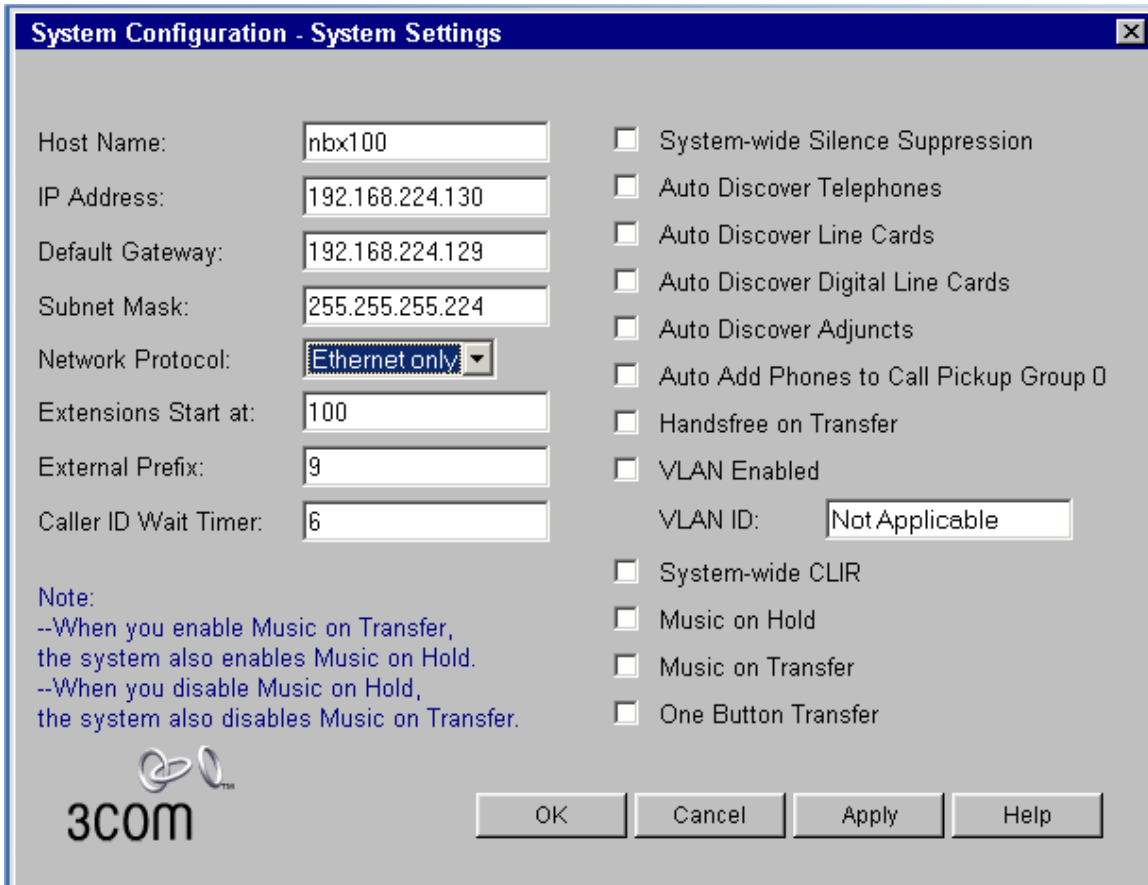
```
0108:223932 CSSpan I State WaitForChanReady respond count 1
0108:223933 CSSpan I State WaitForChanReady respond count 2
0108:223933 CSSpan I State WaitForChanReady respond count 3
0108:223933 CSSpan I State WaitForChanReady respond count 4
0108:223933 CSSpan I State WaitForChanReady respond count 5
0108:223933 CSSpan I State WaitForChanReady respond count 6
0108:223933 CSSpan I State WaitForChanReady respond count 7
0108:223933 CSSpan I State WaitForChanReady respond count 8
0108:223934 CSSpan I State WaitForChanReady respond count 9
0108:223934 CSSpan I State WaitForChanReady respond count 10
0108:223934 CSSpan I State WaitForChanReady respond count 11
0108:223934 CSSpan I State WaitForChanReady respond count 12
0108:223934 CSSpan I State WaitForChanReady respond count 13
0108:223934 CSSpan I State WaitForChanReady respond count 14
0108:223935 CSSpan I State WaitForChanReady respond count 15
0108:223935 CSSpan I State WaitForChanReady respond count 16
0108:223935 CSSpan I State WaitForChanReady respond count 17
0108:223935 CSSpan I State WaitForChanReady respond count 18
0108:223935 CSSpan I State WaitForChanReady respond count 19
0108:223935 CSSpan I State WaitForChanReady respond count 20
0108:223936 CSSpan I State WaitForChanReady respond count 21
0108:223936 CSSpan I State WaitForChanReady respond count 22
0108:223936 CSSpan I State WaitForChanReady respond count 23
0108:223936 CSSpan I State WaitForChanReady respond count 24
0108:223936 CSSpan I Chans ready starting span config
0108:223936 CSSpan I Enabled periodic span slave status timer
```

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

14. Next , make sure that your network connection is plugged back in and ,go back to your NetSet session and select 'Device Configuration', then select the 'Digital Line Card' tab and check to see if the MAC Address of the new board is present. If so go to next step. If not go back to step 13.

15. Now press the back arrow on the NetSet Screen  . Make sure to plug network back into Uplink port if disconnected.

16. At the 'Main Menu', select the 'System Configuration' button, then press the 'System Wide' button and uncheck the box 'Auto Discover Digital Line Cards' click 'Apply' and then 'OK' , but remember not to leave autodiscovery turned on for any devices ! After initial discovery , these should be turned off and ONLY turned back on to discover new devices .



**System Configuration - System Settings**

Host Name:	<input type="text" value="nbx100"/>	<input type="checkbox"/> System-wide Silence Suppression
IP Address:	<input type="text" value="192.168.224.130"/>	<input type="checkbox"/> Auto Discover Telephones
Default Gateway:	<input type="text" value="192.168.224.129"/>	<input type="checkbox"/> Auto Discover Line Cards
Subnet Mask:	<input type="text" value="255.255.255.224"/>	<input type="checkbox"/> Auto Discover Digital Line Cards
Network Protocol:	<input type="text" value="Ethernet only"/>	<input type="checkbox"/> Auto Discover Adjuncts
Extensions Start at:	<input type="text" value="100"/>	<input type="checkbox"/> Auto Add Phones to Call Pickup Group 0
External Prefix:	<input type="text" value="9"/>	<input type="checkbox"/> Handsfree on Transfer
Caller ID Wait Timer:	<input type="text" value="6"/>	<input type="checkbox"/> VLAN Enabled
		VLAN ID: <input type="text" value="Not Applicable"/>
		<input type="checkbox"/> System-wide CLIR
		<input type="checkbox"/> Music on Hold
		<input type="checkbox"/> Music on Transfer
		<input type="checkbox"/> One Button Transfer

Note:  
--When you enable Music on Transfer,  
the system also enables Music on Hold.  
--When you disable Music on Hold,  
the system also disables Music on Transfer.

**3COM**

OK Cancel Apply Help

17. This completes the installation / discovering of the Digital Line Card.

### Configuring the T1

1. Go to: NetSet, Digital Line Card, select the Board from the select device type window and click apply, then click on the left side "Modify".
2. Under the Board name – you can re-name your T1, (optional).
3. "Card Type" should be T1.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

4. "Online" should be checked.
5. Click "Apply"
6. Select "Span" and click apply. ( WATCH YOUR HYPERTERMINAL SESSION TO SEE THE SPAN LOADING )
7. Name your board, (optional)
8. Choose:
  - ESF – Framing Type
  - B8ZS – Line Coding
  - Line length should be 0 to 35 meters
  - Loop – Timing mode must be selected as LOOP !
9. Select "Apply" And your hyperterminal session should show the span loading .
10. Click "OK"

PLEASE NOTE THAT ANY CALLS IN PROGRESS OR ATTEMPTED WILL BE DISCONNECTED UNTIL THE BOOT SEQUENCE IS FINISHED !

Next, from the "Select Device Type":

1. Select "Groups"
2. Click "Apply"
3. Name your group (Optional)
4. Channel Protocol : E&M
  - Direction : 2 way
  - Start Type: WINK (3Com ONLY supports this type of line start)
  - Digit Collection: DNIS/DID
  - Called Party Digits: 4 (This is the number of digits you are collecting from the Telco- please see notes below !)
  - Calling party digits: (This is if you are using caller ID – the amount of digits that the Central Office is sending you : 7, 10 , or 11 digits ) .
  - Trunk to Trunk: Restricted (Please note to check documentation for this feature as this can be checked in COS for different applications. By setting it to Restricted, it will not affect the setup your T1 circuit.
5. Click "Online"
6. Click "Apply".
7. Go back to the Groups screen
8. Select Group 1
9. Go to MEMBERSHIP
10. Click on the : COPY SETTINGS
11. Click on the : REFRESH CHANNELS
12. Click CLOSE
13. This should complete the programming of the board and your span should be operational .
14. Set your Auto Extensions if applicable .
15. At this time, check your channel online status by looking at the number of online channels at the top right of this screen. All 24 channels should be showing "Online".
16. Make sure that you have configured and imported your dialplan for your T1 application and that it is a current plan .
17. Make sure that in Extension List \*0002, it has all the T1 channels in it and all the T1 channels are in the Incoming DID and Auto-Attd. Table (#2).
18. Finally, make some test calls, and check to make sure your calls are terminating at the correct destination.

Note, To view the complete setup that you have just configured for the T1 (NBX 3.0.X and higher)

1. Go to, "Digital Line Card"

## **3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide**

2. Select under “Device Type” ‘ T1/ISDN Board List’
3. Click ‘Apply’
4. Highlight the appropriate board from the list and then click on “ Config and Status Report”

### Tips :

If you receive dead air or the Auto Attendant on inbound calls , then check to make sure that you are receiving the correct amount of digits ( 3Com recommends 4 digits as an industry standard ) under Group 1 settings , then , verify that the value is set to the correct number that you are receiving from your local provider .

On dropping calls : unplug the T1 uplink port located on the right side of the T1 board . Also , Make sure that the switch port ( Your data switch ) that the port is set for 10base T half duplex .

Make sure to check the CSU for alarms as the span may not be ready to accept inbound or outbound calls from your carrier . Make a call to verify that the circuit is up and ready !

## **TROUBLESHOOTING TECHNIQUES**

### T1 Card Alarm Indicators

The Yellow Alarm (or Remote Alarm Indication, RAI) is an indication that the remote end of the line has declared an alarm condition and wants to inform the local end.

The Blue Alarm (or Alarm Indication Signal, AIS) occurs when two consecutive frames have fewer than three zeros in the data stream.

The Red Alarm is generated for a Loss of Synchronisation of 2.5ms or more.

Red Alarm – **CF** - Carrier Failure (Used by E1 and T1)  
Yellow Alarm – **RA** - Remote Alarm (Used by T1)  
Blue Alarm – **LB** - Local Look Back (Used by T1)  
Nominal (Used by E1 and T1)

### **Troubleshooting Tools**

Before Calling into Tech Support, please have ready and double-checked the following info regarding the Span:

Please see additional T1 troubleshooting tips and solutions listed below that you can also access via 3com knowledge base

**"KNOW YOUR SPAN"**

Make sure to have your csu installed and working properly before proceeding .

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Rev. Level of NBX T1 card hardware (is printed on a UPC sticker on the board, behind the front face)
- Framing Type
- Line Coding
- Channel Protocol
- Clocking information (who is providing)
- Start Type
- Type of Digit Collection
- Range of Called Party Digits
- Current 'Wink Wait Timer' and 'Guard Timer' values
- Possible 'Timing Mode' variation.
- Dial Plan Pretranslators, Table 2, any customization

... These settings must match exactly from Telco, the External CSU, and on the NBX configuration screens

There are special considerations for setting up Point-to-Point T1 with two NBX boxes. See related documents listed at the end of this document

T1 Card Loopback test utilizing an RJ-45 plug with jumpers, from pin 1 to pin 4, and a jumper from pin 2 to pin 5. The RJ-45 plug would be inserted in the T1 card, normally where the circuit from the carrier would be connected. The T1 card after a moment of about 20 -25 seconds would look like it was sync'ed up with a circuit. Indicating that the card itself is operational.

### Clock Timing:

All T1 equipment has a clock timing parameter. All equipment must use the same clock for proper synchronization - meaning, get clock from one side of the circuit, and pass it down to the next piece of equipment. If Telco is not providing clock, or you have two NBX's tied together, special considerations apply. Please use solution # 2.0.70112518.3181880 for more information on proper timing setup.

Improper clock settings will result in either no calls, some calls, the T1 going "down" for a minute at a time from time to time, or crackling, popping, and clicks heard during conversation (clock slips; frames lost or duplicated)

### Frame Type:

The NBX can only be set to ESF (Extended Super Frame), or D4. This type must match Telco settings, or you must have a CSU doing a conversion.

Improper setup of this may result in Loss Of Signal on your external CSU, and no call setup.

### Line Coding:

The NBX can only be set to AMI (Alternate Mark Inversion) or B8ZS (Bipolar 8 Zero Substitution). B8ZS (R2.6 and higher only) is recommended with ESF for all installations to Telco. Ensure Frame type is maintained on all equipment back to the CO.

Improper setup of this will result in Frame light / errors on your external CSU, and probably no call setup.

### Extension List:

By default the NBX places ALL channels of ALL T1's into the \*0002 extension list pool for dialing outbound. If you are implementing a fractional T1, or have multiple T1 but wish outbound dialing restricted to less than all T1 channels, you must modify the T1 Channels extension list.

Improper setup of the extension list may result in some calls trying to use non-provisioned channels and not connect.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

### Dial Plan Configuration:

Dial Plan errors or improper setup can cause inbound calls to route to wrong extensions, Pretranslators, Routes, or Timed Routes may not work as expected, or Auto Attendant problems may result. See below related documents for Dial Plan Troubleshooting

### Guard Time:

It is recommended that Telco Guard time be set at approx. 2300 milliseconds and the NBX Guard time be set at 2200mS . This may seem long compared to other PBX's, but is optimal for the NBX. On the NBX, the Guard time for INBOUND is fixed at around 600mS. The Guard Time setting on the Span or Channel is Guard for outbound only.

Improper match of these settings (especially at the CO) may result in channels being locked out by Telco, and the NBX T1 card needing to be rebooted periodically to make calls some time after the first call is made on each channel. Channels may still appear as "IDLE" even if placed in Maintenance mode at Telco.

### Wink Wait Time:

It is recommended that both Telco and the NBX Wink Time be set to 3000mS.

Improper match of these settings to Telco may result in channel lockout as described above in Guard Time.

### DTMF Duration:

The NBX is set according to the EIA/TIA standards document 464B of 50mS Digit duration and 40mS inter-digit timing. There is some allowance to this, but note these possible problems:

Too short DTMF tones from Telco may result in calls inbound to "hang" and get dead air, or route to the Auto Attendant (if digit collection is 0). This is because we "miss a digit" and the NBX is still listening for another digit indefinitely.

Too long DTMF tones from Telco may result in calls to Auto Attendants where the last digit of the incoming digits is "still sounding" when call control is transferred to the Auto Attendant, resulting in the NBX Auto Attendant trying to execute the last digit of the incoming string as a Menu Tree Option. This would result in anything from "invalid extension", to "invalid key", to a certain menu option that is configured to be executed every time when this DID is called. Click [\[here\]](primus://:2.0.69581298.3176231) for more information on DTMF digit duration problems.

### Digit Collection:

Number of digits received from the telco eg : 4 digits

You can receive any length from the telco in re to digits , but industry standard uses 4 digits on ALL applications of did or dnis digits being received .

You must match exactly what Telco is sending, but you should also be able to tell Telco what you want to see. If you use any options with ANI, make sure Telco is sending it (ANI is caller ID). If you are using any option with asterisks (meaning the digit length varies and Telco sends asterisks to denote end of dial string, be certain Telco is sending them. For Called Party Digits, this is the DNIS or DID digits which Telco is sending - must match exactly the digit length they are sending. For Calling Party Digits, this is the ANI portion, set to 0 unless Telco is sending Caller ID, in which case you must match the exact number of digits being sent for ANI in this field

Improper settings in digit collection will result in the NBX either waiting for more digits, and thus INBOUND calls may not complete, or, inbound calls route to the wrong destination (possibly auto attendant) because Telco sends 4 digits and we are set to 3 and thus only look at the first 3 inbound digits and try to process the call.

Sending NO digits from Telco is not supported and although may work, may cause many problems. Knowledge Base solution ID # 2.0.69581298.3176231 for more info on proper Digit Collection.

### Hardware Failure:

Please reference the following related solutions first before replacing hardware



<b>3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide</b>
--

- Dial Plan: Calls route to improper destination: Solution # 2.0.57842839.3016667
- Audio Quality - voice is choppy: Solution # 2.0.66741890.3137177
- T1 Configuration/Ordering Guide: Solution # 2.0.51089926.2905338
- T1 Messages via the Console Port: Solution # 2.0.47521636.2854917
- Outbound Caller ID on PRI : Solution #2.0.52863275.2929835
- How to Configure T1 Point-to-Point between two NBX boxes:  
- Solution #2.0.25218126.2547003

E&M Direction setting incorrect:

E&M set to "DID" will prevent outbound calling. Set to "2-way" if you wish to allow outbound calls in T1 Group Settings. You can alternatively control outbound channel use by editing the extension lists to add/remove/prioritize channels used for making outbound calls.

**Cross-Over T1 to T1 card cable**

**T1 Card Loopback Plug (RJ-45)**

**Pin 1 -----Pin 4**  
**Pin 2 -----Pin 5**  
**Pin 4 -----Pin 1**  
**Pin 5 -----Pin 2**

**One Jumper from Pin 1 to Pin 4**  
**One Jumper from Pin 2 to Pin 5**

**T1 Card “i” Command Output**

The information below shows name and status of a T1 card’s processes at the given time that the ‘i’ command is executed from the command prompt, (HyperTerm). This capture is another troubleshooting tool that is used for diagnosing T1 problems, both at install and later.

When you plug into the T1 board Via the console cable port on the card :

Type in a small “ i “

This will tell you if any programs are **suspended** , and allowing your card to come online

Ready , Pending , Pending+ T and Delay are all normal .

-> **i**

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

NAME	ENTRY	TID	PRI	STATUS	PC	SP	ERRNO	DELAY
tExcTask	208708	feb808	0	PEND	22d348	feb778	3006b	0
tLogTask	1a146c	fe8f04	0	PEND	22d348	fe8e70	0	0
tShell	218af0	f7aefc	1	READY	1b2a10	f7abd8	1c0001	0
tWdbTask	1d5128	f7c0b4	3	PEND	1a79b4	f7bf5c	0	0
tTmrTask	1484f4	f78658	10	DELAY	1a4be6	f78610	0	1
nbxH3errorH1572a4		e15a38	43	PEND	1a79b4	e159a0	0	0
tAioIoTask120de90		fdca08	50	PEND	1a79b4	fdc9b0	0	0
tAioIoTask020de90		fd5874	50	PEND	1a79b4	fd581c	0	0
tNetTask	1a2cb0	f91540	50	PEND	1a79b4	f914e8	0	0
tH3Input	17e7b0	c2cda4	50	PEND	1a79b4	c2cd1c	0	0
tH3LoSnd	17871c	c2bc10	50	PEND	1a79b4	c2bbc8	0	0
tH3UDPRx	1952b0	c2aa7c	50	PEND	1a79b4	c2a8f0	0	0
tAioWait	20e2b0	fe3b9c	51	PEND	1a79b4	fe3aa8	0	0
tFtpdTask	1cc830	f80484	55	PEND	1a79b4	f803b8	0	0
TEPDSPSnd0	19b6d4	c29044	75	PEND	22d348	c28fb8	0	0
TEPDSPSnd1	19b6d4	c24090	75	PEND	22d348	c24004	0	0
TEPDSPSnd2	19b6d4	c1f0dc	75	PEND	22d348	c1f050	0	0
TEPDSPSnd3	19b6d4	c1a128	75	PEND	22d348	c1a09c	0	0
TEPDSPSnd4	19b6d4	c15174	75	PEND	22d348	c150e8	0	0
TEPDSPSnd5	19b6d4	c101c0	75	PEND	22d348	c10134	0	0
TEPDSPSnd6	19b6d4	c0b20c	75	PEND	22d348	c0b180	0	0
TEPDSPSnd7	19b6d4	c06258	75	PEND	22d348	c061cc	0	0
tExecSigT	148d20	a0db18	92	PEND	1a79b4	a0dacc	0	0
TEPH3Router1574c8		e10a84	100	PEND	1a79b4	e10a00	0	0
		TEPDSPRcv	19bc20		a59eac	100	PEND	22d348
	a59a4c	0	0					
tISDNReadr	16c9c0	a0565c	100	PEND	22d348	a05578	0	0
tPipeReadr	16ce18	a006a8	100	PEND	1a79b4	9fff90	0	0
tFALC_RCV	110618	a09984	109	PEND	1a79b4	a09948	0	0
tL1_ALARM	110668	a077f0	109	PEND	1a79b4	a077a8	0	0
tMEIF_Sta	139928	e0883c	110	PEND	22d348	e087b4	0	0
tCC_Task	112040	a15fd4	110	PEND	22d348	a15f4c	0	0
tL3IF_Sta	129cc4	a13e40	110	PEND	22d348	a13db8	0	0
tL2IF_Sta	13db40	a11cac	110	PEND	22d348	a11c24	0	0
nbxLogger	153b38	eac574	200	PEND	22d348	eac30c	0	0
nbxLoggerRe1563dc		e1aa20	200	PEND	22d348	e1a94c	0	0
tBdMgr_Tmr	15e220	a1ff3c	200	DELAY	1a4be6	a1fef4	0	13
tADCTask	15f020	a1af88	200	PEND	22d348	a1aec8	0	0
value = 0 = 0x0								

Obtaining T1 data for review

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

Below is the instructions to activate T1 logging on a per channel basis . On most occasions , it is not necessary to log every channel , Only the ones that are affected . Accompanied below the logging list is a list to show you the different states and statuses of an individual channel .

Tip :

On outbound calling problems that affect all 24 channels : turn on only the last six channels

On inbound calling problems that affect all 24 channels : turn on only the first 6 channels

If the customer is experiencing problems with his T1, perform the following procedure and attempt to recreate the problem.

This Procedure describes how to enable logging on the NBX 100 and T1 card

- 1) Set Hyperterminal to 9600bps, 8 bit, no parity, 1 stop bit and no flow control.
- 2) Attach a straight though serial cable to COM 1 of the NCP card.
- 3) At NBX 100 -> type the following commands:

```
nbxSetLogDevices 3
nbxSetLogLevelFilter 5
nbxSetMsgTypeFilter ("T1Channel",-1)
```

- 4) To enable logging on the T1 card attach a serial cable to COM 1 of the T1 card and type the following commands.

```
nbxSetLogLevelFilter(5)
nbxSetLogDevices(3)
```

Below is a listing of all 24 channels and the codes to turn on logging , note that the channel number is at the end of the string eg : CSCtrl\_1 is channel one , etc .

```
nbxSetMsgTypeFilter "CSCtrl_1", -1
nbxSetMsgTypeFilter "CSCtrl_2", -1
nbxSetMsgTypeFilter "CSCtrl_3", -1
nbxSetMsgTypeFilter "CSCtrl_4", -1
nbxSetMsgTypeFilter "CSCtrl_5", -1
nbxSetMsgTypeFilter "CSCtrl_6", -1
nbxSetMsgTypeFilter "CSCtrl_7", -1
nbxSetMsgTypeFilter "CSCtrl_8", -1
nbxSetMsgTypeFilter "CSCtrl_9", -1
nbxSetMsgTypeFilter "CSCtrl_10", -1
nbxSetMsgTypeFilter "CSCtrl_11", -1
nbxSetMsgTypeFilter "CSCtrl_12", -1
nbxSetMsgTypeFilter "CSCtrl_13", -1
nbxSetMsgTypeFilter "CSCtrl_14", -1
nbxSetMsgTypeFilter "CSCtrl_15", -1
nbxSetMsgTypeFilter "CSCtrl_16", -1
nbxSetMsgTypeFilter "CSCtrl_17", -1
nbxSetMsgTypeFilter "CSCtrl_18", -1
nbxSetMsgTypeFilter "CSCtrl_19", -1
nbxSetMsgTypeFilter "CSCtrl_20", -1
nbxSetMsgTypeFilter "CSCtrl_21", -1
nbxSetMsgTypeFilter "CSCtrl_22", -1
nbxSetMsgTypeFilter "CSCtrl_23", -1
nbxSetMsgTypeFilter "CSCtrl_24", -1
```

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- 5) Capture the Hyperterminal screen. Transfer -> capture text-> type directory and folder.
- 6) **Make sure that logging is turned off when troubleshooting is completed. Logging that has been left on for too long can lock up or effect system performance.**
- 7) This can be done by setting all log devices and log level filters to ('4')
- 8) The following needs to be typed for the all the channels of T1 to disable logging.

nbxSetMsgTypeFilter "CSCtrl\_1", -0

### Section 2 Troubleshooting Outbound calls

0220:194212 CSCtrl\_24 I State Idle - Event Setup - Next WinkWait  
0220:194212 CSCtrl\_24 I Event Setup - Called#14083265442 Calling#  
0220:194212 CSCtrl\_24 I Chan 24 sending Span Chan status 5  
0220:194212 CSSpan I Chan 24 status 5  
0220:194213 CSCtrl\_24 I State WinkWait - Event Wink - Next DialComplete  
0220:194215 CSCtrl\_24 I State DialComplete - Event DialComplete - Next AnswerWait  
0220:194218 CSCtrl\_24 I State AnswerWait - Event RingbackStart - Next AnswerWait  
0220:194239 CSCtrl\_24 I State AnswerWait - Event OffHook - Next State Conversation  
0220:194344 CSCtrl\_24 I State Conversation - Event Disconnect - Next State WaitForOnHook  
0220:194344 CSCtrl\_24 I State Conversation - Event Disconnect - sending OnHook  
0220:194344 CSCtrl\_24 I State Conversaion - Event Disconnect - Next WaitForOnHook  
0220:194346 CSCtrl\_24 I State WaitForOnHook - Event OnHook - Next State Idle  
0220:194346 CSCtrl\_24 I State WaitForOnHook - Event OnHook - sending Release  
0220:194346 CSCtrl\_24 I State WaitForRlsComplete - Event ReleaseComplete - Next State Idle  
0220:194346 CSCtrl\_24 I Chan 24 sending Span Chan status 4  
0220:194346 CSCtrl\_24 I Chan 24 Idle

### Section 3 Troubleshooting Inbound Calls

0220:194248 CSCtrl\_7 I State Idle - Event OffHook - Next State CollectDigits  
0220:194248 CSCtrl\_7 I State Idle - Event OffHook - enabling DTMF Det  
0220:194248 CSCtrl\_7 I State Idle - Event OffHook - sending Wink  
0220:194248 CSCtrl\_7 I Chan 7 sending Span Chan status 5  
0220:194248 CSCtrl\_7 I State CollectDigits - eDigitCollectionDTMF  
0220:194248 CSSpan I Chan 7 status 5  
0220:194248 CSCtrl\_7 I State CollectDigits - Event DTMF Digit(s) 0 looking for 4 called# digits  
0220:194248 CSCtrl\_7 I State WaitForDigit - Event Digit - Next State WaitForDigit  
0220:194249 CSCtrl\_7 I State CollectDigits - Event DTMF Digit(s) 01 looking for 4 called# digits  
0220:194249 CSCtrl\_7 I State WaitForDigit - Event Digit - Next State WaitForDigit  
0220:194249 CSCtrl\_7 I State CollectDigits - Event DTMF Digit(s) 018 looking for 4 called# digits  
0220:194249 CSCtrl\_7 I State WaitForDigit - Event Digit - Next State WaitForDigit  
0220:194249 CSCtrl\_7 I State CollectDigits - Event DTMF Digit(s) 0185 looking for 4 called# digits  
0220:194249 CSCtrl\_7 I State CollectDigits - Done - CalledParty 0185 - CallingParty  
0220:194250 CSCtrl\_7 I State WaitForDigit - Event Digit - Next State WaitForAlert  
0220:194250 CSCtrl\_7 I State CollectDigits - Event DigitsComplete - Next State WaitForAlert  
0220:194250 CSCtrl\_7 I State CollectDigits - Event DigitsComplete - disabling DTMF Det  
0220:194250 CSCtrl\_7 I State CollectDigits - Event DigitsComplete - sending setup called# 0185 calling#  
0220:194250 CSCtrl\_7 I State WaitForAlert - Event Alert - Next State WaitForConnect  
0220:194250 CSCtrl\_7 I State WaitForAlert - Event Alert - enabling EnableCORingBack  
0220:194313 CSCtrl\_7 I State WaitForConnect - Event Connect - Next State Conversation  
0220:194313 CSCtrl\_7 I State WaitForConnect - Event Connect - disabling CORingBack  
0220:194313 CSCtrl\_7 I State WaitForConnect - Event Connect - sending OffHook  
0220:194417 CSCtrl\_7 I State Conversaion - Event OnHook - Next WaitForRelease  
0220:194417 CSCtrl\_7 I Sending Disconnect - Chan 7  
0220:194417 CSCtrl\_7 I State WaitforRelease - Event release - Next State WaitForGaurdTimeOut  
0220:194422 CSCtrl\_7 I State GaurdTimeOut - Event TimeOut - Next Idle  
0220:194422 CSCtrl\_7 I Chan 7 sending Span Chan status 4  
0220:194422 CSCtrl\_7 I Chan 7 Idle  
0220:194422 CSSpan I Chan 7 status 4

Troubleshooting Tips :

# 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

## Installing and Auto Discovering a Digital Line Card)

( Standard T1 Applications Only, Non PRI)  
3C10116 Board  
3C10116B Board ( R2.6 code or higher )

### Requirements:

1. 3Com recommends and ONLY supports a CSU installed in T1 applications. Your CSU MUST be Connected and working at this time !
2. Hyper-Terminal or similar terminal emulation software et , al VT 100
3. A straight through DB 9 Male to Female cable.
4. A network connection for your laptop that has been tested and working allowing you to connect to netset
5. A loop back plug for the T1 board .

### Preparing to install Digital Line Card:

1. Make sure that you have a HyperTerminal or similar terminal emulation software set up and ready. You will need to create a new connection, when running Hyper-Terminal you will be prompted with the following screen:



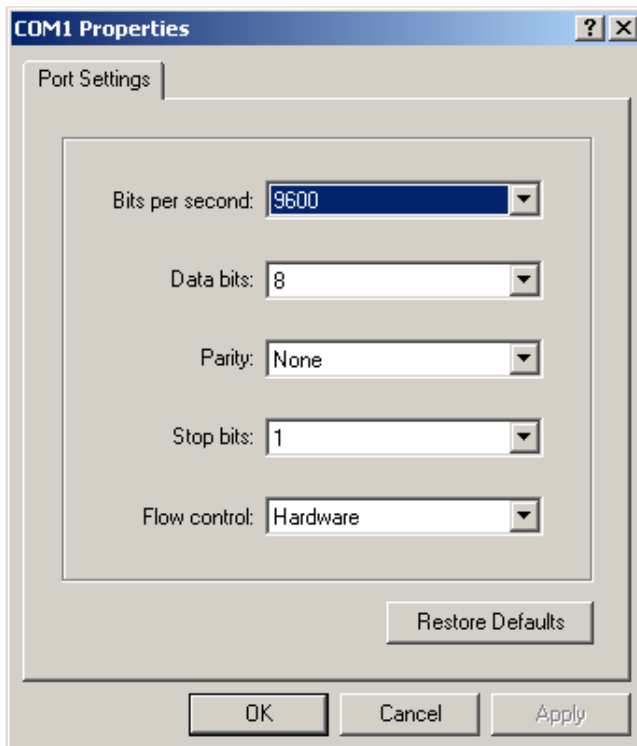
Enter a name for the Connection (Ex: T-1 Monitor) , pick an icon , and then click the 'OK' button.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Next you will see the “Connect To” dialog screen, you will need to pull down the menu next to the “Connect Using” field and select “Com 1” as seen below:



- Click the ‘OK’ button and proceed.
- Setting up the “Com 1” properties will be next, The correct list of settings are below , and you will need to setup the up configuration as follows :

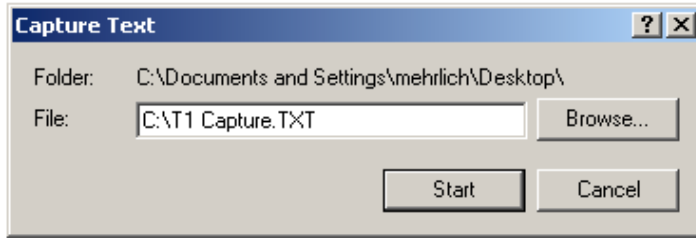


**Make sure the Flow Control is set to None**

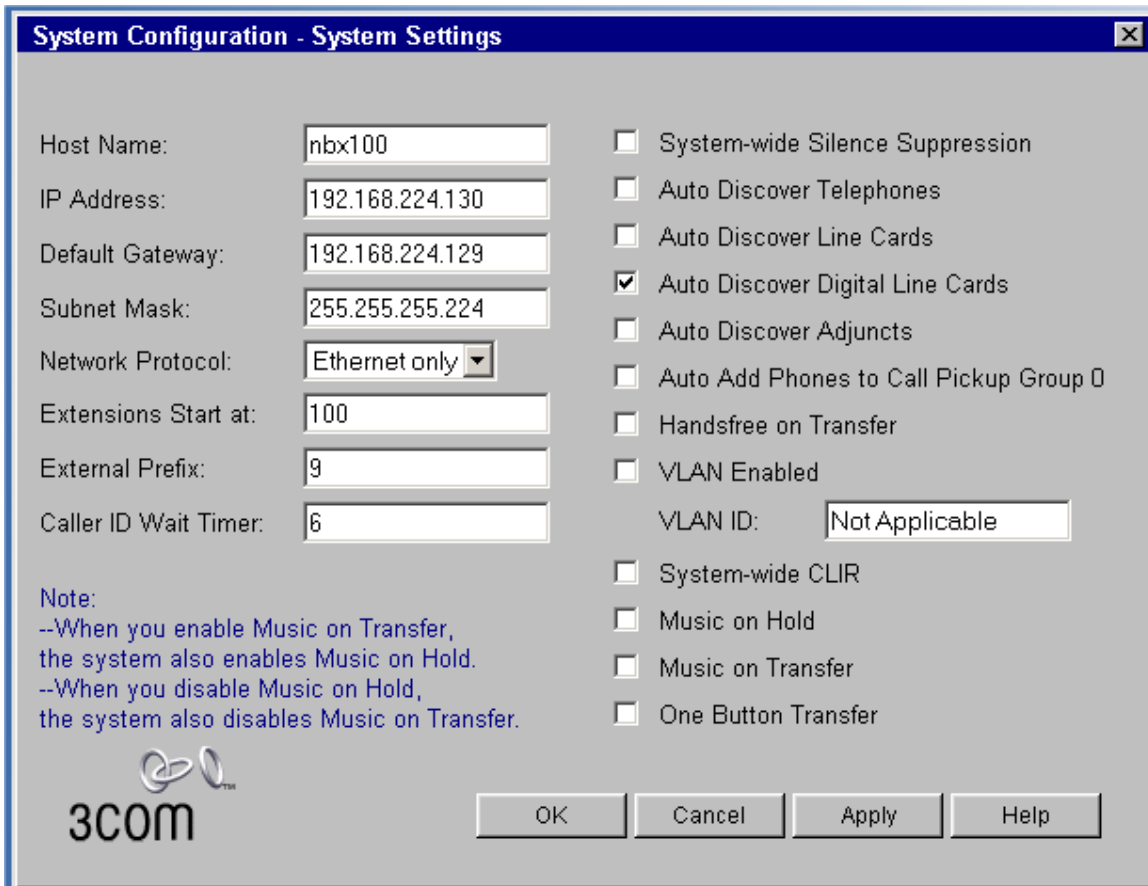
- Press the ‘OK’ button and proceed.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Next, you will need to select the “Transfer” button at the top of the screen and select “Capture Text”. This is where you will name your saved file .



- Select a location click the ‘Start’ button. .
- Plug the Cable into the console port of the T1 card but **DO NOT PLUG THE BOARD IN YET** .
- Open up your web browser and access NetSet.
- Click on ‘System Configuration’, then select ‘System Wide’ and check the box next to ‘Auto Discover Digital Line Cards’ , But **DO NOT PLUG IN** your card yet . Make sure that **ONLY** autodiscover digital line card is checked !



- Click ‘Apply’ and then click ‘OK’.
- Remove the network uplink cable from the NCP and the T1 card
- Slide the Digital Line Card into the Chassis Slot.
- The card should start booting and you should see this on the Hyper-Terminal display. The card will actually boot up twice, first as a load and second as a boot up. This process can take up to 5 to 10 minutes.

**T1 CARD BOOT SEQUENCE**

**Madrid Diagnostics X1.0.0**

**Creation Date: Mar 24 2000**

**Bank 0 is enabled as:**

32 bits wide

4 Mbits deep

Size: 16777216 bytes

**Bank 1 is disabled (On production cards, only bank 0 is populated)**

**Bank 2 is disabled**

**Bank 3 is disabled**

**Total DRAM memory detected: 16777216 bytes**

**Initializing Interrupts**

**Initializing memory allocation subsystem**

**Initializing Timers**

**RTC and CMOS RAM are invalid This is due to no Real Time Clock present**

**Time: 22:38:28**

**On the boardDate: Wednesday, January 8, '97**

**Initializing Ethernet Controller**

**Crystal CS8900 Ethernet Controller (Real Time Clock (RTC) is not set on card)**

**Starting Memory Cell Test ... PASSED**

**Two sets of 8 DSP tests check the interface to the DSP's. Note that on depop T1 boards, ( 3C10116B) there are only 6 DSP's (numbers 0,1,2, 4,5,6). DSP's 3 & 7 will either show as 'failed/not present', or may not be shown at all. This is normal. Failure of other DSP's indicates a hardware failure. When running this portion of the boot tests , you will see this occur .**

	<b>3C10116</b>	<b>3C10116B</b>
<b>HPI Memory Test for DSP 0:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 1:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 2:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 3:</b>	<b>PASSED</b>	<b>FAILED see note above</b>
<b>HPI Memory Test for DSP 4:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 5:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 6:</b>	<b>PASSED</b>	<b>PASSED</b>
<b>HPI Memory Test for DSP 7:</b>	<b>PASSED</b>	<b>FAILED see note above</b>
<b>0000008368: HPI DSP Init Msg, DSP0 OK</b>	<b>DSP0 OK</b>	<b>DSP0 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP1 OK</b>	<b>DSP1 OK</b>	<b>DSP1 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP2 OK</b>	<b>DSP2 OK</b>	<b>DSP2 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP3 OK</b>	<b>FAILED see note above</b>	<b>FAILED see note above</b>
<b>0000008368: HPI DSP Init Msg, DSP4 OK</b>	<b>DSP4 OK</b>	<b>DSP4 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP5 OK</b>	<b>DSP5 OK</b>	<b>DSP5 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP6 OK</b>	<b>DSP6 OK</b>	<b>DSP6 OK</b>
<b>0000008368: HPI DSP Init Msg, DSP7 OK</b>	<b>FAILED see note above</b>	<b>FAILED see note above</b>



**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**The sequence of dots appear below, one by one. This is normal activity , as the board will pass thru this test and continue .**

**If the boot sequence reaches this point, then the system hardware is functioning correctly. If not, then there is a problem either with the hardware, or the image in flash. On rare occasions, a DSP may fail, but will recover on subsequent reboot. Try to load the board again , and if it fails , Please contact 3Com Technical Support .**

**During this phase, the flash contents may be upgraded according to the following sequence:**

- \* TEP Bootloader requests runtime image, with old version number.**
- \* NCP sends 'intermediate' image run by the TEP card (T1 card).**
- \* 'Intermediate' image requests new flash code from NCP.**
- \* NCP sends new flash image which is installed by the T1 card.**
- \* T1 card reboots and requests runtime image with new version number.**
- \* NCP sends runtime image which is run by the T1 card.**

**The messages seen for a typical boot (No flash upgrade) are shown below:**

**ROM0MapSpaceAddrStart = 0011e000  
ROM0MapSpaceAddrStop = 0019d000  
ROM0MapSpaceAddrOffset = fff62000  
Starting copy from 0011e000 to 0019ea48**

**VxWorks System Boot**

**Copyright 1984-1998 Wind River Systems, Inc.**

**CPU: PC 486  
Version: 5.4  
BSP version: 1.2/0  
Creation date: Mar 24 2000, 17:10:22**

**(Countdown will appear on screen, either 1-0 or 7-0, depending on bootcode version.**

**1  
0**

**auto-booting.....**

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

boot device : cs  
unit number : 0  
processor number : 0  
host name : T1Board  
file name : vxworks  
inet on ethernet (e) : 192.168.1.192 (Used for BOOTING only)  
user (u) : target  
ftp password (pw) : target  
flags (f) : 0x1008  
target name (tn) : vxworks\_T1Board

Attached TCP/IP interface to cs0. (Network connection OK)

**NOTE :** On your laptop that you are running , make sure that the IP address is above 192.168.1.195 or not the same as the nbx because the nbx uses 192.168.1.190 and a few others in this range . This could pose a problem if the ncp detects one of these being used on a laptop or computer on your network .

(Bootloader version is not the same as runtime release version, e.g. the line below is NOT indicating R2.0.0.)

**Current Bootloader Version:**

**Boot Release Type = 2, Boot Major Revision = 0**

**Boot Minor Revision = 0, Boot Point Revision = 0**

**It is at this point that any flash upgrades will occur. If the image size is approx. 800k (left hand figure) then this is the intermediate code version that is being sent. This will then request the new flash code from the NCP (size -500k). When the T1 card reboots with the new flash code, the version shown in the line above will be different to the one given at first bootup.**

**The numbers below indicate image size being downloaded. They will appear approx. 20 seconds after the boot version above. If they do not appear, then there is a problem communicating with the NCP card. Check the network connections, and that the NCP is functioning.**

**(Note that E&M image size is approx. 1,490,000 bytes, PRI image is approx. 1,427,000 bytes)**

**1485272 + 50784 + 72988  
Starting at 0x108000...**

<p style="text-align: center;"><b>3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide</b></p>
---

The runtime image has now been loaded successfully,. Failures during this process are likely to be:

- \* a faulty network connection.
- \* running an R1.x version of NBX code which doesn't support T1 and has no software.
- \* flash upgrade fails and causes continual reboots - if version data on NCP and image on NCP do not match.

The boot code running from flash has now finished it's task. Code now being run is the image downloaded from the NCP, and problems are now likely to be related to configuration issues.

**(Runtime code must reattach to the network)**

Attached TCP/IP interface to cs unit 0

Attaching network interface lo0... done.

NFS client support not included.

**The next line is not an error- the software looks for this file which is used to aid debugging, if present. If not present, as is the usual case , this is not a problem.**

Loading symbol table from T1Board:vxworks.sym ...Login failed.  
Error opening T1Board:vxworks.sym: status = 0x212



**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

```
RTS debug: -> Task 0 detached
Task 3 detached
objectime: external layer not enabled
0xb85988 (nbxH3initialization):
NBX H3 Started, H3 Version: 0x202 Date: 11/11/1999 9:00am
FALC-LH Version 1.3 is detected
it__ I Initializing the Device Interface Layer
0108:223907 DIL      W DeviceILInit: spawn H3 Errors
0108:223907 DIL      W DeviceILInit: spawn H3 Router
0108:223907 DIL      W DeviceILInit: spawn H3 Protocol
```

**If a non-zero IP address is printed below, this indicates that the board has been previously configured with an IP address in NetSet. This is only needed when using standard IP across the system.**

```
0108:223907 __TaskInit__ I Setting IP Hostname = T1Board, IP Address = 0.0.0.0
0108:223908 __TaskInit__ I Deleting old address for IP Hostname = T1Board, Old
IP Address = , status = 0
0108:223908 __TaskInit__ I hostAdd() returned 0
0108:223908 __TaskInit__ I Setting Subnet mask = 0.0.0.0, network-order
0x00000000, host-order 0x00000000
0108:223908 __TaskInit__ I ifAddrSet() returned 0
0108:223908 __TaskInit__ I sethostname() returned 0
0108:223908 __TaskInit__ I routeNetAdd() returned 0
0108:223909 __TaskInit__ I Got TEPH3Router initialization
0108:223909 __TaskInit__ I Got nbxH3errorHandler initialization
0108:223909 __TaskInit__ I Got nbxH3initialization initialization
0108:223909 __TaskInit__ I Got tH3Input initialization
0108:223909 __TaskInit__ I Got tH3LoSend initialization
0108:223909 __TaskInit__ I Putting non-ROOM tasks into run mode
```

**The Network configuration is complete.**

The message below means that your card is bound to the ncp :

```
0101:000527 DIL      E Found valid NCP MAC Address in EEPROM:
00e0:bb00:1e38
```

```
0108:223909 CSSpan    I Span Logger init
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
0108:223910 __TaskInit__ E Write to ROOM pipe failed
```

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**Instead the following line should appear (value irrelevant), indicating that the NCP has been found. There will then follow a pause of 10 seconds to make sure that a second NCP isn't present. Providing it isn't, the boot sequence will continue. If there are two or more NCP's, the card will not bind to any one card, but will wait.**

**0108:223910 DIL        E mac 0x284140**

**10 second pause**

**0108:223910 \_\_TaskInit\_\_ E Write to ROOM pipe failed  
0108:223929 T1Interface E InitT1Interface() Logger init for module**

**0108:223929 DSPRcvT    I Task initialized  
0108:223929 DSPMGR    W DSP Download process started  
0108:223929 BoardMGR   W Board Manager initialized 0xb80dcc**

**If Autodiscover is enabled, and this is the first time that the NCP has seen this card, then the card will reboot here, or very soon after, as this is the point at which the NCP receives a SLAVE\_STATUS message from the T1 card. The next time through the boot sequence, the boot sequence should continue further, though how far will depend on whether the span has been configured.**

**0108:223932 DSPMGR    E DSP 0 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 1 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 2 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 3 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 4 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 5 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 6 prev status 1 - new status 2 - no action taken  
0108:223932 DSPMGR    E DSP 7 prev status 1 - new status 2 - no action taken**

**The Boot Process will stop here if:**

- a) Autodiscover is off and board hasn't been configured already.**
- b) The board has been discovered, but span hasn't been configured.**

**IMPORTANT !!!! The BOOT SEQUENCE will only continue once the board and span have been configured ! Read on to the next steps in Programming your T1**

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

**board as this is a sample configuration report ! After you finish configuring the board , These are the actions taken to finish the sequence . You will continue to run your Hyperterminal session !**

**AT THIS TIME , PLEASE PROCEED BY CONFIGURING YOUR SPAN AND GROUPS ! AS YOU FINISH YOUR CONFIGURATION , YOU CAN COME BACK TO THIS STEP AND VIEW YOUR HYPERTERMINAL SESSION AS A REFERENCE TO MAKE SURE THAT THE SPAN LOADED CORRECTLY !**

**Note : You will not see this action below until the span , and groups programming has been completed !**

**0101:000548 BoardMGR W All span(s) configured.**

**The above line indicates receipt of SPAN\_CONFIG message. As a result, the DSP's are initialized, as indicated by the text below.**

**The following lines below show that the span has been configured and the channels are ready.**

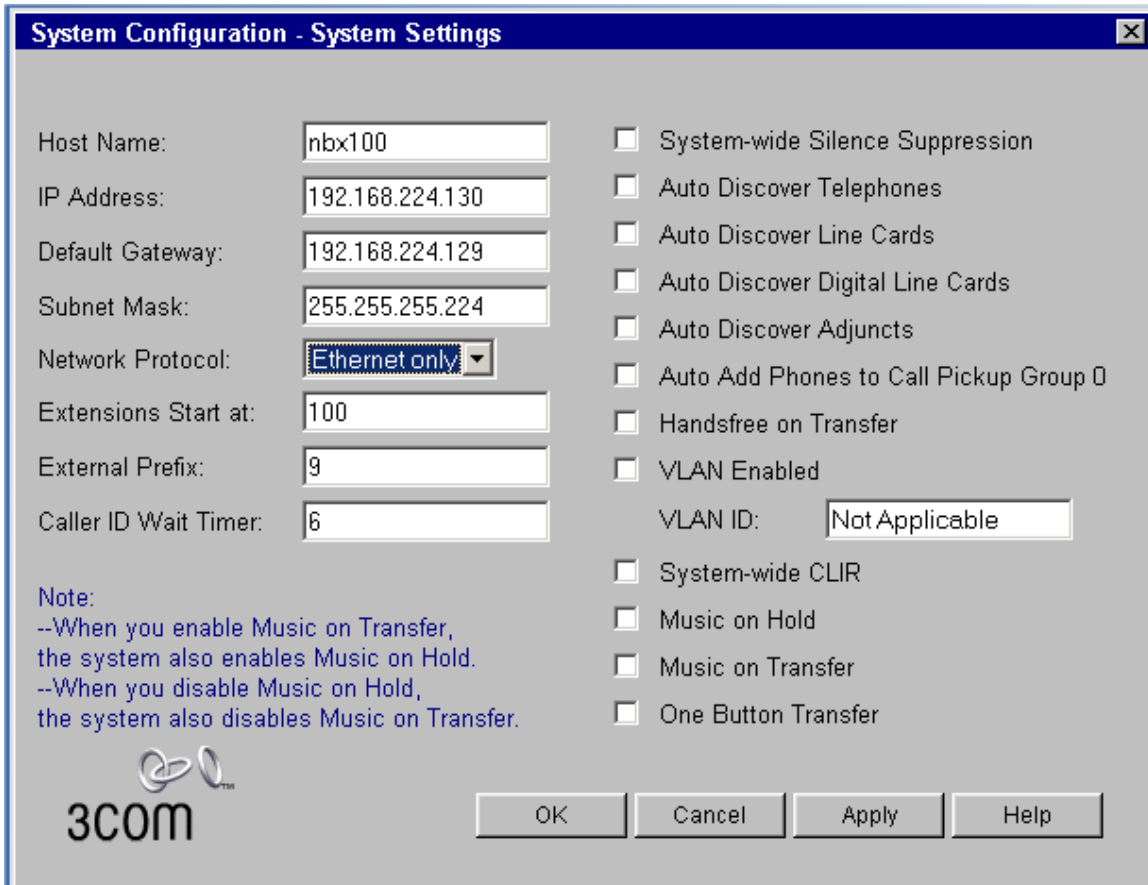
```
0108:223932 CSSpan I State WaitForChanReady respond count 1
0108:223933 CSSpan I State WaitForChanReady respond count 2
0108:223933 CSSpan I State WaitForChanReady respond count 3
0108:223933 CSSpan I State WaitForChanReady respond count 4
0108:223933 CSSpan I State WaitForChanReady respond count 5
0108:223933 CSSpan I State WaitForChanReady respond count 6
0108:223933 CSSpan I State WaitForChanReady respond count 7
0108:223933 CSSpan I State WaitForChanReady respond count 8
0108:223934 CSSpan I State WaitForChanReady respond count 9
0108:223934 CSSpan I State WaitForChanReady respond count 10
0108:223934 CSSpan I State WaitForChanReady respond count 11
0108:223934 CSSpan I State WaitForChanReady respond count 12
0108:223934 CSSpan I State WaitForChanReady respond count 13
0108:223934 CSSpan I State WaitForChanReady respond count 14
0108:223935 CSSpan I State WaitForChanReady respond count 15
0108:223935 CSSpan I State WaitForChanReady respond count 16
0108:223935 CSSpan I State WaitForChanReady respond count 17
0108:223935 CSSpan I State WaitForChanReady respond count 18
0108:223935 CSSpan I State WaitForChanReady respond count 19
0108:223935 CSSpan I State WaitForChanReady respond count 20
0108:223936 CSSpan I State WaitForChanReady respond count 21
0108:223936 CSSpan I State WaitForChanReady respond count 22
0108:223936 CSSpan I State WaitForChanReady respond count 23
0108:223936 CSSpan I State WaitForChanReady respond count 24
0108:223936 CSSpan I Chans ready starting span config
0108:223936 CSSpan I Enabled periodic span slave status timer
```

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

14. Next , make sure that your network connection is plugged back in and ,go back to your NetSet session and select 'Device Configuration', then select the 'Digital Line Card' tab and check to see if the MAC Address of the new board is present. If so go to next step. If not go back to step 13.

15. Now press the back arrow on the NetSet Screen  . Make sure to plug network back into Uplink port if disconnected.

16. At the 'Main Menu', select the 'System Configuration' button, then press the 'System Wide' button and uncheck the box 'Auto Discover Digital Line Cards' click 'Apply' and then 'OK' , but remember not to leave autodiscovery turned on for any devices ! After initial discovery , these should be turned off and ONLY turned back on to discover new devices .



**System Configuration - System Settings**

Host Name:	<input type="text" value="nbx100"/>	<input type="checkbox"/> System-wide Silence Suppression
IP Address:	<input type="text" value="192.168.224.130"/>	<input type="checkbox"/> Auto Discover Telephones
Default Gateway:	<input type="text" value="192.168.224.129"/>	<input type="checkbox"/> Auto Discover Line Cards
Subnet Mask:	<input type="text" value="255.255.255.224"/>	<input type="checkbox"/> Auto Discover Digital Line Cards
Network Protocol:	<input type="text" value="Ethernet only"/>	<input type="checkbox"/> Auto Discover Adjuncts
Extensions Start at:	<input type="text" value="100"/>	<input type="checkbox"/> Auto Add Phones to Call Pickup Group 0
External Prefix:	<input type="text" value="9"/>	<input type="checkbox"/> Handsfree on Transfer
Caller ID Wait Timer:	<input type="text" value="6"/>	<input type="checkbox"/> VLAN Enabled
		VLAN ID: <input type="text" value="Not Applicable"/>
		<input type="checkbox"/> System-wide CLIR
		<input type="checkbox"/> Music on Hold
		<input type="checkbox"/> Music on Transfer
		<input type="checkbox"/> One Button Transfer

Note:  
--When you enable Music on Transfer,  
the system also enables Music on Hold.  
--When you disable Music on Hold,  
the system also disables Music on Transfer.

**3COM**

OK Cancel Apply Help

17. This completes the installation / discovering of the Digital Line Card.

### Configuring the T1

1. Go to: NetSet, Digital Line Card, select the Board from the select device type window and click apply, then click on the left side "Modify".
2. Under the Board name – you can re-name your T1, (optional).
3. "Card Type" should be T1.



## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

4. "Online" should be checked.
5. Click "Apply"
6. Select "Span" and click apply. ( WATCH YOUR HYPERTERMINAL SESSION TO SEE THE SPAN LOADING )
7. Name your board, (optional)
8. Choose:
  - ESF – Framing Type
  - B8ZS – Line Coding
  - Line length should be 0 to 35 meters
  - Loop – Timing mode must be selected as LOOP !
9. Select "Apply" And your hyperterminal session should show the span loading .
10. Click "OK"

PLEASE NOTE THAT ANY CALLS IN PROGRESS OR ATTEMPTED WILL BE DISCONNECTED UNTIL THE BOOT SEQUENCE IS FINISHED !

Next, from the "Select Device Type":

1. Select "Groups"
2. Click "Apply"
3. Name your group (Optional)
4. Channel Protocol : E&M
  - Direction : 2 way
  - Start Type: WINK (3Com ONLY supports this type of line start)
  - Digit Collection: DNIS/DID
  - Called Party Digits: 4 (This is the number of digits you are collecting from the Telco- please see notes below !)
  - Calling party digits: (This is if you are using caller ID – the amount of digits that the Central Office is sending you : 7, 10 , or 11 digits ) .
  - Trunk to Trunk: Restricted (Please note to check documentation for this feature as this can be checked in COS for different applications. By setting it to Restricted, it will not affect the setup your T1 circuit.
5. Click "Online"
6. Click "Apply".
7. Go back to the Groups screen
8. Select Group 1
9. Go to MEMBERSHIP
10. Click on the : COPY SETTINGS
11. Click on the : REFRESH CHANNELS
12. Click CLOSE
13. This should complete the programming of the board and your span should be operational .
14. Set your Auto Extensions if applicable .
15. At this time, check your channel online status by looking at the number of online channels at the top right of this screen. All 24 channels should be showing "Online".
16. Make sure that you have configured and imported your dialplan for your T1 application and that it is a current plan .
17. Make sure that in Extension List \*0002, it has all the T1 channels in it and all the T1 channels are in the Incoming DID and Auto-Attd. Table (#2).
18. Finally, make some test calls, and check to make sure your calls are terminating at the correct destination.

Note, To view the complete setup that you have just configured for the T1 (NBX 3.0.X and higher)

1. Go to, "Digital Line Card"

## **3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide**

2. Select under “Device Type” ‘ T1/ISDN Board List’
3. Click ‘Apply’
4. Highlight the appropriate board from the list and then click on “ Config and Status Report”

### Tips :

If you receive dead air or the Auto Attendant on inbound calls , then check to make sure that you are receiving the correct amount of digits ( 3Com recommends 4 digits as an industry standard ) under Group 1 settings , then , verify that the value is set to the correct number that you are receiving from your local provider .

On dropping calls : unplug the T1 uplink port located on the right side of the T1 board . Also , Make sure that the switch port ( Your data switch ) that the port is set for 10base T half duplex .

Make sure to check the CSU for alarms as the span may not be ready to accept inbound or outbound calls from your carrier . Make a call to verify that the circuit is up and ready !

## **TROUBLESHOOTING TECHNIQUES**

### T1 Card Alarm Indicators

The Yellow Alarm (or Remote Alarm Indication, RAI) is an indication that the remote end of the line has declared an alarm condition and wants to inform the local end.

The Blue Alarm (or Alarm Indication Signal, AIS) occurs when two consecutive frames have fewer than three zeros in the data stream.

The Red Alarm is generated for a Loss of Synchronisation of 2.5ms or more.

Red Alarm – **CF** - Carrier Failure (Used by E1 and T1)  
Yellow Alarm – **RA** - Remote Alarm (Used by T1)  
Blue Alarm – **LB** - Local Look Back (Used by T1)  
Nominal (Used by E1 and T1)

### **Troubleshooting Tools**

Before Calling into Tech Support, please have ready and double-checked the following info regarding the Span:

Please see additional T1 troubleshooting tips and solutions listed below that you can also access via 3com knowledge base

**"KNOW YOUR SPAN"**

Make sure to have your csu installed and working properly before proceeding .

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- Rev. Level of NBX T1 card hardware (is printed on a UPC sticker on the board, behind the front face)
- Framing Type
- Line Coding
- Channel Protocol
- Clocking information (who is providing)
- Start Type
- Type of Digit Collection
- Range of Called Party Digits
- Current 'Wink Wait Timer' and 'Guard Timer' values
- Possible 'Timing Mode' variation.
- Dial Plan Pretranslators, Table 2, any customization

... These settings must match exactly from Telco, the External CSU, and on the NBX configuration screens

There are special considerations for setting up Point-to-Point T1 with two NBX boxes. See related documents listed at the end of this document

T1 Card Loopback test utilizing an RJ-45 plug with jumpers, from pin 1 to pin 4, and a jumper from pin 2 to pin 5. The RJ-45 plug would be inserted in the T1 card, normally where the circuit from the carrier would be connected. The T1 card after a moment of about 20 -25 seconds would look like it was sync'ed up with a circuit. Indicating that the card itself is operational.

### Clock Timing:

All T1 equipment has a clock timing parameter. All equipment must use the same clock for proper synchronization - meaning, get clock from one side of the circuit, and pass it down to the next piece of equipment. If Telco is not providing clock, or you have two NBX's tied together, special considerations apply. Please use solution # 2.0.70112518.3181880 for more information on proper timing setup.

Improper clock settings will result in either no calls, some calls, the T1 going "down" for a minute at a time from time to time, or crackling, popping, and clicks heard during conversation (clock slips; frames lost or duplicated)

### Frame Type:

The NBX can only be set to ESF (Extended Super Frame), or D4. This type must match Telco settings, or you must have a CSU doing a conversion.

Improper setup of this may result in Loss Of Signal on your external CSU, and no call setup.

### Line Coding:

The NBX can only be set to AMI (Alternate Mark Inversion) or B8ZS (Bipolar 8 Zero Substitution). B8ZS (R2.6 and higher only) is recommended with ESF for all installations to Telco. Ensure Frame type is maintained on all equipment back to the CO.

Improper setup of this will result in Frame light / errors on your external CSU, and probably no call setup.

### Extension List:

By default the NBX places ALL channels of ALL T1's into the \*0002 extension list pool for dialing outbound. If you are implementing a fractional T1, or have multiple T1 but wish outbound dialing restricted to less than all T1 channels, you must modify the T1 Channels extension list.

Improper setup of the extension list may result in some calls trying to use non-provisioned channels and not connect.

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

### Dial Plan Configuration:

Dial Plan errors or improper setup can cause inbound calls to route to wrong extensions, Pretranslators, Routes, or Timed Routes may not work as expected, or Auto Attendant problems may result. See below related documents for Dial Plan Troubleshooting

### Guard Time:

It is recommended that Telco Guard time be set at approx. 2300 milliseconds and the NBX Guard time be set at 2200mS . This may seem long compared to other PBX's, but is optimal for the NBX. On the NBX, the Guard time for INBOUND is fixed at around 600mS. The Guard Time setting on the Span or Channel is Guard for outbound only.

Improper match of these settings (especially at the CO) may result in channels being locked out by Telco, and the NBX T1 card needing to be rebooted periodically to make calls some time after the first call is made on each channel. Channels may still appear as "IDLE" even if placed in Maintenance mode at Telco.

### Wink Wait Time:

It is recommended that both Telco and the NBX Wink Time be set to 3000mS.

Improper match of these settings to Telco may result in channel lockout as described above in Guard Time.

### DTMF Duration:

The NBX is set according to the EIA/TIA standards document 464B of 50mS Digit duration and 40mS inter-digit timing. There is some allowance to this, but note these possible problems:

Too short DTMF tones from Telco may result in calls inbound to "hang" and get dead air, or route to the Auto Attendant (if digit collection is 0). This is because we "miss a digit" and the NBX is still listening for another digit indefinitely.

Too long DTMF tones from Telco may result in calls to Auto Attendants where the last digit of the incoming digits is "still sounding" when call control is transferred to the Auto Attendant, resulting in the NBX Auto Attendant trying to execute the last digit of the incoming string as a Menu Tree Option. This would result in anything from "invalid extension", to "invalid key", to a certain menu option that is configured to be executed every time when this DID is called. Click [\[here\]](primus://:2.0.69581298.3176231) for more information on DTMF digit duration problems.

### Digit Collection:

Number of digits received from the telco eg : 4 digits

You can receive any length from the telco in re to digits , but industry standard uses 4 digits on ALL applications of did or dnis digits being received .

You must match exactly what Telco is sending, but you should also be able to tell Telco what you want to see. If you use any options with ANI, make sure Telco is sending it (ANI is caller ID). If you are using any option with asterisks (meaning the digit length varies and Telco sends asterisks to denote end of dial string, be certain Telco is sending them. For Called Party Digits, this is the DNIS or DID digits which Telco is sending - must match exactly the digit length they are sending. For Calling Party Digits, this is the ANI portion, set to 0 unless Telco is sending Caller ID, in which case you must match the exact number of digits being sent for ANI in this field

Improper settings in digit collection will result in the NBX either waiting for more digits, and thus INBOUND calls may not complete, or, inbound calls route to the wrong destination (possibly auto attendant) because Telco sends 4 digits and we are set to 3 and thus only look at the first 3 inbound digits and try to process the call.

Sending NO digits from Telco is not supported and although may work, may cause many problems. Knowledge Base solution ID # 2.0.69581298.3176231 for more info on proper Digit Collection.

### Hardware Failure:

Please reference the following related solutions first before replacing hardware

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

- Dial Plan: Calls route to improper destination: Solution # 2.0.57842839.3016667
- Audio Quality - voice is choppy: Solution # 2.0.66741890.3137177
- T1 Configuration/Ordering Guide: Solution # 2.0.51089926.2905338
- T1 Messages via the Console Port: Solution # 2.0.47521636.2854917
- Outbound Caller ID on PRI : Solution #2.0.52863275.2929835
- How to Configure T1 Point-to-Point between two NBX boxes:  
- Solution #2.0.25218126.2547003

E&M Direction setting incorrect:

E&M set to "DID" will prevent outbound calling. Set to "2-way" if you wish to allow outbound calls in T1 Group Settings. You can alternatively control outbound channel use by editing the extension lists to add/remove/prioritize channels used for making outbound calls.

**Cross-Over T1 to T1 card cable**

**T1 Card Loopback Plug (RJ-45)**

**Pin 1 -----Pin 4**  
**Pin 2 -----Pin 5**  
**Pin 4 -----Pin 1**  
**Pin 5 -----Pin 2**

**One Jumper from Pin 1 to Pin 4**  
**One Jumper from Pin 2 to Pin 5**

**T1 Card "i" Command Output**

The information below shows name and status of a T1 card's processes at the given time that the 'i' command is executed from the command prompt, (HyperTerm). This capture is another troubleshooting tool that is used for diagnosing T1 problems, both at install and later.

When you plug into the T1 board Via the console cable port on the card :

Type in a small "i"

This will tell you if any programs are **suspended** , and allowing your card to come online

Ready , Pending , Pending+ T and Delay are all normal .

-> i

**3Com NBX T1 Digital Line Card  
Installation and Trouble Shooting Guide**

NAME	ENTRY	TID	PRI	STATUS	PC	SP	ERRNO	DELAY
tExcTask	208708	feb808	0	PEND	22d348	feb778	3006b	0
tLogTask	1a146c	fe8f04	0	PEND	22d348	fe8e70	0	0
tShell	218af0	f7aefc	1	READY	1b2a10	f7abd8	1c0001	0
tWdbTask	1d5128	f7c0b4	3	PEND	1a79b4	f7bf5c	0	0
tTmrTask	1484f4	f78658	10	DELAY	1a4be6	f78610	0	1
nbxH3errorH1572a4		e15a38	43	PEND	1a79b4	e159a0	0	0
tAioIoTask120de90		fdca08	50	PEND	1a79b4	fdc9b0	0	0
tAioIoTask020de90		fd5874	50	PEND	1a79b4	fd581c	0	0
tNetTask	1a2cb0	f91540	50	PEND	1a79b4	f914e8	0	0
tH3Input	17e7b0	c2cda4	50	PEND	1a79b4	c2cd1c	0	0
tH3LoSnd	17871c	c2bc10	50	PEND	1a79b4	c2bbc8	0	0
tH3UDPRx	1952b0	c2aa7c	50	PEND	1a79b4	c2a8f0	0	0
tAioWait	20e2b0	fe3b9c	51	PEND	1a79b4	fe3aa8	0	0
tFtpdTask	1cc830	f80484	55	PEND	1a79b4	f803b8	0	0
TEPDSPSnd0	19b6d4	c29044	75	PEND	22d348	c28fb8	0	0
TEPDSPSnd1	19b6d4	c24090	75	PEND	22d348	c24004	0	0
TEPDSPSnd2	19b6d4	c1f0dc	75	PEND	22d348	c1f050	0	0
TEPDSPSnd3	19b6d4	c1a128	75	PEND	22d348	c1a09c	0	0
TEPDSPSnd4	19b6d4	c15174	75	PEND	22d348	c150e8	0	0
TEPDSPSnd5	19b6d4	c101c0	75	PEND	22d348	c10134	0	0
TEPDSPSnd6	19b6d4	c0b20c	75	PEND	22d348	c0b180	0	0
TEPDSPSnd7	19b6d4	c06258	75	PEND	22d348	c061cc	0	0
tExecSigT	148d20	a0db18	92	PEND	1a79b4	a0dacc	0	0
TEPH3Router1574c8		e10a84	100	PEND	1a79b4	e10a00	0	0
		TEPDSPRcv	19bc20		a59eac	100	PEND	22d348
	a59a4c	0	0					
tISDNReadr	16c9c0	a0565c	100	PEND	22d348	a05578	0	0
tPipeReadr	16ce18	a006a8	100	PEND	1a79b4	9fff90	0	0
tFALC_RCV	110618	a09984	109	PEND	1a79b4	a09948	0	0
tL1_ALARM	110668	a077f0	109	PEND	1a79b4	a077a8	0	0
tMEIF_Sta	139928	e0883c	110	PEND	22d348	e087b4	0	0
tCC_Task	112040	a15fd4	110	PEND	22d348	a15f4c	0	0
tL3IF_Sta	129cc4	a13e40	110	PEND	22d348	a13db8	0	0
tL2IF_Sta	13db40	a11cac	110	PEND	22d348	a11c24	0	0
nbxLogger	153b38	eac574	200	PEND	22d348	eac30c	0	0
nbxLoggerRe1563dc		e1aa20	200	PEND	22d348	e1a94c	0	0
tBdMgr_Tmr	15e220	a1ff3c	200	DELAY	1a4be6	a1fef4	0	13
tADCTask	15f020	a1af88	200	PEND	22d348	a1aec8	0	0
value = 0 = 0x0								

Obtaining T1 data for review

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

Below is the instructions to activate T1 logging on a per channel basis . On most occasions , it is not necessary to log every channel , Only the ones that are affected . Accompanied below the logging list is a list to show you the different states and statuses of an individual channel .

Tip :

On outbound calling problems that affect all 24 channels : turn on only the last six channels

On inbound calling problems that affect all 24 channels : turn on only the first 6 channels

If the customer is experiencing problems with his T1, perform the following procedure and attempt to recreate the problem.

This Procedure describes how to enable logging on the NBX 100 and T1 card

- 1) Set Hyperterminal to 9600bps, 8 bit, no parity, 1 stop bit and no flow control.
- 2) Attach a straight though serial cable to COM 1 of the NCP card.
- 3) At NBX 100 -> type the following commands:

```
nbxSetLogDevices 3
nbxSetLogLevelFilter 5
nbxSetMsgTypeFilter ("T1Channel",-1)
```

- 4) To enable logging on the T1 card attach a serial cable to COM 1 of the T1 card and type the following commands.

```
nbxSetLogLevelFilter(5)
nbxSetLogDevices(3)
```

Below is a listing of all 24 channels and the codes to turn on logging , note that the channel number is at the end of the string eg : CScCtrl\_1 is channel one , etc .

```
nbxSetMsgTypeFilter "CScCtrl_1", -1
nbxSetMsgTypeFilter "CScCtrl_2", -1
nbxSetMsgTypeFilter "CScCtrl_3", -1
nbxSetMsgTypeFilter "CScCtrl_4", -1
nbxSetMsgTypeFilter "CScCtrl_5", -1
nbxSetMsgTypeFilter "CScCtrl_6", -1
nbxSetMsgTypeFilter "CScCtrl_7", -1
nbxSetMsgTypeFilter "CScCtrl_8", -1
nbxSetMsgTypeFilter "CScCtrl_9", -1
nbxSetMsgTypeFilter "CScCtrl_10", -1
nbxSetMsgTypeFilter "CScCtrl_11", -1
nbxSetMsgTypeFilter "CScCtrl_12", -1
nbxSetMsgTypeFilter "CScCtrl_13", -1
nbxSetMsgTypeFilter "CScCtrl_14", -1
nbxSetMsgTypeFilter "CScCtrl_15", -1
nbxSetMsgTypeFilter "CScCtrl_16", -1
nbxSetMsgTypeFilter "CScCtrl_17", -1
nbxSetMsgTypeFilter "CScCtrl_18", -1
nbxSetMsgTypeFilter "CScCtrl_19", -1
nbxSetMsgTypeFilter "CScCtrl_20", -1
nbxSetMsgTypeFilter "CScCtrl_21", -1
nbxSetMsgTypeFilter "CScCtrl_22", -1
nbxSetMsgTypeFilter "CScCtrl_23", -1
nbxSetMsgTypeFilter "CScCtrl_24", -1
```

## 3Com NBX T1 Digital Line Card Installation and Trouble Shooting Guide

- 5) Capture the Hyperterminal screen. Transfer -> capture text-> type directory and folder.
- 6) **Make sure that logging is turned off when troubleshooting is completed. Logging that has been left on for too long can lock up or effect system performance.**
- 7) This can be done by setting all log devices and log level filters to ('4')
- 8) The following needs to be typed for the all the channels of T1 to disable logging.

nbxSetMsgTypeFilter "CSCtrl\_1", -0

### Section 2 Troubleshooting Outbound calls

```
0220:194212 CSCtrl_24 I State Idle - Event Setup - Next WinkWait
0220:194212 CSCtrl_24 I Event Setup - Called#14083265442 Calling#
0220:194212 CSCtrl_24 I Chan 24 sending Span Chan status 5
0220:194212 CSSpan I Chan 24 status 5
0220:194213 CSCtrl_24 I State WinkWait - Event Wink - Next DialComplete
0220:194215 CSCtrl_24 I State DialComplete - Event DialComplete - Next AnswerWait
0220:194218 CSCtrl_24 I State AnswerWait - Event RingbackStart - Next AnswerWait
0220:194239 CSCtrl_24 I State AnswerWait - Event OffHook - Next State Conversation
0220:194344 CSCtrl_24 I State Conversation - Event Disconnect - Next State WaitForOnHook
0220:194344 CSCtrl_24 I State Conversation - Event Disconnect - sending OnHook
0220:194344 CSCtrl_24 I State Conversaion - Event Disconnect - Next WaitForOnHook
0220:194346 CSCtrl_24 I State WaitForOnHook - Event OnHook - Next State Idle
0220:194346 CSCtrl_24 I State WaitForOnHook - Event OnHook - sending Release
0220:194346 CSCtrl_24 I State WaitForRlsComplete - Event ReleaseComplete - Next State Idle
0220:194346 CSCtrl_24 I Chan 24 sending Span Chan status 4
0220:194346 CSCtrl_24 I Chan 24 Idle
```

### Section 3 Troubleshooting Inbound Calls

```
0220:194248 CSCtrl_7 I State Idle - Event OffHook - Next State CollectDigits
0220:194248 CSCtrl_7 I State Idle - Event OffHook - enabling DTMF Det
0220:194248 CSCtrl_7 I State Idle - Event OffHook - sending Wink
0220:194248 CSCtrl_7 I Chan 7 sending Span Chan status 5
0220:194248 CSCtrl_7 I State CollectDigits - eDigitCollectionDTMF
0220:194248 CSSpan I Chan 7 status 5
0220:194248 CSCtrl_7 I State CollectDigits - Event DTMF Digit(s) 0 looking for 4 called# digits
0220:194248 CSCtrl_7 I State WaitForDigit - Event Digit - Next State WaitForDigit
0220:194249 CSCtrl_7 I State CollectDigits - Event DTMF Digit(s) 01 looking for 4 called# digits
0220:194249 CSCtrl_7 I State WaitForDigit - Event Digit - Next State WaitForDigit
0220:194249 CSCtrl_7 I State CollectDigits - Event DTMF Digit(s) 018 looking for 4 called# digits
0220:194249 CSCtrl_7 I State WaitForDigit - Event Digit - Next State WaitForDigit
0220:194249 CSCtrl_7 I State CollectDigits - Event DTMF Digit(s) 0185 looking for 4 called# digits
0220:194249 CSCtrl_7 I State CollectDigits - Done - CalledParty 0185 - CallingParty
0220:194250 CSCtrl_7 I State WaitForDigit - Event Digit - Next State WaitForAlert
0220:194250 CSCtrl_7 I State CollectDigits - Event DigitsComplete - Next State WaitForAlert
0220:194250 CSCtrl_7 I State CollectDigits - Event DigitsComplete - disabling DTMF Det
0220:194250 CSCtrl_7 I State CollectDigits - Event DigitsComplete - sending setup called# 0185 calling#
0220:194250 CSCtrl_7 I State WaitForAlert - Event Alert - Next State WaitForConnect
0220:194250 CSCtrl_7 I State WaitForAlert - Event Alert - enabling EnableCORingBack
0220:194313 CSCtrl_7 I State WaitForConnect - Event Connect - Next State Conversation
0220:194313 CSCtrl_7 I State WaitForConnect - Event Connect - disabling CORingBack
0220:194313 CSCtrl_7 I State WaitForConnect - Event Connect - sending OffHook
0220:194417 CSCtrl_7 I State Conversaion - Event OnHook - Next WaitForRelease
0220:194417 CSCtrl_7 I Sending Disconnect - Chan 7
0220:194417 CSCtrl_7 I State WaitforRelease - Event release - Next State WaitForGaurdTimeOut
0220:194422 CSCtrl_7 I State GaurdTimeOut - Event TimeOut - Next Idle
0220:194422 CSCtrl_7 I Chan 7 sending Span Chan status 4
0220:194422 CSCtrl_7 I Chan 7 Idle
0220:194422 CSSpan I Chan 7 status 4
```

Troubleshooting Tips :