

Lesson 4. NTools

Objectives:

- Open Ntools with options
- Under Ntools Screens and functions

Command Line Options

NetworkTools has seven command-line options: -c, -e, -pg, -pit, -l, -nl and -u.

Start NetworkTools at the command prompt with the line:

ntools -c to start it in “ControlNet” mode. In this mode Network Tools scans the supervisory segments for MAC Ids from 1 to 99.

ntools -e to start it in “EtherNet” mode. In this mode Network Tools gets a list of all installed EtherNet drivers and scans them periodically.

ntools -pg to enable updating of ControlNet parameters.

ntools -pit to allow setting ANY value of Network Update Time (NUT), when used with the -pg option. Using this option without using ‘-pg’ option does not permit updating of ControlNet parameters.

Command Line Options *continued*

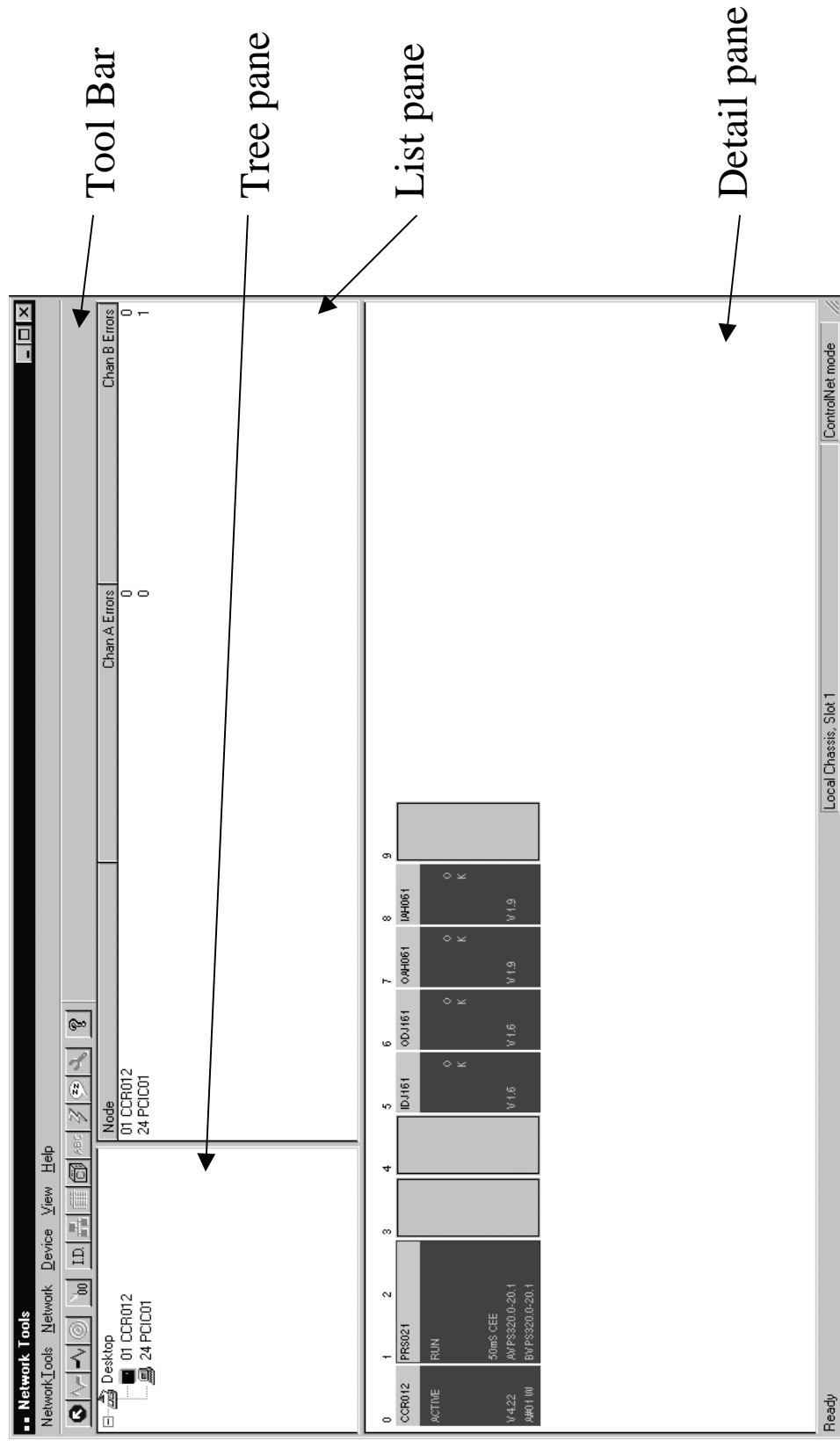
ntools -l to have it run in "Log" mode. This mode creates an ASCII text file called log.txt in the same directory in which NetworkTools lives. This contains a textual record of what modules were found on the last scan. The log.txt file also contains a "path string" (per module) that can be cut and pasted into the RSI ControlFlash tool. It will save you a few minutes when upgrading module firmware. Look for the word "ControlFlash" in the log.txt file.

Note: this option causes the log.txt file to be written every scan - this may be more hard drive activity than some users want. Suggestion: only use this when running NetworkTools in "ping" mode.

ntools -nl if you do not want to get warning messages (dialog boxed) for Lonely CNIs'. This is discouraged in normal practice but this warning may become a nuisance in certain commissioning situations.

ntools -u to enable you to Update the device firmware. See the Update Firmware from File topic for more information.

Ntools Main Window

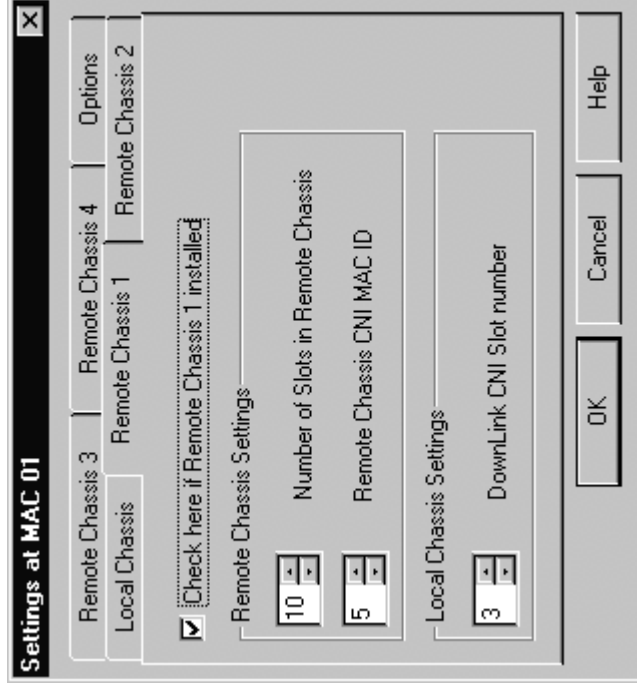
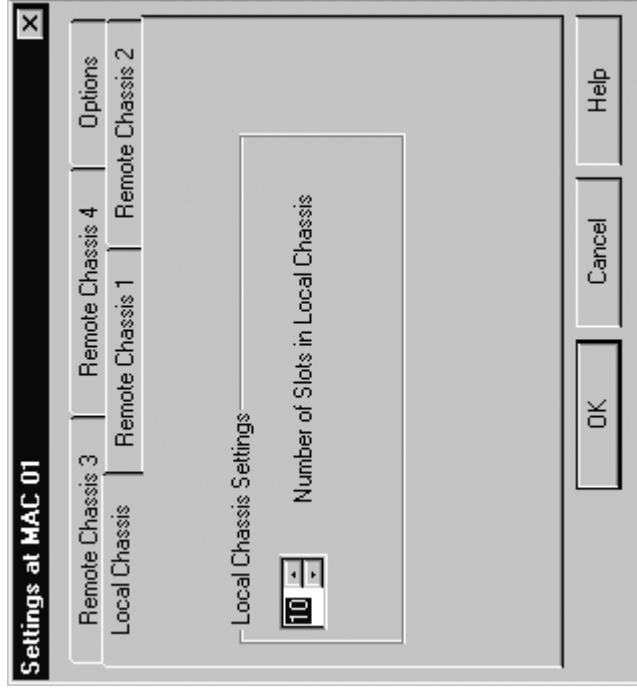


Tool Bar Icons



Settings

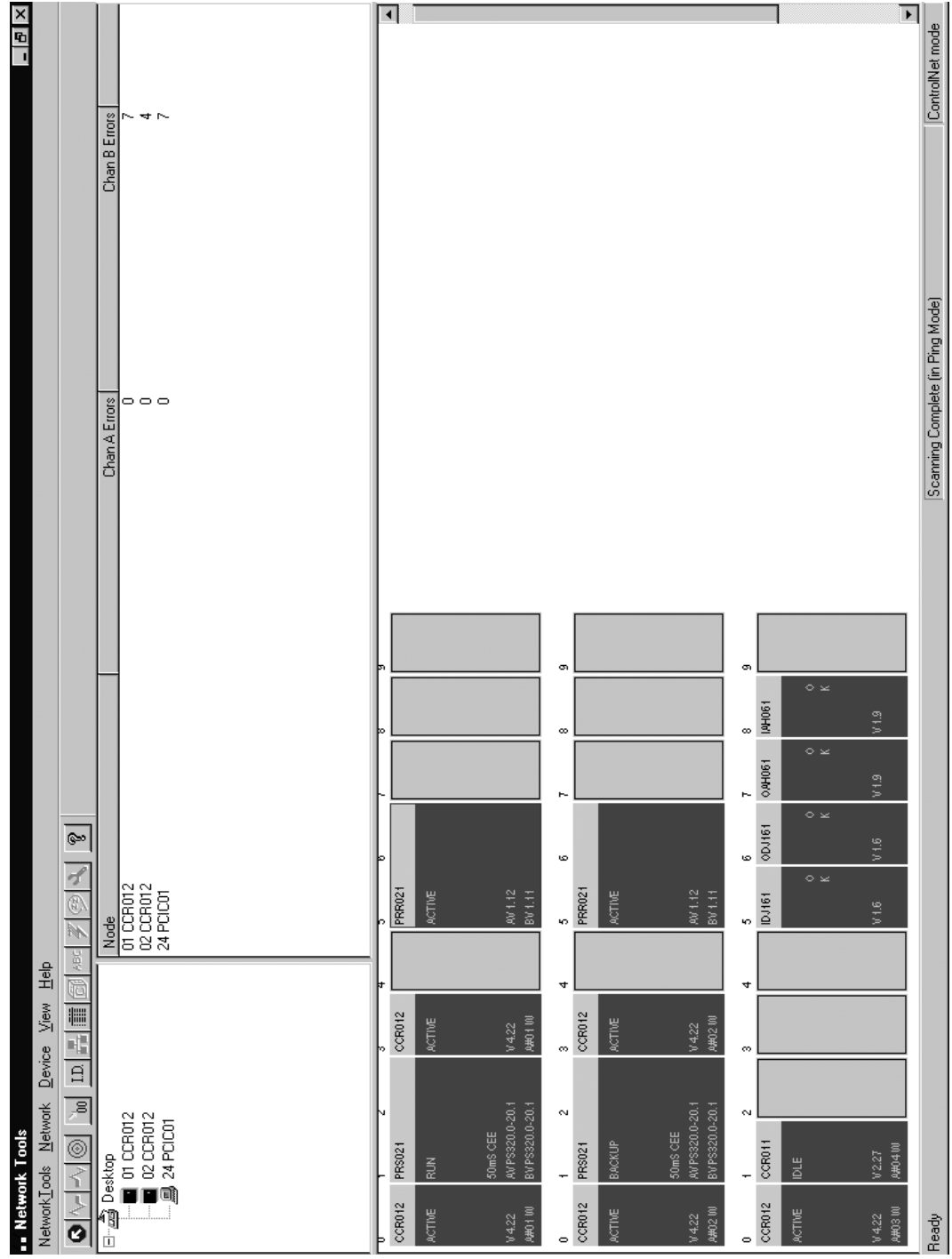
This menu pick launches the dialog that permits you to configure the Ntools display.






The Remote Chassis can be used to configure the detail panel to display up to five racks

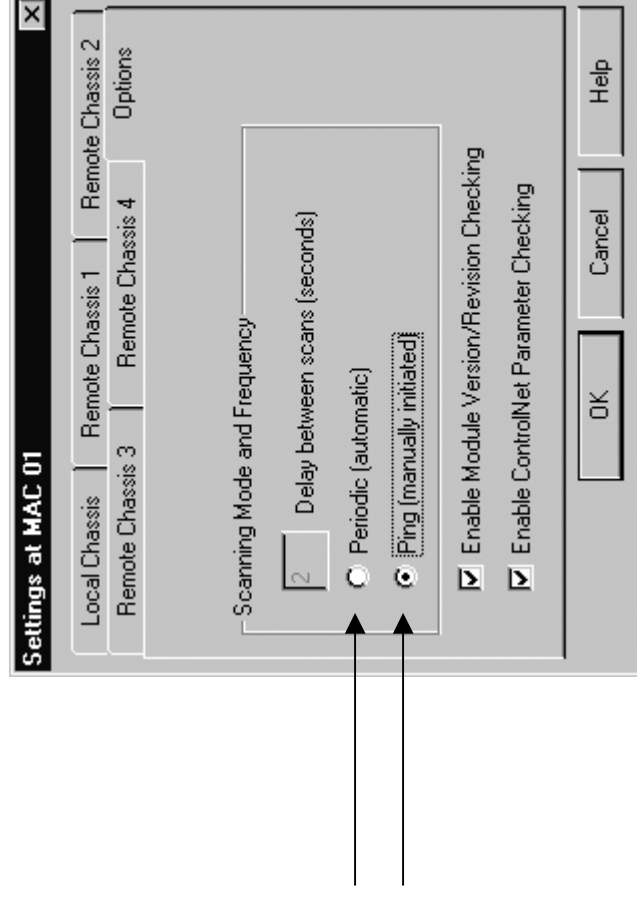
Tool Bar Icons *continued*

➤ Settings for redundant controller to show Primary, Secondary, and I/O racks




Tool Bar Icons *continued*

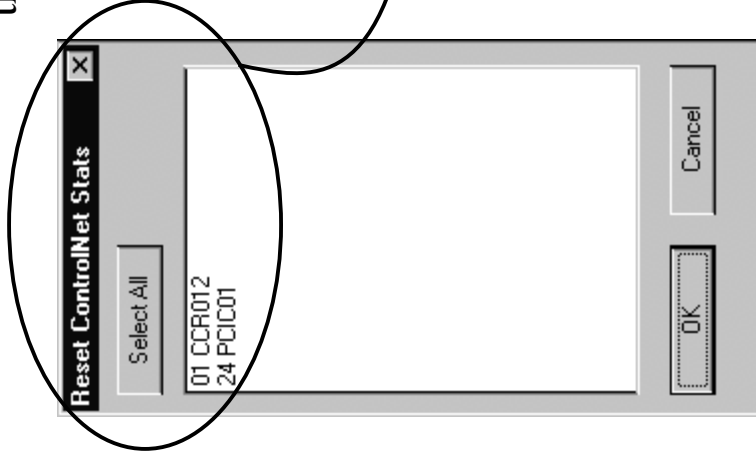
-  **Pause** - While the automatic scanning is taking place, selecting this icon the Pause will stop all scanning
-  **Resume** - While the automatic scanning is "Paused", selecting this icon will cause scanning to resume.
-  **Ping** - If the scanning mode selected in the Options page of the Settings dialog is "Ping (manual)" then this menu pick will be enabled. (This menu pick will be disabled if the "Periodic (automatic)" mode was chosen.)
Selecting this choice will cause exactly one scan.



Tool Bar Icons *continued*

 **Reset errors** - This menu pick launches a dialog with a multiple-selection list box so you can choose which node's error counters (in NetworkTools) are reset.

These counters are shown in the “List” pane (upper right portion of the main window).



Main window - List pane

Node	Chan A Errors	Chan B Errors
01 CCR012	0	1
24 PCIC01	0	1

Tool Bar Icons *continued*



Details - This menu pick launches a dialog to show the actual Device Identity Object contents for the selected module (the one with the red framing rectangle).



The 'Module Details' dialog box displays the following information:

Chassis: Local Slot: 0	
Vendor Code:	0x0003
Product Type:	12
Product Code:	8
Major Revision:	4
Minor Revision:	22
Status Value:	0x0060
Status String:	ACTIVE (CONNECT)
Serial Number:	0x000358b9
Name Length:	9
Name:	TC-CCR012

Buttons: OK

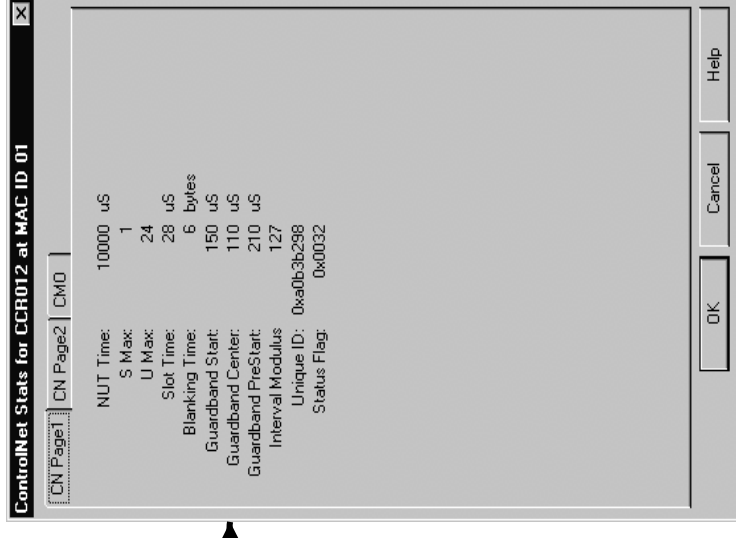
CCR012	PRS021	IDJ161	QDJ161	QAH061	IAH061	
ACTIVE	RUN	V1.5	V1.5	V1.9	V1.9	
V4.22	50ms CEE					
0A01 00	AVPSS320.0-20.1					
	BVPS320.0-20.1					

Tool Bar Icons *continued*



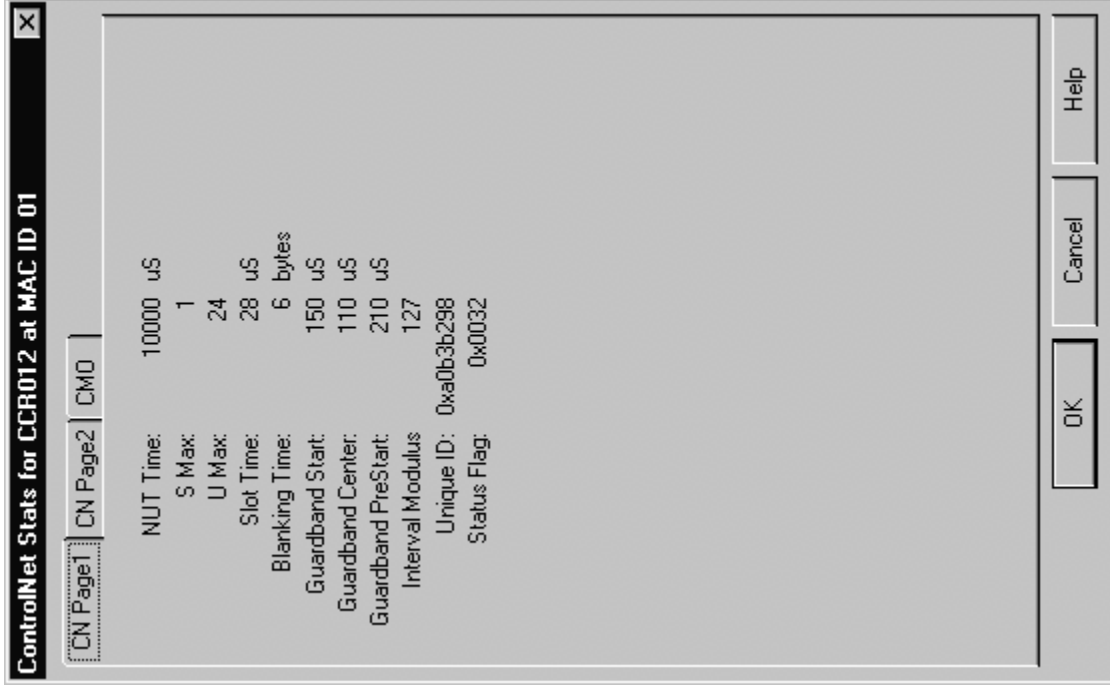
ContrlNet Stats - This menu choice launches a dialog to display three pages of ControlNet statistics as maintained by a particular CNI.

Note: The presently selected module (the one with the red framing rectangle) must be a CNI.



CCR012	PRS021	IDJ161	QDJ161	QAH061	IAH061	
ACTIVE	RUN	V1.5	V1.5	V1.9	V1.9	
V4.22	50ms CEE					
0A01 00	AVP320.0-20.1					
	BVP320.0-20.1					

ControlNet Stats Page 1



ControlNet Stats Page 1

- **The NUT Time** is the period at which the basic transfer of information on ControlNet occurs.
- **S Max and U Max** are the highest numbered node (ControlNet device) to participate in the Scheduled and Unscheduled portions, respectively, of the Net Time.
- **The Slot Time** is a specific network parameter relating to the time a node waits to hear activity.
- **The Blank Time** is a specific network parameter.
- **GB** stands for guardband and three times are defined: Start, Center and PreStart.
- **The Interval Modulus** is related to bandwidth loading across NUT Time periods.

ControlNet Stats Page 1 *continued*

- **The Unique ID** is a unique identifier. This helps resolve identity of nodes.
- **The Status Flag** is a bit field per the following: (see Knowledge Builder - Troubleshooting and Maintenance Guide - Network Tools)
- **TUI** is Table Unique Identifier and is a 32 bit CRC of important network parameters. It is calculated by the Keeper node and distributed to all other nodes as a security protocol.
- **The Keeper** (ControlNet Configuration Manager) is the object that is in the CNI that holds the operational network parameters.

ControlNet Stats Page 2

ControlNet Stats for CCR012 at MAC ID 01

CN Page1

CN Page2

CMD

	CNI	NTools
Buffer Errors:	0	
Error Log:	n/a	
Good Frames Transmitted:	9998490	
Good Frames Received:	8154207	
Selected Channel Frame Errors	0	
Channel A Frame Errors:	0	0
Channel B Frame Errors:	95	0
Aborted Frames Transmitted:	0	
Highwaters	0	
NUT Overloads	0	
Slot Overloads	0	
Blockages:	0	
Non-Concurrences:	0	
Aborted Frames Received:	0	
Lonely Counter:	0	
Duplicate Node:	0	
Noise Hits:	0	
Collisions:	0	
Moderator MAC ID:	1	
Non-Lowman Moderators:	0	
Mismatch:	0	
Unheard Moderator:	0	
SM Commands:	0	
Pre-Reset Fault:	0	
Post-Reset Fault:	0	

OK

Cancel

Help

Reset

ControlNet Stats Page 2 *continued*

- **Buffer Errors** - Buffer Errors is the buffer event counter.
- **Error Log** - is the bad MAC Frame log.
- **Good Frames Transmitted** - is the number of good frames.
- **Good Frames Received** - is the number of good frames.
- **Selected Channel Frame Errors** - is the number of framing errors in the active receive channel.
- **Channel A Frame Errors** - is the number of framing errors on A.
- **Channel B Frame Errors** - is the number of framing errors on B.

ControlNet Stats Page 2 *continued*

- **Aborted Frames Transmitted** - is the number of aborted transmissions (due to underflows).
- **Highwaters** - is the maximum of: transmit/receive FIFO under/overflows and out-of-step events.
- **NUT Overloads** - is the number of occurrences when there was no unscheduled time in the NUT.
- **Slot Overloads** - is the number of occurrences of more scheduled data queued for one NUT than allowed by the sched_max_frame parameter.
- **Blockages** - Blockages is the number of Lpackets which exceed the sched_max_frame parameter.

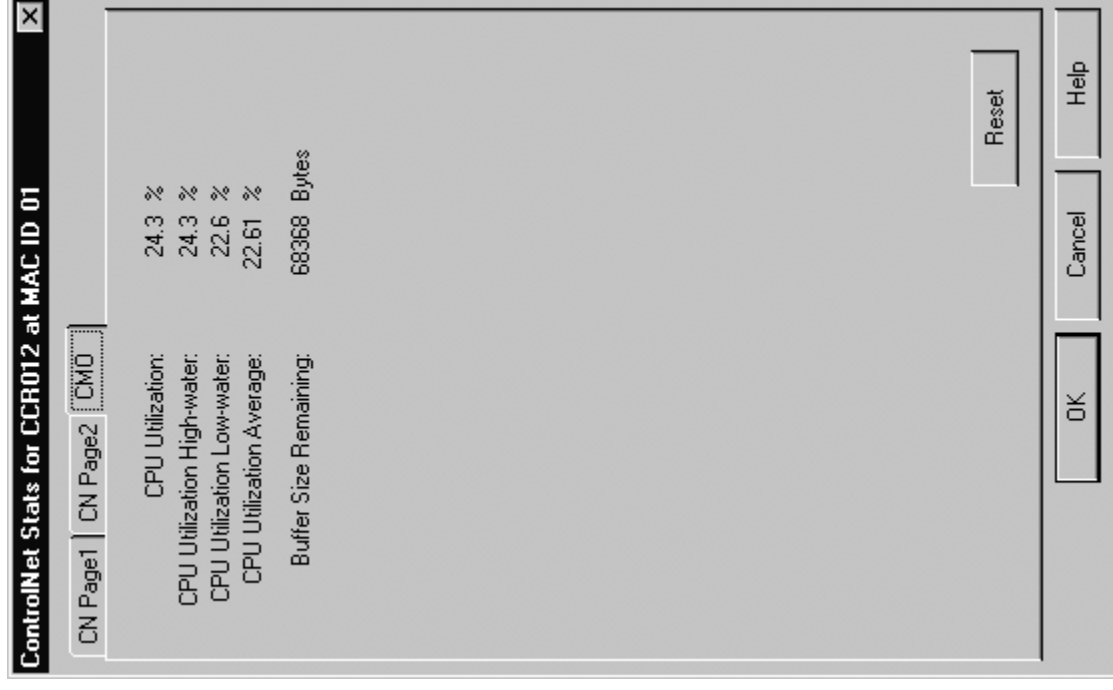
ControlNet Stats Page 2 *continued*

- **Non-Concurrences** - Non-Concurrences is the count of cases where two or more nodes can't agree on whose turn it is to transmit.
- **Aborted Frames Received** - Aborted Frames Received is the count of incomplete can't agree on whose turn it is to transmit.
- **Lonely Counter** - Lonely Counter is the number of times nothing heard for eight or more NUTs.
- **Duplicate Node** - Duplicate Node is the count of frames received with this node's MAC ID.
- **Noise Hits** - Noise Hits is the count of noise hits which briefly synched the modem receive PLL (but were not associate with the reception of a frame).
- **Collisions** - Collisions is the count of cases where receive data was heard just when this node was to transmit.

ControlNet Stats Page 2 *continued*

- **Moderator MAC ID** - Moderator MAC ID is just that.
- **Non-Lowman Moderators** - is the count of moderator packets heard from non-lowman nodes.
- **Mismatch** - is the count of cases where the moderator frame received does not match the link configuration information in this node.
- **Unheard Moderator** - is the count of cases where normal packets are being heard but not moderator packets.
- **SM Commands** - is the number of Station Management commands heard on the network.
- **Pre-Reset Fault** - is a fault condition detected prior to reset.
- **Post-Reset Fault** - Post-Reset Fault is a fault condition retained after reset.

ControlNet Stats Page 3



ControlNet Stats Page 3 *continued*

- **CPU Utilization** - is a number between 0 and 100.
- **PU Utilization Highwater** - is the highest value of CPU Utilization while this dialog page has been displayed.
- **CPU Utilization Lowwater** - is the lowest value of CPU Utilization while this dialog page has been displayed.
- **CPU Utilization Average** - A 2 minute first-order lag average of the CPU Utilization.
- **Buffer Size Remaining** - Buffer Size Remaining is just that.
- **The Reset Button** causes a reset to the logic involved in the calculation of CPU Utilization Highwater, CPU Utilization Lowwater and CPU Utilization Average . This has the same effect as tabbing to another page and then tabbing back to the Connection Manager Stats page.

Tool Bar Icons *continued*



History - History of the RM (events) and history of the CPM (bread crumbs) can be shown. (Only available to redundant controller systems)

The screenshot shows the 'RM Event Log' window with a table of events and a 'Set Time for RM Event Log' dialog box. The table has columns for #, Mod, Slot, S/N, Src, Class, ID, and Ext Data. The dialog box has fields for Zone, Year, Month, Day, Hour, and Minute, and a list of time zones.

#	Mod	Slot	S/N	Src	Class	ID	Ext Data
00009425	RM	05	2551452693	T	State Changes	Chassis redundancy state PwQS	RM Extended info
00009424	RM	05	2551452693	T	Qualification	Qualification Complete	RM Extended info
00009423	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00] Auto Trigg
00009422	RM	05	2551452693	T	Qualification	Autoqual. Trigger	[0x00] PwDS Stat
00009421	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info
00009420	CPM	01	278475636	T	Synchronization	LOS_CPM_CONFIG_LOAD_IN_PROG...	[0a] 0008000e 0C
00009419	RM	05	2551452693	T	State Changes	Chassis redundancy state PwQS	RM Extended info
00009418	RM	05	2551452693	T	Qualification	Qualification Complete	RM Extended info
00009417	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00] Auto Trigg
00009416	RM	05	2551452693	T	Qualification	Autoqual. Trigger	[0x00] PwDS Stat
00009415	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info

Use Copy of Partner's Log ☐ Quantity 5 to get

Set Time for RM Event Log

Zone 5 Year 2001 Month 2 Day 14 Hour 15 Minute 30

Zones:

- 0-4 (display as xT)
- 5 Eastern Time
- 6 Central Time
- 7 Mountain Time
- 8 Pacific Time
- 9-23 (display as xT)

History

RM Event Log									
#	Mod	Slot	S/N	Src	Class	ID	Ext Data		
00009425	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info		
00009424	RM	05	2551452693	T	Qualification	Qualification Complete	RM Extended info		
00009423	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00] Auto Trigg		
00009422	RM	05	2551452693	T	Qualification	Autoqual Trigger	[0x00] PwDS Stat		
00009421	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info		
00009420	CPM	01	278475636	T	Synchronization	LOS_CPM_CONFIG_LOAD_IN_PROG...	(0a) 0008000e 0C		
00009419	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info		
00009418	RM	05	2551452693	T	Qualification	Qualification Complete	RM Extended info		
00009417	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00] Auto Trigg		
00009416	RM	05	2551452693	T	Qualification	Autoqual Trigger	[0x00] PwDS Stat		
00009415	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM Extended info		

Knowledge Builder / Troubleshooting and Maintenance Guide / RM fault codes

Cause: The RM either entered this state from qualification due to an autoqualification trigger or a command.

Corrective Action: None. Event posted for information purposes only.

History - CPM Breadcrumbs

RM Event Log							Ext D
#	Mod	Slot	S/N	Src	Class	ID	Ext D
00009449	RM	05	2551452693	T	State Changes	Chassis redundancy state PwQS	RM E:
00009448	RM	05	2551452693	T	Qualification	Qualification Complete	RM E:
00009447	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00]
00009446	RM	05	2551452693	T	Qualification	Autoqual. Trigger	[0x01]
00009445	CPM	01	278475636	T	Qualification	SYN_PARTNER_STARTUP_COMPLETE	CPM
00009444	RM	05	2551452693	T	State Changes	Chassis redundancy state PwQS	RM E:
00009443	RM	05	2551452693	T	Qualification	Qualification Abort	[0x02]
00009442	RM	05	2551452693	T	Qualification	Module Rejected Qualification	Slot 0:
00009441	RM	05	2551452693	T	Qualification	Qualification Attempted	[0x00]
00009440	RM	05	2551452693	T	Qualification	Autoqual. Trigger	[0x03]
00009439	RM	05	2551452693	T	State Changes	Chassis redundancy state PwDS	RM E:

☐ Use Copy of Partner's Log

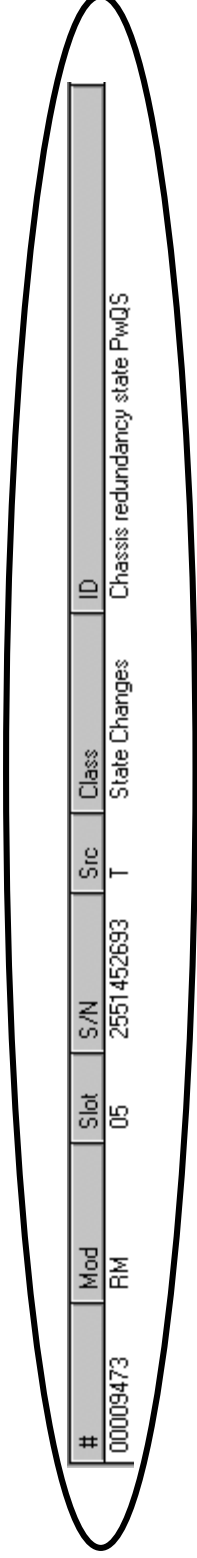
Quantity to get

Knowledge Builder / Troubleshooting and Maintenance Guide / Network Tools

Description: The CPM has attempted to trigger initial synchronization due to completion of the secondary CPM system startup.

Cause: Secondary CPM system startup completion

History Detail



#	Mod	Slot	S/N	Src	Class	ID
00009473	RM	05	2551452693	T	State Changes	Chassis redundancy state PwQS

- **Entry Number** - Sequential number, unique to each entry.
- **Module** - Type of module that submitted the event based on its Product Type and Product Code attributes.
- **Slot Number** - Slot number of module that submitted the event.
- **Serial Number** - Serial Number of module that submitted the event.
- **Source** - In addition to viewing the RM's log the Network Tools utility allows the user to the RM's copy of its partner RMs log. To distinguish which RM log is being displayed the Network Tools utility specifies the RM log source as "T" or "O" for **This RM** or the **Other RM** respectively.
- **Event Class** - Represents the event classification.
- **Event ID Module** - specific event.

History Detail *continued*



Ext Data	Evt Time	Log Time	Subsystem	Function	Error
RM Extended info unused	10562:21:08:30.640.520	2000/12/01...			

- **Extended Event Info.** - Module-specific extended event data.
- **Event Time-stamp** - Time that event was observed on module that submitted the event.
- **Logging Time-stamp** - RM time that event was stored into the event log.

Tool Bar Icons *continued*



Crash Block - If a CPM, SIM or FEE is selected you can save the Crash Block (with stack info). Outputs a text file for use by TAC



Firmware - Updating device firmware should not be done on-process. The "Update Firmware from file" menu pick can only be used if you launched Network Tools with the -u command line option.

Crash Block Output File

CPM0101:

BOOT FILENAME = cpmboot2
BOOT VERSION = PS320.0-20.1
BOOT CREATED = Tue Sep 12 10:29:40 2000
PERSONALITY = ceerex2
FILE VERSION = PS320.0-20.1
FILE CREATED = Tue Sep 12 10:50:09 2000
CR = 0x00000000 MSR = 0x00000000 HID0 = 0x00000000 XER = 0x00000000
LR = 0x00000000 CTR = 0x00000000 SRR0 = 0x00000000 SRR1 = 0x00000000
DEC = 0x00000000 IP = 0x00000000 HSR = 0x00000000
DSISR = 0x00000000 DAR = 0x00000000

R00	= 0x00000000	R01	= 0x00000000	R02	= 0x00000000	R03	= 0x00000000
R04	= 0x00000000	R05	= 0x00000000	R06	= 0x00000000	R07	= 0x00000000
R08	= 0x00000000	R09	= 0x00000000	R10	= 0x00000000	R11	= 0x00000000
R12	= 0x00000000	R13	= 0x00000000	R14	= 0x00000000	R15	= 0x00000000
R16	= 0x00000000	R17	= 0x00000000	R18	= 0x00000000	R19	= 0x00000000
R20	= 0x00000000	R21	= 0x00000000	R22	= 0x00000000	R23	= 0x00000000
R24	= 0x00000000	R25	= 0x00000000	R26	= 0x00000000	R27	= 0x00000000
R28	= 0x00000000	R29	= 0x00000000	R30	= 0x00000000	R31	= 0x00000000

Application error address - 0x0

Initialized data address 0x00000000 (size 0x0)
Uninitialized data address 0x00000000 (size 0x0)
Stack address 0x00000000 (size 0x0)

Tool Bar Icons *continued*



Sim Details - If a Serial Interface Module (Sim) is selected you can display the strings corresponding to each FTA. See *Knowledge Builder/Serial Interface Implementation Guide* for more information



Change ControlNet - This powerful feature should only be used by those with a thorough understanding of the operation of ControlNet. Please contact your authorized service representative.

The reason this is under the "Device" menu is that one must select a CNI with MAC ID 1 (the Keeper) for NetworkTools to effect the network changes operation.

CNIs have the Keeper Object that orchestrates the distribution of new network parameters to all segment nodes.

Keeper Values

Changes

Present Keeper

Future Keeper

New Parameters

NUT Time:10000microSeconds

SMax:1(Max Scheduled)

UMax:24(Max Unscheduled)

Number of Repeaters:0

Cable Length:0meters

Cable Usage:A

My System uses Fiber Optics:☐

Background Information

The values for Number of Repeaters, the Cable Length and the Fiber Optics checkbox are not stored in the Device. They are provided above as suggested values for the new programming should you decide to proceed. Edit the values to reflect your system.

OK

Cancel

Help

Present Keeper

Future Keeper

NUT Time:10000uS

SMax:1

UMax:24

Slot Time:6bytes

Blanking Time:150uS

ardband Start:110uS

rdband Center:210uS

band PreStart:127

erval Modulus:0xa0b3b298

Unique ID:A

Cable Usage:384Kbytes/S

um Bandwidth:(point-to-point)

Status:Master

OK

Cancel

Help

Present Keeper

Future Keeper

NUT Time:10000uS

SMax:1

UMax:24

Slot Time:6bytes

Blanking Time:140uS

ardband Start:100uS

rdband Center:190uS

band PreStart:127

erval Modulus:0x6c09f60d

Unique ID:A

Cable Usage:384Kbytes/S

um Bandwidth:(point-to-point)

OK

Cancel

Help