Cyrano to OptoControl Migration Technical Note

Introduction

Before OptoControl™ came along, Opto 22's Cyrano 200 Visual Control Language was state-of-the-art. Then came OptoControl, and now we offer PAC Control.

Customers who have used Cyrano are now taking advantage of newer hardware and features by migrating to OptoControl and PAC Control. Migration to PAC Control requires the intermediate step of migrating to OptoControl.

This document shows you how to convert a Cyrano strategy to OptoControl and briefly reports the major differences between the two programs. It also compares the command sets for the two languages.

NOTE: If you will be migrating to PAC Control after moving to OptoControl, you'll also need Opto 22 form #1692, FactoryFloor to PAC Project Migration Technical Note*. This form is available on our website, www.opto22.com. The easiest way to find it is to search on the form number.*

Converting a Cyrano Strategy

Planning step: It may be necessary to upgrade I/O unit firmware before the strategy can be run in OptoControl. Contact Opto 22 Product Support to request appropriate EPROMs for the firmware upgrade.

To become familiar with the conversion process, Opto 22 recommends doing a test conversion of the strategy. This way, you can see what is involved before committing to the conversion.

To convert a Cyrano program into an OptoControl strategy, you must first open it in OptoControl using the steps on page 2. OptoControl converts the database, charts, most commands, and so on to OptoControl format. Note that OptoControl will not convert any motion commands (nuLogic motion products) and will not convert any external commands.

Converting Pre-3.0 Cyrano Strategies

NOTE: For very old versions of Cyrano, it may be necessary to upgrade to Cyrano 1.5 before converting to Cyrano 3.3.

If you are converting a pre-3.0 Cyrano strategy into OptoControl, start with these steps:

1. Open the older Cyrano strategy in Cyrano 3.3a.
2. Save the strategy, and then exit Cyrano.
3. Run the DOS utility CYRFIX.EXE (located in the Cyrano sub directory) to make certain all the Cyrano strategy tags have been updated properly. After launching CYRFIX.EXE, type in the full DOS directory path name along with the full strategy name to properly process all the Cyrano strategy files.

   Example: `C:\Cyrano\cyrfix.exe C:\directory\strategy.gml`
4. When the tags are updated, continue with the conversion steps in the next section.

Conversion Steps

1. Close any strategy you may have open in OptoControl, then select File→OpenStrategy.
2. To locate a Cyrano strategy, click the "Files of type" field at the bottom of the dialog box and select "Cyrano Strategy Files (*.gml)."

   Cyrano strategies appear in the window.
3. Navigate to a directory containing the Cyrano program you wish to convert and double-click the .gml file to open it.
4. In the Convert Cyrano Strategy dialog box, navigate to a location and create a new directory for the converted strategy. Remember that each OptoControl strategy must be stored in its own directory. Click Open.

   OptoControl begins the conversion process. When the strategy is in OptoControl format, the Strategy Tree for the newly-converted strategy appears.

If any errors are encountered during the conversion, they appear in the Information Window under the title "Errors During Conversion." You can review this file on screen, but we recommend printing a copy to look through it on paper.

Typical conversion errors include unknown commands, commands that are no longer used, and invalid subroutine references. The chart and block containing each command are listed so you can open each block and resolve the problem. When you open a block, you will notice each problem command has been incorporated into a single-line comment, such as "Invalid command," "Action #140 undefined," and "Invalid subroutine reference." You can then replace the comment with an appropriate new command.

NOTE: If you run into issues that cannot be corrected, it may be necessary to convert from Cyrano to OptoControl 2.2 first. Once this conversion is successful, then upgrade from OptoControl 2.2 to 4.1.

Graphics

Since the conversion of graphics from DOS-based Cyrano to OptoControl is very basic, you will probably want to adjust the size of blocks, connecting lines, and text so that charts are optimized for your window size. If you find that the chart at 50% is too small, but at 100% you cannot see enough of it, for example, you may need to change block, line, and text sizes. Unfortunately there is no shortcut for changing sizes.

You can set the size of blocks and text to the default properties of OptoControl so that the charts are easier to read. You will also need to move the blocks around and adjust the connection lines to make the chart graphics look good. Remember to allocate time for changing graphics as part of converting your strategy from Cyrano to OptoControl.

Differences in Functionality

If you are familiar with Cyrano, you will enjoy a smooth transition to the way OptoControl works, since the fundamental concept of designing a control application through flowcharts remains the same.

There are some important differences between the two programs, however, besides the obvious enhancements OptoControl offers in appearance and interaction. We'll look at the most important of these here.

Modes Instead of Modules

Whereas Cyrano includes individual modules for separate tasks, OptoControl integrates all of these into one program. Each major set of tasks is available within one of three OptoControl modes: Configure, Debug, and Online. These modes correspond to Cyrano's Configurator, Debugger, and Online modules. Cyrano's Subroutine module provides subroutine configuration capabilities that have been integrated directly into OptoControl's Configure and Online modes.

Multiple Windows

You can have multiple windows open at once in OptoControl. This means, for example, that you can view and exchange information between two or more charts at the same time. You can dock Strategy Tree and watch windows so they always remain where you want them, and switch between open charts by just clicking the chart tab.

You can also place several items—I/O points, charts, variables, and so on—in the same watch window in Debug mode to view and manipulate them.

New Download Utility

Cyrano's Flash200 utility for downloading firmware to a controller has been replaced by OptoTerm. This utility is installed as part of the OptoUtilities set during OptoControl installation. See the *OptoControl User's Guide* for details on OptoTerm, including how to download firmware.

New Table Sizes

In Cyrano, when you declared a table of size 10, for example, 11 elements were created. This was done to allow you to reference table indices zero through nine or one through 10, whichever you preferred.

In OptoControl, tables are indexed zero through (n-1). For example, a table declared with a length of 10 will contain 10 entries indexed as zero through nine.

During conversion of a Cyrano strategy, all tables are automatically lengthened by one index number to resolve any possible conflicts. For example, a 10-element table in Cyrano will become an 11-element table in OptoControl, allowing the strategy to continue referencing indices zero through nine or one through 10 as referenced in the original Cyrano strategy. Make sure you check table lengths and usage of table indices in the converted strategy.

Integrated Initialization

Whereas Cyrano provides a separate Init utility to handle the initialization of variables and I/O, OptoControl allows you to specify initial values right when you configure the elements.

An exception to this is that to initialize numeric, string, or pointer table entries to individual values, rather than to one value for all entries, you will need to create and download a separate initialization file.

Embedding of Control Characters

Some control characters cannot be embedded within strings in OptoControl as they were in Cyrano. However, OptoControl does allow you to append control characters to strings one at a time, thereby allowing you to construct a string with control characters included.

The control characters affected are:

- Null ("\00")
- Line Feed ("\0A")
- Carriage Return ("\0D")
- Backspace ("\08")
- ctrl+z ("\1A")

Auto Stepping Behavior

Both Cyrano and OptoControl provide the ability to auto step through a chart. The only noticeable difference in functionality between the two programs occurs when auto stepping is stopped. In OptoControl, a chart will pause if it is auto stepping and the Auto Step toolbar button is clicked. If a chart is auto stepping and you wish to have it start executing at full speed, click the Pause button instead of the Auto Step button in the toolbar.

Event/Reaction Groups

OptoControl allows event/reactions to be organized in groups of 16. You can name these groups and manipulate them as a whole. This functionality did not exist in Cyrano.

Notes on Ports

The following ports are used in OptoControl:

Port	Use
0–3	Serial ports
4	ARCNET host port
5	Front-panel display on G4LC32; ISA bus port on ISA controllers
6	Local bus I/O port
7	ARCNET peer port
8	Ethernet host port
9–10	Ethernet peer ports
12–19	Twisted-pair ARCNET ports

Note that Cyrano had only one command to move a table to a port (MOVE FROM TABLE TO PORT), which specified which port to use. OptoControl, however, has separate commands for serial (0–3), ARCNET peer (7), or Ethernet peer (9 or 10) ports: Transmit Table via Serial Port, Transmit Table via ARCNET, and Transmit Table via Ethernet. In the conversion process, all MOVE FROM TABLE TO PORT commands default to Transmit Table via Serial Port. If your Cyrano strategy used ARCNET or Ethernet ports with this command, you must manually change the OptoControl command to the correct one for the port used.

New Command Set

OptoControl's command set is an enhanced and expanded version of the Cyrano command set. While the two overlap a great deal, OptoControl includes numerous commands not featured in Cyrano. In addition, in many instances, two Cyrano commands were combined into a single

OptoControl command. Some Cyrano commands were split into two or three OptoControl commands. Still other Cyrano commands were eliminated because they are now obsolete.

Perhaps the most obvious difference between the two command sets is that OptoControl commands feature Title Capitalization Like This, rather than the ALL CAPS style featured in Cyrano commands.

OptoControl provides three ways to select commands — typing them in directly, selecting from an alphabetical list, and selecting from command groups. To further help those of you familiar with Cyrano to select the right command in OptoControl, the next several pages provide a list of all Cyrano commands and their OptoControl equivalents. Some of these commands are different from the Cyrano versions; these have notes about the differences. Be sure to review this list and the use of these commands in your strategy and make adjustments as necessary.

The commands are listed on the following pages and organized by type: actions (called "operations" in Cyrano) are listed first, then conditions. Following both is a list of new OptoControl commands, also organized by type. Note that any Cyrano commands that are now obsolete are marked.

To get help on any command, select the command in the Add Instruction dialog box and press F1. The online help will give you information from the *OptoControl Command Reference*.

Action Commands

Cyrano Operation Command	OptoControl Action Command
# OF CHARACTERS WAITING (PORT)	(obsolete)
# OF CHARACTERS WAITING FROM PORT [ports 0–7]	Get Number of Characters Waiting [ports 0–3, 4, or 7–10; not 5 or 6]
\ COMMENT	Comment (Single Line)
\\ COMMENT	Comment (Block)
AND	AND
APPEND CHARACTER	Append Character to String
APPEND STRING	Append String to String
BIT AND	Bit AND
BIT CLEAR	Bit Clear
BIT NOT	Bit NOT
BIT OR	Bit OR
BIT ROTATE	Bit Rotate
BIT SET	Bit Set
BIT SHIFT	Bit Shift

Cyrano Operation Command	OptoControl Action Command
BIT TEST	Bit Test
BIT XOR	Bit XOR
CALC & SET ANALOG GAIN	Calculate & Set Analog Gain
CALC & SET ANALOG OFFSET	Calculate & Set Analog Offset
CALCULATE STRATEGY CRC	Calculate Strategy CRC
CLEAR ALL ERRORS	Clear All Errors
CLEAR ALL EVENT LATCHES	Clear All Event Latches
CLEAR ALL LATCHES	Clear All Latches
CLEAR EVENT LATCH	Clear Event Latch
CLEAR I/O UNIT INTERRUPT	Clear I/O Unit Interrupt
CLEAR OFF-LATCH	Clear Off-Latch
CLEAR ON-LATCH	Clear On-Latch
CLEAR RECEIVE BUFFER	Clear Receive Buffer
CLEAR RECEIVE BUFFER (PORT)	(obsolete)
COMPLEMENT	Complement
CONFIGURE PORT	Configure Port
CONTINUE CALLING CHART	Continue Calling Chart
CONTINUE CHART	Continue Chart
CONV FLOATING POINT # TO STRING	Convert Float to String
CONV FORMATTED # TO HEX STRING	Convert Number to Formatted Hex String
CONV IEEE HEX STRING TO NUMBER	Convert IEEE Hex String to Number
CONV STRING TO INTEGER #	Convert String to Integer
CONVERT HEX STRING TO NUMBER	Convert Hex String to Number
CONVERT NUMBER TO HEX STRING	Convert Number to Hex String
CONVERT NUMBER TO STRING	Convert Number to String
CONVERT NUMBER TO STRING FIELD	Convert Number to String Field
CONVERT STRING TO FLOATING POINT #	Convert String to Float
COPY DATE TO STRING (EUR)	Copy Date to String (YY/MM/DD)
COPY DATE TO STRING (U.S.)	Copy Date to String (MM/DD/YY)
COPY TIME TO STRING	Copy Time to String

Cyrano Operation Command	OptoControl Action Command
DECREMENT VARIABLE	Decrement Variable
DELAY (MSEC)	Delay (mSec)
DELAY (SEC)	Delay (Sec)
DISABLE ANALOG POINT	Disable Communication to Analog Point
DISABLE DIGITAL POINT	Disable Communication to Digital Point
DISABLE EVENT SCANNING	Disable Scanning For All Events
DISABLE EVENT/REACTION	Disable Communication to Event/Reaction
DISABLE I/O UNIT	Disable Communication to I/O Unit
DISABLE INTERRUPT ON EVENT	Disable Interrupt on Event
DISABLE ON I/O UNIT ERROR	Disable I/O Unit Causing Current Error
DISABLE PID LOOP	Disable Communication to PID Loop
DISABLE SCAN FOR EVENT	Disable Scanning for Event
DO ADDITION	Add
DO BINARY ACTIVATE	(obsolete)
DO BINARY DEACTIVATE	(obsolete)
DO BINARY READ	Get Digital I/O Unit as Binary Value
DO BINARY WRITE [Uses one argument for turn-on and turn-off masks]	Set Digital I/O Unit from MOMO Masks [Uses two separate arguments for turn-on and turn-off masks]
DO DIVIDE	Divide
DO MODULO	Modulo
DO MULTIPLY	Multiply
DO SUBTRACTION	Subtract
ENABLE ANALOG POINT	Enable Communication to Analog Point
ENABLE DIGITAL POINT	Enable Communication to Digital Point
ENABLE EVENT SCANNING	Enable Scanning for All Events
ENABLE EVENT/REACTION	Enable Communication to Event/Reaction
ENABLE I/O UNIT	Enable Communication to I/O Unit
ENABLE INTERRUPT ON EVENT	Enable Interrupt on Event
ENABLE ON I/O UNIT ERROR	Enable I/O Unit Causing Current Error
ENABLE PID LOOP	Enable Communication to PID Loop

Cyrano Operation Command	OptoControl Action Command
ENABLE SCAN FOR EVENT	Enable Scanning for Event
GENERATE N PULSES	Generate N Pulses
GET AND CLEAR COUNTER VALUE	Get & Clear Counter
GET AND CLEAR OFF-LATCH VALUE	Get & Clear Off-Latch
GET AND CLEAR ON-LATCH VALUE	Get & Clear On-Latch
GET AND CLEAR QUADRATURE VALUE	Get & Clear Quadrature Counter
GET ARCNET DEST ADDR	Get ARCNET Destination Address
GET BAD I/O UNIT ADDRESS	Get Address of I/O Unit Causing Current Error
GET BAD I/O UNIT PORT	Get Port of I/O Unit Causing Current Error
GET CHAR (PORT)	(obsolete)
GET CHR FROM PORT [ports 0–7]	Receive Character via Serial Port [ports 0–3. Use other commands for ARCNET and Ethernet ports.]
GET CHART STATUS	Get Chart Status
GET COUNTER VALUE	Get Counter
GET DAY	Get Day
GET DAY OF WEEK	Get Day of Week
GET ERROR CODE	Get Error Code of Current Error
GET ERROR COUNT	Get Error Count
GET FREQUENCY	Get Frequency
GET HOURS	Get Hours
GET MINUTES	Get Minutes
GET MONTH	Get Month
GET NTH CHARACTER	Get Nth Character
GET OFF-LATCH VALUE	Get Off-Latch
GET OFF-PULSE MEAS	Get Off-Pulse Measurement
GET OFF-PULSE MEAS AND RESTART	Get & Restart Off-Pulse Measurement
GET OFF-PULSE MEAS COMP. STAT	Get Off-Pulse Measurement Complete Status
GET ON-LATCH VALUE	Get On-Latch
GET ON-PULSE MEAS	Get On-Pulse Measurement

Cyrano Operation Command	OptoControl Action Command
GET ON-PULSE MEAS AND RESTART	Get & Restart On-Pulse Measurement
GET ON-PULSE MEAS COMP. STAT	Get On-Pulse Measurement Complete Status
GET PEER DESTINATION ADDRESS	Get ARCNET Peer Destination Address
GET PERIOD	Get Period
GET PERIOD AND RESTART	Get & Restart Period
GET QUADRATURE VALUE	Get Quadrature Counter
GET RTU TEMPERATURE	Get RTU/DAS/IO Temperature
GET RTU VOLTAGE	Get RTU/DAS/IO Voltage
GET SECONDS	Get Seconds
GET SIZE OF NUMERIC TABLE [Size of 10 means valid indices are 0–10.]	Get Length of Table [Size of 10 means valid indices are 0–9.]
GET SIZE OF STRING TABLE [Size of 10 means valid indices are 0–10.]	Get Length of Table [Size of 10 means valid indices are 0–9.]
GET STRING (PORT)	(obsolete)
GET STRING LENGTH	Get String Length
GET SUBSTRING	Get Substring
GET THIS CONTROLLER'S ADDRESS	Get Controller Address
GET TOTALIZE OFF VALUE	Get Off-Time Totalizer
GET TOTALIZE ON VALUE	Get On-Time Totalizer
GET YEAR	Get Year
GET/RESTART TOTALIZE OFF VALUE	Get & Restart Off-Time Totalizer
GET/RESTART TOTALIZE ON VALUE	Get & Restart On-Time Totalizer
INCREMENT VARIABLE	Increment Variable
MOVE	Move
MOVE ANL. I/O UNIT TO TABLE	Move Analog I/O Unit to Table
MOVE FLOAT TABLE TO FLOAT TABLE	Move Table Element to Table
MOVE FROM STRING TABLE	Move from String Table
MOVE FROM TABLE	Move from Table Element
MOVE FROM TABLE TO (PORT)	(obsolete)

Cyrano Operation Command	OptoControl Action Command
MOVE FROM TABLE TO PORT [Ports 0–4, 6–7]	Transmit Table via Serial Port [Ports 0–3. Use other commands for ARCNET and Ethernet ports.]
MOVE INT TABLE TO INT TABLE	Move Table Element to Table
MOVE STRING	Move String
MOVE TABLE TO ANL I/O UNIT	Move Table to Analog I/O Unit
MOVE TO FLOAT TABLE	Move to Table Element
MOVE TO INTEGER TABLE	Move to Table Element
MOVE TO STRING TABLE	Move to String Table
MOVE TO TABLE FROM (PORT)	(obsolete)
MOVE TO TABLE FROM PORT [Ports 0–4, 6–7]	Receive Table via Serial Port [Ports 0–3. Use other commands for ARCNET and Ethernet ports.]
NOT	NOT
OR	OR
POINT TO NEXT ERROR	Remove Current Error and Point to Next Error
PRINT CHAR TO PORT	Transmit Character via Serial Port
PRINT CHARACTER (PORT)	(obsolete)
PRINT DATE (PORT)	(obsolete)
PRINT FORMATTED NUMBER (PORT)	(obsolete)
PRINT NEW LINE (PORT)	(obsolete)
PRINT NEW LINE (PORT) W/TIMEOUT	(obsolete)
PRINT NEW LINE TO PORT	Transmit New Line via Serial Port
PRINT NUMBER (PORT)	(obsolete)
PRINT NUMBER AS FIELD (PORT)	(obsolete)
PRINT STRING (PORT)	(obsolete)
PRINT TIME (PORT)	(obsolete)
PRINT TO PORT [Ports 0–4, 6–7]	Transmit String via Serial Port [Ports 0–3. Use other commands for ARCNET and Ethernet ports.]
PULSE OFF	Start Off-Pulse
PULSE ON	Start On-Pulse

Cyrano Operation Command	OptoControl Action Command
RAISE E TO	Raise e to Power
RAISE TO POWER	Raise to Power
RAMP TO POINT	Ramp Analog to Point
READ ANALOG FILTERED VALUE	Get Analog Filtered Value
READ ANALOG MAX VALUE	Get Analog Maximum Value
READ ANALOG MIN VALUE	Get Analog Minimum Value
READ ANALOG SQRT FILTERED VALUE	Get Analog Square Root Filtered Value
READ ANALOG SQRT VALUE	Get Analog Square Root Value
READ ANALOG TOTAL VALUE	Get Analog Totalizer Value
READ AND CLEAR ANALOG FILTERED VAL	Get & Clear Analog Filtered Value
READ AND CLEAR ANALOG MAX VAL	Get & Clear Analog Maximum Value
READ AND CLEAR ANALOG MIN VAL	Get & Clear Analog Minimum Value
READ AND CLEAR ANALOG TOTAL VAL	Get & Clear Analog Totalizer Value
READ E/R HOLD BUFFER	Read Event/Reaction Hold Buffer
READ OUTPUT RATE OF CHANGE	Get PID Output Rate of Change
READ PID INPUT	Get PID Input
READ PID OUTPUT	Get PID Output
READ PID SETPOINT	Get PID Setpoint
RECEIVE FROM PORT [Ports 0–4, 6–7]	Receive String via Serial Port [Ports 0–3. Use other commands for ARCNET and Ethernet ports.]
RELEASE ACTIVE PORT	(obsolete)
Cyrano Operation Command	OptoControl Action Command
REQUEST PORT	(obsolete)
RESET COUNTER	Clear Counter
RESET QUADRATURE COUNTER	Clear Quadrature Counter
RETRIEVE SAVED CRC	Retrieve Strategy CRC
SEND/RECEIVE PORT (OPTOMUX)	Transmit/Receive OPTOMUX String
SEND/RECEIVE PORT W/CRC	Transmit/Receive Mistic I/O Hex String with CRC
SEND/RECEIVE USING PORT N	Transmit/Receive String via Serial Port

Cyrano Operation Command	OptoControl Action Command
SET ANALOG FILTER WEIGHT	Set Analog Filter Weight
SET ANALOG GAIN	Set Analog Gain
SET ANALOG OFFSET	Set Analog Offset
SET ANALOG TOTALIZE RATE	Set Analog Totalizer Rate
SET ANALOG TPO PERIOD	Set Analog TPO Period
SET ARCNET DEST ADDR	Set ARCNET Destination Address
SET D TERM	Set PID D Term
SET DATE	Set Date
SET DAY	Set Day
SET DAY OF WEEK	Set Day of Week
SET HOST PRIORITY	Set Priority of Host Task
SET HOURS	Set Hours
SET I TERM	Set PID I Term
SET LAST CHARACTER	Turn Off RTS After Next Character
SET MINUTES	Set Minutes
SET MONTH	Set Month
SET NUMBER OF RETRIES	Set Number of Retries to all I/O Units
SET OUTPUT RATE OF CHANGE	Set PID Output Rate of Change
SET P TERM	Set PID P Term
SET PEER DESTINATION ADDRESS	Set ARCNET Peer Destination Address
SET PID AUTO MODE	Set PID Mode to Auto
SET PID INPUT	Set PID Input
SET PID MANUAL MODE	Set PID Mode to Manual
SET PID SCAN RATE	Set PID Scan Rate
SET PORT TIMEOUT DELAY	Configure Port Timeout Delay
SET PRIORITY	Set Priority
SET SECONDS	Set Seconds
SET SETPOINT	Set PID Setpoint
SET TIME	Set Time
SET TIME PROP OUTPUT	Set TPO Period

Cyrano Operation Command	OptoControl Action Command
SET TIME PROP PERCENT	Set TPO Percent
SET VARIABLE FALSE	Set Variable False
SET VARIABLE TRUE	Set Variable True
SET YEAR	Set Year
SHIFT TABLE	Shift Table Elements
START CHART	Start Chart
START CONTINUOUS SQUARE WAVE	Start Continuous Square Wave
START COUNTER	Start Counter
START DEFAULT HOST TASK	Start Default Host Task
START HOST TASK (ASCII)	Start Host Task (ASCII)
START HOST TASK (BINARY)	Start Host Task (Binary)
START QUADRATURE COUNTER	Start Quadrature Counter
STOP CHART	Stop Chart
STOP CHART ON ERROR	Stop Chart on Error
STOP COUNTER	Stop Counter
STOP HOST TASK	Stop Host Task
STOP QUADRATURE COUNTER	Stop Quadrature Counter
SUSPEND CHART	Suspend Chart
SUSPEND CHART ON ERROR	Suspend Chart on Error
SUSPEND DEFAULT HOST TASK	Suspend Default Host Task
TAKE ABSOLUTE VALUE OF	Absolute Value
TAKE ARC COS OF	Arccosine
TAKE ARC SIN OF	Arcsine
TAKE ARC TAN OF	Arctangent
TAKE COS OF	Cosine
TAKE COSH	Hyperbolic Cosine
TAKE NATURAL LOG OF	Natural Log
TAKE SIN OF	Sine
TAKE SINH OF	Hyperbolic Sine
TAKE SQUARE ROOT OF	Square Root

Cyrano Operation Command	OptoControl Action Command
TAKE TAN OF	Tangent
TAKE TANH OF	Hyperbolic Tangent
TEST EQUAL	Test Equal
TEST EQUAL STRINGS	Test Equal Strings
TEST GREATER	Test Greater
TEST GREATER OR EQUAL	Test Greater or Equal
TEST LESS	Test Less
TEST LESS OR EQUAL	Test Less or Equal
TEST NOT EQUAL	Test Not Equal
TURN OFF	Turn Off
TURN ON	Turn On
XOR	XOR

Conditions

Cyrano Condition Command	OptoControl Condition Command
\ COMMENT	Comment (Single Line)
\\ COMMENT	Comment (Block)
AND	AND?
BIT AND	Bit AND?
BIT NOT?	Bit NOT?
BIT OFF?	Bit Off?
BIT ON?	Bit On?
BIT OR	Bit OR?
BIT XOR	Bit XOR?
CALLING CHART RUNNING?	Calling Chart Running?
CALLING CHART STOPPED?	Calling Chart Stopped?
CALLING CHART SUSPENDED?	Calling Chart Suspended?
CAUSED A CHART ERROR?	Caused a Chart Error?
CAUSED AN I/O UNIT ERROR?	Caused an I/O Unit Error?
CHARACTERS WAITING (PORT)?	(obsolete)

Cyrano Condition Command	OptoControl Condition Command
CHARACTERS WAITING? [Ports 0–7]	Characters Waiting at Serial Port? [Ports 0–3. It is better to use the action command “Get Number of Characters Waiting on Serial or ARCNET Port” or “Get Number of Characters Waiting on Ethernet Session.” Then follow it with a condition block to see if the value is greater than zero.]
CHART RUNNING?	Chart Running?
CHART STOPPED?	Chart Stopped?
CHART SUSPENDED?	Chart Suspended?
CLOSED?	(obsolete)
EQUAL	Equal?
EQUAL TO FLOAT TABLE DATA	Equal to Table Element?
EQUAL TO INTEGER TABLE DATA	Equal to Table Element?
EQUAL TO STRING TABLE DATA?	String Equal to String Table Element?
ERROR ON I/O UNIT?	Error on I/O Unit?
ERROR?	Error?
EVENT SCANNING DISABLED?	Event Scanning Disabled?
EVENT SCANNING ENABLED?	Event Scanning Enabled?
GENERATING INTERRUPT?	Generating Interrupt?
GREATER	Greater?
GREATER OR EQ TO FLOAT TABLE DATA	Greater Than or Equal to Table Element?
GREATER OR EQ TO INTEGER TABLE DATA	Greater Than or Equal to Table Element?
GREATER OR EQUAL	Greater Than or Equal?
GREATER THAN FLOAT TABLE DATA	Greater Than Table Element?
GREATER THAN INTEGER TABLE DATA	Greater Than Table Element?
HAS EVENT OCCURRED?	Event Occurred?
INTERRUPT DISABLED FOR EVENT?	Interrupt Disabled for Event?
INTERRUPT ENABLED FOR EVENT?	Interrupt Enabled for Event?
IS ARCNET CONNECTED?	ARCNET Connected?
IS ARCNET MSG ADDR EQUAL TO?	ARCNET Message Address Equal to?
IS ARCNET NODE PRESENT?	ARCNET Node Present?

Cyrano Condition Command	OptoControl Condition Command
IS EVENT OCCURRING?	Event Occurring?
LATCH SET?	(obsolete)
LESS	Less?
LESS OR EQ TO FLOAT TABLE DATA	Less Than or Equal to Table Element?
LESS OR EQ TO INT TABLE DATA	Less Than or Equal to Table Element?
LESS OR EQUAL	Less Than or Equal?
LESS THAN FLOAT TABLE DATA	Less Than Table Element?
LESS THAN INT TABLE DATA	Less Than Table Element?
LOW BATTERY?	Low RAM Backup Battery?
NOT EQUAL	Not Equal?
NOT EQUAL TO FLOAT TABLE DATA	Not Equal to Table Element?
NOT EQUAL TO INTEGER TABLE DATA	Not Equal to Table Element?
NOT?	NOT?
OFF?	Off?
ON?	On?
OPEN?	(obsolete)
OR	OR?
RECEIVED MESSAGE FROM HOST?	Host Task Received a Message?
STRING EQUAL	String Equal?
TIMER EXPIRED?	Timer Expired?
VARIABLE FALSE?	Variable False?
VARIABLE TRUE?	Variable True?
WITHIN LIMITS?	Within Limits?
XOR	XOR?

New Commands in OptoControl

New Action Commands

Accept Session on TCP Port	Add User Error to Queue
Add User I/O Unit Error to Queue	Calculate & Store Strategy CRC
Clamp Float Table Element	Clamp Float Variable
Clamp Integer Table Element	Clamp Integer Variable
Clamp PID Output	Clamp PID Setpoint
Clear PC Byte Swap Mode (ISA only)	Clear Pointer
Clear Pointer Table Element	Close Ethernet Session
Configure I/O Unit	Continue Timer
Convert Number to Mistic I/O Hex	Convert String to Lower Case
Convert String to Upper Case	Disable Communication to All I/O Units
Disable Event/Reaction Group	Disable PID Output
Disable PID Output Tracking in Manual Mode	Disable PID Setpoint Tracking in Manual Mode
Disable Scanning of Event/Reaction Group	Enable Communication to All I/O Units
Enable Event/Reaction Group	Enable PID Output
Enable PID Output Tracking in Manual Mode	Enable PID Setpoint Tracking in Manual Mode
Enable Scanning of Event/Reaction Group	Find Character in String
Find Substring in String	Generate Checksum on String
Generate Forward CCITT on String	Generate Forward CRC-16 on String
Generate Random Number	Generate Reverse CCITT on String
Generate Reverse CRC-16 on String	Get & Clear Event Latches
Get Active Interrupt Mask	Get Controller Type
Get Ethernet Session Name	Get Event Latches
Get Firmware Version	Get ID of Block Causing Current Error
Get Julian Day	Get Name of Chart Causing Current Error
Get Name of I/O Unit Causing Current Error	Get Number of Characters Waiting on Ethernet Session
Get Period Measurement Complete Status	Get PID Control Word
Get PID D Term	Get PID I Term

Get PID Mode	Get PID P Term
Get PID Scan Rate	Get Priority
Get Priority of Host Task	Get Seconds Since Midnight
Get System Time	IVAL Set Analog From Table
IVAL Set Analog Point	IVAL Set Counter
IVAL Set Digital Binary	IVAL Set Frequency
IVAL Set Off-Latch	IVAL Set Off-Pulse
IVAL Set Off-Totalizer	IVAL Set On-Latch
IVAL Set On-Pulse	IVAL Set On-Totalizer
IVAL Set Period	IVAL Set PID Control Word
IVAL Set PID Process Term	IVAL Set Quadrature Counter
IVAL Set TPO Percent	IVAL Set TPO Period
IVAL Turn Off	IVAL Turn On
Maximum	Minimum
Move Digital I/O Unit to Table	Move Digital I/O Unit to Table Element
Move From Pointer	Move From Pointer Table Element
Move Mixed I/O Unit to Table	Move Table Element to Digital I/O Unit
Move Table to Digital I/O Unit	Move Table to Mixed I/O Unit
Move to Pointer	Move to Pointer Table Element
Open Ethernet Session	Pause Timer
Read Byte from PC Memory (ISA only)	Read Byte from PC Port (ISA only)
Read Word from PC Memory (ISA only)	Read Word from PC Port (ISA only)
Receive N Characters via ARCNET	Receive N Characters via Ethernet
Receive N Characters via Serial Port	Receive String via ARCNET
Receive String via Ethernet	Receive Table via ARCNET
Receive Table via Ethernet	Reset Controller
Round	Seed Random Number
Set ARCNET Mode Raw	Set ARCNET Mode Standard
Set Down Timer Preset Value	Set End-of-Message Terminator
Set I/O Unit Configured Flag	Set Nth Character
Set PC Byte Swap Mode (ISA only)	Set PID Control Word

Set Up Timer Target Value	Start Timer
Stop Timer	Table Element Bit Clear
Table Element Bit Set	Table Element Bit Test
Test Within Limits	Transmit String via ARCNET
Transmit String via Ethernet	Transmit Table via ARCNET
Transmit Table via Ethernet	Transmit/Receive Mistic I/O Hex String with Checksum
Transmit/Receive String via ARCNET	Transmit/Receive String via Ethernet
Truncate	Turn Off RTS
Turn On RTS	Verify Checksum on String
Verify Forward CCITT on String	Verify Forward CRC-16 on String
Verify Reverse CCITT on String	Verify Reverse CRC-16 on String
Write Byte to PC Memory (ISA only)	Write Byte to PC Port (ISA only)
Write I/O Unit Configuration to EEPROM	Write Word to PC Memory (ISA only)
Write Word to PC Port (ISA only)	

New Condition Commands

CTS Off?	CTS On?
Down Timer Expired?	Ethernet Session Open?
Event/Reaction Communication Enabled?	Event/Reaction Group Communication Enabled?
Interrupt on Port 0?	Interrupt on Port 1?
Interrupt on Port 2?	Interrupt on Port 3?
Interrupt on Port 6?	I/O Point Communication Enabled?
I/O Unit Communication Enabled?	I/O Unit Ready?
Off-Latch Set?	On-Latch Set?
PID Loop Communication Enabled?	Pointer Equal to NULL?
Pointer Table Element Equal to NULL?	Up Timer Target Time Reached?