249099-L
April 2001

BECKMAN COULTER™

SYNCHRON CX®
Clinical Systems

HOST COMPUTER INTERFACE SPECIFICATIONS

This manual is intended for use with

SYNCHRON CX® 4/CX® 7 DELTA
SYNCHRON CX4CE/CX7
SYNCHRON CX7 RTS/CX9 ALX
SYNCHRON CX® 4 PRO/CX® 5 PRO/CX® 7 PRO/CX® 9 PRO

NOTICE OF DISCLAIMER

Beckman Coulter makes no warranty as to the compatibility of any particular host computer software to the SYNCHRON CX Systems. From time to time, Beckman Coulter may change SYNCHRON CX to host interface specifications and/or SYNCHRON CX software. Beckman Coulter disclaims any and all liability and the host computer owner and/or user assumes all risk and responsibility for any and all losses, expenses and/or damages alleged to have been caused by connection or use of a host computer to or with a SYNCHRON CX System, and/or Beckman Coulter's changing the interface specifications or SYNCHRON CX software.

SYNCHRON CX System operating and performance characteristics and the instructions contained in this interface specification are based on the computer system hardware configuration specified by Beckman Coulter. Beckman Coulter disclaims all liability, including all warranties, whether express or implied, for SYNCHRON CX System performance when operated other than the specified hardware configuration.

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CX4CE/CX5CE/CX7 DELTA Operational Notes For Host Interface Specifications

The SYNCHRON DELTA System host interface is basically equivalent to the SYNCHRON CX4CE/CX5CE/CX7 interface, except for the following additions:

- There are host query timeout options of 2.5, 5, 7.5, 10 minutes and OFF. Refer to Section 4 of Host Computer Interface Specifications.
- The Define Reportable Ranges feature uses three new Result Error Codes: UH, reportable range high; UL, reportable range low; and UO, ORDAC reportable range high. These are transmitted in Stream 702, Function 3. Refer to Section 4 and Appendix F of Host Computer Interface Specifications.
- The system software will prevent the operator from programming a chemistry combination for CSF samples that will exceed the sampling capacity of the ratio pump. If the programming is done at the instrument, a pop-up window will alert the operator to this condition. If the programming is done at the host system a Return Code will be transmitted in Stream 701, Function 2. Refer to Section 4 of Host Computer Interface Specifications.
- If the system is set to program controls by reagent cartridge positions, the host will not be able to differentiate which control results apply to each reagent cartridge position if either of the following scenarios exist:

1. Multiple reagent cartridges of the same reagent are manually loaded and the serial number is not entered; or
2. Multiple User Defined Reagent cartridges are loaded, all with identical chemistry names.

- Alternate method of downloading sample programming that is more efficient and easier for the Host. Instead of downloading one sample programming and then releasing the line, as described in SECTION 3, *Bidirectional Protocol*, Table 3.4, the Host may download up to 7 sample programming at one time. The Host then releases the line and waits until all sample program return status messages are issued by SYNCHRON. Note that these return status messages might not be sent immediately after the line is released by the Host. Also, they might not be sent sequentially nor corresponding to the same order as the sample programming download. The bidirectional handshaking protocol and time-outs described in Section 3.1 - 3.3 still apply in this case.

Example

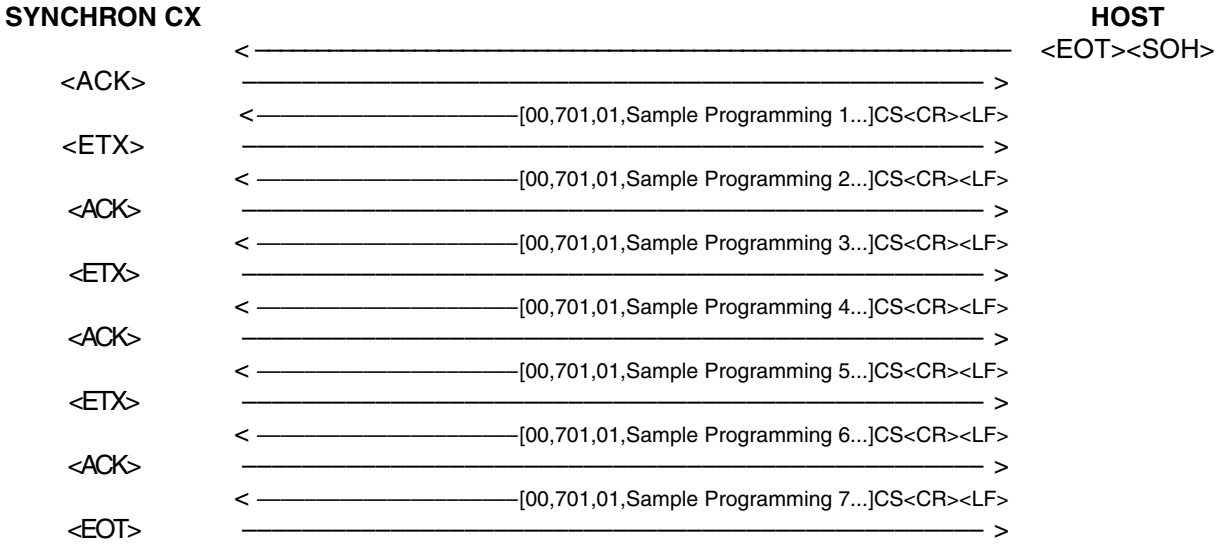

SYNCHRON CX
HOST
<EOT><SOH>
<ACK>
[00,701,01,Sample Programming 1...]CS<CR><LF>
<ETX>
[00,701,01,Sample Programming 2...]CS<CR><LF>
<ACK>
[00,701,01,Sample Programming 3...]CS<CR><LF>
<ETX>
[00,701,01,Sample Programming 4...]CS<CR><LF>
<ACK>
[00,701,01,Sample Programming 5...]CS<CR><LF>
<ETX>
[00,701,01,Sample Programming 6...]CS<CR><LF>
<ACK>
[00,701,01,Sample Programming 7...]CS<CR><LF>
<EOT>

Table of Contents

List of Tables

SECTION 1 Description of Interface

1.1 Introduction

These instructions provide the necessary information to interface the SYNCHRON CX3, CX4, CX5, CX7 DELTA, CX4CE, CX5CE, CX7 Systems, and CX PRO Systems to a laboratory computer system.

Table 1.1 lists several definitions that are useful in understanding this interface specification.

Table 1.1 Definitions

SYNCHRON CX	SYNCHRON CX3, CX4, CX5, CX7 DELTA, and CX4CE, CX5CE, CX7 Systems, and CX PRO Systems.
Host	Clinical laboratory computer system.
Download[a]	The process of a host sending sample/cup programming to the SYNCHRON CX System.
Handshake[a]	The process of the SYNCHRON CX System and the host communicating with each other by requesting permission to transmit, granting permission, and acknowledging receipt of transmission (ACK - NAK protocol).

[a] Bidirectional only.

1.2 Interface Protocol Options

SYNCHRON CX Systems provide two interface protocol options which are selected using the Define Host Screen:

UNIDIRECTIONAL — Information is transmitted from the SYNCHRON CX System to the host computer. An X-ON, X-OFF protocol can be used by the host to control the information flow. (Section 2)

BIDIRECTIONAL — Information is transmitted from the SYNCHRON CX System to the host computer and from the host computer to the SYNCHRON CX System. An X-ON, X-OFF protocol can be used by the host to control the information flow. The two systems communicate with each other using a software handshake, requesting permission to send information and acknowledging receipt of information (ACK - NAK protocol). (Section 3)

1.3 Hardware Interface

The hardware interface to the SYNCHRON CX Systems external communication port uses a standard RS-232-C 9-pin or 25-pin D-connector (male). Communication is done with asynchronous byte transmission. The host communication port is located on the back of the computer console.

1.3.1 Connector Pin Assignments

Connector pin assignments are shown in Table 1.2.

Table 1.2 Connector Pin Assignments

25-PIN	9-PIN	Signal	Direction
1	---	Protected ground - used on one side only	
2	3	Transmit data	Out
3	2	Receive Data	In
4[a]	8[a]	Clear to send (CTS)	In
5[b]	7[b]	Request to send (RTS)	Out
6[c]	4[c]	Data terminal ready	Out
7	5	Signal ground	
20[c]	6[c]	Data set ready	In
---	1	Data Carrier Detect	In
---	9	Ring Indicator	In

[a] CTS is required before data will be transmitted, when using hardware flow control.
[b] RTS is turned on when operational, when using hardware flow control.
[c] Pins 6 and 20 (25-pin), and 4 and 6 (9-pin) are only needed when a modem is used.

1.3.2 Cable Length

The recommended cable length when using the RS-232-C interface should not exceed 40 feet (12 m).

1.4 Transmission

The SYNCHRON CX Systems use 7 bit ASCII (provides the 128 character ASCII set when 7 data bits are selected). For local languages, 8 bit ASCII must be used (provides the 256 character ASCII set).

1.4.1 Transmission Format

The serial transmission format is configured from the SYNCHRON CX System console using the Define Host Screen. The following options are available:

Interface Options:	Unidirectional, Bidirectional or None
Data Bits:	7 or 8*
Parity:	Even, Odd or None
Stop Bits:	1 or 2
Baud Rates:	600, 1200, 2400, 4800 or 9600

* For use with non-English keyboards, select 8-bit ASCII for the host interface in order to send and receive special characters (for key code conversion information, refer to Appendix J).

1.4.2 Data Record Format

The data record format, in both the unidirectional and bidirectional modes, used for all transmissions to and from the SYNCHRON CX System is:

'['<MESSAGE>']'<CS><CR><LF>

where:

'['	Is the start of message character (HEX = 5B).
<MESSAGE>	Is the data to be transmitted (refer to Section 4).
']'	Is the end of message character (HEX = 5D).
<CS>	<CS> is the checksum. It is two hexadecimal digits. 256 -((Sum of ASCII value of all characters in <MESSAGE>, including spaces, commas, '[' and ']') MODULE 256) = CS
<CR>	Is an ASCII carriage return.
<LF>	

SECTION 2 Unidirectional Protocol

2.1 Description

In unidirectional transmission, information is transmitted in one direction only - from the SYNCHRON CX System to the host computer. The information flow can be controlled by the host through software protocols with software versions prior to 1.7. The information flow can be controlled by the host through software or hardware protocols with software version 1.7 and above (Sections 2.2 and 2.3). This information is transmitted as soon as it is available. The information transmitted includes:

CUP HEADER	When a cup has finished and results are ready to send to the host, the cup header information is transmitted. (Stream 702 - Function 1)
REAGENT PACK HEADER	The reagent pack header contains reagent and chemistry information and is sent before sending any calibration results. (Stream 702, Function 21)
TEST RESULTS	Test results are sent as a group when all the tests in the cup are completed. CX3 results (on CX7) and ISE results (on CX5) may be sent before all tests are completed if CX3/ISE immediate output is enabled (refer to Paragraph 6.5.6). An expanded results record is transmitted when the expanded result option is enabled. (Stream 702 - Functions 3, 7, 9, 11, 13, 23, 25, 81, 83)
END OF CUP	When all tests programmed for a sample are completed and sent, an end of cup message is transmitted. (Stream 702 - Function 5)
END OF REAGENT PACK	A reagent pack end is sent after all the calibration results (Stream 702, Function 27).
END OF RUN	When all tests programmed have been completed and the SYNCHRON CX System has gone into the standby mode an end of run message is transmitted. (Stream 703 - Function 17)
HOST SETUP CHANGES	When any options in the Define Host Screen are changed a host setup change message is transmitted. (Stream 700 - Function 2)
POWER UP	Transmitted when the SYNCHRON CX System is booted. (Stream 703 - Function 1)

NOTICE

Output field width is dependent on the units and decimal precision selected. This should not exceed the fixed field width specified in this document.

The same transmission format is used in both the unidirectional and bidirectional modes. Refer to Section 4 for the details of the transmitted messages.

Table 2.1 Protocol Control Characters

Character	Name	ASCII	HEX
X-ON	Resume transmission	DL1	11
X-OFF	Suspend transmission	DL3	13

2.2 Software Control

The flow of information from the SYNCHRON CX Systems can be controlled by the host through an X-ON, X-OFF protocol (Table 2.1). The host transmits the character X-OFF prior to its buffer overflowing. The SYNCHRON CX suspends transmission after a few characters. When the host's buffer is ready to accept information again, the character X-ON is transmitted. The SYNCHRON CX then resumes transmission. Also, the host should transmit the X-ON character after power up to indicate it is ready to receive data.

⚠ WARNING - Lost Data

After the host transmits X-OFF, the SYNCHRON CX stores the data to be transmitted in a buffer. If the host does not transmit X-ON before the SYNCHRON CX buffer overflows, the overflow data will be lost. The size of the buffer is 600 samples.

2.3 Hardware Control

The flow of information from the SYNCHRON CX Systems can be controlled by the host through the CTS hardware signal (refer to Paragraph 1.3.1). When the CTS signal is brought negative, the SYNCHRON CX will suspend transmission. The SYNCHRON CX will resume transmission when the CTS signal is brought positive.

⚠ WARNING - Lost Data

When the CTS signal is brought negative, the SYNCHRON CX stores the data to be transmitted in a buffer. If the CTS signal is not brought positive before the SYNCHRON CX buffer overflows, the overflow data will be lost. The size of the buffer is 600 samples.

2.4 Transmission Examples

EXAMPLE 1:

Unidirectional mode is selected and the host is not using software control of transmission. The accession number is 1100, sector 1, cup 3, and the selected chemistries are creatinine (03A), chloride (04A), potassium (01B), and sodium (01A). The special calculation anion gap with potassium (K) is also transmitted for the sample.

[- 0,702,01,270291,113121,- 1100,RG,- 1,- 3,RO,#########,TU,SAMPLE1.01- ,
- - - - - - - - - - - - - - - - - - - ,- ,- ,
Lee- - - - - - - - - - - - - - - ,John- - - - - - - - - - - ,- ,39485- - - - - - ,Nelson- - - - - - - - - - - - ,270291,
1044,304- - - - - - - - - - - - - - - - - ,- 39,5,- - - - - - ,M,- ,1400.00,
24.0,2.30,1.7300,- - 4,03A- ,04A- ,01B- ,01A-]35<CR><LF>
[- 0,702,03,270291,114132,- 1100,- - - - - 3442,- 1,- 3,SAMPLE1.01- ,03A- ,2sk,911150,
19,- 1,#########,#########,2,1,- 0,NA,NR,NR,0,NA,#########,- - - - - - - - - ,DL,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,1.0000,#########################]
9D<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3430,- 1,- 3,SAMPLE1.01- ,04A- ,###,######,
##,- 1,- - - - 123.9,#########,2,0,- 4,NA,NR,NA,0,NA,123.91887,- - - - - - - - - ,NO,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,1.0000,#########################]
E9<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3429,- 1,- 3,SAMPLE1.01- ,01B- ,###,######,
##,- 1,- - - - - 3.60,#########,2,0,- 4,NA,NR,NA,0,NA,3.6003411,- - - - - - - - - ,NO,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,1.0000,#########################]
0E<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3428,- 1,- 3,SAMPLE1.01- ,01A- ,###,######,
##,- 1,- - - - 174.3,#########,2,0,- 4,NA,NR,NA,0,NA,174.28595,- - - - - - - - - ,NO,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,1.0000,#########################]
E3<CR><LF>
[- 0,702,11,270291,114148,-1100,-1,- 3,SAMPLE1.01- ,-1,USER- SPL- CALC- - - - - - ,OK,
120.31853,UN/UN- -]4B<CR><LF>
[- 0,702,11,270291,114148,-1100,-1,- 3,SAMPLE1.01- ,- 1,USER- SPL- CALC2- - - - - ,OK,
50.367081,UNIT- - -]47<CR><LF>
[- 0,702,13,270291,114148,- 1100,-1,- 3,SAMPLE1.01- ,- 1,CREA- - - - - - - - - - - - - - - - ,AB,
0.0000000,- - - - - - -]92<CR><LF>
[- 0,702,13,270291,114148,- 1100,-1,- 3,SAMPLE1.01- ,- 1,CL- - - - - - - - - - - - - - - - - - ,OK,
173.48641,mmol/24.]2D<CR><LF>
[- 0,702,13,270291,114148,- 1100,-1,- 3,SAMPLE1.01- ,- 1,K- - - - - - - - - - - - - - - - - - ,OK,
5.0404774,mmol/24.]54<CR><LF>
[- 0,702,13,270291,114148,- 1100,-1,- 3,SAMPLE1.01- ,- 1,NA- - - - - - - - - - - - - - - - - - ,OK,
244.00033,mmol/24.]3F<CR><LF>
[- 0,702,05,270291,114148,- 1100,SAMPLE1.01- ,- 1,- 3]0A<CR><LF>
[- 0,703,17,190291,103626]DE

(- indicates space holder)

EXAMPLE 2:

The same information is transmitted as in EXAMPLE 1, but software transmission control is implemented by the host.

SYNCHRON CX **HOST**

<=== X - ON
[- 0,702,01,270291,113121,- 1100,RG,- 1,- 3,RO,#########,TU,SAMPLE1.01- ,
- - - - - - - - - - - - - - - - - - - ,- ,
- ,Lee- - - - - - - - - - - - - - - ,John- - - - - - - - - - - ,- ,
39485- - - - - - - ,Nelson- - - - - - - - - - - - ,270291,1044,304- - - - - - - - - - - - - - - - - ,
- 39,5,- - - - - - ,M,- ,1400.00,24.0,2.30,
1.7300,- - 4,03A- ,04A- ,01B- ,01A-]35<CR><LF>
<=== X - OFF
<=== X - ON
[- 0,702,03,270291,114132,- 1100,- - - - - 3442,- 1,- 3,SAMPLE1.01- ,03A- ,
2sk,911150,19,- 1,#########,#########,2,1,- 0,NA,NR,NR,0,NA,
#########,- - - - - - - - - ,DL,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,########################]9D<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3430,- 1,- 3,SAMPLE1.01- ,04A- ,
###,######,##,- 1,- - - - 123.9,#########,2,0,- 4,NA,NR,NA,0,NA,
123.91887,- - - - - - - - - ,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,########################]E9<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3429,- 1,- 3,SAMPLE1.01- ,01B- ,
###,######,##,- 1,- - - - - 3.60,#########,2,0,- 4,NA,NR,NA,0,NA,
3.6003411,- - - - - - - - - ,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,########################]0E<CR><LF>
[- 0,702,03,270291,113741,- 1100,- - - - - 3428,- 1,- 3,SAMPLE1.01- ,01A- ,
###,######,##,- 1,- - - - 174.3,#########,2,0,- 4,NA,NR,NA,0,NA,
174.28595,- - - - - - - - - ,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,########################]E3<CR><LF>
[- 0,702,11,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
USER- SPL- CALC- - - - - - - ,OK,120.31853,UN/UN- - -]4B<CR><LF>
[- 0,702,11,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
USER- SPL- CALC2- - - - - - ,OK,50.367081,UNIT- - - -]47<CR><LF>
[- 0,702,13,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
CREA- - - - - - - - - - - - - - - - ,AB,0.0000000,- - - - - - - -]92<CR><LF>
[- 0,702,13,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
CL- - - - - - - - - - - - - - - - - - ,OK,173.48641,mmol/24.]2D<CR><LF>
[- 0,702,13,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
K- - - - - - - - - - - - - - - - - - ,OK,5.0404774,mmol/24.]54<CR><LF>
[- 0,702,13,270291,114148,- 1100,- 1,- 3,SAMPLE1.01- ,- 1,
NA- - - - - - - - - - - - - - - - - - ,OK,244.00033,mmol/24.]3F<CR><LF>
[- 0,702,05,270291,114148,- 1100,SAMPLE1.01- ,- 1,- 3]0A<CR><LF>
[- 0,703,17,190291,103626]DE

(- indicates space holder)

SECTION 3 Bidirectional Protocol

3.1 Description

In bidirectional transmission, information is transmitted in two directions - from the SYNCHRON CX System to the host and from the host to the SYNCHRON CX System. The two systems communicate with each other using a software handshake, requesting permission to send information, granting permission, and acknowledging receipt of information (ACK - NAK protocol). Table 3.1 describes the bidirectional protocol control characters that are referred to throughout this section.

Table 3.1 Bidirectional Protocol Control Characters

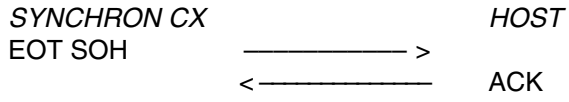
Acronym	Name	ASCII	HEX
LB	Line Bid	SOH	01
LBO	Line Bid Override Request	STX	02
LF	Line Feed	LF	0A
ENQ	Enquiry (used to reestablish communications)	ENQ	05
EOT	End Of Transmission	EOT	04
ACK-0	Even Acknowledgement	ACK	06
ACK-1	Odd Acknowledgement	ETX	03
NAK	Negative Acknowledgement	NAK	15

3.2 Line Bidding

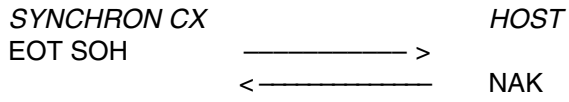
Before either the SYNCHRON CX System or the host transmit a message, they must bid for the communication line. Line bidding uses the LB, LBO, EOT, ACK-0, and NAK characters.

To bid for the line, <EOT><SOH> is transmitted when the line is idle. The EOT clears the line. The receiving system responds by transmitting ACK to acknowledge the line bid and allow message transmission or NAK to deny the line bid. If the line bid is denied, the originator should wait a short period of time (e.g. one second) before bidding for the line again.

SUCCESSFUL LINE BID



UNSUCCESSFUL LINE BID



The examples above are also correct if the labels SYNCHRON CX and HOST are reversed.

LINE BID - When the SYNCHRON CX is very busy, the response to a LINE BID may take up to a maximum of 15 seconds. The host may have to wait up to 15 seconds for the LINE BID response.

When the SYNCHRON CX has some messages in the output queue, it does a LINE BID. When the LINE BID is accepted by the host, the instrument sends one set of messages at a time, then gives up the line and waits for 2 seconds, then repeats the process if other messages are to be sent.

If the host has messages to transmit, it can do a LINE BID (EOT SOH) even if the instrument is busy transmitting messages. After sending a message, the SYNCHRON CX looks for a NAK, ACK, or SOH. When SYNCHRON CX sends a message, host can respond with a line bid <EOT> <SOH>. The message in progress will be saved by SYNCHRON CX and the line will be granted to the host by sending an <ACK>. This is not recommended because it will stop the collation of results.

LINE BID TIME OUT occurs if the receiving system does not respond to the EOT LB within fifteen (15) seconds. After seven (7) consecutive time outs or unrecognizable responses (i.e. not ACK or NAK), the originator considers the line "DOWN". The originator waits twenty (20) seconds and tries again.

CONTENTION occurs when both systems bid for the line at the same time. The SYNCHRON CX will be considered the master and the host should respond with ACK. However, the host may override the SYNCHRON CX line bid by transmitting LBO in response. The SYNCHRON CX will respond by transmitting ACK to acknowledge the line bid override and allow message transmission or will ignore the message if SYNCHRON CX was not bidding for the line when the message was sent.

3.3 Data Transfer

After successfully bidding for the line (Paragraph 3.2), the originator or sending system transmits its message. The message format is described in Paragraph 1.4.2 and Section 4.

A successful data transfer consists of:

[<MESSAGE>]<CS><CR><LF>

If the checksum is incorrect or any element is missing, the data transfer is unsuccessful.

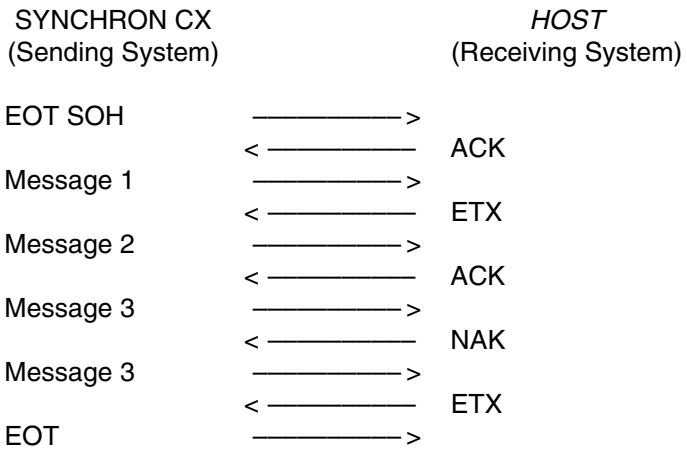
After data transmission, the receiving system acknowledges transmission as follows:

1. If data transfer was successful, then the receiving system alternately returns ETX and ACK after each message. Since the receiving system responded ACK to the line bid, ETX is the correct acknowledgement to the first message, ACK to the second message, then ETX again, etc. When data transfer is complete, the sending system transmits EOT.
2. If data transfer was unsuccessful due to a bad checksum or other problem, then the receiving system responds NAK. The sending system retransmits the message up to seven times. If unsuccessful, the sending system rebids for the line and retransmits the last message.
3. If the sending system does not receive an acknowledgement within fifteen (15) seconds after data transfer or an incorrect acknowledgement is received, it transmits ENQ. The receiving system retransmits its last acknowledgement (e.g., ACK, ETX, NAK, or EOT). The sending system responds to the acknowledgement in one of the following manners:
    - If the correct acknowledgement is transmitted, the sending system transmits the next message or EOT.
    - If an incorrect acknowledgement or NAK is transmitted, the sending system retransmits the last message.
    - If the receiving system transmits an EOT, the sending system rebids for the line and retransmits the last message.
4. TIME OUT occurs:
    - If the sending system does not transmit data in twenty (20) seconds after successfully bidding for the line (Paragraph 3.2) the receiving system times out and returns to idle.
    - If the sending system does not receive an acknowledgement within fifteen (15) seconds after data transfer or an incorrect acknowledgement is received, it transmits ENQ. If an acknowledgement is not received after seven (7) consecutive ENQ transmissions, the SYNCHRON CX waits twenty (20) seconds and attempts a line bid and will continue to do so until an acknowledgement is received.

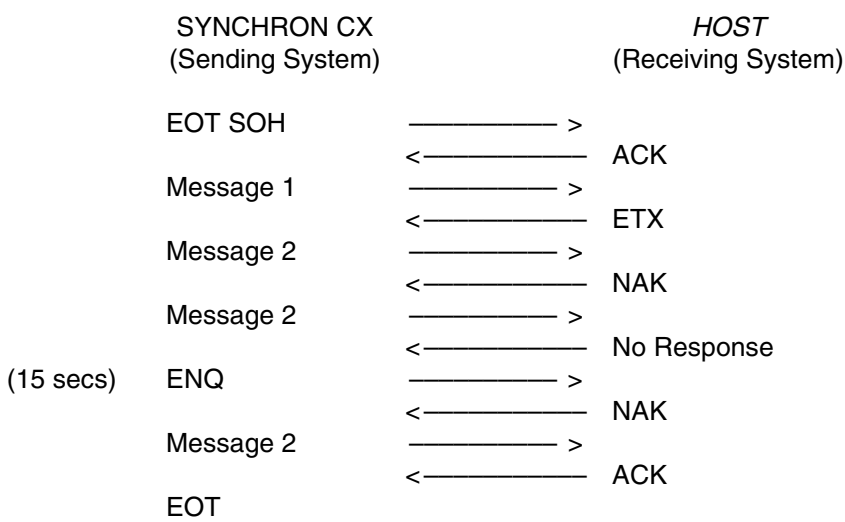
5. IDLE state occurs:
    - The receiving system requests an IDLE state by transmitting an EOT. The sending system will retransmit the interrupted message.

Examples of data transfer (These examples are also correct if the labels SYNCHRON CX and HOST are reversed.):

NAK Example



No Response



No Response Return to Idle

	SYNCHRON CX (Sending System)		*HOST* (Receiving System)
	EOT SOH	——————>	
		<——————	ACK
	Message 1	——————>	
		<——————	ETX
	Message 2	——————>	
		<——————	No Response
(>20 secs)	ENQ	——————>	
		<——————	EOT
	EOT SOH	——————>	
		<——————	ACK
	Message 2	——————>	
		<——————	ETX
	EOT		

Request for Idle State

SYNCHRON CX (Sending System)		*HOST* (Receiving System)
EOT SOH	——————>	
	<——————	ACK
Message 1	——————>	
	<——————	ETX
Message 2	——————>	
	<——————	EOT
	<——————	EOT SOH
ACK	——————>	
	<——————	Message 1
ETX	——————>	
	<——————	EOT
EOT SOH	——————>	
	<——————	ACK
Message 2	——————>	
	<——————	ETX
Message 3	——————>	
	<——————	ACK
EOT		

3.4 Unsolicited Messages

Unsolicited messages are those messages which are automatically transmitted by the SYNCHRON CX System as the information becomes available. The following unsolicited messages are transmitted in the bidirectional mode:

REAGENT PACK HEADER	The reagent pack header contains reagent and chemistry information, and is sent before sending any calibration results. (Stream 702 - Function 21).
REAGENT RESULTS	Calibration results are sent as a group when all tests in the cup are completed.
END OF REAGENT	A reagent pack end is sent after all calibration results and indicating that all information for that reagent pack is complete. (Stream 702 - Function 7, 9, 21, 23, 25, 27, 83)

NOTICE

Output field width is dependent on the units and decimal precision selected. This should not exceed the fixed field width specified in this document.

CUP HEADER	When a cup has finished and results are ready to send to the host, the cup header information is transmitted. (Stream 702 - Function 1)
TEST RESULTS	Test results are sent as a group when all the tests in the cup are completed. CX3 results (on CX7) and ISE results (on CX5) may be sent before all tests are completed if CX3/ISE immediate output is enabled (refer to Paragraph 6.5.6). An expanded results record is transmitted when the expanded result option is enabled. (Stream 702 - Functions 3, 7, 9, 11, 13, 23, 25, 81, 83)
END OF CUP	When all tests programmed for a sample are completed and sent, an end of cup message is transmitted. (Stream 702 - Function 1, 3, 5, 11, 81)
END OF RUN	When all tests programmed have been completed and the SYNCHRON CX has gone into the idle mode an end of run message is transmitted. (Stream 703 - Function 17)
NORMAL/CRITICAL RANGES CHANGED **OR** **CHEMISTRY CONFIGURATION CHANGED**	When any normal and/or critical range is changed, or the chemistry configuration is changed the appropriate message is transmitted. (Stream 703 - Functions 7, 13)
HOST SETUP CHANGES	When any options in the Define Host Screen are changed a host setup change message is transmitted. (Stream 700 - Function 2)
POWER UP	Transmitted when the SYNCHRON CX is booted. (Stream 703 - Function 1)

NOTICE

Undefined characters may be transmitted during system boot-up.

BIDIRECTIONAL STARTUP Transmitted when the bidirectional interface option is enabled. (Stream 703 - Function 2)

Refer to Section 4 for the details of the transmitted messages and Table 3.2 for an example of SYNCHRON CX unsolicited message transmission.

Table 3.2 Unsolicited Message Transmission Example

SYNCHRON CX **HOST**

EOT SOH ==========>

<==========ACK

[-0,702,01,270291,113121,-1100,RG,-1,-3,RO,#########,TU,SAMPLE1.01-,
----------,----------,
----------,Lee----------,John----------,-,
39485-------,Nelson----------,270291,1044,304----------,
-39,5,------,M,----------,1400.00,24.0,2.30,1.7300,
--4,03A-,04A-,01B-,01A-]35<CR><LF>

<==========ETX

-0,702,03,270291,114132,-1100,-----3442,-1,-3,SAMPLE1.01-,03A-,
2sk,911150,19,-1,#########,#########,2,1,-0,NA,NR,NR,0,NA,
#########,---------,DL,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,##########]9D<CR><LF>

<==========ACK

[-0,702,03,270291,113741,-1100,-----3430,-1,-3,SAMPLE1.01-,04A-
###,######,##,-1,----123.9,#########,2,0,-4,NA,NR,NA,0,NA,
123.91887,---------,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,##########]E9<CR><LF>

<==========ETX

[-0,702,03,270291,113741,-1100,-----3429,-1,-3,SAMPLE1.01-,01B-,
###,######,##,-1,-----3.60,#########,2,0,-4,NA,NR,NA,0,NA,
3.6003411,---------,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,##########]0E<CR><LF>

<==========ACK

[-0,702,03,270291,113741,-1100,-----3428,-1,-3,SAMPLE1.01-,01A-,
###,######,##,-1,----174.3,#########,2,0,-4,NA,NR,NA,0,NA,
174.28595,---------,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,
NO,NO,1.0000,##########]E3<CR><LF>

<==========ETX

[-0,702,11,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
USER-SPL-CALC-------,OK,120.31853,UN/UN---]4B<CR><LF>

<==========ACK

[-0,702,11,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
USER-SPL-CALC2------,OK,50.367081,UNIT----]47<CR><LF>

<==========ETX

[-0,702,13,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
CREA----------,AB,0.0000000,--------]92<CR><LF>

<==========ACK

[-0,702,13,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
CL----------,OK,173.48641,mmol24.]2D<CR><LF>

<==========ETX

[-0,702,13,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
K----------,OK,5.0404774,mmol24.]54<CR><LF>

<==========ACK

[-0,702,13,270291,114148,-1100,-1,-3,SAMPLE1.01-,-1,
NA----------,OK,244.00033,mmol24.]3F<CR><LF>

<==========ETX

[-0,702,05,270291,114148,-1100,SAMPLE1.01-,-1,-3]0A<CR><LF>

<==========ACK

[-0,703,17,190291,103626]DE

<==========ETX

EOT==========>

(-indicates space holder)

3.5 Solicited Messages

Solicited messages are transmitted by the host to request information from the SYNCHRON CX System. Solicited messages are used by the host to:

- Identify that a bidirectional system is attached to the host serial port. (Stream 700 - Function 1)
- Obtain SYNCHRON CX instrument status information. (Stream 703 - Function 3)
- Obtain a list of the SYNCHRON CX installed chemistries and their corresponding defined normal and critical ranges. (Stream 704 - Functions 7, 9)

Refer to Section 4 for the details of the transmitted messages and Table 3.3 for an example of host solicited message transmission.

Table 3.3 Solicited Message Transmission Example

SYNCHRON CX		HOST
	< ———	EOT SOH
ACK	< ———>	
	< ——— [00,703,03] <CS><CR><LF>	
ETX	< ———	
	< ———	EOT
EOT SOH	< ———>	
	< ———	ACK
	[00,703,04,120888,093044,CX7--,01,01,##,01]<CS><CR><LF> ———>	
	< ———	ETX
EOT	———>	

(<CS> indicates checksum.)
(-indicates space holder)

3.6 Downloading Sample Programming from Host to SYNCHRON CX

Sample programming may be transmitted directly from the host to the SYNCHRON CX System. The information which can be programmed includes sector and cup number, sample ID, test type, fluid type, demographics, and chemistry requests (Stream 701 - Function 1). The dilution factor cannot be downloaded from the host. It must be edited at the SYNCHRON CX System before the sample is recognized on the sample carousel. The response by the SYNCHRON CX is used to notify the host whether or not the program was accepted (e.g. a BUSY response may indicate programming is being done at the SYNCHRON CX console). There is an interlock prohibiting simultaneous programming of a single sample from the host and the SYNCHRON CX console. After the SYNCHRON CX releases the line (sends an EOT), the host may then repeat the process for as many sample cups as necessary for completion of the download.

In addition, the host can clear previous sector programming before transmitting the new sample programming (Stream 701 - Function 3). In response to the clear sector message transmitted by the host, the SYNCHRON CX transmits an OK, BUSY or SYNTAX ERROR message (Stream 701 - Function 4). This response by the SYNCHRON CX is used to notify the host whether or not the sector was cleared (e.g. A BUSY response may indicate programming is being done at the SYNCHRON CX console or the sector is on the sample wheel.) There is an interlock prohibiting simultaneous clearing from the host and clearing or programming from the SYNCHRON CX console.

Refer to Section 4 for the details of the transmitted messages and Table 3.4 for an example of host downloading.

Table 3.4 Host Downloading Sample Programming Example

SYNCHRON CX		**HOST**
	<==========	EOT SOH
CK	==========>	
	<========== [00,701,01,-2,-1,1,ST,SE,235--------,	
----------, FASTING----------,		
LIPEMIC----------,JOHNSON----------,HAROLD---------,-,		
-39-44-6207-,WASHINGTON--------,110391,1130,CCU-2----------,		
035,5,170852,M,PATIENT-IS-DIABETIC------,-------,----,----,------,		
004,01A-,0,01B-,0,04A-,0,02A-,0]<CS><CR><LF>		
ETX	==========>	
	<==========	EOT
EOT SOH	==========>	
	<==========	ACK
[-0,701,02,-0,--230,-2,-1,235--------]<CS><CR><LF>		
==========>		
	<==========	ETX
EOT	==========>	
	<==========	EOT SOH
ACK	==========>	
	<========== [00,701,01,02,02,0,RO,SE,238--------,	
----------,----------,		
----------,BROWN----------,DOROTHY--------,		
-,480-22-0894-,JONES----------,110391,1115,		
202----------,060,5,------,F,----------,		
-------,----,----,------,003,03A-,0,05A-,0,06A-,1]<CS><CR><LF>		
ETX	==========>	
	<==========	EOT
EOT SOH	==========>	
	<==========	ACK
[-0,701,02,-0,--231,-2,-2,238--------]<CS><CR><LF>		
==========>		
	<==========	ETX
EOT	==========>	
	<==========	EOT SOH
ACK	==========>	
	<========== [00,701,01,02,03,0,RO,UR,239--------,	
----------,----------,		
----------,SMITH----------,SAM----------,		
-,123-45-6789-,WASHINGTON--------,110891,1000,		
445-1----------,028,5,------,M,----------,		
-------,----,----,------,004,03A-,0,01B-,0,04A-,0,06A-,0]		
<CS><CR><LF>		
ETX	==========>	
	<==========	EOT
EOT SOH	==========>	
	<==========	ACK
[-0,701,02,-0,--232,-2,-3,239--------]<CS><CR><LF>==========>		
	<==========	ETX
EOT	==========>	

(<CS> indicates checksum, -indicates space holder)

SECTION 4 Description of Messages

4.1 Introduction

The data record format for all messages transmitted to and from the SYNCHRON CX System is:

'['<MESSAGE>']'<CS><CR><LF>

This Section describes the information contained in the <MESSAGE> portion. Refer to Paragraph 1.4.2 for a description of '[', ']', <CS>, <CR> and <LF>.

4.2 Message Format

The format of the <MESSAGE> is:

<DEVICE ID>,<STREAM>,<FUNCTION>,<FIELD1>,...,<FIELDN>

where:

- <DEVICE ID> is a number between 0 and 99. The default SYNCHRON CX ID is 0 but can be changed using the Define Host Screen. All messages which have a different Device ID from the Define Host Screen will not be processed.
- <STREAM> is a number between 700 and 799 (refer to Table 4.1).
- <FUNCTION> is a number between 1 and 99 (refer to Table 4.1).
- <FIELD1>,...,<FIELDN> are data fields associated with the <STREAM> and <FUNCTION>.

NOTICE

All data fields (<FIELDN>) are fixed length. Numeric fields, excluding function numbers, are right justified and blank filled to the maximum length. Character and string fields are left justified and right blank filled to the maximum length. If numeric data exceeds the maximum field length, the field will be filled with asterisks (*). If a field does not apply in a record it will be filled with pound signs (#).

Alphanumeric fields received from the host cannot contain commas(,). Commas received in an alphanumeric field will generate an HCP error. A comma entered in an alphanumeric field at the instrument is transmitted as a semicolon (;). A semicolon received from the host is converted to a comma. Acceptable characters for Sample ID ASCII characters are 33-126 (except , ; $ * ? [ ] \ and ^). For other entries, ASCII characters 32-175 are acceptable except 127 and 44.

Messages sent to and from the SYNCHRON CX are divided into streams. Each stream corresponds to one group of related operations within the interface. Within each stream are one or more functions. For each stream only one function can be active at a time. However, multiple streams can be active at the same time. The SYNCHRON CX's streams and associated functions are described in Table 4.1. Note that only the items with an asterisk (*) are used by the unidirectional interface.

Stream transmission options are selected through the Special Functions: 4. System Setup, 10. Host Communications Parameters.

SYNCHRON CX Streams and Functions

Table 4.1 SYNCHRON CX Streams and Functions

Operation	Stream	Function	Information	Sent By
Special Functions	700	1	Are you there?	Host
		2	Host Setup	SYNCHRON CX (U)
		7	Protocol control message (Clear Queue)	Host
SampleCup Program	701	1	Sample/cup program	Host
		2	Sample/cup return status	SYNCHRON CX(S)
		3	Clear sector/sample IDs	Host
		4	Clear sector/sample IDs	SYNCHRON CX(S) status
		6	Host Query sector/sample IDs Auto Clear Queue	SYNCHRON CX (U)
Results	702	1[a]	Cup header	SYNCHRON CX(U)
		3[a]	Test result	SYNCHRON CX(U)
		5[a]	End of cup.	SYNCHRON CX(U)
		7[a]	Linear calibration result.	SYNCHRON CX(U)
		9[a]	Multipoint calibration result.	SYNCHRON CX(U)
		11[a]	Special calculation result.	SYNCHRON CX(U)
		13[a]	Timed Urine Result	SYNCHRON CX(U)
		21[a]	Reagent pack header.	SYNCHRON CX(U)
		23[a]	Results for calibration.	SYNCHRON CX(U)
		25[a]	Expanded result for calibration.	SYNCHRON CX(U)
		27[a]	End of Reagent Pack	SYNCHRON CX(U)
		81[a]	Expanded result.	SYNCHRON CX(U)
		83[a]	Expanded multipoint calibration result.	SYNCHRON CX(U)
Instrument Status	703	1[a]	Power up.	SYNCHRON CX(U)
		2	Bidirectional interface.	SYNCHRON CX(U)
		3	Request instrument status	Host
		4	Instrument status.	SYNCHRON CX(S)
		5[a]	Instrument exception.	SYNCHRON CX(U)
		7	Chemistry configuration change.	SYNCHRON CX(U)
		13	Normal/critical range change.	SYNCHRON CX(U)
		17[a]	End of run.	SYNCHRON CX(U)
Setup Status	704	7	Request for installed chemistries.	Host
		8	Installed chemistries.	SYNCHRON CX(S)

1 of 2

Table 4.1 SYNCHRON CX Streams and Functions, continued

Operation	Stream	Function	Information	Sent By
		9	Request for normal/critical ranges.	Host
		10	Normal/critical ranges.	SYNCHRON CX(S)

2 of 2

* Supported by unidirectional interface.
(S) indicates solicited message.
(U) indicates unsolicited message.

Paragraphs 4.3 through 4.7 describe the transmission format details of each stream and its associated functions.

4.3 Stream 700 - Special Function

Stream 700 - Function 1 Are you there?

SENT BY: Host

PURPOSE: Identify that a bidirectional system is attached to the host port; also clears the status power-up flag.

Table 4.2 Stream 700 - Function 1 Are you there?

Field	Length	Format	Description
Device I.D.	2	0 -- 99	Operator assigned
Stream	3	700	Always 700
Function	2	01	Always 01

EXAMPLE: `[00,700,01]98<CR><LF>`

Stream 700 - Function 2 Host Setup

SENT BY: Host

PURPOSE: Identify that a bidirectional system is attached to the host port; also clears the status power-up flag.

Table 4.3 Stream 700 - Function 2 Host Setup

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	700	Always 700
Function	2	02	Always 02
Date	6	ddmmyy	Always ddmmyy
Time	6	hhmmss	Always hhmmss
Software Revision	10	Alphanumeric	REV NNN.N
Driver Mode	1	B or U	Bidirectional or Unidirectional
STREAM 700 FUNCTION 2	1	0 or 1	0 = off, 1 = on
STREAM 701 FUNCTION 6	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 3[1]	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 7[4]	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 9[4]	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 11	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 23	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 25[5]	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 81[1]	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 83	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 1	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 2	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 5	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 7	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 13	1	0 or 1	0 = off, 1 = on
STREAM 703 FUNCTION 17	1	0 or 1	0 = off, 1 = on
STREAM 702 FUNCTION 13	1	0 or 1	0 = off, 1 = on
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3
Unused Stream and Function	1	0 or 1	0 = off, 1 = on, Refer to Note 3

1 of 2

Table 4.3 Stream 700 - Function 2 Host Setup, continued

Field	Length	Format	Description
EXAMPLE: [-0,700,02,270291,163322,v0.0.04.07,B,1,0,1,1,1,1, 1,1,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1]6E<CR><LF>			
(- Indicates space holder)			
Note 1: Stream 702 function 3, or Stream 702 function 81, or both Stream 702 functions 3 and 81 will be turned ON. It is not permitted to turn OFF both function 3 and 81.			
Note 2: Stream 702 function 1 and Stream 702 function 5 will always be sent.			
Note 3: Unused stream and function fields are for future use as new streams and functions are defined.			
Note 4: Complete reagent pack messages can be turned off/on.			
Note 5: Should be turned off/on separately.			

Stream 700 - Function 7 Clear Queue

SENT BY: Host

PURPOSE: Controls the transmission of unsolicited messages (refer to Section 3.4) from the SYNCHRON CX. In response to this message the SYNCHRON CX clears the unsolicited and query queues.

NOTICE

When the SYNCHRON CX transmission is enabled, the SYNCHRON CX transmission queue is cleared to ensure transmission of current information. All items in unsolicited and query queue are deleted and are not sent to the host.

Table 4.4 Stream 700 - Function 7 Clear Queue

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	700	Always 700
Function	2	07	Always 07
EXAMPLE: [00,700,07]92<CR><LF>			

4.4 Stream 701 - Sample/Cup Program

Stream 701 - Function 1 Sample/Cup Program

SENT BY: Host

PURPOSE: Sample programming information, sent by the host, required by the SYNCHRON CX to process the sample in the specified cup.

Table 4.5 Stream 701 - Function 1 Sample/Cup Program

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	701	Always 701
Function	2	01	Always 01
Sector Number	2	0 - 60	Numeric; 0 = no sector number in barcode mode
Cup Number	2	0 - 7	Numeric; 0 = no cup number in barcode mode
Update Flag	1	Flag	0 = Replace all programming 1 = Only add new chemistries if sample program exists, else program new sample; Refer to Note 4
Test Type	2	AA	Refer to Appendix A
Sample Type	2	AA	Refer to Appendix B
Sample ID	11	Alphanumeric	Refer to Note 2
Control Name	20	Alphanumeric	
Sample Comment Code 1	25	Alphanumeric	Refer to Note 1
Sample Comment Code 2	25	Alphanumeric	
Last Name	18	Alphanumeric	
First Name	15	Alphanumeric	
Middle Initial	1	Alphanumeric	
Patient ID	12	Alphanumeric	
Doctor	18	Alphanumeric	
Draw Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Draw Time	4	hhmm	Hours Minutes (military)*
Location	20	Alphanumeric	
Age	3	0-999	in hours, days, weeks, months, years
Age Units	1	Numeric	hours, days, weeks, months, years; Refer to Appendix K
Birth Date	6	ddmmyy	Day Month Year
Sex	1	A	M = Male; F = Female
Patient Comments	25	Alphanumeric	
Timed Urine Volume	7	Alphanumeric	

Table 4.5 Stream 701 - Function 1 Sample/Cup Program, continued

Field	Length	Format	Description
Timed Urine Period	4	Numeric	Collection Period
Timed Urine Creatinine	4	Numeric	Serum Creatinine (Note 6)
Timed Urine Area	6	Numeric	Surface Area
Number of Tests	3	1 - 999	Numeric
Programmed for Sample			
Chemistry 1	4	Chem Code	
ORDAC Chemistry 1	1	Flag	1 = ORDAC 0 = Do not ORDAC
Chemistry 2	4	Chem Code	
ORDAC Chemistry 2	1	Flag	1 = ORDAC 0 = Do not ORDAC
⋮			
Chemistry N (Refer to Note 5)	4	Chem Code	(N ≤ 72)
ORDAC Chemistry N	1	Flag	1 = ORDAC 0 = Do not ORDAC

EXAMPLE:

```
[00,701,01,01,03,1,RO,SE,samp3------,CONTROL_NAME________,
------------------------,SAMPLE_COMMENT_TWO_______,
------------------,PATIENT_F_NAME_,M,------------,
------------------,------,----,--------------------,
000,4,------,M,------------------------,-------,
----,----,------,001,01B-,0]2F<CR><LF>
```

(-Indicates space holder)

Table 4.5 Stream 701 - Function 1 Sample/Cup Program, continued

Field	Length	Format	Description

Note 1: Control name is the unique identifier indicating which control this result is for. Only the selected fluid type for the control can be used. Any other fluid type is a syntax error. All lower case letters are converted to upper case.

Note 2: The Sample ID must be filled in both modes. It is converted to upper case when received in lower case. Invalid characters:

33 – 126	(decimal) valid
44, 59, 36	(decimal) invalid
* ?] [\^;,	invalid

Note 3: The cup number and sector number must be filled in when the instrument is in sector and cup mode.

Note 4: When update flag is on, chemistries that are programmed will not be added again to the chemistry list. When the update flag is sent from the host, the flag applies only to chemistries added to the sample program. This flag cannot be used for updating any other sample programming parameter.

Note 5: The number in the number of tests field must equal N. If Q C is programmed by cartridge then $N \leq 33$

Note 6: Serum creatinine values must be received from the host in default units (mg/dL) for creatinine clearance calculations to be performed correctly, and to avoid erroneous answers.

3 of 3

Stream 701 - Function 2 Sample/Cup Return Status

SENT BY: SYNCHRON CX

PURPOSE: Notify the host whether or not the downloaded sample/cup program (Stream 701 - Function 1) was accepted. An OK message indicates the program was accepted. A BUSY, SYNTAX ERROR or INV. CHEM COMB. message indicates the program was not accepted (e.g. Programming was being done at the SYNCHRON CX console). An INVALID CHEMISTRY REQUESTED or INVALID ORDAC REQUESTED message indicates that a request for a particular chemistry was not accepted, and, consequently, remaining chemistries for that cup were not accepted and will not be run.

Table 4.6 Stream 701 - Function 2 Sample/Cup Return Status

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	701	Always 701
Function	2	02	Always 02
Return Code	2	NN	00 = OK
			-1 = SYNTAX ERROR (Incorrect message syntax)
			-2 = BUSY (The cup is running or being programmed at the SYNCHRON CX)
			-3 = INVALID CHEMISTRY REQUESTED
			-4 = INVALID ORDAC REQUESTED
			-5 = INVALID CHEMISTRY COMBINATION PROGRAMMED (one or more chemistries require dilution or sample volume exceeds hardware limitations)
			-6 = CONTROL NOT CONFIGURED
			-7 = CALIBRATOR SECTOR ONLY
			-8 = MODE MISMATCH (barcode/sector mode is not the same for SYNCHRON CX and host)
			-9 = SYNCHRON CX Error (some internal logical error has occurred)
			10 = COMPLETED SAMPLE (program update only)
			11 = Incompatible Fluid Types. Used for program update or control sample program.
			12 = Incompatible Test Types. Used only for program update.
			13 = Incompatible Patient Name. Used only for program update (first, middle, last).
			14-20 = Future Use.
Accession Number	5	1 - 65535	Unique ID assigned by SYNCHRON CX to each sample programmed; if any change to a programmed sample is made, a new accession number will be assigned.

1 of 2

Table 4.6 Stream 701 - Function 2 Sample/Cup Return Status, continued

Field	Length	Format	Description
Sector Number	2	0 - 60	0 = NO SECTOR NUMBER IN BAR CODE MODE
Cup Number	2	0 - 7	0 = NO CUP NUMBER IN BAR CODE MODE
Sample ID	11	Alpha	

EXAMPLE: `[-0,701,02,-0,--230,-1,-3,samp3------]5D<CR><LF>`

(-Indicates space holder)

2 of 2

Stream 701 - Function 3 Clear Sector/Sample IDs

SENT BY: Host

PURPOSE: Clears previous programming from the indicated sector when SYNCHRON CX is in sector mode, or will clear a list of sample IDs when in bar code mode. If not sent, the new programming will cause the old sample program to be reassigned.

Table 4.7 Stream 701 - Function 3 Clear Sector/Sample IDs

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	701	Always 701
Function	2	03	Always 03
Sector Number	2	0 - 60	0 = NO SECTOR IN BAR CODE MODE
Sample ID 1	11	Alpha	Sample ID for a cup
Sample ID 2	11	Alpha	Sample ID for a cup
Sample ID 3	11	Alpha	Sample ID for a cup
Sample ID 4	11	Alpha	Sample ID for a cup
Sample ID 5	11	Alpha	Sample ID for a cup
Sample ID 6	11	Alpha	Sample ID for a cup
Sample ID 7	11	Alpha	Sample ID for a cup

EXAMPLE: `[00,701,03,00,SAMP1------,SAMP2------,SAMP3------,`
`SAMP4------,SAMP5------,SAMP6------,SAMP7------]`
`D2<CR><LF>`

(-Indicates space holder)

Stream 701 - Function 4 Clear Sector/Sample IDs Status

SENT BY: SYNCHRON CX

PURPOSE: Notify the host whether or not the clear sector/sample ID command (Stream 701 - Function 3) was accepted. An OK message indicates the sector was cleared; a BUSY or BAD MESSAGE indicates the sector or not all of the sample IDs were cleared (e.g. Programming was being done at the SYNCHRON CX console).

Table 4.8 Stream 701 - Function 4 Clear Sector/Sample IDs Status

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	701	Always 701
Function	2	04	Always 04
Sector Number	2	0 - 60	0 = NO SECTOR IN BAR CODE MODE
Return Code	2	0 - 99	-0 = COMPLETE SECTOR OR ALL SAMPLE IDs CLEARED
			-1 = BAD
			MESSAGE (Incorrect message syntax)
			-2 = BUSY (The sector or one of the sample IDs is running)
			-3 = SYNCHRON CX ERROR
			-4 = NON EXISTENT ERROR
Return Codes:			
Sample ID 1	2	0 - 99	-0 = CLEARED
Sample ID 2	2	0 - 99	-2 = BUSY - NOT CLEARED
Sample ID 3	2	0 - 99	-3 = SYNCHRON CX ERROR
Sample ID 4	2	0 - 99	-4 = NON EXISTENT ERROR
Sample ID 5	2	0 - 99	
Sample ID 6	2	0 - 99	
Sample ID 7	2	0 - 99	

EXAMPLE: `[-0,701,04,-0,-4,-4,-4,-4,-4,-4,-4,-4]28<CR><LF>`

(-Indicates space holder)

Stream 701 - Function 6 HOST QUERY Sector/Sample IDs

SENT BY: SYNCHRON CX to Host

PURPOSE: To request from the host the sample program for the sample ID's specified. This message can be turned off in the host setup screen. After receiving this message, the host has a period of time to respond with the first sample program. For the CX DELTA Systems this time period is selected by the operator in the host setup screen. Options are OFF, 2.5, 5, 7.5, and 10 minutes. The CX DELTA System also has an AUTO CLEAR QUEUE function. This option, if ON, will clear all programming for the sample ID as soon as the sample is identified a second time, causing the instrument to requery the host. The host can respond by resending the same sample programming (rerun tests,), send new programming (including rerunning specific tests), or send nothing (no sample programming available).

Table 4.9 Stream 701 - Function 6 HOST QUERY Sector/Sample IDs

Field	Length	Format	Description
Device ID	2	0-99	Operator assigned
Stream	3	701	
Function	2	06	
Sample ID 1	11	Alpha	
—			
—			
Sample ID 7	11	Alpha	

EXAMPLE:
```
[-0,701,06,samp1------,samp2------,samp3------,
samp4------,samp5------,samp6------,samp7------]
EB<CR><LF>
```

(-Indicates space holder)

4.5 Stream 702 - Results

Stream 702 - Function 1 Cup Header

SENT BY: SYNCHRON CX

PURPOSE: The cup header (sample ID and demographic information) is transmitted prior to the transmission of the test results.

Table 4.10 Stream 702 - Function 1 Cup Header

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	01	Always 01
Date Start	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Start	6	hhmmss	Hour Minute Second
Accession Number	5	number	1 - 65535 Unique ID assigned by SYNCHRON CX to each sample programmed
Print Type	2	AA	RG = Regular[a] RE = Recall[a] IN = INCOMPLETE
Sector Number	2	1 - 60	Numeric
Cup Number	2	1 - 7	Numeric
Test Type	2	Test Code	Refer to Appendix A
Future Use Space	9	Alphanumeric	
Sample Type	2	Fluid Code	Refer to Appendix B
Sample ID	11		Alphanumeric
Control Name	20		Alphanumeric (Note 1)
Sample Comment Code 1	25		Alphanumeric
Sample Comment Code 2	25		Alphanumeric
Last Name	18		Alphanumeric
First Name	15		Alphanumeric
Middle Initial	1		Alphanumeric
Patient ID	12		Alphanumeric
Doctor	18		Alphanumeric
Draw Date	6	ddmmyy	Day Month Year
Draw Time	4	hhmm	Alphanumeric
Location	20		Alphanumeric
Age	3	0 - 999	Hours Days Weeks Months Years
Age Units	1		Number; Refer to Appendix K
Birth Date	6	ddmmyy	Day Month Year

1 of 2

Table 4.10 Stream 702 - Function 1 Cup Header, continued

Field	Length	Format	Description
Sex	1	A	M = Male; F = Female
Patient Comments	25		Alphanumeric
Timed Urine Volume	7	Real	0-99999.0 (Note 2)
Timed Urine Period	4	Real	Collection Period
Timed Urine Creatinine	4	Real	Serum Creatinine 0-99.9 (Note 2)
Timed Urine Area	6	Real	Surface Area 0-99.999 (Note 2)
Number of Tests Programmed for Sample	3	1 - 999	Numeric (does not include replicates)
Chemistry 1	4	Chem Code	Refer to Appendix C
Chemistry 2	4	Chem Code	Refer to Appendix C
Chemistry N	4	Chem Code	Refer to Appendix C (N= 0 - 999)

EXAMPLE:

```
[-0,702,01,270291,113120,--212,RE,-1,-1,RO,#########,
SE,28903T-----,--------------------,
------------------------,------------------------,
Wilson------------,Joe------------,-,23895-------,
Kildare-----------,270291,1039,220-----------------,
-34,5,------,M,------------------------,#######,####,
####,######,--5,44A-,04A-,02A-,01B-,01A-]53<CR><LF>
```

(-Indicates space holder)

Note 1: Control name is the unique identifier indicating which control this result is for.

Note 2: The number of decimal places is adjusted so that the number can fit in this field. The urine volume field length in Sample Programming is 5 characters long. When results are transmitted to the host, all 7 characters for timed urine are transmitted.

[a] All automatic transmissions are identified as "RG"; transmission initiated through the SYNCHRON CX recall functionare identified as "RE".

Stream 702 - Function 3 Test Results

SENT BY: SYNCHRON CX

PURPOSE: Transmission of test results when cup is complete.

Table 4.11 Stream 702 - Function 3 Test Results

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	03	Always 03
Date Complete	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Complete	6	hhmmss	Hour Minute Second
Accession Number	5	1 - 65535	Unique ID assigned by SYNCHRON CX to each sample programmed
Result Record Number	9	1 - 10000	Numeric
Sector Number	2	1 - 60	Numeric
Cup Number	2	1 - 7	Numeric
Sample ID	11		Alphanumeric
Chemistry	4	Chem Code	Refer to Appendix C
Reagent Serial No.	3		Alphanumeric
Reagent Lot No.	6		Alphanumeric
Cuvette No.	2		Numeric
Replicate No.	2		Numeric
Result in Selected Units*	9	Real	Numeric or ********* = invalid data or ######### = result suppressed. Result in user-selected units which is reported on the SYNCHRON CX.
Calibration Rate	9	Real	
Positive or Negative	1	Code	Positive or Negative 0 = Negative[a] 1 = Positive[a] 2 = Not Applicable 3 = No Decision
Suppress Result	1	Flag	0 = Do not suppress result 1 = Suppress result
Units	2	Code	Refer to Appendix D
Normal Range Flag	2	Code	**Refer to Range Codes below
Instrument Range Flag	2	Code	**Refer to Range Codes below
Critical Range Flag	2	AA	**Refer to Range Codes below

1 of 3

Table 4.11 Stream 702 - Function 3 Test Results, continued

Field	Length	Format	Description
ORDAC Result	1	N	0 = ORDAC not used 1 = ORDAC used
Control Range Flag	2	AA	NA = Not applicable NR = Within 2 SD of mean H2 = Between 2 SD and 3 SD above mean H3 = Greater than 3 SD above mean H4 = Greater than 4SD above mean L2 = Between 2SD + 3SD below mean L3 = Greater than 3SD below mean L4 = Greater than 4SD below mean IT = Invalid SD IC = Incomplete Ranges CD = Control or chemistry deleted
Calculated Result	9	Real	Numeric or ********* = invalid data or ######### = result suppressed. Result calculated using the SYNCHRON CX default units.
Instrument Codes	9		Refer to Appendix E
Result Error 1	2	Code	Refer to Appendix F
Result Error 2	2	Code	Refer to Appendix F
Result Error 3	2	Code	Refer to Appendix F
Result Error 4	2	Code	Refer to Appendix F
Result Error 5	2	Code	Refer to Appendix F
Result Error 6	2	Code	Refer to Appendix F
Result Error 7	2	Code	Refer to Appendix F
Result Error 8	2	Code	Refer to Appendix F
Result Error 9	2	Code	Refer to Appendix F
Result Error 10	2	Code	Refer to Appendix F
Result Error 11	2	Code	Refer to Appendix F
Result Error 12	2	Code	Refer to Appendix F
Result Error 13	2	Code	Refer to Appendix F
Result Error 14	2	Code	Refer to Appendix F
Result Error 15	2	Code	Refer to Appendix F
Result Error 16	2	Code	Refer to Appendix F
Dilution Factor	6	Real	0.0 - 1000.0 (refer to Note 1)
Reportable Range	2	Code	**Refer to range codes below
Future Use Space	20	Alpha	

Table 4.11 Stream 702 - Function 3 Test Results, continued

Field	Length	Format	Description

EXAMPLE:

```
[-0,702,03,270291,114739,--212,-----3468,-1,-1,
28903T-----,44A-,2D6,008150,12,-1,------150,#########,
2,0,-0,NA,NR,NR,0,NA,149.51265,---------,NO,NO,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,1.0000,
NR,####################]ED<CR><LF>
```

(-Indicates space holder)

* If a chemistry is considered to be not run by the SYNCHRON CX due to an error condition, no result or flag will be transmitted to the host.

** Range Codes: NR = Within defined range
HI = Above defined range
LO = Below defined range
NA = Not applicable
OR = Out of range

Note 1: It will be possible for samples to contain tests that were run with different dilution factors.

3 of 3

[a] 0 and 1 are used only for drugs of abuse. All other chemistries use 2, not applicable.

Stream 702 - Function 5 End of Cup

SENT BY: SYNCHRON CX

PURPOSE: Notify host that all tests on a sample have been completed.

Table 4.12 Stream 702 - Function 5 End of Cup

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	05	Always 05
Date Completed	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Completed	6	hhmmss	Hour Minute Second
Accession Number	5	1 - 65535	Unique ID assigned by SYNCHRON CX to each sample programmed
Sample ID	11		Alphanumeric
Sector Number	2	1 - 60	Numeric
Cup Number	2	1 - 7	Numeric

EXAMPLE: `[-0,702,05,220291,155308,--105,1----------,58,-1]`
`2F<CR><LF>`

(-Indicates space holder)

Stream 702 - Function 7 Linear Calibration Result

SENT BY: SYNCHRON CX

PURPOSE: Transmission of linear calibration results. This message is only transmitted after all tests for the calibration are complete. This message can be turned off in the Host Setup screen.

Table 4.13 Stream 702 - Function 7 Linear Calibration Result

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	07	Always 07
Date Completed	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Completed	6	hhmmss	Hour Minute Second
Chemistry	4	Chem Code	Refer to Appendix C
Reagent Serial No.	3		Alphanumeric
Reagent Lot No.	6		Alphanumeric
Reag Record Number	9		Numeric
Set Point 1	9	Real	Numeric - Calibrator 1 or ne (Note 1)
Set Point 2	9		Numeric - Calibrator 2 or lo (Note 1)
Set Point 3	9	Real	Calibrator 3 or mi (Note 1)
Cal Rate	9	Real	Calibrator ne (Note 2)
Cal Rate	9	Real	Calibrator lo (Note 2)
Cal Rate	9	Real	Calibrator mi (Note 2)
Calibration	1	Flag	0 = Not bypassed
Bypassed			1 = Bypassed
Calibration Override	1	Flag	0 = Not overridden 1 = Overridden
Calibration Timeout	1	Flag	0 = Not timed out 1 = Timed out
Calibration Calibrated	1	Flag	0 = Not calibrated 1 = Calibrated
Set Points Modified	1	Flag	0 = Not modified 1 = Modified
Calibration Error 1	2	Code	Refer to Appendix G
Calibration Error 2	2	Code	Refer to Appendix G
Calibration Error 3	2	Code	Refer to Appendix G
Calibration Error 4	2	Code	Refer to Appendix G
Calibration Error 5	2	Code	Refer to Appendix G

1 of 2

Table 4.13 Stream 702 - Function 7 Linear Calibration Result, continued

Field	Length	Format	Description
Calibration Error 6	2	Code	Refer to Appendix G
Calibration Error 7	2	Code	Refer to Appendix G
Calibration Error 8	2	Code	Refer to Appendix G
Calibration Error 9	2	Code	Refer to Appendix G
Calibration Error 10	2	Code	Refer to Appendix G
Calibration Error 11	2	Code	Refer to Appendix G
Calibration Error 12	2	Code	Refer to Appendix G
Calibration Error 13	2	Code	Refer to Appendix G
Calibration Error 14	2	Code	Refer to Appendix G
Calibration Error 15	2	Code	Refer to Appendix G
Calibration Error 16	2	Code	Refer to Appendix G
Calibration Slope	10	NNNN.NNNNN	Real; ******** = Does not fit
Calibration Offset	10	NNNN.NNNNN	Real; ******** = Does not fit
Slope Adjustment	10	NNNN.NNNNN	Real; ******** = Does not fit
Offset Adjustment	10	NNNN.NNNNN	Real; ******** = Does not fit
Cal Factor	9		Real; (Note 2)
Cal Span	9		Real; calibrator ne (Note 2)
Cal Span	9		Real; calibrator lo (Note 2)
Cal Span	9		Real; calibrator mi (Note 2)
Future Use Space	30		alpha

EXAMPLE:

```
[-0,702,07,280291,120101,83A-,0RO,010226,-------34,
48.500000,#########,#########,#########,#########,
#########,0,0,0,1,0,00,00,00,00,00,00,00,00,00,00,00,
00,00,00,00,-281.10751,---0.00000,---1.00000,---0.00000,
#########,#########,#########,#########,
##############################]2F<CR><LF>
```

(-Indicates space holder)

Note 1: The number of decimal places in this field is the number in the selected precision for the default units field in the chem database plus an additional decimal place

Note 2: 5 decimal places

2 of 2

Stream 702 - Function 9 Multipoint Calibration Result

SENT BY: SYNCHRON CX

PURPOSE: Transmission of multipoint calibration results. This message is only transmitted after all tests for the calibration are complete. This message can be turned off on the Host Setup screen.

Table 4.14 Stream 702 - Function 9 Multipoint Calibration Result

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	09	Always 09
Date Completed	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Completed	6	hhmmss	Hour Minute Second
Chemistry	4	Chem Code	Refer to Appendix C
Reagent Serial No.	3		Alphanumeric
Reagent Lot No.	6		Alphanumeric
Reagent Record Number	9		Numeric
Set Point 1	9		Real - Calibrator 1 (Note 1)
Set Point 2	9		Real - Calibrator 2 (Note 1)
Set Point 3	9		Real - Calibrator 3 (Note 1)
Set Point 4	9		Real - Calibrator 4 (Note 1)
Set Point 5	9		Real - Calibrator 5 (Note 1)
Set Point 6	9		Real - Calibrator 6 (Note 1)
Calibration Bypassed	1	Flag	0 = Not bypassed 1 = Bypassed
Calibration Override	1	Flag	0 = Not overridden 1 = Overridden
Calibration Timeout	1	Flag	0 = Not timed out 1 = Timed out
Calibration Calibrated	1	Flag	0 = Not calibrated 1 = Calibrated
Set Points Modified	1	Flag	0 = Not modified 1 = Modified
Calibration Error 1	2	Code	Refer to Appendix G
Calibration Error 2	2	Code	Refer to Appendix G
Calibration Error 3	2	Code	Refer to Appendix G
Calibration Error 4	2	Code	Refer to Appendix G
Calibration Error 5	2	Code	Refer to Appendix G
Calibration Error 6	2	Code	Refer to Appendix G
Calibration Error 7	2	Code	Refer to Appendix G

Table 4.14 Stream 702 - Function 9 Multipoint Calibration Result, continued

Field	Length	Format	Description
Calibration Error 8	2	Code	Refer to Appendix G
Calibration Error 9	2	Code	Refer to Appendix G
Calibration Error 10	2	Code	Refer to Appendix G
Calibration Error 11	2	Code	Refer to Appendix G
Calibration Error 12	2	Code	Refer to Appendix G
Calibration Error 13	2	Code	Refer to Appendix G
Calibration Error 14	2	Code	Refer to Appendix G
Calibration Error 15	2	Code	Refer to Appendix G
Calibration Error 16	2	Code	Refer to Appendix G
Model	2	1 - 5,8,9	Model number
RO	9		Real (Note 2)
Kc	9		Real (Note 2)
a	9		Real (Note 2)
b	9		Real (Note 2)
c	9		Real (Note 2)
d	9		Real (Note 2)
Slope Adjustment	10		Real (Note 2)
Offset Adjustment	10		Real (Note 2)
Future Use Space	30		Alpha

EXAMPLE:
```
[-0,702,09,060391,103806,MPT6,###,######,-------10,
0.0000000,1.0000000,2.0000000,4.0000000,8.0000000,
16.000000,0,0,0,1,0,00,00,00,00,00,00,00,00,00,
00,00,00,00,00,00,-1,879.68268,-787.9960,0.1827289,
0.7196383,0.0000000,0.0000000,---1.00000,---0.00000,
##############################]90<CR><LF>
```

(-Indicates space holder)

Note 1: The number of decimal places in this field is the number in the selected precision for the default units field in the chem database plus an additional decimal place

Note 2: The number of decimal places is adjusted so that the number can fit in this field

2 of 2

Stream 702 - Function 11 Special Calculation Result

SENT BY: SYNCHRON CX

PURPOSE: Transmission of special calculation results. One message is transmitted for each special calculation result. This message cannot be transmitted until all test results are completed. This message can be turned off on the Host Setup screen.

Table 4.15 Stream 702 - Function 11 Special Calculation Result

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	11	Always 11
Date Run	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Run	6	hhmmss	Hour Minute Second
Accession Number	5	1 - 65535	Unique ID assigned by SYNCHRON CX to each sample programmed
Sector Number	2	1 - 60	Numeric
Cup Number	2	1 - 7	Numeric
Sample ID	11		Alphanumeric
Replicate No.	2		Numeric
Special Calculation Name	20		Alphanumeric; Name given by operator
Special Calculation Status	2	Code	Refer to Appendix H
Special Calculation Result	9		Real (Note 1)
Special Unit String	8		Alpha

EXAMPLE:
```
[-0,702,11,060391,123246,---19,18,-3,----------,-1,
OSMOLALITY-(1)------,OK,308.60977,--------]46<CR><LF>
```

(- Indicates space holder)

Note 1: The number of decimal places is adjusted so that the number can fit in this field.

Stream 702 - Function 13 Timed Urine Result

SENT BY: SYNCHRON CX

PURPOSE: This message is sent whenever all results are completed. There is one message for each timed urine result. This message can be turned off on the Host Setup screen.

Table 4.16 Stream 702 - Function 13 Timed Urine Result

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	
Function	2	13	
Date	6	ddmmyy	
Time	6	hhmmss	
Accession Number	5	Number	1 to 65535
Sector Number	2	1 - 60	
Cup Number	2	1 - 7	
Sample ID	11	Alpha	
Replicate #	2	Number	
TU Calc Name	20	Alpha	
TU Calc Status	2	Code	Refer to Appendix H
TU Calc Results	9	Real	Refer to Note 1
TU Unit String	8	Alpha	

EXAMPLE: `[-0,702,13,270291,114148,--215,-1,-3,866463K----,-1,CL----------,OK,173.48641,mmol/24.]CD<CR><LF>`

(- Indicates space holder)

Note 1: The number of decimal places is adjusted so that the number can fit in this field.

Stream 702 - Function 21 Reagent Pack Header

SENT BY: SYNCHRON CX

PURPOSE: A reagent pack header is sent before sending any calibration results. The header contains reagent and chemistry information.

Table 4.17 Stream 702 - Function 21 Reagent Pack Header

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	
Function	2	21	
Start Date	6	ddmmyy	Day Month Year
Start time	6	hhmmss	Hours Minutes Seconds
COM CHEM ID	4	Chem Code	Refer to Appendix C or User Defined Chemistry
Print Type	2	Code	RG=Regular RE=Recall IN=Incomplete
Serial reagent	3	Alpha	
Lot reagent	6	Alpha	
Calibrator Lot	7	Alpha	
Number of Level	2	Number	1-6
Number of reps cup 1	2	Number	1-5
Number of reps cup 2	2	Number	1-5
Number of reps cup 3	2	Number	1-5
Number of reps cup 4	2	Number	1-5
Number of reps cup 5	2	Number	1-5
Number of reps cup 6	2	Number	1-5
Reagent position	2	Number	25-33 = CX3/ISE Module 1-24 CX4 positions
Sector number	2	1-60	
Cup number	2	1-7	first cup
Cup number	2	1-7	
Cup number	2	1-7	
Cup number	2	1-7	
Cup number	2	1-7	
Cup number	2	1-7	sixth cup
Future Use Space	30	Alpha	

1 of 2

Table 4.17 Stream 702 - Function 21 Reagent Pack Header, continued

Field	Length	Format	Description
EXAMPLE: [-0,702,21,270291,102849,01A-,RG,---,N/A---,N/A----, -2,-2,-2,00,00,00,00,25,-0,-0,-0,-0,-0,-0,-0, ##############################]FF<CR><LF>			
(- Indicates space holder)			

2 of 2

Stream 702 - Function 23 Calibration Results

SENT BY: SYNCHRON CX

PURPOSE: This message is sent when a chemistry is calibrated

Table 4.18 Stream 702 - Function 23 Calibration Results

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	
Function	2	23	
Completion date	6	ddmmyy	Days Months Years
Completion time	6	hhmmss	Hours Minutes Seconds
Result record number	9	Number	1 - 10,000
CHEM ID	4	CHEM CODE	Refer to Appendix C or User Defined Chemistry
Cuvette	2	Number	
Replicate	2	Number	
Cal Level	2	1 - 6	
Units	2	Code	Refer to Appendix D
Calculated Result	9	Real	Refer to Note 1
Suppress Value	1	Flag	1 = suppress value and Refer to Note 2
Instrument Codes	9	Alpha	Refer to Appendix E
Result Error 1	2	Alpha	Refer to Appendix F
Result Error 2	2	Alpha	Refer to Appendix F
Result Error 3	2	Alpha	Refer to Appendix F
Result Error 4	2	Alpha	Refer to Appendix F
Result Error 5	2	Alpha	Refer to Appendix F
Result Error 6	2	Alpha	Refer to Appendix F
Result Error 7	2	Alpha	Refer to Appendix F
Result Error 8	2	Alpha	Refer to Appendix F

1 of 2

Table 4.18 Stream 702 - Function 23 Calibration Results, continued

Field	Length	Format	Description
Result Error 9	2	Alpha	Refer to Appendix F
Result Error 10	2	Alpha	Refer to Appendix F
Result Error 11	2	Alpha	Refer to Appendix F
Result Error 12	2	Alpha	Refer to Appendix F
Result Error 13	2	Alpha	Refer to Appendix F
Result Error 14	2	Alpha	Refer to Appendix F
Result Error 15	2	Alpha	Refer to Appendix F
Result Error 16	2	Alpha	Refer to Appendix F
Future Use Space	30	Alpha	

EXAMPLE: `[-0,702,23,200291,124727,-------44,83A-,76,-1,-1,-0,`
`-999.0000,1,---------,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,`
`NO,NO,NO,NO,NO,##############################]F9<CR><LF>`

(- Indicates space holder)

Note 1: The number of decimal places is adjusted so that thenumber can fit in this field.

Note 2: If answer suppressed = 1

2 of 2

Stream 702 - Function 25 Expanded Result for Calibration

SENT BY: SYNCHRON CX

PURPOSE: This message is sent when a calibration is complete and contains an image of the data base result record. It is used primarily for diagnostic and research purposes. This message can be turned off on the Host Setup screen.

Table 4.19 Stream 702 - Function 25 Expanded Result for Calibration

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	
Function	2	25	
Date	6	ddmmyy	Day Month Year
Time	6	hhmmss	Hours Minutes Seconds
Result record number	9	Number	1 - 10,000
Reagent record number	9	Number	
Replicate number	2	Number	
COM CHEM ID	4	CHEM CODE	Refer to Appendix C or User Defined Chemistry
Cuvette number	2	Number	
Cal level	2	1-6	
Noise Maximum	5	Number	
Outlier Maximum	5	Number	
Noise Thresh Total	3	Number	
Outlier Thresh Total	3	Number	
Initial Abs	9	Real	Refer to Note 1
Final Abs	9	Real	Refer to Note 1
Water Blank- Rate	9	Real	Refer to Note 1
- Abs	9	Real	Refer to Note 1
- Mean Dev	9	Real	Refer to Note 1
- Max Dev	9	Real	Refer to Note 1
Blank - Rate	9	Real	Refer to Note 1
- Abs	9	Real	Refer to Note 1
- Mean Dev	9	Real	Refer to Note 1
- Max Dev	9	Real	Refer to Note 1
Reaction - Rate	9	Real	Refer to Note 1
- Abs	9	Real	Refer to Note 1
- Mean Dev	9	Real	Refer to Note 1
- Max Dev	9	Real	Refer to Note 1
Raw Result	9	Real	Refer to Note 1
Calculated Result	9	Real	Refer to Note 1
Units	2	Code	Refer to Appendix D
Instrument Codes	9	Alpha	Refer to Appendix E

Table 4.19 Stream 702 - Function 25 Expanded Result for Calibration, continued

Field	Length	Format	Description
Result Error 1	2	Code	Refer to Appendix F
Result Error 2	2	Code	Refer to Appendix F
Result Error 3	2	Code	Refer to Appendix F
Result Error 4	2	Code	Refer to Appendix F
Result Error 5	2	Code	Refer to Appendix F
Result Error 6	2	Code	Refer to Appendix F
Result Error 7	2	Code	Refer to Appendix F
Result Error 8	2	Code	Refer to Appendix F
Result Error 9	2	Code	Refer to Appendix F
Result Error 10	2	Code	Refer to Appendix F
Result Error 11	2	Code	Refer to Appendix F
Result Error 12	2	Code	Refer to Appendix F
Result Error 13	2	Code	Refer to Appendix F
Result Error 14	2	Code	Refer to Appendix F
Result Error 15	2	Code	Refer to Appendix F
Result Error 16	2	Code	Refer to Appendix F
Intermediate ADC 1	5	Numeric	
Intermediate ADC 2	5	Numeric	
Intermediate ADC 3	5	Numeric	
Intermediate ADC 4	5	Numeric	
Intermediate ADC 5	5	Numeric	
Future Use Space	30	Alpha	

EXAMPLE:

```
[-0,702,25,200291,124727,-------44,-------34,-1,83A-,
76,-1,----0,----0,--0,--0,0.0430298,0.1992825,
3.0000000,-0.103444,20.000000,37.000000,-0.000680,
0.0250737,0.0000678,0.0001638,0.0005545,0.1991538,
0.0000275,0.0000604,#########,-999.0000,-0,---------,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,#####,
#####,#####,#####,#####,##############################]
64<CR><LF>
```

(-Indicates space holder)

Note 1: The number of decimal places is adjusted so that the number can fit in this field.

2 of 2

Stream 702 - Function 27 End of Reagent Pack

SENT BY: SYNCHRON CX

PURPOSE: A reagent pack end is sent after all the calibration results for a pack, indicating information for that reagent pack is completed.

Table 4.20 Stream 702 - Function 27 End of Reagent Pack

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	27	Always 27
Start Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Start Time	6	hhmmss	Hour Minute Second
COM CHEM ID	4	CHEM CODE	Refer to Appendix C or User Defined Chemistry
Reagent Serial No.	3	Alpha	
Reagent Lot No.	6	Alpha	
Calibrator Lot No.	7	Alpha	
Reagent Position	2	Numeric	0=CX3/CX3 DELTAISE Module, 1-24 for CX4 chems
Sector Number	2	1 - 60	
Cup Number	2	1 - 7	first cup
Cup Number	2	1 - 7	
Cup Number	2	1 - 7	
Cup Number	2	1 - 7	
Cup Number	2	1 - 7	
Cup Number	2	1 - 7	sixth cup

```
EXAMPLE:    [-0,702,27,200291,124727,83A-,0RO,010226,M911051,
            -6,17,-2,-0,-0,-0,-0,-0]EB<CR><LF>
```

(-Indicates space holder)

Stream 702 - Function 81

SENT BY: SYNCHRON CX

PURPOSE: Transmission of expanded test result message. An expanded test result message is only transmitted when the expanded result option is enabled at the SYNCHRON CX. This message can be turned off on the Host Setup screen.

Table 4.21 Stream 702 - Function 81

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	81	Always 81
Date Run	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Run	6	hhmmss	Hour Minute Second
Accession Number	5	1 - 65535	Unique ID assigned by SYNCHRON CX to each sample programmed
Sample Record Number	9		Numeric
Result Record Number	9		Numeric
Sample ID	11		Alphanumeric
Sector Number	2	1 - 60	Numeric
Cup Number	2	1 - 7	Numeric
Reagent Record Number	9		Numeric
Replicate No.	2		Numeric
COM CHEM ID	4	Chem Code	Refer to Appendix C
Cuvette Number	2		Numeric
Calibrator Level	1	0 - 6	Not used
Suppressed Result	1	Flag	0 = Result not suppressed 1 = Suppressed result
ORDAC Result	1	Flag	0 = ORDAC not used 1 = ORDAC used
Noise Maximum	5		Numeric
Outlier Maximum	5		Numeric
Noise Thresh Total	3		Numeric
Outlier Thresh Total	3		Numeric
Initial Absorbance	9		Real Refer to Note 1
Final Absorbance	9		Real Refer to Note 1
Water Blank - Rate	9		Real Refer to Note 1
- Abs	9		Real Refer to Note 1
- Mean Dev	9		Real Refer to Note 1
- Max Dev	9		Real Refer to Note 1

Table 4.21 Stream 702 - Function 81, continued

Field		Length	Format	Description
Blank	- Rate	9		Real Refer to Note 1
	- Abs	9		Real Refer to Note 1
	- Mean Dev	9		Real Refer to Note 1
	- Max Dev	9		Real Refer to Note 1
Reaction	- Rate	9		Real Refer to Note 1
	- Abs	9		Real Refer to Note 1
	- Mean Dev	9		Real Refer to Note 1
	- Max Dev	9		Real Refer to Note 1
Raw Result		9		Real Refer to Note 1
Calculated Result		9		Real Refer to Note 1
Calculated Rate		9		Real Refer to Note 1
Positive or Negative		1		Flag 0 = negative 1 = positive 2 = not applicable 3 = no decision
Units		2	Code	Refer to Appendix D
Instrument Codes		9	Alpha	Refer to Appendix E
Result Error 1		2	Code	Refer to Appendix F
Result Error 2		2	Code	Refer to Appendix F
Result Error 3		2	Code	Refer to Appendix F
Result Error 4		2	Code	Refer to Appendix F
Result Error 5		2	Code	Refer to Appendix F
Result Error 6		2	Code	Refer to Appendix F
Result Error 7		2	Code	Refer to Appendix F
Result Error 8		2	Code	Refer to Appendix F
Result Error 9		2	Code	Refer to Appendix F
Result Error 10		2	Code	Refer to Appendix F
Result Error 11		2	Code	Refer to Appendix F
Result Error 12		2	Code	Refer to Appendix F
Result Error 13		2	Code	Refer to Appendix F
Result Error 14		2	Code	Refer to Appendix F
Result Error 15		2	Code	Refer to Appendix F
Result Error 16		2	Code	Refer to Appendix F
Intermediate ADC 1		5		Numeric
Intermediate ADC 2		5		Numeric
Intermediate ADC 3		5		Numeric
Intermediate ADC 4		5		Numeric
Intermediate ADC 5		5		Numeric
Dilution Factor		6	Real	0.0 - 1000 Refer to Note 2

Table 4.21 Stream 702 - Function 81, continued

Field	Length	Format	Description
Future Use Space	23	Alpha	

EXAMPLE:

```
[-0,702,81,270291,113741,--215,------202,-----3430,
866463K----,-1,-3,-------51,-1,04A-,##,#,0,0,#####,
#####,###,###,#########,#########,#########,#########,
#########,#########,#########,#########,#########,
#########,#########,#########,#########,#########,
#########,123.91887,#########,#,-4,---------,NO,NO,NO,
NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,NO,--490,--396,
---94,----0,----1,1.0000,########################]
D8<CR><LF>
```

(-Indicates space holder)

Note 1: The number of decimal places is adjusted so that the number can fit in this field.

Note 2: It will be possible for samples to contain tests that were run with different dilution factors.

3 of 3

Stream 702 - Function 83 Expanded Multipoint Calibration

SENT BY: SYNCHRON CX

PURPOSE: This message is the result of a multipoint calibration and is sent whenever all tests for a multipoint calibration are completed.

Table 4.22 Stream 702 - Function 83 Expanded Multipoint Calibration

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	702	Always 702
Function	2	83	Always 83
Date	6	ddmmyy	
Time	6	hhmmss	
Comm Chem ID	4	Chem Code	
Reagent Serial No.	3	Alphanumeric	
Reagent Lot No.	6	Alphanumeric	
Reagent Record Number	9	Numeric	
Set Point 1	9	Numeric	Refer to Note 1
Set Point 2	9	Numeric	Refer to Note 1
Set Point 3	9	Numeric	Refer to Note 1
Set Point 4	9	Numeric	Refer to Note 1
Set Point 5	9	Numeric	Refer to Note 1
Set Point 6	9	Numeric	Refer to Note 1
Cal Bypassed	1	Flag	1 = bypassed
Cal Override	1	Flag	1 = bypassed
Cal Time-out	1	Flag	1 = bypassed
Cal Calibrated	1	Flag	1 = calibrated
Set Points Modified	1	Flag	1 = modified
Cal Error - 1	2	Code	Refer to Appendix G
Cal Error - 2	2	Code	Refer to Appendix G
Cal Error - 3	2	Code	Refer to Appendix G
Cal Error - 4	2	Code	Refer to Appendix G
Cal Error - 5	2	Code	Refer to Appendix G
Cal Error - 6	2	Code	Refer to Appendix G
Cal Error - 7	2	Code	Refer to Appendix G
Cal Error - 8	2	Code	Refer to Appendix G
Cal Error - 9	2	Code	Refer to Appendix G
Cal Error - 10	2	Code	Refer to Appendix G
Cal Error - 11	2	Code	Refer to Appendix G
Cal Error - 12	2	Code	Refer to Appendix G

Table 4.22 Stream 702 - Function 83 Expanded Multipoint Calibration, continued

Field	Length	Format	Description
Cal Error - 13	2	Code	Refer to Appendix G
Cal Error - 14	2	Code	Refer to Appendix G
Cal Error - 15	2	Code	Refer to Appendix G
Cal Error - 16	2	Code	Refer to Appendix G
Span - 1	9	Real	5 decimal places
Span - 2	9	Real	5 decimal places
Span - 3	9	Real	5 decimal places
Span - 5	9	Real	5 decimal places
Span - 6	9	Real	5 decimal places
Rate - 1	9	Real	5 decimal places
Rate - 2	9	Real	5 decimal places
Rate - 3	9	Real	5 decimal places
Rate - 5	9	Real	5 decimal places
Rate - 6	9	Real	5 decimal places
Conc_Hi	9	Real	Refer to Note 2
Iteration Number	5	Numeric	
Iteration Tolerance	9	Real	Refer to Note 2
Standard Deviation	9	Real	Refer to Note 2
Rate Deviation - 1	9	Real	Refer to Note 2
Rate Deviation - 2	9	Real	Refer to Note 2
Rate Deviation - 3	9	Real	Refer to Note 2
Rate Deviation - 4	9	Real	Refer to Note 2
Rate Deviation - 5	9	Real	Refer to Note 2
Rate Deviation - 6	9	Real	Refer to Note 2
Recovery Deviation - 1	9	Real	Refer to Note 2
Recovery Deviation - 2	9	Real	Refer to Note 2
Recovery Deviation - 3	9	Real	Refer to Note 2
Recovery Deviation - 4	9	Real	Refer to Note 2
Recovery Deviation - 5	9	Real	Refer toNote 2
Recovery Deviation - 6	9	Real	Refer to Note 2
Model	2	1 - 5, 8, 9	model number
RO	9	Real	Refer to Note 2
Kc	9	Real	Refer to Note 2
a	9	Real	Refer to Note 2
b	9	Real	Refer to Note 2
c	9	Real	Refer to Note 2

Table 4.22 Stream 702 - Function 83 Expanded Multipoint Calibration, continued

Field	Length	Format	Description
d	9	Real	Refer to Note 2
Slope Adjustment	10	Real	5 decimal places ********** = does not fit
Offset Adjustment	10	Real	5 decimal places
Future Use Space	30	Alphanumeric	

EXAMPLE:

```
[-0,702,83,060391,103825,MPT6,###,######,-------26,
0.0000000,1.0000000,2.0000000,4.0000000,8.0000000,
16.000000,0,0,0,1,0,00,00,00,00,00,00,00,00,00,
00,00,00,00,00,00,--0.42980,--0.10018,--0.08096,
--0.05396,--0.04705,--0.71195,881.13220,451.33038,
351.15433,270.19046,216.23090,169.18050,16.000000,
----9,27.955742,0.0023646,-0.000037,0.0009348,
-0.001393,-0.001537,0.0042340,-0.002202,0.0000020,
0.9937373,2.0214555,4.0612559,7.5468578,16.750963,
-1,105.32443,775.84485,-0.221832,-0.776385,0.0000000,
0.0000000,---1.00000,---0.00000,
##############################]ED<CR><LF>
```

(-Indicates space holder)

Note 1: The number of decimal places in this field is the number in the selected precision for the default units field in the chem database plus an additional decimal place.

Note 2: The number of decimal places is adjusted so that the number can fit in this field.

3 of 3

4.6 Stream 703 - Instrument Status

Stream 703 - Function 1 Power Up

SENT BY: SYNCHRON CX to host

PURPOSE: This message is sent whenever the SYNCHRON CX goes through power up or is reset. This message can be turned off on the host setup screen.

Table 4.23 Stream 703 - Function 1 Power Up

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	
Function	2	01	
Date	6	ddmmyy	
Time	6	hhmmss	
S.W. REVISIONS from versions files master version number	10	ALPHA	
CX4 zos version	10	ALPHA	
CX4 cpu boot prom	10	ALPHA	
CX4 host version	10	ALPHA	
CX4 host diag version	10	ALPHA	
CX4 barcode	10	ALPHA	
CX4 mac version	10	ALPHA	
CX4 mac prom	10	ALPHA	
CX4 mac diag	10	ALPHA	
CX4 mmc version	10	ALPHA	
CX4 mmc prom	10	ALPHA	
CX4 mmc seqr	10	ALPHA	
CX4 mmc seqr diag	10	ALPHA	
CX4 mmc seqr tbl	10	ALPHA	
CX4 mmc dev func	10	ALPHA	
CX4 mmc motor func	10	ALPHA	
CX4 msc slave	10	ALPHA	
CX4 msc prom	10	ALPHA	
CX4 msc diag	10	ALPHA	
CX3/ISE zos version	10	ALPHA	
CX3/ISE cpu boot prom	10	ALPHA	
CX3/ISE host version	10	ALPHA	
CX3/ISE host diag version	10	ALPHA	
CX3/ISE mmc version	10	ALPHA	
CX3/ISE mmc prom	10	ALPHA	

1 of 2

Table 4.23 Stream 703 - Function 1 Power Up, continued

Field	Length	Format	Description
PS2 QNX version	10	ALPHA	
PS2 CPU BOOT PROM	10	ALPHA	
PS2 CLOCK TASK	10	ALPHA	
PS2 DBM TASK	10	ALPHA	
PS2 DISPMGR TASK	10	ALPHA	
PS2 EMULATE TASK	10	ALPHA	
PS2 EVENT TASK	10	ALPHA	
PS2 KEYDEV TASK	10	ALPHA	
PS2 LINK_CRT TASK	10	ALPHA	
PS2 MASTER_SCR TASK	10	ALPHA	
PS2 NOTE TASK	10	ALPHA	
PS2 REC_ISR TASK	10	ALPHA	
PS2 REC_TASK	10	ALPHA	
PS2 SAMP_PROG TASK	10	ALPHA	
PS2 SCSITASK	10	ALPHA	
PS2 SENDTASK	10	ALPHA	
PS2 SETUP TASK	10	ALPHA	
PS2 CXSERVER TASK	10	ALPHA	
PS2 DOWNLOAD TASK	10	ALPHA	
PS2 CONSOLE TASK	10	ALPHA	
PS2 SHUTDOWN TASK	10	ALPHA	
PS2 ALARM TASK	10	ALPHA	
PS2 QUEUE TASK	10	ALPHA	
PS2 HCP TASK	10	ALPHA	
PS2 RESULT TASK	10	ALPHA	
PS2 PRINTER TASK	10	ALPHA	

EXAMPLE:

```
[-0,703,01,280291,115648,v0.0.04.07,v0.0.05.00,
v1.0.11.00,v0.0.04.07,v0.0.04.07,v0.0.02.00,v0.0.02.00,
v0.0.02.00,v0.0.02.00,v0.0.02.00,v0.0.02.00,v0.0.03.00,
v0.0.02.00,v0.0.03.00,v0.0.02.00,v0.0.02.00,v0.0.02.00,
v0.0.02.00,v0.0.02.00,v0.0.05.00,v1.0.11.00,v0.0.04.07,
v0.0.04.07,v0.0.02.00,v0.0.02.00,v0.2.15.00,v0.0.01.01,
v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,
v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,
v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,
v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07,
v0.0.04.07,v0.0.04.07,v0.0.04.07,v0.0.04.07]3F<CR><LF>
```

(-Indicates space holder)

2 of 2

Stream 703 - Function 2 Bidirectional On

SENT BY: SYNCHRON CX

PURPOSE: Notify the host when the SYNCHRON CX bidirectional interface option is enabled.

Table 4.24 Stream 703 - Function 2 Bidirectional On

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	02	Always 02
Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time	6	hhmmss	Hour Minute Second
Software Set	10	Alphanumeric	PGM: SOFT. VER

EXAMPLE: `[-0,703,02,270291,163322,v0.0.04.07]8F<CR><LF>`

(-Indicates space holder)

Stream 703 - Function 3 Request Instrument State

SENT BY: Host

PURPOSE: Request the SYNCHRON CX transmit its instrument status information.

Table 4.25 Stream 703 - Function 3 Request Instrument State

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	03	Always 03

EXAMPLE: `[00,703,03]93<CR><LF>`

Stream 703 - Function 4 Instrument State

SENT BY: SYNCHRON CX

PURPOSE: Transmission of SYNCHRON CX instrument status information.

Table 4.26 Stream 703 - Function 4 Instrument State

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	04	Always 04
Date	6	ddmmyy	Day Month Year (e.g. 240795 = 24 July 1995)
Time	6	hhmmss	Hour Minute Second
Instrument Configuration	5	CXNAA	SYNCHRON CX instrument configuration (e.g. CX7)
CX3/ISE State	2	Code	Refer to Appendix I
CX4 State	2	Code	Refer to Appendix I
Future Use Space	2		
Instrument Mode	2	Code	-0 = cup and sector mode -1 = barcode mode

EXAMPLE: `[-0,703,04,270291,163324,CX7--,-2,15,##,-1]A5<CR><LF>`

(-Indicates space holder)

Stream 703 - Function 5 Instrument Exception

SENT BY: SYNCHRON CX to host

PURPOSE: This message is sent by the SYNCHRON CX whenever it encounters an exception condition. This corresponds to the same messages seen on the operator terminal.

Table 4.27 Stream 703 - Function 5 Instrument Exception

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	05	Always 05
Date	6	ddmmyy	Day Month Year (e.g. 240795 = 24 July 1995)
Time	6	hhmmss	Hour Minute Second
Error Number	5	Numeric	This is the error number.
Data	10	Alpha	Optional data associated with the error

Stream 703 - Function 7 Chemistry Configuration Change

SENT BY: SYNCHRON CX to host

PURPOSE: Notify the host when the installed chemistry list has been changed at the SYNCHRON CX. This message is transmitted when the SYNCHRON CX Installed Chemistries function is exited. This message can be turned off on the Host Setup screen.

Table 4.28 Stream 703 - Function 7 Chemistry Configuration Change

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	07	Always 07
Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time	6	hhmmss	Hour Minute Second

EXAMPLE: `[-0,703,07,280291,100914]E2<CR><LF>`

(-Indicates space holder)

Stream 703 - Function 13 Range Change

SENT BY: SYNCHRON CX

PURPOSE: Notify the host when the defined normal andor critical ranges have been changed at the SYNCHRON CX. This message is transmitted when the SYNCHRON CX Define Ranges function is exited. This message can be turned off on the Host Setup screen.

Table 4.29 Stream 703 - Function 13 Range Change

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	13	Always 13
Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time	6	hhmmss	Hour Minute Second
Comm Chem ID	4	Chem Code	Refer to Appendix C; 0000 = all

EXAMPLE: `[-0,703,13,280291,101724,THO1]9D<CR><LF>`

(-Indicates space holder)

Stream 703 - Function 17 End of Run

SENT BY: SYNCHRON CX

PURPOSE: Notify the host when all programmed tests have been completed. This message can be turned off on the Host Setup screen.

Table 4.30 Stream 703 - Function 17 End of Run

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	703	Always 703
Function	2	17	Always 17
Date Queued	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time Queued	6	hhmmss	Hour Minute Second

EXAMPLE: `[-0,703,17,190291,103626]DE<CR><LF>`

(-Indicates space holder)

4.7 Stream 704 - Setup Status

Stream 704 - Function 7 Request Installed Chemistries

SENT BY: Host

PURPOSE: Request transmission of the list of installed chemistries from the SYNCHRON CX.

Table 4.31 Stream 704 - Function 7 Request Installed Chemistries

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	704	Always 704
Function	2	07	Always 07
EXAMPLE: `[00,704,07]8E<CR><LF>`			

Stream 704 - Function 8 Installed Chemistries

SENT BY: SYNCHRON CX

PURPOSE: Transmit the list of installed chemistries on the SYNCHRON CX.

Table 4.32 Stream 704 - Function 8 Installed Chemistries

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	704	Always 704
Function	2	08	Always 08
Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time	6	hhmmss	Hour Minute Second
Chem ID 1	4	AAAA	Refer to Appendix C. Up to 999 chemistry codes may be transmitted.
Chem ID 2	4	AAAA	
⋮	⋮	⋮	The last chemistry code transmitted is `0000', indicating no more codes will follow. If there are no installed chemistries there will be one zero field.
Chem ID N	4	AAAA	

1 of 2

Table 4.32 Stream 704 - Function 8 Installed Chemistries, continued

Field	Length	Format	Description
EXAMPLE:	[-0,704,08,280291,103941,MIGA,MDLC,CAL1,CAL2,CAL3, CAL4,THO1,74A-,59A-,40A-,75A-,46A-,76A-,77A-,57A-, 78A-,48A-,55A-,82A-,90A-,79A-,83A-,91A-,89A-,08A-, 35A-,31A-,10A-,30A-,12A-,11A-,05A-,09A-,44A-,42B-, 42C-,32A-,03A-,36A-,06A-,33A-,34A-,43A-,07A-,42A-, 41A-,62A-,72A-,67A-,68A-,69A-,70A-,52A-,51A-,53A-, 71A-,04A-,02A-,01B-,01A-,05C-,06C-,03C-,09C-,0000] C6<CR><LF>		
(-Indicates space holder)			

2 of 2

Stream 704 - Function 9 Request Chemistry Ranges

SENT BY: Host

PURPOSE: Request transmission of the defined normal and critical ranges from the SYNCHRON CX.

Table 4.33 Stream 704 - Function 9 Request Chemistry Ranges

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	704	Always 704
Function	2	09	Always 09
Chem ID	4	Chem Code	Refer to Appendix C Chem Code 0000 = all
EXAMPLE:	[00,704,09,THO1]44<CR><LF>		

Stream 704 - Function 10 Chemistry Ranges

SENT BY: SYNCHRON CX

PURPOSE: Transmit the defined normal and critical ranges for all installed chemistries on the SYNCHRON CX.

Table 4.34 Stream 704 - Function 10 Chemistry Ranges

Field	Length	Format	Description
Device ID	2	0 - 99	Operator assigned
Stream	3	704	Always 704
Function	2	10	Always 10
Date	6	ddmmyy	Day Month Year (e.g. 240795 = July 24, 1995)
Time	6	hhmmss	Hour Minute Second
Last Message	1	Flag	0 = last range message 1 = more range messages follow
COM CHEM ID	4	CHEM	zero if none, or refer to Appendix C
Fluid Type	2	FLUID	Refer to Appendix B
Number of Ranges	3	Numeric	1-10, times 3 (up to 30)
Selected Units	2	Code	Refer to Appendix D
Sex	1	Alpha	M = Male, F = Female, B = Both
Age Units	1	Numeric	Refer to Appendix K
Age Low	3	Real	
Age Units	1	Number	Refer to Appendix K
Age High	3	Real	
Age Normal Low	8	Real	
Age Normal High	8	Real	
Age Critical Low	8	Real	
Age Critical High	8	Real	
Sex	1	Alpha	M = Male, F = Female, B = Both
Age Units	1	Numeric	Refer to Appendix K
Age Low	3	Real	
Age Units	1	Number	Refer to Appendix K
Age High	3	Real	
Age Normal Low	8	Real	
Age Normal High	8	Real	
Age Critical Low	8	Real	
Age Critical High	8	Real	
Sex	1	Alpha	M = Male, F = Female, B = Both
Age Units	1	Numeric	Refer to Appendix K

1 of 2

Table 4.34 Stream 704 - Function 10 Chemistry Ranges, continued

Field	Length	Format	Description
Age High	3	Real	
Age Normal Low	8	Real	
Age Normal High	8	Real	
Age Critical Low	8	Real	
Age Critical High	8	Real	
⋮	⋮	⋮	
Sex	1	Alpha	M = Male, F = Female, B = Both
Age Units	1	Numeric	Refer to Appendix K
Age High	3	Real	
Age Normal Low	8	Real	
Age Normal High	8	Real	
Age Critical Low	8	Real	
Age Critical High	8	Real	

EXAMPLE:

```
[-0,704,10,280291,103159,0,THO1,SE,--4,-0,B,2,--1,
2,-10,------12,------15,------11,------16,B,3,-10,
3,-15,------30,------35,------29,------37,B,4,-10,
4,-12,------35,------40,------30,------41,B,5,-10,
5,-81,------50,------60,------49,------65]1B<CR><LF>
```

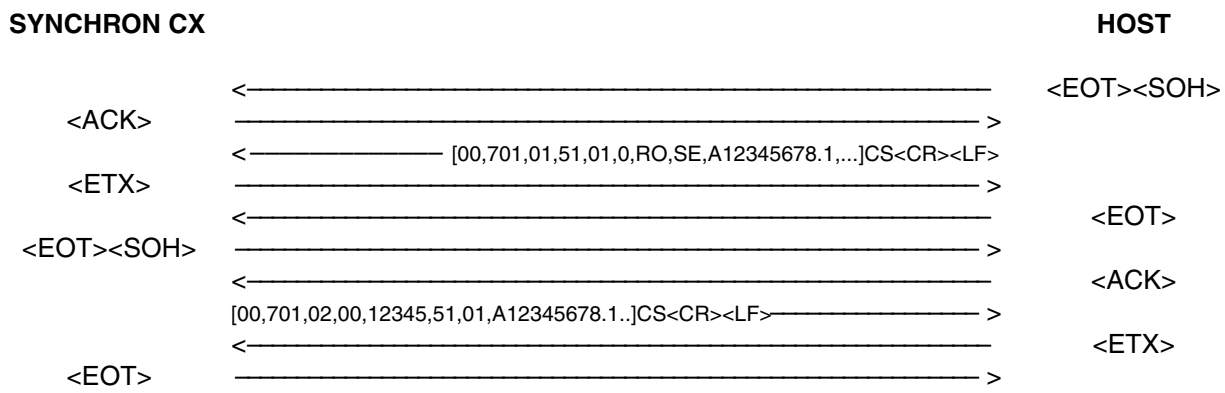
(-Indicates space holder)

2 of 2

SECTION 5 Results and Sample Programming Sequence:

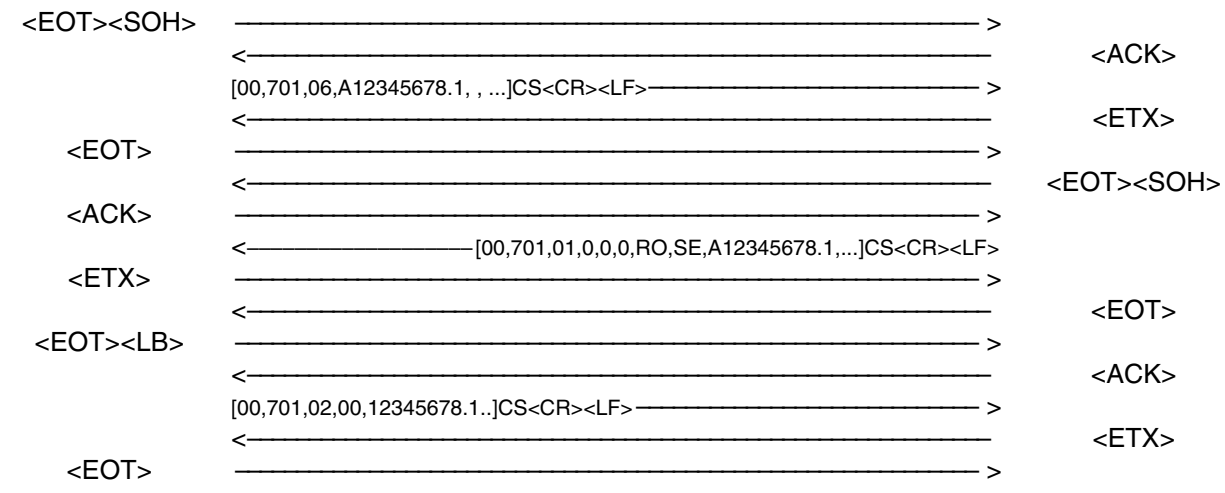
5.1 Sample Programming

For each sample program, the host needs to bid for the line and send 701-1. SYNCHRON CX will respond with program ok, 701-2 message. If the status return is different from "-0" then sample is not programmed.



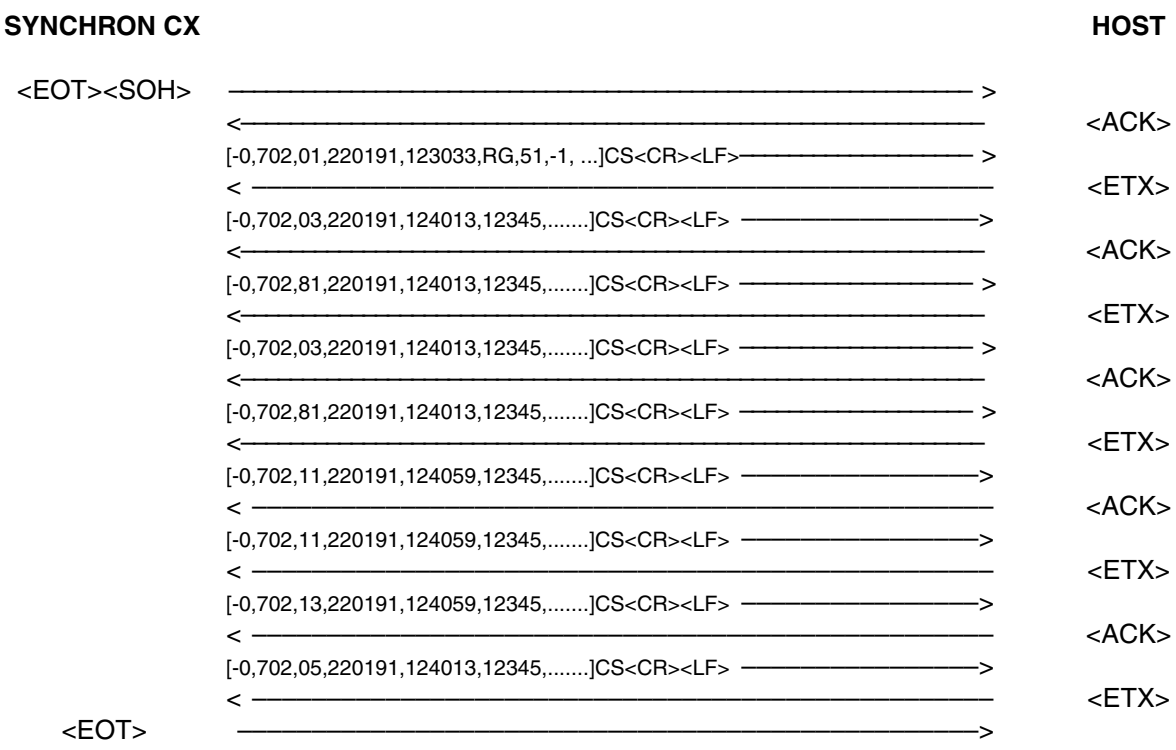
5.2 Host Query and Sample Programming

Each time the SYNCHRON CX instrument loads a sector, it checks if those samples are programmed. If samples are not programmed and SYNCHRON CX is in barcode mode it will send a host query message, if that message is "turned on". The host has a period of time to respond with the first sample program for that sector. For the CX DELTA Systems this period of time is selected by the operator in the host setup screen. Options are OFF, 2.5, 5, 7.5, and 10 minutes. Other systems are set to 2.5 minutes. Host query will have 1 to 7 sample ids.



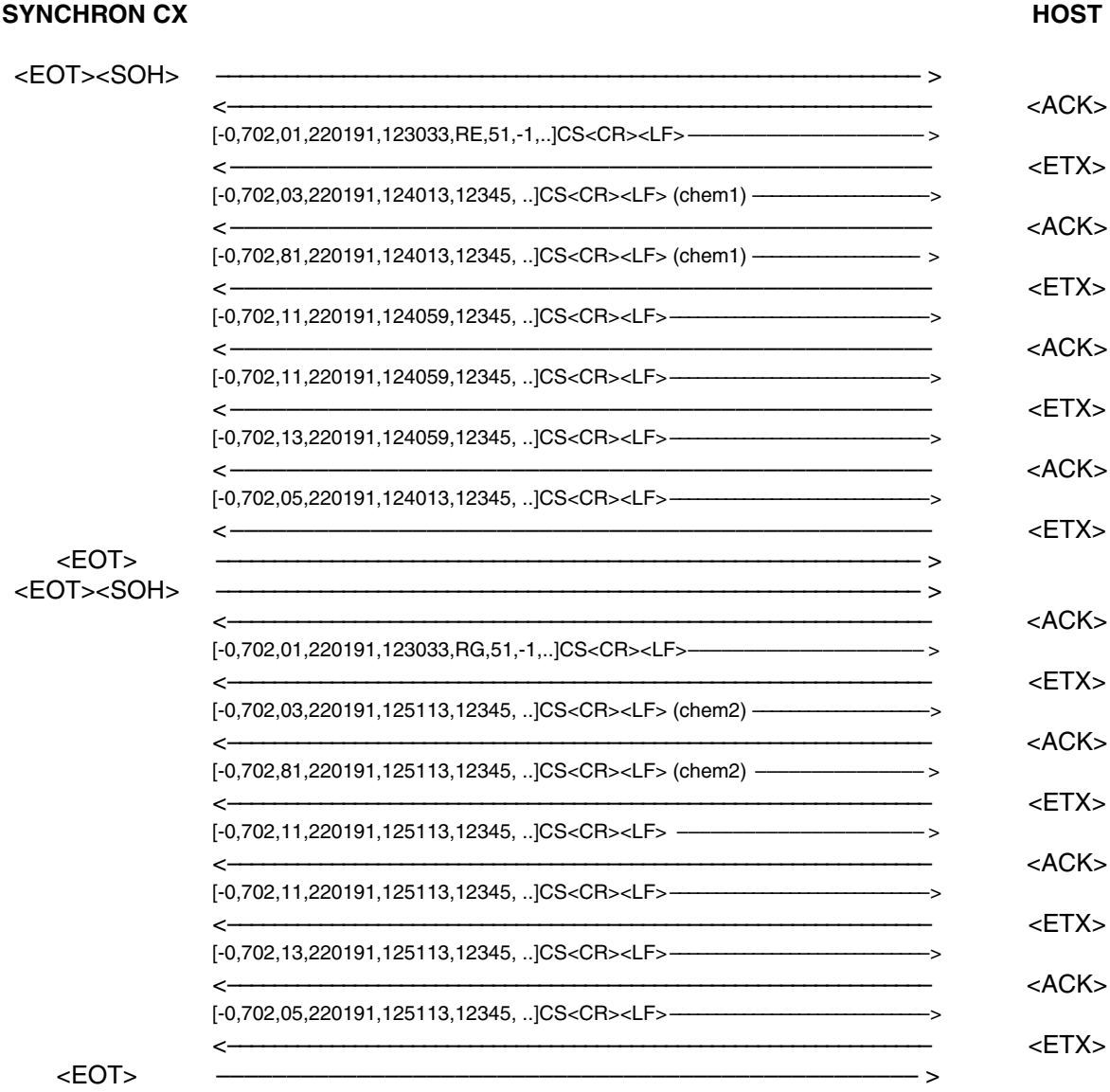
5.3 Results

When a sample is completed, SYNCHRON CX will send the sample result collated, meaning no other messages will be sent when one set of result is being sent. Special calculation and timed urine results are sent just before end of cup.



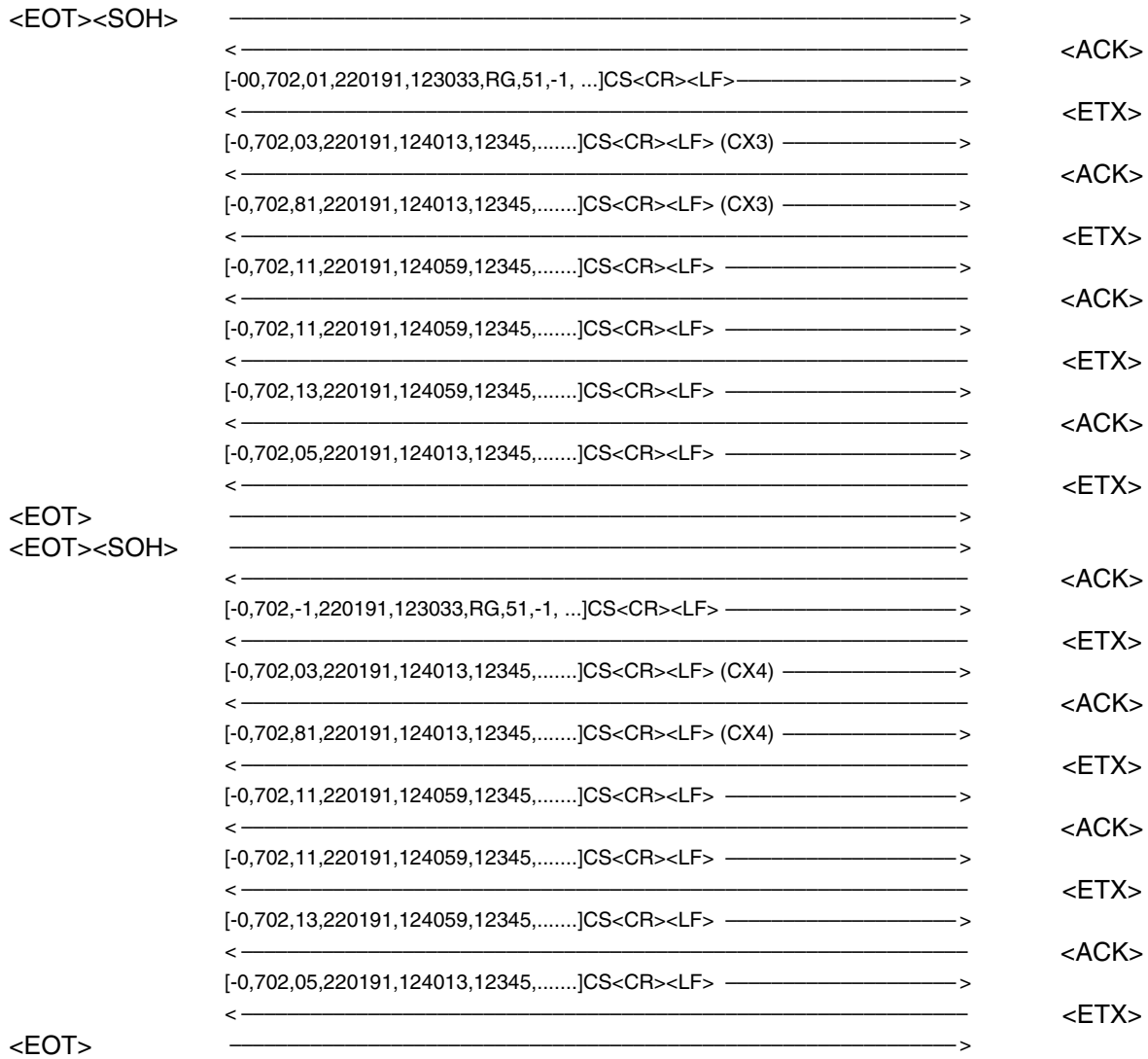
5.4 Results Recalled When Running

When the operator recalls results for a sample which are not complete, the SYNCHRON CX will send all the tests which are complete. When sample is completed, it will send the rest of the results. Complete special calculation and timed urine will be sent in both sets.



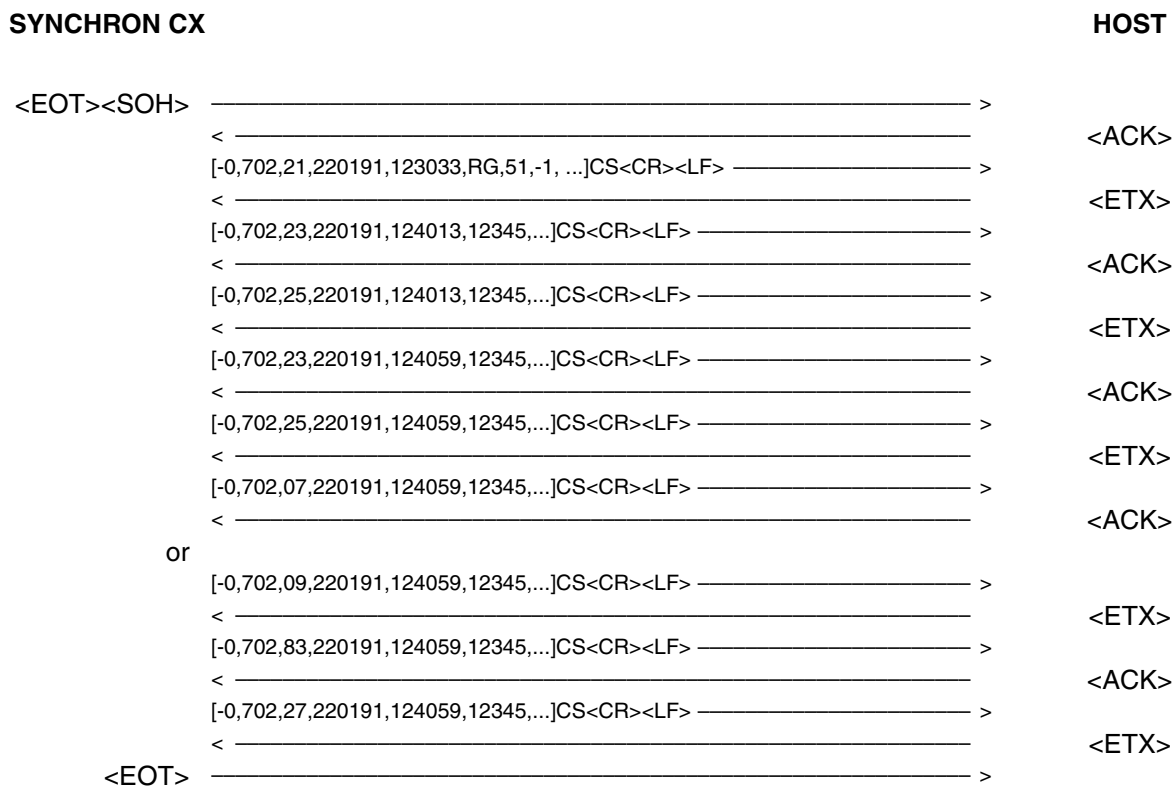
5.5 Options for Sending CX3 Results (on CX7) And ISE Results (on CX5)

When a sample is completed, and it has CX3/ISE chemistries, the user can opt to send CX3/ISE chemistries three different ways. Users can have the system send results only when the sample is finished, or send STAT CX3/ISE results as soon as available, or send any CX3/ISE result as soon as available. If the user elects to send STAT CX3/ISE results or any/all routine CX3/ISE results prior to sample completion, two sets of results will be sent to the host. The first set will include the CX3/ISE results (STAT or routine) and the second set the remaining results.



5.6 Reagent Pack

When a calibration is completed, SYNCHRON CX will send reagent result collated.



SECTION 6 Operator Interface - Setting Host Communications Parameters

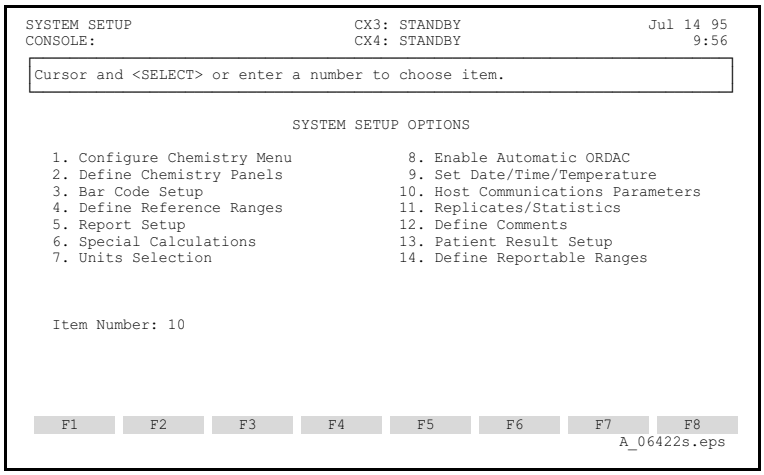
This feature allows the operator to establish compatibility between the instrument and a host computer for data transmission. Host Communications Parameters may be viewed at any time, but modifications can be made only when the system is in Standby.

> NOTICE
>
> The console displays a message that Host Communications is going to be disabled when **IDLE** is pressed (for Backup, Restore, Resume, or Rebuild Databases), when performing a Chemistry Update, or when switching from barcode mode to sector mode and vice versa. The system will reestablish Host Communications following Backup, Resume, Rebuild Databases, Chemistry Update and switching between sector and barcode mode. However, the operator must toggle Host Communications to the desired mode following the Restore function.

Defining Host Communications Parameters

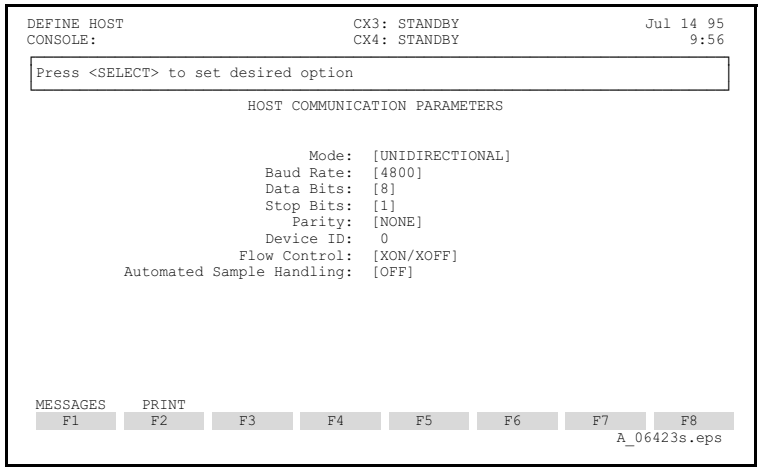
> NOTICE
>
> Screens are for example only and may not reflect your specific instrument configuration.

1. From the MASTER Screen, press **F4 SPECIAL FUNCTION**.
2. Cursor and **SELECT 4**. System Setup, or type **4 ENTER**.
3. Cursor and **SELECT 10**. Host Communications Parameters, or type **10 ENTER**.

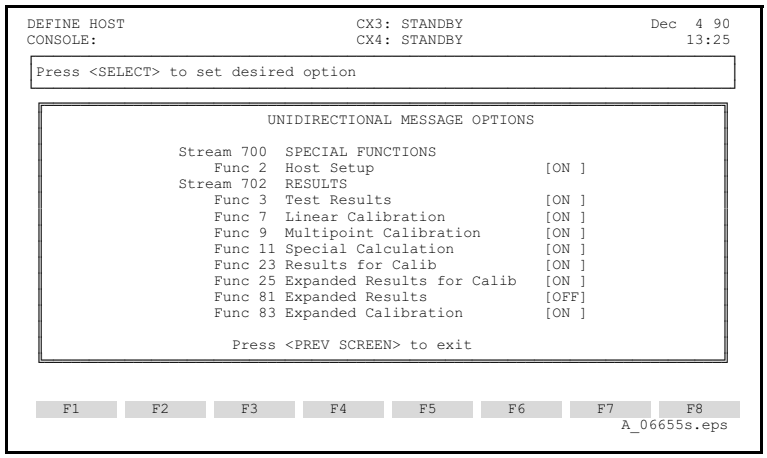


4. Refer to this Host Computer Interface Specifications and also to Table 6.1 for comprehensive documentation of the host parameters. Move cursor to the desired parameter and press **SELECT** to scroll through available options or enter the appropriate values.

> NOTICE
> Automated Sample Handling is for use with Optional Robotics interface.



5. Message options can be accessed by pressing the F1 messages key. Move cursor to desired option and press **SELECT** key to toggle OFF/ON. Use PAGE key to access additional messages.



6. Press **PREV SCREEN** to return to the SYSTEM SETUP Screen, or press **MASTER SCREEN** to exit.

Table 6.1 Host Communication Parameter Setup Options

Field	Available Options
MODE:	UNIDIRECTIONAL, BIDIRECTIONAL, OFF
BAUD RATE:	600, 1200, 2400, 4800, 9600
DATA BITS:	7, 8
STOP BITS:	1, 2
PARITY:	NONE, ODD, EVEN
DEVICE ID:	0 - 99
FLOW CONTROL:	XON/XOFF, RTS/CTS, NONE
Status Messages: (U)nidirectional, (B)idirectional	
Stream 700/Func 2:	Host Setup ON, OFF (U,B)
Stream 701/Func 6:	Host Query ON, OFF (B)
	Auto Clear Queue ON, OFF (B)
Stream 702/Func 3:	Test Results ON, OFF (U,B)
Stream 702/Func 7:	Linear Calibration ON, OFF (U,B)
Stream 702/Func 9:	Multipoint Calibration ON, OFF (U,B)
Stream 702/Func 11:	Special Calculations ON, OFF (U,B)
Stream 702/Func 13:	Timed Urine Result ON, OFF (U,B)
Stream 702/Func 23:	Results for Calibration ON, OFF (U,B)
Stream 702/Func 25:	Expanded Calib Result ON, OFF (U,B)
Stream 702/Func 81:	Expanded Results ON, OFF (U,B)
Stream 702/Func 83:	Expanded Calibration ON, OFF (U,B)
Stream 703/Func 1:	Power Up ON, OFF (U,B)
Stream 703/Func 5:	Instrument Exception ON, OFF (U,B)
Stream 703/Func 7:	Chem Change ON, OFF (U,B)
Stream 703/Func 13:	Range Change ON, OFF (U,B)
Stream 703/Func 17:	End of Run ON, OFF (U,B)

IMPORTANT NOTE

Regarding Stream 702, Functions 3 and 81 - at least one of these functions must be set ON. Both can be ON, but both cannot be set to OFF at the same time.

SECTION 7 Appendices

APPENDIX A – Test Type Codes

CA* = Calibrator
CO = Control
EX* = Extinction
RO = Routine
SC = STAT Control
ST = STAT

*Cannot be programmed by the host computer.

APPENDIX B – Sample Type Codes

SE = Serum
SF = Spinal Fluid
UR = Urine
TU = Timed Urine
PL = Plasma
Future Use
Future Use

APPENDIX C – Chemistry Codes

01A = Sodium (NA)
01B = Potassium (K)
02A = Carbon Dioxide (CO_2)
03A = Creatinine (CRE)
03C = CX3/CX3 DELTA Creatinine (CRE3/CREA)
03D = Creatinine Triggered (CR-T)
04A = Chloride (CL)
05A = Blood Urea Nitrogen (BUN)
05C = CX3/CX3 DELTA Blood Urea Nitrogen (BUN3/BUN)
06A = Glucose (GLU)
06C = CX3/CX3 DELTA Glucose (GLU3/GLU)
07A = Total Protein (TP)
07B = Micro Protein (M-TP)
07C = CX3/CX3 DELTA Total Protein (TP3/TP)
08A = Albumin (ALB)
08E = Prealbumin (PAB)
08M = Microalbumin (MA)
09A = Calcium (CA)
09C = CX3/CX7 Cup Calcium (CA/CA3)
09D = CX3 DELTA ISE/CX5/CX7 DELTA ISE (Ca/CALC)
10A = Amylase (AMY)
10B = Pancreatic Amylase (PAMY)
11A = Total Bilirubin (TBIL)
12A = Direct Bilirubin (DBIL)
14A = Hemoglobin (HB)
14B = Hemoglobin A1c (A1c)
30A = Aspartate Aminotransferase (AST)
30B = Aspartate Aminotransferase-Pyridoxal-5'-Phosphate (AST-)
31A = Alanine Aminotransferase (ALT)
31B = Alanine Aminotransferase-Pyridoxal-5'-Phosphate (ALT-)
32A = Creatine Kinase (CK)
32B = Creatine Kinase-N-Acetyl-L-Cysteine (CK-)
33A = Lactate Dehydrogenase (LD-L)
34A = Lactate Dehydrogenase (LD-P)
35A = Alkaline Phosphatase (ALP)
36A = Gamma Glutamyltransferase (GGT)
40A = Creatine Kinase MB (CKMB)
41A = Uric Acid (URIC)
42A = Triglycerides (TRIG)
42B = Triglycerides GPO (TG)
42C = Triglycerides (TG-B)
43A = Inorganic Phosphorus (PHOS)
43B = Inorganic Phosphorus (PO4)
44A = Cholesterol (CHOL)
46A = Iron (IRON)
46B = Iron (FE)
48A = Magnesium (MG)
49A = Acid Phosphatase (ACP)
50A = Lipase (LIPA)
50B = Lipase Wash (LIWA)

51A = Immunoglobulin G (IGG)
52A = Immunoglobulin A (IGA)
53A = Immunoglobulin M (IGM)
54A = Ammonia (AMM)
55A = Lactate (LAC)
56A = Ethyl Alcohol (ETOH)
56B = Alcohol (ALC)
57A* = a-Hydroxybutyrate Dehydrogenase (HBDH)
59A* = Cholinesterase (CHE)
62A = Digoxin (DIG)
62B = Digoxin (DIGN)
63A = Methaqualone (METQ)
64A = Methadone (METD)
65A = Propoxyphene (PROX)
66A = Phencyclidine (PCP)
67A = Phenobarbital (PHNB)
67B = Phenobarbital (PBR)
67C = Phenobarbital (PHE)
68A = Phenytoin (PHNY)
68C = Phenytoin (PHY)
69A = Theophylline (THEO)
69C = Theophylline (THE)
70A = Tobramycin (TOBR)
70C = Tobramycin (TOB)
71A = Transferrin (TRF)
72A = Gentamicin (GENT)
72C = Gentamicin (GEN)
73A = Urea Nitrogen (UREA)
73C = CX3/CX3 DELTA Urea Nitrogen (URE3/UREA)
74A* = Alkaline Phosphatase (ALPd)
75A* = Creatine Kinase NAC Buffer (CKNa)
76A* = Glutamate Oxalacetate Transaminase (GOT)
77A* = Glutamate Pyruvate Transaminase (GPT)
78A* = Lactate Dehydrogenase (LDH)
79A = Total Iron Binding Capacity (TIBC)
79B = Total Iron Binding Capacity (IBCT)
82A = Leucine Aminopeptidase (LAP)
83A = High Density Lipoprotein Cholesterol (HDLC)
83D = High Density Lipoprotein Cholesterol Direct (HDLD)
84A = Amphetamines (AMPH)
85A = Barbiturates (BARB)
86A = Benzodiazepine (BENZ)
87A = Cocaine Metabolites (COCM)
88A = Cannabinoids - 100ng (THC)
88B = Cannabinoids - 20ng (THC2)
88C = Cannabinoids - 50ng (THC5)
89A = C Reactive Protein (CRP)
89B = C Reactive Protein (CRP-)
90A = T Uptake (TU)
91A = Thyroxine (T4)
92A = Opiates (OP)
92B = Opiate 2000 ng (OP2)

93A = Antistreptolysin O (ASO)
93B = Antistreptolysin O (ASO-)
93C = Rheumatoid Factor (RF)
94A = Salicylate (SAL)
94M = Acetaminophen (ACTM)
95A = Valproic Acid (VPA)
98A = Carbamazepine (CAR)
99B = Icterus (ICTER)
99C = Lipemia (LIPEM)
99D = Hemolysis (HEMOL)
99G = Diluent 1 (DIL1)

* Deutsche Gesellschaft für Klinische Chemie (German Clinical Chemistry Association) Formulations

NOTICE

Chemistry codes for user-defined chemistries correspond to the testname defined for the chemistry on the SYNCHRON CX USER-DEFINED SETUP Screen.

APPENDIX D – Unit Codes

00	=	mg/dL	14	=	nmol/L
01	=	mg/L	15	=	Ku.u.
02	=	g/dL	16	=	U/L
03	=	g/L	17	=	Other
04	=	mmol/L	18	=	%
05	=	µmol/L	19	=	mA
06	=	mEq/L	20	=	mA/min
07	=	nKat/L	21	=	IU/mL
08	=	µKat/L	22	=	U/mL
09	=	IU/L	23	=	Rate
10	=	µg/mL	24	=	ng/dL
11	=	ng/mL	25	=	µIU/mL
12	=	µg/dL	26	=	mIU/mL
13	=	µg/L	27	=	KU/L

APPENDIX E – Instrument Codes

CX4CX5			CX3CX3 DELTA		
C	=	Calibration Overridden	C	=	Calibration Overridden
D	=	Days Exceeded	E	=	Cal Time Extended
E	=	Calibration Time Extended	T	=	Cal Time Modified
H	=	Temperature Error	B*	=	Channel Bypassed
J	=	Slope/Offset Adjustment	P	=	Creatinine Bubble
M	=	Set Point Modification	H*	=	DAC Offset
O	=	ORDAC Sample	A*	=	Erratic ADC
R	=	Reagent Expired	I	=	GLU IC
S	=	Service Mode	G	=	GLU membrane
T	=	Temperature Correction	D*	=	No Sample
V	=	Rerun Sample	N*	=	Not Run
Z	=	Edited Result	O	=	ORDAC Sample
			R	=	Reagent Strength
			X*	=	Reference Drift
			S*	=	Service
			F	=	ORDAC to follow
			V	=	Rerun Sample
			Z	=	Edited Result

* Also applies to ISE Module on CX5

APPENDIX F – Result Error Codes

AE = ADC Error
AH = Initial Absorbance High
BH = Blank Absorbance High
BL = Blank Absorbance Low
BN = Blank Mean Deviation
BO = Blank Maximum Deviation
DE = Out of Instrument Electronic Range
DH = Out of Instrument Range High
DL = Out of Instrument Range Low
DR = Reference Drift (ISE)
EA = Erratic ADC (ISE)
HI = Out of Instrument Range High (CX3 DELTA ONLY)
HR = Reaction Absorbance High
IR = Initial Rate High
IT = Iteration Tolerance
LO = Out of Instrument Range Low (CX3 DELTA ONLY)
LR = Reaction Absorbance Low
NO = No Result Error
NT = Noise Threshold
OH = ORDAC High
OL = ORDAC Low
OT = Outliers Threshold
RH = Reaction Rate High
RL = Reaction Rate Low
RN = Reaction Mean Deviation
RO = Reaction Maximum Deviation
SD = Substrate Depleted
SH = Blank Rate High
SL = Blank Rate Low
TM = Temperature
UO = Out of ORDAC Reportable Range High
UH = Out of Reportable Range High
UL = Out of Reportable Range Low

APPENDIX G – Calibration Error Codes

00 = No Error
01 = Back-To-Back Error
02 = Blank Absorbance High
03 = Blank Absorbance Low
04 = DAC
05 = Erratic ADCs
06 = Inconsistent Data
08 = Math Error 1
09 = Math Error 2
10 = Math Error 3
12 = Math Error 5
13 = Math Error 6
14 = Math Error 7
15 = Math Error 8
16 = Math Error 9
17 = Math Error 10
18 = Math Error 11
19 = Math Error 12
20 = Math Error 13
21 = Math Error 14
22 = Math Error 15
23 = Math Error 16
25 = Range Error
26 = Calibrator Range Hi
27 = Calibrator Range Lo
28 = Reaction Absorbance Hi
29 = Reaction Absorbance Lo
30 = Span
31 = Sensitivity Error
32 = Severe Sensitivity Error
33 = Recovery Error
34 = Severe Recovery Error
35 = ADC Electrolyte Error

APPENDIX H – Special Calculation Status Codes

AB = One of the involved chemistries was not run.
OK = Valid result.
UN = Units for the involved chemistries are not compatible.
ZD = Denominator of a ratio is zero.

APPENDIX I – Instrument Status Codes

CX4 Instrument States Available			CX3/ISE Module States Available		
00	=	No state	00	=	No state
01	=	Stopped	01	=	Stopped
02	=	Pause initiated	02	=	Standby
04	=	Extinction-Coefficient	03	=	System home
05	=	Running	04	=	Reagent load
06	=	Idle shutdown in progress	05	=	Prime
07	=	Idle	06	=	Calibration
08	=	Initializing	07	=	Running
09	=	Reagent load	08	=	Maintenance
10	=	Homing	09	=	Autoprime
11	=	Priming	10	=	Calibration request
13	=	Saving to disk	11	=	No state
14	=	reading from disk	12	=	Boot
15	=	standby	13	=	Pause-initiated
16	=	Checking levels	14	=	Waiting
18	=	procedure in progress	15	=	System-idle
19	=	procedure termination in progress	16	=	Loading*
20	=	Procedure complete	17	=	System Stopping*
21	=	Waiting			

* Synchron CX3 DELTA only

APPENDIX J – Key Code Conversion for Local Languages

For communications between the host computer and the SYNCHRON CX, local language character handling is accomplished via the extended ASCII character set as defined by IBM for the IBM PC and IBM compatible units. The correct interpretation of foreign language characters on the SYNCHRON CX will require the use of 8-bit communication between the system and the host computer.

The defined foreign language characters and their extended ASCII character codes are as follows:

DECIMAL VALUE ➡	0	16	32	48	64	80	96	112
HEXA DECIMAL VALUE ⬇	0	1	2	3	4	5	6	7
0	BLACK (NULL)	►	BLANK (SPACE)	0	@	P	‘	p
1	☺	◄	!	1	A	Q	a	q
2	☻	↕	"	2	B	R	b	r
3	♥	‼	#	3	C	S	c	s
4	♦	¶	$	4	D	T	d	t
5	♣	§	%	5	E	U	e	u
6	♠	▬	&	6	F	V	f	v
7	•	↨	′	7	G	W	g	w
8	◘	↑	(	8	H	X	h	x
9	○	↓	)	9	I	Y	i	y
10	A	◙	→	*	:	J	Z	j	z
11	B	♂	←	+	;	K	[	k	{
12	C	♀	∟	,	<	L	\	l	¦
13	D	♪	↔	–	=	M	]	m	}
14	E	♫	▲	·	>	N	^	n	~
15	F	☼	▼	/	?	O	_	o	⌂

DECIMAL VALUE ➡	128	144	160	176	192	208	224	240
HEXA DECIMAL VALUE ⬇	8	9	A	B	C	D	E	F
0	Ç	É	á	▒	└	╨	α	≡
1	ü	æ	í	▒	┴	╤	ß	±
2	é	Æ	ó	▓	┬	╥	Γ	≥
3	â	ô	ú	│	├	╙	π	≤
4	ä	ö	ñ	┤	─	╘	Σ	⌠
5	à	ò	Ñ	╡	┼	╒	σ	⌡
6	å	û	ª	╢	╞	╓	µ	÷
7	ç	ù	º	╖	╟	╫	τ	≈
8	ê	ÿ	¿	╕	╚	╪	Φ	°
9	ë	Ö	⌐	╣	╔	┘	Θ	•
10	è	Ü	¬	║	╩	┌	Ω	•
11	ï	¢	½	╗	╦	■	δ	√
12	î	£	¼	╝	╠	▄	∞	n
13	ì	¥	¡	╜	═	▌	φ	2
14	Ä	₧	«	╛	╬	▐	∈	■
15	Å	ƒ	»	┐	╧	▀	∩	BLACK FF

A_00071C.EPS

No other extended ASCII characters are supported by the SYNCHRON CX system for display, printing and host communication.

APPENDIX K – Age Units

1 = Hours
2 = Days
3 = Weeks
4 = Months
5 = Years