

**Hostess<sup>®</sup> S**  
**User Guide**

Copyright © 1993, 1994. Control Corporation.  
**Second Edition, second printing: 10/31/96**  
All Rights Reserved.

**Trademarks**

Hostess is a registered trademark of Control Corporation.

Control is a trademark of Control Corporation.

The Control logo is a registered trademark of Control Systems, Inc.

Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

# Before You Begin

## Scope

---

Use this guide to configure and install the Hostess *S* controller. In addition, Section 5 provides you with information about the programs on the *Sample Programs* diskette that came with the controller.

## Prerequisites

---

This guide assumes that you somewhat familiar with installing computer equipment.

## Audience

---

This guide is primarily for developers who implement and integrate the controller into the system or the person who installs hardware on the system.

## Organization

---

This guide contains the following information to configure and install the controller or controllers.

### **Section 1. Installing the Hostess *S* Controller**

Contains installation procedures for controller, such as;

- Setting the base I/O address and IRQ on the DIP switch
- Optionally, setting the jumpers for RS-422 termination
- Optionally, installing a security PAL
- Optionally, connecting a DB25 connector for Port 2.

### **Section 2. Controller Specifications and Cabling**

Contains information about specifications for the controller. In addition, it discusses port pinout and connector information for the controller.

---

### **Section 3. Technical References**

Contains information about the following topics:

- I/O register details
- I/O addresses defined
- Using the serial communications controller
- Using the configuration register
- Using the modem register
- RTS enables

### **Section 4. Troubleshooting**

Contains information that may help you resolve installation or operations problems. In addition, it provides information about way to contact Control.

### **Section 5. Sample Program Overview**

Discusses the programs included on the *Sample Programs* diskette.

# Table of Contents

## **Before You Begin**

Scope .....	1
Prerequisites .....	1
Audience .....	1
Organization .....	1

## **Table of Contents**

Figures .....	4
Tables .....	4

## **Section 1. Installing the Controller**

1.1. Introduction .....	5
1.2. Installing the Optional Security PAL .....	5
1.3. Setting the I/O Address and IRQ .....	6
1.4. Setting Jumpers for RS-422 Termination .....	8
1.5. Attaching Another DB25 Connector .....	9
1.6. Installing the Hostess S Controller .....	10

## **Section 2. Controller Specifications and Cabling**

2.1. Controller Overview .....	11
2.2. Controller Specifications .....	11
2.3. Cabling Introduction .....	12
2.4. The Connectors and Port Pinouts .....	12

## **Section 3. Technical Reference**

3.1. Introduction .....	15
3.2. I/O Addresses Defined .....	15
3.3. Using the Serial Communications Controller .....	16
3.4. Using the Configuration Register .....	17
3.5. Using the Modem Status Register .....	19
3.6. Using the Optional Security PAL .....	20
3.7. RTS Enables .....	20

## **Section 4. Troubleshooting**

4.1. Resolving Problems .....	21
4.2. Contacting Control .....	23

## **Section 5. Programming Examples**

5.1. Sample Program Overview .....	24
5.2. Diagnostic Sample Overview .....	24

# List of Figures and Tables

## Figures

---

Figure 1-1. Hostess <i>S</i> Components.....	6
Figure 2-1. DB25 Connector for Port 1 (Optionally Port 2) ...	12
Figure 2-2. Standard Port 2 DB9 Connector .....	13
Figure 3-1. Configuration Register Layout.....	18
Figure 3-2. Modem Status Register Layout.....	19

## Tables

---

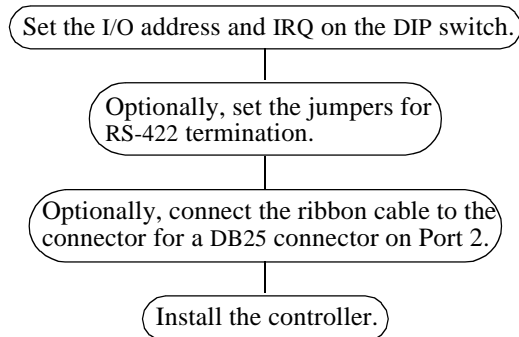
Table 1-1. Setting the DIP Switch.....	7
Table 1-2. RS-422 Termination Selections .....	8
Table 2-1. Controller Specifications.....	11
Table 2-2. Condition Specifications for the Controller.....	12
Table 2-3. Port Pinouts.....	14
Table 3-1. I/O Address Functions .....	15
Table 3-2. Local Request Source .....	16
Table 4-1. System I/O Addresses – Up to 3FF .....	21
Table 4-2. Possible Solutions.....	22

# Section 1. Installing the Controller

## 1.1. Introduction

---

This section explains how to set up and install your controller. For technical information about the controller, see Section 3. The following flowchart shows you the configuration and installation procedures for the controller.



Use the remainder of this section to set up and install the controller.

## 1.2. Installing the Optional Security PAL

---

A custom-order security PAL is available for the Hostess *S* controller. A security PAL may be useful in many software development and integration scenarios to accomplish a certain task. For example, you could load security screens that meet your specifications to lock out unwanted users.

A special socket must be mounted to the controller to install the security PAL. Typically, Control installs the socket and security PAL.

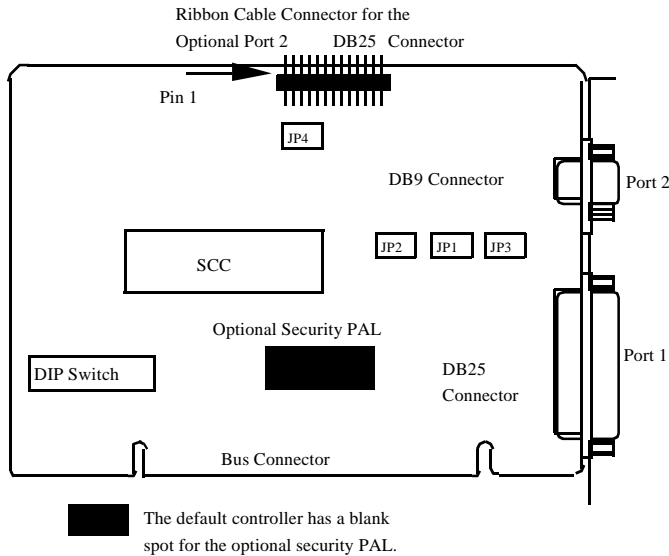
*Note: For information about security PALs, contact Control.*

### 1.3. Setting the I/O Address and IRQ

Before you install the Hostess *S* controller into your system, you must select a base input/output (I/O) address for the controller and the IRQ.

Use Table 1-1 to set a base I/O address and IRQ for each controller you plan on installing. If you are unsure about available I/O addresses, see Table 4-1 or your system documentation.

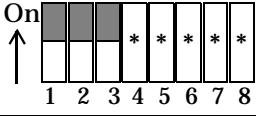
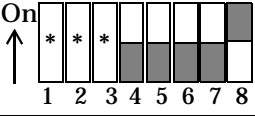
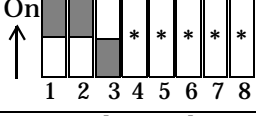
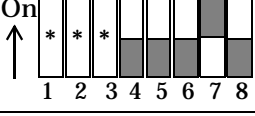
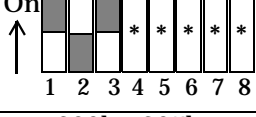

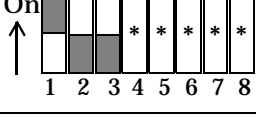
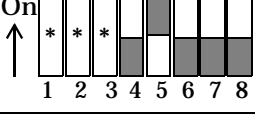
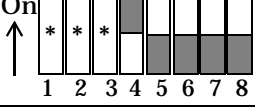
The following figure shows the location of important components on the controller.



**Figure 1-1. Hostess *S* Components**



**Table 1-1. Setting the DIP Switch**

Base I/O Address Range and Switch Setting	IRQ Number and Switch Setting
<p style="text-align: center;">200h - 207h</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>	<p style="text-align: center;">2</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>
<p style="text-align: center;">280h - 287h</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>	<p style="text-align: center;">3</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>
<p style="text-align: center;">2C0h - 287h</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>	<p style="text-align: center;">5</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>
<p style="text-align: center;">300h - 307h</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>	<p style="text-align: center;">10</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>
	<p style="text-align: center;">11</p> <p>On ↑</p>  <p style="text-align: center;">1 2 3 4 5 6 7 8</p>

## 1.4. Setting Jumpers for RS-422 Termination

---

The Hostess *S* controller has four jumper headers that permit you to install 120  $\Omega$  line-to-line termination resistors for RS-422 mode (see Table 2). This termination reduces noise on the circuit, which may be useful for high-speed data rate or long-distance transmission.

The jumper headers (JP1, JP2, JP3, and JP4) are shipped in a neutral position from the factory (the header is only placed over one pin). To install the jumper header for RS-422 termination, move the header and place it over both pins.

**Table 1-2. RS-422 Termination Selections**

Port	Signal	Jumper
1	RxCk	JP1
	RxD	JP2
	TxCk (input)	JP3
2	RxD	JP4

*Note: RS-422 signals are driven when RTS is active.*

## 1.5. Attaching Another DB25 Connector

You can optionally order the Hostess *S* controller with a DB25 connector for Port 2. The optional DB25 connector provides the following support for transmit and receive data signals on Port 2:

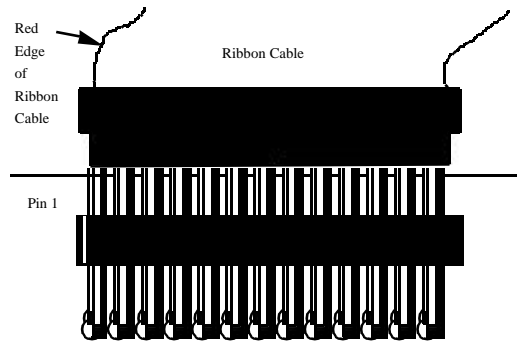
- Synchronous RS-232
- Asynchronous RS-422

*Note: RS-232/422 asynchronous support is provided with the default DB9 connector on Port 2.*

This optional connector includes a ribbon cable and attaches to the 26-pin header on the top of the controller.

To attach the connector, cable, and bracket to the controller, use the following procedure:

1. Connect the 26-pin ribbon cable connector to the 26-pin header.



*Note: The red edge of the ribbon cable should attach to Pin 1 of the connector.*

2. Press straight down on the connector.

## 1.6. Installing the Hostess *S* Controller

---

After configuring the controller and optionally installing other components, you are ready to install the controller.

1. Turn the power switch for the system unit to the OFF position.
2. Remove the system unit cover.
3. Select a slot to install the controller.

If you are installing a Hostess *S* controller with the optional second DB25, you should select a slot that also has an available slot or expansion slot cover next to it.

4. Remove the expansion slot cover or covers.
5. Insert the controller in the expansion slot, make sure that it is properly seated.
6. Optionally, attach the bracket on the optional DB25 connector to the slot with the expansion slot screw.



7. Attach the controller to the chassis with the expansion slot screw.
8. Repeat Steps 3 through 7 for each controller.
9. Replace the cover on the system unit.
10. Attach your peripheral cables to the connectors on the controller. For connector pinout information, see Section 2.

# Section 2. Specifications and Cabling

## 2.1. Controller Overview

---

The Hostess *S* is a 2-port, non-intelligent controller for use in ISA or EISA compatible PCs. It is perfect for high-speed WAN connections because

- Port 1 can be configured as RS-232/422 synchronous or asynchronous
- Port 2 can be configured as RS-232 (synchronous or asynchronous) or RS-422 asynchronous

The Hostess *S* controller comes with one DB25 and one DB9 connector, with an optional DB25 connector available for Port 2. The controller operates at speeds up to 2M bps and uses host system DMA channels for file transfer. An optional security PAL is also available.

*Note: For information about security PALs, contact Control Corporation using one of the methods discussed in Section 4.*

## 2.2. Controller Specifications

---

Table 1 lists the specifications for the Hostess *S* controller. Table 2 lists conditions for the controller.

**Table 2-1. Controller Specifications**

<b>Function</b>	<b>Specification</b>
I/O ports/expansion slot	2 ports per slot
Baud rate	
Maximum asynchronous	19.2K bps
Maximum synchronous	2M bps
Power requirements	
+5 VDC	360 mA
+12 VDC	33 mA
-12 VDC	40 mA
Heat output	9.2 BTU/HR
Mean time between failures	46 years

**Table 2-1. Controller Specifications**

Function	Specification
Interface	RS-232/422
SCC device	85230
Dimensions	4.25" by 5.25"

The Hostess *S* controller operates under these conditions:

**Table 2-2. Condition Specifications for the Controller**

Condition	Specification
Air temperature: System on System off	0 to 50 degrees C -65 to 150 degrees C
Humidity: System on System off	8% to 80% 20% to 80%
Altitude	0 to 10,000 feet 0 to 3,048 meters

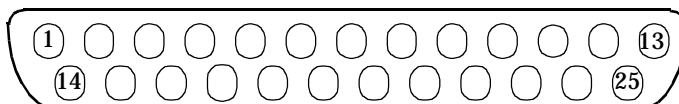
### 2.3. Cabling Introduction

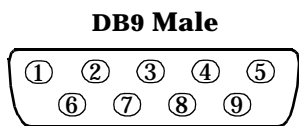
With the controller installed, the next phase is to connect terminals, modems, printers, or other peripheral devices to the Hostess *S* controller. Usually this is not difficult; you can buy the correct cables from distributors and electronics stores.

If you want to build your own cables or interfaces, use this section for information about the controller port pinouts.

### 2.4. The Connectors and Port Pinouts

The following figures and table provide detailed information about the DB25 and DB9 connectors for the controller.

**DB25 Male****Figure 2-1. DB25 Connector for Port 1 (Optionally Port 2)**



**Figure 2-2. Standard Port 2 DB9 Connector**

**Table 2-3. Port Pinouts**

Port 1 (DB25)			Port 2 (DB9 or DB25) =			
Pin	RS-232	RS-422*	9-Pin	25-Pin	RS-232	RS-422*
2	TxD		3	2	TxD	
3	RxD	RxD-	2	3	RxD	RxD-
4	RTS		7	4	RTS	
5	CTS		8	5	CTS	
6	DSR		6	6	DSR	
7	Gnd		5	7	Gnd	
8	CD		1	8	CD	
10		TxD-		10		TxD-
12		TxCk- (DTE source)				
14		TxCk+ (DCE source)				
15	TxCk (DCE source)	TxCk- (DCE source)		15	DTE	
16		RxD+		16		RxD+
17	RxCk	RxCk-		17	RxCk	
18		RxCk+				
20	DTR		4	20	DTR	
22	RI		9	22	RI	
23		TxD+		23		TxD+
24	TxCk (DTE source)			24	DCE	
25		TxCk+ (DTE source)				

= An optional external ribbon cable to DB25 connector is needed to run Port 2 in RS-232 synchronous or RS-422 asynchronous mode.

\* You may want to use the 120  $\Omega$  line-to-line terminating resistors under some circumstances, see Section 1.4.



## Section 3. Technical Reference

### 3.1. Introduction

---

This section presents technical information about the Hostess *S* controller, which includes:

- I/O addresses defined
- Using the serial communications controller
- Using the configuration register
- Using the modem register
- Using the security PAL
- RTS enables

### 3.2. I/O Addresses Defined

---

The controller uses a block of eight consecutive I/O addresses. Table 1 lists the offset from the base address and its function.

**Table 3-1. I/O Address Functions**

<b>Base I/O Address Offset</b>	<b>Description</b>	<b>Function</b>
0	SCC Port 2	Control
1	SCC Port 1	Control
2	SCC Port 2	Data
3	SCC Port 1	Data
4	Configuration register	Write
	Modem status register	Read
5	Reserved	
6	Reserved	
7	Security PAL	

See Subsection 3.4 for information about the configuration register and Subsection 3.5 for information about the modem status register.

### 3.3. Using the Serial Communications Controller

---

The primary device on the controller is the 85230 Serial Communications Controller (SCC). The SCC is the only interrupt source.

For complete documentation for the 85230 SCC, contact your Zilog dealer.

Each physical port of the SCC is connected to one of the ports on the controller:

- Port A of the SCC is connected to Port 1 of the controller (25-pin D-style connector)
- Port B of the SCC is connected to Port 2 of the controller (9-pin D-style connector or the optional DB25 connector)

The clock supplied to the SCC has a frequency of 8.192 MHz. Therefore, the maximum RS-422 synchronous clock rate is 2.048 MHz.

The Hostess *S* controller provides direct memory access to the system memory. The controller can use either the system DMA channel 1 or DMA channel 3:

- Port 1 supports full-duplex DMA using channels 1 and 3.
- Port 2 supports half-duplex DMA using channel 3.

Table 2 lists the SCC output signal that the configuration register uses to select the system DMA channel.

**Table 3-2. Local Request Source**

Port	Output Signal	Local Request Source
1	DTR/REQ	0
	W/REQ	1
2	W/REQ	2

When programming the SCC, no jump short instructions are needed to ensure minimum recovery time. Back-to-back accesses to the SCC are permissible.

To program for interrupts, refer to the **interrupt without acknowledge** mode explained in the *Interfacing the SCC* chapter of the Zilog manual. Use this mode because the DIP switch on the controller selects the IRQ, and the inverted interrupt output signal is connected to the bus IRQ line.

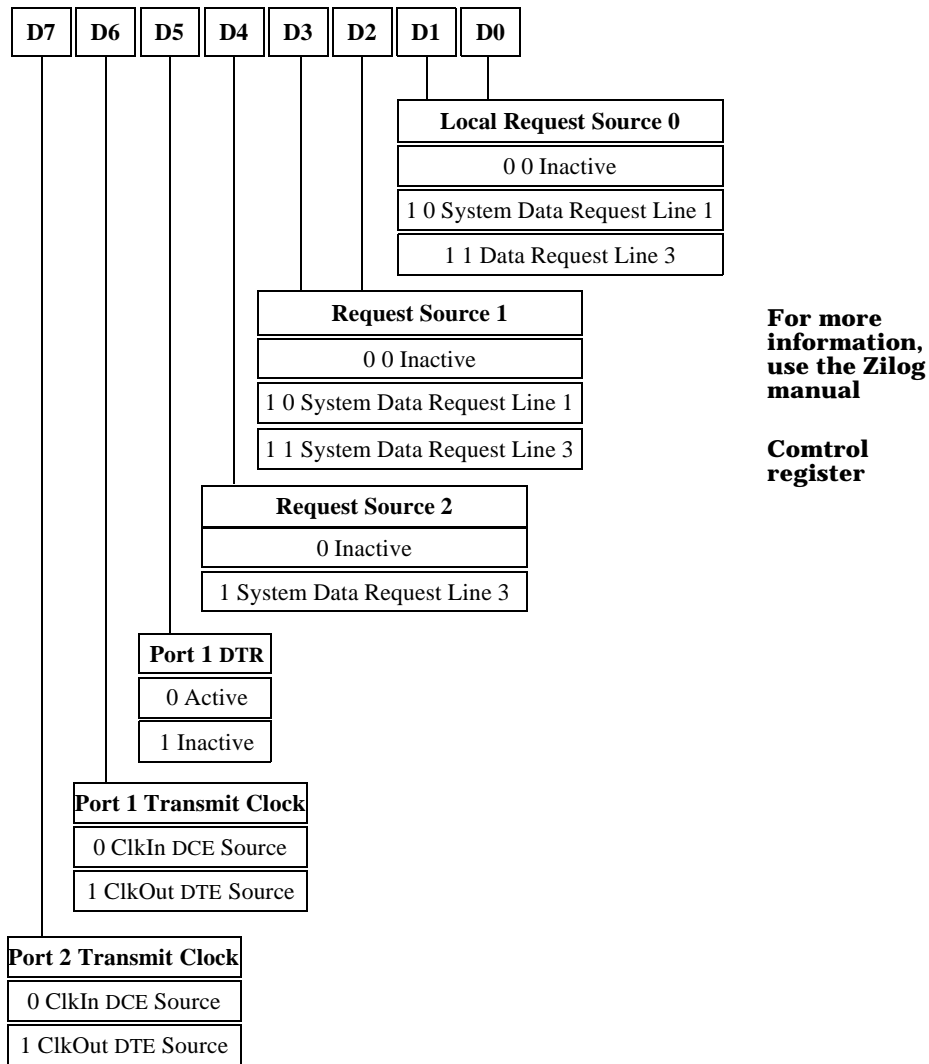
The SCC does not control the DTR output signal for Port 1, it is controlled by the configuration register described in Subsection 3.4.

### **3.4. Using the Configuration Register**

---

Writing to I/O base + 4 address sets the configuration register for the controller. The configuration register (Figure 3-1) selects:

- The DMA channel used by the SCC DMA request source
- The transmit clock source
- The DTR state for Port 1



**Figure 3-1. Configuration Register Layout**

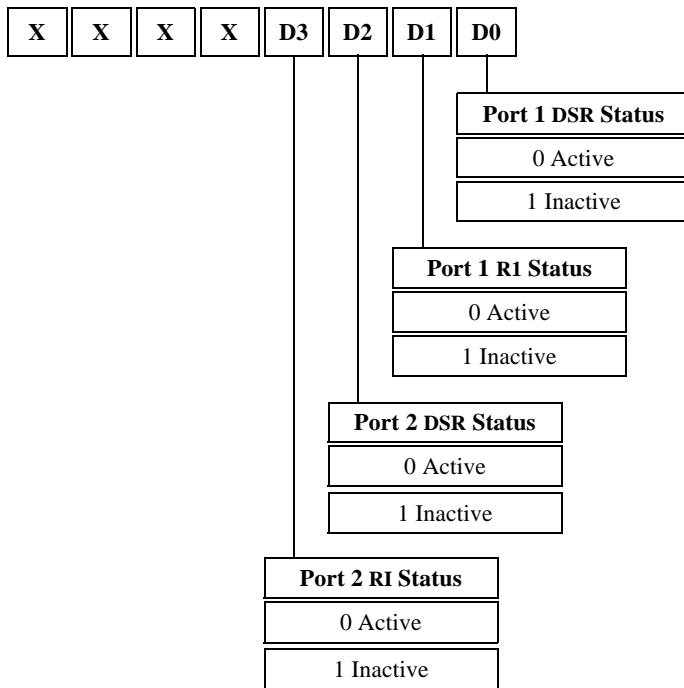
For the configuration register, the following applies:

- Setting the channels to an inactive state, disconnects the controller from the system's DMA.

- The D5 bit acts as the DTR signal for SCC port A (Port 1).
- Bits D6 and D7 set the transmit clock source as either DTE (output) or DCE (input).

### 3.5. Using the Modem Status Register

Reading I/O base + 4 address selects the modem status register for the Hostess S controller. The modem status register reflects the state of the DSR and RI signals for Ports 1 and 2. Figure 3-2 shows the layout of the modem status register.



**Figure 3-2. Modem Status Register Layout**

### **3.6. Using the Optional Security PAL**

---

Reading and writing to I/O base + 7 address selects the security PAL on for Hostess *S* controller. This chip is an option for the Hostess *S* controller.

For information about the security PAL, contact Control Corporation using one of the methods discussed in Section 4.

### **3.7. RTS Enables**

---

Activate the RTS signal to enable the RS-422 transmitters. The controller uses the RTS signal on

- Port 1 to enable the RS-422 transmitters for Port 1.
- Port 2 to enable the RS-422 transmitters for Port 2.

This section should help you troubleshoot install or operational problems.

# Section 4. Troubleshooting

## 4.1. Resolving Problems

---

If installation fails or you are trying to resolve a problem, you should try the following before calling the Control technical support line:

- Check the signals between your peripherals and the peripheral device to verify that they match. See Section 3 for Hostess *S* pinout information.
- Check to make sure the serial and interface cables are connected properly.
- Check to see if the DIP switch is set to the desired address.
- Reseat the controller in the slot.
- Make sure that the expansion slot screw was replaced after inserting the controller.
- Select a different I/O address range for the controller. For possible I/O address conflicts, see Table 1.

**Table 4-1. System I/O Addresses - Up to 3FF**

<b>Address Block</b>	<b>Addresses Used</b>	<b>Description</b>
000 - 03F 040 - 07F 080 - 0BF 0C0 - 0FF		Reserved for Motherboard
100 - 13F 140 - 17F 180 - 1BF		
1C0 - 1FF	1F0 - 1F8	Fixed Disk
200 - 23F		

**Table 4-1. System I/O Addresses - Up to 3FF(Continued)**

<b>Address Block</b>	<b>Addresses Used</b>	<b>Description</b>
240 – 27F	278 – 27F	LPT2, IDE controllers, multifunction boards (game ports)
280 – 2BF		
2C0 – 2FF	2E8 – 2EF 2F8 – 2FF	COM4 COM2
300 – 33F		
340 – 37F	378 – 37F	LPT1
380 – 3BF	3B0 – 3BF	Monochrome Display and LPT3
3C0 – 3FF	3D0 – 3DF 3E8 – 3EF 3F0 – 3F7 3F8 – 3FF	Graphics Monitor Adapter COM3 Floppy Disk Controller COM1

The following table lists simple problems, probable causes, and possible solutions.

**Table 4-2. Possible Solutions**

<b>Problem</b>	<b>What May Be Wrong</b>	<b>What To Do</b>
Controller active, but data garbled.	Wrong parity, baud, or speed set.	Check settings.
Modem cannot send nor receive data.	DSR or DCD signal is set high.	Check modem signal settings.
Inconsistent data on screen.	Power overload.	Determine if the components in your system exceed its power supply.



If your problem appears in Table 2, first try the suggested solutions. If the problem persists:

1. Remove the device driver or associated software and reinstall it.
2. Remove the controller and reinstall it.
3. Check-out your system using the system diagnostics provided by your computer manufacturer (if any).
4. Use the diagnostic software on the *Sample Programs* diskette. Section 5 contains an overview of the HS.C diagnostic example program. In addition, the README.HS file on the diskette provides you with plans to build a test cable and loopback plug for testing.

## 4.2. Contacting Control

---

If you encounter problems or have questions about the controller or the installation procedures, contract Control Corporation using one of the following methods.

### **Corporate Headquarters**

Email: support@Comtrol.com

FAX:(612) 631-8117

BBS: (612) 631-8310

*Note: Comtrol supports a BBS for software updates or technical support) for our customers. The BBS supports modem speeds up to 28.8 Kbps with 8 bits and no parity.*

WEB:<http://www.comtrol.com>

Phone: (612) 631-7654

### **Comtrol Europe**

BBS: (44) 869-243-687

FAX: (44) 869-323-211

Phone: (44) 869-323-220

email: support@comtrol.co.uk

This section provides you with an overview of the program example code found on the Hostess *S Sample Programs* diskette.

# Section 5. Programming Examples

## 5.1. Sample Program Overview

---

The diskette contains the following files:

- **HS.C** – the diagnostic example program for the Hostess *S* controller. The diagnostic example program is rather extensive, the highlights are listed in the following subsection.
- **HS.H** – the header file for HS.C.
- **MENUS.C** – the user interface for the HS program.
- **MINTHND.ASM** – enables and disables interrupts, invokes C interrupt handler when an interrupt occurs.
- **README.HS** – the layout of the test cable and loopback plug for the HS program.

## 5.2. Diagnostic Sample Overview

---

The diagnostic example program (HS.C) contains functions that perform the following tasks. The README.HS file contains the layout of the test cable and loopback plug for this program.

- Displays menus and calls selected test routines.
- Loads up memory with transmit data and returns the number of bytes loaded into memory.
- Resets the SCC channel and initializes the SCC register.
- Enables transmit, receive, and baud rate generator for polled response.
- Sets up system DMA controller.
- Transmits from Port 1 using polling.
- Receives characters from Port 1 using polling.
- Receives characters from Port 2 using polling.
- Transmits from Port 2.
- Transmits characters from Port 1 using DMA Channel 1.
- Transmits characters from Port 2 using DMA Channel 3.
- Tests controller completely.

- Tests modem control signal for loopback cable (Port 1 to Port 2).
- Clears Ports 1 and 2 DTR and RTS.
- Checks DTR on Port 1 to DSR and DCD on Port 2.
- Checks RTS on Port 1 to CTS and RI on Port 2.
- Checks DTR on Port 2 to DSR and DCD on Port 2.
- Checks RTS on Port 2 to CTS and RI on Port 1.
- Clears Ports 1 and 2 DTR and RTS.
- Tests for modem control signals for Port 2 through the DB9 loopback connector.
- Clears DTR and RTS.
- Checks DTR to DSR and DCD.
- Checks RTS to CTS and RI.
- Sets the addresses for the Hostess *S* registers.
- Tests the controller when Ports 1 and 2 have been looped together.
- Performs a DMA receive on Port 1 and polled transmit from Port 2.
- Performs a DMA receive on Port 2 and polled transmit from Port 1.
- Tests synchronous receive and transmit between Ports 1 and 2.
- Tests controller when the ports have been looped together by polled transmit and polled receive.
- Tests the controller when the ports have been looped together using the DMA for receiving characters and polling to transmit characters.
- Initializes the SCC for bisynchronous operation in polled mode.
- Tests Port 2 with a loopback plug installed in the DB9 connector; interrupt driven I/O on Port 2 (DB9).
- Performs an interrupt service routine (ISR) that `en_irq()` sets the interrupt vector and transmits characters from Port 2.
- Computes the time factor for the `wait()` function and the global variable `time_factor` is modified.
- Waits for the length of time specified.