6.2 SERIAL ASCII PROTOCOL PORT

6.2.1 Introduction

The serial interface available on the CM9502 CPU card is designed to communicate with any single device capable of communication in ASCII. This serial port uses the Pelco ASCII Interface Protocol for communication. (Reference: see table in Section 6.2.3.1.) The protocol consists of a basic ASCII character set used to transmit and receive commands that control pan and tilt mechanisms (both fixed and variable speed), camera functions, auxiliary relays, and systems tasks such as sequences and tours.

> **NOTE**: This serial port **cannot** be used as a keyboard port. Furthermore, devices connected to this port do not require a logon or logoff process to access CM9502 system functions. In addition, devices controlling functions via this serial port are set at the **lowest "system priority"**. That is to say that if a device is controlling a PTZ device via this ASCII serial port, it can be overridden by any keyboard user or system background task, such as an event, tour, sequence or alarm.

6.2.2 Specifications

The ASCII serial port communicates in a standard, asynchronous, byte oriented protocol that includes: 1 start bit, 8 data bits, 1 parity bit (odd), and 1 stop bit. The communications rate is 9600 baud.

The physical layer of the CM9502 ASCII serial port follows the RS-422 standard. Depending on the users equipment selection for ASCII control, a conversion device may be needed to provide a proper interface between the CM9502 serial port and the user's control device. See Figure 39 for suggested physical connection between an RS-422 device and an RS-232 device.

6.2.2.1 Serial Port Cabling

To facilitate connection of the CM9502 ASCII serial port to the end user's equipment, a RJ-45 to multiwire junction box and interface cable are provided with the CM9502 card cage (see Figure 36).One end of the interface cable connects to either of the RJ-45 sockets on the CPU card labeled, "Serial Port" (see Figure 37).The serial port is provided with two (2) RJ-45 8-pin modular female connectors (looped together) that are located directly below the printer interface connector on the CPU card. The opposite end of the cable then connects to the RJ-45 socket of the junction box. Removing the cover of the junction box reveals eight (8) screw down terminals for connection to the end user's equipment (see Figures 38 and 39). If the end user's ASCII device uses an RS-422 port for communication, only four wires need be used to connect the ASCII device to the junction box. If the ASCII device uses an RS-232 port, refer to Section 6.2.2.2.
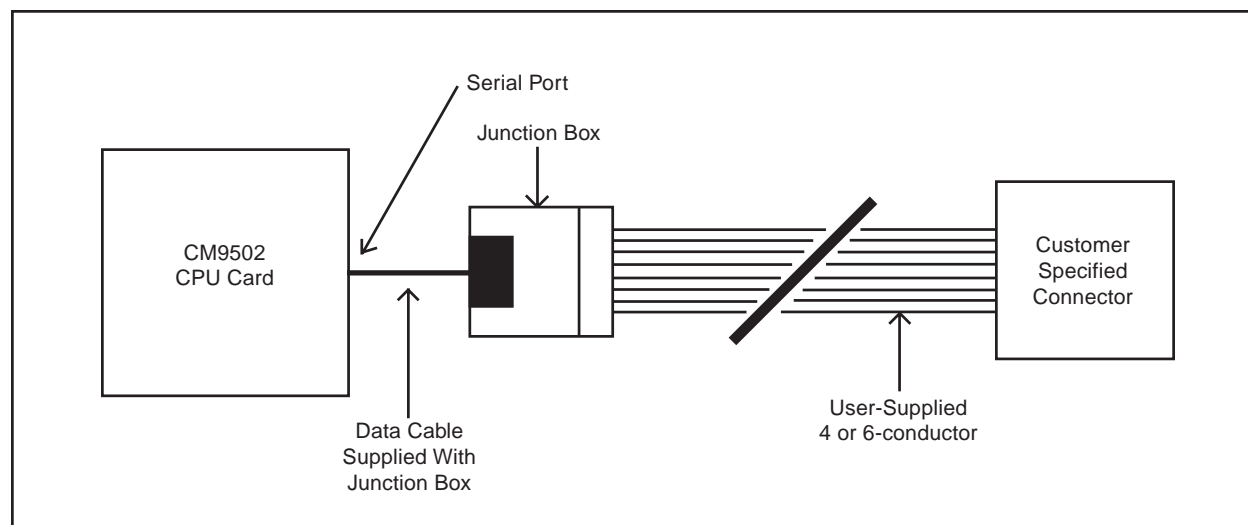

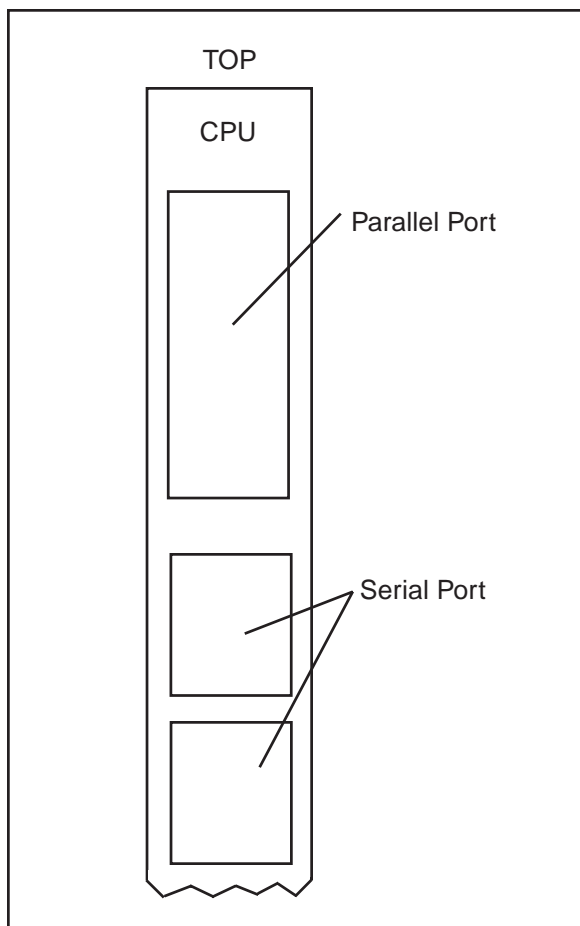**Figure 36**. Cable Connection of CM9502 ASCII Port
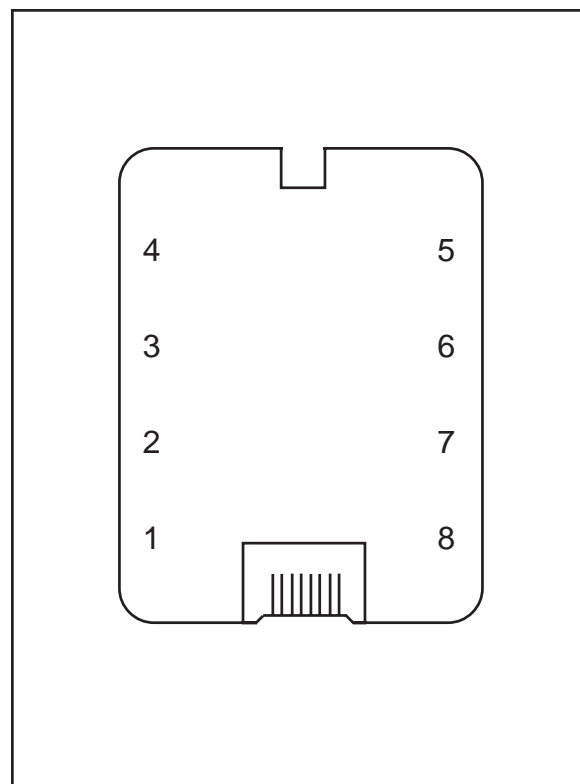
TOP

CPU

Parallel Port

Serial Port

Figure 37. Parallel and Serial Port Location

4   5

3   6

2   7

1   8

Figure 38. J-Box (Top View)

Pin 1

Pin 8

1 2 3 4 5 6 7 8

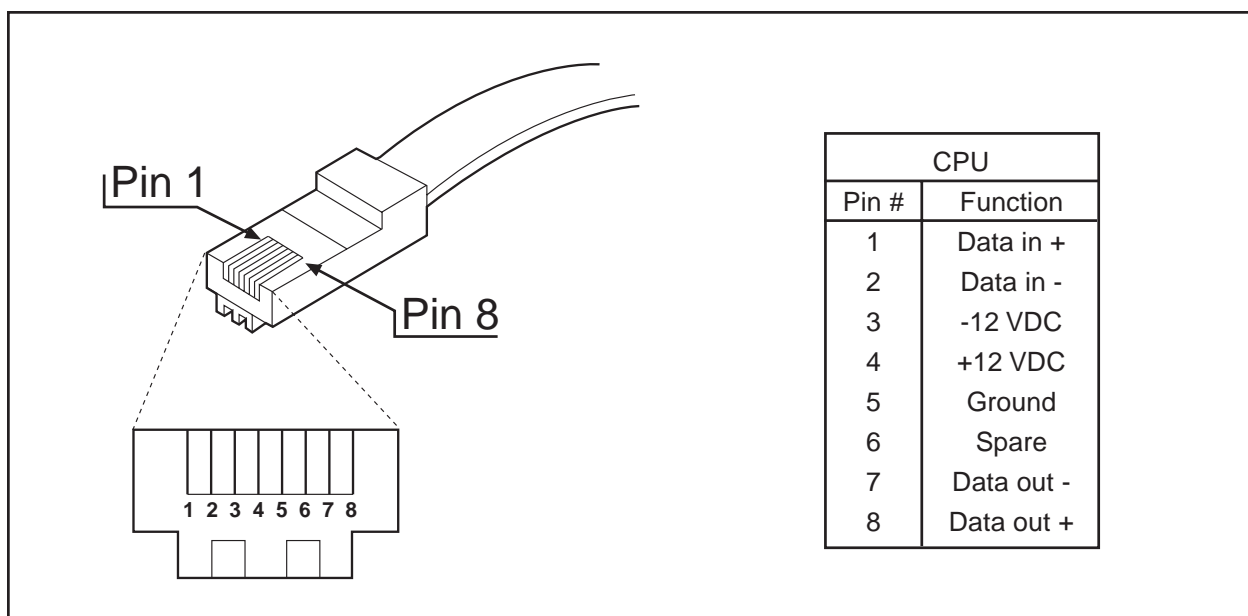| CPU	
Pin #	Function
1	Data in +
2	Data in -
3	-12 VDC
4	+12 VDC
5	Ground
6	Spare
7	Data out -
8	Data out +

Figure 39. Data Cable Pin Assignments

6.2.2.2 Converting RS-422 to RS-232

When converting RS-422 to RS-232 be certain to connect the communication wires from the CM9502 ASCII port via an RS-422 to RS-232 converter as shown in Figure 40 below. Figure 40 shows the receive data (Rx DATA) and transmit data (Tx DATA) lines crossing when connecting from the user's ASCII control device to the converter. Some converters may not require the wires be crossed. Refer to the user's manual of the converter device.

> **NOTE:** Depending on the brand of converter used, the +12 VDC and Return Ground connections may not be necessary. Refer to the user's manual of the converter device for details.
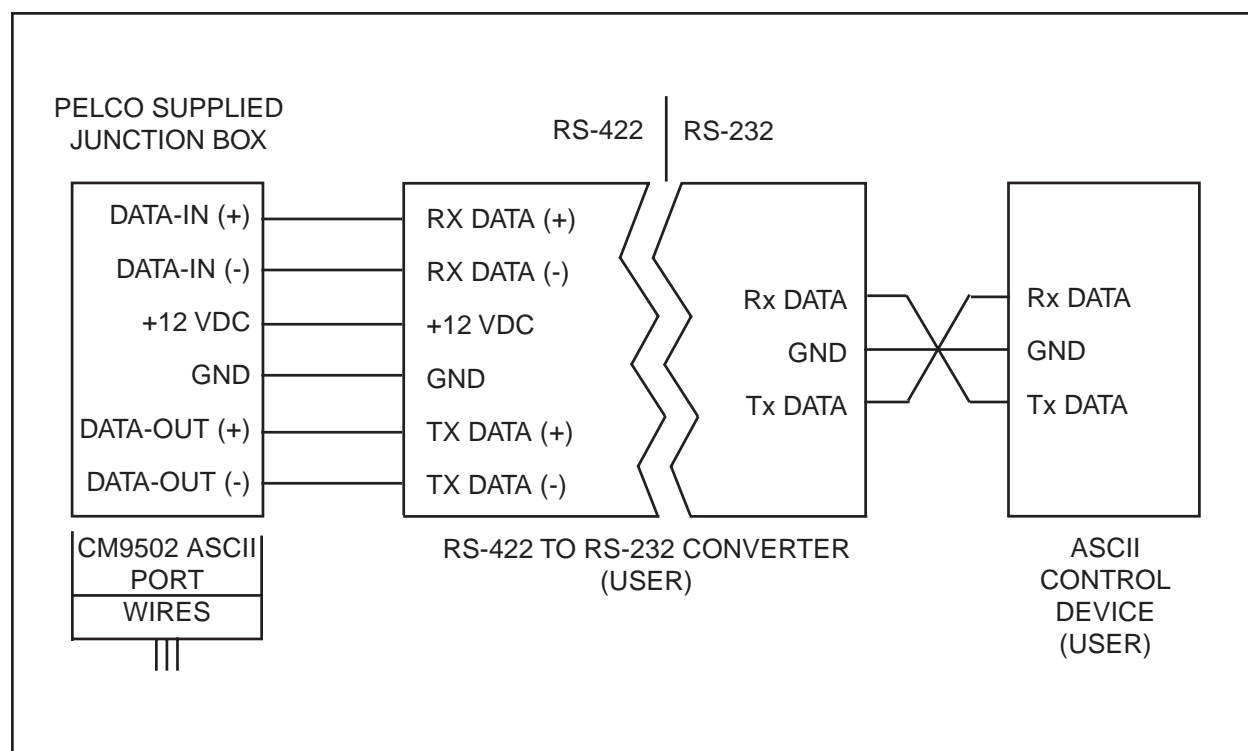
Figure 40. RS-422 TO RS-232 Converter Connection

6.2.3 ASCII Command Structure

The Pelco ASCII Interface Protocol Commands have a relatively simple format. Each command is identified by an ASCII character. Commands that require a numeric value must transmit the ASCII representation of that value in front of the command identifier. Each command is followed by a lower case "a" (also represented in ASCII).

For example, to select a pan/tilt device labeled "CAMERA # 16" and switch it to monitor # 3, the following command sequence should be sent to the CM9502 ASCII serial port:

Command	Definition/Function
3Ma	- select monitor 3
16#a	- switch camera # 16 to currently selected monitor

> **NOTE:** If control of some camera or monitor is taken by another operator, the ASCII commands for the camera or monitor will no longer be executable since the resource is not available or is no longer defined. In this case the CM9502 would respond to the command(s) with a negative acknowledgment.

Furthermore, once this camera-to-monitor selection has been established, the ASCII control device (the user's system) can now control the previously selected pan/tilt device as if operating from a keyboard. The following sequence of commands will illustrate how the user can manipulate the pan/tilt device:

Command	Definition/Function
27La	- pan left at a speed value of 27
15Da	- tilt down at a speed value of 15
sa	- stop all PTZ movement
3\a	- go to Preset position number 3
Ta	- perform a telephoto zoom
~Ta	- stop a telephoto zoom
9qa	- begin system sequence number 9

> **NOTE**: Section 6.2.3.1 lists the ASCII commands supported by the CM9502. The complete ASCII command set is available from the factory.

The Pelco ASCII Protocol also consists of an acknowledgment string which the CM9502 will return to the ASCII control device. A positive acknowledgment consists of the ASCII characters "AK", followed by a lower case "a" as the ending character.

If a particular command sent by the ASCII control device cannot be executed by the CM9502, a negative acknowledgment is returned. This negative acknowledgment consists of the ASCII letters, NA; the ASCII representation of the unexecutable command; and a lower case "a" as the ending character. If a particular command sent by the ASCII control device is not recognized by the CM9502, the negative acknowledgment takes the form of the ASCII letters, NA, immediately followed by the lower case "a" as the ending character. For example, an ASCII control device transmits a command to switch to monitor 17 (an invalid monitor) by sending the command, 17Ma. The response from the CM9502 would be, NAa. Another example, if a monitor switch command is sent to the CM9502 that addresses a monitor currently being used by another keyboard operator, the response would be, NAMa.

> **NOTE**: When the CM9502 printer interface is configured and enabled, all commands initiated via the serial ASCII port will be time stamped and identified as keyboard: 00 and user: 00

6.2.3.1 Pelco Serial ASCII Protocol Commands

In the command descriptions that follow, the range of legal values differs between commands and is shown preceding the command. The system configuration may narrow the range of legal values. For example, when you control a fixed speed pan and tilt, the speed information should be omitted.

PAN AND TILT COMMANDS

Command	PTZ Func. Start	PTZ Func. Stop
Pan Left*	[1-64]La	~La
Pan Right*	[1-64]Ra	~Ra
Tilt Up	[1-63]Ua	~Ua
Tilt Down	[1-63]Da	~Da
Go To Preset Position	[1-99]\a	
Stop Pan/Tilt/Lens Motion	sa	
Execute Pattern**	[1-99]pa	
End Pattern**	[1-99]na	

MATRIX CONTROL COMMANDS

Select Monitor	[1-16]Ma
Select Camera	[1-208]#a
Start a Sequence	[1-16]qa
End a Sequence	[1-16]ea
Begin a Tour	[1-14]ta
End a Tour	[1-14]ra
Next Camera	+a
Previous Camera	–a

CAMERA CONTROL COMMANDS

Command	Lens Func. Start	Lens Func. Stop
Focus Near	Na	~Na
Focus Far	Fa	~Fa
Iris Open	Oa	~Oa
Iris Close	Ca	~Ca
Zoom Telephoto	Ta	~Ta
Zoom Wide	Wa	~Wa

OTHER COMMANDS

Activate Auxiliary	[1-8]Aa
Deactivate Auxiliary	[1-8]Ba
Version	va
(Returns the current revision number of the CPU Firmware in the following format: VERSION X.XX)	
Alarm Acknowledge	[1-64]Ia

*Speed value '64' defines "Turbo" Pan Speed

** Refer to your Pelco receiver product documentation for receivers able to execute this command.