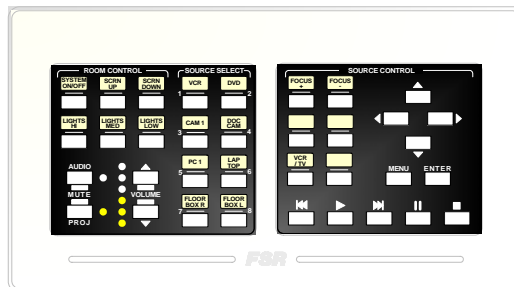




# RN-8200 REFERENCE MANUAL



FSR, Inc.  
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## Document Control

Release No.	Date	Revision Description
Rev. D13	9/5/05	Update to incorporate CU changes
Rev. D14	9/27/05	Mechanical correction on p. 2-11 for 2.5.3 graphic and general formatting corrections
Rev. D15	01/29/06	Update to incorporate CU changes

## Copyright

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## Warranty Policy

This product is warranted against failures due to defective parts or faulty workmanship for a period of three years after delivery to the original owner. During this period, FSR will make any necessary repairs or replace the unit without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner, return-shipping charges, via UPS / FedEx ground, will be paid by FSR.

This warranty applies only to the original owner and is not transferable. In addition, it does not apply to repairs done by other than the FSR factory or Authorized Repair Stations.

This warranty shall be cancelable by FSR at its sole discretion if the unit has been subjected to physical abuse or has been modified in any way without written authorization from FSR. FSR's liability under this warranty is limited to repair or replacement of the defective unit.

FSR will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

## Service

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

**NOTE:** All equipment being returned for repair must have a Return authorization (RMA) Number. To get a RMA Number, please call the FSR Service Department (973-785-4347). Please display your RMA Number prominently on the front of all packages.

### CONTACT INFORMATION:

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# TABLE OF CONTENTS

Page #

COPYRIGHT .....	II
WARRANTY POLICY .....	II
SERVICE .....	II
<b>1.0 GENERAL INFORMATION.....</b>	<b>1-1</b>
1.1 INTRODUCTION .....	1-1
1.1.1 Room Navigator .....	1-1
1.1.2 Feature Summary .....	1-1
1.1.3 Preliminary Specifications .....	1-2
1.2 TYPICAL APPLICATION.....	1-3
1.3 BLOCK DIAGRAMS .....	1-4
1.3.1 Video and Audio Switching .....	1-4
1.4 ACRONYMS AND ABBREVIATIONS .....	1-4
<b>2.0 INSTALLATION AND OPERATION OVERVIEW .....</b>	<b>2-1</b>
2.1 PRODUCT OVERVIEW .....	2-1
2.1.1 Panel Descriptions .....	2-1
2.1.1.1 Front Panels .....	2-1
2.1.1.2 Rear Panel.....	2-3
2.2 CABLING CONSIDERATIONS .....	2-3
2.2.1 RS-485 Remote Control Panel Port (WallPlate Interface) .....	2-3
2.2.1.1 RS-485 Bus Termination – ARP and BRP Panels .....	2-4
2.2.1.2 Panel Addressing .....	2-4
2.2.2 RS-232 Remote Host Port Cabling (DB9).....	2-5
2.2.3 RS-232 Control Port Cabling (3 wire interface).....	2-5
2.2.4 RJ-45 LAN Interface Cabling.....	2-6
2.2.5 Relay Control Ports.....	2-6
2.2.6 IR Control Ports.....	2-7
2.2.6.1 IR Power Adjustment.....	2-7
2.2.7 S-Video Input Connector Cabling .....	2-7
2.2.8 Composite Video Inputs and Outputs Connector Cabling.....	2-7
2.2.9 Audio Inputs Connector Cabling.....	2-8
2.2.10 Audio Outputs Connector Cabling .....	2-9
2.3 WALLPLATE SETUP.....	2-10
2.4 RACK UNIT FRONT PANEL SETUP .....	2-11
2.5 GETTING STARTED – QUICK START .....	2-12
2.5.1 Connect Your Room Navigator to Your PC.....	2-12
2.5.2 Apply Power to Your Room Navigator .....	2-12
2.5.3 Install the CU Software .....	2-12
2.5.4 Start the CU Software and Connect to Your Room Navigator .....	2-12
2.5.5 Create and Save Your Configuration.....	2-13
<b>3.0 CONFIGURATION UTILITY (CU) SOFTWARE .....</b>	<b>3-1</b>
3.1 CONNECTING THE HARDWARE.....	3-1
3.2 USING THE CONFIGURATION UTILITY .....	3-1
3.2.1 Connecting the CU to the Room Navigator.....	3-1
3.2.2 CU Main Screen Layout and Features.....	3-1
3.2.3 Menu Items .....	3-2
3.2.3.1 “File” I/O .....	3-2
3.2.3.2 “Device” Functions.....	3-3
3.2.3.3 “Options” Settings .....	3-4
3.2.3.4 “Help” .....	3-4

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3.2.4	FW Update Tab .....	3-4
3.2.4.1	Obtaining the Room Navigator Current Version Data .....	3-4
3.2.4.2	Performing a FW Update .....	3-5
3.2.5	Notes Tab.....	3-6
3.2.6	Serial Ports Tab .....	3-6
3.2.6.1	Device Addresses.....	3-7
3.2.6.2	Serial Ports.....	3-7
3.2.6.3	Serial Port Echo Modes .....	3-8
3.2.7	IR Setup Tab.....	3-9
3.2.7.1	Learning IR Commands.....	3-9
3.2.7.2	Immediate Playback of IR Commands.....	3-10
3.2.7.3	IR Learning Help and Tips.....	3-10
3.2.7.4	IR Data Analysis .....	3-11
3.2.8	Button Cmd Setup Tab .....	3-11
3.2.8.1	Panel “Overlay” .....	3-12
3.2.8.2	Panel Buttons and Virtual Buttons.....	3-12
3.2.8.3	Configuring a Button with Commands .....	3-14
3.2.8.4	Configuring a Serial Command .....	3-18
3.2.8.5	Configuring an IR Playback Command .....	3-20
3.2.8.6	Configuring a Relay Command .....	3-21
3.2.8.7	Configuring a Wait Command .....	3-21
3.2.8.8	Configuring a Button Press Command.....	3-21
3.2.8.9	Configuring a Lamp State Command.....	3-22
3.2.8.10	Configuring an Audio Output Adjust Command .....	3-22
3.2.8.11	Configuring an Audio Input Trim Adjust Command .....	3-22
3.2.8.12	Set Operational Mode Command.....	3-23
3.2.8.13	Set Idle Mode Command .....	3-23
3.2.8.14	Configuring an A/V Switch Command .....	3-23
3.2.8.15	Configuring a Remap Mode Command .....	3-23
3.2.9	Test Tab .....	3-24
<b>4.0</b>	<b>FACTORY DEFAULT SETTINGS .....</b>	<b>4-1</b>
<b>5.0</b>	<b>ASCII CODE TABLE.....</b>	<b>5-1</b>

## 1.0 GENERAL INFORMATION

### 1.1 Introduction

#### 1.1.1 Room Navigator

The Room Navigator (RN) is a multi video format A/V switcher and control system integrated into a single unit. The RN's A/V switching capability consists of 4 co-existing switches; a composite, an S-Video, an RGB, and an audio switch. The RN's configurable room/device controller provides five (5) RS-232 Serial, a 10/100 LAN, and an RS-485 remote control interfaces. The RN is capable of directly controlling multiple RS-232, IR and Contact Closure controlled devices such as A/V switchers, projectors, VCR/DVD players, document cameras, etc. This controller may be used for direct control of 4 IR devices (using single head emitters), 4 relay controlled devices, and 4 RS-232 devices. The RN includes both RS232 Host and a 10/100 LAN Host interface for remote control and embedded web server capability. The embedded web server provides a built-in virtual control panel interface allowing the unit to completely control the user's application without an additional physical interface. The RN is supported with an optional Advanced or Basic Remote Panel that connects via the dedicated Remote Panel RS-485 interface. The RN comes in a standard 19-inch rack mount chassis and comes configured with or without a front panel controls. Typical applications include classrooms, courtrooms, houses of worship, and board rooms.

#### 1.1.2 Feature Summary

- MS Windows®-based utility for easy setup
  - Embedded Web Server with pre-configured Virtual Control Panel for easy LAN-based remote control (SL model Only)
  - User configurable email alerts (future capability, SL model only)
  - RS232 (both models) and TCP/IP host control (SL model Only)
  - Built-In IR Learner with 61 Internal Command Storage Locations
    - Learns both normal and toggling IR Commands
  - Internal storage for Application Specific Information
    - 60 IR Command Labels (7 bytes per)
    - 15 Device Labels (16 bytes per)
    - 1 location for General User Notes (248 bytes)
  - Non-Volatile Internal Storage for all settings and stored commands
    - 182 X 128 byte Configurable Button Commands
  - SW assignable Unit Addresses for Expansion
  - Front Panel Operational Status Lights
  - Robust Configurable Functionality
    - Multiple, Mixed Command Sequences
    - Programmable Delays
    - Toggling Command Functions
    - Time Elapsed Auto-Execute Commands (i.e., auto-shutdown)
    - Configurable Auto Power-Up Commands
  - (4) Bidirectional, Configurable Serial Control Ports
    - Bauds 1200 to 57600 bps
    - 7 or 8 data bits, selectable parity
  - (4) Relay Control Ports (Normally Open Standard)
    - Front Panel Relay State Status Lights
    - Robust Relay Control (Set/Reset, Toggle, Timed Pulse and combos)
    - Contact Rating = 200V, 0.5A, 10W
  - (4) Power Adjustable IR Control Ports
  - (1) RS485 Remote Control Interface
  - Audio/Video Switching Functions:
    - 8x1 Composite Video \*
    - 8x1 S-Video \*
    - 4x1 configurable RGB w/ sync, or Composite/S-Video
    - 8x1 Stereo Audio w/ volume control
- \* reduces input capacity to minimum of 4x1 if using configurable RGB (HD15) inputs with RGB sources

### 1.1.3 Preliminary Specifications

#### General

<b>Power</b>	100 – 240 VAC, 43-65 Hz, 25 Watts
<b>Temperature / Humidity</b>	
<b>Enclosure Type</b>	Metal
<b>Enclosure Dimensions</b>	
<b>Product Weight</b>	
<b>Shipping Weight</b>	
<b>DIM Weight</b>	
<b>Approval Listings</b>	UL
<b>MTBF</b>	30,000 hours
<b>Warranty</b>	

#### Audio

<b>Audio</b>	Frequency Response: 20 Hz to 20 KHz Gain: +6dB THD + Noise: <.0.15% Crosstalk: >.90dB Stereo Channel Separation: > 100dB @ 1KHz PSRR: 90dB
<b>Video Inputs</b>	Number of Inputs / type: ▪ 8 stereo or mono, balanced or unbalanced Connectors: Pluggable screw terminals Impedance: 10 KOhms, unbalanced Nominal Level: 0.775 V Maximum Level: .5.0V Input Gain adjustment: -.45 dB to +5 dB Input Trim adjustment: -.5 to +15 dB
<b>Audio Outputs</b>	Number/ signal type: ▪ 1 Stereo or mono, balanced or unbalanced Connectors: Pluggable screw terminal Impedance: 50 Ohms designed to drive 600-Ohm load Nominal level: +6 dBu Maximum level: +22 dBu

#### Control

<b>Serial Control</b>	Serial Control Ports: 6 total ▪ (4) RS-232 ports w/ 3 pole captive screw connectors: – Pin 1 = Tx, – Pin 2 = Rx, – Pin 3 = Gnd ▪ (1) RS232 serial port, w/ 9-pin Sub D female connector – Supports remote control from PC (or similar), configuration from PC – Can be used a fifth device control port ▪ (1) RS-485 serial port for remote wall panel control
<b>LAN Interface</b>	1 RJ-45 female Ethernet control port <b>Ethernet Data Rate:</b> 10/100 BaseT <b>Protocols:</b> TCP/IP, SMTP, ARP, DHCP, HTTP, ICMP, Telnet
<b>Relay Control</b>	Number/Type: (4), 1 Amp Form A Connectors: Pluggable, captive screw connectors Connector rating: 200V, 0.5A, 10W
<b>Remote Panel Control I/F</b>	5-Pole captive screw connector supporting a dedicated RS485 serial connection
<b>IR Remote Control</b>	Front panel IR learner: 40KHz center freq (4) IR output ports ▪ 2 pole pluggable captive screw connectors
<b>Program Control</b>	Window's® based Configuration Utility Web Browser for control via embedded web server Virtual Control Panel

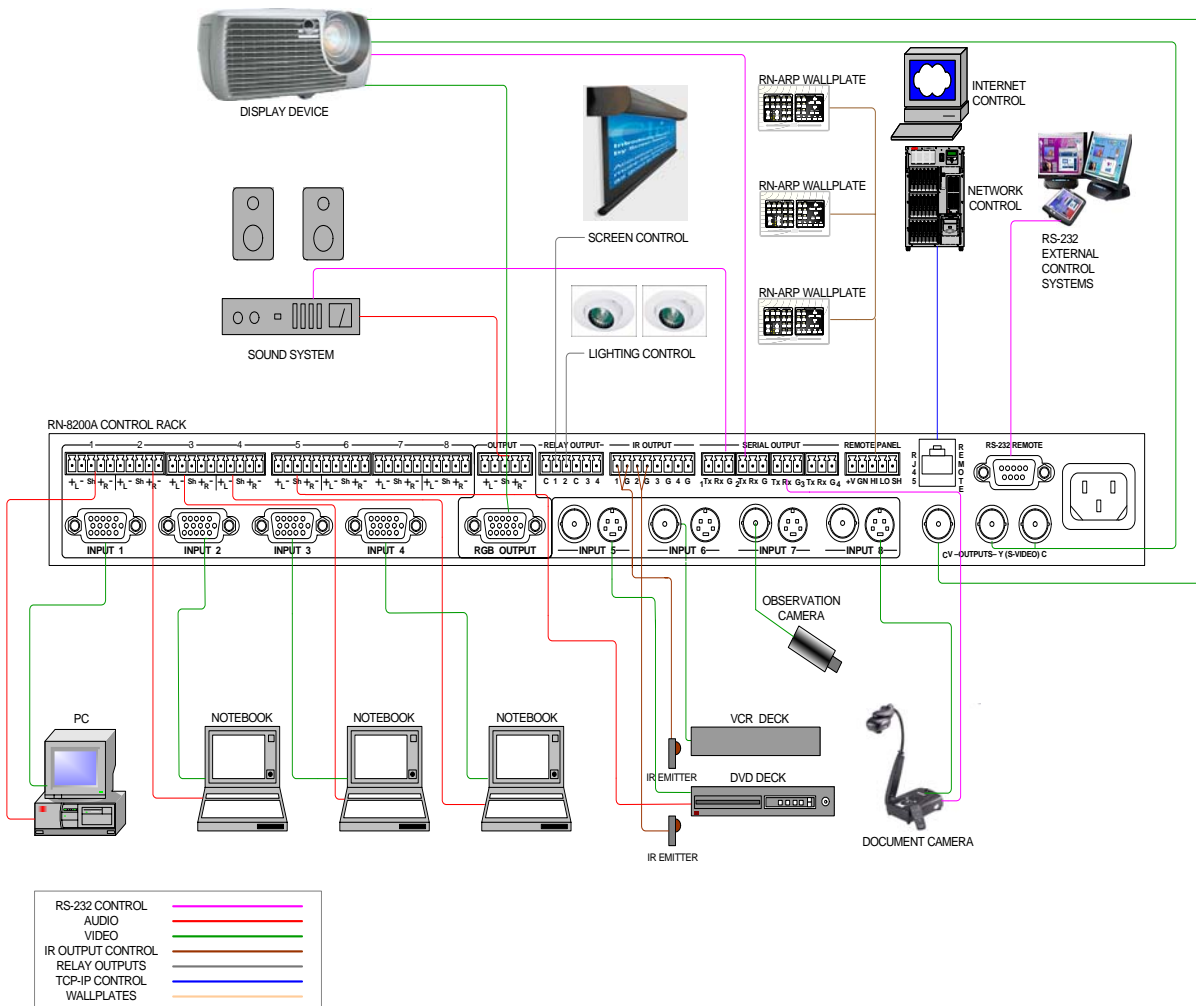
#### Video

<b>Video</b>	Bandwidth: 275 MHz (+/- 3dB), fully loaded Gain: Unity Flatness: ▪ RGB +/- 0.5dB to 182MHz Crosstalk: ▪ RGB: -45dB @ 5MHz ▪ S-video and Composite video: -52 dB @ 10 MHz Differential Phase Error: < 0.1° Differential Gain Error: < 0.1%
<b>Sync</b>	Input Type: RGBHV Output Type: RGBHV Standards: ▪ TTL (RGB), ▪ NTSC3.58, ▪ NTSC 4.43, ▪ PAL, ▪ SECAM Input level: 2.0 V TO 5.0V p-p Output level: 5.0V p-p, un-terminated Input impedance: 511 Ohms Output impedance: 75 Ohms Max. Input voltage: 5.0V p-p Max. Propagation delay: 48ns Max. Rise/fall time: 6ns Polarity: positive or negative depending on input
<b>Video Outputs</b>	Type 1: RGBHV Type 2: Composite Video Type 3: S-Video  Impedance: 75 Ohms Nominal Level: ▪ RGB: 0.7V p-p ▪ Y of S-Video and Composite Video: 1 V p-p ▪ C of S-Video: 0.3Vp-p Connectors: ▪ RGBHV: (1) 15 pin sub_D ▪ Composite Video: (1) Female BNC ▪ S-Video: (2) Female BNC Return loss: ▪ RGB < -45dB@5MHz ▪ Composite and S-video: < -25dB 0 to 10 MHz DC offset: +/- 30 mV with input at 0 V offset
<b>Video Inputs</b>	Inputs 1 – 4, Signal Type: ▪ RGBHV, S-Video, or Composite Video Inputs 4 – 8, Signal Type: ▪ S-Video, Composite Video only Nominal signal Levels: ▪ RGBHV: 0.7V p-p ▪ Y of S-Video and Composite Video: 1V p-p ▪ C of S-Video: 0.3V p-p Maximum levels: ▪ RGB Analog: +/-1.3V p-p with no offset ▪ S-video, composite video Analog: +/-2.2 V p-p with no offset Input Connectors: ▪ 1 – 4, RGBHV: Four, 15 Pin Female sub-D ▪ 4 – 8, has both: – S-Video: Four, 4 pin DIN, and – Composite: Four, BNC Female RGBHV Pin-Out: ▪ RGBHV: Pin 1: R, Pin 2: G, Pin 3: B ▪ S-Video: Luma (Y) Pin 2, Chroma (C) Pin3 ▪ Composite, CV Pin 1 Return Loss: ▪ RGB: < -43dB@5MHz ▪ S-Video: < -30dB 0 to 10 MHz ▪ Composite video: < -30dB 0 to 10 MHz DC offset (max allowable): +/- 1.5V Input Impedance: 75 Ohms for all input types

## 1.2 Typical Application

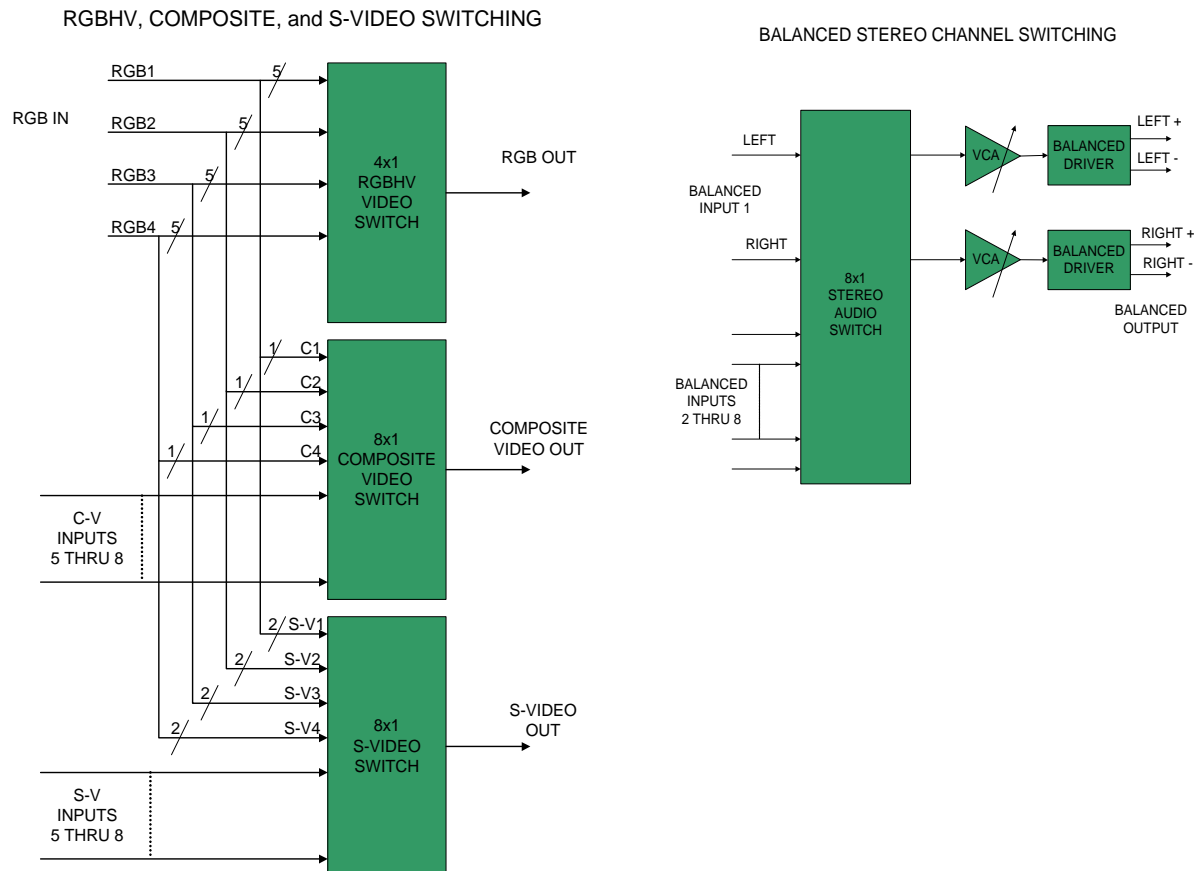
The Room Navigator is a complete control solution contained in a single, 1U, rack mountable unit that can be supported with a software-based control interface (optional) or with one or more physical button panels (optional). The Room Navigator control interfaces can be directly connected to the equipment to be controlled. Configuration is completely supported by the easy-to-use CU. Using the built-in IR learner and the IR remote controls for your equipment you can add an IR command library. The internal command storage is allocated to “buttons” (and button combinations) to allow configuration for serial, contact closure, and/or IR command playback to control your equipment. These “buttons” can be triggered using an external control application, or using one or more FSR Basic Remote Panel (BRP) and/or Advanced Remote Panels (ARP).

Toggling command features, auto-repeating commands, and auto-executing commands are just a few of the many features that enable the Room Navigator to support most medium and many large applications. Typical applications include classrooms, courtrooms, houses of worship, and board rooms. A typical application diagram is shown below.



## 1.3 Block Diagrams

### 1.3.1 Video and Audio Switching



## 1.4 Acronyms and Abbreviations

Item	Meaning	Definition
RN	Room Navigator	
ARP	Advanced Remote Panel Wallplate	Physical control panel that can be used directly via connection to the Room Navigator's RS-485 remote control interface.
CU	Configuration Utility	PC-based software application to configure the Room Navigator
BRP	Basic Remote Panel Wallplate	Physical control panel that can be used directly via connection to the Room Navigator's RS-485 remote control interface.
CIO	Control I/O Board	An internal component of the Room Navigator
AVS	Audio / Video Switch Board	An internal component of the Room Navigator
FW	Firmware	Operating code that runs on several internal components of the Room Navigator.



## 2.0 INSTALLATION AND OPERATION OVERVIEW

### 2.1 Product Overview

Before beginning, unpack and inspect your product to make sure you have everything and that all items are free from defects. The included items are as follows:

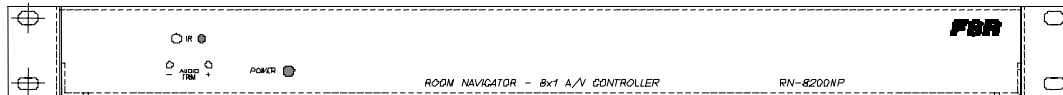
- Qty (1) RN-8200 Rack Unit (with or without Front Panel Controls)
- (1) Host RS-232 Serial Interface Cable
- Captive Screw Connectors for all interfaces
- (1) AC Power Cord
- (4) IR emitter cables (Single head)
- Software CD (contains Configuration Utility)

If ordered, your RN will also include the following optional item(s):

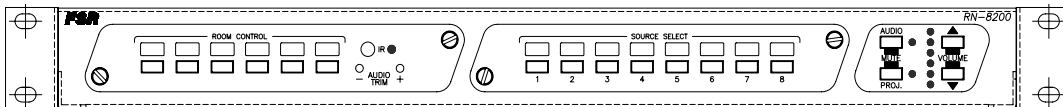
- One or more ARP and/or BRP Wallplates
- Control Cables

The figures below provide a visual overview of the RN-8200 Base Unit Panels.

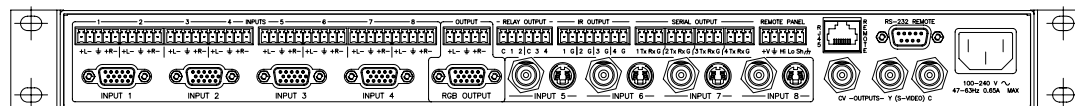
#### Blank Front-Panel Option



#### Standard Front-Panel



#### Rear Panel



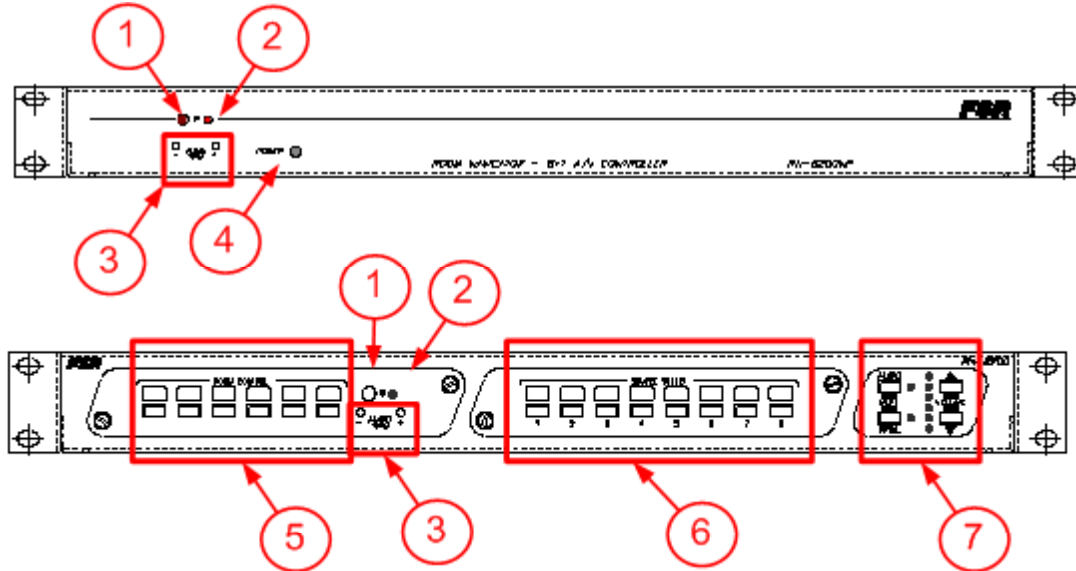
### 2.1.1 Panel Descriptions

#### 2.1.1.1 Front Panels

The front panel variants are shown below. Features of these panels are as follows:

- 1) IR Learning Receiver Window
- 2) Status Lamp (Red)

- 3) Audio Input Trim Up/Down Buttons
- 4) Power On Indicator (Blank Front-Panel Only)
- 5) Room Control Buttons (Standard Front-Panel Only)
- 6) Source Select Buttons (Standard Front-Panel Only)
- 7) Audio Control and Projector Mute Buttons/Indicators (Standard Front-Panel Only)

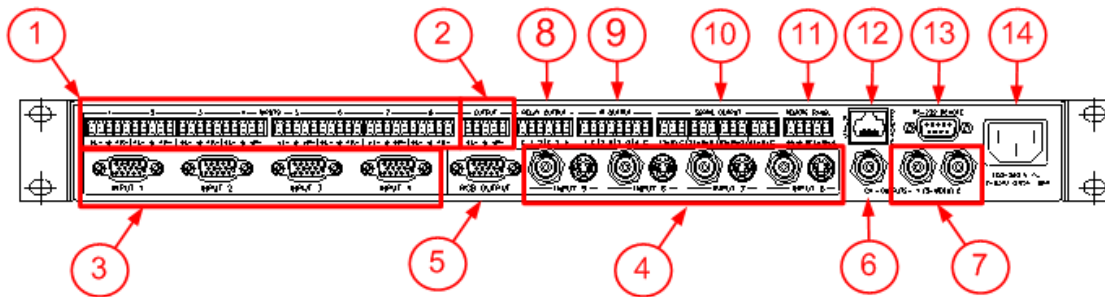


Indicator	Label	Color	Purpose and Operation
Power On LED	POWER	Green	On steady whenever power is applied
Status LED	IR	Red	<p>This indicator LED serves as a communication status and normal processing status indicator. It comes on at times to indicate operations are occurring. Specific indications provided by this indicator are as follows:</p> <ul style="list-style-type: none"> <li>Each time an incoming data byte is received from Serial Port 1, the light comes on momentarily as the byte is moved into the incoming data buffer. This flash is usually not noticeable because it happens so fast.</li> <li>Comes on whenever one or more commands are processed; the commands could be a result of button presses, or from data coming in via serial port 1.</li> <li>Comes on during IR Learn command to tell the user the learner is ready and waiting for the IR signal.</li> <li>Flashes at power-up to indicate the current Port 1 baud rate setting:  1 = 1200    2 = 2400    3 = 4800    4 = 9600  5 = 19200    6 = 28800    7 = 38400    8 = 57600</li> </ul>
<p><b>Note:</b> If upon power-up, the Status LED is on steady, it means the RN was left in FW Update Mode. This is an unusual condition but can occur if a FW update was interrupted by a power outage or other unexpected condition. If this occurs, the CU will recognize this condition and allow you to either return to normal mode or execute a complete FW update before returning to normal mode.</p>			

### 2.1.1.2 Rear Panel

The rear panel is shown below. Features of this panel are as follows:

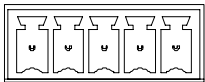
- |                               |  |
|-------------------------------|--|
| 1) Audio Inputs (1 through 8) | 8) Relay Control Ports (1 through 4)                           |
| 2) Audio Output               | 9) IR Control Ports (1 through 4)                              |
| 3) Video Inputs (1 through 4) | 10) Serial (RS-232) Control Ports (1 through 4)                |
| 4) Video Inputs (5 through 8) | 11) Remote Panel Interface (RS-485)                            |
| 5) RGB Video Output           | 12) LAN Interface (RJ45)                                       |
| 6) Composite Video Output     | 13) RS-232 Remote Control Interface (or serial control port 0) |
| 7) S-Video Output             | 14) AC Power Input   |



## 2.2 Cabling Considerations

### 2.2.1 RS-485 Remote Control Panel Port (WallPlate Interface)

REMOTE PANEL



+V  $\frac{\perp}{\perp}$  Hi Lo Sh  $\perp$

#### Pinout

The RN-8200 has a five pin pluggable screw connectors for wiring the Remote Panel(s) to the Rack Unit. The cable types and limitations are detailed in the chart below.

The RN Rack unit can support up to 8 Remote Panel's daisy-chained on its remote panel interface. The Rack Unit's internal power supply can directly support three control panels. Additional Remote Panels require a separate power supply. The front panel on the rack unit counts as one panel and has the reserved address of "0". Each remote panel has a dipswitch for setting its unique ID (0 through 7).

**Note:** If more than 2 wallplates are required for an installation, an additional external power supply is required to supply current to the wallplates. The last Remote Panel in the chain should have Dipswitch 1 placed in the up position. A "daisy chained wiring configuration is preferred over a "star" for Remote Panel wiring (see section 2.2.1.1 below).

- Recommended Cable Type: Two twisted pair with an overall shield or CAT5 per table below

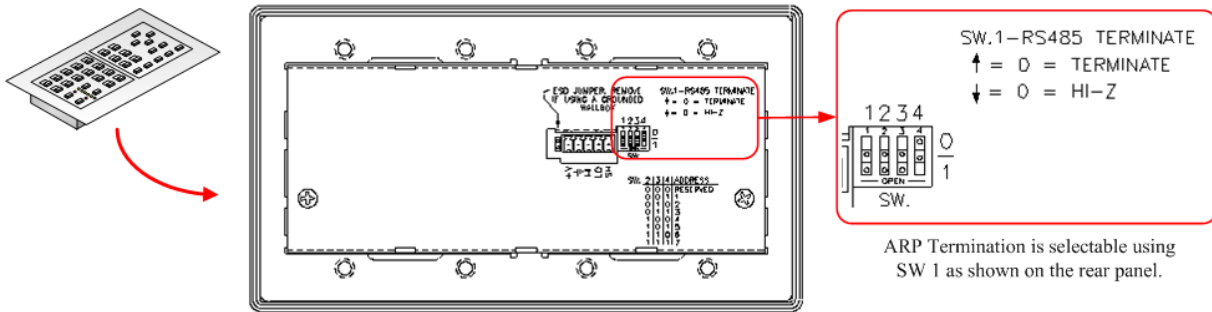
# Wallplates	Wire Gauge	Max Cable Length
1	22 *	450 ft
1	18	1200 ft
2	22 *	350 ft
2	18	900 ft

\* CAT5 cable (24ga., 4 pair) may be used:

- one pair for "V+",
- one pair for ground return,
- one pair for data and one pair for shield.

### 2.2.1.1 RS-485 Bus Termination – ARP and BRP Panels

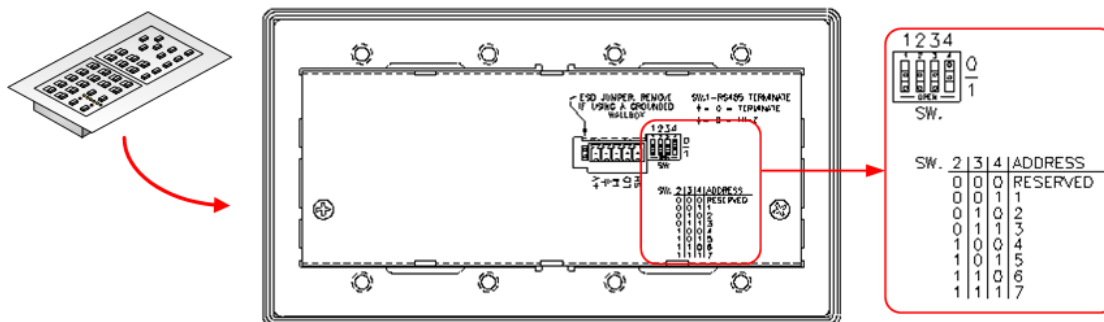
When more than one ARP and/or BRP are used in a daisy-chain connected to a single RN, only the last ARP or BRP in the chain should terminate the RS-485 bus. Use the DIP switch position 1 to disconnect the “middle” wallplates bus termination as shown below. The BRP is terminated the same way as the ARP, which is shown.



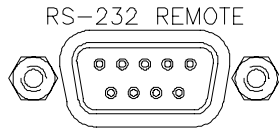
### 2.2.1.2 Panel Addressing

The RN support up to 8 remote control panels connected simultaneously in daisy-chain configuration on the RS-485 bus. To accommodate this, each panel must be set with a different address. The FSR ARP/BRP provides a DIP switch to set the panel address as shown below.

**Note:** If more than 2 wallplates are required for an installation, an additional external power supply is required to supply current to the wallplates.



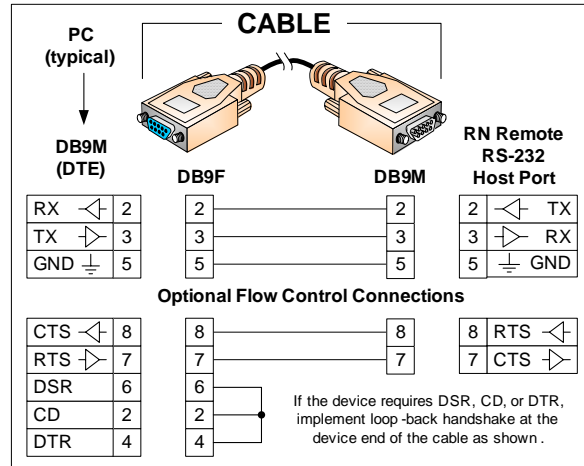
### 2.2.2 RS-232 Remote Host Port Cabling (DB9)



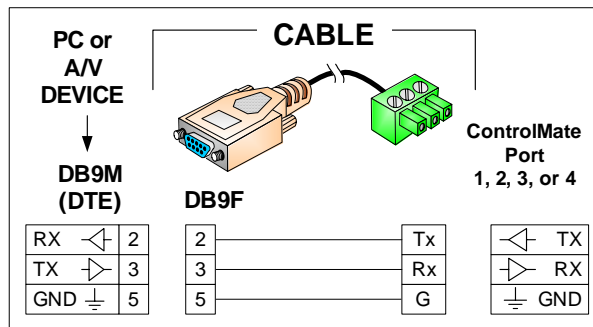
The RN-8200 Rack Unit has a standard RS-232 (DB9F) communication port that connects the host PC to the RN-8200 Rack Unit allowing the CU software control and configuration.

Cable Type (supplied): Straight through DB-9 Male (To mate with Female on RN-8200 Base) to DB-9 Male (to mate with DB-9 Male on typical PC COMM port).

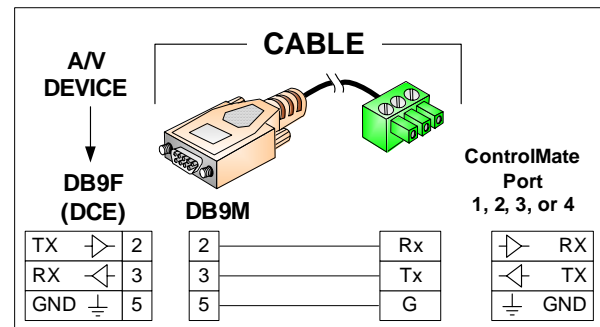
Recommended Maximum Length: 50 ft



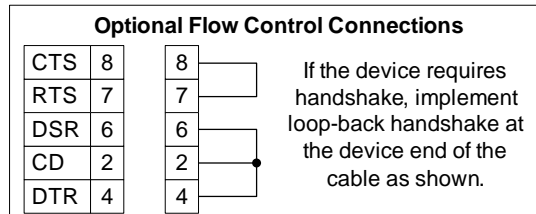
### 2.2.3 RS-232 Control Port Cabling (3 wire interface)



Serial Control Port for Control of DTE Devices



Serial Control Port for Control of DCE Devices



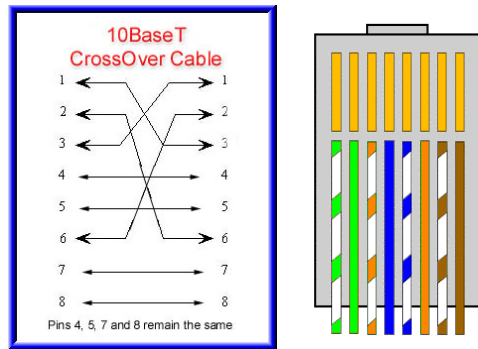
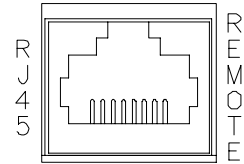
## 2.2.4 RJ-45 LAN Interface Cabling

This port is used to access the RN-8200 Embedded Web Server via TCP-IP from a host computer or network.

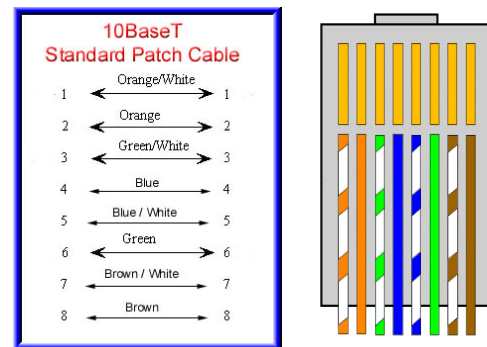
Cable type:

- RJ-45 Crossover for direct computer to RN-8200 control
- RJ-45 Straight through for Network to RN-8200 control

Recommended Maximum Length: 329 feet

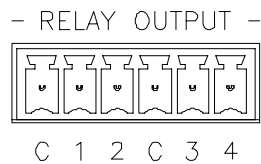


Crossover Cable

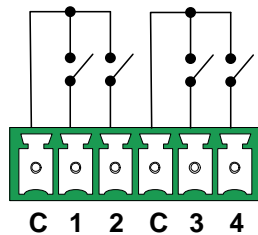


Standard Patch Cable

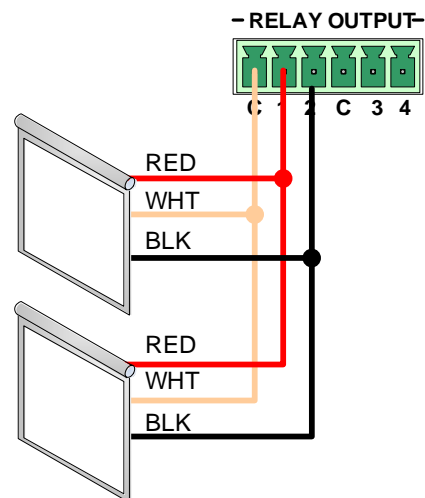
## 2.2.5 Relay Control Ports



The RN relay ports shown above, consist of 4, single-pole, normally open relays grouped as 2 sets with each set sharing a common leg. The internal relay configuration is shown below and a typical application is shown to the right.



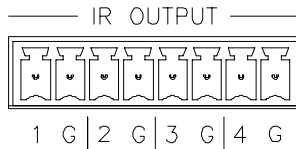
Internal Configuration



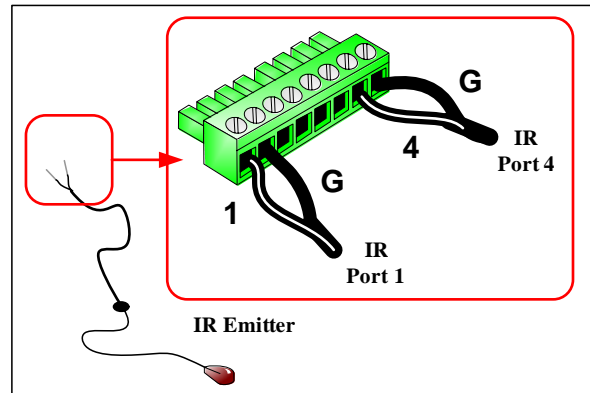
### Sample Application: Da-Lite Screen Control

- Setting Relay 1 momentarily drives both screens up
- Setting Relay 2 momentarily drives both screens down
- Wire colors are per screen control interface

## 2.2.6 IR Control Ports



The RN has 4 IR control ports and comes with 2 IR emitters. Each emitter has two wires. The white stripe is the positive lead and it goes on the right when looking into the wire end of the connector. At the IR port, the white stripe connects to the pin labeled 1, 2, 3, or 4, depending on the port you wish to use. When you connect the emitter to the equipment, be sure to center it over the IR receiver as closely as possible. If you are having trouble locating the IR receiver, try using a small flashlight to illuminate the inside of the equipment panel as this can sometimes allow you to see the receiver location clearly.



Ports 1 and 4 shown wired.

### 2.2.6.1 IR Power Adjustment

The IR power output can be adjusted using trim pots located inside the unit. This adjustment capability is provided to accommodate the occasional piece of equipment that may require a higher power IR signal (or lower power). For most equipment, the power can be left centered (factory default position). The four adjustment pots are located inside the rear panel approximately behind the IR output ports. Trim pot 1 is for IR port 1 and so on. To increase the power, you decrease the output resistance by turning the adjustment counter-clockwise. To decrease the power, turn the adjustment clockwise.

## 2.2.7 S-Video Input Connector Cabling



Cable Type: Standard 4 pin S-Video to two BNC male cable.

Maximum Recommended Length: 35 ft

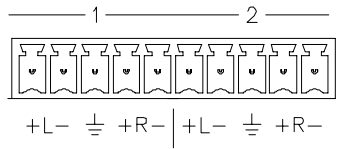
Pin	Name	Description
1	GND	Ground (Y)
2	GND	Ground (C)
3	Y	Intensity (Luminance)
4	C	Color (Chrominance)

Pinout

## 2.2.8 Composite Video Inputs and Outputs Connector Cabling

Use standard 75 ohm BNC cable for all composite video inputs and outputs.

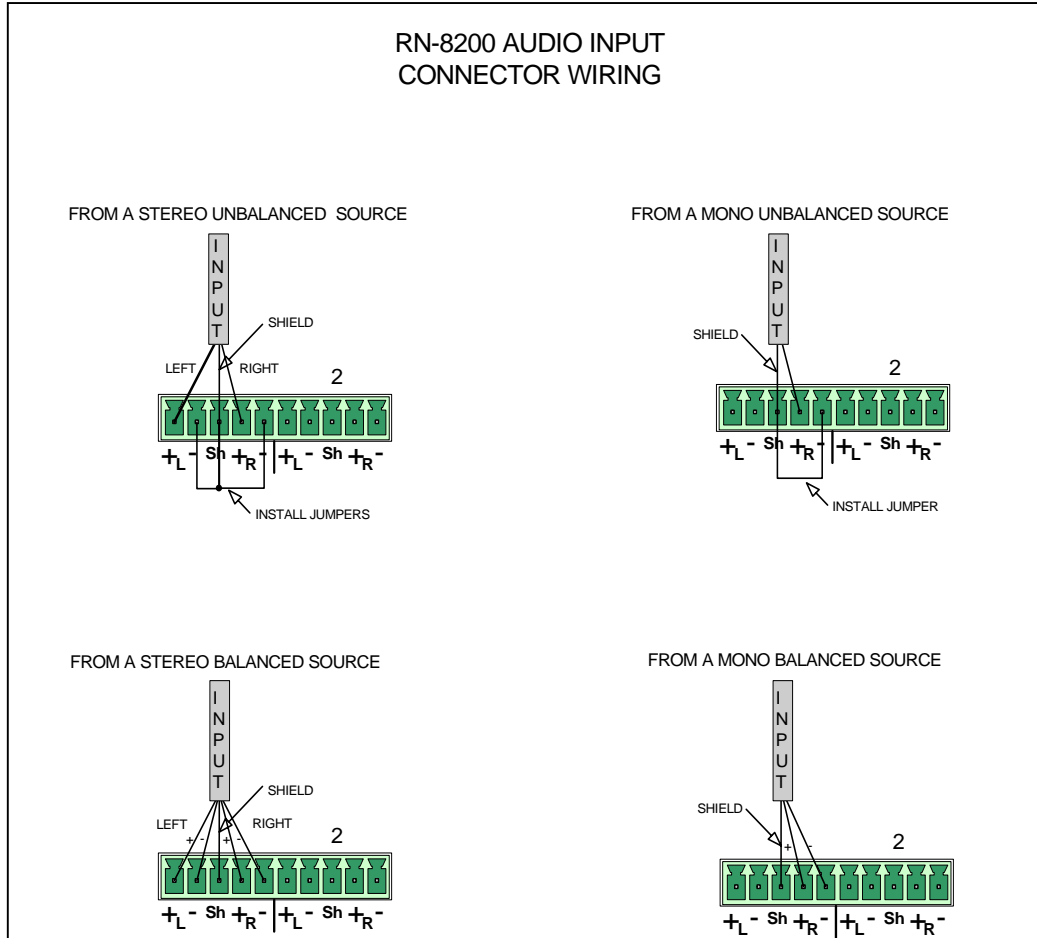
### 2.2.9 Audio Inputs Connector Cabling



There is one stereo audio input for each of the 8 sources. The audio inputs are paired as 2-inputs per 10-pin pluggable screw connector. The possible audio wiring alternatives are shown in the diagrams below.

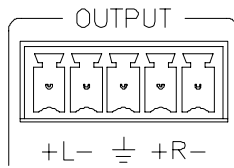
Cable Type: Varies with application

#### Pinout





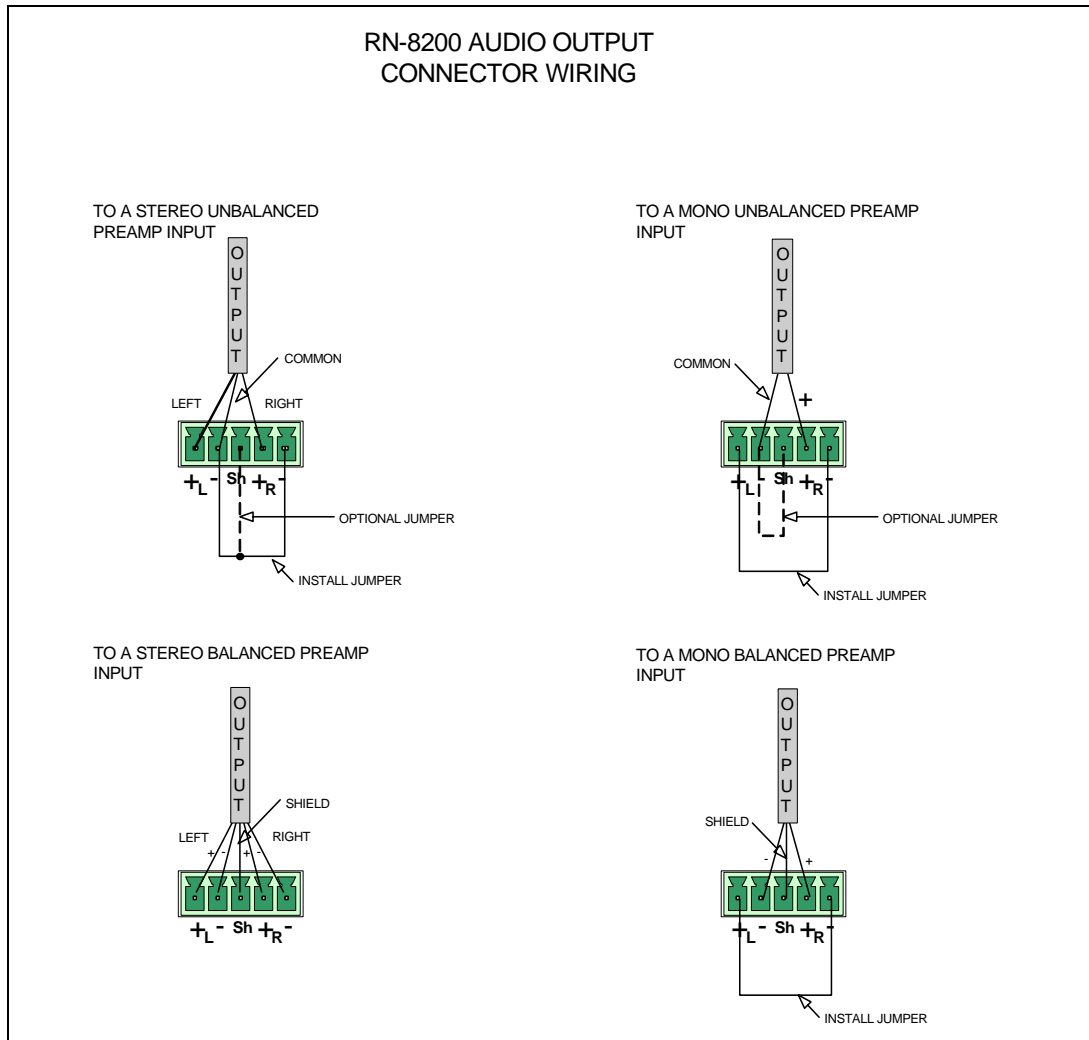
### 2.2.10 Audio Outputs Connector Cabling



**Pinout**

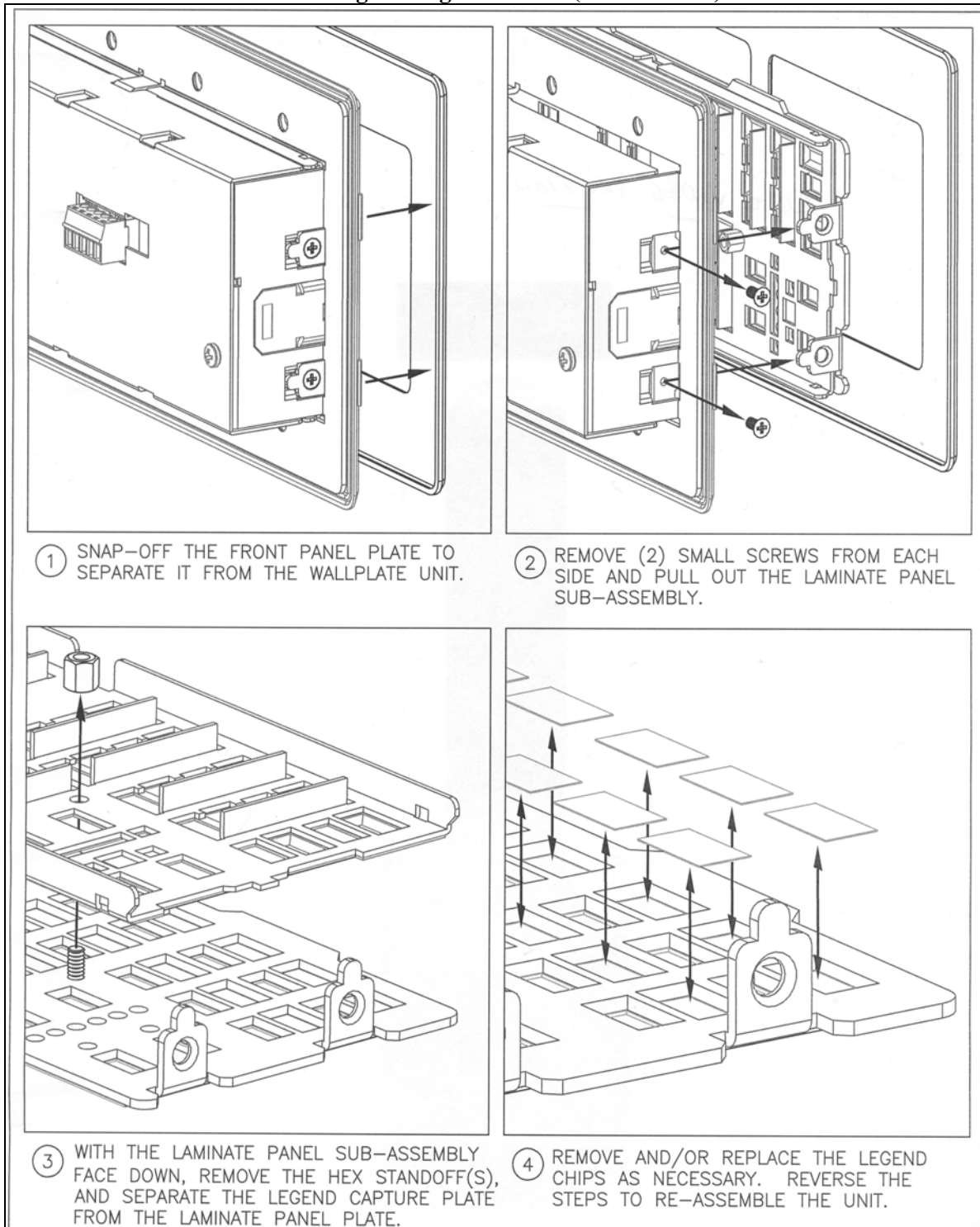
There is one stereo audio output. The physical connection is a 5-pin pluggable screw connector. The possible audio output wiring alternatives are shown in the diagrams below.

Cable Type: Varies with application



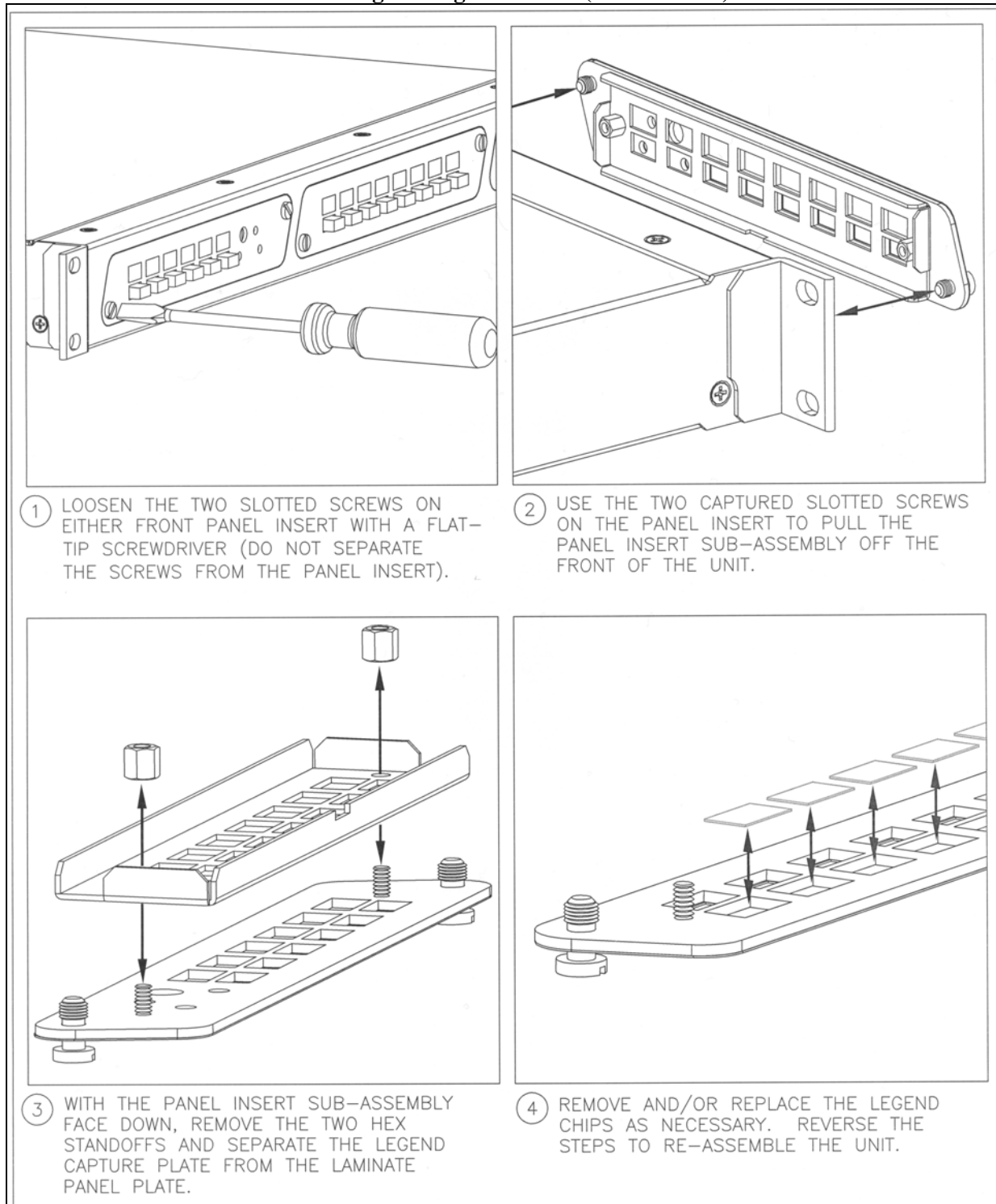
## 2.3 Wallplate Setup

### Installing the Legend Inserts (button labels)



## 2.4 Rack Unit Front Panel Setup

### Installing the Legend Inserts (button labels)



## 2.5 Getting Started – Quick Start

### 2.5.1 Connect Your Room Navigator to Your PC

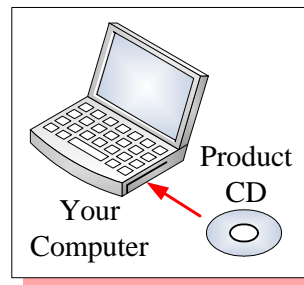
Using the serial cable provided, connect the Room Navigator RS-232 Host Port to your PC serial port.

### 2.5.2 Apply Power to Your Room Navigator

Connect the AC power cord to the Room Navigator. Watch the front panel of the Room Navigator and plug the cord into facility AC power. Normal Room Navigator power-up will consist of the red status lamp flashing 4 times to indicate normal start and factory baud rate setting on RS-232 Host Port of 9600 bps. The RS-232 Host Port is used to communicate with your PC running the Configuration Utility.

### 2.5.3 Install the CU Software

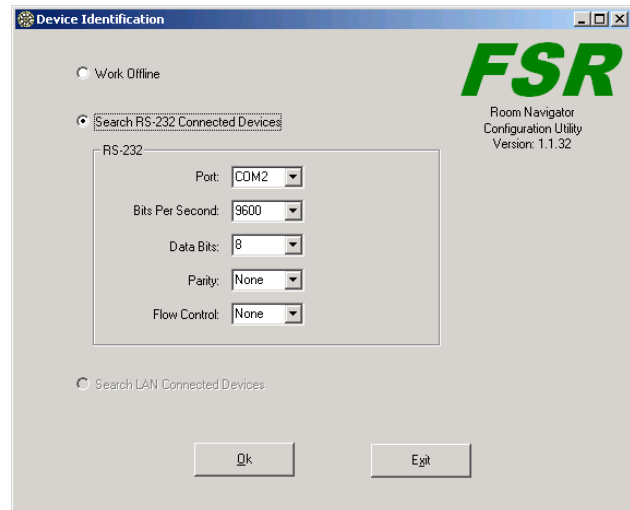
Install the Room Navigator Configuration Utility onto your computer from the product CD.



### 2.5.4 Start the CU Software and Connect to Your Room Navigator

At the end of the install, the install wizard will ask if you want to launch the application. If you checked the “Launch Application” box, you will see the “Device Identification” screen shown below. If you didn’t already launch the application, use the shortcut or the start menu to find the “Room Navigator CU” and start the application.

Select “Detect RS-232 Connected Devices”, leave the default comm settings and click the “Ok” button. The CU will establish communication with the connected Room Navigator and the main application will start.



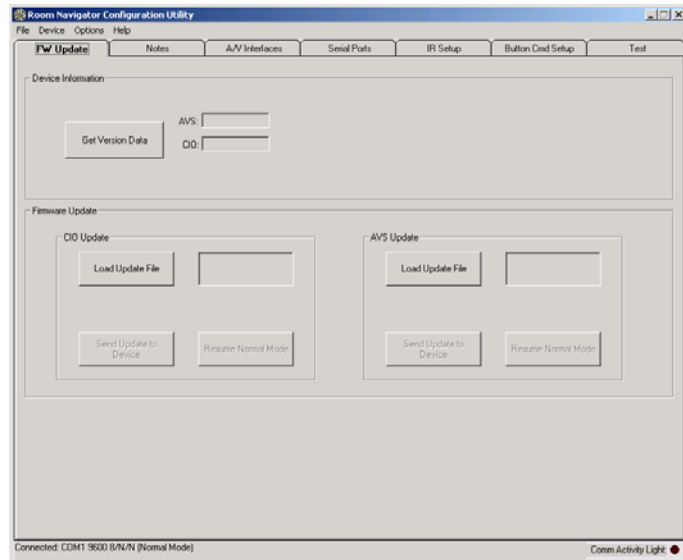
**Note:** The CU has a capability to detect old FW versions and provide notification that you require a FW Update. If your CU displays a message indicating you do not have the most current FW version, follow the instructions in the message and update your FW version.

### 2.5.5 Create and Save Your Configuration

The CU should now be open with the first tab, “FW Update”, showing (see image below). Note the status in the lower left corner shows you connected and operating in normal mode.

You are ready to configure the Room Navigator.

Refer to Section 3 for complete details about the CU and Room Navigator features and capabilities. Before starting your real configuration, it is recommended you gain familiarity with the CU and Room Navigator features by trying things. Try anything you want, you can’t hurt it.



### 3.0 CONFIGURATION UTILITY (CU) SOFTWARE

The CU, as the name implies, is used to configure the Room Navigator. The CU provides an easy to use graphical interface for the user while eliminating the need for the user to worry about the low-level command formatting.

**Note:** The appearance of the CU screens is dependent on your window's display settings and therefore your CU may look different than the examples shown but the content will be the same.

### 3.1 Connecting the Hardware

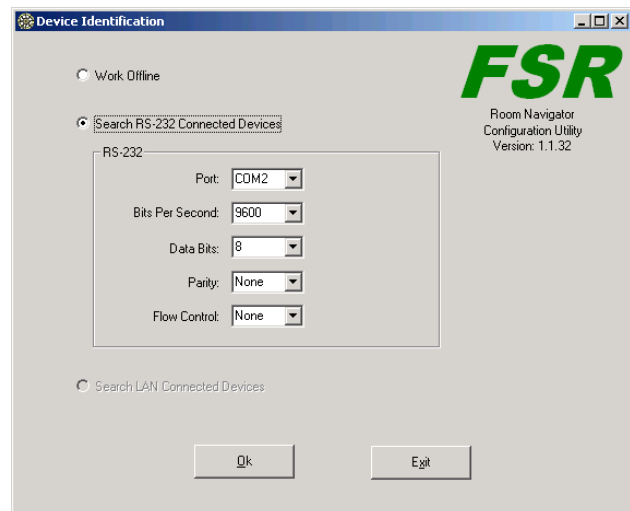
If you haven't already done so, do the following:

- 1) Using the serial cable provided with the Room Navigator, connect Room Navigator RS-232 Host Port to the PC serial port.
- 2) Apply power to Room Navigator using the AC power cord provided with the unit.
- 3) If not already done, install the CU software on your PC
- 4) Start the CU application and refer the next section to configure the Room Navigator

### 3.2 Using the Configuration Utility

#### 3.2.1 Connecting the CU to the Room Navigator

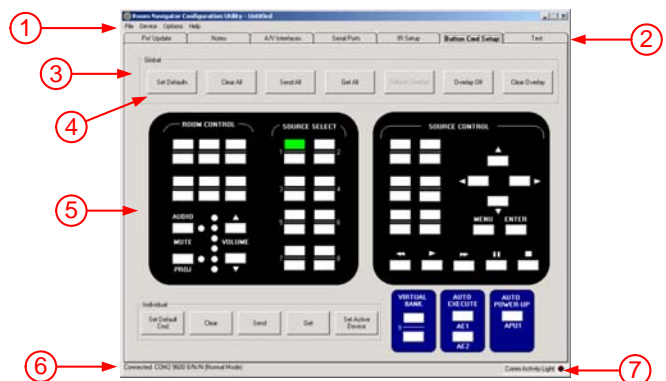
When you start the CU application, the "Device Identification" screen will appear as shown to the right. You can choose to "Work Offline" or connect to the Room Navigator using the "Detect RS-232 Connected Devices". The RS-232 settings shown are for the PC serial port and settings shown match the Room Navigator factory default for Port 1. You may need to change the PC port if the port being used is not "COM1" but the other settings should not be changed unless you know that the Room Navigator Port 1 settings have been changed. To start using the CU, make your selection and click the "Ok" button.



#### 3.2.2 CU Main Screen Layout and Features

The CU Main Screen has the following features and layout:

- 1) Menu Items across the top
- 2) Tabs for configuring function groupings
- 3) Group boxes for like functions within a tab
- 4) Control Buttons for specific functions
- 5) Graphical input or output area
- 6) Current connection status information
- 7) Comm Activity Light provides an indication of when the CU is busy communicating with the Room Navigator



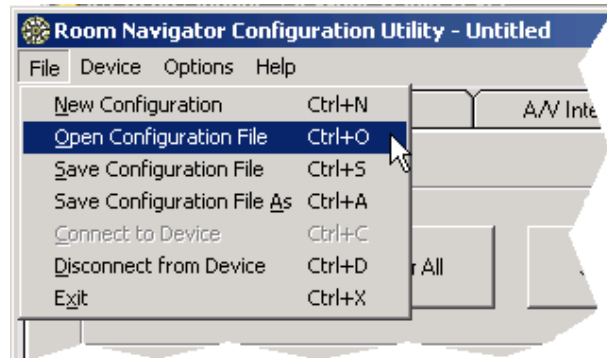
### 3.2.3 Menu Items

#### 3.2.3.1 “File” I/O

The CU provides the ability to save and load configuration files. The Room Navigator uses the “.mcf” format for configuration files it creates, saves and subsequently loads. To start a new configuration, save a configuration and/or subsequently load a configuration, use the “File” menu options. The CU File menu options are shown in the figure on the right.

- If you have questions about your configuration file or would help understanding its contents contact FSR Tech support at [techsupport@fsrinc.com](mailto:techsupport@fsrinc.com). Send your file along with your questions

The title bar at the top of the application window always shows the current configuration file being used. At a startup, the word “Untitled” is shown because no configuration file has been loaded and the current workin file has not been named and saved.



#### 3.2.3.1.1 Configuration Files

The CU provides the capability to save and load configuration files. The CU uses “.mcf” format for files it creates, saves and subsequently loads using the “File” menu options of the CU. The CU files contain the entire configuration of the RN as configured in the CU (i.e., for your application). These files provide a convenient way to configure duplicate systems as often as needed or modify one configuration as a starting point for the next.

A default configuration file, “RN8200\_Default\_xxxxxx.mcf”, is provided with the RN on the CD that contains the CU. The default template configures the RN panels to perform fixed functions such as controlling the remote panel return to Operational Mode, audio volume up and down, and audio mute. You should always load the defaults file and start with this file to create your configuration so that you will have the default functions in your configuration. If for some reason you do not wish to use the defaults, then you don’t need to load this file as your starting template. Be sure to save the modified file under a new name.

**Note:** It is highly recommended you start with the default template and build you application configuration on top of the default functionality. Changing or not using the defaults may result in unexpected or missing behavior. Consult your RN technical representative if you are unsure. If you choose not to use the default template, you must as a minimum configure a System On/Off button to execute a Set Operational Mode Command or the RN will not respond to remote panel button presses.

#### 3.2.3.1.2 Default Configuration File

The RN8200 is shipped with a default configuration file, “RN8200\_Default\_xxxxxx.mcf”. This file will provide a minimum of functionality that will enable the user to control the audio level adjust and mute functions and select from eight video and audio sources.

With this default configuration file, the system is configured as follows:

Video Source	Video Format
1	RGB
2	RGB
3	RGB
4	RGB
5	Composite
6	Composite

- Pressing the audio mute button will toggle the audio state between mute/un-mute.
- Pressing the Volume up button will increase the audio sound level.
- Pressing the Volume down button will decrease the audio sound level.
- The upper leftmost Room Control button is designated the System Operational / Idle Mode toggle button. At power-up, the lamp above this button will be illuminated “red” as an indication of the system being in Idle Mode. In Idle Mode, the system will not respond to any button presses except pressing this button to place the system into Operational Mode. As part of the command sequence for entering Operational Mode, the source 1 is also activated. Pressing the button a second time will place the system back into Idle

7	S-Video
8	S-Video

Mode.

**Note:** It is recommended that you use the CU and examine how these buttons are configured

The Figure below shows the commands configured in the Default file for the “System Operational / Idle” Toggle Button (the upper leftmost Room Control Button):

This command is the “Set Operational” Command which sets the internal state to operational and activates the system to respond to button presses from connected panels .

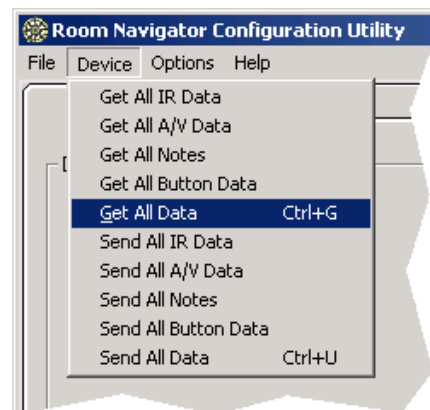
This command is a “Button Press” Command that is essentially the same as pressing the Source Select 1 button. It is used to establish source 1 as active when the system starts . Note also that this command will result in executing any commands configured into the Source Select 1 button.

This command is the “Set Idle” Command which sets the internal state to idle and stops the system from responding to button presses from connected panels.

### 3.2.3.2 “Device” Functions

The “Device” functions are actions that either “Get” data from, or “Send” data to, the connected Room Navigator device. All of these “Device” actions can also be executed using buttons that appear on the various tabs in the CU and this menu item is just repeat of all the data interchange actions with the device in one place.

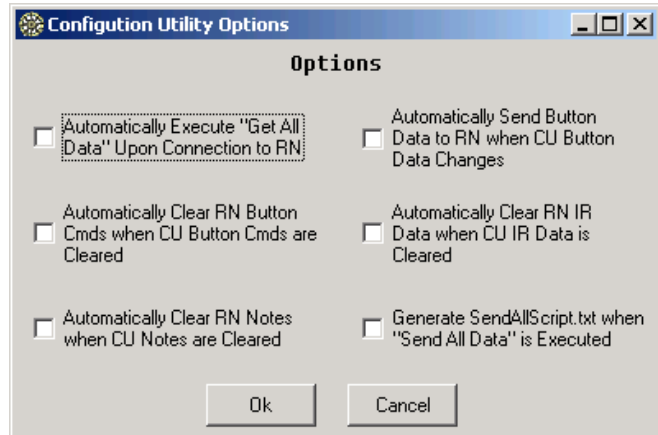
Since these functions require a connected device, when you are working offline, this menu item is deactivated. Each action in the sub-menu selections identifies the specific type of data involved (IR, Notes, or Button Data) or all of the data.





### 3.2.3.3 “Options” Settings

On the menu bar the “Options” item provides automatic features for the CU that can be turned On/Off depending on your personal preferences. The options are turned on by selecting the corresponding check box. The options are primarily to turn on automatic interaction with the connected Room Navigator as items are configured in the CU. All the options can be executed manually using command in the “Device” pull down menu and/or using buttons on the various CU tabs. The options are provided as a means to reduce user actions required to configure the Room Navigator and should be taken advantage of once the user becomes more familiar with how the CU and Room Navigator interact.



A brief description of each option item is provided below:

OPTION ITEM	DESCRIPTION
Automatically Execute “Get All Data” Upon Connection to the Room Navigator	Automatically executes the Device>Get All Data function to extract the current configuration from the connected Room Navigator
Automatically Clear Room Navigator Button Cmds when CU Button Cmds are Cleared	Automatically clears both the corresponding configuration data in the CU’s buffer and in the connected Room Navigator whenever a “Clear” button is pressed on any of the function tabs of the CU.
Automatically Clear Room Navigator Notes when CU Notes are Cleared	This option makes the clear buttons on the Notes Tab clear both the data in the CU’s buffer and the data in the connected Room Navigator
Automatically Send Button Data to Room Navigator when CU Button Data Changes:	This option applies to working on the Button Cmd Setup Tab and it automatically configures the connected Room Navigator as Button Commands are setup as opposed to asking the user each time
Automatically Clear Room Navigator IR Data when CU IR Data is Cleared	This option makes the clear buttons on the IR Setup Tab clear both the data in the CU’s buffer and the data in the connected Room Navigator.
Generate SendAllScript.txt when “Send All Data” is Executed	This generates a text file in the application directory whenever a “Send All Data” from the Device Menu is Executed. The script is useful to see the ASCII commands used to configure the Room Navigator

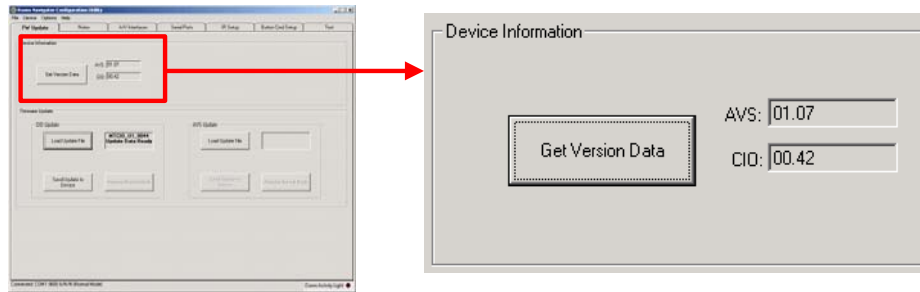
### 3.2.3.4 “Help”

The help menu item bring up the version identification information for the CU. For help using the CU, use this manual.

## 3.2.4 FW Update Tab

### 3.2.4.1 Obtaining the Room Navigator Current Version Data

In the upper portion of the FW Update Tab is the “Device Information group box and within it is a “Get Version Data” button. Clicking this button will update the text boxes to the right of the button with the FW and HW version from the connected Room Navigator. The figure below shows a closer look at the Device Information group box after the Get Version Data button was clicked.



### 3.2.4.2 Performing a FW Update

In the center portion of the FW Update Tab is the “Firmware Update” group box. This area contains the controls used to perform a FW update for the Room Navigator. The FW Update process is implemented using a common interface and process for all FSR products that support FW update.

#### Important Note

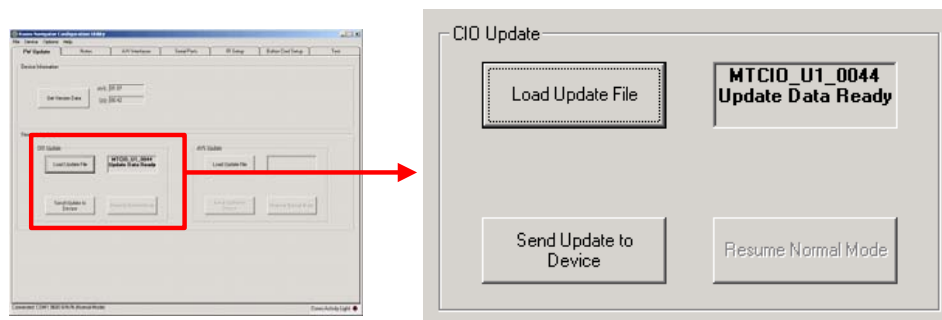
Save your configuration before implementing a FW update and then after the update is complete, load and send the configuration back to the Room Navigator.

To execute a FW update, do the following (assumes you are already connected to the Room Navigator):

- 1) On the “FW Update” Tab, click the “Load Update File” button and find and load the file to be used for the FW update. FW Update files, when available, can be found on the FSR Product Support Website (URL provided below).

FSR Product Support Website URL: [www.fsrinc.com](http://www.fsrinc.com)

The file extension for a firmware update file is “.mex” which indicates the file is a Modified Encrypted hex file. The filename will identify the product type and the version. A progress bar will indicate the status of the load and once the file is loaded and prepared for the update, you’ll see the filename in the box beside the “Load Update File” button along with the “Update Data Ready” status message as shown below:

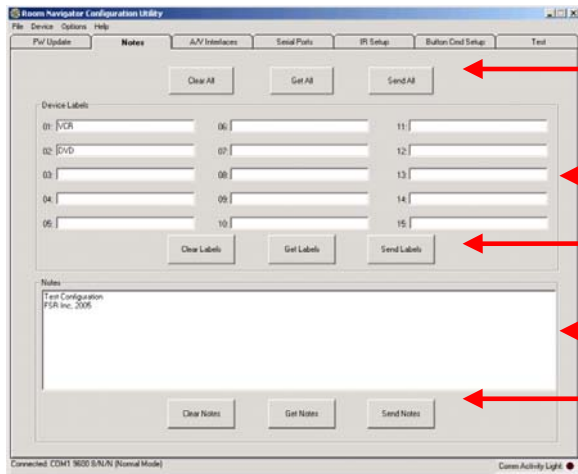


- 2) Click the “Send Update to Device” button to execute the upgrade. The front panel status lamps will illuminate briefly and then begin flashing. You will see the progress bar begin to show the progress. The update process executes a “dry-run” first to ensure the integrity of the data being used for the update. Once the dry run phase is completed and the data is verified as complete and accurate, the actual update will begin. The progress bar will indicate “performing Update”, the front panel status lamp will flash until the update is completed.
- 3) When the update completes, the Room Navigator will return to normal mode and you will see the front panel status lamp do its normal startup where it flashes to indicate the current baud rate setting. The CU will display a message telling you the update was successfully completed and indicate the new FW version. The Room Navigator is now ready for use running the new FW version.

You can now use all features of the Room Navigator and CU.

### 3.2.5 Notes Tab

The Notes Tab provides a means for the user to enter and store in the Room Navigator nonvolatile memory, device labels and general application notes. The Notes Tab, has three (3) functions, Clear, Get, and Send, that are either globally applicable using the top row of buttons, applicable to only Device labels using the buttons inside the corresponding group box, or applicable to only the Notes using the buttons inside the Notes group box.



These buttons are outside Device Labels and Notes group boxes and therefore apply to both the device labels and notes.

Device Labels group box

These buttons are inside the Device Labels group boxes and therefore apply only to the Device Labels.

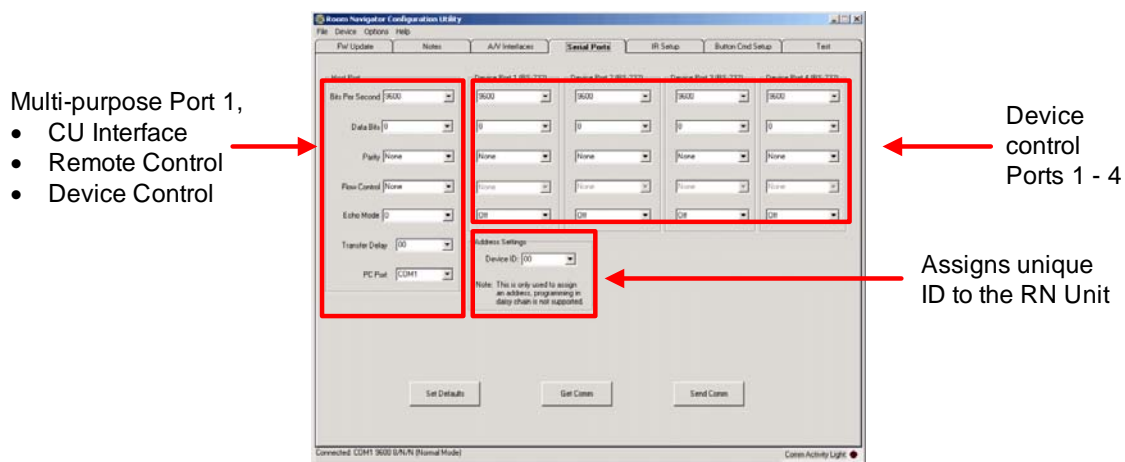
Notes group box

These buttons are inside the Notes group boxes and therefore apply only to the Notes.

ITEM	DESCRIPTION
Device Labels	<ul style="list-style-type: none"> <li>These labels will be referenced when you Learn IR commands so that each learned command can be associated with its device. Therefore, for convenience, list your IR devices first.</li> <li>Total of 15 user label slots numbered 01 through 15 with each having a text entry box</li> <li>Each label can be up to 16 characters in length</li> </ul>
Notes	<ul style="list-style-type: none"> <li>Can be used to store any information desired such as project name, date of install, who configured the system, key customer POC, etc.</li> <li>One notes location with up to 248 characters in length using any character except the closing square bracket = "]"</li> </ul>

### 3.2.6 Serial Ports Tab

The Serial Ports Tab provides the interface to configure the communications protocol settings for the Room Navigator serial ports. The major function groups are shown in the figure below.



Each port has the standard serial port communications protocol parameters of Bits Per Second (or baud rate), Data Bits, Parity and Parity. Flow Control is available on Port 1. Since the Room Navigator Port 1 also serves as the interface port for the CU, the PC Port used by the CU will share the Room Navigator Port 1 settings and there is

also a “PC Port” drop-down item to allow selection or change of the PC COM port being used. The remaining parameters are described in the table below.

ITEM	DESCRIPTION
Echo Mode	<p>This item designates a destination port to which all incoming data will be echoed meaning it will be transmitted out that port. When Echo Mode is off, the incoming data is not echoed to another port.</p> <ul style="list-style-type: none"> <li>▪ Example 1: If Port 1 Echo Mode is set to “Port 2”, all data received on Port 1 will be echoed to Port 2 meaning it will be transmitted out Port 2.</li> <li>▪ Example 2: If Port 2 Echo Mode is set to “Port 1”, then all incoming data on Port 2 will be echoed to Port 1. Echoing port 2, 3, or 4 to Port 1 allows you to direct device responses to commands back to a controlling host connected to Port 1.</li> </ul>
Transfer Delay	<p>The Transfer Delay is provided as a means to interact with some old equipment that cannot process standard RS-232 data streams without providing the delay between bytes. These old systems are not common and unless you know you need the delay, this value should always be 00 to ensure best performance.</p>
Address Setting	<p>Allows you to assign a unique Device ID to the Room Navigator. This can be useful when multiple Room Navigator units are daisy-chained together. The Device ID can be used in any command to specifically target one or more, but not all, Room Navigator devices in the chain.</p>

### 3.2.6.1 Device Addresses

The RN is addressable so that it may be daisy-chained with other FSR control devices. The device comes from the factory with the default address of “00”. Valid addresses are 00-99. Device addresses are an optional element of each command sent to the device or to a chain of devices. When no device address is used, the command is a “wild card” and all connected devices will accept and execute the command.

When only one device is connected, no device addressing is necessary and all commands can be sent as wild card commands. When more than one device will be connected, it is recommended that the devices are programmed one at a time and addresses are assigned starting at “01”. Up to 100 devices may be daisy-chained using addressing “00” through “99”.

### 3.2.6.2 Serial Ports

The RN has 5 RS-232 serial ports; 1 is for remote control and uses a DB9F interface and the other 4 are for device control and they use a 3-wire Phoenix-Style connector interface. During operation, all 5 RS-232 ports can be separately used to control devices in that serial control strings can be designated to be transmitted out to these ports when buttons are pressed or via remote commands received from the Remote RS-232 port.

The remote RS-232 port is also designated as the programming port and only this port can be used to configure (using the CU). This port can also be used to remotely control the RN from a remote control host device or a PC running a control application. Unlike the 4 serial device control ports, all data received on the remote RS-232 port is processed by the RN and any data sequences that match the valid commands of the RN command set will be processed accordingly. Therefore, always use the remote RS-232 port as the connection to a remote controlling device. A remote controlling device is considered any device intended to send commands to the RN or intended to send commands through the RN to a device that may connected to one of the other serial ports.

### 3.2.6.1.1 Serial Port Communication Data Formats

The RN supports several common data formats for the number of data bits and parity. One Start bit and one Stop bit are always used. The supported data formats combined with selectable baud rate and flow control make the RN capable of supporting the vast majority of devices that may be encountered. The BAUD SET command is used to configure the serial ports to the desired format including the desired baud rate and flow control. The table below identifies the communication format options available.

Format	Start Bits	Data Bits	Parity	Stop Bits	Comments
8N1	1	8	None	1	Factory Default
8E1	1	8	Even	1	
8O1	1	8	Odd	1	
8M1	1	8	Mark	1	Parity bit always "1"
8S1	1	8	Space	1	Parity bit always "0"
7N1	NOT USABLE				7 Data bits only valid with a parity bit
7E1	1	7	Even	1	
7O1	1	7	Odd	1	
7M1	1	7	Mark	1	Parity bit always "1"
7S1	1	7	Space	1	Parity bit always "0"

### 3.2.6.1.2 Serial Port Communication Flow Control

The serial control ports use the most common and easiest interface of only 3 wires (RX, TX and GND). The remote RS-232 host port use a DB9 interface and supports user selectable hardware flow control (RTS, CTS). The table below provides a summary of the Remote RS-232 DB9 connector interface on the Room Navigator.

Equipment Type	DB9 Connector	Pin Assignments				
DCE RTS = INPUT CTS = OUTPUT	Female	CTS (8)	RTS (7)	TD (2)	RD (3)	GND (5)

The RN uses a common form of hardware handshaking supported by most RS232 interfaces where each end has a handshake output signal and the receiver brings its handshaking output signal high when it's ready to receive data. The transmitter must monitor this signal and ensure it is high before each transmission. For example, when using hardware handshaking, a computer, being a DTE device, uses RTS to indicate when it is ready to receive data. Similarly, the computer monitors the CTS from the RN to know when the RN is ready to receive data. When connected to a computer, and using hardware handshaking, the RN uses the computer's RTS signal so that it knows when the computer is ready for data. Similarly, the RN uses its CTS signal to tell the computer when it is ready for data.

### 3.2.6.3 Serial Port Echo Modes

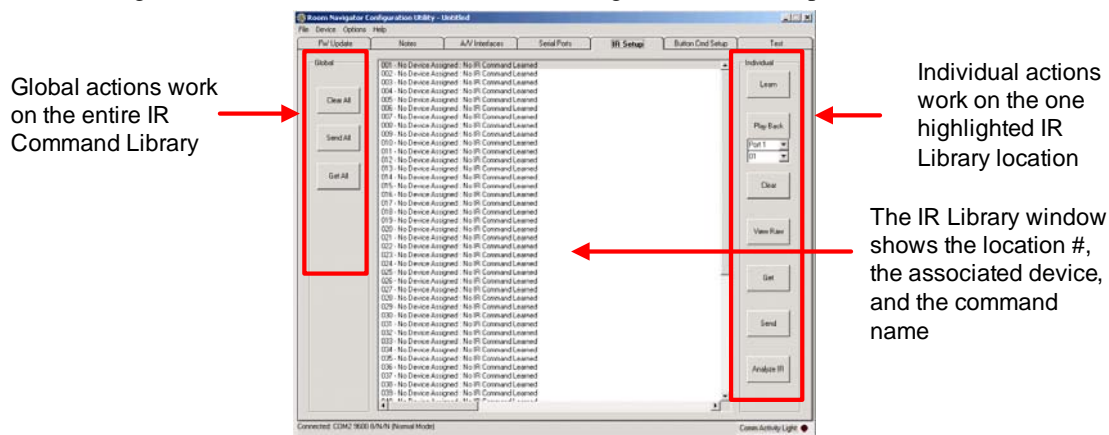
Echo Mode is a parameter associated with each serial port and it provides a means to relay information from the host port to a device or monitor serial feedback from devices. For example, a PC-based host application may want to get bulb usage from a projector and in order to do so; it must be able to pass data from the serial control port back to the host connected to the host port. Therefore a serial control command to the appropriate serial control port with Echo Mode turned ON for that control port, will achieve this "echoing" of the feedback to the host. For all 4 serial control ports, the echo modes are either On or Off.

The remote RS-232 host port Echo Mode is a designation of the control port to which incoming data will be echoed and can be set to OFF, 1, 2, 3, or 4. For example, if host port echo mode is set to “1”, in addition to every byte being processed internally by the RN, every byte received is also echoed to serial control port 1. In effect this creates a pass-through. This concept for the serial control ports allows multiple boxes to be daisy-chained so that you can control them all. Echo Mode is a bidirectional capability. For the 4 serial control ports, you can turn on either direction independently.

For example, to pass data to/from a device from a PC-based host application, you would turn on echo mode for the serial port connected to the device and set the host serial port echo mode for the port connected to the device.

### 3.2.7 IR Setup Tab

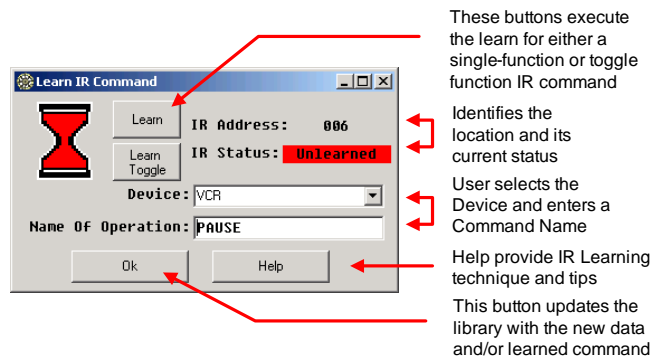
The IR Setup Tab provides controls for setting up the IR command library that will be learned and stored in the Room Navigator. This IR command library will be accessed for playback by button commands for IR control of applicable equipment in your specific application. On this tab, individual or global changes can be made to the 61 IR command storage locations available within the Room Navigator. The IR Setup Tab is shown below.



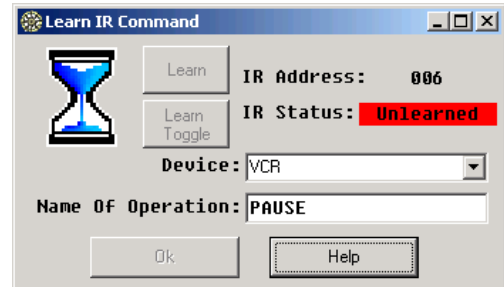
The IR Setup Tab shows the current IR command library in the center window with each location identifying the location number, the associated device, and the specific IR command name. The device and command name are assigned by the user as part of the IR learn process.

#### 3.2.7.1 Learning IR Commands

- 1) To learn an IR command, click on an IR location in the library window as the storage destination and click on the [Learn] button. The “Learn IR Command” panel will open as shown below. Select the “Device” associated with the command you will be learning from the corresponding pull-down selection box. Type in the name of the command to be learned. i.e., Play, FFWD, etc. in the “Name of Operation” window.

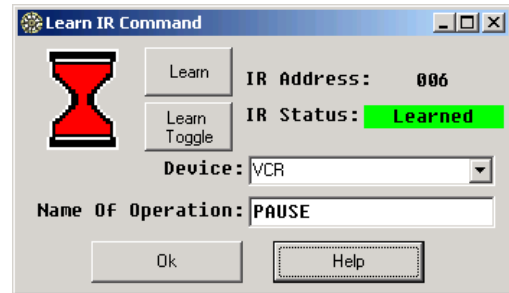


- 2) Click on the “Learn” button. The front panel S1 (green) LED will illuminate indicating the Room Navigator is ready and waiting to learn the command. The hour-glass icon will begin a timeout animation while the Room Navigator waits for the IR signal. Point the hand-held remote at the IR Learn window and press and hold the IR remote button for the command to be learned. The S1 (green) LED will go off and the S2 (red) LED will flash three times indicating the learn operation is complete.



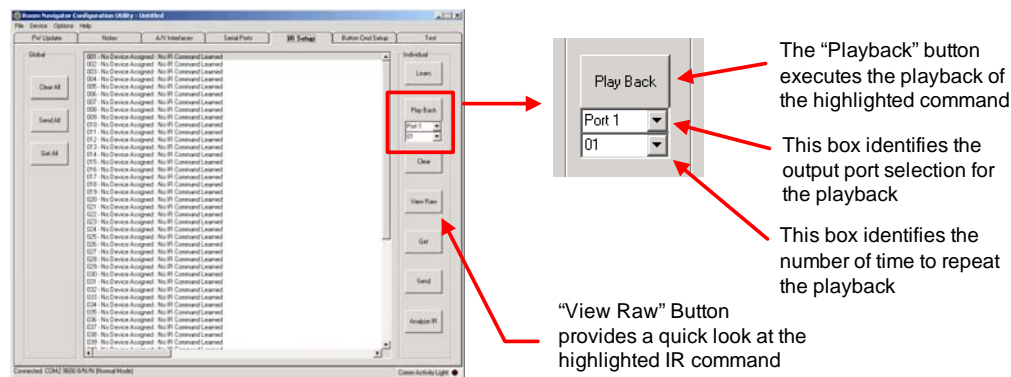
- 3) The CU will change its status to “Processing” while the Room Navigator processes the IR signal. The CU then retrieves the IR command and changes the status to Learned as show in the figure to the right. Click the “Ok” button to end the IR learn process for this location.

All IR commands to be used in your application should be learned and stored in this same manner. The resultant IR command library is then available for playback as part of the configuration of the button functions that will be done using the “Button Cmd Setup” Tab.



### 3.2.7.2 Immediate Playback of IR Commands

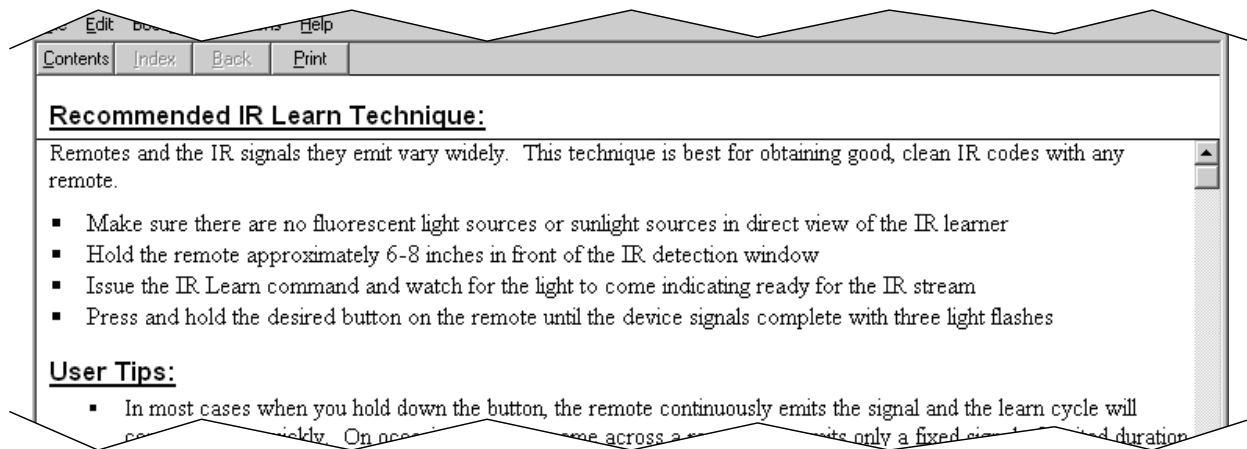
If the Room Navigator has an IR emitter connected to one of the Room Navigator IR ports and to a device, you can use the IR Setup Tab to playback any IR command in the library as a test. The figure below shows the IR Setup Tab and the elements associated with immediate playback of learned IR commands.



### 3.2.7.3 IR Learning Help and Tips

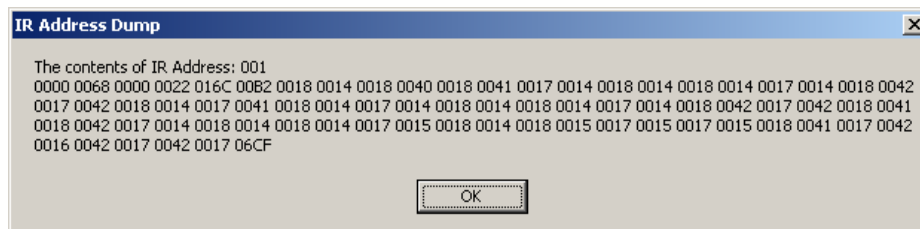
On the Learn IR Command Panel, there is a Help button that accesses IR Learning Help Information. This information contains tips for the best learning technique and other information about learned IR codes. Before learning IR codes, it is recommended that you read this help information. A short excerpt from the help information is shown below.





### 3.2.7.4 IR Data Analysis

The “View Raw” button, shown above in Figure 3.2.6.2-1, provides the capability to view the raw IR data as stored in the Room Navigator. This information can be useful in analyzing IR codes. This raw data is also stored in saved configuration files. If you need help analyzing your IR codes contact FSR Tech support at [techsupport@fsrinc.com](mailto:techsupport@fsrinc.com). Send your file along with your questions. An example of the format for a good IR code as displayed when the “View Raw” button is pressed is shown below.



### 3.2.8 Button Cmd Setup Tab

This tab is where commands or command sequences (or scripts) can be associated with buttons on the FSR Advanced Remote Panel. The graphical interface and the command scripting for configuring the button functions combine to provide a flexible and comprehensive ability to configure the system.

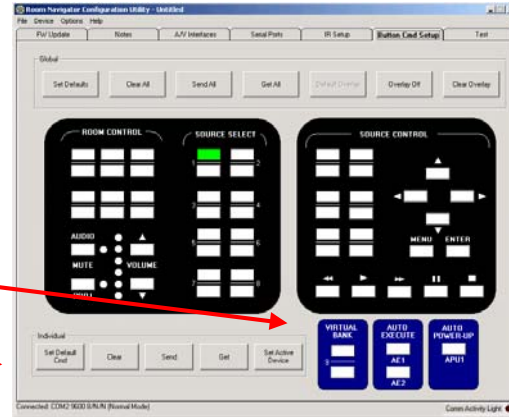


Global actions work on the entire IR Command Library

Clicking any button on the panel opens the Button Cmd Configuration screen to allow entry of commands to associate with the button

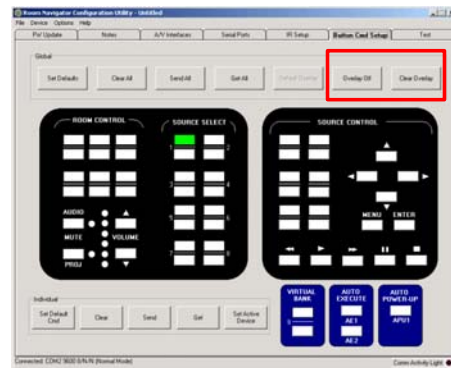
Configurable buttons include functions: Auto-Executing, Auto Power-Up and Virtual Buttons

Individual actions work on one button location, when clicked, cursor changes to allow selection of the button for the action



### 3.2.8.1 Panel “Overlay”

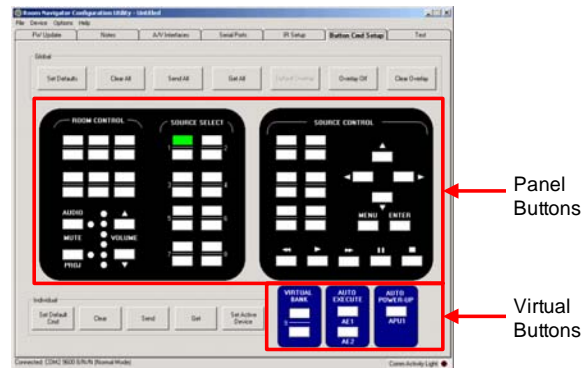
The “Overlay” function of the CU is currently not implemented. This feature is reserved to support entry of a meaningful overlay text that will automatically populate the corresponding locations in the virtual control panel accessible via the embedded web server.



### 3.2.8.2 Panel Buttons and Virtual Buttons

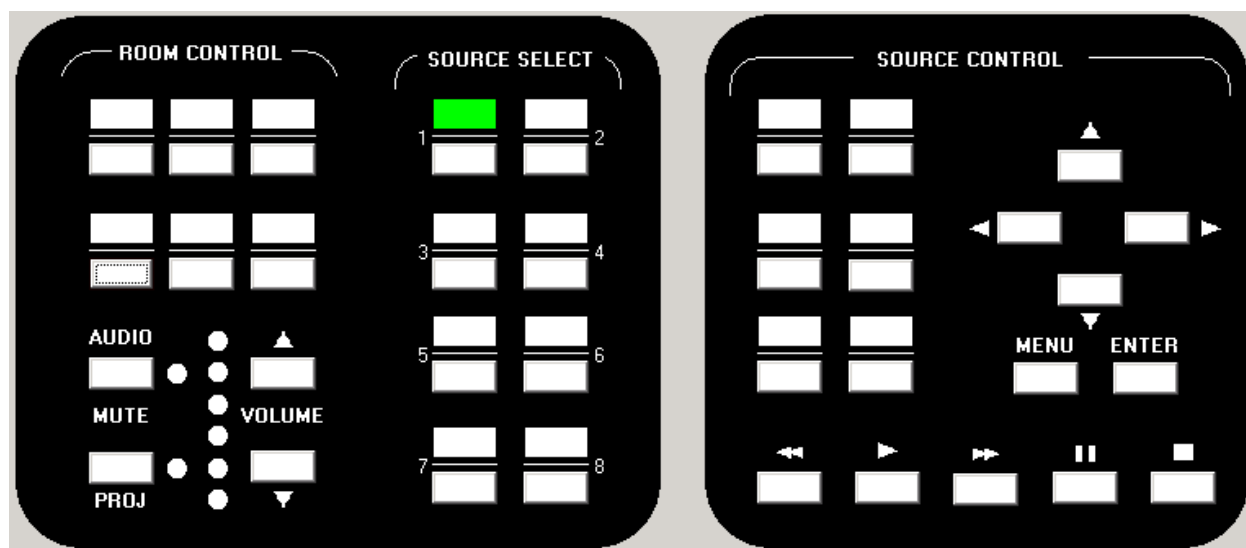
The Button Cmd Setup interface shows 2 types of buttons that can be configured with commands: panel buttons and virtual buttons.

- Panel Buttons are buttons that represent an actual button on the front panel of the Room Navigator. The command(s) associated with these buttons will be triggered by pressing the corresponding button on the Room Navigator front panel.
- Virtual Buttons do not have a physical button that can trigger their command(s) execution (at least not directly). These button command(s) are triggered by automatic events or by using a command to tell them to execute (see Button Press Command).



#### 3.2.8.2.1 Panel Buttons - Room Control, Source Select and Source Control

The Room Navigator panel buttons are designated as either Room Control, Source Select or Source Control as show in the figure below.



The designation of the button type is important to the overall operational concept for the Room Navigator.

The Room Control Buttons can be configured to provide one function where the function can be one command or a sequence of commands. For example, the upper leftmost Room Control Button is typically used as the System On/Off button where it is used to take the system from Idle Mode to Operational Mode and it can be configured to contain a start-up command script that configures the system and the connected equipment to a known state to begin normal use (i.e., power up to connected devices, set the starting active source, switch the A/V to a starting source, set audio to starting state, etc.).

The function buttons can be thought of as different pages of functions where each page corresponds to a particular source. The source select buttons, select which page of function buttons will be active. When a device is “active” as indicated by an illuminated LED above the button, the corresponding page of function buttons is also active as illustrated in the figure to the right. This concept allows the 17 source control functions for each of the 8 possible sources.

There are 175 total programmable button locations for user commands consisting of the following:

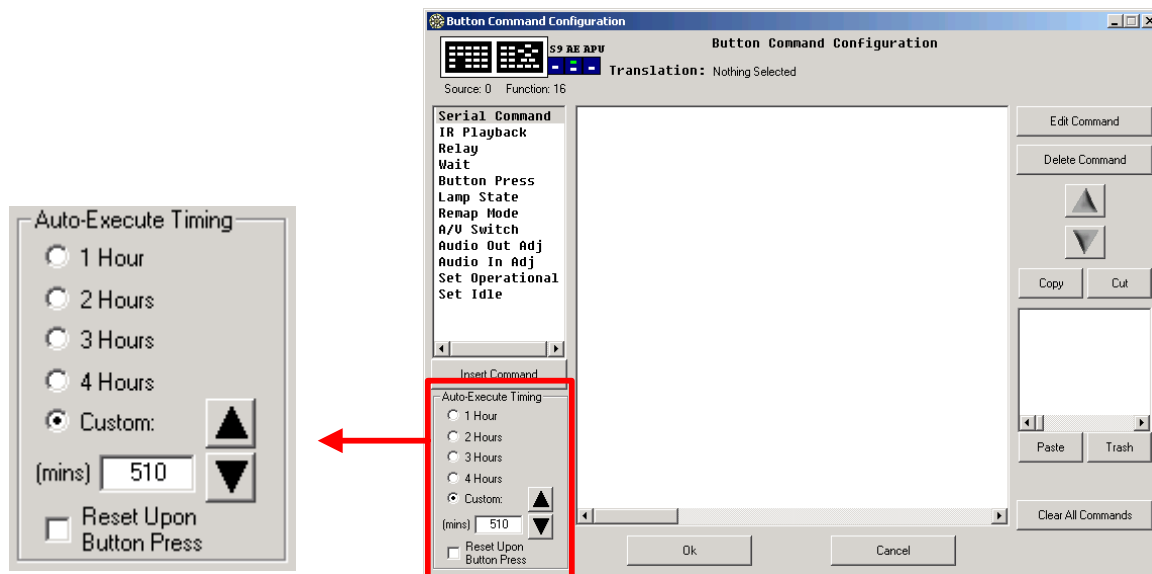
- 8 real + 1 virtual Device Select = 9
- 8 Device Select x 17 functions each = 136
- 1 virtual device x 17 functions = 17
- 2 Auto Execute
- 1 Auto Power-Up
- 10 Room Control

### 3.2.8.2.2 Virtual Buttons - Auto-Execute

There are 2 “Auto-Execute” function buttons, AE1 and AE2. These virtual buttons can be configured with a command or command sequence that will automatically execute after a user designated time period. The time period can be set to reset anytime a button (any button) is pressed on the panel. These buttons are perfect for automatic shutdown of equipment.



When an Auto-Execute Button is selected to configure by clicking it on the panel graphic, the Button Command Configuration Screen that opens will have an “Auto-Execute Timing” configuration group in the lower left corner as shown below.



### 3.2.8.2.3 Virtual Buttons – Auto Power-Up

There is 1 “Auto Power-Up” function button. This virtual button can be configured with a command or command sequence that will automatically execute whenever power is applied to the Room Navigator as part of the start-up process. This feature can be used to ensure your controlled equipment is at a known state when the system is powered on.



### 3.2.8.2.4 Virtual Buttons – Virtual Bank

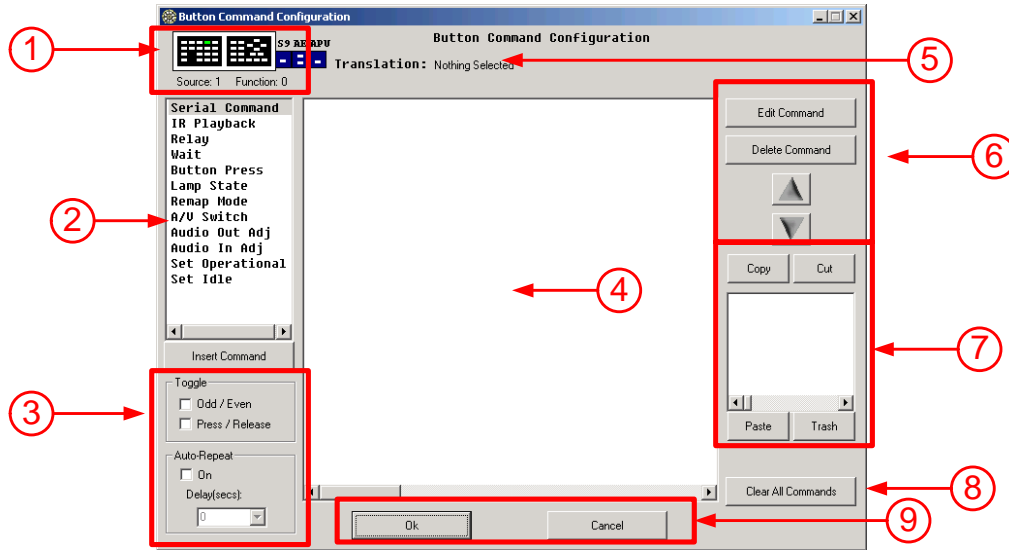
The “Virtual Bank” provides additional button command locations that can be called by other buttons and it provides an additional 18 command storage locations. While these virtual buttons have no front panel button to execute them directly, the Button Press command can point to any button (real or virtual) and therefore, these virtual button locations can serve as storage for extremely long command sequences.




### 3.2.8.3 Configuring a Button with Commands

To configure a button, click the button on the panel graphic shown in the center of the Button Cmd Setup Tab to open the Button Command Configuration Panel as shown below.

- **Note:** Source Select buttons will require 2 clicks if it is not the currently active device.

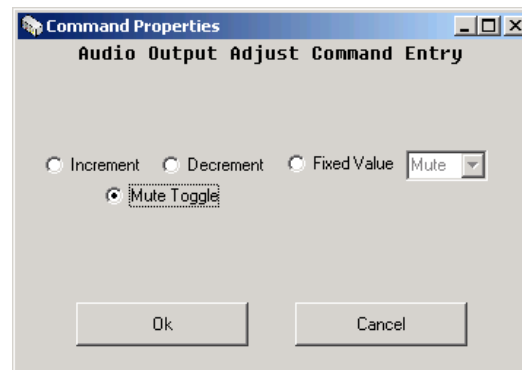


#	ITEM	DESCRIPTION
1	Button Map	<p>The small "button map" graphic and text is provided in the upper left corner to identify the particular button being configured. The button being configured is highlighted in green. Note that when a function button is being configured, there will be 2 buttons highlighted in green, one to identify the "Device" (or source) and one to identify the "Function". Several examples of the button map are shown below.</p> 
2	Command Type List	<p>The Command Type List shows the types of commands that can be configured to control the equipment in the user's application. These commands can be configured for a button in any combination desired as single commands or in a sequence of commands. To configure any given command type, you can use the mouse and "drag-and-drop" the command from the list into the command script window (# 4), or you can highlight the command in the list and click the "Insert Command" button located below the list. Each command type is described in detail later in the subparagraphs that follow.</p>
3	Special Button Attributes	<p>Special Button Attributes are as follows:</p> <p><b>Toggle Check Boxes:</b>  This feature allows configuration of a different command or command set to be configured for execution on either Odd/Even button presses or when the button is pressed and released. This feature is not applicable to virtual buttons.</p> <p><b>Auto Repeat Check Box:</b>  This feature allows configuration of auto-repeating commands that will repeat as long as the button is pressed. When checked, the "Delay" will become active so that a delay between repeats can be assigned if desired. The default delay between repeats is 0.00 seconds. This feature is not applicable to virtual buttons.</p>

4	Command Scripting Window	This window shows the commands configured for the button. As each command is configured, it gets added to this window. The commands shown in the window are formatted as required by the Room Navigator. While it is not necessary, if you are interested in becoming familiar with the Room Navigator command format, refer to the Room Navigator Programmer's Guide.
5	Translation	The command translator provides a translation of any command highlighted in the scripting window. This is an aid in becoming familiar with the Room Navigator command format or just a means to help you remember what a particular command is after you have added it to the button.
6	Command Script Editing Controls	These controls allow you to manipulate commands after they have been added to your command script. To use these controls, highlight a command in the scripting window. You can then Edit it or Delete it, or move it up or down in the script list.
7	Scripting Scratch Pad Controls	The scratch pad provides a way to copy and paste commands. It can be used as a way to avoid having to create new commands if they are merely minor changes to commands already in your script. It can also be used to copy and paste commands between buttons. <b>Copy Button:</b> This copies the highlighted command from the scripting window into the scratch pad. <b>Cut Button:</b> This cuts the highlighted command from the scripting window into the scratch pad. <b>Scratch Pad Window:</b> This shows the commands currently available in the scratch pad. <b>Paste Button:</b> This pastes the highlighted command from the scratch pad to the scripting window. <b>Trash Button:</b> This deletes the highlighted command from the scratch pad.
8	Clear All Commands Button	This button deletes all commands from the scripting window (or clears the command script).
9	Command Configuration Controls	These controls decide if you want to save the configuration for the button or cancel it and do something else.

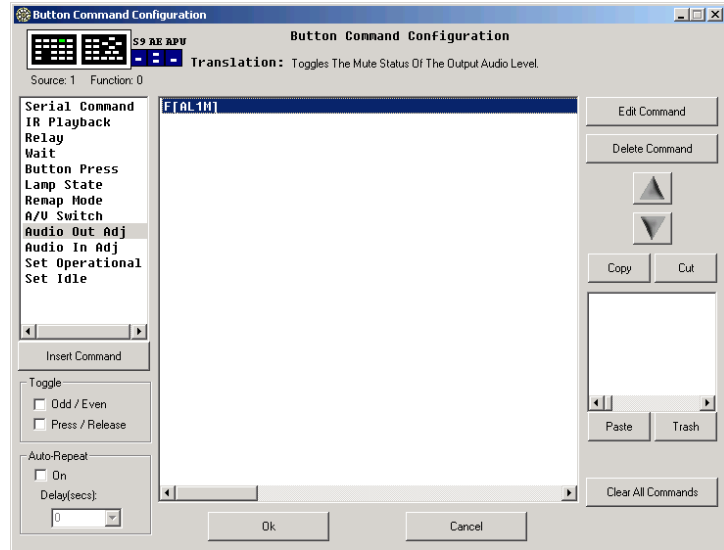
### 3.2.8.3.1 Example 1: Configuring a Button with a Command – Audio Mute

To configure the Audio Mute function, click on the Audio Mute button on the Button Cmd Setup Tab to open the Button Command Configuration panel. Note that the Audio Mute button is green on the button map in the upper left corner to indicate this is the button we are currently configuring. Use the cursor to “drag-and-drop” the “Audio Output Adj” command from the Command Selection Window into the Command Script Window. This opens the Audio Output Command Entry Panel so that you can specify exactly what audio adjustment you want this button to make when pressed. On this panel, simply select the “Mute” radio button and click “Ok” as shown to the right.

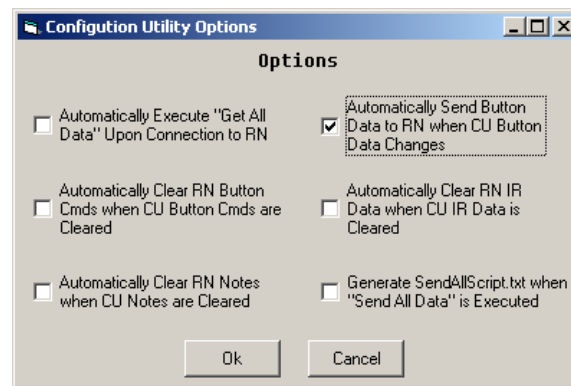


The Audio Mute Toggle Command will now appear in the command script window as shown to the right.

To save this configured button, click “Ok” again on the Button Command Configuration panel. The CU will ask “Do you want to program this button now?” Click Yes to program the button or No to do it later. If you click that button again, you’ll see that the Button Command Configuration Panel opens with the already configured command showing in the Command Script Window.

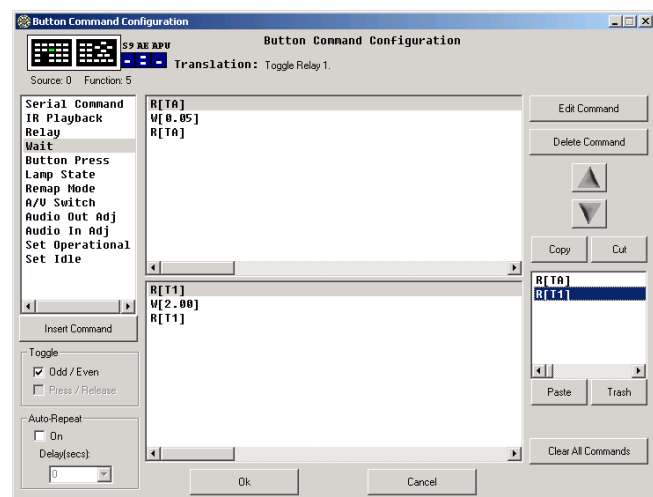


**Note:** Once you become more familiar with the CU, you may want to select the automatic option for configuring the RN as button configurations are made in the CU. This automatic option is accessed using the “Options” item from the menu bar and checking the corresponding box as shown below.

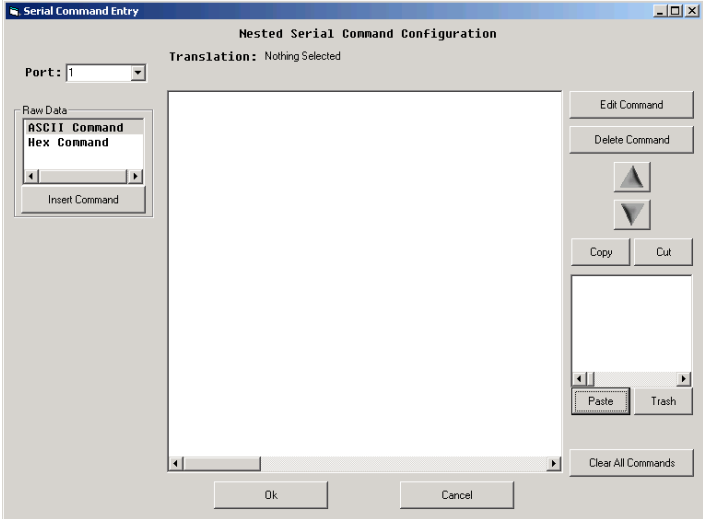


### 3.2.8.3.2 Example 2: Configuring a with an Even/Odd Toggle Command

Select another button from the Room Control Area of the panel. Then check the box beside “Even/Odd Toggle”. The Command Scripting Window will split into a top and bottom section. The top is now the “Even” button-press command script and the bottom is the “Odd”. This means whatever command or command sequence you put in the top area, will execute on even presses of the corresponding button. Similarly, whatever you put in the bottom will execute on odd button presses. The Press/Release toggle works in a similar manner except the top area represents the command(s) that will execute when the button is pressed and the bottom area represents the command(s) that execute when the button is released. The figure to the right shows an example of an Even/Odd configuration. For this example, on Even presses, Relay 1 is toggled then the RN waits 0.5 seconds then toggles Relay 1 again. On Odd presses, Relay 3 is toggled then the RN waits 2 seconds then toggles Relay 3 again.





#	ITEM	DESCRIPTION
3	Nested Command Entry	<p>In the event you are using a serial port to control another FSR control products and you want to command that product to issue a serial, IR or Relay command, the nested Commands makes this easy to do. When you select a nested command, a corresponding command entry panel will open to allow easy setup of the nested command. The IR Playback and Relay command entry panels are exactly the same as they are described in 3.2.8.5, and 3.2.8.6, respectively. The nested serial command entry panel is shown below. The CM CU supports one level of nested serial commands and therefore the nested serial command configuration panel is setup for data entry in ASCII and/or Hex as previously described. The Nested Serial Command Configuration Panel is shown below.</p> 

#	ITEM	DESCRIPTION
4	Command Scripting Window	<p>This window shows the serial commands configured. As each portion of a serial command is configured, it gets added to this window. The commands shown in the window are formatted as required by the CM. While it is not necessary, if you are interested in becoming familiar with the CM command format, refer to the CM Programmer's Guide.</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>

#	ITEM	DESCRIPTION
5	Translation	<p>The command translator provides a translation of any command highlighted in the scripting window. This is an aid in becoming familiar with the CM command format or just a means to help you remember what a particular command is after you have added it to the button.</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>

#	ITEM	DESCRIPTION
6	Serial Command Script Editing Controls	<p>These controls allow you to manipulate commands after they have been added to your command script. To use these controls, highlight a command in the scripting window. You can then Edit it or Delete it, or move it up or down in the script list.</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>



#	ITEM	DESCRIPTION
7	Scripting Scratch Pad Controls	<p>The scratch pad provides a way to copy and paste commands. It can be used as a way to avoid having to create new commands if they are merely minor changes to commands already in your script. It can also be used to copy and paste commands between buttons.</p> <p><b>Copy Button:</b> This copies the highlighted command from the scripting window into the scratch pad.</p> <p><b>Cut Button:</b> This cuts the highlighted command from the scripting window into the scratch pad.</p> <p><b>Scratch Pad Window:</b> This shows the commands currently available in the scratch pad.</p> <p><b>Paste Button:</b> This pastes the highlighted command from the scratch pad to the scripting window.</p> <p><b>Trash Button:</b> This deletes the highlighted command from the scratch pad.</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>

#	ITEM	DESCRIPTION
8	Clear All Serial Commands Button	<p>This button deletes all portions of the serial command from the scripting window (or clears the command script).</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>

#	ITEM	DESCRIPTION
9	Serial Command Configuration Controls	<p>These controls decide if you want to save the configuration for the button or cancel it and do something else.</p> <ul style="list-style-type: none"> <li>Note: This element of the Serial Command works in same way as the corresponding element on the overall Button Command Configuration panel.</li> </ul>

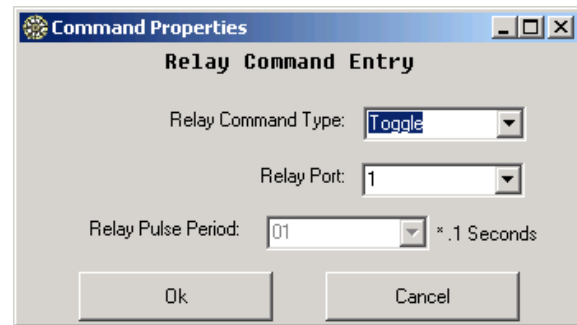
### 3.2.8.5 Configuring an IR Playback Command

The IR Playback Command allows the user to create commands that will control IR connected devices by playing back the learned IR commands stored in the Room Navigator IR command library. The IR Address Location is a pull down for selection of one of the 61 possible IR command locations. The IR Port identified the IR output port to which the command will be sent. The command can be repeated up to 99 times using the Repeat option at the bottom of the entry panel. Once the IR Playback Command is configured as needed, click the "Ok" button to build the final formatted command in the main Button Command Configuration panel. The IR Playback Command Entry panel is shown to the right.

The screenshot shows a Windows-style dialog box titled "Command Properties" with a subtitle "IR Playback Command Entry". Inside the dialog, there are three dropdown menus. The first is labeled "IR Address Location:" and is set to "001 - VCR : POWER". The second is labeled "IR Port:" and is set to "1". The third is labeled "Number Of Times To Repeat IR Playback:" and is set to "01". At the bottom of the dialog are two buttons: "Ok" and "Cancel".

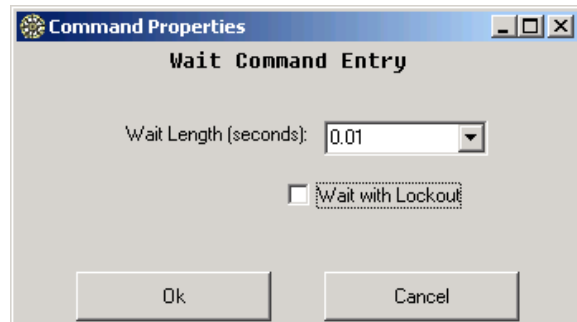
### 3.2.8.6 Configuring a Relay Command

The Relay Command allows the user to create commands that will control devices using contact closure. The relay command can toggle, set, reset, pulse set, or pulse reset any of the relays (or all simultaneously). The specific relay action is selected in the Relay Command Type area. The individual or the All relays option is selected in the Relay Port area. The Pulse Period becomes active and can be set as desired when a pulse set or rest action is the relay command type desired. Once the Relay Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Relay Command Entry panel is shown to the right.



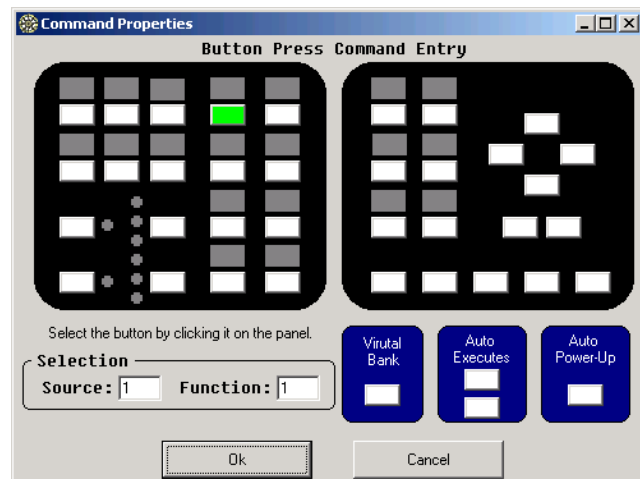
### 3.2.8.7 Configuring a Wait Command

The Wait Command allows the user to create time delays between various commands in a sequence. For example, it may be necessary to wait some short time after a relay is closed to be sure the action completed before taking the next action. There are 2 types of Wait Command possible, normal and Wait with Lockout. The normal wait can be any duration between 0.01 seconds to 9.99 seconds in increments of 0.01 second. The “Wait with Lockout” changes the duration values from 1 second to 999 seconds. The wait with lockout “locks-out” all button presses during the wait period. An example of a Wait with lockout might be to allow a time for a projector to warm-up before accepting further control actions. Once the Wait Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Wait Command Entry panel is shown to the right.



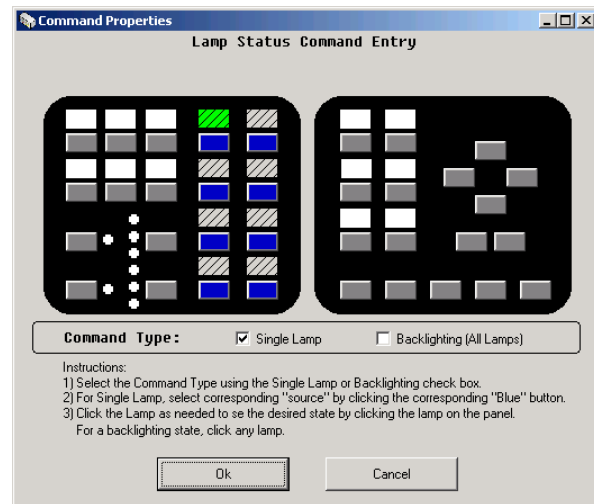
### 3.2.8.8 Configuring a Button Press Command

The Button Press Command allows the user to execute a simulated button press in order to execute the functions already programmed into any button without having to repeat all the commands. To select the button for the BP command, click the button on the graphic. One very useful way to use this command would be for executing very long command scripts that will not fit into a single button location. Some of the commands can be placed in the Source Control function buttons of the “Virtual Bank” and then these buttons can be “called” using the Button Press Command. Once the Button Press Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Button Press Command Entry panel is shown to the right.



### 3.2.8.9 Configuring a Lamp State Command

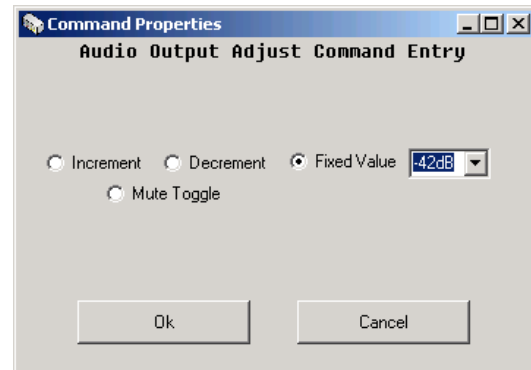
The Lamp State Change Command allows the user to change the illumination state of any lamp on the remote panel. For this command, the user clicks the lamp until the desired state is reached (each “click” cycles the state of the lamp). Once the Lamp State Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Lamp State Command Entry panel is shown to the right.



### 3.2.8.10 Configuring an Audio Output Adjust Command

The Audio Output Adjust Command allows the user to adjust the audio level of the audio output. For this command, the user selects the adjustment type desired: Increment, Decrement, Fixed Value or Mute Toggle. For Fixed Value adjustment, the user also selects the specific dB level using the pull-down (range from -45dB to +5dB in 1 dB step sizes and Mute).

Once the Audio Output Adjust Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Audio Output Adjust Command Entry panel is shown to the right.

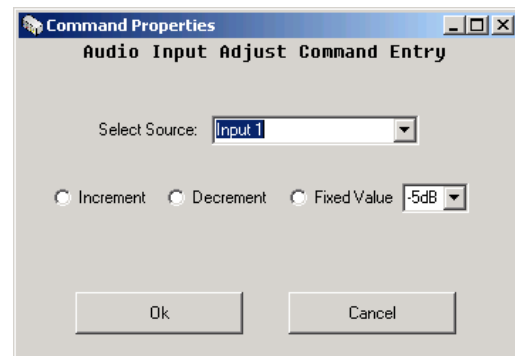


**Note:** Mute Toggle command toggles the current audio mute state so that if the audio is currently muted, it will be un-muted and visa-versa. The Increment and Decrement commands use a 1 dB step size.

### 3.2.8.11 Configuring an Audio Input Trim Adjust Command

The Audio Input Trim Adjust Command allows the user to adjust the audio trim level of any one of the 8 audio inputs. For this command, the user selects the adjustment type desired: Increment, Decrement, or Fixed Value. For Fixed Value adjustment, the user also selects the specific dB level using the pull-down (range from -5dB to +15dB in 1dB step sizes).

Once the Audio Input Trim Adjust Command is configured as needed, click the “Ok” button to build the final formatted command in the main Button Command Configuration panel. The Audio Input Trim Adjust Command Entry panel is shown to the right.



**Note:** The Increment and Decrement commands use a 1 dB step size.

### 3.2.8.12 Set Operational Mode Command

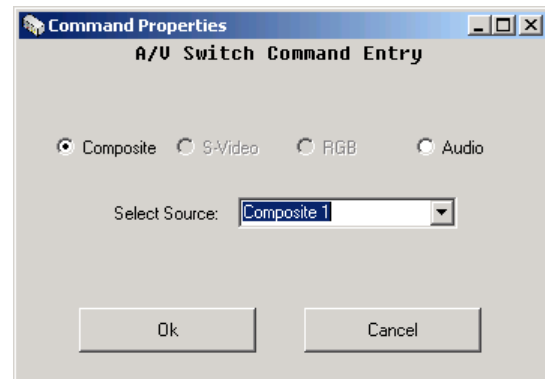
The Set Operational Mode is a fixed command with no options that need to be selected. This command should be used per the RN8200\_Default\_XXXXXX.mcf as described in section 2.3.1 of this manual. Note that the Set Operational Mode command only works in the System On/Off button. Note that this command can be sent to the RN using the Remote RS-232 interface at any time to put the system into Operational Mode as might be desired when the system is connected to a PC-based software control application.

### 3.2.8.13 Set Idle Mode Command

The Set Idle Mode is a fixed command with no options that need to be selected. This command can be used in any button configuration but should always be the last command in the command sequence. Refer to section 2.3.1 of this manual to see how this command is used in the RN8200\_Default\_XXXXXX.mcf.

### 3.2.8.14 Configuring an A/V Switch Command

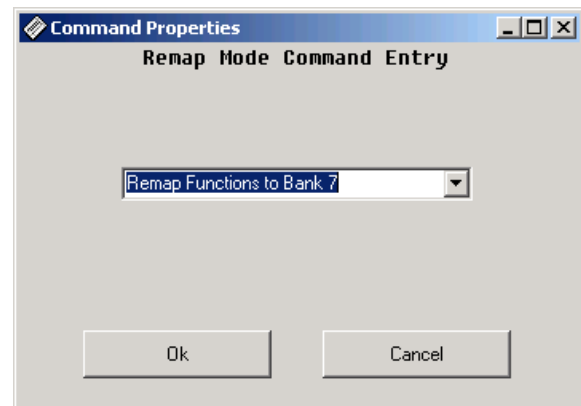
The A/V Switch Change Command allows the user to connect an audio or video input to the corresponding output. This command uses the user's A/V interface configuration identified on the A/V Interfaces Tab to limit the valid connections to those that are consistent with the user's A/V interface assignments. For this command, the user selects the specific output that will be connected, Composite, S-Video, RGB, or Audio. The user then selects the specific source that will be connected to the selected output. For each video output type, only those inputs assigned to this video type will be made available in the source selection drop-down based on the current A/V Interface Tab configuration. Once the A/V Switch Command is configured as needed, click the "Ok" button to build the final formatted command in the main Button Command Configuration panel. The A/V Switch Command Entry panel is shown to the right.



### 3.2.8.15 Configuring a Remap Mode Command

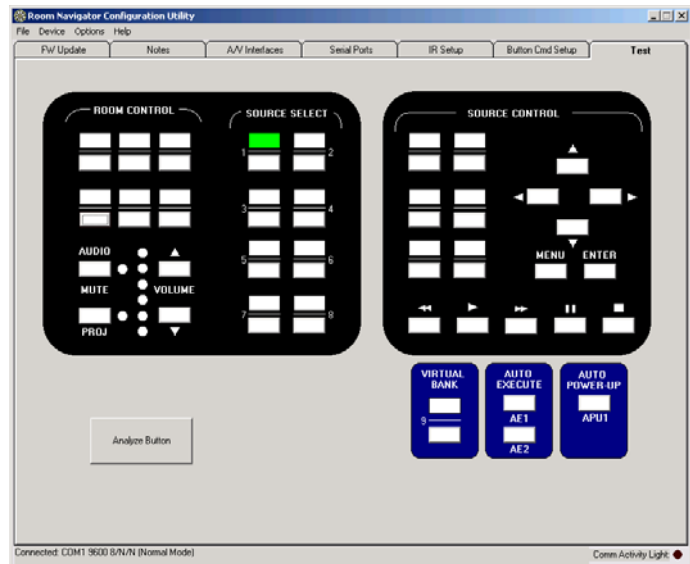
Remap Mode is a mode where function button presses are remapped to be associated with locations other than the currently active bank. While originally intended to provide access to the virtual bank locations using the standard panel, any bank can be the target of remap mode. REMAP Mode is activated by a Remap CMD using the Remap Mode Command Entry Panel by selecting the Remap Mode condition desired using the pull-down options. The Remap Mode Command Entry panel is shown to the right.

In order to provide a visual indication that a remap condition is in effect, the active device lamp will blink as opposed to being on steady. Once REMAP MODE is activated, it remains in effect until it is either deactivated using a REMAP OFF CMD or by pressing any device select button.



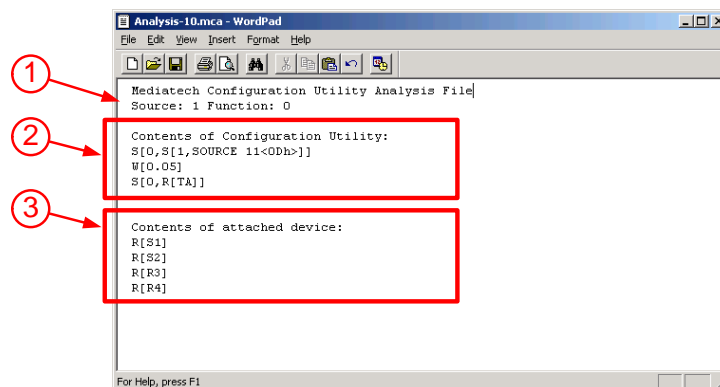
### 3.2.9 Test Tab

The test tab provides a means to test button functionality while the CU is connected to the Room Navigator so that adjustments can be made if necessary. Using the Test Tab, click on the button as if using the actual Room Navigator panel and you can observe the Room Navigator execute the command(s) configured in the button. The panel shown in the test tab will correspond to the panel last shown on the Button Cmd Setup tab – this way you can test using the panel interface you configured. This is essentially the same as pressing the button on the Room Navigator panel. One distinct advantage of the Test Tab over the actual panel is that you can test all your virtual button functions such as your Auto Power-Up sequence without having to cycle power and/or your Auto-Execute commands without having to wait for the time period to expire. The test tab with BMR and ARP are shown below.



The “Analyze Button” located in the lower left of the Test Tab is a troubleshooting aid. When clicked, this button will change the cursor to a special action cursor that you can then use to click the button you wish to analyze. The CU will extract the associated command(s) from both the CU buffer and the connected device and save it to a text file with the extension “.mca” and tell you the filename and path to the output file.

An example analysis file is shown below. The format of the analysis file consists of 3 main sections: 1) the header that identifies the file and the button being analyzed by its source and functions number, 2) the contents of the CU buffer for this button, and 3) the contents of the connected CM. Note that this example shows that the CU buffer is different from what is configured in the CM which means the button configuration was changed in the CU but never programmed into the CM.



## **4.0 FACTORY DEFAULT SETTINGS**

All device settings are configurable using the CU. The factory default settings for the Room Navigator are as follows:

- Serial Port 0: 9600 baud, 8-N-1 (8 data bits, no parity, 1 stop bit), no flow control, Echo Mode OFF
- Serial Port 1: 9600 baud, 8-N-1 (8 data bits, no parity, 1 stop bit), no flow control, Echo Mode OFF
- Serial Port 2: 9600 baud, 8-N-1 (8 data bits, no parity, 1 stop bit), no flow control, Echo Mode OFF
- Serial Port 3: 9600 baud, 8-N-1 (8 data bits, no parity, 1 stop bit), no flow control, Echo Mode OFF
- Serial Port 4: 9600 baud, 8-N-1 (8 data bits, no parity, 1 stop bit), no flow control, Echo Mode OFF
- Auto-Execute 1: Timeout Period 255 units (1 unit = 128 seconds), Reset Mode = ON
- Auto-Execute 2: Timeout Period 255 units (1 unit = 128 seconds), Reset Mode = ON
- Start-up Active Device: 6
- XFER Delay (min): 0 ms

## 5.0 ASCII CODE TABLE

HEX	DEC	ASCII	HEX	DEC	ASCII	HEX	DEC	ASCII	HEX	DEC	ASCII
00	0	NULL	20	32	(SP)	40	64	@	60	96	`
01	1	SOH	21	33	!	41	65	A	61	97	a
02	2	STX	22	34	"	42	66	B	62	98	b
03	3	ETX	23	35	#	43	67	C	63	99	c
04	4	EOT	24	36	\$	44	68	D	64	100	d
05	5	ENQ	25	37	%	45	69	E	65	101	e
06	6	ACK	26	38	&	46	70	F	66	102	f
07	7	BEL	27	39	'	47	71	G	67	103	g
08	8	BS	28	40	(	48	72	H	68	104	h
09	9	HT	29	41	)	49	73	I	69	105	i
0A	10	LF	2A	42	*	4A	74	J	6A	106	j
0B	11	VT	2B	43	+	4B	75	K	6B	107	k
0C	12	FF	2C	44	,	4C	76	L	6C	108	l
0D	13	CR	2D	45	-	4D	77	M	6D	109	m
0E	14	SO	2E	46	.	4E	78	N	6E	110	n
0F	15	SI	2F	47	/	4F	79	O	6F	111	o
10	16	DLE	30	48	0	50	80	P	70	112	p
11	17	DC1	31	49	1	51	81	Q	71	113	q
12	18	DC2	32	50	2	52	82	R	72	114	r
13	19	DC3	33	51	3	53	83	S	73	115	s
14	20	DC4	34	52	4	54	84	T	74	116	t
15	21	NAK	35	53	5	55	85	U	75	117	u
16	22	SYN	36	54	6	56	86	V	76	118	v
17	23	ETB	37	55	7	57	87	W	77	119	w
18	24	CAN	38	56	8	58	88	X	78	120	x
19	25	EM	39	57	9	59	89	Y	79	121	y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	<	5C	92	\	7C	124	
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	RS	3E	62	>	5E	94	^	7E	126	~
1F	31	US	3F	63	?	5F	95	_	7F	127	(sp)