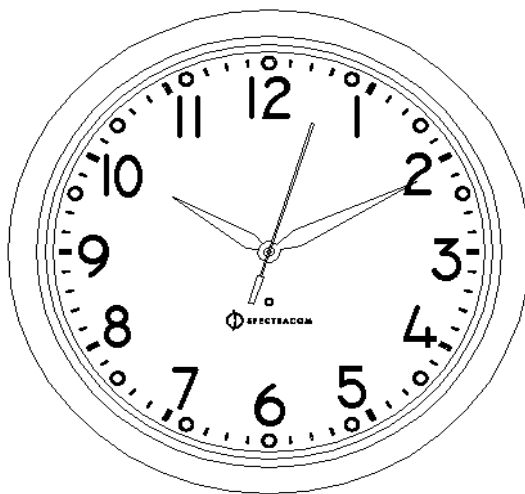# SPECTRACOM

TIMEVIEW 312W, 312V, 312U, 312G

WIRED AND WIRELESS
ANALOG DISPLAY CLOCKS

INSTRUCTION MANUAL

SPECTRACOM CORPORATION
95 METHODIST HILL DRIVE
ROCHESTER, NY 14623

PHONE   585.321.5800
FAX   585.321.5219

www.spectracomcorp.com

SPECTRACOM LIMITED WARRANTY

LIMITED WARRANTY

Spectracom warrants each new product manufactured and sold by it to be free from defects in software, material, workmanship, and construction, except for batteries, fuses, or other material normally consumed in operation that may be contained therein AND AS NOTED BELOW, for five years after shipment to the original purchaser (which period is referred to as the "warranty period"). This warranty shall not apply if the product is used contrary to the instructions in its manual or is otherwise subjected to misuse, abnormal operations, accident, lightning or transient surge, repairs or modifications not performed by Spectracom.

The GPS receiver is warranted for one year from date of shipment and subject to the exceptions listed above. The power adaptor, if supplied, is warranted for one year from date of shipment and subject to the exceptions listed above.

THE ANALOG CLOCKS ARE WARRANTED FOR ONE YEAR FROM DATE OF SHIPMENT AND SUBJECT TO THE EXCEPTIONS LISTED ABOVE.

THE TIMECODE READER/GENERATORS ARE WARRANTED FOR ONE YEAR FROM DATE OF SHIPMENT AND SUBJECT TO THE EXCEPTIONS LISTED ABOVE.

The Rubidium oscillator, if supplied, is warranted for two years from date of shipment and subject to the exceptions listed above.

All other items and pieces of equipment not specified above, including the antenna unit, antenna surge suppressor and antenna pre-amplifier are warranted for 5 years, subject to the exceptions listed above.

WARRANTY CLAIMS

Spectracom's obligation under this warranty is limited to in-factory service and repair, at Spectracom's option, of the product or the component thereof, which is found to be defective. If in Spectracom's judgment the defective condition in a Spectracom product is for a cause listed above for which Spectracom is not responsible, Spectracom will make the repairs or replacement of components and charge its then current price, which buyer agrees to pay.

Spectracom shall not have any warranty obligations if the procedure for warranty claims is not followed. Users must notify Spectracom of the claim with full information as to the claimed defect. Spectracom products shall not be returned unless a return authorization number is issued by Spectracom.

Spectracom products must be returned with the description of the claimed defect and identification of the individual to be contacted if additional information is needed. Spectracom products must be returned properly packed with transportation charges prepaid.

Shipping expense: Expenses incurred for shipping Spectracom products to and from Spectracom (including international customs fees) shall be paid for by the customer, with the following exception. For customers located within the United States, any product repaired by Spectracom under a "warranty repair" will be shipped back to the customer at Spectracom's expense unless special/faster delivery is requested by customer.

Spectracom highly recommends that prior to returning equipment for service work, our technical support department be contacted to provide trouble shooting assistance while the equipment is still installed. If equipment is returned without first contacting the support department and "no problems are found" during the repair work, an evaluation fee may be charged.

EXCEPT FOR THE LIMITED WARRANTY STATED ABOVE, SPECTRACOM DISCLAIMS ALL WARRANTIES OF ANY KIND WITH REGARD TO SPECTRACOM PRODUCTS OR OTHER MATERIALS PROVIDED BY SPECTRACOM, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Spectracom shall have no liability or responsibility to the original customer or any other party with respect to any liability, loss, or damage caused directly or indirectly by an Spectracom product, material, or software sold or provided by Spectracom, replacement parts or units, or services provided, including but not limited to any interruption of service, excess charges resulting from malfunctions of hardware or software, loss of business or anticipatory profits resulting from the use or operation of the Spectracom product or software, whatsoever or howsoever caused. In no event shall Spectracom be liable for any direct, indirect, special or consequential damages whether the claims are grounded in contract, tort (including negligence), or strict liability.

EXTENDED WARRANTY COVERAGE

Extended warranties can be purchased for additional periods beyond the standard five-year warranty. Contact Spectracom no later than the last year of the standard five-year warranty for extended coverage.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

SECTION 1 – GENERAL INFORMATION

GENERAL INFORMATION

1.0   INTRODUCTION

The Spectracom TimeView® 312 analog display clock (Figure 1-1) is a synchronized wall clock. The synchronization options available for the TimeView 312 are RS-485 wired data input (TV312W) and wireless (TV312V, TV312U, TV312G). The analog TimeView's 12-inch diameter face is visible from distances of up to 75 feet.

The TimeView 312 is part of Spectracom Corporation's display family of products, used to distribute accurate and traceable timing throughout a single facility or across an entire community. In addition to the TimeView 312, Spectracom offers TimeView 210 and TimeView 400 digital display clocks.

The primary TimeView system time source is a Spectracom NetClock® receiver. Spectracom currently offers GPS synchronized receivers and previously offered WWVB synchronized receivers. In wireless applications, the NetClock feeds a continuous time data stream to a Model 8185 TimeBurst™. The TimeBurst connects to the customer's radio console or transmitter to provide wireless synchronization. On a schedule chosen by the customer, the TimeBurst automatically keys the transmitter and sends a short coded time of day message in the form of a digital burst. TimeBurst is "polite" to voice communications and will wait for "clear air" to transmit.

The wired TimeView 312W clock has no radio receiver. It connects to an RS-485 continuous time data stream provided by a NetClock receiver or the RS-485 output of an Ethernet time server. The TV312W decodes time data stream and then synchronizes to within 250 milliseconds of the traceable NetClock receiver.

The wireless TimeView 312 clocks have internal radio receivers and built-in antennas. Each wireless TimeView clock decodes the TimeBurst transmission and synchronizes to within 250 milliseconds of the traceable NetClock receiver. Spectracom offers VHF FM, UHF FM commercial, and UHF FM government band versions of the TimeView 312. Specify TimeView 312V for VHF FM frequencies, TimeView 312U for UHF FM commercial, and TimeView 312G for UHF FM government band.
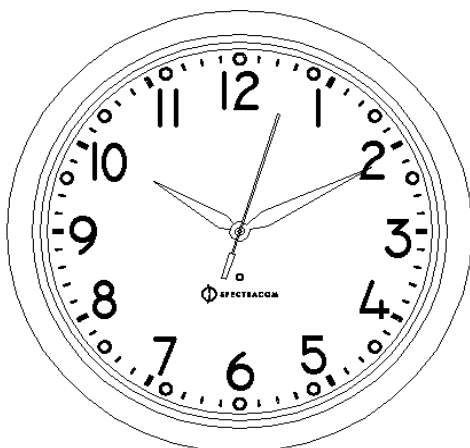
FIGURE 1-1: TIMEVIEW 312 ANALOG DISPLAY CLOCK

1.1   FEATURES

The Spectracom TimeView 312 offers the following features:

- **WIRELESS OR WIRED SYNCHRONIZATION AVAILABLE:** Wireless communication link eliminates costly wiring and labor expenses and simplifies installation. The wired communication link is for areas that will not receive the wireless signal reliably.   In both methods of synchronization, Daylight Savings/Standard Time changes occur automatically, driven from the NetClock receiver.

- **ACCURACY:** The Analog TimeView 312 displays traceable time when synchronized to a NetClock Receiver. Time accuracy is within 250 milliseconds of UTC.

- **EXCEPTIONAL VISIBILITY:** Large 12-inch diameter face is easily visible.

- **RECEIVED SIGNAL STRENGTH INDICATOR:** The wireless TV312 clocks utilize visible alert LEDs to provide a ready means of assessing radio signal coverage and to simplify installation.

- **RS-485 OUTPUT:** Serial Time Code data is provided to connect to products that require RS-485 data inputs.

- **RS-232 PORT:** Setup port provided for parameters, such as time, radio frequency (wireless clocks only), and calibration of analog display.

- **SETTINGS PROTECTION:**   Clock control settings are stored in non-volatile memory.

1.2   WARRANTY INFORMATION AND PRODUCT SUPPORT

Warranty information is found on the leading pages of this manual. Should it become necessary to exercise the warranty, contact Spectracom Corporation to obtain a replacement or service.

Spectracom continuously strives to improve its products and greatly appreciates any and all customer feedback. Please direct any comments or questions regarding application, operation, or service to Spectracom's Customer Service department. Customer Service is available Monday through Friday from 8:00 a.m. to 5:00 p.m. EST.

Customers may telephone Customer Service at **585.321.5800**.

In addition, please contact Customer Service to obtain a Return Material Authorization Number (RMA#) before returning any instrument to Spectracom Corporation. Please provide the serial number and failure symptoms. Transportation to the factory is to be prepaid by the customer.

Product support is also available by e-mail. Questions on equipment operation and applications may be e-mailed to Spectracom:

techsupport@spectracomcorp.com

Visit our web page for warranty registration, product information, and upgrade notices as they become available:

http://www.spectracomcorp.com

1.3   MANUAL ERRATA AND SPECIAL DOCUMENTATION

Information concerning manual corrections or product changes occurring after printing, when required, is appended to this manual. Please review and incorporate changes whenever errata are included.

Spectracom may make instrument modifications on (special) request. The documentation associated with any modification is provided as necessary in addition to this manual.

1.4   UNPACKING

On receipt, carefully examine the shipping carton and its contents. If there is damage to the carton that has caused damage to the unit, contact the carrier immediately. Retain the carton and packing materials in the event the carrier wishes to witness the shipping

damage. Failing to report shipping damage immediately may forfeit any claim against the carrier. Also, immediately notify Spectracom Corporation of shipping damage or shortages in order to obtain replacement components or repair services.

Remove the packing list from the envelope on the outside of the carton. Check the packing list against the contents to make sure all items have been received, including an instruction manual and ancillary kit. Table 1-1 lists the items included in the TimeView ancillary kit.

Description	Part Number	Quantity
Power Adapter, 12 VDC	PS03-0T0J-WM01	1
Plastic Anchor	HD0001	2
Screw, #6 x 1"	H100-1000-0016	2
Terminal Strip, 6-Position	P13006	1
Resistor, 120Ω	R02121	1

TABLE 1-1: TIMEVIEW ANCILLARY KIT

1.5   SPECIFICATIONS

This section contains specifications for the Analog TimeView 312 clocks. Material applicable only to wired or wireless models is identified accordingly.

1.5.1 Display

Display Hands:	Hours:Minutes:Seconds.
Display Size:	12-inch Diameter
Update Speed:	4.8 minutes to adjust by 1 hour
Fault Indication:	Orange LED time-sync indicator lighted steadily to indicate loss of synchronization. *Wireless clocks must receive a sync burst **at least** every 8.5 hours in order to maintain synchronization.*
Sync Indication:	Orange LED time-sync indicator off (not lighted) to indicate synchronization.
	Wireless clocks illuminate this LED for 1 second whenever time data is received.
	When in sync, clocks blink this light for ⅛ second at the top of every minute (:59 to: 00).
	This light also blinks twice for ⅛ second at the top of every hour.
Accuracy:	±250 milliseconds relative to the NetClock's time when synchronized. Typically ±2 seconds/day when not synchronized or computer-set.

1.5.2 WIRELESS Models Only

1.5.2.1   Wireless Receiver

Frequency Range:	VHF: 150-174 MHz, specify TimeView 312V.
	UHF: 440-470 MHz, specify TimeView 312U.
	Govt: 406-420 MHz, specify TimeView 312G
Default Frequency:	VHF: 174 MHz
	UHF: 469.5 MHz
	Govt: 406.1 MHz
Frequency Selection:	6.25 kHz steps over entire frequency range to operate with both 25 kHz and 12.5 kHz spaced channels. Frequency selection is made using rear panel RS-232 serial setup port interface.
Modulation Type:	FM with 5 kHz deviation nominal; supports 2.5 kHz deviation
Frequency Stability:	3 ppm initial accuracy; 1 ppm per year aging
Sensitivity:	107 dBm (1 µV) typical at receiver RF Input
Selectivity:	30 dB @ 25 kHz, 60 dB @ 50 kHz
Spurious/Image Reject:	50 dB

1.5.2.2   Wireless Serial Input/Output

Ports:	One RS-232 DCE port for connection with PC (for configuration)
	Two RS-485 three-position terminal blocks for connecting other Spectracom products
Data Format:	Spectracom Format 0 (default)
	Format 5 included for Event Alert options

1.5.3 WIRED Models Only

1.5.3.1 Wired Serial Input/Output

Ports:	One RS-232 DCE port for connection with PC (for configuration)
	Two RS-485 three-position terminal block connectors
	- One for time data input.
	- One for buffered time data output (repeater of input)
Data Format:	Spectracom Format 0 or Format 1 (auto-detected)

1.5.3.2 RS-485 Input

Input Signal:	RS-485 ASCII data stream in Format 0 or 1
Baud Rate:	1200 to 9600; SmartBus automatically detects baud rate
Max Cable Length:	4000 feet (1.2 km) using shielded twisted pair
Max RS-485 Loading:	Up to 32 devices may be connected to the NetClock receiver
Transient Protection:	Transient voltages suppressors protect the TimeView from damaging spikes or surges

1.5.3.3 Repeater Output

Output Signal:	Regenerated RS-485 signal of the applied input data stream.
Max Loading:	Up to 32 devices may be connected to the repeater output
Transient Protection:	Transient voltages suppressors protect the TimeView from damaging spikes or surges

1.5.4 Power

Power Source:	UL/CSA listed AC wall adapter (supplied)
Input Power:	100-120 VAC, 60 Hz, 5 Watts
Output Power:	12 VDC, 0.25 Amps, 4 Watts
Connector:	Barrel, 5.5 mm O.D., 2.5 mm I.D., negative shell, positive center
Battery back-up:	Time held for up to 10 years

1.5.5 Physical and Environmental

Dimensions:	14" (356 mm) diameter housing
	11.75" (298 mm) dial imprint area 2.8" (71 mm) depth
Weight:	2 lbs., 0.9 kg.
Mounting:	Wall mount: center mount or tamper proof mounting. Hardware provided.
Temperature:	32-140° F (0-60° C) operating range
	-40 – 185° F, (-40 – 85° C) storage
Relative Humidity:	10% - 95%, non-condensing operating range

SECTION 2 – INSTALLATION

INSTALLATION

2.0   INTRODUCTION

This section describes the mounting, setup configuration, and verification of operation for both wireless and wired versions of the TimeView 312 Analog Clock. To ensure proper operation, please read this manual in its entirety prior to installing and using the equipment.   Material applicable only to wired or wireless models is identified accordingly.

2.1   MOUNTING INSTRUCTIONS

The TimeView 312 is designed to mount over a duplex outlet to conceal the power adapter. The clock may be mounted using the single hole center mount or the two -hole tamper-proof mounting (Figure 2-1).

The ancillary kit includes screws and plastic anchors for mounting the clock. Tools required include a Phillips screwdriver and a ¼ inch drill.
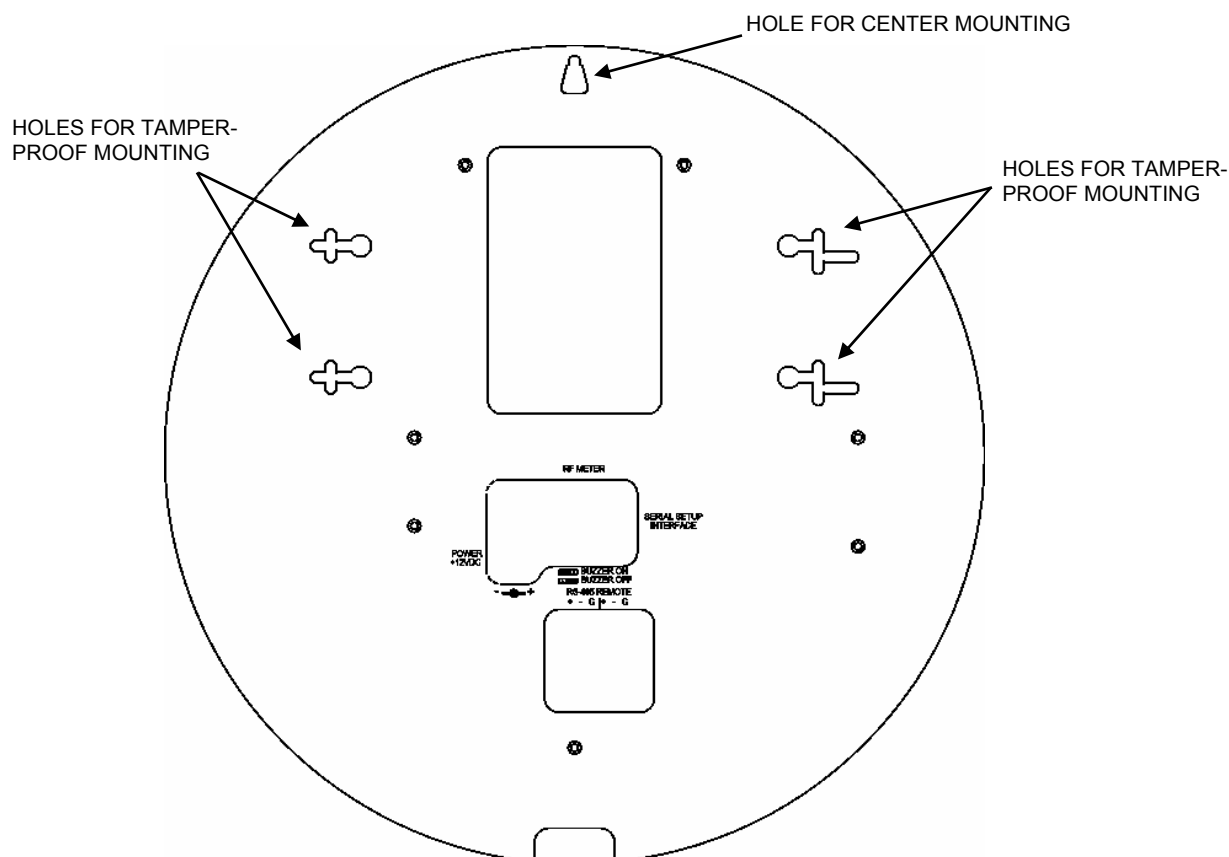
FIGURE 2-1: MOUNTING HOLE LOCATIONS

2.1.1 Single Hole Center Mounting

To mount the TimeView 312 over a duplex outlet using the single center hole, lay out a reference line through the center of the outlet cover plate (Figure 2-2). Mark and drill a ¼ inch hole ¾ inches above and centered on the outlet.
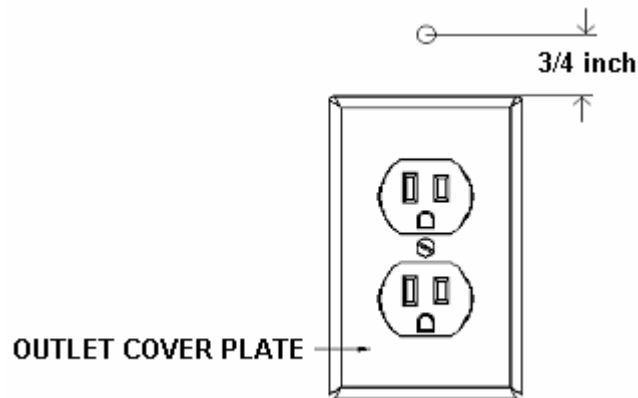
FIGURE 2-2: CENTER MOUNT HOLE LOCATION

2.1.2 Tamper-proof Mounting

Tamper-proof mounting uses keyed mounting holes to make removal of the clock more difficult. To tamper-proof mount the TimeView 312 over a duplex outlet, lay out a reference line through the center of the cover plate as shown in Figure 2-3. Mark and drill two ¼-inch holes that are 8-¼ inches apart and centered on the outlet.
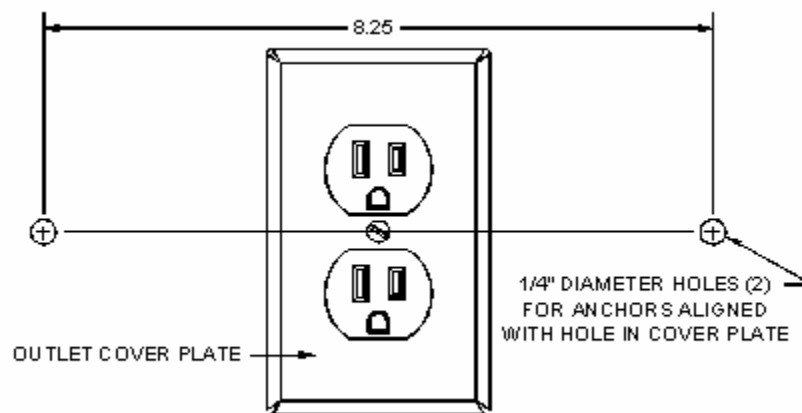
FIGURE 2-3: TAMPER MOUNT HOLE LOCATIONS

Refer to Figure 2-4 to guide the clock into its tamper-proof position. To remove the clock, work backwards from step 4 and move the clock in the direction opposite to the direction specified.

TV312 TAMPER RESISTANT MOUNTING INSTRUCTIONS

1. MOUNT CLOCK ONTO LEFT SCREW HEAD

10   2
9   3

2. SLIDE CLOCK TO RIGHT, THEN SLIDE CLOCK UP & RIGHT. SLIGHT SNAP WILL BE FELT. MOUNT CLOCK ON RIGHT SCREW HEAD.

10   2
9   3

3. SLIDE CLOCK TO LEFT. SLIGHT SNAP WILL BE FELT.

10   2
9   3

4. SLIDE CLOCK DOWN.

10   2
9   3
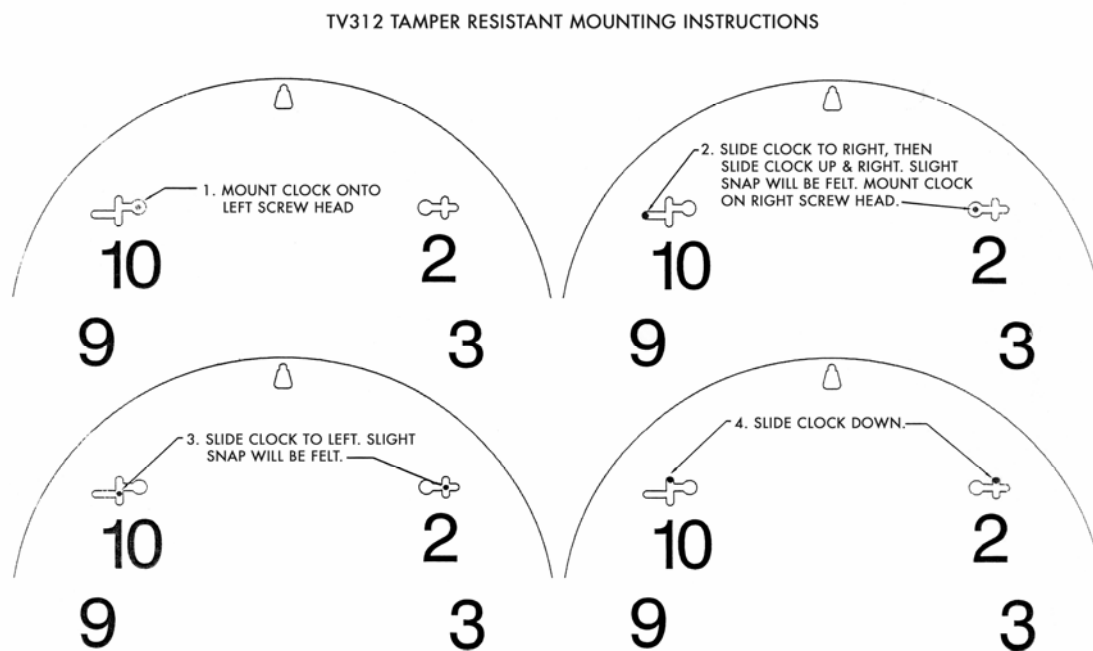
FIGURE 2-4: TAMPER-PROOF MOUNTING INSTRUCTIONS

2.2   POWER

Before applying power to the clock, please verify the hands are set to 12:00. The hands are factory set to 12:00 prior to shipment in order to calibrate the clock. Rough handling during shipment may cause the clock hands to move from their calibrated position.

NOTE: The TimeView 312 <u>will not display the correct time if the hands have moved during shipment</u>.   If the clock does not display 12:00 prior to installation, the hands must be re-calibrated as described in section **2.3.6** of this manual.

Plug the AC adapter into the top outlet with the cord facing downward. The clock hands start at 12:00:00. When power is applied, the clock hands will quickly advance to the internal real-time clock value. During this process, the orange time-sync indicator light will flash continuously to indicate that the clock is adjusting. After power-on adjustment is complete, the indicator will remain on until the clock receives a sync message or is manually set.

NOTE: Only WIRED models may be manually set.

2.3   CLOCK CONFIGURATION

The Analog TimeView 312 default configuration is shown in Table 2-1. The TimeView 312 may be configured by the customer, using the RS-232 serial port, to suit the application. The clock's configuration options include manually setting the clock time and date (wired models only), selecting the radio frequency (wireless models only), setting the group and the sub-group addresses, and adjusting the buzzer volume (applicable only to wireless clocks with Event Alert options installed).

In the event of a power failure, configuration selections are saved in non-volatile memory. Time is maintained by a battery-backup-equipped, real-time clock. The battery has a life expectancy of 10 years.

Parameter	Default Value
Frequency	TV312V: 174.000 MHz
	TV312U: 469.500 MHz
	TV312G: 406.100 MHz
Group Address	001
Sub-Group Address	000
Buzzer Volume	Level 1 (lowest)

TABLE 2-1: DEFAULT CONFIGURATION

2.3.1 Connecting to the TimeView 312

1) Using a one-to-one pinned RS-232 DB9M to DB9F serial cable, connect the TimeView serial setup interface port to a computer COM port (refer to Figure 2-5).

2) Run a terminal emulator application such as HyperTerminal or TeraTerm. HyperTerminal can be found through the Start menu on the PC. It is most likely found under – programs – accessories – communications – HyperTerminal.

3) Create a connection to the serial port being used (COM1, COM2, etc.).

4) Configure the connection using the following parameters:

> - Bits per Second / Baud Rate: 9600
> - Data bits: 8
> - Bit parity: None
> - Stop bits: 1
> - Flow control: None
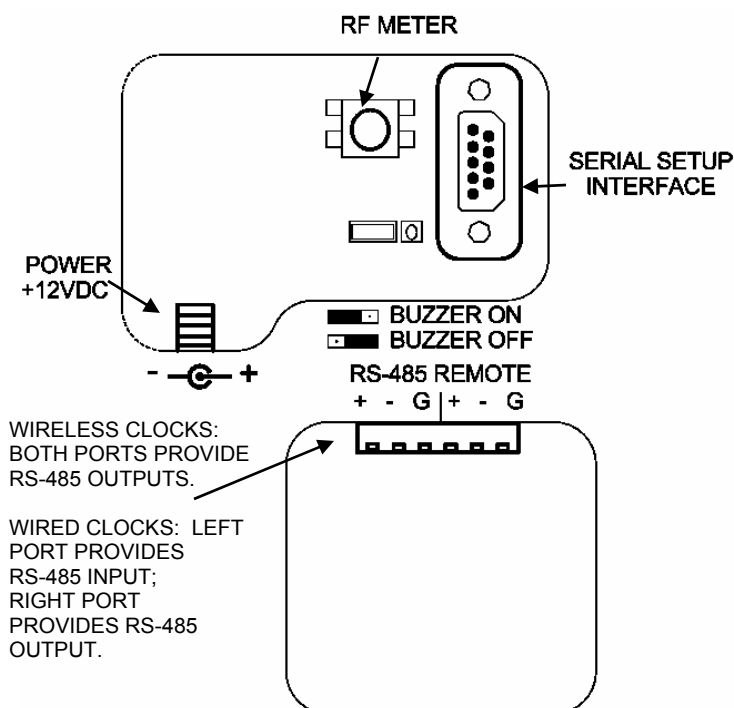
FIGURE 2-5: TIMEVIEW 312 REAR PANEL

NOTE: On all WIRELESS models, after the terminal connection has been created and configured, the current time of the clock will be shown and updated once per second on the terminal application window in the form of a Spectracom Format 0 message. The example below depicts the general appearance of this periodic activity:

```
*   364 08:22:50 STZ=05

*   364 08:22:51 STZ=05

*   364 08:22:52 STZ=05
```

NOTE: On all WIRED models, once the RF Meter switch is pressed, press the Enter key on the PC. The clock should respond with "Error". If this does not occur, cycle the TimeView power and try again. If still unsuccessful, try all the possible baud rates (9600, 4800, 2400, 1200) on the terminal emulator program until successful communication is obtained. (Because of the way the SmartBus automatically detects the baud rate in WIRED clocks, the clock baud rate will vary when the RF Meter switch is pressed. This is because it scans continuously in Normal mode operation. After completing the RS-232

configuration session, cycle the power to the unit to enable RS-485 time synchronization.

2.3.2 Calling the User Menu

2.3.2.1 WIRELESS Models

On **WIRELESS** models, type the following command on the terminal window:

```
>>   ? (↵ Enter)
```

NOTE: If the operation was executed successfully, the time stamp messages should cease and the following menu should appear on the terminal window:

```
>>   Enter any valid command to service
>>   (Wrd Rx press "ESC" first) where "Wrd" stands for wired.

>>   buzz hi/lo/med/off
>>   clbr [hh:mm:ss]
>>   date [yyyy-mm-dd]
>>   dbc [b]
>>   echo [on/off]
>>   exit
>>   freq [abc.def]
>>   group [xxx:yyy]
>>   rssi
>>   sm [on/off]
>>   stat
>>   tc5 disable/enable
>>   time [hh:mm:ss]
>>   time format [12/24]
>>   ticks [on/off]
>>   type
>>   ver
```

NOTE: Commands NOT appearing in **bold** in the help menu above are for factory use only.

2.3.2.2 WIRED Models

On the **WIRED** model, press the RF Meter switch on the rear panel of the unit and then press the Enter key on the terminal window. This will prompt the TimeView clock to stop seeking RS-485 time stream data and to enter the Setup Port mode:

If the operation executed successfully, the following response should appear on the terminal window:

```
>>   ERROR
```

Once this response is received, the wired clock is now in the Setup Port mode. It will remain in that mode until power is cycled to the unit. The wired clock will respond in setup mode in the same manner as the wireless clocks.

NOTE: On all WIRED models, once the RF Meter switch is pressed, press the Enter key on the PC. The clock should respond with "Error". If this does not occur, cycle the TimeView power and try again. If still unsuccessful, try all the possible baud rates (9600, 4800, 2400, 1200) on the terminal emulator program until successful communication is obtained. (Because of the way the SmartBus automatically detects the baud rate in WIRED clocks, the clock baud rate will vary when the RF Meter switch is pressed. This is because it scans continuously in Normal mode operation. After completing the RS-232 configuration session, cycle the power to the unit to enable RS-485 time synchronization.

2.3.3 Putting the Clock in Set Mode

This command allows you to set configuration parameters.

1) Call the User Menu (refer to section **2.3.2**).

2) Type the following command on the terminal window:

```
>>    sm on (↵ Enter)
```

NOTE: If the command was successfully executed, the following message should appear:

```
>>  SET MODE ENABLED
```

The Set mode times out after approximately 5 minutes. The clock will return to the normal Read mode.

2.3.4 Stopping the Clock Hands

This action is useful as part of the calibration procedure (refer to section **2.3.6**).

1) Put the clock in Set mode (refer to section **2.3.3**).

2) Type the following command on the terminal window:

```
>>    ticks off (↵ Enter)
```

NOTE: If the command was executed successfully, the hands of the clock should stop ticking and the following message should appear on the window:

```
>>  REGULAR TICKS DISABLED
```

2.3.5 Setting the Internal Clock (Not Clock Hands)

If the clock is to be synchronized via a wireless or wired method, it is not necessary to manually set the time. However, if there is the need to do so, follow the steps listed below. For example, if installing the clock prior to installing the NetClock system, the clock may be manually set close to the correct time.

> **IMPORTANT:** Time must be entered in a 24-hour format. For example, 5:00PM is equivalent to 17:00. On the analog display, both 5AM and 5PM will be displayed in the same way, but it is important to enter the time in a 24-hour format in order to keep the clock date accurate.

1) Stop the clock hands (refer to section **2.3.4**).

2) Type the following command in the terminal window:

```
>>    time hh:mm:ss (↵ Enter)
```

> **IMPORTANT:** hh, mm and ss represent, respectively, the hours, the minutes, and the seconds of the new time.
>
> Example:
> If the clock time is to be set to 8:55AM, the user should type:
>
> ```
> >>    time 08:55:00 (↵ Enter)
> ```

NOTE: If the command was executed successfully, the following message should be shown (using the time from the example):

```
>>    TIME=08:55:00
```

2.3.6 Calibration: Adjusting the Clock Hands to the Internal Clock

This command is used to ensure that the clock hands are calibrated to the internal microprocessor time setting.

1) Stop the clock hands (refer to section **2.3.4**).

2) Type the following command on the terminal window:

```
>>    clbr hh:mm:ss (↵ Enter)
```

> **IMPORTANT:** *hh*, *mm* and *ss* represent, respectively, the hours, the minutes, and the seconds that are shown by the hands of the clock.

Example:
If the hands of the clock are at 07:45:00, the user should type:

```
>>    clbr 07:45:00 (↵ Enter)
```

NOTE: If the command was executed successfully, the following message will appear:

```
>>  ADJUSTING HANDS, ADJUSTMENT IS COMPLETED WHEN SYNC LED
    STOPS FLASHING
```

The hands will then adjust. The time sync indicator light in the center of the clock face will flash on and off once per second while adjusting.

NOTE: During the clock hands adjustment, the hands will be moving quickly or not moving at all, depending on in which direction the adjustment must be made (and how far the hands must move to make the adjustment).

When the adjustment is completed, the time sync indicator light will remain lighted or not depending on whether the clock time synchronized to the NetClock.

2.3.7 Setting the Clock Date

This command is only used when using the RS-485 output and manually setting the time. In most cases, this is not necessary.

1) Put the clock in Set mode (refer to section **2.3.3**).

2) Type the following command on the terminal window:

```
>>    date yyyy-mm-dd (↵ Enter)
```

IMPORTANT: yyyy, mm, dd represent, respectively, the year, the month, and the day of the new date.

Example:
If the clock date is to be set to January 7th, 2006, the user should type:

```
>>    date 2005-01-07 (↵ Enter)
```

NOTE: If the command was successfully executed, the following message will appear on the window (using the date from the example):

```
>>  DATE=2006-01-07
```

2.3.8 Setting the Radio Frequency (Wireless Models Only)

Spectracom offers both VHF FM and UHF FM versions of the TimeView 312 analog display clock. The frequency ranges are:

VHF FM:	150 to 174 MHz
UHF FM Government:	406 to 420 MHz
UHF FM Commercial:	440 to 470 MHz

1) Put the clock in Set mode (refer to section **2.3.3**).

2) Type the following command on the terminal window:

```
>>    freq abc.def (↵ Enter)
```

IMPORTANT: abc and def represent, respectively, the integer part and the decimal part of the new frequency (in MHz).

Example:
If the clock frequency is to be set to 440.000MHz, the user should type:

```
>>    freq 440.000 (↵ Enter)
```

NOTE: If the command was successfully executed, the following message will appear on the window (using the frequency from the example):

```
>>    Frequency is 440.000 MHz
```

2.3.9 Main Group & Sub-Group Addressing

The Main and Sub-Group addresses are used to control individually the optional LED Event Alert lights and buzzers of multiple wireless clocks in a large organization.

Units ordered with Option 01 are equipped with the top row of seven LED lights (one red, six white) and a buzzer. Option 02 (included with all wireless TimeView 312 clocks) provides a bottom row of five colored LED lights and a buzzer. Option 03 units are equipped with both top and bottom lights and a buzzer. Refer to Figure 2-6 for the optional lamp locations and colors.

NOTE: To make use of the Event Alert LEDs, the TimeBurst must be equipped with Option 01, Event Alert.

The default setting for the Main Group is 001. It is 000 for the Sub-Group. (If not using this feature, skip to the next section.) All wireless clocks receive time broadcasts, so if your clock only displays time, you do not need to be concerned about addressing. Similarly, addressing is not applicable to wired clocks.
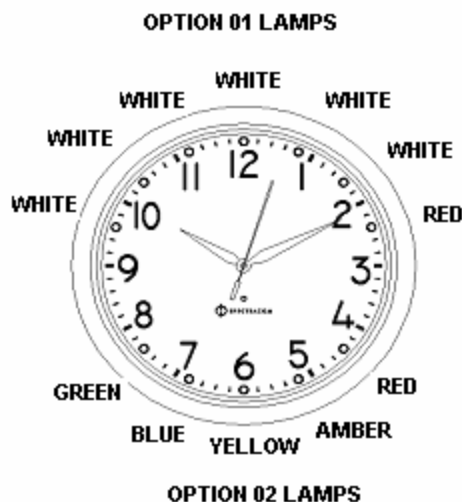
FIGURE 2-6: OPTIONAL LAMPS

The Main Group address range is 000 – 127. A Main Group address of 000 sets the clock to listen to all commands.

The Sub-Group address range is 000 – 255. A Sub-Group address of 000 sets the clock to listen to all commands for the Main Group.

For example, consider a large company with multiple buildings. An assignment can be made as follows:

Clocks located in:	Main Group Address
Building A	001
Building B	002
Building C	003

Clocks located:	Sub-Group Address
Near an Exit	001
On the Second Floor	002
On the Factory Floor	003

Configured this way, commands can be selectively sent as follows:

Selected Group	Main Address	Sub-Group Address
All Clocks in Building A	001	000
All Clocks in Building C	003	000
All 2nd Floor Clocks in Building A	001	002
Clocks in Building B Near an Exit	002	001

2.3.9.1   Setting the Clock Group & Sub-Group

1) Put the clock in Set mode (refer to section **2.3.3**).

2) Type the following command on the terminal window:

```
>>    group xxx:yyy (↵ Enter)
```

IMPORTANT: xxx and yyy represent, respectively, the new main group and the new sub-group.

Example: If the clock main group is to be set to 001 and the sub-group to 002, the user should type:

```
>>    group 001:002 (↵ Enter)
```

NOTE: If the command was successfully executed, the following message will appear on the window (using the group and sub-group from the example):

```
>>    MAIN/SUB GROUPS SET TO: 001:002
```

2.3.10 Setting the Buzzer Volume (Options 01, 02, 03)

The buzzer is an optional feature and may or may not be installed on your wireless clock. Even clocks without the buzzer option have a buzzer jumper on the back panel. If your clock does not have the buzzer option, ignore this jumper. If the buzzer option is not installed, the following instructions will have no effect on the operation of the clock.

NOTE: The volume or pitch of the buzzer may change depending on the type of surface to which the clock is mounted and whether it is held in the hand.

1) Put the clock in Set mode (refer to section **2.3.3**).

2) Type the following command on the terminal window:

```
>>    buzz level (↵ Enter)
```

> **IMPORTANT:** <u>Level</u> represents the buzzer volume level and must be replaced by one of the following four options: <u>hi</u> / <u>lo</u> / <u>med</u> / <u>off</u>.
>
> Example 1:
>
> If the buzzer volume is to be set to high, the user should type:
>
> ```
> >>   buzz hi (↵Enter)
> ```
>
> Example 2:
>
> If the buzzer is to be turned off, the user should type:
>
> ```
> >>   buzz off (↵Enter)
> ```

NOTE: If the command was successfully executed, a short buzz will sound (unless the buzzer is being turned off) and the following message will be shown (using the volume level from Example 1):

```
>>   BUZZER SET TO HIGH
```

2.3.11 Hardware Jumper Buzzer Disable

The buzzer can be disabled by moving the jumper on the three pin header that is on the rear panel of the unit, located near the bottom of the serial port setup 9-pin D-connector (Figure 2-7).

- The buzzer is **enabled** when the jumper is on the left two pins of the three pin header.

- The buzzer is **disabled** when the jumper is on the right two pins of the three pin header.

NOTE: Changing this setting will not adjust the volume level of the buzzer. It will only enable or disable it without the need for a serial setup connection using a PC with Terminal emulator. If the clock does not have a buzzer option, disregard this.
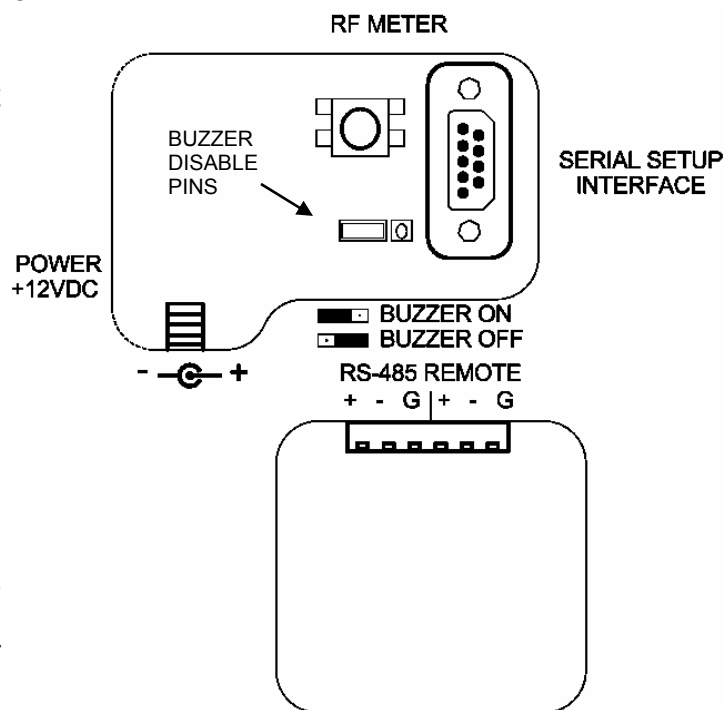
FIGURE 2-7: BUZZER DISABLE

2.4   RF METER (WIRELESS MODELS ONLY)

Pressing the RF Meter button while in the Normal Operation mode puts the clock in the RF Meter mode. While the clock is in this mode, the five lower Event Alert LEDs will indicate the received radio signal strength as measured by the clock. In order to do that, these LEDs will light up sequentially from right to left (red to green) depending on the strength of the signal. More specifically, if only the red LED is on, this means that the signal received by the clock is very weak. By contrast, if the green LED and all the remaining LEDs are lighted, this means that the signal received is very strong.

2.4.1   How to Use the RF Meter

The clock should synchronize when at least three of the Event Alert LEDs are on (specifically, the red, orange, and yellow LEDs). This indicates that the radio signals received by the clock are just strong enough to be decoded. If only two LEDs are lighted, the clock *might* synchronize, but the level is marginal. The more LEDs that are lighted, the easier it will be for the clock to decode the radio signals. When the RF Meter is initially enabled by pressing the RF Meter switch on the unit rear panel, the RF Meter will display the RF level of the last communication received from the TimeBurst for the first 6 or 7 seconds. If the unit has not received a communication from the TimeBurst, the RF Meter will read very low for the first 6 or 7 seconds. After that, it will display whatever RF level is present at the clock antenna.

NOTE: Remember that the TimeBurst™ system only transmits a brief [< 1 second] schedule burst – for example, only once every four hours. If the TimeBurst is the only device controlling the transmitter, the RF Meter will indicate zero [Red LED only] most of the time (except for the first 6 or 7 seconds, during which the RF Meter is activated. If the clock is synchronized, it will display the RF level of the last burst received. For the meter to indicate, the transmitter must be keyed. Some keying methods are:

- Press the Prompt button on the TimeBurst front panel

- Set the TimeBurst to transmit every 10 seconds

- If the transmitter is being shared with a voice or paging system, use those devices to key the transmitter. For example, for a voice system, simply key the hand-held transceiver. For a paging system, dial out a page.

- Place the transmitter in a constant transmit mode.

NOTE: TimeView wireless analog display clocks also include a serial setup command, *rssi*, which reports the last burst and the "live" level at the time of the command.

The brief TimeBurst signal will give only a quick near-peak signal measurement. Refer to the TimeBurst setup procedures for controlling its keying. Refer to the transmitter's manual for keying it.

2.4.2 Returning to Normal Operation Mode

Pressing the rear RF Meter switch while in RF Meter mode returns the clock immediately to Normal Operation mode. Alternatively, cycling the power will place the clock in Normal Operation mode.

NOTE: The RF Meter is not a precision indicator. It is only a relative guide to aid in installation and determining wireless coverage. Some clocks may synchronize even when only the red LED is on, while others may require a greater signal strength level to synchronize. In spite of this, for any particular clock, this meter is useful in determining the relative signal strength for one location or orientation over another.

2.5   TIMEBURST CONFIGURATION

The Spectracom Model 8185 TimeBurst connects to the radio transmitter directly or through the radio console using the Audio Output, PTT (Push To Talk), and Busy (Inhibit) lines. The PTT and Busy lines can be isolated optically. The Busy (Inhibit) signal from the transmitter is monitored by the TimeBurst and holds off sending messages until the channel is clear of traffic. The hold-off does not affect accuracy because the message sent is the current time of transmission.

The TimeBurst sends the time message automatically on a schedule set during its installation. The minimum recommended broadcast schedule is every four hours to maintain the 250-millisecond accuracy of the TimeView 312. Once per hour is a typical schedule. The TimeBurst can be prompted manually by connecting the remote prompt to a push-button on the radio console or by using the front panel Prompt button.

TimeBurst's total airtime is approximately one second. The message is a digital burst in the audio band and sounds like a chirp, similar to an ANI burst from a transceiver (AMSK Audio Minimum Shift Keying).

Refer to the Model 8185 TimeBurst manual for information on message scheduling and operation.

2.6   CONNECTING TO SPECTRACOM ETHERNET TIME SERVERS (WIRELESS MODELS ONLY)

The output port from the wireless TimeView 312 connects to the RS-485 input of a Model 8188/9188 Ethernet NTP time server to provide a quick and easy way to install a

precision NTP time server anywhere in the wireless coverage region. The precision time code received by the clock's receiver is repeated from the data port with an accuracy of +/- 100 milliseconds of the NetClock time.

The RS-485 Time Code output from the wireless clock is the same as the output from any other Spectracom NetClock product, so follow the installation directions for the Model 8188 or 9188 NTP time servers and use the wireless clock as the time source (instead of a NetClock).

Once synchronized, the TimeView 312 will output this code every second, using its own internal oscillator to keep precision time. If the clock stops receiving the TimeBurst after 80 minutes, it will note this in the serial time code output sync status byte, indicating that the time code may no longer be within the 100 millisecond accuracy.

NOTE: Once an 8188 time server receives the Time Sync Status character indicating that the accuracy is no longer 100 milliseconds, the time server will indicate loss of time synchronization. Once a 9188 time server receives the Time Sync Status character indicating that the accuracy is no longer 100 milliseconds, the time server will enter holdover mode. The TimeView 312 analog display clock, however, does not exceed its 250-millisecond accuracy until 8.5 hours have passed. For this time difference, the TimeView 312 seconds will not light the orange time-sync indicator light even though the NTP time server is indicating a loss of synchronization. When using the TimeBurst wireless system to synchronize remote NTP time servers, it is important to set the TimeBurst for 1/2 hour or less periodic updates to keep the servers within accuracy limits.

2.7   RS-485 PORTS

Two RS-485 ports are provided on the rear of the clock as shown in Figure 2-8.
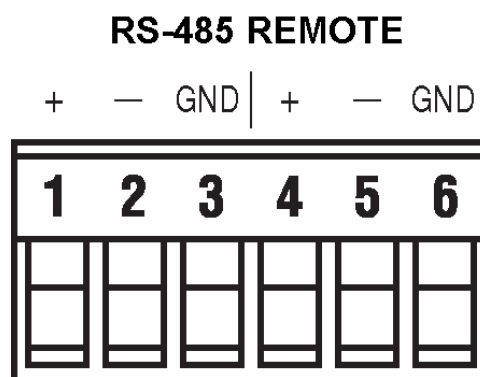
FIGURE 2-8: RS-485 PORTS

These ports provide serial data time code connectivity to other Spectracom Corporation products. In wired clocks, pins 1, 2, 3 are input and pins 4, 5, 6 are output.

NOTE: In the wireless models, both ports are outputs at the same baud rate and same Data Format (9600 Baud, Spectracom Format 0). They can be used to drive other nearby wired clocks that are unable to receive the radio signal or can provide remote timing for other Spectracom products that receive serial time code data, such as the Model 9188 Ethernet Time Server or other Spectracom wired data input display clocks. The default format output from the wireless clocks is Data Format 0. Format 5 is included for clocks equipped with the Event Alert option. Format 5 is not available for use with model 8188 or model 9188 time servers.

In the wired analog display clock, the RS-485 port on the left (as viewed from the rear panel) is the time data stream input. The RS-485 port on the right is an output that is a buffered, repeated version of the data input. The wired data input can be connected to any source of Spectracom RS-485 data that provides Format 0 or Format 1 time data.

NOTE: To prevent creating a single point of failure for downstream devices, Spectracom recommends daisy-chaining the input connectors and NOT using the output port unless synchronizing more than 32 devices.

The data format for the wired clock can be either Format 0 or Format 1. The wired clock will auto-detect the Format 0, Format 1 data input. The default baud rate for the input is 9600 baud, but the wired clock will auto-detect the baud rate as well. The acceptable baud rates are 1200, 2400, 4800, and 9600.

2.7.1 Connecting Wired TimeView Clocks to Wireless TimeView Clocks

It is possible to connect the RS-485 Time Code output of a wireless clock to the input of a Spectracom wired clock to extend the range into areas that have weak or no radio coverage, such as building interiors and basements.

The RS-485 Time Code output from the wireless clock is the same as the Spectracom Format 0 output from any other Spectracom NetClock product, so follow the installation directions for the wired clock and use the wireless clock as the time source (instead of a NetClock).

2.8   VERIFYING OPERATION

After initial startup adjustment during initial operation, the orange LED time-sync indicator (Figure 2-9) on the TimeView 312 analog display clock will remain lighted steadily to indicate that the clock has not received a digital burst from the TimeBurst for wireless models or that it has not received "in sync" RS-485 data input for the wired model. The lighted lamp indicates that the clock is not displaying synchronized time. Because the typical broadcast schedule of the TimeBurst can be configured for up to four hours, verifying wireless operation can take a long time. The wireless verification process can be speeded up by temporarily shortening the TimeBurst's message schedule to every 15 minutes or even to once every 10 seconds. Another method is to have an assistant press the Prompt button on the TimeBurst.
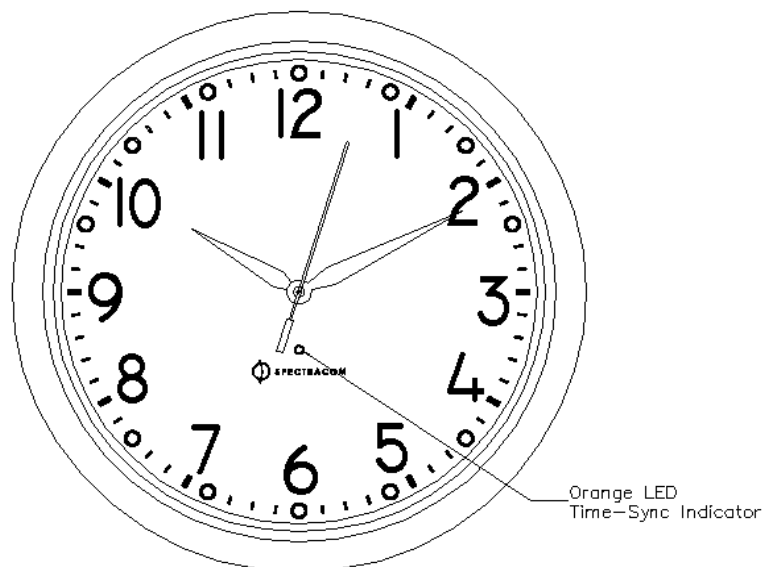
FIGURE 2-9: SYNC STATUS INDICATOR LIGHT

When the wireless TimeView 312 successfully decodes a data burst, the clock hands adjust and the orange LED time-sync indicator turns off. In addition, every time a wireless message has been received and decoded, this indicator will blink. Every time the TimeBurst broadcasts, scheduled or prompted, the time-sync indicator blinks.

The wired Analog TimeView behaves as do the wireless models, except that wired clocks do not blink the orange LED time-sync indicator on every data receipt. Wired clocks usually receive time data every second.

If a wireless TimeView 312 has been unable to decode a sync burst successfully within 8.5 hours, the time-sync indicator will remain on steadily to indicate loss of synchronization. If the wireless clock fails to synchronize, ensure that the received signal strength is sufficient. (Refer to section **2.4**.)

If a wired TimeView 312 has been unable to decode a time data stream input successfully within 8.5 hours, the time-sync indicator will remain on steadily to indicate loss of synchronization. If the wired clock fails to synchronize, ensure that the RS-485 + and RS-485 - wires from the NetClock are connected with the correct polarity and that they are less than the maximum length. Also, verify that the NetClock itself is time-synchronized.

2.9   TIME DISPLAY AUTOMATIC CORRECTION

The TimeView clock automatically corrects its displayed time after power outages and for normal accuracy adjustments. It also corrects DST/Standard time changes through the NetClock's time data.

When the hands are automatically adjusting, the time-sync indicator LED will blink repeatedly until the adjustment is complete.

The adjustment occurs at 12.5 times normal speed, so it takes approximately 4.8 minutes to adjust forward 1 hour. The hands will not turn backwards, so when a large negative correction is needed, the hands will advance rapidly forward. For smaller negative corrections, the hands will simply remain still, not moving until the time is correct. During this wait time, the time-sync indicator LED will blink repeatedly so the viewer knows the clock is adjusting and not malfunctioning. The hands will not move for corrections of less than 51 minutes ahead of the NetClock time.

2.10 TOP OF THE MINUTE AND HOUR CALIBRATION

In addition to indicating when a time sync message is received or when the hands are automatically correcting, the indicator will flash once each minute as the second hand crosses from 59 seconds to 00 (**12** on the clock face). It will blink twice at the top of the hour. This provides visual confirmation that the hands are calibrated correctly.

NOTE: This function only operates *after* the clock has received a valid time message and the time-sync indicator LED has turned off to indicate that the clock is synchronized.

If the time-sync indicator flashes early or late on these conditions, the hands require recalibration. Refer to section **2.3.6** to calibrate the clock.