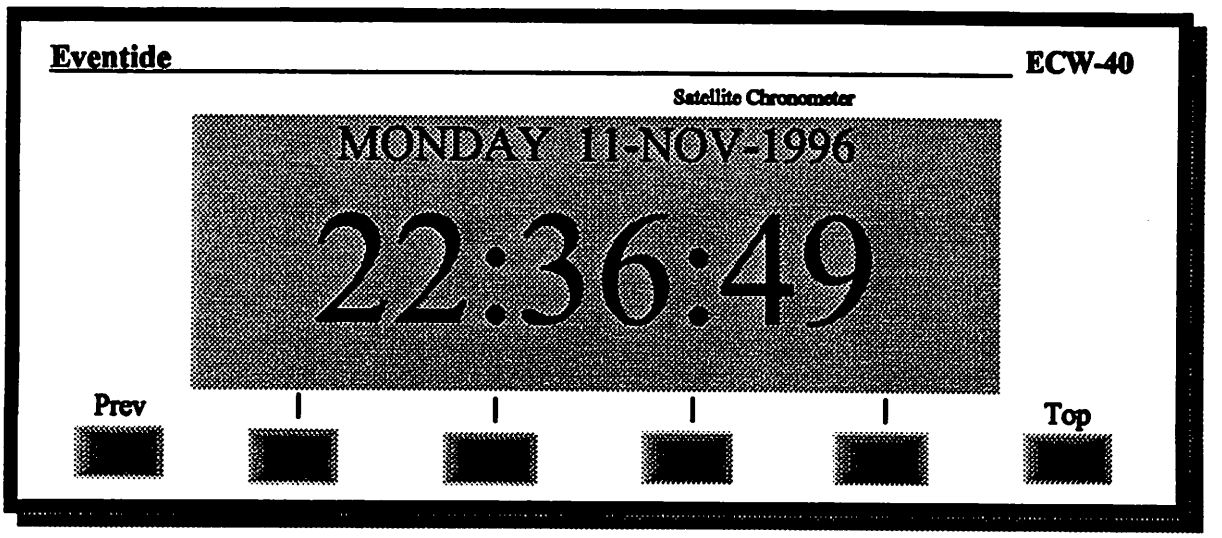
Installation and Operation of the Eventide ECW-40 Satellite Chronometer



Third Edition, March 1997
Software version 1.4

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ECW-40 Quick Setup

> ***WARNING:***
> **Connect antenna cable before applying power to the ECW-40.**

1. Connect your GPS antenna to the rear panel BNC connector labeled **GPS ANTENNA.**

2. Connect the power supply to the rear panel labeled POWER IN, and plug the AC power cord into an AC outlet.

3. After briefly flashing an introductory screen, the ECW-40 displays a date and time screen. The date and time may or, more likely, may not be accurate.

4. Press the pushbutton labeled **Top**. Then press the pushbutton labeled **Status**.

5. Press the pushbutton labeled **GPS Data** and note the line "GPS data is not valid."

6. Watch the screen as the clock's GPS receiver searches for satellites. In a minute or two the message "GPS data is valid" should appear, and your clock is set. If not, try reorienting your antenna until "GPS data is valid" is displayed. (If your clock has been moved a large geographic distance, it may take longer to lock on - indicated by "CS" on line four in the STS (status) column on the GPS Raw Data Screen. See page 10 for more information).

7. Press **Top** and observe the message "Last Valid GPS Time: (xx:xx xx/xx/xx)." Then press **Clock** to display the current GPS-accurate date and time (remember that you have not yet configured your clock for any particular time zone).

Introduction

> ***WARNING:***
> **Connect antenna cable before applying power to the ECW-40.**

Congratulations on your purchase of an Eventide ECW-40 Satellite Chronometer, a precise time base for synchronizing entire systems. Unlike other time measurement systems, the ECW-40 works anywhere on earth, anytime, and under any weather conditions. The ECW-40 is a unique product that can provide a primary source of traceable and reliable time. It meets the critical requirement of providing legal external time synchronization for public safety, transportation, and finance communication systems, and can assure accurate event logging and billing for telephone and power utilities.

The ECW-40 uses the Global Positioning System (GPS) based on satellite data and internal ECW-40 calculations. All outputs are user-configurable and extremely accurate. The ECW-40 can display time from an external RS-232/485 time source on any of 20 of its selectable clock screens or on one of three user-designed screens. The ECW-40 uses the most modern technology available. It has *a built-in* GPS receiver, which simultaneously receives time signals from multiple orbiting satellites. Accuracy is maintained to within plus or minus one microsecond. Battery-backed random access memory (RAM) saves user-set information in the event of a power interruption.

Locate the clock for convenience in connecting cables for AC power, antenna, and perhaps to external devices. The clock is designed to operate indoors with no extremes of temperature or relative humidity.

The clock won't need to be moved often, but if you use optional features that require regular access to the rear panel of the clock you will want to make it easily accessible.

A single Eventide ECW-40 can supply the time reference to several devices, such as voice logging recorders, communication consoles, computer-aided dispatch systems, and high-visibility wall clocks. When 100% redundancy is required, two ECW-40s can be programmed to work together. Software designates one as the master and the other as the backup. If the master detects a failure, it automatically switches to the backup's output, providing full redundancy. If you have purchased a second ECW-40 for a backup, you may want to mount the two clocks side-by-side so connections can easily be made if the master unit should fail. The same installation considerations apply to both a master ECW-40 and a backup unit.

Users of digital communication logging recorders such as the Eventide models VR240 and VR204, and the Dictaphone 9800, will find that the ECW-40 serves as an extremely accurate time and date source, providing an external reference standard to eliminate any possible drift inherent in these units' internal clocks. A single ECW-40 can serve as a master reference clock for a group of such recorders. The ECW-40's extra-large display can also be switched to show the recorded time and date information of an audio channel as it is being played back from a connected logging recorder. This mode is ideal for use when time information is being observed by several people from a distance--for example, in a large control room--or when tapes are being played as evidence in a courtroom.

The Global Positioning System receiver in the ECW-40 requires an external antenna for proper operation and to maintain accurate time. Eventide supplies two types; one mounts on a window, tbe other is mounted outdoors.

Both window and outdoor antennas need a clear view of the sky to provide reliable reception. Window mounted antennas should be placed with the sticker facing out or as shown in the antenna mounting kit manual. The cable (feedline) should run from the antenna to the GPS ANTENNA connector on the back of the ECW-40 (be sure to connect a feedline to this connector ***before*** applying power to the clock).

If you are installing a signal amplifier or surge (lightning) suppressor, connect it in series with the antenna feedline. If you own a back-up ECW-40, you can install a separate antenna for each clock or use a signal "splitter" to feed both clocks from one antenna; it's also okay to mount separate antennas side by side (but not overlapping).

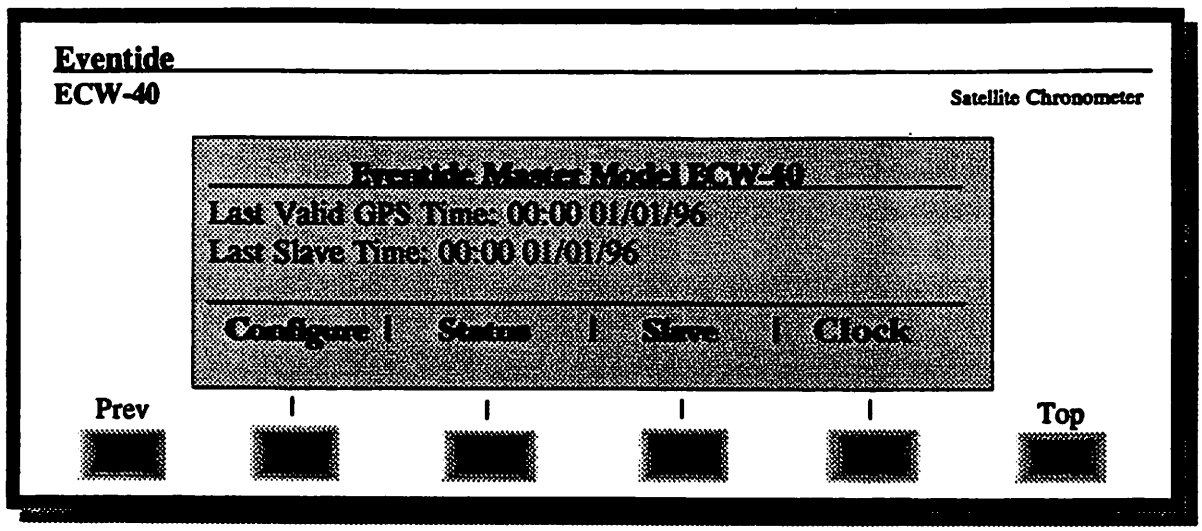
An outdoor roof or a tower-mounted antenna should be placed with the connector side facing down, toward the ground. Follow the mounting kit instructions on mounting the antenna to the roof or tower for best results. Connect a signal amplifier or surge suppressor in series with the feedline, at the clock end.

A mast-mounted antenna should be placed on a sturdy mount and screwed on securely. Connect the BNC plug on the end of the feedline to the back of the ECW-40. **Please remember:** always disconnect the ECW-40 from AC power before either connecting or disconnecting the antenna feedline.

Menu Structure

Setting up the ECW-40 to meet your needs is done through a series of on-screen "menus." If you have done the "Quick Setup" on page five you already have seen the first of these menus. The six pushbuttons below the clock's display access these menus for set-up. They also give quick access during operation to screens containing information you may wish to see.

When first plugged in, the clock displays a title screen and then switches directly to a display of the current day, calendar date, and time. That screen is shown on the title page of this manual and is referred to as the *Clock* screen. To exit the *Clock* screen, press any one of the "softkeys"--the four center pushbuttons--or the **Top** key, to display the *Top* menu, as shown below. If you are starting your clock for the first time you'll see a screen similar to this:



***Top* screen**

The four (center) softkeys are now labeled **Configure, Status, Slave,** and **Clock.** From this point on, no matter where you are in the menu structure, any time you press **Top,** it will take you directly to this *Top* screen. This allows you to make setup changes and then return directly the *Clock* screen.

The *Top* screen always shows the most recent time that the unit received valid GPS information, and the last time the unit received a time from an external time source. From the *Top* screen, you can move directly to screens that display detailed GPS satellite information as well as change the setup of the clock.

The four (center) softkeys operate as follows:

Configure: Choose from **Set Clock, Hardware, Presets,** and **Outputs.**

Status: Choose between **GPS Data** and a **Graph** of GPS data.
Configure **Warning** options or **Reset** the GPS receiver.

Slave: Displays the time as received from an external source.

Clock: Returns to the *Clock* screen.

The Clock Screen

Any time you press the **Clock** softkey the GPS-synchronized time, day and date are ordinarily displayed on the entire screen (other information will be displayed on the *Clock* screen if it has been user-selected; see pages 14 and 15) . From the *Clock* screen, pressing *any* of the six keys displays the *Top* screen, unless the clock's security feature has been enabled (see pages 15 and 16).

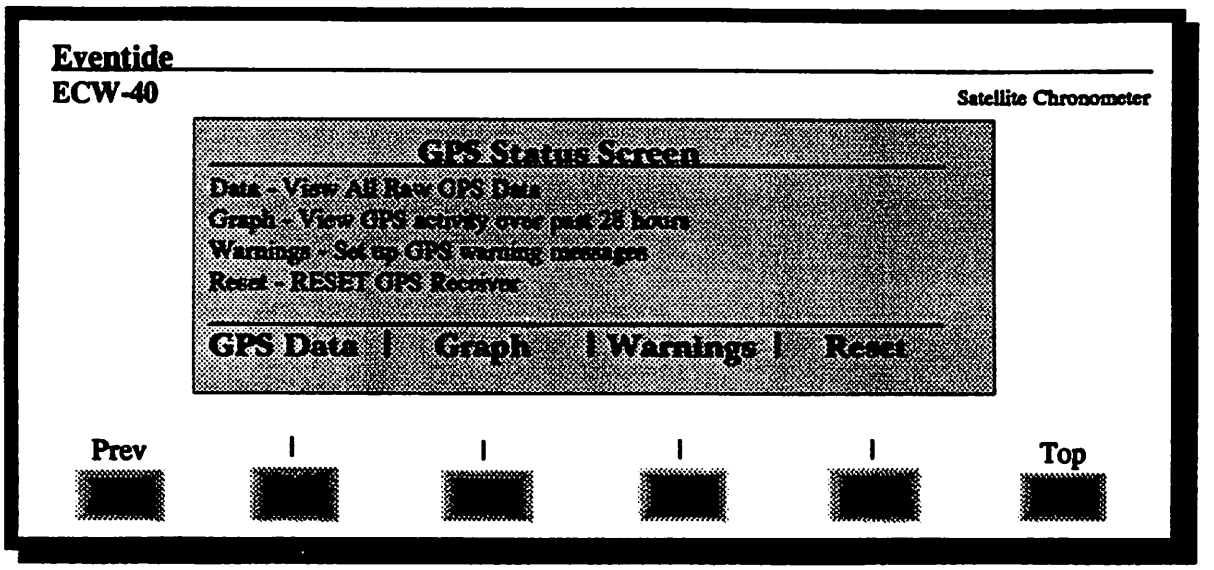
The time display typically includes a colon (:). If you have opted to be warned of GPS status, the colon will blink if GPS data is not valid and the time may or may not be accurate (see *GPS status*, below).

The Slave Screen

From the top menu, the **Slave** softkey displays the time the ECW-40 has received from any external device; the default value is 12:00:00. Pressing any of the six softkeys from the *Slave* screen displays the *Top* screen.

The Status Screen

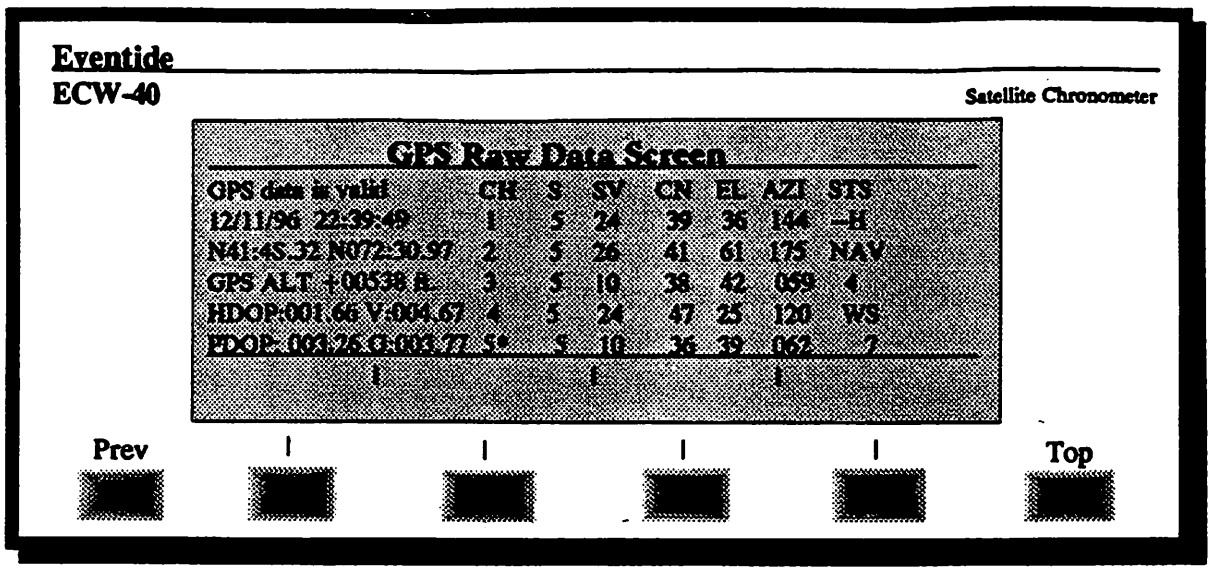
The *Status* screen, selected from the *Top* screen menu, presents choices for displaying raw GPS information. From the *Status* screen menu, you can access GPS receiver information (**GPS Data**), including satellite tracking and position; a 28-hour history graph of satellite reception (**Graph**). From this screen you may also select if, when, and how GPS warnings are displayed. You may also **Reset** the GPS receiver from here. (**Reset** is for extreme circumstances only; see page 10.)



***Status* screen**

The GPS Raw Data Screen

The *GPS Raw Data* screen displays real-time GPS information and allows you to watch the Global Positioning System at work.



***GPS Raw Data* screen**

The only keys used with this screen are **Prev** *and* **Top**.

GPS data is valid: Indicates when the GPS data (position and time) is valid, i.e. when the GPS receiver is in Navigation mode and three or more satellites are being tracked.

GPS date and time: The time, in Greewich Mean Time (GMT, or UTC) only, and date according to the GPS receiver.

GPS longitude and latitude: The longitude and latitude of your clock site.

GPS ALT: A number derived from GPS receiver information approximating your site's altitude above sea level (ASL) in feet. This display is provided only as a further indication that the GPS receiver is at work. Operational limitations imposed by U.S. Department of Defense prevent the clock from providing an accurate readout of ASL altitude.

H, V, P, and G DOP (Dilution of Precision): Information derived from GPS receiver operation relating to error correction; the lower the number the better. This information is not used in normal clock operation. (Abbreviations are (H)orizontal, (V)ertical, (G)eometric, and (P)osition.)

CH (Channel Number): The five GPS satellites. An asterisk (*) indicates a "spare" channel.

S (Channel status): The current status of each of the five tracking satellites as follows:
0 = Idle state
1 = Search in progress for a satellite
5 = Receiver locked on a given satellite

SV (Space vehicle): The numbers assigned by the U.S. government to each satellite.

CN (Carrier to noise ratio): Signal strength from each satellite. The higher the number, the stronger the signal. Readings should range from the upper 20s to low 50s; a reading of zero indicates no signal present on the channel.

EL: Elevation of the satellite above the horizon, from 0 to 90 degrees.

AZI (Azimuth): Position of the satellite off the horizon, from 0 to 360 degrees.

STS (Status): The entire ECW-40 GPS system status as follows:

--H (or --U): GPS receiver function indicators not used in normal clock operation.

NAV (navigational): The GPS receiver is "locked" and date and time are valid. Alternatively, ACQ indicates that the system is acquiring, i.e., in the locking process.

4 indicates that the system is using four satellites; i.e., is locked and valid.

WS indicates that the system was "warm started." CS would indicate that the system was last "cold started." After first use the ECW-40 stores information in non-volatile memory; if the clock is turned off and then turned on again, the search for a satellite lock is faster, thanks to this stored information. If the ECW-40 is moved a large geographical distance the clock will take longer to lock on because the stored presets will not necessarily be valid. If all else fails, pressing **Reset** from the *GPS Status* screen will clear the ECW-40's memories and allow it to restart anew.

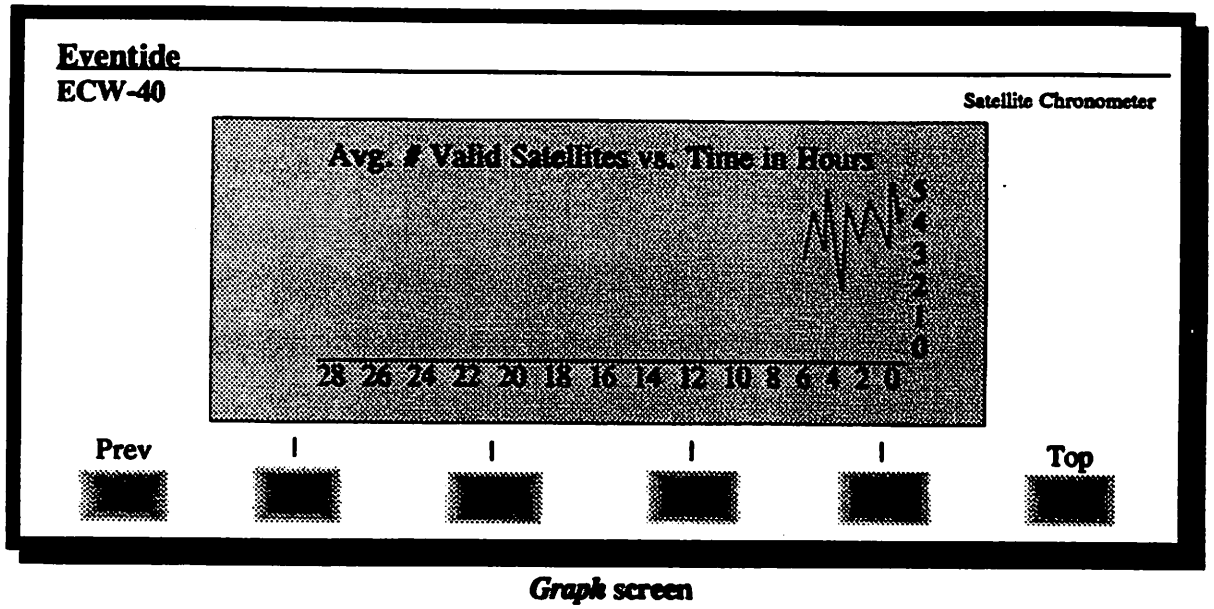
7 is a "figure of merit," a measure of accuracy based on Dilution of Perception (see page 9). A 7 or 12 indicates the unit is locked on. No lock will be indicated by the figure 500.

The Graph Screen

The *Graph* screen displays satellite tracking information over the previous 28 hours. This information enables you to position your GPS antenna in different locations based on the quality of GPS reception. The GPS receiver has 5 channels that can lock on up to 9 satellites at once. The graph displays the average number of channels locked onto satellites at one time. (Range is 0 to 5)

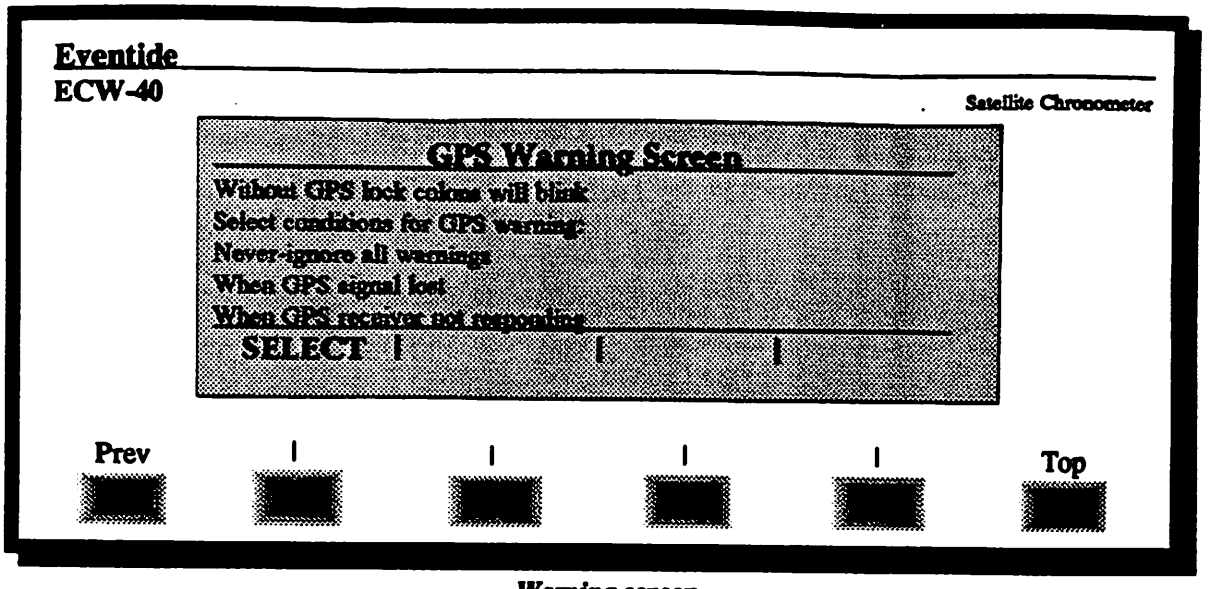
The *Graph* screen enables you to watch how antenna placement has affected your GPS reception and allows you to reposition your antenna for best performance. Fourteen hours after moving your antenna, the *Graph* screen gives you a full-screen, side-by-side "before and after" of antenna performance.

The example below shows how a typical *Graph* screen looks after seven hours of successful reception.



***Graph* screen**

The Warning Screen



Warning screen

Use the GPS Warning Screen menu (above) to choose how you wish to be warned about GPS validity. Press the SELECT button to highlight your choice, it is saved automatically when you exit.

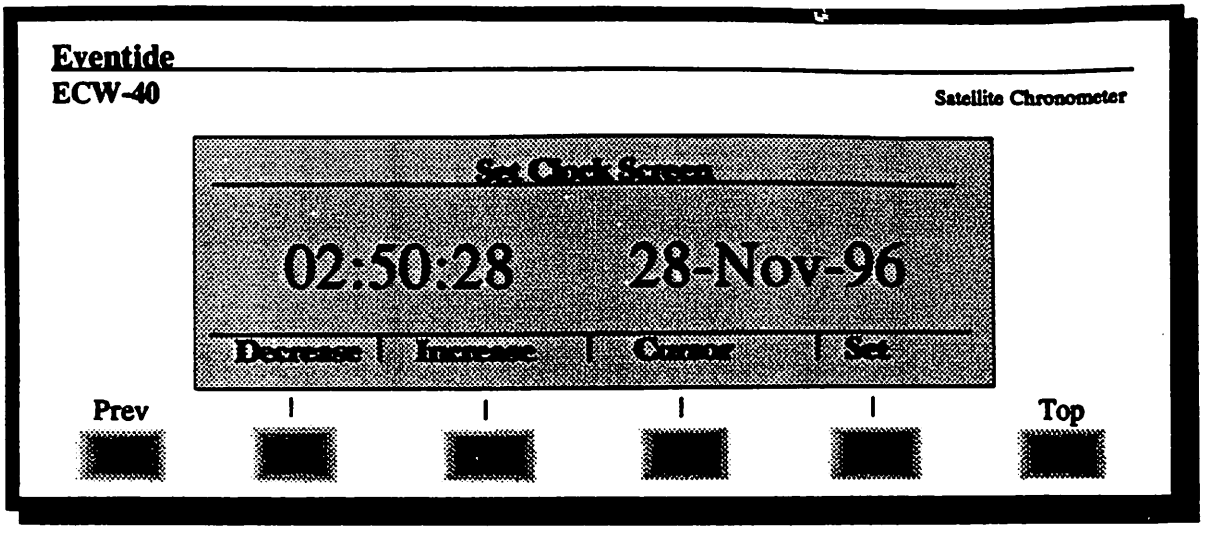
Without GPS lock colons will blink: When *no* satellites have been acquired.

Never: Disables the GPS warning screen.

When GPS signal lost: A warning screen, "WARNING, GPS signal is lost," appears briefly every 10 seconds.

When GPS receiver not responding: A warning screen, "WARNING, GPS receiver defective," appears briefly every 10 seconds.

If you wish to change the time or date of the clock, press **Prev**, then press **Set Time** to present the *Set Clock* screen. The **Cursor** pushbutton selects which item on the screen is highlighted; use the **Decrease** and **Increase** pushbuttons to change the highlighted item as you wish, then press **Set**. A brief message appears, "Clock has been updated," and you are returned to the *Time Configurations* screen.



***Set Clock* screen**

You can change the time or date when you have a GPS lock, but the clock will soon reset itself to the correct GPS time.

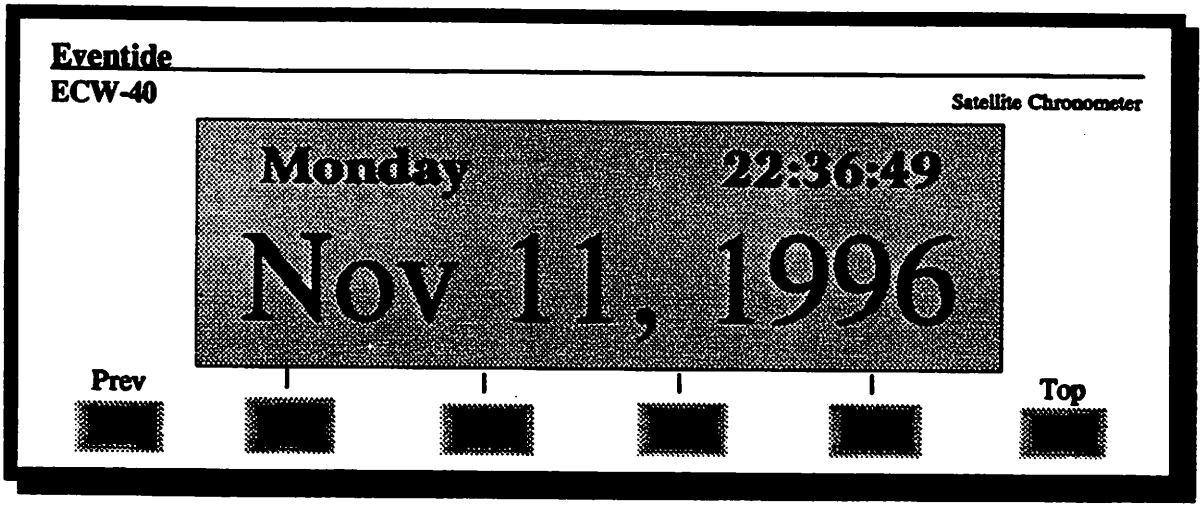
Choosing a Screen Display

You can choose the way information is displayed on the *Clock* or *Slave* screen on your ECW-40. Either select one of the 20 different presets included in your clock or design your own custom preset display. From the Top Menu, press **Configure**, press **Presets**, then press **Clock**. The current screen format will be highlighted

It is likely that one of the 20 supplied screen formats will meet your requirements. Use the "Previous" and "Next" keys to scroll through these options. A brief description of each preset is provided along with the ability to audition a selection by pressing and holding the **View** key. When you find the format you like, press **Choose**. The message "Saved New Clock Screen" briefly appears in the *Preset Menu*. Press **Top**, then **Clock**, to return to the Clock screen.

The screen format options are:

Big Chars with AMPM Time
Big Chars with Military Time
Big Weekday and AMPM Time
Big Weekday and Military Time
Date On Top With AMPM Time
Date on Top With Military Time
AMPM Time Top Right
Military Time Top Right
Large AMPM Time Small Date
Large Military Time Small Date
Day, date, AMPM time same size
Day, date, Mil. time same size
GMT and Local Time - AMPM
GMT and Local Time - Military
Navigation Time
Large Date Small Time On Top
Date Only - No Time
4 US timezones - Standard Time
4 US timezones - Daylight Time
4 Cities Military Time



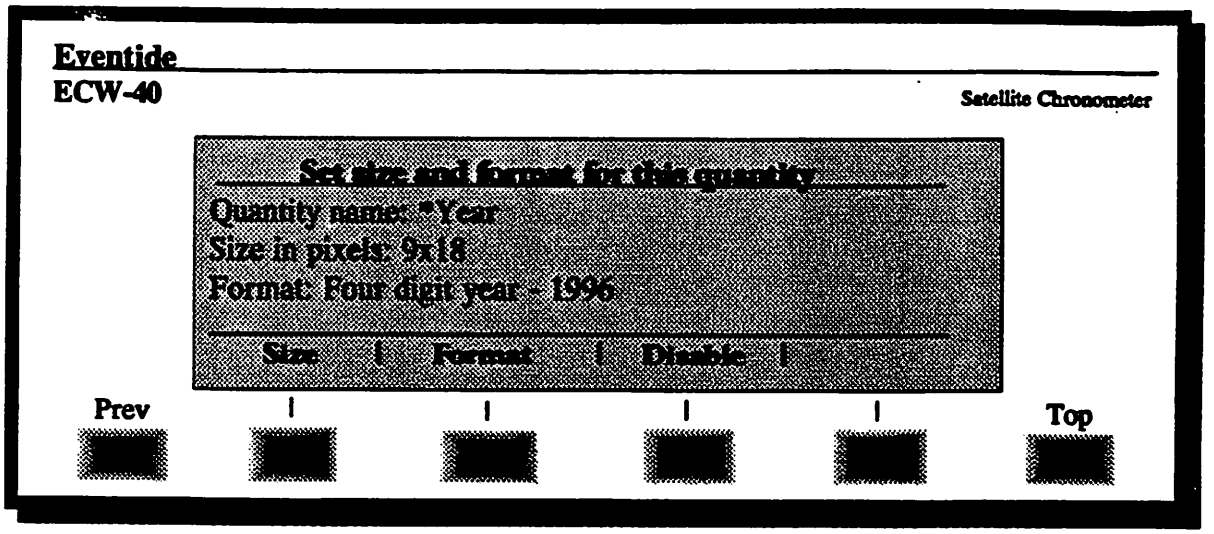
"Large Date Small Time On Top"

Designing a Custom Clock Screen

By designing a custom clock screen you not only can reposition and/or resize the usual clock elements - the date and time - you also can add available GPS information such as latitude and longitude to the *Clock* screen.

Begin by pressing **Top**, then **Configure**, then **Presets**, then **Design**. Note that the *Design* screen includes a **Help** function. From the *Design* screen, press **Start** and select (highlight) **User Preset #1**. Note that you can create three User Preset screens.

Press **Edit**. Now, highlight, by using the **Previous** and **Next** softkeys, the first item you wish to display on your clock screen, then press **Configure**. The "Set size and format for this quantity" screen presents several choices. In the example below, the year has been selected for configuration:



For now, do not change the settings. Press **Prev** and note that on the "Choose quantity to place on screen," "Year" now appears with an asterisk, indicating that at this point, Year is the only quantity that will appear on your new user-designed screen. Press **Position** and your new screen appears, with the year in the upper left corner. The four softkeys, unlabeled, move the year around the screen: left, right, up, and down. Use the softkeys to move the year on the screen to the desired position.

The design elements in the design screen are used for positioning purposes only. These default values will be replaced by correct values when you return to the *Clock* screen.

Now, press **Prev** to repeat the process for the next element you want to appear on your new *Clock* screen. Each new element will appear in the upper left corner of the *Position* screen; use the softkeys to position each new element on the screen.

When your custom screen has all elements in place, press **Prev** once to return to the Preset Design Screen. At this point you can **View** the changes you've made, then press **Save**. A brief message will appear, Saved New User Preset. Press and hold **View** to see your custom screen. If you wish to change the size or format of an element, highlight it in "Choose quantity to place on screen," go to **Configure**, and make the changes. If you wish to remove a quantity from the screen, press **Disable**; note that the asterisk is removed, indicating that the item will no longer appear on the screen. After making changes you must return to the Preset Design

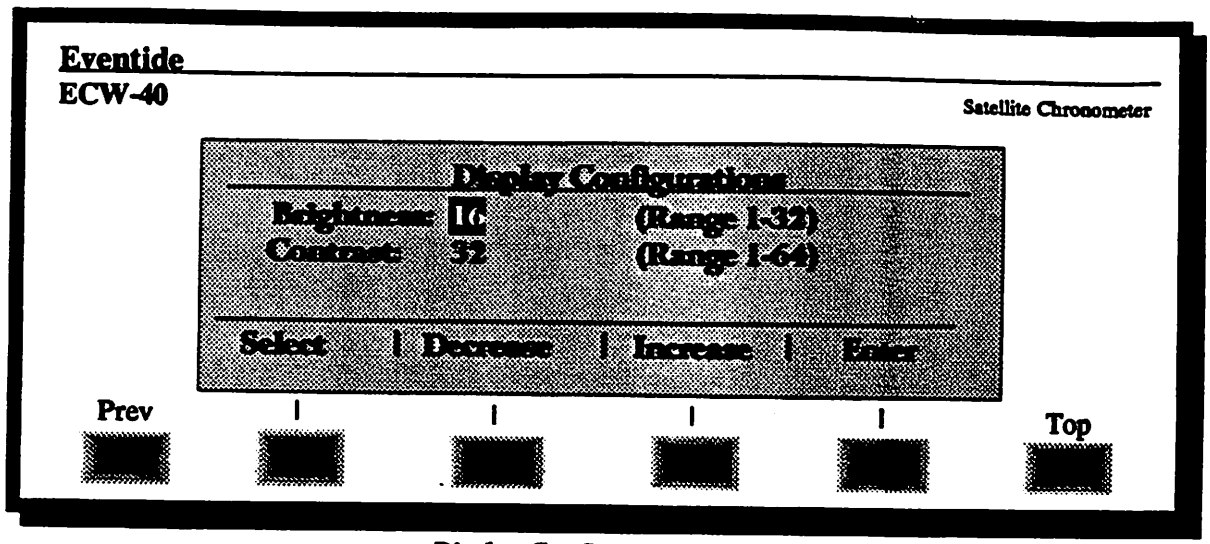
Screen and press **Save**.

Now, press **Prev** twice to display the Preset Menu and press **Clock**. Scroll down to User Preset #1 (or #2 or #3) until it is highlighted. Press **View** to see that the new screen is as you want it, then press **Choose**. Press **Top**, then press **Clock**, and note that your user designed screen is now in effect.

Hardware

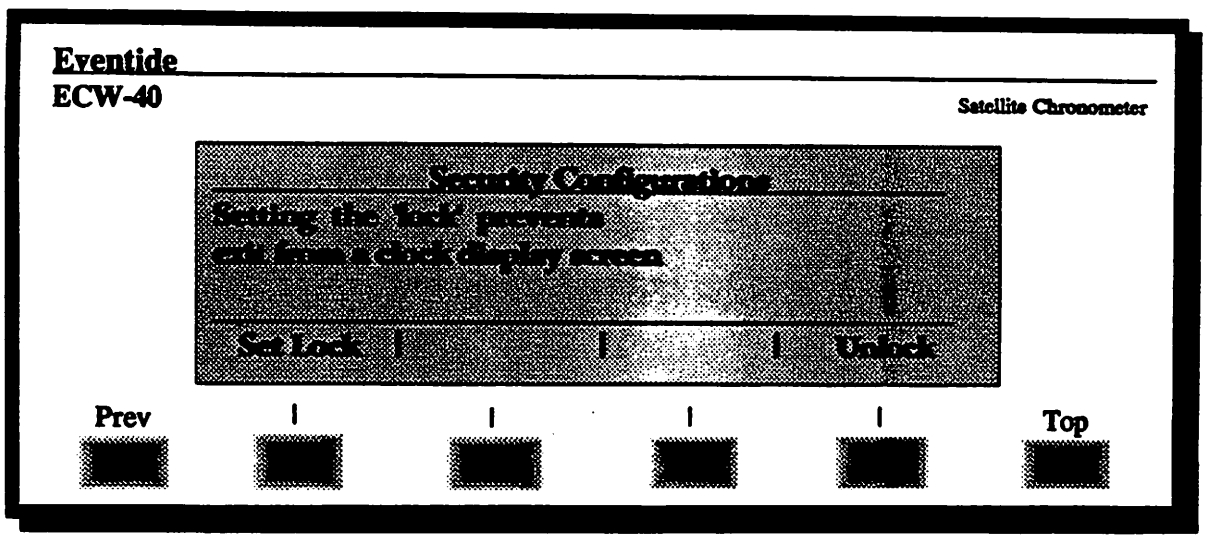
Pressing **Hardware** from the *Configuration menus* screen allows you to adjust the brightness and contrast of the LCD display, and to electronically "lock" the unit on the *Clock* screen for security.

Press **LCD** to see the *Display Configurations* menu; **Select** chooses between Brightness and Contrast, and **Decrease** and **Increase** change their values. Pressing **Enter** or **Prev** saves the changes and returns to the *Hardware Configurations* screen. Pressing **Top** also saves the changes and restores the *Top* screen.



***Display Configurations* screen**

From the *Hardware Configurations* screen, press **Security** for the *Security Configurations* screen. Security mode enables you to "lock" the ECW-40 on the clock screen to prevent unauthorized access.



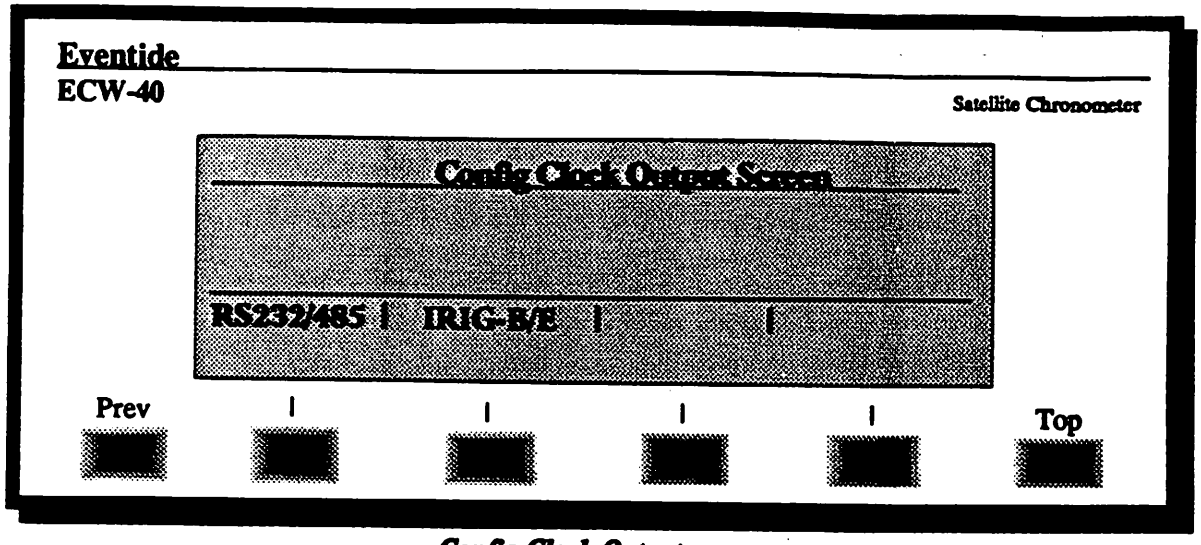
***Security Configurations* screen**

Press **Set Lock** and, after a brief message "The Lock Has Been Enabled" the *Hardware Configurations* screen returns. Now, return to the *Clock* screen by pressing **Top**, followed by pressing **Clock**. Note that, now, pressing **Top** does not produce the *Top* screen. In fact, all of the six pushbuttons have been disabled; the clock is locked.

To unlock the clock, press the three left-most pushbuttons simultaneously; The *Top* screen is displayed *but the clock is not yet unlocked.* To unlock the clock, press **Configure**, then **Hardware**, then **Security**, and then **Unlock**. You'll get the message "The Lock Has Been Disabled" and all clock functions are restored. If the clock is locked but loses power, the lock is disabled when power is restored.

Serial Communication Configuration (RS-232/485)

The ECW-40 supports both RS-232 and RS-485 serial communication. The unit can display only one of these serial formats at a time. The *Slave* screen is reserved for displaying the time received via serial communication. To configure serial communication parameters, go to the *Top* screen, press **Configure**, then press **Outputs** to display the following:

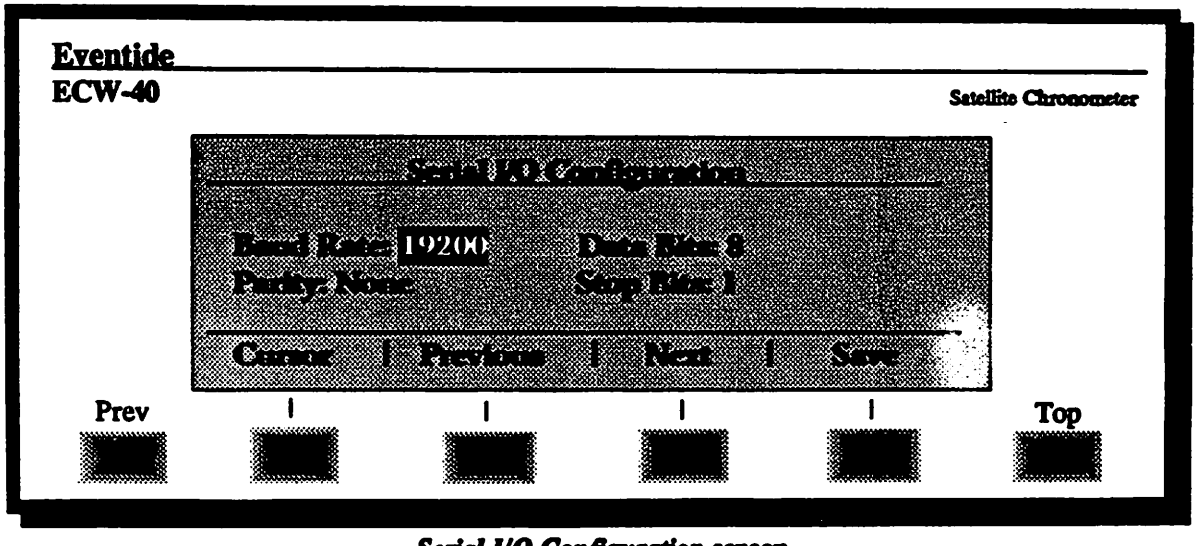


***Config Clock Output* screen**

Now press **RS232/485** to display the format you are currently receiving:

On the *Input/Output Configurations* screen the serial communication format you are set up to receive is highlighted in reverse text. Press **Select** to choose either RS-232 or RS-485 as the serial format you wish to receive.

Press **Configure** to set up serial communication parameters:



***Serial I/O Configuration* screen**

Press **Cursor** to select from Baud Rate, Data Bits, Parity, and Stop Bits.
Press **Previous** to change the displayed, current value to the *previous* available value.
Press **Next** to change the current value to the *next* available value.
Press **Save** to save the changes you've made to the serial I/O parameters.
Press **Top** to return to the *Top* menu without saving changes.

Baud Rate sets the speed at which characters are sent and received by the ECW-40 (300, 1200, 4800, 9600, or 19200 baud).

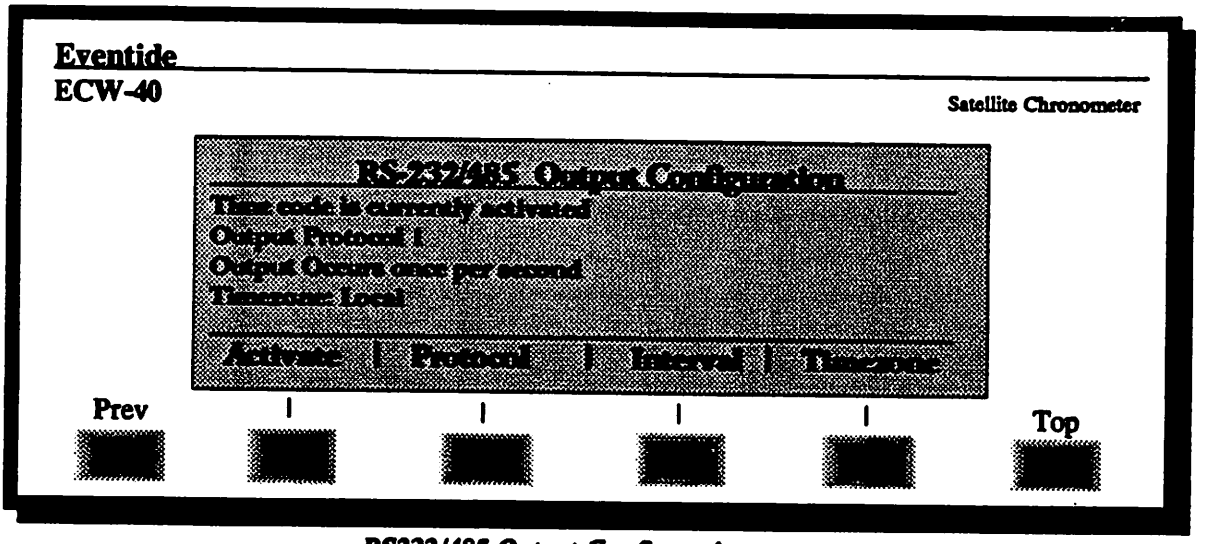
Parity sets parity bits; *None* for no parity, *Even* for even parity, and *Odd* for odd parity.

Data Bits sets the number of data bits per character. The options are 7 bits or 8 bits per character.

Stop Bits sets the number of stop bits. The options are 1 or 2 stop bits.

Pressing **Save** returns you to the *Input/Output Configuration* screen.

From the *Input/Output Configurations* screen, press **OutEnable** to view the *RS-232/485 Output Configuration* screen:



***RS232/485 Output Configuration* screen**

Activate allows you to *activate* or *deactivate* the timecode output (changing screen lines "Time code is currently activated/deactivated" and "Output Occurs."

Protocol selects one of three RS-232/485 protocols (see Formats 0, 1, and 2, below).

Interval selects the frequency of timecode outputs from *never, disabled*; *on demand*; or *once-per second* (changing Output Occurs line on screen). In *On Demand mode* the clock will output the selected protocol timecode when an ASCII "T" is received. An ASCII "S" followed by a protocol time string allows an external source to set the clock.

Timezone selects *UTC* or *local time* for RS-232/485 timecode output. You can set the clock to output formats 0 and 1 as once-per-second data stream outputs - the preferred data stream format.

But the ECW-40 also may be set to output any of the three timecode formats on demand by sending the ECW-40 an ASCII "T" for "time." The ECW-40 responds by sending Formats 0 and 1 on the flip of the next second or Format 2 immediately.

In addition, the ECW-40 can be set by an external device if it does not have a successful GPS lock by sending an asterisk (*) for Manual Set as shown above under the <I> command.

RS-232/485 output protocols

FORMAT 0:

<CR><LF>I<^><^>DDD<^>HH:MM:SS<^>DTZ=XX<CR><LF>

Key:

<CR>	Carriage return
<LF>	Line feed
<I>	Sync Status: ^=sync;?=sync lost;*=Manual Set
<^>	Space
<DDD>	Day of Year (001 -366)
<HH:MM:SS>	Hours:Minutes:Seconds
<D>	Daylight savings time indicator (S,I,D,O)
<XX>	Time Zone Setting (00-23)

FORMAT 1

<CR><LF>I<^>WWW<^>DDMMMYY<^>HH:MM:SS<CR><LF>

Key:

<CR>	Carriage return
<LF>	Line feed
<I>	Sync Status: ^=sync;?=sync lost;*=Manual Set
<^>	Space
<WWW>	Day of week: SUN/MON/TUE/WED/THU/FRI/SAT
<DD>	Numerical day of month 1 to 31
<MMM>	JAN/FEB/MAR/APR/MAY/JUN/JUL/AUG/SEP/OCT/NOV/DEC
<YY>	Year, 00 to 99
<HH:MM:SS>	Hours:Minutes:Seconds

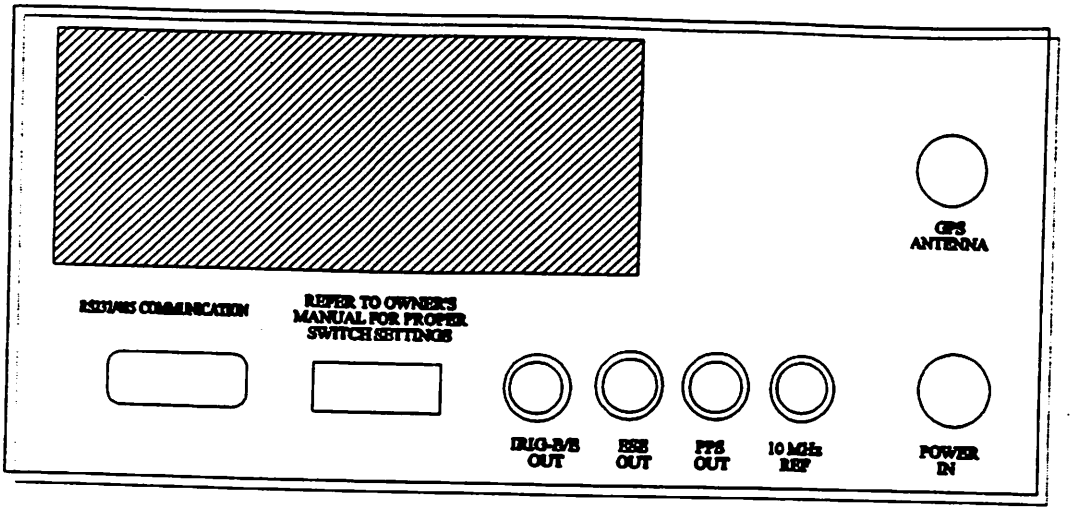
FORMAT 2

<CR><LF>IQYY<^>DDD<^>HH:MM:SS.XXX<^>LD

Key:

<CR>	Carriage return
<LF>	Line feed
<I>	Sync Status: ^=sync;?=sync lost;*=Manual Set
<Q>	Quality (^,A,B,C,D) [^ <1A <10B <100C <500 D <500ms]
<YY>	Year, 00 to 99
<^>	Space
<DDD>	Day of Year (001 to 366)
<HH:MM:SS>	Hours:Minutes:Seconds
<.>	Decimal Separator
<XXX>	Milliseconds
<L>	Leap second indicator
<D>	Daylight savings time indicator (S,I,D,O)

Cable connections to external devices



The 5-pin DIN connector labeled POWER IN connects to the power supply provided, which in turn connects to the AC mains with the 3-pronged power cable provided. The AC outlet should meet the power requirements printed on the power supply: 100 to 240 VAC, 50-60 Hz.

A standard computer-style DB-9 female connector labeled RS-232/485 COMMUNICATION is used to connect an external device providing a time signal to the ECW-40. The DB-9 pins are numbered 1 through 9 on the connector itself and are configured in the ECW-40 as follows:

Pin 1 - No connection
Pin 2 - RS-232 data ECW-40 input from external device (Rx)
Pin 3 - RS-232 data ECW-40 output to external device (Tx)
Pin 4 - Ground
Pin 5 - Ground
Pin 6 - RS-485 positive polarity output to external device (Tx+)
Pin 7 - RS-485 negative polarity output to external device (Tx-)
Pin 8 - RS-485 positive polarity input from external device (Rx+)
Pin 9 - RS-485 negative polarity input from external device (Rx-)

If you are using only RS-232, the connections required are :

Pin 2 - external device output;
Pin 3 - external device input;
Pin 5 - external device ground.

Four female "BNC" connectors are configured for connection of external devices, depending on what ECW-40 options have been installed (see Specifications):

IRIG-B/E OUT is on *optional* amplitude modulated, sinewave time standard output. **IRIG-B** (Interrange Instrumentation Group) output is one second at one kHz; **IRIG-E** output is 10 seconds at one kHz. These optional outputs may be used to synchronize older, analog equipment.

To configure IRIG outputs, proceed from the *Configuration Menus* screen, to **Outputs**, to **IRIG-B/E**, to display the *Configure IRIG Timecode Menu* screen. Highlight either IRIG-B or IRIG-E as desired, and press the **Timecode** softkey to toggle between UTC and local time (this affects only the timecode output; it does not change the time as displayed on the *Clock* screen).

ESE OUT is an *optional*, TTL pulsed time code, broadcast-standard output, usually used with SMPTE (Society of Motion Picture and Television Engineers) clock output.

PPS OUT is a one-second, 5-volt TTL pulsed output that can be used to synchronize a mechanical clock.

10 MHz REF is an *optional*, sine wave or TTL 10 MHz output that may be used for calibrating electronic test equipment.

Eight DIP switches on the rear panel are supplied in the down, OFF position. In the OFF position the switches do the following:

1. Terminates **ESE OUT;**
2. Terminates **PPS OUT;**
3. Not used;
4. Not used;
5. RS-485 receive (-);
6. RS-485 receive (+);
7. RS-485 transmit (-);
8. RS-485 transmit (+).

Specifications

Satellite Signal Input:

Ll, Coarse acquisition (C/A) code performance 1575.42 MHz, five parallel satellite tracking channels, can use measurements of up to nine satellites.

Interfaces:

RS 232 and RS 485 ASCII
IRIG-B or IRIG-E
One-pulse-per-second
Optional SMPTE; Ethernet: ESE; 10 MHz frequency standard

RS 232/485 Protocols:

Format 00:

<CR><LF>I<^><^>DDD<^>HH:MM:SS<^>DTZ=XX<CR><LF>

Format 1:

<CR><LF><^>WWW<^>DDMMMYY<^>HH:MM:SS<CR><LF>

Format 2:

<CR><LF>IQYY<^>DDD<^>HH:MM:SS.XXX<^>LD

Key:

CR=Carriage return
LF=Line feed
I=Sync status - ^ =Sync;? =Sync lost,*=Manual set
Q=Quality (^,A,B,C,D)[^>1 A<10 B<100 C<500 D<500ms]
YY=Year, 00-99
^=Space
DDD=Day of year (001 to 366)
HH:MM:SS=Hours:Minutes:Seconds
.=Decimal separator
XXX=Milliseconds
L=Leap year
D=Daylight Savings Time indicator (S,I,D,O)
XX=Time zone setting (00-23)
WWW=Day of week:Sun/Mon/Tue, etc.
DD=Numerical day of the month, 1-31
MMM=Month:Jan/Feb/Mar, etc.

Capital/Lower case: ECW-40 accepts both.

Once-per-second output: Settable to output Formats 0 or 1 as once-per-second data stream outputs.

Output on demand: Settable to output any of the three formats on demand by sending the ECW-40 an ASCII "T" for time. ECW-40 responds with Format 0 and 1 on the flip of the next second or Format 2 immediately.

Configurable Parameters:

GPS or UTC time
RS-232/485 baud rate, parity, data bits, and stop bits

Accuracy:

One pulse per second relative accuracy to +/- 1 microsecond;
RS232/485 data stream accurate to 20 milliseconds.

Display Characteristics:

Fluorescent backlit liquid crystal display (LCD), 1.5-in high, 5.25-in wide.'

Screens:

Actual time screen
20 pre-defined clock format screen presets
3 presets for custom user-designed screens
28-hour satellite tracking history graph screen
Display screen of time/date from external device

Front Panel Controls: Four variable-function control softkeys plus Prev (previous) screen and *Top* screen keys.

Rear Panel Connectors

POWER IN	(from supplied inverter)
GPS ANTENNA:	TNC
RS 232/485:	DB9
IRIG E/IRIG B:	BNC
One pulse per second:	BNC
10 MHZ reference:	BNC
ESE:	BNC

Antennas: Mast mount or surface (window) mount.

Power requirements: 100 VAC to 240 VAC, 47 to 63 Hz inverter (supplied)

Options & Accessories: SMPTE board; Ethernet board; ESE and 10 MHz outputs; redundant ECW-40 operation; antennas; cable; enhanced visibility displays.

Cabinet: 7.8 x 3 x 1 in. (W,H,D); 4.75 lbs (without DC inverter); desktop or EIA rack mount

Limited Warranty

The Eventide ECW-40 is warranted against defects in material and workmanship for one year from the date of purchase by the original purchaser from Eventide or an authorized dealer. Within the warranty period, Eventide will replace or repair, at its option, an ECW-40 or subassembly that becomes defective during ordinary service.

This warranty does not cover damage caused by mechanical or electrical abuse, such as physical damage, lightning, or connection to an inappropriate power source. It also doesn't cover additional damage caused by unsuccessful attempted repairs.

Responsibility for Shipping

To obtain service under this warranty, it is the responsibility of the customer to notify Eventide of any defects, at which time Eventide will either send replacement hardware as it determines appropriate, or will request return of the unit or of the defective module for repair. All shipping charges to Eventide are the responsibility of the customer. Eventide will pay for normal return shipping to the customer within the United States. All shipping charges outside the United States, and premium shipping charges within the United States, if requested by the customer, are the responsibility of the customer.

Additional Information

Please return your warranty card! The warranty begins when you receive the unit, and is not affected by your filling in the card. However, if we don't receive your card, we don't know who you are and can't send you update information or software.

For our overseas customers, our time zone is UTC-minus-five hours (UTC-minus-four hours from late April to late October). Our office hours are 09:00 to 16:00, our time. However, it is usually possible to call until 18:00 our time and still get useful information.

All return shipments from outside the United States must be fully prepaid, including customs charges, to our door. We recommend using UPS (United Parcel Service) if it's available in your area. (Our address is on Page 1).

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Set-up instructions for using the ECW-40 GPS Chronometer with the Eventide model VR240 Logging Recorder

Configure the VR240 as follows:

Note: Stop recording; the VR240 cannot be configured while in the record mode

1. Press the **Config** soft key
2. Press the **Clock** soft key
3. Press the **TimeInput** soft key
4. Press the **TimeSource** soft key
   Use the **Change** soft key to select **TIME SOURCE: EXTERNAL Chan F**
5. Press the **Done** soft key
6. Press the **TimeFormat** soft key
   Use the **Change** soft key to select **TIME FORMAT: 1**
7. Press the **Done** soft key
8. Press the **Quit** soft key twice
9. Press the **System** soft key
10. Press the **NEXT** soft key twice
11. Press the **Serial I/O** soft key
    Use the **Cursor** and **Change** soft keys to select:
    CHAN F: 19.2; BITS: 8; STOP: 1; PARITY: NONE
12. Press the **Save** soft key
13. Press the **Quit** soft key

Configure the ECW-40 as follows:

1. Press the **TOP** soft key
2. Press the **Configure** soft key
3. Press the **Outputs** soft key
4. Press the **RS323/485** soft key
5. Press **Select** soft key to choose **RS232** or **RS485**
6. Press the **Configure** soft key
7. Set the output for: **Baud Rate: 19200; Parity: NONE; Data Bits: 8; Stop Bit: 1**
8. Press **Save** soft key
9. Press the **Out Enable** soft key. Use the appropriate soft keys to set the output as follows:
   Time code is currently activated
   Output Protocol 1
   Output occurs once per second
   Timezone: local
10. Press the **TOP** soft key
11. Press the **Clock** soft key

Set-up instructions for using the ECW-40 GPS Chronometer with the Eventide model VR204 Logging Recorder

Configure the VR204 as follows:

Note: Stop recording; the VR204 cannot be configured while in the record mode

1. Press the **Config** soft key
2. Press the **Clock** soft key
3. Press the **TimeInput** soft key
4. Press the **Source** soft key
   Use the **Change** soft key to select **TIME SOURCE: EXTERNAL**
5. Press the **Done** soft key
6. Press the **Format** soft key
   Use the **Change** soft key to select **TIME FORMAT: 1**
7. Press the **Done** soft key
8. Press the **Quit** soft key
9. Press the **NEXT** soft key
10. Press the **SerialCom** soft key
    Use the **Cursor** and **Change** soft keys to select:

19.2	8	1	NONE
BaudRate	DataBits	StopBits	Parity

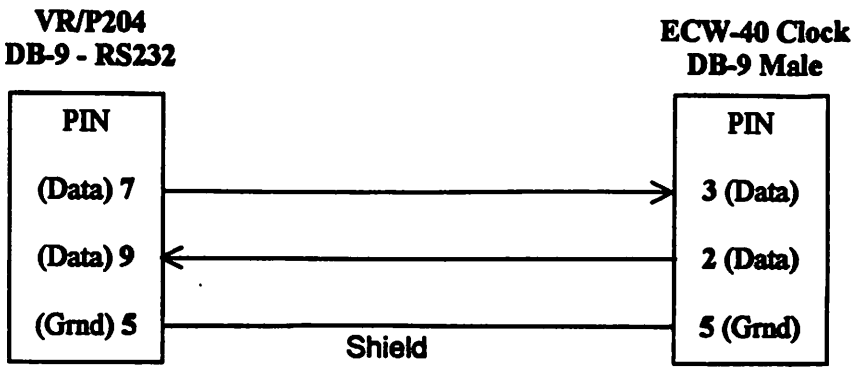
12. Press the **Next** soft key
13. Press the **Quit** soft key

Configure the ECW-40 as follows:

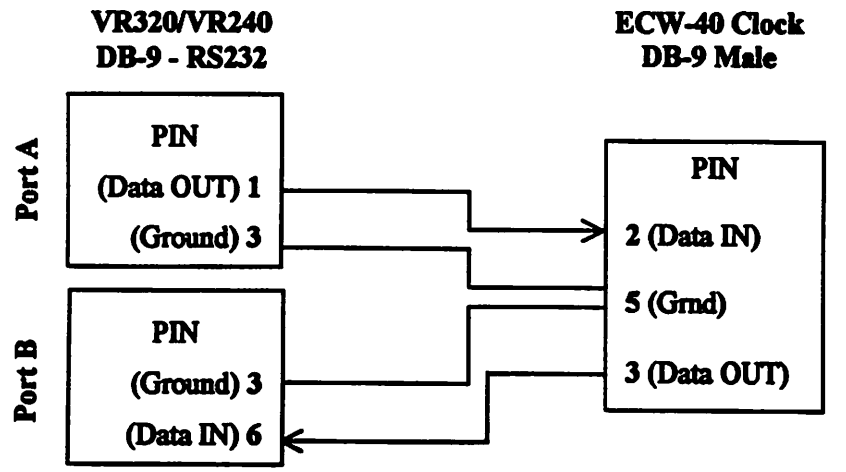
1. Press the **TOP** soft key
2. Press the **Configure** soft key
3. Press the **Outputs** soft key
4. Press the **RS323/485** soft key
5. Press **Select** soft key to choose **RS232** or **RS485**
6. Press the **Configure** soft key
7. Set the output for: **Baud Rate: 19200; Parity: NONE; Data Bits: 8; Stop Bit: 1**
8. Press **Save** soft key
9. Press the **Out Enable** soft key. Use the appropriate soft keys to set the output as follows:
   Time code is currently activated
   Output Protocol 1
   Output occurs once per second
   Timezone: local
10. Press the **TOP** soft key
11. Press the **Clock** soft key

RS232/RS485 Cable Diagram

Eventide model VR204 or VP204 Cable Pin-Outs:



Eventide model VR320 and VR240 RS232 Cable Pin-Outs:



Eventide model VR320 and VR240 RS485 Cable Pin-Outs: