

# Ageless Master Oscillator

Models 8197B



- **Simulcast Transmitter Frequency Control  $\pm 0.001$  Hz at 800 MHz**
- **Zero Calibration Costs**
- **Reduce HDTV Adjacent Channel Interference**
- **T1/E1, SONET, and ATM Synchronization**
- **Calibration Labs, Engineering Labs and Factory Reference**
- **GPS Time RAIM Satellite Error Detection**
- **5-Year Limited Warranty**

The patented Spectracom Ageless Master Oscillator is a highly accurate frequency and timing source. Outputs are locked to the U.S. Naval Observatory via the NAVSTAR Global Positioning System (GPS). A Time Receiver Autonomous Integrity Monitor (T-RAIM) algorithm detects and disqualifies faulty satellites to maintain the reliability of system outputs. Spectracom's field-proven Ageless Oscillator technology provides continuous automatic frequency control, compensating for aging and temperature drift.

The 8197B includes an internal Rubidium reference. It is ideally suited for use as a site master oscillator for communications systems. Typical applications include calibration, land mobile simulcast, narrow band land mobile radio, Specialized Mobile Radio (SMR), paging simulcast, satellite/microwave communication links, T1/E1, wireless telephone, SONET and ATM enterprise timing, and broadcast radio and television. To support your installation, Spectracom offers ancillary system components, including distribution amplifiers, frequency synthesizers, clock selectors, and clock converters.

## Output Accuracy

Locked:  $\pm 1 \times 10^{-12}$  typical, 24-hour average  
 Unlocked:  $\pm 2 \times 10^{-11}$ /week typical aging

## Front Panel

### 10 MHz:

One 10 MHz output (BNC Female); 750 mVrms sinewave, 50 ohm impedance 30 dB harmonic suppression.

### 1PPS:

TTL signal (BNC Female), accuracy is  $\pm 500$  nanosecond typical with SA off and in position hold.

### Data Comm Port:

RS-232 (DB 9 Female) interface for maintenance and performance monitoring.

## Rear Panel

### 10 MHz:

Four 10 MHz outputs (BNC Female); 750 mVrms sinewave, 50 ohm impedance 30 dB harmonic suppression.

### Phase Noise At 10 MHz Outputs:

Phase Noise:	Offset:
<97 dBc	1 Hz
<110 dBc	10 Hz
<125 dBc	100 Hz
<135 dBc	1000 Hz

### Timing Outputs:

1544 kHz (T1 rate) and 2048 kHz (E1 rate) @ RS-485 levels (RJ-11)

### Data Clock Outputs:

9.6 kHz, 18 kHz, and disciplined 1PPS at RS-485 levels (DB 9 Female)

### Data Sync Outputs:

64 kHz, 18 kHz, 17-2/3 Hz, 33-1/3 Hz at RS-485 levels (DB 15 Female)

**Alarm Outputs:** Relay contacts SPDT, 2A @ 30 VDC (terminal strip)

### Data Comm Port:

RS-485 (RJ-11) interface for maintenance and performance monitoring.

### GPS Antenna:

L1, C/A Code transmitted at 1575.42 MHz ("N" Type Female)

**Received Frequency:** 1575.42 MHz Satellites

**Tracked:** Up to 12, simultaneous, GPS T-RAIM satellite error management

### Power:

115/230 VAC  $\pm 15\%$ , 50/60 Hz (3-prong connector, 7' cord included). Maximum power consumption, 60W. Option 03 adds 25W.

## Options

### Internal Frequency Distribution Amplifier:

Option 03 converts four 10 MHz rear-panel outputs to the equivalent of Model 8140. Provides 10 MHz and +12 VDC to power LineTaps, MultiTaps, and VersaTaps which can also provide frequencies other than 10 MHz. For more information, see Model 8140 data sheet.

### Frequency Outputs:

Four 10 MHz rear panel outputs are converted to 12.8 MHz (Option 6), or 5 MHz (Option 07).

### CTCSS Outputs:

Option 14 provides two low-frequency RS-485 outputs, to nearest 1/3 Hz, synchronized to GPS on-time point. Uses Data Sync Output connector.

Option 17 provides 2 additional integer frequencies on DB9 Data Clock Connector. One Model 1118-2: CTCSS Filter Board is required per base station to be synchronized.

### Power:

12 VDC; Option 52,  $\pm 13.8$  VDC  $\pm 20\%$  (terminal strip)  
 24 VDC; Option 53,  $\pm 27.6$  VDC  $\pm 20\%$  (terminal strip)  
 48 VDC; Option 54,  $\pm 55.2$  VDC  $\pm 20\%$  (terminal strip)

### T1/E1 Outputs:

SP294: Adds (2) T1 (DS1 Framed All 1's) outputs (terminal block)  
 SP295: Adds (2) E1 (Framed All 1's – CAS/CRC4 multiframe, HDB3 coded) outputs (terminal block)

### 1PPS Outputs:

Option 16, 1PPS TTL outputs in place of frequency outputs 3 and 4.

### Mounting Slides:

Option 11 provides mounting slides to enable rack mounting in a 19" rack with slide-out capabilities.

## Physical & Environmental

**Size/Weight:** EIA 19" W X 3.5" H (2ru) x 12.5" D/20 lbs. maximum

### Indicators:

Power, tracking GPS, oscillator locked, minor alarm, major alarm

### Environmental:

-5° to +55° C (23° to +131° F) operating range  
 -40° to +85° C (-40° to +185° F) storage range  
 95% R.H. non-condensing

## FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Ordering Information

- Specify **Spectracom Model 8197B**, plus:  
**Option 03:** Internal Frequency Distribution Amplifier  
**Option 06:** 12.8 MHz Outputs  
**Option 07:** 5 MHz Outputs  
**Option 11:** Mounting Slides  
**Option 14:** CTCSS Outputs 1 and 2  
**Option 16:** 1PPS TTL Outputs in place of frequency outputs 3 and 4  
**Option 17:** CTCSS Outputs 3 and 4 (integers)  
**Option SP294:** T1  
**Option SP295:** E1

For power input other than 115/230 VAC:

**Option 52:** 12 VDC **Option 53:** 24 VDC **Option 54:** 48 VDC

- Specify Antenna and Accessories:

GPS Outdoor Antenna, Model 8225 and mounting hardware  
 Antenna Preamplifier, Model 8227  
 Antenna Surge Protector, GPS, Model 8226  
 Antenna Flat Roof Mount, Model 8213  
 Antenna Cable, LMR-400 equivalent, CAL7xxx (xxx=length in feet)

- Specify **Model 1118-2:** CTCSS Filter Board (one per Base Station).  
 Example: Model 8197B, Model 8225, Model 8226, CAL7100

## Warranty

5-Year Limited Warranty (The Rubidium oscillator component is warranted for two years from date of shipment.)

<sup>1</sup>The warranty period may be dependent on country.

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Specifications subject to change or improvement without notice.

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