

Ageless Master Oscillator

Models 8195B



- **Simulcast Transmitter Frequency Control ± 0.01 Hz at 800 MHz**
- **Precision Frequency Offsets Improve Simulcast Reception**
- **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 Oscillators are highly accurate frequency and timing sources. This model uses an Oven Controlled Crystal Oscillator internal reference. See Model 8197B for the Rubidium reference. Outputs are locked to the U.S. Naval Observatory via the NAVSTAR Global Positioning System (GPS). T-RAIM (Time Receiver Autonomous Integrity Monitor) algorithm detects and disqualifies faulty satellites to maintain the reliability of system outputs.

Spectracom's field-proven Ageless Oscillator technology provides continual automatic frequency control, compensating for aging and temperature drift. They are ideally suited as a site master oscillator for communication systems. Typical applications include calibration, land mobile simulcast, narrow band land mobile radio, SMR (Specialized Mobile Radio), paging simulcast, satellite/microwave communication links, T1/E1, cellular telephone, SONET and ATM enterprise timing and broadcast radio and television.

In simulcast systems, the CTCSS generator outputs are aligned site to site. A precision frequency offset feature minimizes carrier phase cancellation in overlap areas.

If AC power fails, an optional battery maintains the oscillator at its operational temperature thereby reducing the recovery period by eliminating oscillator warm-up and retrace. In addition, the battery keeps the electronics in standby mode to allow rapid recovery of the GPS 1PPS, Data Clock, and Data Sync outputs once power is restored.

Spectracom offers other system components, including distribution amplifiers, frequency synthesizers, clock selectors and clock converters.

Output Accuracy

locked: $\pm 1 \times 10^{-11}$ typical, 24-hour average
unlocked: $\pm 2 \times 10^{-9}$ /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 ± 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:

Phase Noise:	Offset:
< -75 dBc	1 Hz
< -115 dBc	10 Hz
< -135 dBc	100 Hz
< -145 dBc	1000 Hz

Programmable Precision Frequency Offsets:

Zero offset plus 4 positive and negative steps.
Step sizes in Hz: $\pm 3, 5, 7, 9$
at VHF Hi and 0.5, 1, 1.5, 2 at UHF

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, 20W. Option 02 adds 20W. Option 03 adds 25W.

Options**Internal Battery Backup:**

Option 02 Internal Battery Backup is available only on 115/230 VAC power. Upon start-up after a power failure of up to 18 hours, oscillator lock time is reduced to 2 hours from 3-4 hours, and 1PPS, Data Clock, and Data Sync outputs are rapidly realigned to GPS.

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, ± 13.8 VDC $\pm 20\%$ (terminal strip)
24 VDC; Option 53, ± 27.6 VDC $\pm 20\%$ (terminal strip)
48 VDC; Option 54, ± 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. max

Indicators:

Power, tracking GPS, oscillator locked, battery ready, battery charging, battery fault, minor alarm, major alarm

Environmental:

-30° to +60° C (-22° to +140° 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**1. Specify Spectracom Model 8195B, plus:**

Option 02: Internal Battery Backup (on 115/230 VAC version only)

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

2. Specify Antenna and Accessories:

GPS Outdoor Antenna, Model 8225 and mounting hardware

Antenna Surge Protector, GPS, Model 8226

Antenna Pre-amplifier, Model 8227

Antenna Flat Roof Mount, Model 8213

Antenna Cable, LMR-400 equivalent, CAL7xxx (xxx=length in feet)

3. Specify Model 1118-2: CTCSS Filter Board

(one per Base Station)

Example: Model 8195B-02, Model 8225,

Model 8226, CAL7100

Warranty

5-Year Limited Warranty

¹The warranty period may be dependent on country.