

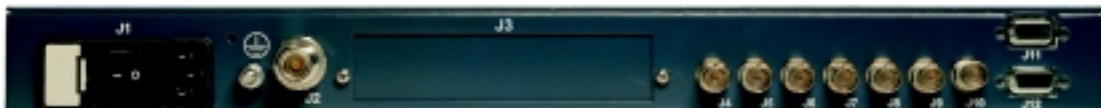
# ExacTime GPS Time Code and Frequency Generator Configuration Guide



This guide is designed to assist the user in customizing the ExacTime Series 6000 Time and Frequency Generator. The BNC connectors on the rear panel can be configured to provide the outputs listed on the data sheet. The factory selections are:

- J4 = Tracking (TTL)
- J5 = Locked (TTL)
- J6 = 1 PPS (TTL)
- J7 = 10 MHz (sine)
- J8 = IRIG B (AC)
- J9 = IRIG B (DCLS, TTL)
- J10 = Time Interval Input (1 PPS, TTL)

The ExacTime unit has a plug-in option motherboard with four (4) option pads (refer to the Option Motherboard, GPS Option 40x). Options are implemented with plug-in modules. The Option Configuration Table on the following page identifies all available options. Some option modules can be stacked together to provide additional functionality. However, stacking options sometimes requires the 2U chassis (ExacTime 6010, 3.5-inch chassis height). **Always consult the factory for assistance with stacked option configurations.**



ExacTime 6000 (1U chassis: 1.75")



ExacTime 6010 (2U chassis: 3.5")



### 01 Multiple Time Code Output

This option is described in detail in a separate data sheet. Three (3) simultaneous modulated time code outputs can be programmed with either the same or different time code formats.

**Option Slots: 2**

**Prerequisite: Option 40**

**Connectors: J3A, B & C or J3D, E & F**

### 01A Multiple Time Code DC Level Output

If Option 01 is selected, this option provides DC level shift outputs for the output time codes.

**Option Slots: 0**

**Prerequisite: GPS Option 01**

**Connectors: J3D, E & F (9390-6000)  
J13 (9390-6010)**

### 06A 1 MHz Sine Wave Output

The 1 MHz Sine Wave output is derived from the internal disciplined oscillator by frequency division. The long term accuracy and stability is the same as the internal crystal oscillator.

**Option Slots: 1**

**Prerequisite: Option 40**

**Connectors: J3A, B, D or E**

### 07A 5 MHz Sine Wave Output

The 5 MHz Sine Wave output is derived from the internal disciplined oscillator by frequency division. The long term accuracy and stability is the same as the internal crystal oscillator.

**Option Slots: 1**

**Prerequisite: Option 40**

**Connectors: J3A, B, D or E**

### 08BE -48 VDC Power

Negative 48 VDC input power is connected via a 4-pin nylon Molex connector. The input connections are completely isolated from the chassis and the signal ground of the unit into the DC/DC converter power supply. Not available with Option 15A.

**Option Slots: 0**

**Prerequisite: None**

**Connectors: J1**

### 08CE 10 to 32 VDC Power

DC input power is connected via a 4-pin nylon Molex connector. The input connections are completely isolated from the chassis and the signal ground of the unit into the DC/DC converter power supply. Not available with Option 15A.

**Option Slots: 0**

**Prerequisite: None**

**Connectors: J1**

### 10B Low Phase Noise Oscillator

Characteristics of this low phase noise, high stability quartz oscillator include aging rate of  $5 \times 10^{-10}$ /day, temperature stability of  $\pm 3 \times 10^{-8}$  from -20 C to +70 C with phase noise of:

- 85 dBc/Hz @ 1 Hz
- 113 dBc/Hz @ 10 Hz
- 134 dBc/Hz @ 100 Hz
- 144 dBc/Hz @ 1 kHz
- 148 dBc/Hz @ 10 kHz

While disciplining, the frequency offset is typically  $< 5 \times 10^{-10}$  in one second and  $< 2 \times 10^{-12}$  when averaged over a day. The above phase noise specifications apply to the 10 MHz sine wave output only.

**Option Slots: 0**

**Prerequisite: None**

### 13A Parallel BCD Output (D-mS)

Time is output by parallel BCD digits representing days, hours, minutes, seconds and three digits of fractional seconds (millisecond resolution). The outputs are standard HCMOS compatible. Each line is capable of sinking and sourcing 4 mA. Included in the output is a strobe signal that is normally low, going high when the BCD data is being updated, and going low when the data is stable. This signal's falling edge can be used as a clock to load data into external registers.

**Option Slots: 2**

**Prerequisite: Option 40A**

### 14 IEEE-488 Bus Interface

This option provides the same remote control commands and responses as the standard RS-232 I/O.

**Option Slots: 2**

**Prerequisite: Option 40D**

**Connectors: J3A, B & C or J3D, E & F**



**15A Rubidium Oscillator (LPRO)**

An Efratom Low Profile Rubidium Oscillator provides an aging rate of  $5 \times 10^{-11}$ /month, typical frequency offset while disciplining of  $< 2 \times 10^{-12}$ , and time stability of less than  $\pm 50$  nanoseconds.

**Option Slots: 0**

**Prerequisites: None**

**20x Long Antenna Cable**

Cable type is Belden 9913 low loss cable with type N connectors at both ends.

Option 20A = 100 foot cable

Option 20B = 200 foot cable

Option 20C = 300 foot cable

**Option Slots: 0**

**Prerequisite: None**

**20x Long Antenna Cable**

Cable type is Belden 9913 low loss cable with type N connectors at both ends.

Option 20D = 400 foot cable

Option 20E = 500 foot cable

**Option Slots: 0**

**Prerequisite: GPS Option 26B**

**21A 10 MHz Sine Wave Output**

The 10 MHz Sine Wave output is derived directly from the internal disciplined oscillator. The long term stability is the same as the internal oscillator.

**Option Slots: 1**

**Prerequisite: None**

**Connectors: J3A, B, D or E**

**23x Lightning Arrestor with Cable**

The lightning arrestor option provides an in-line unit that protects the GPS receiver from lightning surges. It is provided with 25 feet of low loss cable. This option is desirable in high lightning areas of the country. Connectors are Type N at both ends of the cable.

Option 24A is provided with this option.

Option 23A = 25-foot cable

Option 23B = 50-foot cable

**Option Slots: 0**

**Prerequisite: None**

**24A Bias'T' Internal**

This option is required to drive the High Gain Antenna (Option 26B), Airborne Antenna (Option 26C), Lightning Arrestor (Option 23A and 23B) and some long antenna cable runs.

**Option Slots: 0**

**Prerequisite: None**

**25 Rack Mount Slides**

The ExacTime 6000 and 6010 are provided with rack mount flanges, but body support should be provided to avoid twisting the mounting flanges and front panel. This rack mount slide kit fits either chassis. The slides are furnished with hardware for mounting to front and rear RETMA rails.

**Option Slots: 0**

**Prerequisite: None**

**26B 55144 High Gain GPS Antenna**

This antenna supports an antenna cable loss of up to 35dB. It is required for Option 20D (400') or 20E (500') antenna cables. Option 24A is provided with this option.

**Option Slots: 0**

**Prerequisites: None**

**26C 55058-1 Airborne GPS Antenna**

This antenna is required for all airborne installations. The antenna connector is a miniature SMA type. A short type N-to-SMA adapter cable is furnished.

**Option Slots: 0**

**Prerequisites: Option 24A**

**27A Twelve Channel Distribution Board**

This module is used in conjunction with Option 27B (required) to provide up to twelve buffered output signals on BNC connectors. The larger ExacTime 6010 chassis (3.5") is required to accommodate the additional BNC output connectors on the rear panel.

**Option Slots: 2**

**Prerequisite: ExacTime 6010 with Option 40**



### **27B DC to 10 MHz Buffer Module**

One buffer module is required for each signal to be output (up to twelve). Twelve module sockets are provided on the Option 27A board. The module can accommodate a wide range of signals from DC to 10 MHz. It can be used for buffering pulse rates, time codes and frequencies. Many jumper selections are available under each buffer module socket.

**Option Slots: 0**

**Prerequisite: Option 27A**

### **27D 1PPS Pulse Buffer**

The 1PPS Pulse Buffer provides a 1PPS output at 10 volts peak into a 50W load as provided by most Cesium atomic standards.

**Option Slots: 0**

**Prerequisite: Option 27A**

### **33A 1.544/2.048 MHz Square Wave Output**

This module provides a square wave frequency output of either 1.544 MHz or 2.048 MHz (selected by DIP switch) that is phase locked to the internal disciplined oscillator. The basic ExacTime will provide Stratum III performance, Stratum II with Option 10B, and Stratum I with Option 15A.

**Option Slots: 1**

**Prerequisite: Option 40**

### **33B T1 (1.544) Framed Ones Output**

Provides an output of framed all ones T1 signal to operate in telecommunications systems typically within the United States. The basic ExacTime will provide Stratum III performance, Stratum II with Option 10B, and Stratum I with Option 15A.

**Option Slots: 2**

**Prerequisite: Option 40B**

**Connectors: J3A**

### **33C E1 (2.048) Framed Ones Output**

Provides an output of framed all ones E1 signal to operate in telecommunications systems typically outside the United States. The basic ExacTime will provide Stratum III performance, Stratum II with Option 10B, and Stratum I with Option 15A.

**Option Slots: 2**

**Prerequisite: Option 40B**

**Connectors: J3A**

### **40x Option Motherboard**

This assembly provides the GPS unit with four option slots. It is required for most of the option modules described in this Configuration Guide. There is more than one version of this motherboard, so care must be taken to select the Option Motherboard that is required to support a particular option. Each option described here includes a statement of the prerequisite for the option.

**Option Slots: 0**

**Prerequisite: None**

### **43 Remote Control Software for Windows 95/98/NT**

This program provides an intuitive control utility for the ExacTime GPS Time & Frequency Generator. Virtually every control that is available on the front panel is also available through this remote control utility. This is furnished at no cost with every ExacTime unit. An additional free copy may be ordered by sending an email request to [salessj@datum.com](mailto:salessj@datum.com).

**Option Slots: 0**

**Prerequisite: None**

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#### **Datum - San Jose**

6781 Via Del Oro

San Jose CA 95119-1360

Toll Free (800) 348-0648

Telephone (408) 578-4161

Fax (408) 574-4950

e-mail [salessj@datum.com](mailto:salessj@datum.com)

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