

# Epsilon Clocks

## Options for EC2/EC3

### 5 MHz Outputs

#### Description

This option allows Epsilon Clocks, Model EC2S or EC3S to provide 5 MHz frequency outputs instead of 10 MHz.

#### Main Features

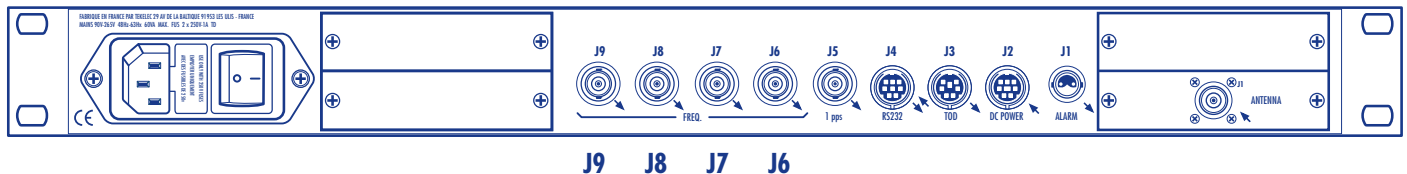
**Connectors:** J6, J7, J8 and J9 on rear panel (BNC Female)

#### Pin settings:

- Core: Sine wave signal  
Frequency: 5 MHz  
Level: > 13 dBm typical over 50 Ω
- Ground: electrical ground of the clock

Other characteristics are identical to the 10 MHz outputs (see EC2S or EC3S data sheet)

### Rear Panel View of Epsilon Clock, Model EC2S



### Additional 1PPS Outputs

#### Description

This option allows Epsilon Clocks, Model EC2S or EC3S to provide three more 1PPS outputs on connectors J11, J12 and J13.

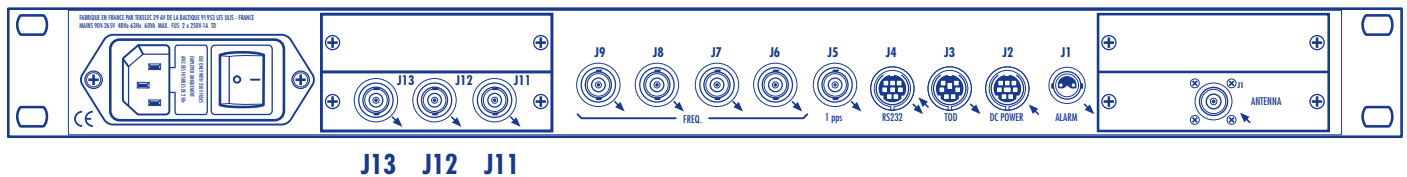
#### Main Features

**Connector:** J11, J12, J13 on rear panel, added module (BNC Female)

#### Pin settings:

- Core: periodic pulse  
Period: 1s  
Active edge: rising  
Pulse duration: 100 μs ± 10 μs  
High-level: > 2.4 V load 50 Ω  
Low-level: < 0.8 V load 50 Ω  
Rising edge duration: < 20 ns load 50 Ω
- Ground: electrical and mechanical ground of the clock

### Rear Panel View of Epsilon Clock, Model EC2S



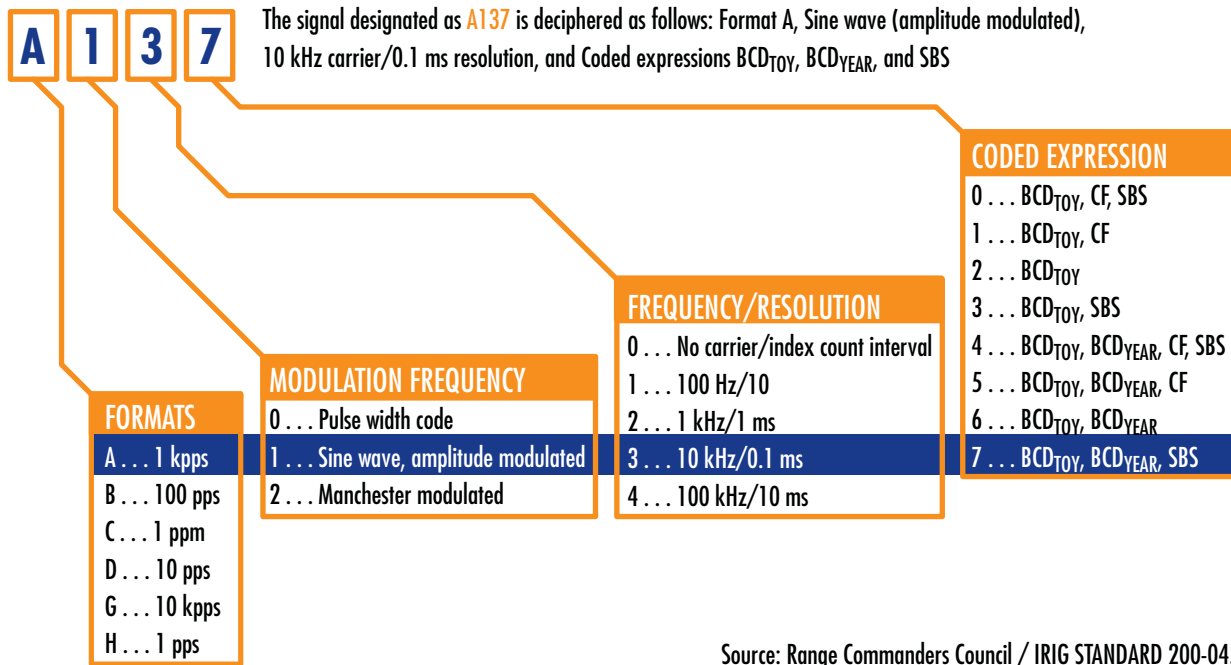
## Additional IRIG-B Time Code Output

### Description

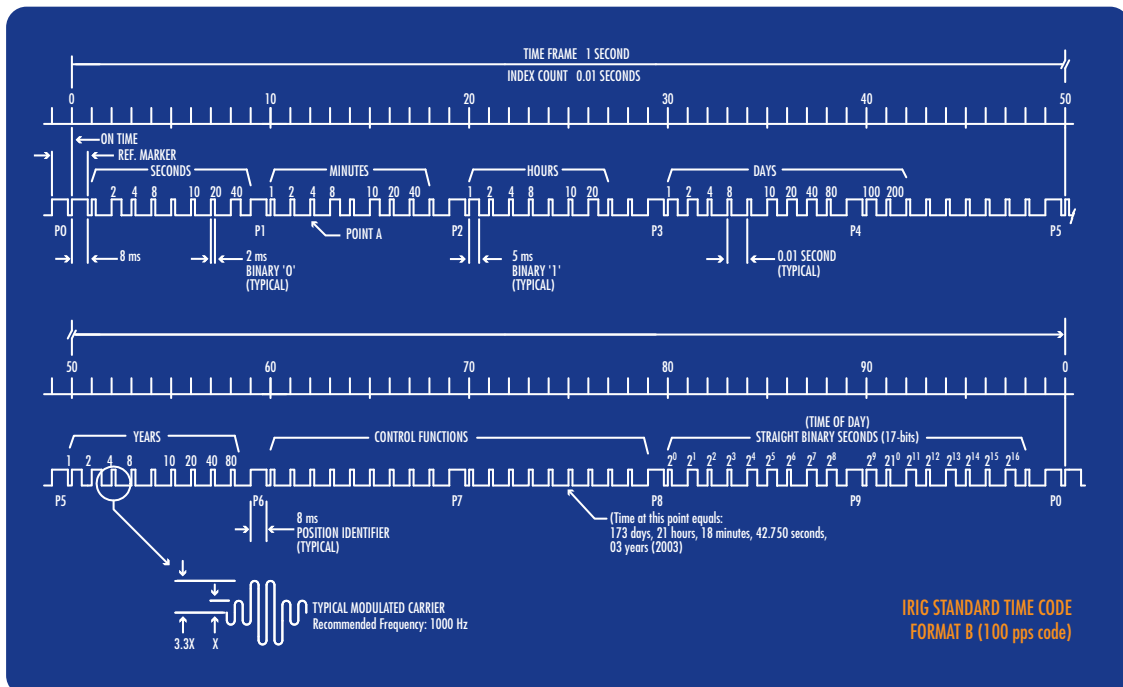
This option allows Epsilon Clocks, Model EC2S or EC3S to provide two time code outputs on J11, J12 in accordance with IRIG-B Recommendation (Inter Range Instrumentation Group - format B).

### Serial Time Code Formats

The family of rate-scaled serial time code formats is designated A, B, D, E, G, and H. Various combinations of sub-words and signal forms make up a time code word. All formats do not contain each standard coded expression, and various signal forms are possible. To differentiate between these forms, signal identification numbers are assigned to each permissible combination.



Source: Range Commanders Council / IRIG STANDARD 200-04.



**Format B example:** BCD time-of-year in days, hours, minutes, seconds and year and straight binary seconds-of-day and control bits

## Available Signal Format on Epsilon Clocks, Model EC2S or EC3S

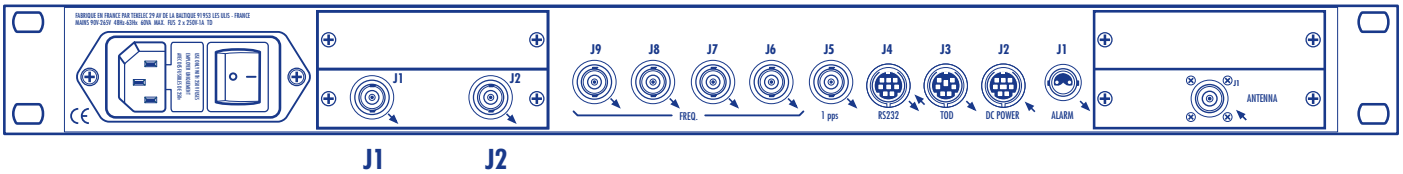
### B 122

- 1 = Sine wave, amplitude modulated
- 2 = 1 kHz/1 ms
- 3 = BCDTOY

### B 123

- 1 = Sine wave, amplitude modulated
- 2 = 1 kHz/1 ms
- 3 = BCDTOY, SBS

Connectors: J11 and J12 on rear panel, added module  
 BNC Female  
 Maximum output level of 1 kHz carrier: 2.2 Vpp / 600 Ω (typical)



## Additional Stanag 4430 Time Code Output

### Description

This option allows Epsilon Clocks, Model EC2S or EC3S to provide one additional time code outputs in accordance with STANAG 4430 Recommendation, Edition 1 (NATO).

### Main Features

STANAG is NATO abbreviation for Standardization Agreement. STANAG 4430 defines "Precise Time and Frequency Standards (PTFS) for military electronic systems."

Spectracom provides three different electrical levels:

- Standard Time Message (STM) and Have Quick\* Message (0/5V square signal) with synchronization
- Standard Time Message (STM) Have Quick\* Message (RS-485 signal) with synchronization

Connector: SUB-D 25 female pins (HE501) mounted on rear panel

"Reserved" pins should not be connected by the user!

(\* ) Aircraft and ground radios that employ HAVE QUICK must be initialized with accurate Time Of Day (TOD), a Word Of the Day (WOD) which serves as a key, and a NET number (providing mode selection and multiple networks to use the same word of the day). The Word Of the Day, Time Of Day and NET number are input to a cryptographic pseudorandom number generator that controls the frequency changes.

### Pin Settings

Pin #	Signal Description
1	Electrical and mechanical ground
2	RS485 Time Message high
3	Reserved
4	XHQ RS485 high message
5	Reserved
6	Electrical and mechanical ground
7	Electrical and mechanical ground
8	Reserved
9	1PPS RS485 high
10	Reserved
11	Reserved
12	Electrical and mechanical ground
13	0/5V Have Quick message broadened
14	RS485 Time Message low
15	Reserved
16	Reserved
17	XHQ RS485 low message
18	Reserved
19	Reserved
20	Reserved
21	1PPS RS485 low
22	Reserved
23	Electrical and mechanical ground
24	1PPS Have Quick 0-5V
25	Electrical and mechanical ground

