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LeapSeconds

Overview

The International Earth Rotation and Reference Systems Service, the organization responsible for measuring the relationship between UTC (Coordinated Universal Time) and the rate of Earth's rotation, announced that a positive leap second would be introduced at the end of December 2005. Leap seconds don't happen every year, only when needed. The last one was on December 31, 1998.

The world's timekeepers will add this leap second on December 31, 2005. The leap second insertion increases the length of the last minute of the UTC day to 61 seconds.

Either the Evertz 5600MSC and 5010-GPSII may be used as a time reference. Depending on the particular product and configuration there are different steps you should take or be aware of as we approach December 31.

If your particular use of the Evertz 5600MSC or 5010-GPSII differs from the information provided here please contact Evertz customer service at service@evertz.com with your specific system details.

How the 5600MSC handles leap seconds.

If you are using the phone line method of updating the 5600MSC time, you may need to check with the provider of this service to verify how they will be handling the leap second. Although the leap second technically happens at 12:00am UTC time on December 31, local reference clocks may choose to update at a more convenient local time to prevent disruptions. Depending on when your current time update is scheduled you may want to change it for this event. When the phone call is made, the 5600MSC system time will be adjusted for the leap second. The time of the phone call is set using the Modem Dial time register. If you want to have the leap second take effect in the 5600MSC at a different time, then you can adjust the Modem Dial time.

If you are using GPS as the Time Reference, the 5600MSC will rejam its system time and adjust for the leap second when it sees the leap second occur (at midnight Dec 31).

Whenever the 5600 system time is adjusted (either manually through the front panel or from its time reference), each of the timecode generators in the 5600 (LTC1, LTC2, the VITC generators for each black output and for the ATG and STG generators) will resynchronize to the new system time, therefore adjusting for the leap second. Note that for PAL related timecode if the Colour frame mode of the generator is Off the jammed timecode may be offset by 1 frame from the actual time to keep it in phase with the 4 field PAL sequence. For PAL related timecodes if the Colour Frame mode is turned On the jammed timecode may be offset by up to 3 frames from the actual time to keep it in phase with the 8 field PAL sequence.

This means that the time code outputs will change at UTC midnight regardless of your local time zone. If you want the change to occur at a more convenient time (i.e. when your station is off air) then you can change the menu settings in the 5600MSC to ignore the GPS time temporarily as follows.

1. On December 31, set the FREQUENCY REF to Internal freq ref and set the TIME REF to No time ref. This will allow the 5600MSC System time to continue counting without disruptions across the leap second change.
2. When the change will be convenient set them back to the original settings FREQUENCY REF to GPS freq ref and set the TIME REF to GPS time ref. This will resync the 5600 System time to the GPS time and cause the leap second adjustment to happen.

How the 5010–GPSII (and 5010–VITC–GPSII) handles leap seconds.

When DIP switch 3 is CLOSED, the 5010–GPS resyncs to the GPS at the time specified by the GPS@ register. At the first GPS@ time after the leap second occurs (at midnight Dec 31) then it will rejam its generator clock and adjust for the leap second. Normally the 'GPS@' time would be set to occur when a station is off air so as not to disrupt the automation systems and other devices that are reading the timecode.

When DIP switch 3 is OPEN (Default), the 5010–GPS resyncs to the GPS whenever the time difference is greater than one half second and at the time specified by the GPS@ register. In this mode the 5010–GPS will resync right after the leap second occurs (at midnight Dec 31) then it will rejam its generator clock and adjust for the leap second. If you want the change to occur at a more convenient time (ie when your station is off air) then you can change the menu settings in the 5010–GPS to ignore the GPS time temporarily as follows.

1. On December 31, set the GEN MODE to TIME DATE. This will allow the 5010–GPS to continue counting without disruptions across the leap second change.
2. When the change will be convenient set the GEN MODE back to the original settings GPS TIME DATE. This will resync the 5010–GPS time to the GPS time and cause the leap second adjustment to happen.

Note that for PAL related timecode if the Colour frame mode of the generator is set to '4 field' the jammed timecode may be offset by 1 frame from the actual time to keep it in phase with the 4 field PAL sequence. For PAL related timecodes if the Colour Frame mode is set to '8 field' the jammed timecode may be offset by up to 3 frames from the actual time to keep it in phase with the 8 field PAL sequence.