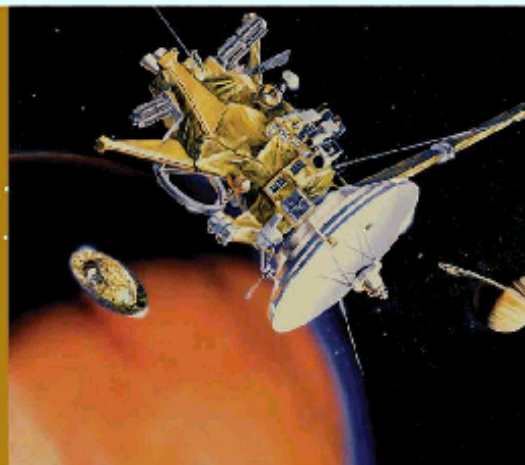
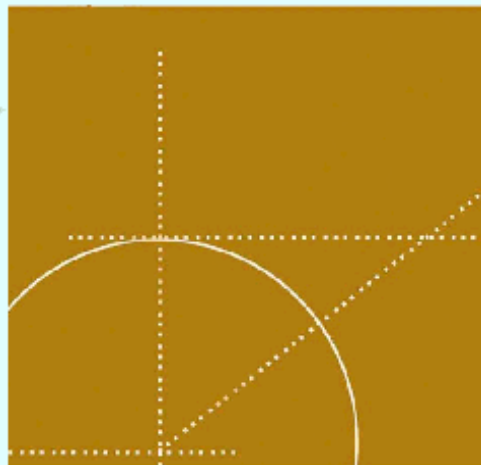




Cirocomm, the Future is Wireless



REV 1.0

GPS Receiver/CT-5510 Application Note

Power Management Features

This document describes the ways to efficiently manage the power consumption of the CT5510 module.

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Agenda

The design of CT5510 emphasizes on compact overall physical dimension and fast fix time. To accomplish these traits, CT5510 was designed not to carry a capacitor or backup battery onboard. This application notes will demonstrate on ways to efficiently manage the power consumption of CT5510 and achieve fast start/fix time.

Power saving methods

1. Using the “Sleep” mode and PWRDOWN command
2. Using the INITAID (Initial position and time aiding) command

Advantages:

PWRDOWN command procedure:

Using the sleep mode is recommended when navigation isn't needed, since CT5510 consumes remarkably little power in the sleep mode and still re-acquires the navigation fix quickly after waking up.

CT5510 consume between 70 μ A to 100 μ A during sleep mode, comparing to 50mA in navigation mode.

INITAID command procedure:

Setting this information before starting navigating with the \$PFST,START command reduces the time required for finding the satellites and receiving the first valid navigation fix. Therefore, CT5510 achieves fast starting time that's comparable to modules that have battery backup units.

(Note: comparing to the PWRDOWN command procedure, INITAID command requires the complete shut down of power supply, including the antenna.)

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1. PWRDOWN – CT5510 to Sleep Mode

Commands CT5510 to sleep mode.

CT5510 wakes up from the sleep mode when the timeout has expired or the GPIO pin 11 state is toggled. If the receiver was navigating when the PWRDOWN command was given, navigation will automatically be restarted after waking up from the sleep mode.

\$PFST,PWRDOWN,<hours>,<minutes>,<seconds>

or

\$PFST,PWRDOWN

<hours>	How many hours to sleep
<minutes>	How many minutes to sleep
<seconds>	How many seconds to sleep

Examples:

```
$PFST,PWRDOWN,1,30,15<CR><LF>
```

Sleep for 1h 30min 15 sec or until GPIO 11 pin is toggled.

```
$PFST,PWRDOWN,0,0,30<CR><LF>
```

Sleep for 30 seconds or until GPIO 11 pin is toggled.

```
$PFST,PWRDOWN<CR><LF>
```

Sleep until GPIO 11 pin is toggled.

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The following section introduces commands for providing the CT5510 receiver with additional data that will be helpful when starting navigation and during navigation.

2. INITAID – Initial position and time aiding

Gives the CT5510 module the current position and time information for aiding the navigation startup.

If the position isn't known, the initial time may also be given alone by omitting the position parameters, i.e. using the command with only the first two parameters. The altitude information is not critical and can be set to zero (i.e. mean sea level) if not known.

NOTE: Even after INITAID is issued, the CT5510 module continues to report the navigation data of the previous actual navigation fix until a new fix is acquired.

\$PFST,INITAID,<time>,<date>,<lat>,<N/S>,<long>,<E/W>,<altitude>

<time>	UTC time in “hhmmss.dd” format, hh = hours (2 digits), mm = minutes (2 digits), ss.dd = seconds with two decimals (2+2 digits).
<date>	UTC date in “ddmmyy” format, dd = day (2 digits), mm = month (2 digits), yy = year (2 digits).
<lat>	Latitude in degrees and minutes in “xxmm.dddd” format, xx = degrees (1-2 digits), mm.dddd = minutes with four decimals (2+4 digits).
<N/S>	Either a character N or S (N = north, S = south).
<long>	Longitude in degrees and minutes in “yyymm.dddd” format, yyy = degrees (1-3 digits), mm.dddd = minutes with four decimals (2+4 digits).
<E/W>	Either a character E or W (E = east, W = west).
<altitude>	Altitude from the sea level in meters (1-5 digits).

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Examples:

```
$PFST,INITAID,131500.78,100102,6016.3075,N,2458.3817,E,40<CR><LF>
```

Sets the initial position and time as follows:

Time = 13:15:00.78 (UTC)

Date = 10 10-Jan Jan-2002

Latitude = N60 816.3075

Longitude = E24858.3817

Altitude = 40 meters above the sea level

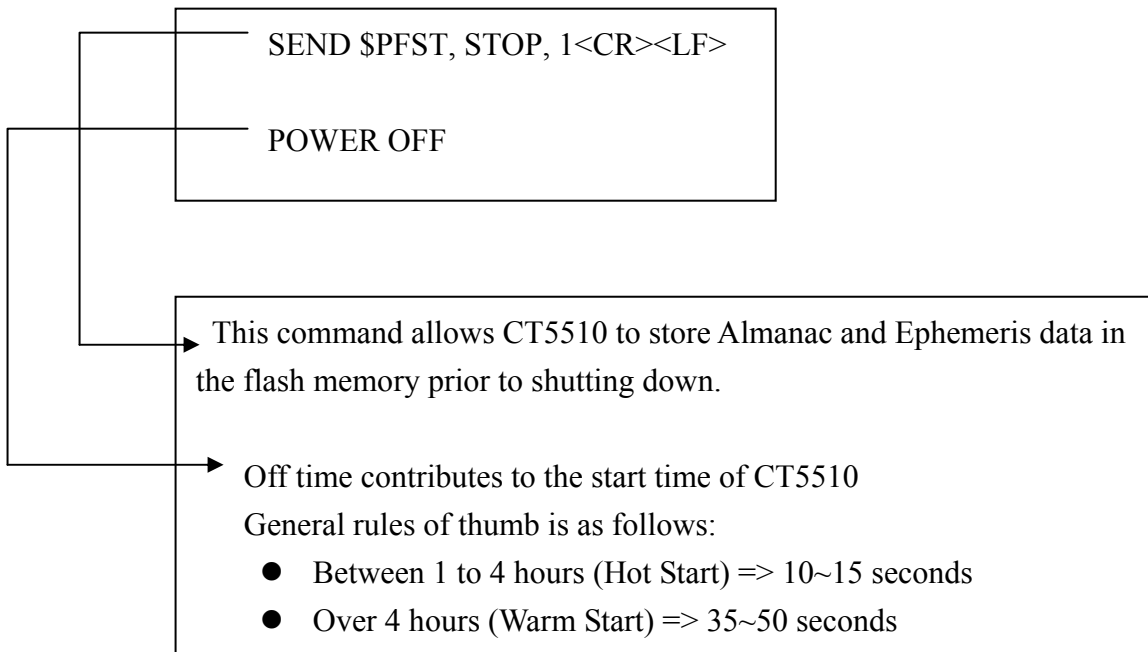
```
$PFST,INITAID,131500.78,100102<CR><LF>
```

Sets the initial time only.

NOTE: This command has to be given before starting navigating. If AUTOSTART is active, navigation has to be stopped after switching on the power, then issue the INITAID command and then START the navigation again. The AUTOSTART is always set in CT5510 so this procedure must always be followed after power-up with CT5510.

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Sample procedure:



1. SEND \$PFST,STOP, 0<CR><LF>
2. SEND \$PFST,INITAID,<current time>,<current date><CR><LF>
3. SEND \$PFST,START<CR><LF>