M10478-A2 & M10578-A2 Feature List and Command Usage

Revision	Date	Description
A	2015-12-14	Release Version

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1 MT3337 Feature List

1.1 Overview of MT3337 FW and Feature List

MT3337	Features
1	Standby mode
2	EPO
3	AIC
4	EASY
5	PPS sync NMEA

2 MT3337 Command Usage

2.1 Standby Mode

2.1.1 Introduction

MT3337 power saving mode.

2.1.2 How to Test EVK

2.1.2.1 Enter Standby Mode

Software on the HOST side sends the “PMTK161” command through the communication interface.

PMTK161 Data Field

$PMTK161,Type

- **Type: Power saving mode**
  - 0: Standby mode
- **Example**
  - $PMTK161,0: Enter standby mode
- **Return**
  - $PMTK001,161,3

2.1.2.2 Wake-up from Standby Mode

Software on the HOST side sends any byte through the communication interface.

2.1.3 Test Result

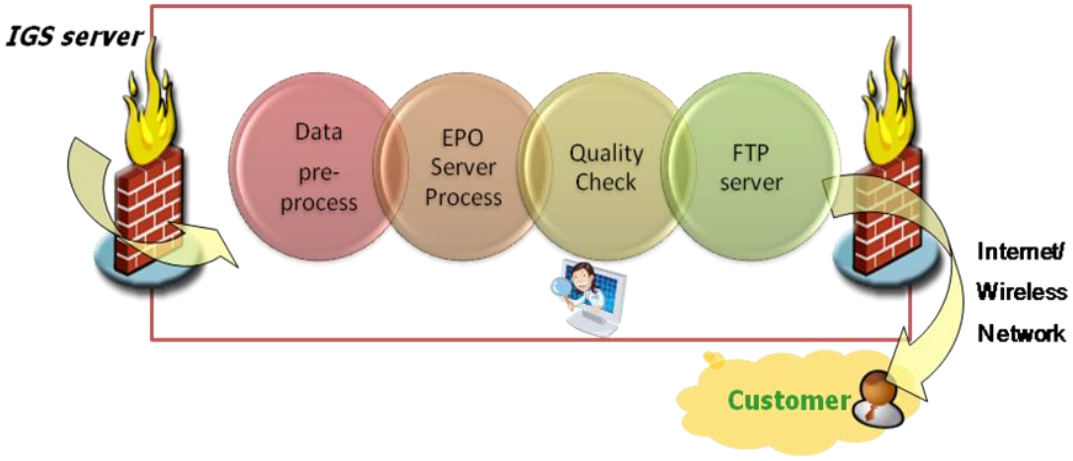
Command	MT3337 standby then wake up	Current measurement
$PMTK161,0*28	MT3337 enters standby mode.	Power saving state < 200 uA
Any byte	MT3337 wakes up from standby mode.	

2.2 EPO (Evaluation SW subject to Antenova approval)

2.2.1 Introduction

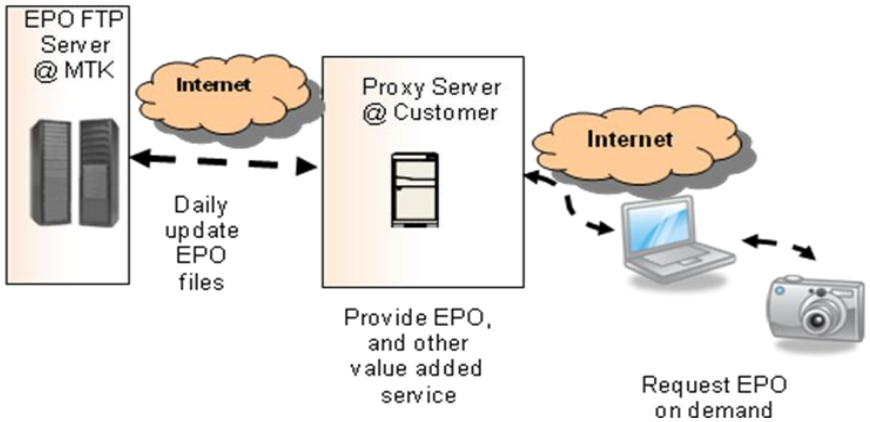
EPO (Extended Prediction Orbit) data service

The world leading technology for supporting ***30-day*** orbit predictions to customers. Needs occasional download from the EPO server.



What will DSC maker do?

- A proxy server on the DSC maker side to update EPO files from MTK server daily.
- Application software to access the proxy server through the Internet (optional if the device can access internet by itself)
- Software on the HOST side to send EPO data to MT3337 depending on the date/time of photographing

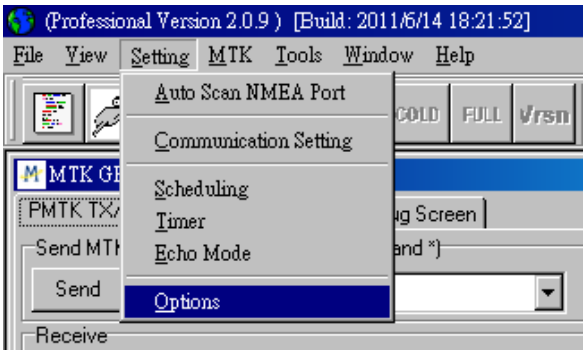


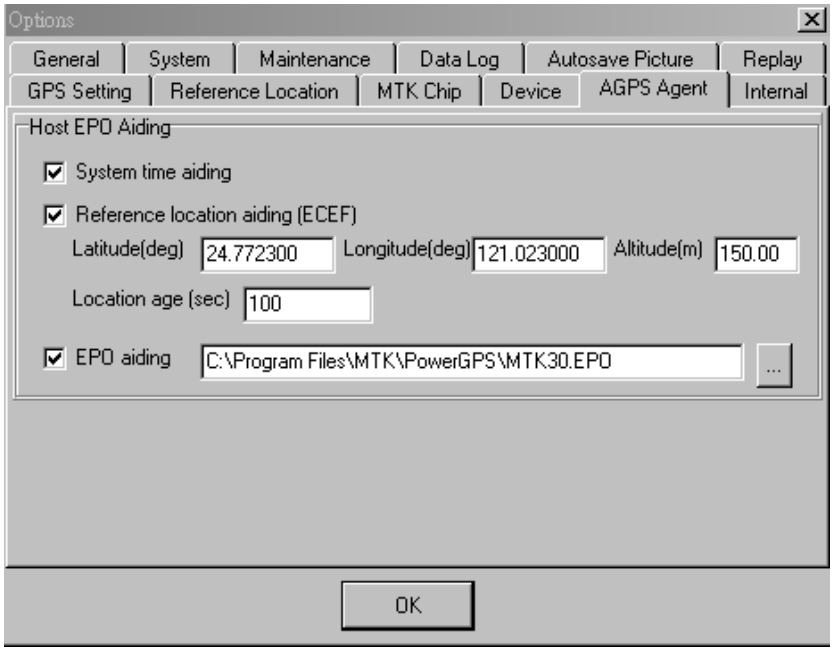
2.2.2 How to Test EVK

Method: [Host EPO]

Step 1: Acquire EPO data from the MTK ftp server.

Step 2: Aiding EPO data to MT3337 NA by PowerGPS EPO agent tool.





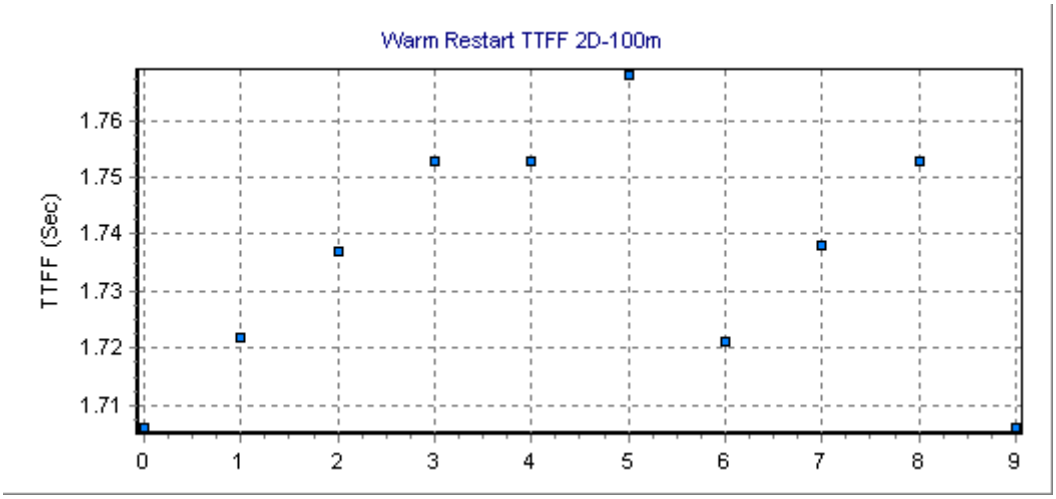
Step 3: WTTFF test 10 times by PowerGPS TTFF test tool.

Step 4: CTTFF test 10 times by PowerGPS TTFF test tool.

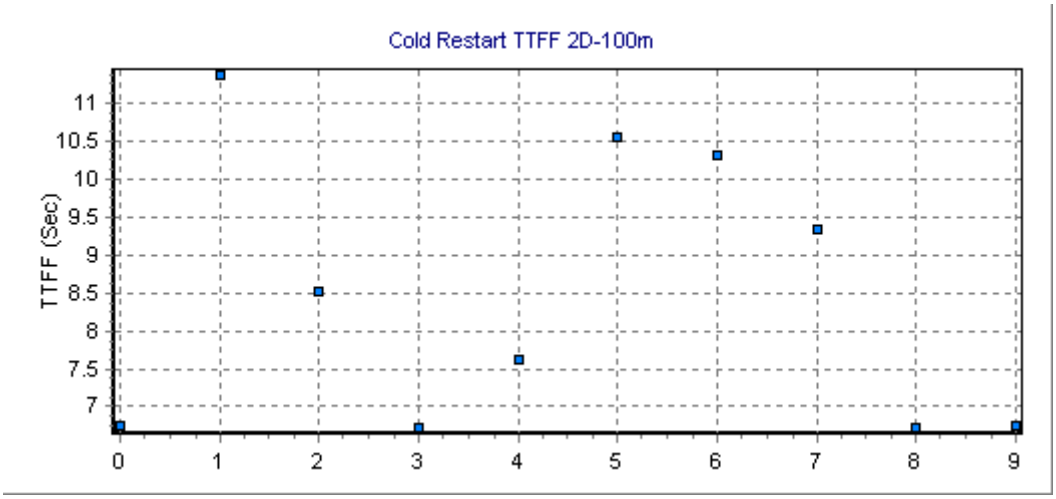
(Evaluation SW subject to Antenova approval)

2.2.3 Test Result

WTTFF < 5sec



CTTFF < 15sec



(Evaluation SW subject to Antenova approval)

2.3 AIC

2.3.1 Introduction

The Active Interference Cancellation (AIC) feature provides effective narrow-band interference and jamming elimination. The GPS signal can be recovered from the jammed signal and allows the user to obtain better navigation quality.

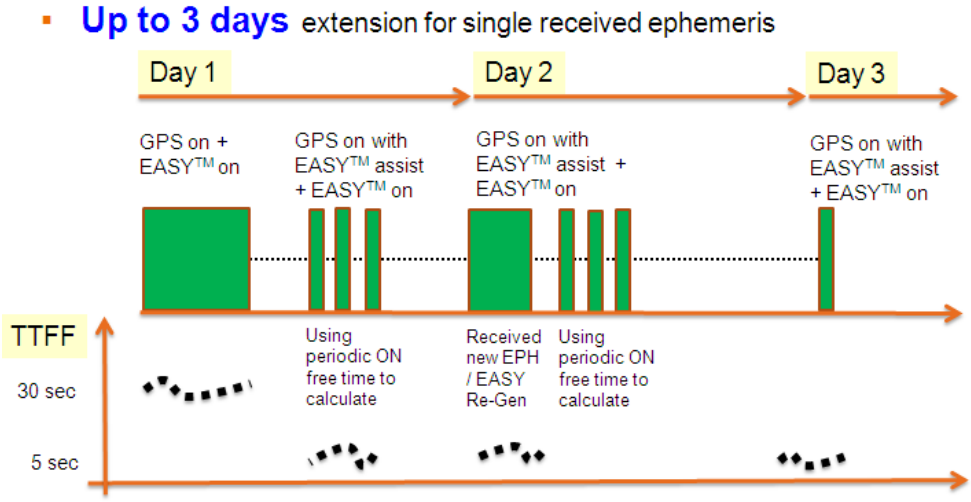
- Enable AIC function: PMTK 286,1
- Disable AIC function: PMTK 286,0

2.4 EASY

2.4.1 Introduction

EASY is the abbreviation of Embedded Assist System. The benefits are:

- **EASY to TTFF**
  EASY works as embedded software which accelerates TTFF by predicting satellite navigation messages from received ephemeris.
- **EASY to calculate**
  No additional computing interval for EASY task. EASY is efficiently scheduled and computed in free time of every second after GPS navigation solution.
- **EASY to design-in**
  World leading technology with no additional design-in efforts



Note: EASY is default on and can be disabled by PMTK command.

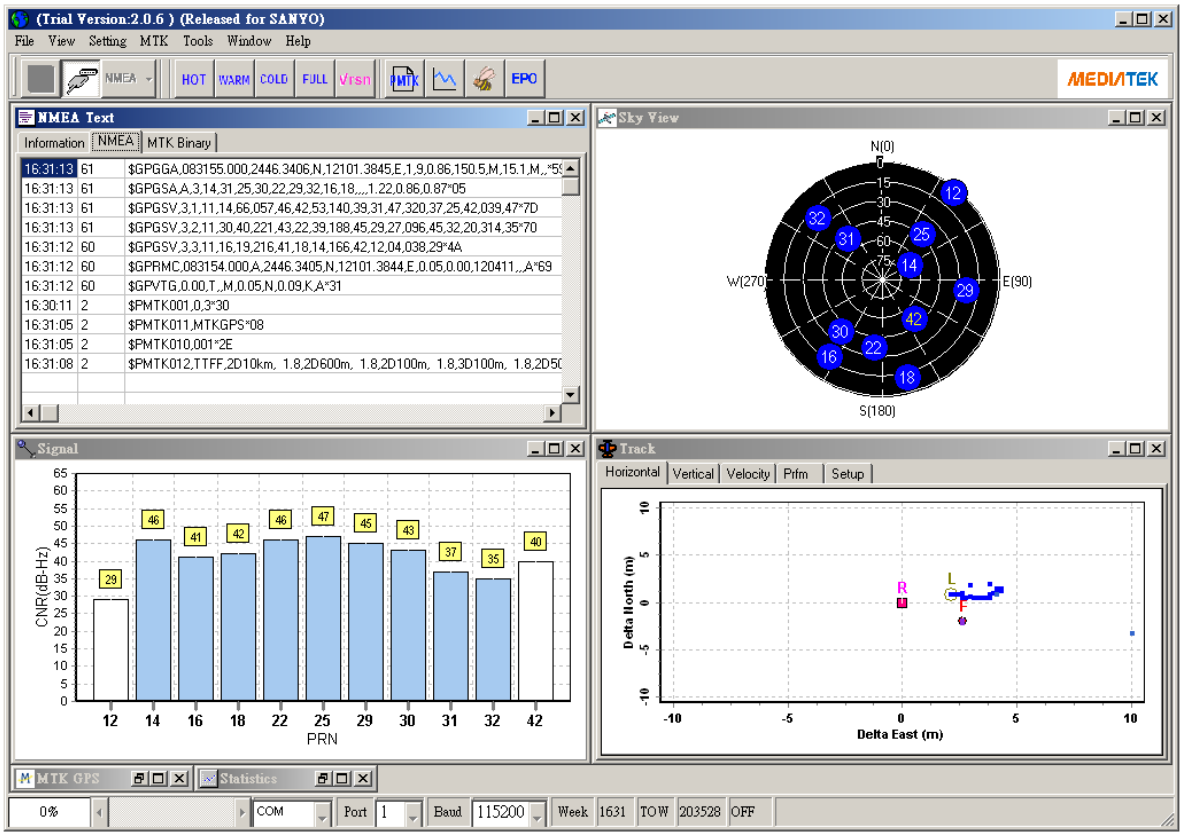
EASY function is conceptually designed to automatically engage for predicting after first receiving the broadcast ephemeris. After a while (generally tens of second), 3-day extensions will be completely generated then all EASY functions will be maintained at a standby condition. EASY assistance is going to be engaged when the GPS requests in new TTFF condition or re-generates again with another new received ephemeris. Meanwhile, TTFF will be benefited by EASY assistance.

2.4.2 Testing Steps and Conditions

The testing steps are:

1) Download software and reboot.
2) Start GPS function and receive for at least 5 mins.
3) Check sky-view and signal condition.
4) Warm start using PowerGPS
5) Statistics results

Testing condition: It is recommend that the testing environment is under *CN_0 > 40 dBHz and number of SV >6.*



2.4.3 Test Result

EASY demo test result:

- Time to First Fix (TTFF) was greatly reduced to < 5 secs. and horizontal accuracy was < 50m.

Restart Type: HOT / WARM / COLD / FULL

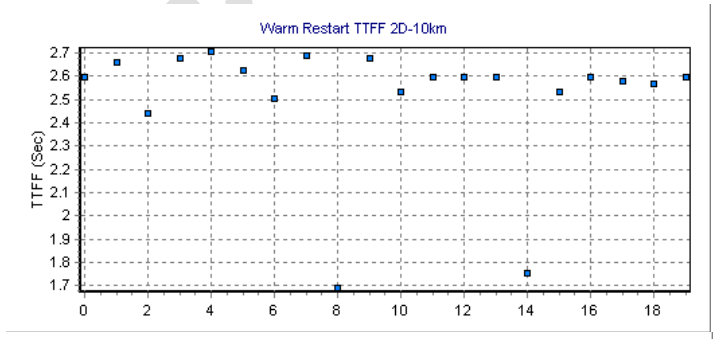
Number of Tests: 1 / 10 / 20 / 100 / 1000 / 10000 / Define (1)

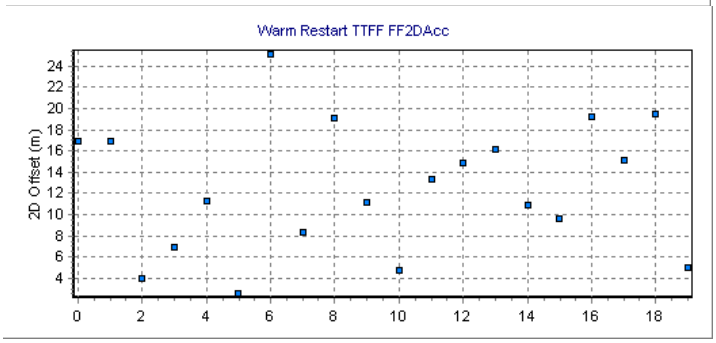
Run | Stop | Result Chart | Config | Set Reference Point | Warm Restart TTFF [20/20]

Ref. Lat	Ref. Lon	Current Lat	Current Lon	2D Error(m)	3D Error(m)	UTC Time	Fix Mode
24.772335	121.023056	24.772378	121.023037	5.1	12.0	07:57:50	3D

INFO	TT1SV	TT3SV	TT4SV	TT3EPH	TT4EPH	TT1GNSS	FF2DAcc	FFVAcc
Current	0.3	0.3	0.3	1.3	1.3	2.6	5.1	10.8
Min	0.3	0.3	0.3	0.5	0.5		2.6	7.4
Mean	0.4	0.4	0.4	1.3	1.3		12.6	9.7
Max	1.5	1.5	1.5	1.5	1.5		25.1	11.7
90%	0.5	0.5	0.5	1.4	1.4		19.3	11.2
95%	0.5	0.5	0.5	1.4	1.4		19.5	11.6

	2D-10km	2D-600m	2D-100m	3D-100m	2D-50m	3D-50m	Dynamic	TT4GNSS
TTFF	2.6	2.6	2.6	2.6	2.6	2.6		
Tests	20	20	20	20	20	20		
Min	1.7	1.7	1.7	1.7	1.7	1.7		
Mean	2.5	2.5	2.5	2.5	2.5	2.5		
Max	2.7	2.7	2.7	2.7	2.7	2.7		
50%	2.6	2.6	2.6	2.6	2.6	2.6		
67%	2.6	2.6	2.6	2.6	2.6	2.6		
90%	2.7	2.7	2.7	2.7	2.7	2.7		
95%	2.7	2.7	2.7	2.7	2.7	2.7		
99%	2.7	2.7	2.7	2.7	2.7	2.7		





2.4.4 PMTK Command List

Packet Type: 869 PMTK_EASY_ENABLE

Packet meaning:

Enable or disable EASY function. Query if EASY is enabled or disabled.

DataField:

PMTK869, CmdType, [Enable]

CmdType: Set or query

0: Query

1: Set

2: Result for Query operation

Enabled: Enable or disable

0: Disable

1: Enable

Example:

To query if EASY is enabled or disabled, use

$PMTK869,0*29<CR><LF>

If EASY is enabled, the receiver returns

$PMTK869,2,1*36<CR><LF>

If EASY is disabled, the receiver returns

$PMTK869,2,0*37<CR><LF>

To enable EASY, use

$PMTK869,1,1*35<CR><LF>

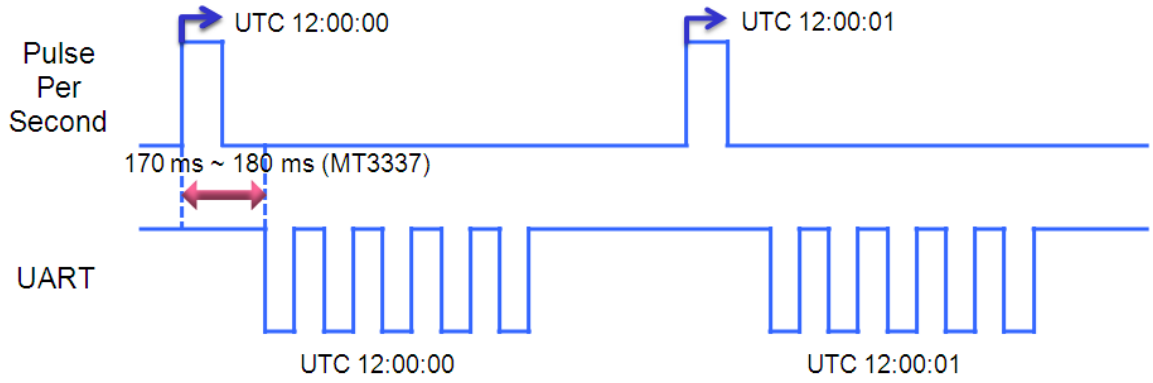
To disable EASY, use

$PMTK869,1,0*36<CR><LF>

2.5 PPS SYNC. NMEA

2.5.1 Introduction

Pulse Per Second (PPS) SYNC. NMEA can be used in time service. The latency range of the beginning of UART Tx is between 170 ms~180ms at MT3337 platform and behind the rising edge of PPS.



2.5.2 Operating Conditions

This feature only support 1 Hz NMEA output and baud rate at 115200~14400. At baud rate of 9600 and 4800, we only support RMC NMEA sentence. Because at low baud rate, if there are many NMEA sentences output, per second transmission may exceed one second

2.5.3 PMTK Command List

Packet Type: 255 PMTK_SET_SYNC_PPS_NMEA

[Packet Meaning]

Enable or disable fix NMEA output time behind PPS function. (Default off)

[Data Field]

PMTK255,Enabled

Enabled: Enable or disable

'0' = Disable

'1' = Enable

Example:

To enable PPS vs. NMEA, use

$PMTK255,1*2D<CR><LF>

To disable PPS vs. NMEA, use

$PMTK255,0*2C<CR><LF>