

# GPS Mobile Locator GM-44 (12V)



## Installation Guide

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**SAN JOSE NAVIGATION, INC.**



ISO 9001  
NO. T2000-351

# Contents

Contents

## Description

Connection to GPS.....	5
Requirements.....	5
Using your GM-44.....	6
Hardware lay-out .....	6
Harness Wiring Layout.....	6
Installation & Operating procedure.....	8
Reference Information's for GM-44.....	9
Communications Specification.....	9
Operation.....	9
Specifications.....	10
Shooting.....	11
Warranty.....	12
NMEA Approved Sentences.....	13
QUICK START.....	19

## 9. QUICK START:

1. Please review the System Lay-out wiring and PC power is OFF before proceedings.
2. Connect the DB09 data cable to your PC computer, locate the PS2 power DIN6 connector and insert to your Laptop PS2 jack(same jack is used for external mouse).
3. Make certain that your new GM-44 is secured properly.
4. Turn your Laptop power on and run your Mapping program, be sure that your Mapping program uses the standard NMEA sentences mentioned in this manual, Some programs are proprietary software and it requires their GPS hardware to run.
5. Select your proper COM-PORT number of your Laptop:  
**Note:** Most Laptops share com-port #1 (PCMCIA & SERIAL DB09) and the BIOS will detect which serial is being used. If your BIOS cannot detect the serial port, then it must be manually selected during your Laptop PC start-up.

## Package Contents

1229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000\*18

Field	Example	Units	Description
Header	\$GPGGA		GGA protocol header
Time	161229		hhmmss
Latitude	3723.2475		ddmm.mmmm
Latitude Direction	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
Longitude Direction	W		E= east or W=west
Mode Indicator	1 see table below		GPS SPS mode,fix valid
Range	07		Range 0 to 12
Horizontal Dilution of Precision	1.0		Horizontal Dilution of Precision
Vertical Dilution of Precision	9.0	meters	
Speed	M	meters	
Course		meters	
Course	M	meters	
Time Corr.		second	Null fields when DGPS is not used
Station ID	0000		
Checksum	*18		
End of message			End of message

- 1 **One GM-44 w/serial & PS2 connector**
- 2 **One PS2 Ciga-Lighter Adapter**
- 3 **User Manual**
- 4 **Free Evaluation GPS Map Software GPSS with maps of the world. <http://www.gpss.co.uk>**

**Please check if all of the contents listed are included and if not damage from shipping If any of the items are missing or damage, please notify San Jose Navigation, Inc.**

**<http://www.sanav.com>  
[sanav@sanav.com](mailto:sanav@sanav.com)**

1=Fix valid GPS	2=DGPS Fix	3=GPS PPS Fix
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# nt Notes

**M-44 unit stowed in a secure location  
er is applied.**

**power and data cable extension for the  
ne to such cable may interfere or degrade  
eration.**

**Power/Data cable of the GM\_44 to protect  
mechanical stress or vibrations.**

**nect the PS2 connector of the data cable  
a POWER source other than the PC PS2  
e PS2 power adapter for the ciga-lighter  
-in DC/DC regulator.**

**DAMAGE MAY OCCUR IF IMPROPER INPUT  
S APPLIED.**

# TABLE 6

GSV - GNSS Satellites in View

\$GPGSV,2,1,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42,\*

Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol
Number of Message	2		Range 1 to 3
Message Number	1		
Satellites in View	07		
Satellite ID	07		Channel 1 (1-4)
Elevation	79	degrees	Channel 1(ma
Azimuth	048	degrees	
SNR (C/No)	42	dBHz	0~99,null when no
....			....
Satellite ID	27		Channel 4(1-4)
Elevation	27	degrees	Channel 4(ma
Azimuth	138	degrees	Channel 4(Tr
SNR(C/No.)	42	dBHz	range 0~99, nul
Ages of Diff. Corr.		second	
Checksum	*71		
<CR> <LF>			End of messa

\$GPVTG, 309.62,T, ,M,0,13,N,0,2,K\*6E

Example	Units	Description
\$GPVTG		VTG protocol header
309.62		Measured heading
T		True
	degrees	Measured heading
M		Magnetic
0.13	knots	Measured horizontal speed
N		Knots
0.2	km/hr	Measured horizontal speed
K		Kilometer per hour
*6E		
>		End of message

5

GLL - Geographic Position-Latitude/Longitude  
 \$GPGLL, 3723.2475,N,12158.3416,W,161229.487,A\*2C

Example	Units	Description
\$GPGLL		GLL protocol header
3723.2475		ddmm.mmmm
N		N=north or S=south
12158.3416		ddd.mm.mmmm
W		E=east or W= west
161229		hhmmss
A		A=valid or V=not valid
*2C		
E		End of message

## 1.1 Introduction

### GM-44 Mobile Locator

Congratulation on your purchase of the GM-44 Mobile Locator. This is the latest GPS product innovation in combining GPS receiver technology and mini-antenna in a Plug-Navigate-Location concept from SAN JOSE NAVIGATION INC.

The GM-44 device unit received the FREE broadcast signal from Low Orbit Global Positioning System(GPS), a satellite-based transmitter which emit ranging/satellite information/ high precision signal that the GM-44 receiver can use to determined positions &

## 1.2 System Requirements

System requirements for operating your new GM-44 Mobile Locator are as follows.

PC running DOS , Windows OS or any OS that accept GPS NMEA data format. PDA, Palm-PC, Chart Plotter, Notebook

Micro-controller using UART as serial bus.  
 Power source using our PS2 for Notebook PC, Ciga-Lighter for Car.

**NOTE:** Regulated DC must be use to this unit either through our connector to your Notebook/PC or the Ciga-Lighter power adapter with a built-in regulator provided.

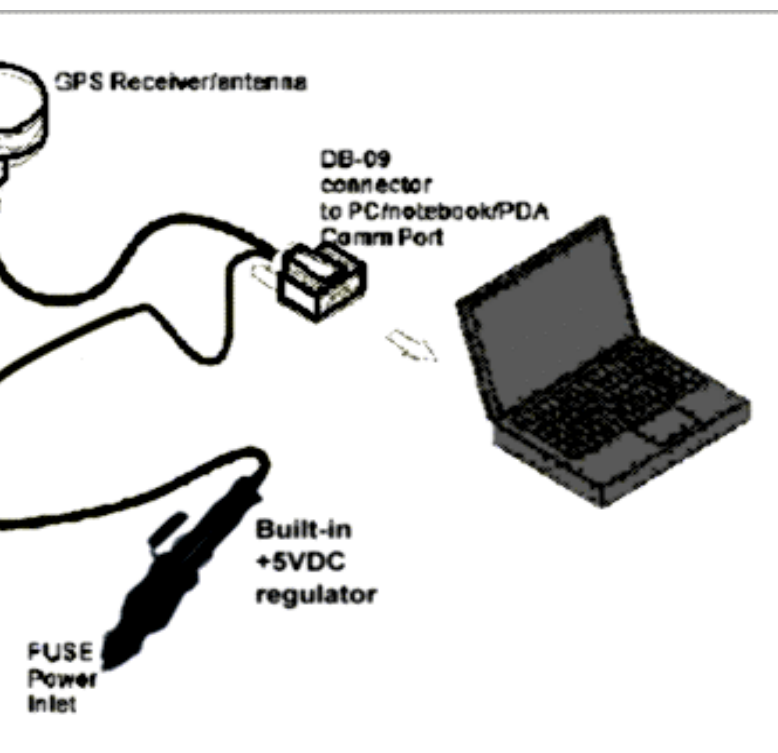
Un-obstructed view of the SKY for the satellites over the sky must be seen by the unit.

# Installing the GM-44 Mobile Locator

## Software lay-out/ Wiring

The GM-44 Mobile Locator is designed as a center mount unit with a fastener for permanent installation.

## GM-44 System Illustration



**TABLE 3**

GSA- GNSS DOP and Active Satellites

\$GPGSA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,00

Name	Example	Units	Description
Message ID	\$GPGSA		GSA protocol
Mode 1	A		Automatic-swap
Mode 2	3		1=No Fix, 2=
Satellite Used	07		Sv on Channel
Satellite Used	02		Sv on Channel
	.		
Satellite Used			Sv on Channel
PDOP	1.8		Position Dilution of Precision
HDOP	1.0		Horizontal Dilution of Precision
VDOP	1.5		Vertical Dilution of Precision
Checksum	*33	meters	
<CR> <LF>		meters	End of message

Recommended Minimum Specific GNSS Data

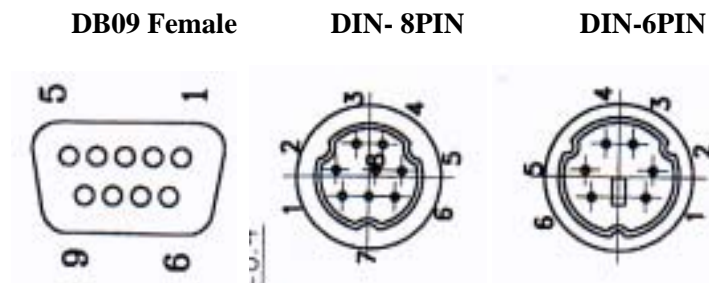
Recommended Minimum Specific GNSS Data

Name	Example	Units	Description
ID	\$GPRMC		RMC protocol header
Position	161229		hhmmss
	A		A=data valid or V=Not
	3723.2475		ddmm.mmmm
Indicator	N		N=north or S=south
Value	12158.3416		dddmm.mmmm
Indicator	W		E= east or W=west
Over ground	0.13	knots	
Over Ground	309.62	degrees	True
	120598		ddmmyy
Altitude	9.0	meters	
Magnetic Variation		degrees	E= east or W=west
Scale	*10		
<LF>			End of message

## 2.2 Cable harness wiring layout,

Please note that the connector wire destination DOES not coincide with wire the signal name

Figure 2: Connector Wire pin-out:



pin1=n/c	pin1=TXA	pin1=n/c
pin2=TXA	pin2=RXA	pin2=GND
pin3=RXA	pin3=+5VDC	pin3=n/c
pin4=n/c	pin4=1pps/TTL	pin4=n/c
pin5=GND	pin5=n/c	pin5=+5VDC
pin6=n/c	pin6=GND	pin6=n/c
pin7=n/c	pin7=n/c	
pin8=n/c	pin8=n/c	
pin9=n/c		

## *lation & Operating procedure*

Complete familiarity of your new Mobile Locator using Figure 2, you are ready to interface the unit to your device. PLEASE MAKE SURE THAT POWER IS MORE PROCEEDING.

Place your new GM-44 in an open sky view to a secure

Connect the data DIN 8PIN connector and plug it to your device and secure the cable harness from vibration.

Connect the data DB09 connector and plug it to your device serial COM -PORT.

Connect the power DIN 6 PIN connector and connect it to a power source (PS2 of Notebook or our Ciga-Lighter) PS2.

The GM-44 Mobile Locator DOES NOT have a power source. If power source is applied, this in turn also power the device. Data is output in 1Hz(1second) interval.

Program is included for your computer running Windows. Please load the program to your computer and follow the instructions in running and loading your own MAPS. Visit <http://www.gpss.co.uk> web pages for more information.

## 9. NMEA-0183 APPROVED SENTENCES

Approved sentences are those of which formats are defined in the NMEA-0183 standard. An approved sentence generally takes the following form: See Tables examples: ZDA, RMC, VTG, GSV, GLL, GGA.

\$<address field>, <data field>.....[\*<checksum field>] <CR>

TABLE 1:

ZDA - DATE/ TIME

\$GPZDA, 123456,01,02,2001,+09,00,\*6B

Name	Example	Units	Description
Message ID	\$GPZDA		ZDA protocol
UTC: Time	12-34-56		hh-mm-ss
UTC: Day of Month	01		DD
UTC: Month	02		MM
UTC: Year	2001		YYYY
Local Zone Time	+09		hh
Local Zone Time	00		mm
Checksum	*6B		
<CR> <LF>			End of message

Interpreting Example:

February, 1, 2001

12:34:56

Local Zone Time: +09:00

## *duct Limited Warranty*

It can be used as part of a navigational aid,  
not intended to replace other means of navigation or aids.  
San Jose Navigation, Inc. warrants this GPS receiver and accessories  
to be free of defect for a period of 12 months from the date of  
purchase.

### **WARRANTY APPLIES ONLY TO ORIGINAL PUR-**

In the event of a product defect while in normal usage, San Jose  
Navigation, Inc. will replace or repair the defective with no charge  
to the original purchaser for parts and labor. However, San Jose  
Navigation, Inc. reserves the right of determination to replace or  
repair the defective product. The replacement or repaired product  
is warranted for a total of 90 days (ninety) from the date of  
replacement, or for the remaining balance of the original  
warranty, whichever is longer.

### **BUYER'S DUTIES**

The purchaser must return defective unit postpaid, with the  
receipt of original purchase and a return address to  
San Jose Navigation, Inc.

105, Shi-Cheng Road, Pan-Chiao City  
Tainan Hsien, Taiwan, R.O.C.(220)

Phone: 86-2-26879500

Phone: 86-2-26878893

Website: <http://www.sanav.com>

Technical Support:

[www.sanav.com](http://www.sanav.com)

## *3.1 Software information:*

The GM-44 Mobile Locator is NMEA 0183 compatible data  
output sentences in which ALL mapping software or GIS software  
will support

The following are examples of commercial Map Software:

Street Atlas

Fugawi

Route66

## *3.2 Communication Specification*

**System: Asynchronous**

**Speed: 4800bps**

**Start Bit: 1 bit**

**Data Length: 8bits(MSB=0)**

**Stop Bit: 1 bit**

**Parity Bit: None**

## **4. Application**

GM-44 Mobile Locator can be used towards applications in  
GPS Navigational needs or Precise Timing source.

Mobile Navigation

Marine GPS Chart Plotter

Fleet Management GPS System

Avionics

Land Survey GPS data collection

AVL GPS data

? GPS Network Timing

## System Specifications:

### Characteristics Performance

Channels.....12 CH/Parallel  
Frequency.....1575.42MHz  
Encoding Code.....C/A codes  
Number of Satellites Tracked.....12 satellites  
Position Time.....18seconds typ.(warm start)  
Position Accuracy.....15m or 50ft RMS\*(DOP<3)  
Velocity Accuracy.....0.1knots RMS steady state  
Update Rate.....1Hz (1 second continuous)

### Interface

Communication.....RS232(standard), USB(option)  
Data Format.....NMEA 0183  
Supported Protocols: \$GPRMC, \$GPGSV, \$GPVTG, \$GPGLL, \$GPGSA

Power.....+8~+35VDC reverse protected  
Power Consumption.....0.9watt max.

### Environmental

Operating Temperature.....-30~+75degree C  
Storage Temperature.....-40~+80degree C  
Humidity.....95%non-condensing

### Construction

Case.....Polycarbonate  
Frame.....Hard-steel with course tread  
Mounting.....Center mount  
Dimensions.....52mmX 22mm

## 6. Troubleshooting Tips:

### 1. No output:

If you are using your PS2 Notebook supply, check if the PS2 connector is connected to your notebook properly.

Check to see if the COM PORT is enable.

If you are using the PS2 Ciga-Lighter adapter, check if the RED LED is lit, if not check the built-in FUSE 1A inside Adapter.

### 2. GPS Data is not in correct positions:

During the FIRST COLD start situation, when the unit turn-on at your location. The unit will AUTOMATICALLY search for the satellites and accumulate new data for your receiver and this may take from 4~5min.

NOTE: One can use any comm-program or WINDOWS TERMINAL to see the raw data at 1Hz, 4800bps.

3. No activity or the Map Software is not receiving any GPS data. In the FREE GPSS program the software will auto search for COM1 & COM2 data as soon as the program is executed, be sure that the GM-44 is connected to COM1 & COM2.