SPEC NO.	SP07FL18000-080	ISSUED DATE	91.10.21	PUBLISHED BY
PRODUCT NAME	FL-18	VERSION	02	
		PAGE	1/19	

SPECIFICATION

SPEC NO. : SP07FL18000-080

PART NO. : 074121212100320

PRODUCT NAME : GPS RECEIVER/FL18

DESCRIPTION : 48;NM/G/H.F.L./11P90/BT/C

REVISION STATUS

VERSION	DATE	PAGE	REVISION DESCRIPTION	PREPARED	DESIGNED	APPROVED
01	91.05.09	WHOLE	48;NM /G/H.F.L./11P90/BT/C	JASON	HARK	FRED
02	91.10.21	P.6 P.12	Recommend using Ant Add PKODG,14 Sentence Output Modified	JASON	HARK	FRED

Prepared By	Designed By	Approved By
趙永健	陳明君	簡維元

Data output

Data Format :

NMEA

Baud rate :

4800

RF Connector TYPE.

H.FL-R-SMT

I/O Connector TYPE

JST 11pin

Shield Case

Yes

Cautions

GPS (Global Positioning System) is a satellite-based navigation system. In an unobstructed, clear view of the sky, GPS works anywhere in the world, 24 hours a day.

GPS is developed and operated by the government of the United States. Under the policy of the government, the degradation of accuracy will occur without announcement in advance, and sometimes satellites doesn't transmit signal due to adjustment, test, and orbital revision.

Please be aware that the Approval Sheet of the performance of GPS receiver module does not warrant against the above factors.

(Position Accuracy)

When GPS satellites transmit signals, satellite geometry, electric magnetic interference, and multipath will affect position data and degrade the position accuracy.

(Equipment)

The high frequency noise will interfere in signal receiving. The high frequency noise that within the receiver frequency band, 1575Mhz ±10MHz, will affect the receiver quality. Also because of the mixer and modulation, the low frequency noise will be increased the frequency by several times. If this increased frequency drop into the 1575MHz ±10MHz band will also affect the receiver quality. That will also cast problem.

Another warning should be notified. GPS receiver module should not be placed close to heat and fans. Drastic change of temperature will still degrade the signal receiving even with the operation temperature. Crystal and crystal oscillator on PCB ASSY should keep away from the cooling of fan.

(Power)

If the impedance of power terminal is too high (power cable too thin and over 10 cm long), then S/N will be degraded. Please insert condenser (47 μF above) into cable terminal to remove ripple.

(Operation)

Static electricity will destroy IC and erase backup data. Wear anti static electricity bundle while you are using the GPS Receive Module).

Besides static electricity, plugging in or out the connector while power on will cause initialization. Make sure to do this in power-off condition.

(DARC Format)

DGPS service of Satellite Navigation Information Center should be applied under permission. If your products are manufactured and marketed with Gpex Trademark, an agreement shall be entered by and between your company and Satellite Navigation Information Center.

(Antenna)

In order to strengthen the sensitivity for car navigation, GPS antenna is suggested to mount on a flat place around 80x80mm. The antenna cable should not protrude from bottom of antenna. See attachment of “GPS Antenna Manual and Equipment” for installation.

SPECIFICATION FOR GPS RECEIVER

1.Major Specification

*Receiving channel : Digital 11-channel parallel/sequential (Maxiview 11 channels)

*Receiving frequency :1575.42MHz±1MHz(C/A code)

*Receiving sensitivity :Under –130dBm(Note 1)

*Accuracy a)Position :15m or less 2D RMS(without SA,PDOP=3 or less)

, Spherical probability 95%

b)Speed :1m/s or less(without SA,PDOP=3 or less)

*Minimum units of measurement

a)Position :1/10,000min

b)Velocity :0.1knots or 0.1km/h

c)Bearing : 0.1 degree

*Dynamics a)Velocity :less than 350km/h

b)Acceleration :less than 1G

*Position update rate :1 sec

*Warm start :Within 60 sec typ.(at normal temperature)

*Cold start :180 sec typ.(at normal temperature)

*Positioning mode :2-D Positioning(3 Satellites: HDOP<10)

:3-D Positioning(4 Satellites: PDOP<7)

*Memory backup :input external battery

Voltage:+2.5VDC~4VDC

consumption:9 μA or less(at normal temperature ; input +3v)

*Initial position data :Not necessary

*Almanac and Time data : Not necessary

*Supply power

Voltage:+5V±5%,with ripples within 50mV

Current consumption:max140mA or less(at normal temperature ; without antenna)

*Temperature range

Operating:-30℃ to +70℃(Note 2)

Storage:- 40℃ to +85℃

*Weight :20g or less

*Data communication :Asynchronous bi-directional data communication with TTL level

Baud rate:9600bps or 4800bps

DATA:8bit

Start bit:1bit

Stop bit:1bit or more

Parity:None

*Differential GPS :RTCM SC-104 *message type 1 and 9

*Speed pulse input Level :TTL (for ROM TYPE CIJxx)

Frequency:0~4 kHz

Minimum pulse Width:250n sec

*Back Signal Input TTL(low level：Back ON)

*Gyro signal input :Equivalent spec. of Gyro type (for ROM TYPE CIJxx)

'EWTS4A' (FUKUI MATSUSHITA products)

*Antenna : Equivalent spec. of Antenna type as follows

'GA-22'(Cirocomm Technology Corp products)

'YOP-5107KD1'(YOKOWU Co., LTD. Products)

'DA-1A17EVFH'(FDK CORPORATION products)

'EBMGUB91R5XA'(Miyazaki Matsushita products)

(Note1)In the condition of connecting antenna which posses a preamplifier of 15 dB of gain or more with 3 or less of noise figure.

(Note2)The initial positioning time is within 3 minutes(when posses the almanac data). Degradation of S/N is under 3.(compared with normal temperature.)

(Note3)When the output impedance of the power supply side is high(5Ω over),it must is need to insert a capacitor(47 μF or more).

If the impedance is high, it will become S/N deterioration of satellite signal.

2.Input format

2.1 Input format

X X 0 0 0 0 <CR> <LF>

1 2 3

1:Header (HEX)
2:Value (integer)
3:END code

Parameter	Header (HEX)	Range	Default setting	Note
Antenna height	10	0~9999m	0	
Elevation mask	11	0~45°	10	
PDOP mask	12	0~99	5	(Note 1) When not RD:7
HDOP mask	13	0~99	5	When not RD:10
S/N mask	14	0~25	3	
Datum	15	00~83	00	00 for WGS-84 (Note 2)
Averaging factor	16	1~3	3	(Note 3)
Differential Switch	18	0:OFF 1:ON	1	
Differential time out	19	10~180 SEC	100	
Selection of Sentence	1E02	2^{N-1}(0001~1024)	GGA+RMC+ GSA+GSV+ PKODG,14	(Note 4) Default set RMC ,etc. are optional
Delete of Sentence	1E03	2^{N-1}(0001~1024)		(Note 4)
Initialization	1E1E1E			(Note 5)

(Note 1) This value should be 0 if only two-dimensional positioning is used.

(Note 2) Select the datum in reference to the list provided separately.

(make a choice from the datum 00 to 85)

(Note 3) The averaging factor can be selected out of 1 (for low speed) through 3

(for high speed).

(Note 4) N=1:GGA sentence(2^{N-1}=1), 2:GLL(2), 3:VTG(4), 4:RMC(8), 5:ZDA(10), 6:GSA(20),

7:GSV(40), 8:PKODA(100), 9:PKODG,1(200), 10:PKODG, 7(400),11:PKODG,14(800)

STEP1: LET PKODG,1 SENTENCE SHOW OUT ,write following

command:

0x1E 0x02 0x32 0x36 0x36 0x35 0x0D 0x0A
Header ASCⅡ Code CR LF

0x1E 0x03 0x36 0x32 0x38 0x37 0x30 0x0D 0x0A
Header ASCⅡ Code CR LF

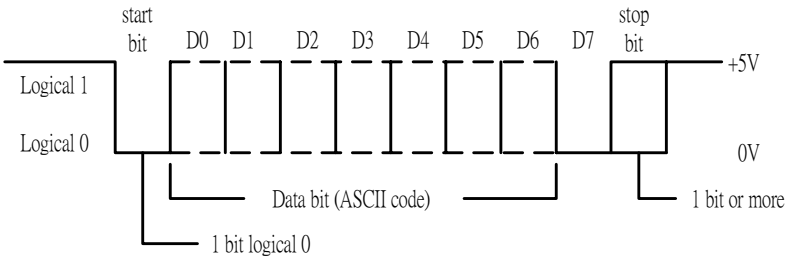
STEP2:Write DATUM Command:

0x15 0x30 0x34 0x0D 0x0A
Header ASCⅡ Code CR LF

(Note 5) During initialization, CPU self test will be performed (ROM, RAM, I/O and RAM's contents is cleared).

3.Output format

3.1 Data format



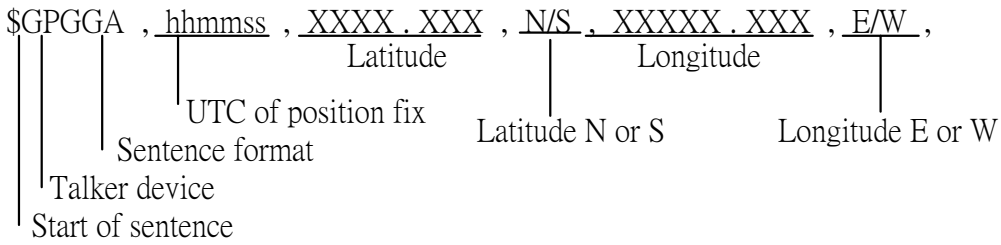
3.2 Data specification

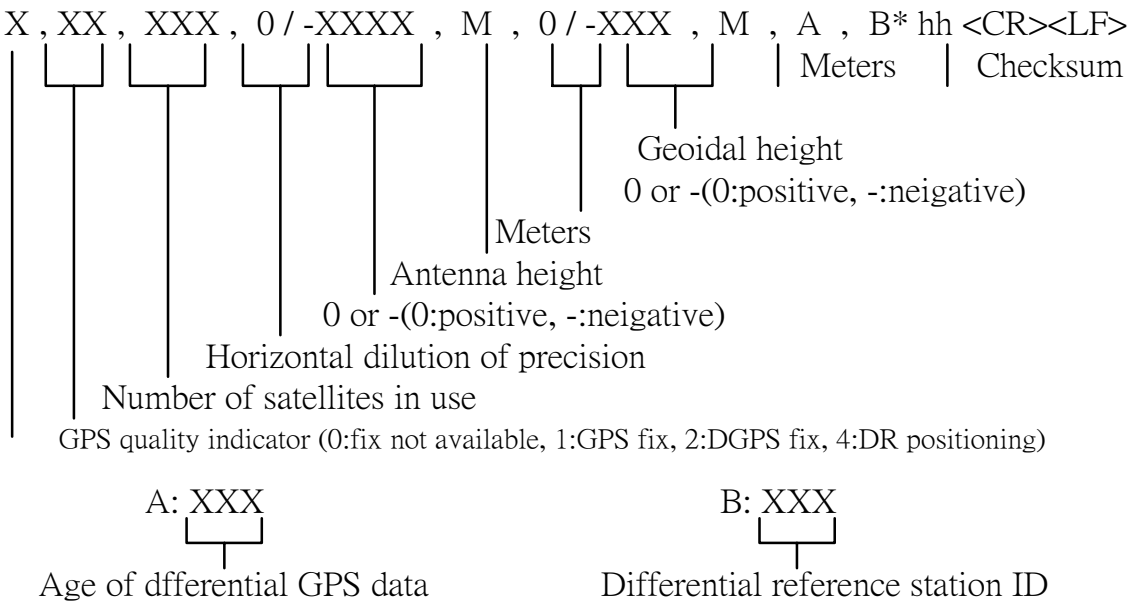
Baud rate	Output level	Output current	Output data	Transmission cycle
4800 baud	TTL level	H level: max. 5mA L level: max. 30mA	GGA+GLL+VTG+RMC+ZDA +PKODA+PKODG, 1+PKODG, 7+GSA+GSV	1 second 2 second 2 ~ 6 second

3.3 Output sentence

Contents of the data field.

3.3.1 GPGGA/GPS Position Information h: hour m: minute s: second





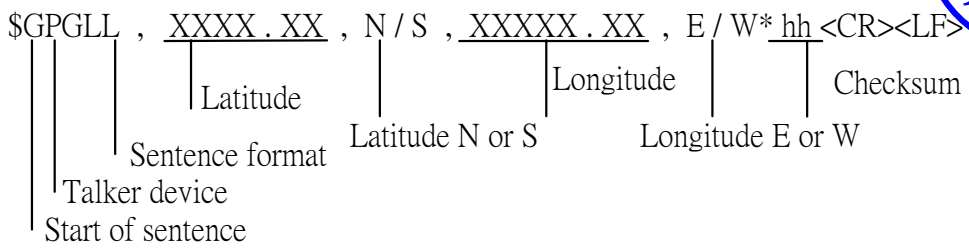
A: XXX

Age of dfferential GPS data

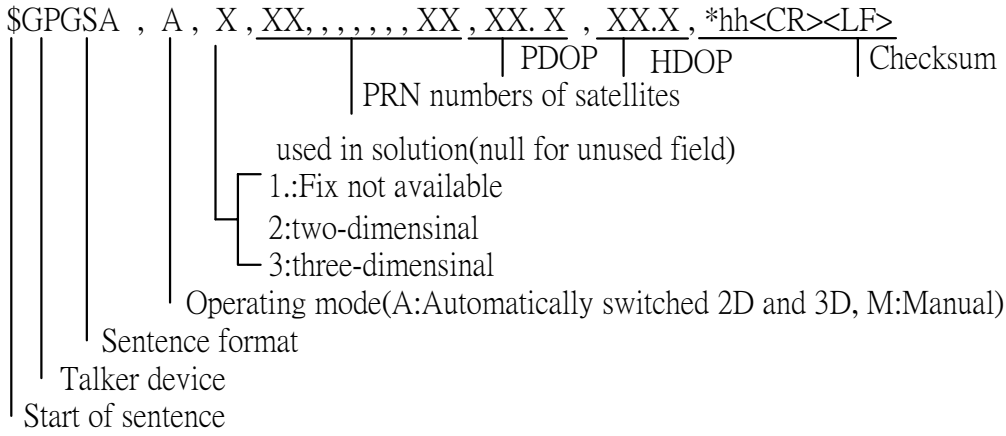
B: XXX

Differential reference station ID

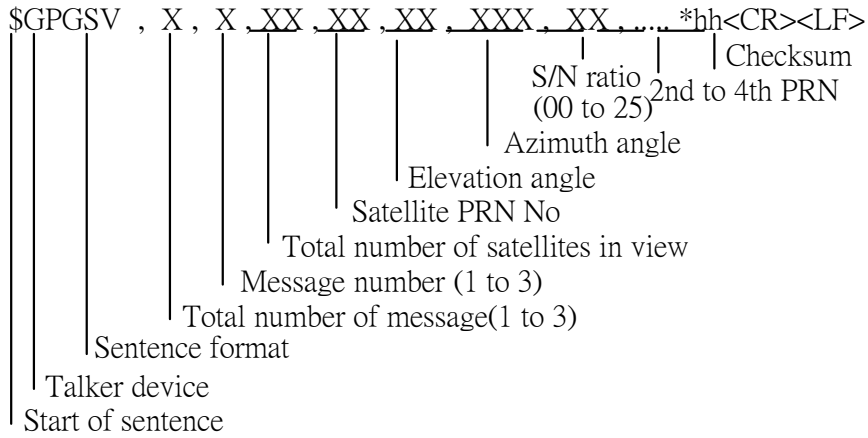
3.3.2 GPGLL/Geographic Position, Latitude/Longitude



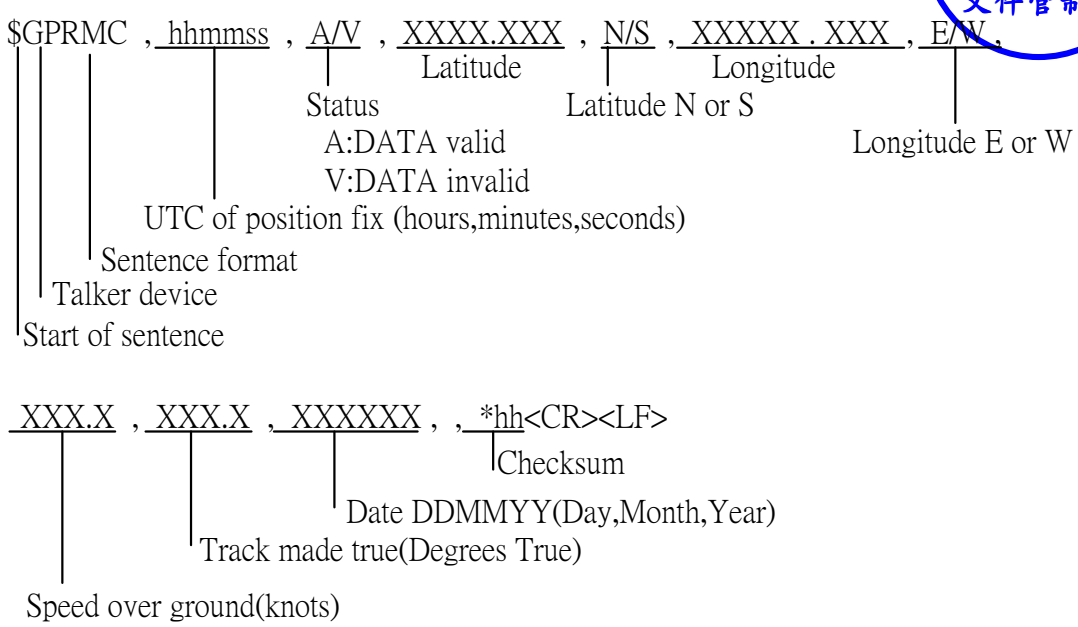
3.3.3 GPGSA/GPS DOP and Active Satellites



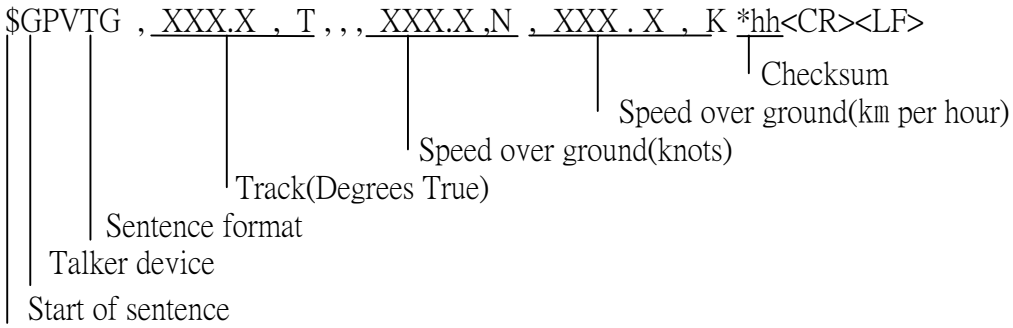
3.3.4 GPGSV/GPS Satellite in View



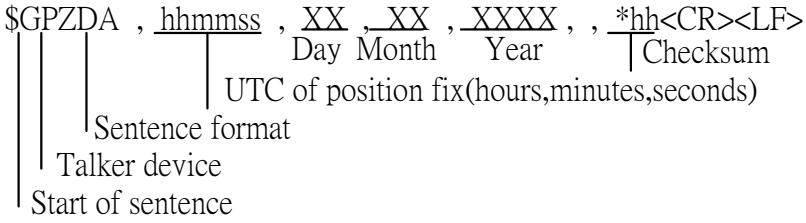
3.3.5 GPRMC/Recommended Minimum Specific GPS DATA



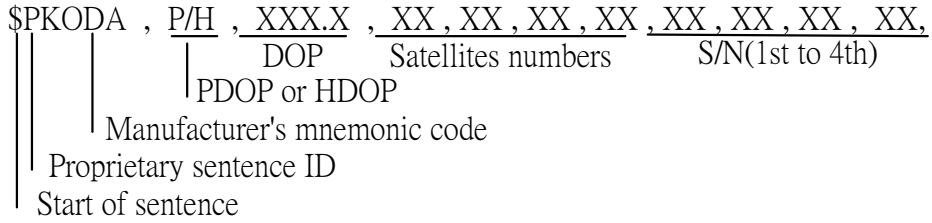
3.3.6 GPVTG/Course and Ground Speed

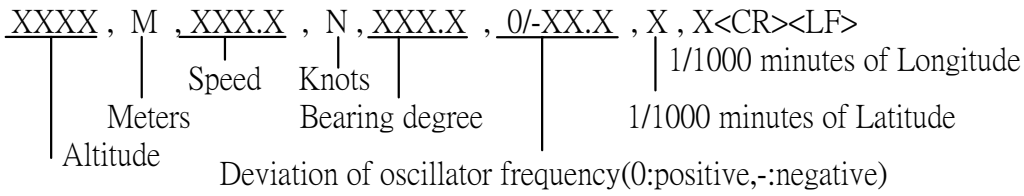


3.3.7 GPZDA/Time and Date

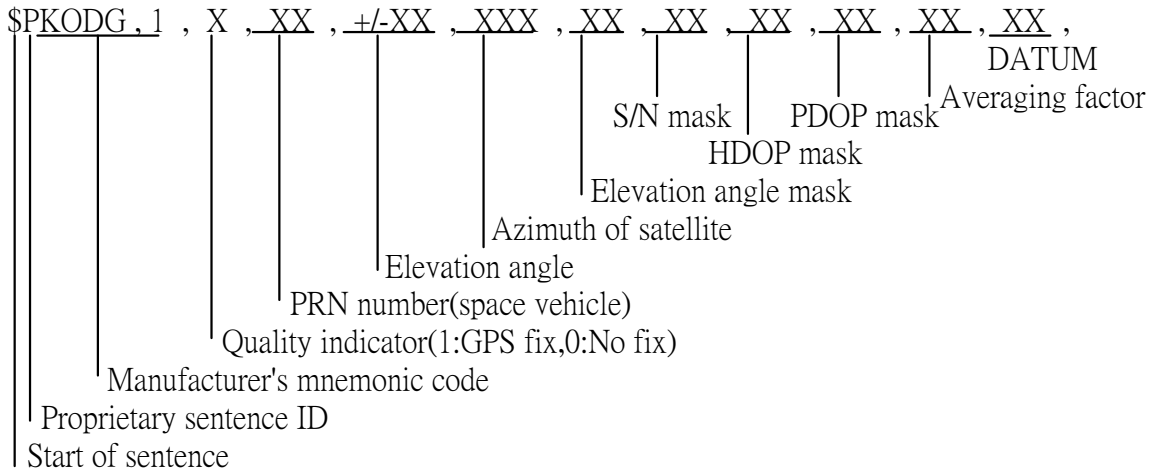


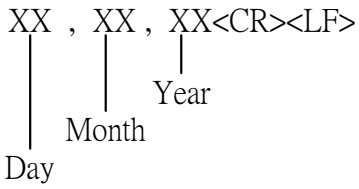
3.3.8 PKODA/Satellites Information



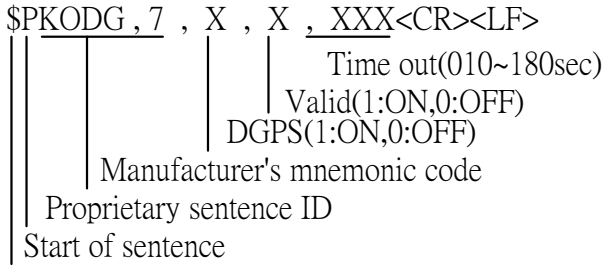


3.3.9 PKODG, 1/Satellites Information

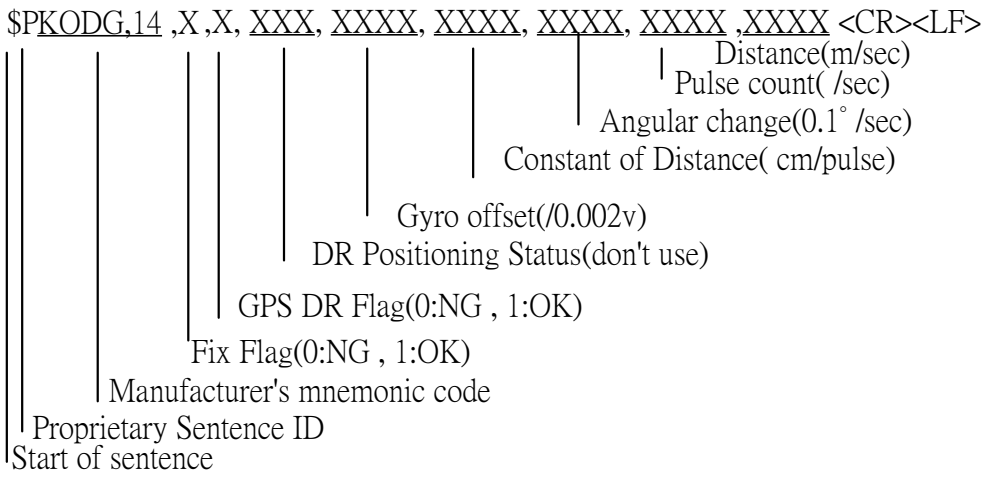




3.3.10 PKODG, 7/Differential Information



3.3.11 PKODG, 14/Dead Reckoning(DR) Information



3.4 Output value when Cold start

1)latitude 36’00.000N

2)longitude 136’00.000E

3)Antenna height 0m

4)date and time ROM made time

5)Deviation of oscillator frequency +50Hz

6)Velocity 0.0km/h

7)Bearing 0.0°

8)Satellites data None(Null)

3.5 Output value when Warm start and Hot Start

1)latitude Last fixed Position

2)longitude Last fixed Position

3)Antenna height Last computed value

4)date and time the time of RTC

5)Deviation of oscillator frequency Last computed value

6)Velocity 0.0km/h

7)Bearing 0.0°

8)Satellites data Computed value from backup almanac and ephemeris data

*Almanac data hold time :52weeks(warm start) ,Ephemeris hold time :4hours (hot start)

4. Warranty

If the product fails within one year after the date of delivery while it has been used properly , it will be replaced or repaired free of charge.

5.Environmental conditions

5.1 The product should be suitably installed or shielded so that it should not be affected by high frequency(1575.42MHz±10MHz)noises from other devices like CPUs.

5.2 Don't allow the air flow from the cooling fan to come directly to the quartz crystal oscillator in the receiver module.

6.Supply power and data I/O connectors

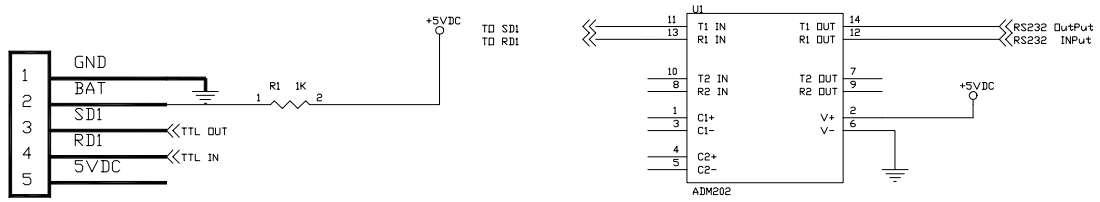
Supply power and data I/O connectors are described in Table.

JP1	Signal name	Function
1	GND	Ground
2	BATT	Back-up power supply
3	$\overline{SD1}$	Serial data output 1
4	$\overline{RD1}$	Serial data input 1
5	Vcc	Power supply input
6	$\overline{RD2}$	Serial data input 2
7	Speed pulse input	TTL level(0 to 4Khz)
8	Back signal input	（Reserve）
9	Gyro VCC	+5VDC Out for GYRO
10	Gyro signal input	0 to +5VDC Analog signal
11	Gyro GND	GYRO GND

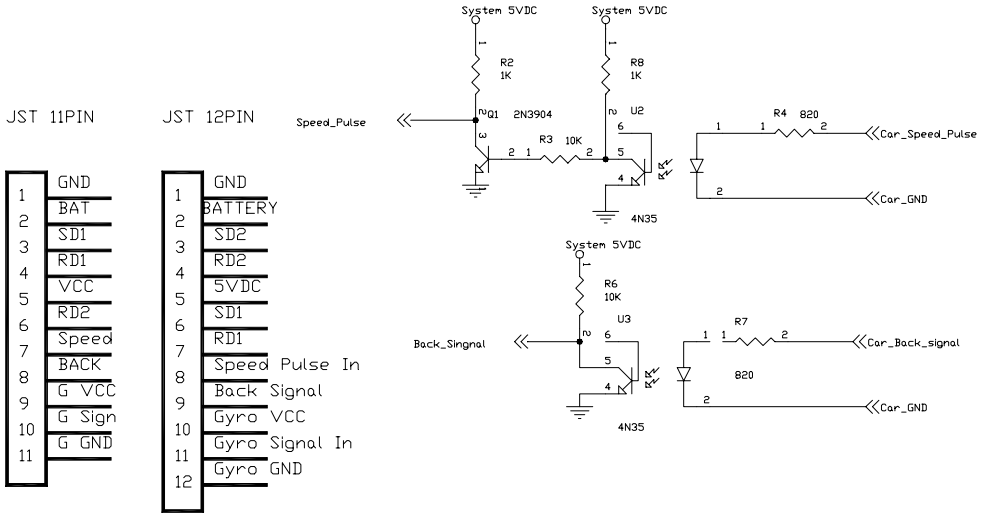
Receptacle

JP1 ：SM11B-SRSS-TB（JST）

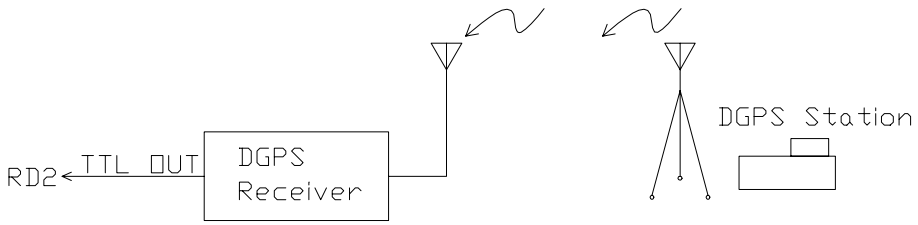
(1)JST 5 PIN

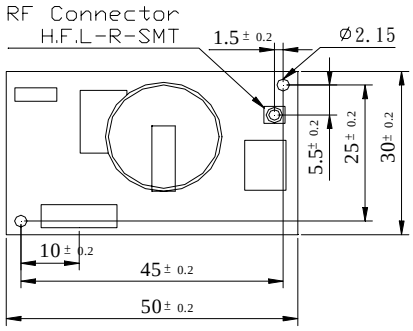


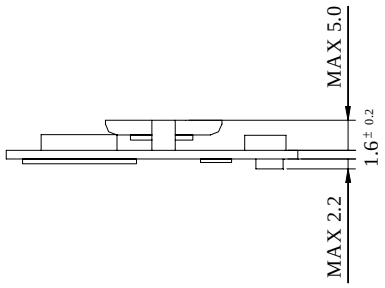
(2) DR Recommender Schmatic



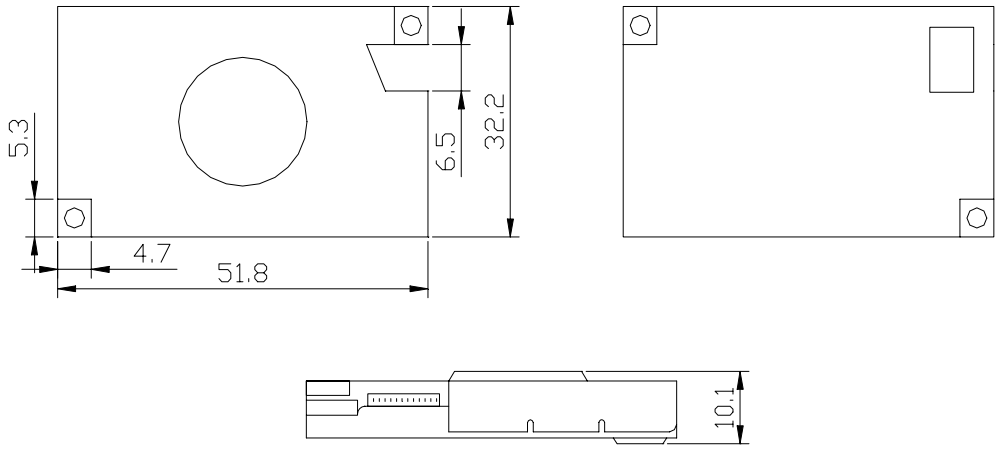
(3)DGPS

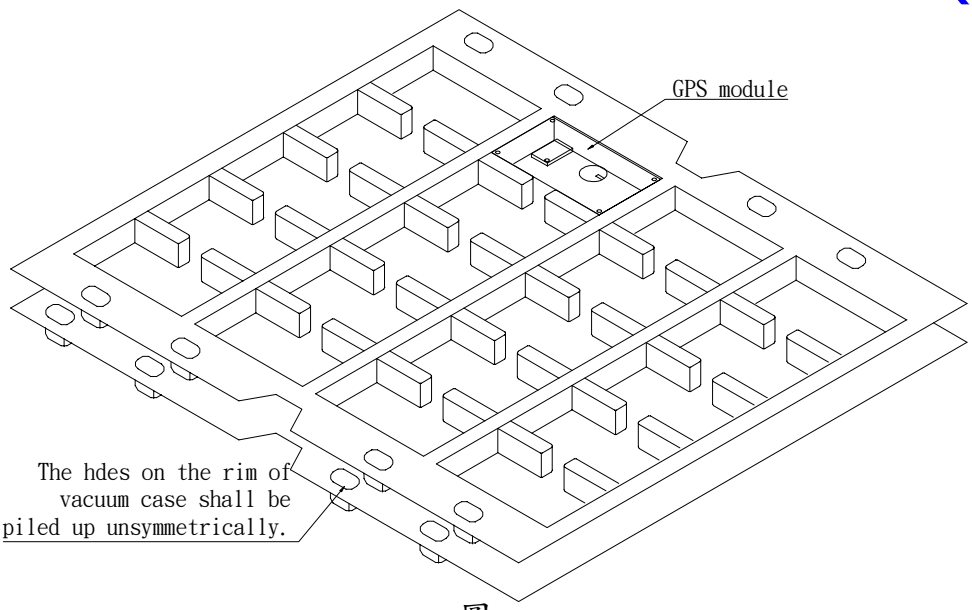




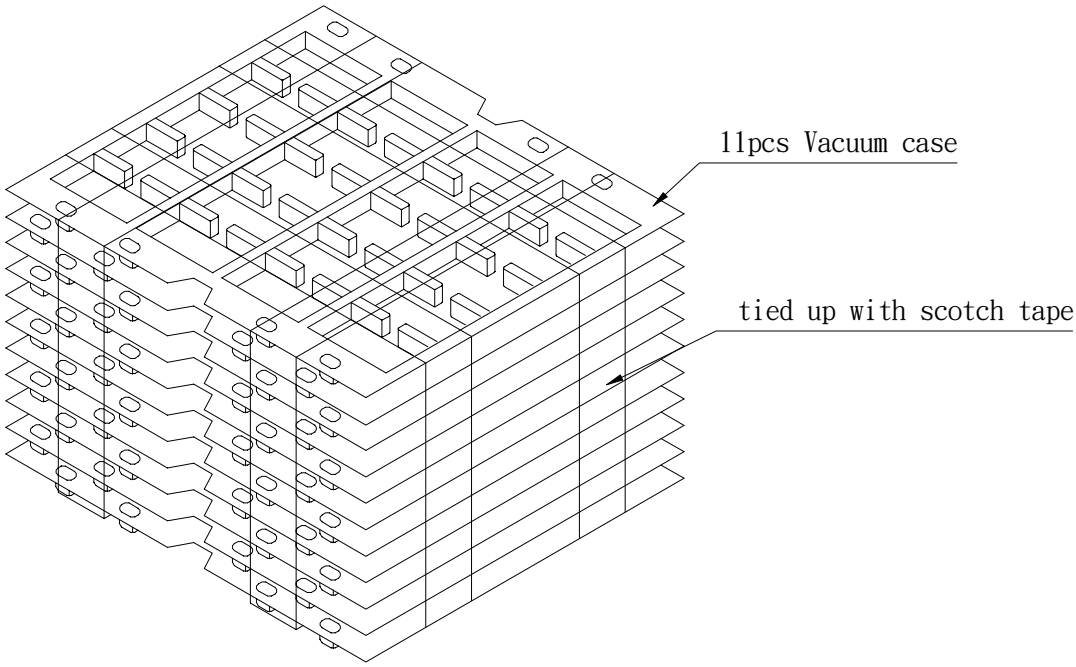


Shield Case Out Line





圖一



圖二

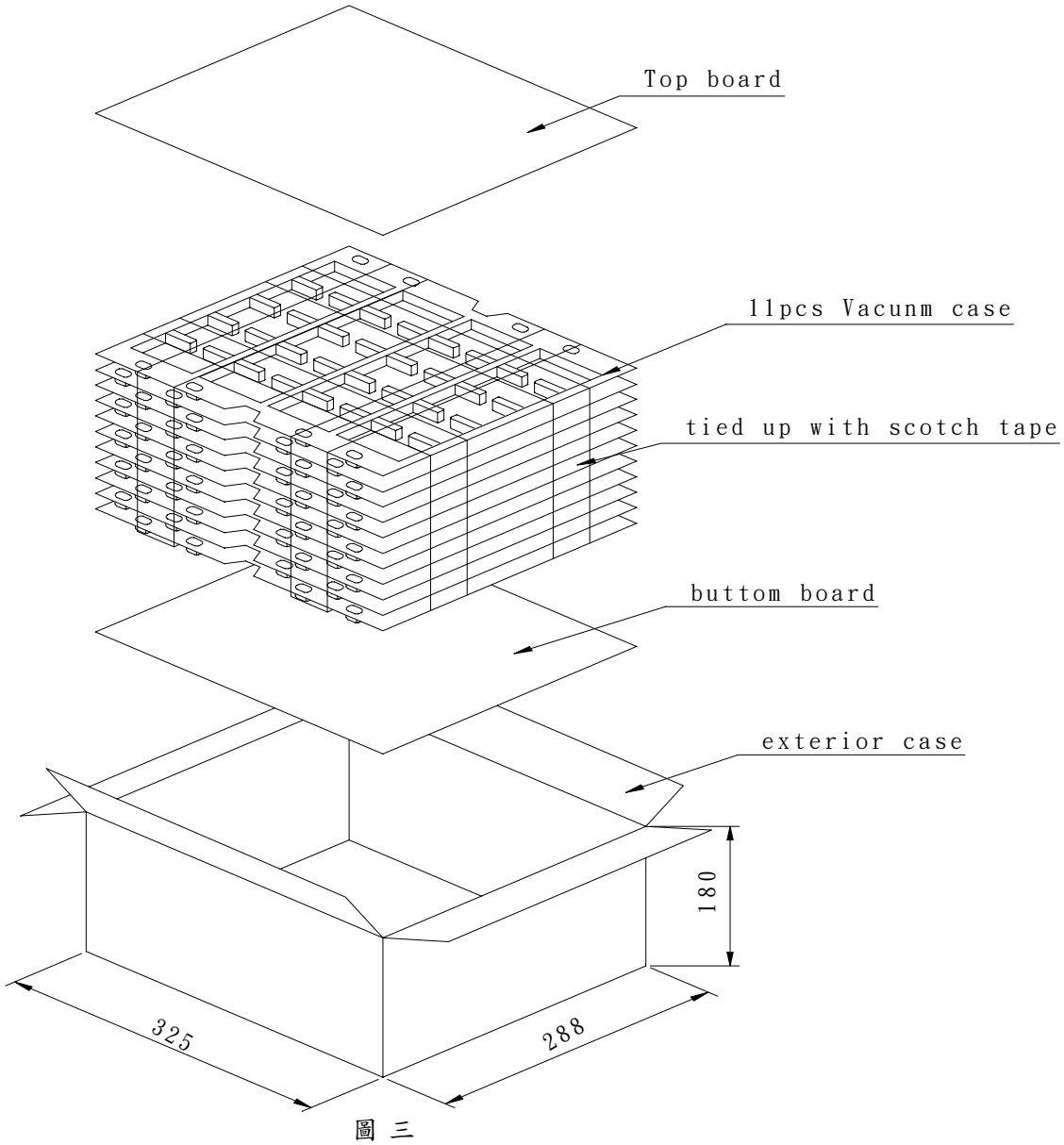
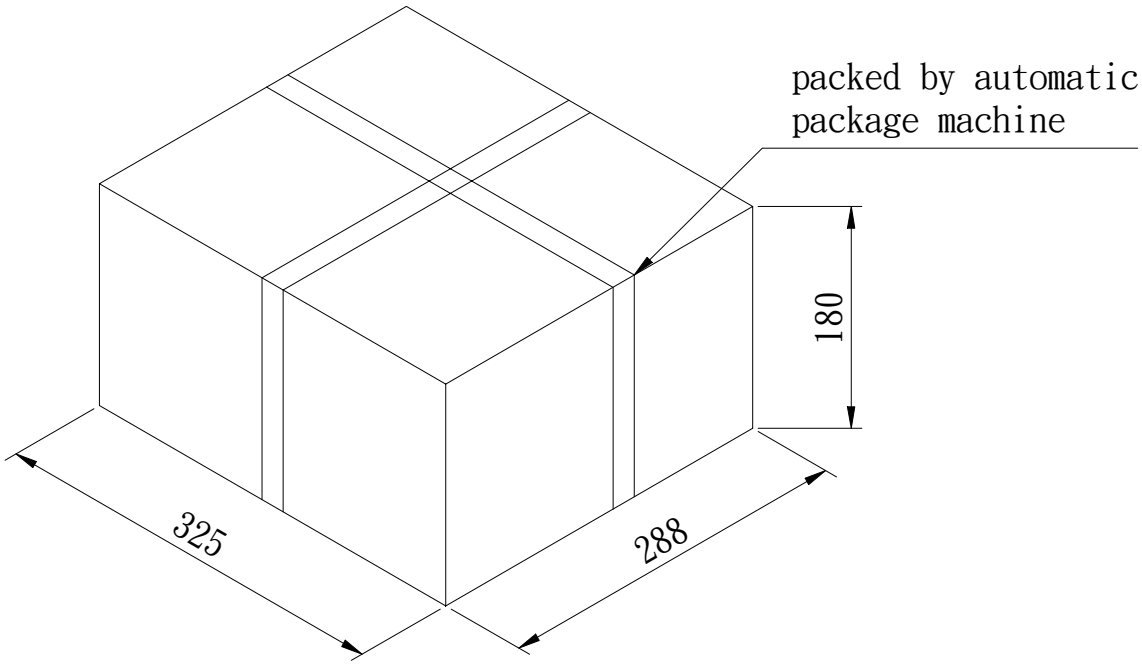


圖 三



圖四

〔List of Datum :Local geodetic system〕

Name	No	Name	No	No	Name	No	Name
Alaska/Canada	04	Liberia 1964	57	00	WGS-84	43	Chatham
ARC 1950	29	Maha 1971	58	01	WGS-72	44	Paraguay
ARC 1960	30	Malaysia	23	02	Tokyo	45	Brazil
Argentin	39	Maldive	48	03	NAD-27	46	New georgia
Ascension	31	Marcus	35	04	Alaska/Canada	47	Easter
Australian 1969	06	Marshall	82	05	European 1950	48	Maldive
Bahrain	27	Mascarene	73	06	Australian 1969	49	Guam 1963
Bermuda	37	Midway 61	62	07	South asia	50	Guadalcanal
Brazil	45	Morocco	61	08	South america	51	Hong kong 1963
Canary	68	Tokyo	03	09	Greenland	52	Diego garcia
Cayman brac	56	NAD-83	10	10	NAD-83	53	Jhonston
Chatham	43	New georgia	46	11	Iceland 1955	54	Sri lanka
Cocos	28	New zealand	13	12	Ireland 1965	55	Kelguelen
Colombia	38	Nigeria	63	13	New zealand	56	Cayman brac
Corvo/Flores	65	Oman	67	14	European 1979	57	Liberia 1964
Diego garcia	52	Paraguay	44	15	Rome 1940	58	Maha 1971
Djakarta	22	Phillippines	19	16	South africa	59	Salvage
East falkland 43	76	Phoenix	40	17	Saudi arabia	60	Eritrea
East malaysia	79	Pitcairn	69	18	Indian/Nepal	61	Morocco
Easter	47	Porto santo	77	19	Phillippines	62	Midway 61
Efate	36	Puerto rico	71	20	England	63	Nigeria
Egypt	66	Qatar	72	21	Hawaii	64	Trinidad
England	20	Rome 1940	15	22	Djakarta	65	Corvo/Flores
Eritrea	60	Salvage	59	23	Malaysia	66	Egypt
Ethiophia	25	Santa maria	75	24	Japan	67	Oman
European 1950	05	Santo	74	25	Ethiophia	68	Canary
European 1979	14	Saudi arabia	17	26	Somalia	69	Pitcairn
Faial	78	Somalia	26	27	Bahrain	70	South chile
Fiji	81	South africa	16	28	Cocos	71	Puerto rico
Finland	84	South america	08	29	ARC 1950	72	Qatar
Florida	41	South asia	07	30	ARC 1960	73	Mascarene
Greenland	09	South chile	70	31	Ascension	74	Santo
Guadalcanal	50	Sri lanka	54	32	Iwo jima	75	Santa maria
Guam 1963	49	St. Helena	34	33	Tern	76	East falkland 43
Hawaii	21	Surinam	83	34	St. Helena	77	Porto santo
Hong kong 1963	51	Sweden	85	35	Marcus	78	Faial
Iceland 1955	11	Tern	33	36	Efate	79	East malaysia
Indian/Nepal	18	Tokyo	02	37	Bermuda	80	Tristan
Ireland 1965	12	Trinidad	64	38	Colombia	81	Fiji
Iwo jima	32	Tristan	80	39	Argentin	82	Marshall
Japan	24	Tunisia	42	40	Phoenix	83	Surinam
Jhonston	53	WGS-72	01	41	Florida	84	Finland
Kelguelen	55	WGS-84	00	42	Tunisia	85	Sweden