*Rikaline*  **GPS-6021-X6**

## High Sensitivity
# CF GPS Receiver

| User's   Guide |
| --- |

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*Rikaline*  **International Corp.**

# TABLE OF CONTENTS

## 0. Quick Use

## 0.1 Check GPS Package
### 0.1.1 Standard Package
GPS-6021-X6 (GPS Receiver) + CD + Warranty Card + quick installation reference.

### 0.1.2 Optional Package
The shop may bundle different accessories for you as follows:
1. Active Antenna
2. PCMCIA Adapter
3. PDA Holder
4. Software (Navigation Software + Digital Map)
5. Others

## 0.2 Check Accessories
1. A-10302-M Active antenna is used when GPS-6020 can not get good signal. We do not recommend you to connect it all the way. If you got signal from both the GPS-6020 main unit and the active antenna, the signal strength could be less than they have to be.
2. The GPS-6021-X6 is design as plug in and use. You do not need any driver for CF slot.
3. GPS-6020 is CF type I device. It could be used for CF type I and II. When you put GPS-6020 in CF type II slot, please pay attention not to damage the CF slot or the GPS.
4. When you connect GPS-6021-X6 with your PC (Webpad PC, Tablet PC, Laptop PC or other PCs) through a PCMCIA adapter, you need a driver which is included in the CD.

## 0.3 Connect GPS-6021-X6 to your machine.
Turn on your machine and execute the navigation software.

## 0.4 Manufacturing Default
1. Sentence: GGA, GSA, GSV, RMC, VTG
2. Baud Rate: 4800
3. Datum: WGS84
4. DGPS: Not connected

## 0.5 Important Information
1. First time use: please wait a little bit longer to have the unit got position fix for minimum 1 minutes. Then you may experience the high sensitivity of using GPS-6021-X6.
2. Active Antenna:
   a// The connector of the active antenna might be fragile. Be sure to place it correctly when plug in and un-plug it.

   b//  If your device can not receive GPS signal when you un-plug the active antenna, please plug in and un-plug again. Because there is a small switch inside the small MC card connector in the GPS unit, some time it does not retain to its normal position when you un-plug the active antenna.
3. Operating temperature range from -40$^{o}$C to +85$^{o}$C (internal temperature)

## 0.6 Accessories
1. Active Antenna: A-10302-MC, with 2 meter cable, MC card connector.
2. Active Antenna: A-10305-MC, with 5 meter cable, MC card connector.
3. PDA Holder: Please refer page 11.

# 1. Introduction

## 1.1 Overview

The *Rikaline* **GPS-6021-X6 High Sensitivity CF GPS Receiver** is a total solution GPS receiver, designed based on **SiRF Star II** Architecture with the newest **Xtrac high sensitivity** system. This revolutionary system provides you unbelievable positioning sensitivity allowing you to have easy position fix in urban canyon conditions. This positioning application meets strict needs such as car navigation, mapping, surveying, security, agriculture and so on. Only clear view of sky and certain power supply are necessary to the unit. It communicates with other electronic utilities via compatible dual-channel through RS-232 and saves critical satellite data by built–in backup memory. With low power consumption, the **GPS-6021-X6** tracks up to 12 satellites at a time, re-acquires satellite signals in 100 ms and updates position data every second. Trickle-Power allows the unit operates a fraction of the time and Push-to-Fix permits user to have a quick position fix even though the receiver usually stays off.

## 1.2 Features

The GPS-6021-X6 provides a host of features that make it easy for integration and use.

1.  **SiRF Star II** chipset with embedded ARM7TDMI CPU available for customized applications in firmware.
2.  High performance receiver tracks up to 12 satellites while providing first fast fix and low power consumption.
3.  Differential capability (Optional function built by demand) utilizes real-time RTCM corrections producing 1-5 meter position accuracy.
4.  Compact design ideal for applications with minimal space.
5.  A rechargeable battery sustains internal clock and memory. It is recharged during normal operation.
6.  User initialization is not required.
7.  Dual communication channels and user selectable baud rates allow maximum interface capability and flexibility.
8.  FLASH based program memory: New software revisions upgradeable through serial interface.
9.  LED display status: The LED will be "ON" when power connected.
10. Built-in WAAS / EGNOS demodulator.
11. Small size.

## 1.3 Technology specifications

### 1.3.1 Physical Dimension
   Single construction integrated antenna/receiver.
   Size: 83.0(H) x 47.5(W) x 14.5(D) (mm)
        3.27"(H) x 1.87"(W) x 0.57"(D).

### 1.3.2 Environmental Characteristics
   1)  Operating temperature: -40$^{o}$C to +85$^{o}$C(internal temperature).
   2)  Storage temperature: -55$^{o}$C to +100$^{o}$C.

### 1.3.3 Electrical Characteristics
   1)  Input voltage: +2.5 ~ 5.5 VDC without accessories.
   2)  Backup power: 3V Rechargeable Lithium cell battery, up to 767 hours (31.9 days) discharge.

### 1.3.4 Performance
   1)  Tracks up to 12 satellites.
   2)  Update rate: 1 second.
   3)  Acquisition time
       Reacquisition   0.1 sec., averaged
       Snap start      2   sec., averaged
       Hot start       8   sec., averaged
       Warm start      38 sec., averaged

4

Cold start          45 sec., averaged
4)  Position Accuracy
    A) Non DGPS (Differential GPS)
        Position              15-meter 2D RMS
                      7-meter 2D RMS with WAAS corrected
        Velocity              0.1   meters/second, with SA off
        Time                 1        microsecond synchronized GPS time
    B) DGPS (Differential GPS)
        Position              1 to 5 meter, typical
        Velocity              0.05   meters/second, typical
5) Dynamic Conditions:
    Altitude              18,000 meters (60,000 feet) max
    Velocity              515     meters / second (1000 knots) max
    Acceleration      4 G,    max
    Jerk                  20      meters/second$^3$ , max

(DGPS function built by demand)

## 1.3.5 Interfaces
1)  Dual channel RS-232 level, with user selectable baud rate (4800-Default, 9600, 19200, 38400).
2)  NMEA 0183 Version 2.2 ASCII output (GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG).
3)  Real-time Differential Correction input (RTCM SC-104 message types 1, 5 and 9).
4)  SiRF protocol.

## 2. Operational characteristics

### 2.1 Initialization

As soon as the initial self-test is complete, the GPS-6021-X6 begins the process of satellite acquisition and tracking automatically. Under normal circumstances, it takes approximately 45 seconds to achieve a position fix, 38 seconds if ephemeris data is known. After a position fix has been calculated, information about valid position, velocity and time is transmitted over the output channel.

The GPS-6021-X6 utilizes initial data, such as last stored position, date, time and satellite orbital data, to achieve maximum acquisition performance. If significant inaccuracy exists in the initial data, or the orbital data is obsolete, it may take more time to achieve a navigation solution. The GPS-6021-X6 Auto-locate feature is capable of automatically determining a navigation solution without intervention from the host system. However, acquisition performance can be improved when the host system initializes the GPS-6021-X6 in the following situation:

1) Moving further than 1,500 kilometers.
2) Failure of data storage due to the inactive internal memory battery.

### 2.2 Navigation

After the acquisition process is complete, the GPS-6021-X6 sends valid navigation information over output channels. These data include:

1) Latitude/longitude/altitude
2) Velocity
3) Date/time
4) Error estimates
5) Satellite and receiver status

The GPS-6021-X6 sets the default of auto-searching for real-time differential corrections in RTCM SC-104 standard format, with the message types 1, 5, or 9. It accomplishes the satellite data to generate a differential (DGPS) solution. The host system, at its option, may also command the GPS-6021-X6 to output a position whenever a differential solution is available.

# 3. Hardware interface

## 3.1 Dimension
Size: 83.0(H) x 47.5(W) x 14.5(D) (mm)
3.27"(H) x 1.87"(W) x 0.57"(D).

## 3.2 Hardware Interface
The GPS-6021-X6 includes an antenna in a unique style gadget. It is a type I CF card device, which can be used with both type I and type II CF slot. Simply put it into a CF card slot or insert it into PCMCIA slot through a PCMCIA adapter of any type of PC with Windows OS. The interface is through a standard 50-pin PCMCIA connector with RS-232 level.

## 3.3 Connector
1) Standard 50-pin CF female connector.
2) Optional active antenna female MC Card connector.

### 3.3.1 Function definition of CF card connector
Please download detail at    http://compactflash.org/specdl1.htm

## 3.4 Accessories
### 3.4.1 Active Antenna
A-10302-MC    Active Antenna with 2 meter 180° MC Card connector
A-10305-MC    Active Antenna with 5 meter 180° MC Card connector

# 4. PCMCA Installation File

## 4.1 System Requirements

IBM, Pentium or other compatible PC, Windows 98/Me/2000.

## 4.2 Installation

1.  Insert GPS-6021-X6 into PCMCIA card, then insert PCMCIA card into your PC.
2.  Turn your PC.
3.  Your PC will show new device found.
4.  Indicate to the direction you store GPS-6021-X6.inf file.
5.  Click "Yes". Your PC will installation the file automatically.

**Note:** 1// The GPS-6021-X6.inf installation file is needed when a PCMCIA adapter used.
　　　2// PDA does not need to install any extra file.
　　　3// Please download installation file at
　　　http://www.socketcom.com/support/redirect.asp?URL=ftp://ftp.socketcom.com/io/sio9xme2k.exe

# 5. Warranty

　　The GPS-6021-X6 is warranted to be free from defects in material and functions for one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers.

# Appendix    A        Software Interface

The GPS-6021-X6 interface protocol is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification, which is defined in NMEA 0183, Version 2.2 and the Radio Technical Commission for Maritime Services (RTCM Recommended Standards For Differential Navstar GPS Service, Version 2.1, RTCM Special Committee No.104).

## A.1 NMEA Transmitted Messages

The GPS-6021-X6 supported by SiRF Technology Inc. also outputs data in NMEA-0183 format as defined by the National Marine Electronics Association (NMEA), Standard.

The default communication parameters for NMEA output are 4800 baud, 8 data bits, stop bit, and no parity.

**Table A-1 NMEA-0183 Output Messages**

| NMEA Sentence | Description |
|---|---|
| GPGGA | Global positioning system fixed data |
| GPGLL | Geographic position latitude \ longitude |
| GPGSA | GNSS DOP and active satellites |
| GPGSV | GNSS satellites in view. |
| GPRMC | Recommended minimum specific GNSS data |
| GPVTG | Coruse over ground and ground speed |

### A.1.1 Global Positioning System Fix Data (GGA)

Table A-2 contains the values for the following example:

**$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000*18**

**Table A-2 GGA Data Format**

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPGGA | | GGA protocol header |
| UTC Time | 161229.487 | | Hhmmss.sss |
| Latitude | 3723.2475 | | ddmm.mmmm |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 12158.3416 | | dddmm.mmmm |
| E/W Indicator | W | | E=east or W=west |
| Position Fix Indicator | 1 | | See Table 5-3 |
| Satellites Used | 07 | | Range 0 to 12 |
| HDOP | 1.0 | | Horizontal Dilution of Precision |
| MSL Altitude | 9.0 | Meters | |
| Units | M | Meters | |
| Geoid Separation | | Meters | |
| Units | M | Meters | |
| Age of Diff. Corr. | | second | Null fields when DGPS is not used |
| Diff. Ref. Station ID | 0000 | | |
| Checksum | *18 | | |
| <CR> <LF> | | | End of message termination |

**Table A-3 Position Fix Indicator**

| Value | Description |
|---|---|
| 0 | 0 Fix not available or invalid |
| 1 | GPS SPS Mode, fix valid |
| 2 | Differential GPS, SPS Mode, fix valid |
| 3 | GPS PPS Mode, fix valid |

## A.1.2 Geographic Position with Latitude/Longitude (GLL)

Table A-4 contains the values for the following example:

**$GPGLL,3723.2475,N,12158.3416,W,161229.487,A*2C**

**Table A-4 GLL Data Format**

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPGLL | | GLL protocol header |
| Latitude | 3723.2475 | | ddmm.mmmm |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 12158.3416 | | dddmm.mmmm |
| E/W Indicator | W | | E=east or W=west |
| UTC Position | 161229.487 | | hhmmss.sss |
| Status | A | | A=data valid or V=data not valid |
| Checksum | *2C | | |
| <CR> <LF> | | | End of message termination |

## A.1.3 GNSS DOP and Active Satellites (GSA)

Table A-5 contains the values for the following example:

**$GPGSA,A,3,07,02,26,27,09,04,15, , , , , ,1.8,1.0,1.5*33**

**Table A-5 GSA Data Format**

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPGSA | | GSA protocol header |
| Mode 1 | A | | See Table 5-6 |
| Mode 2 | 3 | | See Table 5-7 |
| Satellite Used (1) | 07 | | Sv on Channel 1 |
| Satellite Used (1) | 02 | | Sv on Channel 2 |
| …… | | | …. |
| Satellite Used | | | Sv on Channel 12 |
| PDOP | 1.8 | | Position Dilution of Precision |
| HDOP | 1.0 | | Horizontal Dilution of Precision |
| VDOP | 1.5 | | Vertical Dilution of Precision |
| Checksum | *33 | | |
| <CR> <LF> | | | End of message termination |

(1) Satellite used in solution.

**Table A-6 Mode 1**

| Value | Description |
|---|---|
| M | Manual—forced to operate in 2D or 3D mode |
| A | 2D Automatic—allowed to automatically switch 2D/3D |

**Table A-7 Mode 2**

| Value | Description |
|---|---|
| 1 | Fix Not Available |
| 2 | 2D |
| 3 | 3D |

## A.1.4 GNSS Satellites in View (GSV)

Table A-8 contains the values for the following example:

**$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*71**
**$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41**

**Table A-8 GSV Data Format**

10

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPGSV | | GSV protocol header |
| Number of Messages | 2 | | Range 1 to 3 |
| Message Number | 1 | | Range 1 to 3 |
| Satellites in View | 07 | | Range 1 to 12 |
| Satellite ID | 07 | | Channel 1 (Range 1 to 32) |
| Elevation | 79 | degrees | Channel 1 (Maximum 90) |
| Azimuth | 048 | degrees | Channel 1 (True, Range 0 to 359) |
| SNR (C/No) | 42 | dBHz | Range 0 to 99, null when not tracking |
| .... | .... | | |
| Satellite ID | 27 | | Channel 4 (Range 1 to 32) |
| Elevation | 27 | degrees | Channel 4 (Maximum 90) |
| Azimuth | 138 | degrees | Channel 4 (True, Range 0 to 359) |
| SNR (C/No) | 42 | dBHz | Range 0 to 99, null when not tracking |
| Checksum | *71 | | |
| <CR> <LF> | | | End of message termination |

**NOTE:** Items <4>,<5>,<6> and <7> repeat for each satellite in view to a maximum of four (4) satellites per sentence. Additional satellites in view information must be sent in subsequent sentences. These fields will be null if unused.

## A.1.5 Recommended Minimum Specific GNSS Data (RMC)

Table A-9 contains the values for the following example:

**$GPRMC,161229.487,A,3723.2475,N,12158.3416,W,0.13,309.62,120598, ,*10**

**Table A-9 RMC Data Format**

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPRMC | | RMC protocol header |
| UTC Time | 161229.487 | | hhmmss.sss |
| Status | A | | A=data valid or V=data not valid |
| Latitude | 3723.2475 | | ddmm.mmmm |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 12158.3416 | | dddmm.mmmm |
| E/W Indicator | W | | E=east or W=west |
| Speed Over Ground | 0.13 | Knots | |
| Course Over Ground | 309.62 | Degrees | True |
| Date | 120598 | | ddmmyy |
| Magnetic Variation (1) | | Degrees | E=east or W=west |
| Checksum | *10 | | |
| <CR> <LF> | | | End of message termination |

(1) SiRF Technology Inc. does not support magnetic declination. All "course over ground" data are geodetic WGS84 directions.

## A.1.6 Course Over Ground and Ground Speed

Table A-10 contains the values for the following example:

**$GPVTG,309.62,T, ,M,0.13,N,0.2,K*6E**

**Table A-10 VTG Data Format**

| Name | Example | Units | Description |
|---|---|---|---|
| Message ID | $GPVTG | | VTG protocol header |
| Course | 309.62 | Degrees | Measured heading |
| Reference | T | | True |
| Course | | Degrees | Measured heading |
| Reference | M | | Magnetic (1) |

11

| Speed | 0.13 | Knots | Measured horizontal speed |
|---|---|---|---|
| Units | N | | Knots |
| Speed | 0.2 | Km/hr | Measured horizontal speed |
| Units | K | | Kilometers per hour |
| Checksum | *6E | | |
| <CR> <LF> | | | End of message termination |

(1) SiRF Technology Inc. does not support magnetic declination. All "course over ground" data are geodetic WGS84 directions.

## A.2 RTCM Received Data

The default communication parameters for DGPS Input are 9600 baud, 8 data bits, stop bit, and no parity. Position accuracy of less than 5 meters can be achieved with the GPS-6021-X6 by using Differential GPS (DGPS) real-time pseudo-range correction data in RTCM SC-104 format, with message types 1, 5, or 9.   As using DGPS receiver with different communication parameters, GPS-6021-X6 may decode the data correctly to generate accurate messages and save them in battery-back SRAM for later computing.

# Appendix B Earth Datums & Output Setting

## B.1 Setting
### B.1.1 Manufacturing Default
Datum: WGS84.
Baud Rate: 4800.
Output: GGA, GSA, GSV, RMC.

### B.1.2 Baud Rate and Output Sentences Setting

#### B.1.2.1 By SiRFdemo Program
1// Connect your GPS-6021-X6 to PC (through PCMCIA adapter)
2// Execute SiRFdemo.exe (Program is in the CD)
3// When "Data Source Setup" shows, select the port (COM 1, 2 or 3….) you used, click "OK".
4// Click "Action", select "Open Data Source", Then you will see lots of sentences shows. All the sentences start with $GPxxxx. This is NMEA protocol. If you do not see these sentences, please click "View", "Select Message", then click "Development". The message will appear. If it still shows nothing, then continue below steps.
5// There is a screen "Selection of Target Receiver Software" might appear, please select "SiRFstar II".
6// Click "Action", Select "Switch to SiRF Protocol". Then you will see SiRF binary and the sentences start with #Time, shows every 4 lines and you can not see the sentences start with $GP. These sentences are for setting or viewing the GPS receiver's performance. If your software is using standard NMEA protocol, please do the following:
7// Click "Action", Select "Switch to NMEA Protocol". You will see GGA, GSV, GSA and RMC in black and the Baud Rate is 4800. These are the default we put inside the receiver. Please click "OK". Then you can use it as a standard GPS receiver. If your software uses different sentence, please choose the sentences you need.

After above actions, the new setting will be kept in SRAM. If no power supplied to GPS-6021-X6 for more than 30 days, user must re-set again when power on.

#### B.2.2.2 By other SiRF based demo program
There are a few companies or private website providing some very good demo software.

## B.2 Earth Datums
The GPS-6021-X6 is built in earth datum with WGS84.

### B.2.1 Built –in Earth Datums

The GPS-6021-X6 supports 219 datums. You may change it by following **Change Datum** step by step.
**Note:** dX, dY and dZ are the 3 dimension tolerance with WGS-84 (scale: meter).

| | Datum | dX | dY | dZ | Ellipsoid | Region of use | Name in GM-305 |
|---|---|---|---|---|---|---|---|
| 1. | WGS-84 | 0 | 0 | 0 | WGS 84 | Global | WGS 1984 |
| 2. | Adindan | -118 | -14 | 218 | Clarke 1880 | Burkina Faso | Adindan- Burkina Faso |
| 3. | Adindan | -134 | -2 | 210 | Clarke 1880 | Cameroon | Adindan- Cameroon |
| 4. | Adindan | -165 | -11 | 206 | Clarke 1880 | Ethiopia | Adindan- Ethiopia |
| 5. | Adindan | -123 | -20 | 220 | Clarke 1880 | Mali | Adindan- Mali |
| 6. | Adindan | -166 | -15 | 204 | Clarke 1880 | Mean for Ethiopia; Sudan | Adindan-Regional Mean |
| 7. | Adindan | -128 | -18 | 224 | Clarke 1880 | Senegal | Adindan- Senegal |
| 8. | Adindan | -161 | -14 | 205 | Clarke 1880 | Sudan | Adindan- Sudan |
| 9. | Afgooye | -43 | -163 | 45 | Krassovsky 1940 | Somalia | Afgooye- Somalia |
| 10. | Ain el Abd 1970 | -150 | -250 | -1 | International 1924 | Bahrain | Ain el Abd'70- Bahrain |
| 11. | Ain el Abd 1970 | -143 | -236 | 7 | International 1924 | Saudi Arabia | Ain el Abd'70- Saudi Arabia |
| 12. | American Samoa 1962 | -115 | 118 | 426 | Clarke 1866 | American Samoa Islands | American Samoa'62 |
| 13. | Anna 1 Astro 1965 | -491 | -22 | 435 | Australian National | Cocos Islands | Anna 1 Astro'65 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14. | Antigua Island Astro 1943 | -270 | 13 | 62 | Clarke 1880 | Antigua (Leeward Islands) | Antigua Island Astro'43 |
| 15. | Arc 1950 | -138 | -105 | -289 | Clarke 1880 | Botswana | Arc'50- Botswana |
| 16. | Arc 1950 | -153 | -5 | -292 | Clarke 1880 | Burundi | Arc'50- Burundi |
| 17. | Arc 1950 | -125 | -108 | -295 | Clarke 1880 | Lesotho | Arc'50- Lesotho |
| 18. | Arc 1950 | -161 | -73 | -317 | Clarke 1880 | Malawi | Arc'50- Malawi |
| 19. | Arc 1950 | -143 | -90 | -294 | Clarke 1880 | Mean for Botswana; Lesotho; Malawi; Swaziland; Zaire; Zambia; Zimbabwe | Arc'50-Regional Mean |
| 20. | Arc 1950 | -134 | -105 | -295 | Clarke 1880 | Swaziland | Arc'50- Swaziland |
| 21. | Arc 1950 | -169 | -19 | -278 | Clarke 1880 | Zaire | Arc'50- Zaire |
| 22. | Arc 1950 | -147 | -74 | -283 | Clarke 1880 | Zambia | Arc'50- Zambia |
| 23. | Arc 1950 | -142 | -96 | -293 | Clarke 1880 | Zimbabwe | Arc'50- Zimbabwe |
| 24. | Arc 1960 | -160 | -6 | -302 | Clarke 1880 | MEAN FOR Kenya; Tanzania | Arc'60- Mean of Kenya, Tanzania |
| 25. | Arc 1960 | -157 | -2 | -299 | Clarke 1880 | Kenya | Arc'60- Kenya |
| 26. | Arc 1960 | -175 | -23 | -303 | Clarke 1880 | Tanzania | Arc'60- Tanzania |
| 27. | Ascension Island 1958 | -205 | 107 | 53 | International 1924 | Ascension Island | Ascension Island'58 |
| 28. | Astro Beacon E 1945 | 145 | 75 | -272 | International 1924 | Iwo Jima | Astro Beacon E'45 |
| 29. | Astro DOS 71/4 | -320 | 550 | -494 | International 1924 | St Helena Island | Astro DOS 71/4 |
| 30. | Astro Tern Island (FRIG) 1961 | 114 | -116 | -333 | International 1924 | Tern Island | Astro Tern Island |
| 31. | Astronomical Station 1952 | 124 | -234 | -25 | International 1924 | Marcus Island | Astronomical Station'52 |
| 32. | Australian Geodetic 1966 | -133 | -48 | 148 | Australian National | Australia; Tasmania | Australian Geodetic'66 |
| 33. | Australian Geodetic 1984 | -134 | -48 | 149 | Australian National | Australia; Tasmania | Australian Geodetic'84 |
| 34. | Ayabelle Lighthouse | -79 | -129 | 145 | Clarke 1880 | Djibouti | Ayabelle Lighthouse |
| 35. | Bellevue (IGN) | -127 | -769 | 472 | International 1924 | Efate & Erromango Islands | Bellevue |
| 36. | Bermuda 1957 | -73 | 213 | 296 | Clarke 1866 | Bermuda | Bermuda 1957 |
| 37. | Bissau | -173 | 253 | 27 | International 1924 | Guinea-Bissau | Bissau |
| 38. | Bogota Observatory | 307 | 304 | -318 | International 1924 | Colombia | Bogota Observatory |
| 39. | Bukit Rimpah | -384 | 664 | -48 | Bessel 1841 | Indonesia (Bangka & Belitung Ids) | Bukit Rimpah |
| 40. | Camp Area Astro | -104 | -129 | 239 | International 1924 | Antarctica (McMurdo Camp Area) | Camp Area Astro |
| 41. | Campo Inchauspe | -148 | 136 | 90 | International 1924 | Argentina | Campo Inchauspe |
| 42. | Canton Astro 1966 | 298 | -304 | -375 | International 1924 | Phoenix Islands | Canton Astro'66 |
| 43. | Cape | -136 | -108 | -292 | Clarke 1880 | South Africa | Cape- South Africa |
| 44. | Cape Canaveral | -2 | 151 | 181 | Clarke 1866 | Bahamas; Florida | Cape Canaveral |
| 45. | Carthage | -263 | 6 | 431 | Clarke 1880 | Tunisia | Carthage- Tunisia |
| 46. | Chatham Island Astro 1971 | 175 | -38 | 113 | International 1924 | New Zealand (Chatham Island) | Chatham Island Astro'71 |
| 47. | Chua Astro | -134 | 229 | -29 | International 1924 | Paraguay | Chua Astro- Paraguay |
| 48. | Corrego Alegre | -206 | 172 | -6 | International 1924 | Brazil | Corrego Alegre |
| 49. | Dabola | -83 | 37 | 124 | Clarke 1880 | Guinea | Dabola- Guinea |
| 50. | Deception Island | 260 | 12 | -147 | Clarke 1880 | Deception Island; Antarctia | Deception Island |
| 51. | Djakarta (Batavia) | -377 | 681 | -50 | Bessel 1841 | Indonesia (Sumatra) | Djakarta-Batavia |
| 52. | DOS 1968 | 230 | -199 | -752 | International 1924 | New Georgia Islands (Gizo Island) | DOS 1968 |
| 53. | Easter Island 1967 | 211 | 147 | 111 | International 1924 | Easter Island | Easter Island'67 |
| 54. | Estonia Coordinate System 1937 | 374 | 150 | 588 | Bessel 1841 | Estonia | Estonia Coord Sys'37 |
| 55. | European 1950 | -104 | -101 | -140 | International 1924 | Cyprus | Euro'50- Cyprus |
| 56. | European 1950 | -130 | -117 | -151 | International 1924 | Egypt | Euro'50- Egypt |
| 57. | European 1950 | -86 | -96 | -120 | International 1924 | England; Channel Islands; Scotland; Shetland Islands | Euro'50- England |
| 58. | European 1950 | -86 | -96 | -120 | International 1924 | England; Ireland; Scotland; Shetland Islands | Euro'50- North Regional Mean |
| 59. | European 1950 | -87 | -95 | -120 | International 1924 | Finland; Norway | Euro'50- Finland,Norway |
| 60. | European 1950 | -84 | -95 | -130 | International 1924 | Greece | Euro'50- Greece |
| 61. | European 1950 | -117 | -132 | -164 | International 1924 | Iran | Euro'50- Iran |

14

| # | Datum | X | Y | Z | Ellipsoid | Region | Name |
|---|---|---|---|---|---|---|---|
| 62. | European 1950 | -97 | -103 | -120 | International 1924 | Italy (Sardinia) | Euro'50-Italy-Sardinia |
| 63. | European 1950 | -97 | -88 | -135 | International 1924 | Italy (Sicily) | Euro'50-Italy-Sicily |
| 64. | European 1950 | -107 | -88 | -149 | International 1924 | Malta | Euro'50-Malta |
| 65. | European 1950 | -87 | -98 | -121 | International 1924 | Mean for Austria; Belgium; Denmark; Finland; France; W Germany; Gibraltar; Greece; Italy; Luxembourg; Netherlands; Norway; Portugal; Spain; Sweden; Switzerland | Euro'50-West Regional Mean |
| 66. | European 1950 | -87 | -96 | -120 | International 1924 | Mean for Austria; Denmark; France; W Germany; Netherlands; Switzerland | Euro'50-East Regional Mean |
| 67. | European 1950 | -103 | -106 | -141 | International 1924 | Mean for Iraq; Israel; Jordan; Lebanon; Kuwait; Saudi Arabia; Syria | Euro'50-South Regional Mean |
| 68. | European 1950 | -84 | -107 | -120 | International 1924 | Portugal; Spain | Euro'50- Portugal,Spain |
| 69. | European 1950 | -112 | -77 | -145 | International 1924 | Tunisia | Euro'50- Tunisia |
| 70. | European 1979 | -86 | -98 | -119 | International 1924 | Mean for Austria; Finland; Netherlands; Norway; Spain; Sweden; Switzerland | European 1979 |
| 71. | Fort Thomas 1955 | -7 | 215 | 225 | Clarke 1880 | Nevis; St. Kitts (Leeward Islands) | Fort Thomas 1955 |
| 72. | Gan 1970 | -133 | -321 | 50 | International 1924 | Republic of Maldives | Gan 1970 |
| 73. | Geodetic Datum 1949 | 84 | -22 | 209 | International 1924 | New Zealand | Geodetic Datum'49 |
| 74. | Graciosa Base SW 1948 | -104 | 167 | -38 | International 1924 | Azores (Faial; Graciosa; Pico; Sao Jorge; Terceira) | Graciosa Base SW'48 |
| 75. | Guam 1963 | -100 | -248 | 259 | Clarke 1866 | Guam | Guam'63 Guam |
| 76. | Gunung Segara | -403 | 684 | 41 | Bessel 1841 | Indonesia (Kalimantan) | Gunung Segara |
| 77. | GUX 1 Astro | 252 | -209 | -751 | International 1924 | Guadalcanal Island | GUX 1 Astro |
| 78. | Herat North | -333 | -222 | 114 | International 1924 | Afghanistan | Herat North |
| 79. | Hermannskogel Datum | 653 | -212 | 449 | Bessel 1841 (Namibia) | Croatia -Serbia, Bosnia-Herzegovina | Hermannskogel Datum |
| 80. | Hjorsey 1955 | -73 | 46 | -86 | International 1924 | Iceland | Hjorsey 1955 |
| 81. | Hong Kong 1963 | -156 | -271 | -189 | International 1924 | Hong Kong | Hong Kong'63 |
| 82. | Hu-Tzu-Shan | -637 | -549 | -203 | International 1924 | Taiwan | Hu-Tzu-Shan |
| 83. | Indian | 282 | 726 | 254 | Everest (India 1830) | Bangladesh | Indian- Bangladesh |
| 84. | Indian | 295 | 736 | 257 | Everest (India 1956) | India; Nepal | Indian- India,Nepal |
| 85. | Indian | 283 | 682 | 231 | Everest (Pakistan) | Pakistan | Indian- Pakistan |
| 86. | Indian 1954 | 217 | 823 | 299 | Everest (India 1830) | Thailand | Indian 1954 |
| 87. | Indian 1960 | 182 | 915 | 344 | Everest (India 1830) | Vietnam (Con Son Island) | Indian'60- Con Son Island |
| 88. | Indian 1960 | 198 | 881 | 317 | Everest (India 1830) | Vietnam (Near 16øN)) | Indian'60-Vietnam |
| 89. | Indian 1975 | 210 | 814 | 289 | Everest (India 1830) | Thailand | Indian 1975 |
| 90. | Indonesian 1974 | -24 | -15 | 5 | Indonesian 1974 | Indonesia | Indonesian'74 |
| 91. | Ireland 1965 | 506 | -122 | 611 | Modified Airy | Ireland | Ireland 1965 |
| 92. | ISTS 061 Astro 1968 | -794 | 119 | -298 | International 1924 | South Georgia Islands | ISTS 061 Astro'68 |
| 93. | ISTS 073 Astro 1969 | 208 | -435 | -229 | International 1924 | Diego Garcia | ISTS 073 Astro'69 |
| 94. | Johnston Island 1961 | 189 | -79 | -202 | International 1924 | Johnston Island | Johnston Island'61 |
| 95. | Kandawala | -97 | 787 | 86 | Everest (India 1830) | Sri Lanka | Kandawala |
| 96. | Kerguelen Island 1949 | 145 | -187 | 103 | International 1924 | Kerguelen Island | Kerguelen Island'49 |
| 97. | Kertau 1948 | -11 | 851 | 5 | Everest (Malay. & Sing) | West Malaysia & Singapore | Kertau 1948 |
| 98. | Kusaie Astro 1951 | 647 | 1777 | -1124 | International 1924 | Caroline Islands | Kusaie Astro'51 |
| 99. | Korean Geodetic System | 0 | 0 | 0 | GRS 80 | South Korea | Korean Geo Sys |
| 100 | L. C. 5 Astro 1961 | 42 | 124 | 147 | Clarke 1866 | Cayman Brac Island | L. C. 5 Astro'61 |
| 101 | Leigon | -130 | 29 | 364 | Clarke 1880 | Ghana | Leigon |
| 102 | Liberia 1964 | -90 | 40 | 88 | Clarke 1880 | Liberia | Liberia 1964 |
| 103 | Luzon | -133 | -77 | -51 | Clarke 1866 | Philippines (Excluding Mindanao) | Luzon-Philip |
| 104 | Luzon | -133 | -79 | -72 | Clarke 1866 | Philippines (Mindanao) | Luzon-Philip- Mindanao |
| 105 | M'Poraloko | -74 | -130 | 42 | Clarke 1880 | Gabon | M'Poraloko |
| 106 | Mahe 1971 | 41 | -220 | -134 | Clarke 1880 | Mahe Island | Mahe 1971 |

| 107 | Massawa | 639 | 405 | 60 | Bessel 1841 | Ethiopia (Eritrea) | Massawa |
|---|---|---|---|---|---|---|---|
| 108 | Merchich | 31 | 146 | 47 | Clarke 1880 | Morocco | Merchich |
| 109 | Midway Astro 1961 | 912 | -58 | 1227 | International 1924 | Midway Islands | Midway Astro'61 |
| 110 | Minna | -81 | -84 | 115 | Clarke 1880 | Cameroon | Minna- Cameroon |
| 111 | Minna | -92 | -93 | 122 | Clarke 1880 | Nigeria | Minna- Nigeria |
| 112 | Montserrat Island Astro 1958 | 174 | 359 | 365 | Clarke 1880 | Montserrat (Leeward Islands) | Montserrat Island Astro'58 |
| 113 | Nahrwan | -247 | -148 | 369 | Clarke 1880 | Oman (Masirah Island) | Nahrwan-Oman-Masirah Island |
| 114 | Nahrwan | -243 | -192 | 477 | Clarke 1880 | Saudi Arabia | Nahrwan- Saudi Arabia |
| 115 | Nahrwan | -249 | -156 | 381 | Clarke 1880 | United Arab Emirates | Nahrwan- United Arab Emirates |
| 116 | Naparima BWI | -10 | 375 | 165 | International 1924 | Trinidad & Tobago | Naparima BWI |
| 117 | North American 1927 | -5 | 135 | 172 | Clarke 1866 | Alaska (Excluding Aleutian Ids) | N-Amer'27-Alaska |
| 118 | North American 1927 | -2 | 152 | 149 | Clarke 1866 | Alaska (Aleutian Ids East of 180øW) | N-Amer'27-Aleutian Ids E |
| 119 | North American 1927 | 2 | 204 | 105 | Clarke 1866 | Alaska (Aleutian Ids West of 180øW) | N-Amer'27-Aleutian Ids W |
| 120 | North American 1927 | -4 | 154 | 178 | Clarke 1866 | Bahamas (Except San Salvador Id) | N-Amer'27-Bahamas |
| 121 | North American 1927 | 1 | 140 | 165 | Clarke 1866 | Bahamas (San Salvador Island) | N-Amer'27-San Salvador |
| 122 | North American 1927 | -7 | 162 | 188 | Clarke 1866 | Canada (Alberta; British Columbia) | N-Amer'27-Alberta |
| 123 | North American 1927 | -9 | 157 | 184 | Clarke 1866 | Canada (Manitoba; Ontario) | N-Amer'27- Manitoba, Ontario |
| 124 | North American 1927 | -22 | 160 | 190 | Clarke 1866 | Canada (New Brunswick; Newfoundland; Nova Scotia; Quebec) | N-Amer'27- New Brunswick |
| 125 | North American 1927 | 4 | 159 | 188 | Clarke 1866 | Canada (Northwest Territories; Saskatchewan) | N-Amer'27-Saskatchewan |
| 126 | North American 1927 | -7 | 139 | 181 | Clarke 1866 | Canada (Yukon) | N-Amer'27- Yukon |
| 127 | North American 1927 | 0 | 125 | 201 | Clarke 1866 | Canal Zone | N-Amer'27-Canal Zone |
| 128 | North American 1927 | -9 | 152 | 178 | Clarke 1866 | Cuba | N-Amer'27-Cuba |
| 129 | North American 1927 | 11 | 114 | 195 | Clarke 1866 | Greenland (Hayes Peninsula) | N-Amer'27-Greenland |
| 130 | North American 1927 | -3 | 142 | 183 | Clarke 1866 | Mean for Antigua; Barbados; Barbuda; Caicos Islands; Cuba; Dominican Republic; Grand Cayman; Jamaica; Turks Islands | N-Amer'27-Antigua, Barbados |
| 131 | North American 1927 | 0 | 125 | 194 | Clarke 1866 | Mean for Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua | N-Amer'27-Costa Rica, El Salvador |
| 132 | North American 1927 | -10 | 158 | 187 | Clarke 1866 | Mean for Canada | N-Amer'27- Mean of Canada |
| 133 | North American 1927 | -8 | 160 | 176 | Clarke 1866 | Mean for Conus | N-Amer'27-Mean of Conus |
| 134 | North American 1927 | -9 | 161 | 179 | Clarke 1866 | Mean for Conus (East of Mississippi; River Including Louisiana; Missouri; Minnesota) | N-Amer'27-E-Mississippi |
| 135 | North American 1927 | -8 | 159 | 175 | Clarke 1866 | Mean for Conus (West of Mississippi; River Excluding Louisiana; Minnesota; Missouri) | N-Amer'27-W-Mississippi |
| 136 | North American 1927 | -12 | 130 | 190 | Clarke 1866 | Mexico | N-Amer'27-Mexico |
| 137 | North American 1983 | 0 | 0 | 0 | GRS 80 | Alaska (Excluding Aleutian Ids) | N-Amer'83-Alaska |
| 138. | North American 1983 | -2 | 0 | 4 | GRS 80 | Aleutian Ids | N-Amer'83-Aleutian Ids |
| 139 | North American 1983 | 0 | 0 | 0 | GRS 80 | Canada | N-Amer'83-Canada |
| 140 | North American 1983 | 0 | 0 | 0 | GRS 80 | Conus | N-Amer'83-Conus |
| 141 | North American 1983 | 1 | 1 | -1 | GRS 80 | Hawaii | N-Amer'83-Hawaii |
| 142 | North American 1983 | 0 | 0 | 0 | GRS 80 | Mexico; Central America | N-Amer'83-Mexico, |

16

| | | | | | | Central America |
|---|---|---|---|---|---|---|
| 143 | North Sahara 1959 | -186 | -93 | 310 | Clarke 1880 | Algeria | North Sahara'59 |
| 144 | Observatorio Meteorologico 1939 | -425 | -169 | 81 | International 1924 | Azores (Corvo & Flores Islands) | Observatorio Meteorologico'39 |
| 145 | Old Egyptian 1907 | -130 | 110 | -13 | Helmert 1906 | Egypt | Old Egyptian 1907 |
| 146 | Old Hawaiian | 89 | -279 | -183 | Clarke 1866 | Hawaii | Old Hawaiian- Hawaii |
| 147 | Old Hawaiian | 45 | -290 | -172 | Clarke 1866 | Kauai | Old Hawaiian- Kauai |
| 148 | Old Hawaiian | 65 | -290 | -190 | Clarke 1866 | Maui | Old Hawaiian- Maui |
| 149 | Old Hawaiian | 61 | -285 | -181 | Clarke 1866 | Mean For Hawaii; Kauai; Maui; Oahu | Old Hawaiian-Regional Mean |
| 150 | Old Hawaiian | 58 | -283 | -182 | Clarke 1866 | Oahu | Old Hawaiian- Oahu |
| 151 | Oman | -346 | -1 | 224 | Clarke 1880 | Oman | Oman |
| 152 | Ordnance Survey Great Britain 1936 | 371 | -112 | 434 | Airy 1830 | England | Ord Sur GB'36- England |
| 153 | Ordnance Survey Great Britain 1936 | 371 | -111 | 434 | Airy 1830 | England; Isle of Man; Wales | Ord Sur GB'36- Isle of Man |
| 154 | Ordnance Survey Great Britain 1936 | 375 | -111 | 431 | Airy 1830 | Mean For England; Isle of Man; Scotland; Shetland Islands; Wales | Ord Sur GB'36-Regional Mean |
| 155 | Ordnance Survey Great Britain 1936 | 384 | -111 | 425 | Airy 1830 | Scotland; Shetland Islands | Ord Sur GB'36- Scotland, Shetland |
| 156 | Ordnance Survey Great Britain 1936 | 370 | -108 | 434 | Airy 1830 | Wales | Ord Sur GB'36- Wales |
| 157 | Pico de las Nieves | -307 | -92 | 127 | International 1924 | Canary Islands | Pico de las Nieves |
| 158 | Pitcairn Astro 1967 | 185 | 165 | 42 | International 1924 | Pitcairn Island | Pitcairn Astro 1967 |
| 159 | Point 58 | -106 | -129 | 165 | Clarke 1880 | MEAN FOR Burkina Faso & Niger | Point 58 |
| 160 | Pointe Noire 1948 | -148 | 51 | -291 | Clarke 1880 | Congo | Pointe Noire 1948 |
| 161 | Porto Santo 1936 | -499 | -249 | 314 | International 1924 | Porto Santo; Madeira Islands | Porto Santo 1936 |
| 162 | Provisional South American 1956 | -270 | 188 | -388 | International 1924 | Bolivia | Prov S-Amer'56- Bolivia |
| 163 | Provisional South American 1956 | -270 | 183 | -390 | International 1924 | Chile (Northern; Near 19 øS) | Prov S-Amer'56-Chile-North |
| 164 | Provisional South American 1956 | -305 | 243 | -442 | International 1924 | Chile (Southern; Near 43 øS) | Prov S-Amer'56-Chile-South |
| 165 | Provisional South American 1956 | -282 | 169 | -371 | International 1924 | Colombia | Prov S-Amer'56- Colombia |
| 166 | Provisional South American 1956 | -278 | 171 | -367 | International 1924 | Ecuador | Prov S-Amer'56- Ecuador |
| 167 | Provisional South American 1956 | -298 | 159 | -369 | International 1924 | Guyana | Prov S-Amer'56- Guyana |
| 168 | Provisional South American 1956 | -288 | 175 | -376 | International 1924 | Mean for Bolivia; Chile; Colombia; Ecuador; Guyana; Peru; Venezuela | Prov S-Amer'56-Regional Mean |
| 169 | Provisional South American 1956 | -279 | 175 | -379 | International 1924 | Peru | Prov S-Amer'56- Peru |
| 170 | Provisional South American 1956 | -295 | 173 | -371 | International 1924 | Venezuela | Prov S-Amer'56- Venezuela |
| 171 | Provisional South Chilean 1963 | 16 | 196 | 93 | International 1924 | Chile (Near 53 øS) (Hito XVIII) | Prov S-Chilean'63 |
| 172 | Puerto Rico | 11 | 72 | -101 | Clarke 1866 | Puerto Rico; Virgin Islands | Puerto Rico |
| 173 | Pulkovo 1942 | 28 | -130 | -95 | Krassovsky 1940 | Russia | Pulkovo 1942 |
| 174 | Qatar National | -128 | -283 | 22 | International 1924 | Qatar | Qatar National |
| 175 | Qornoq | 164 | 138 | -189 | International 1924 | Greenland (South) | Qornoq |
| 176 | Reunion | 94 | -948 | -1262 | International 1924 | Mascarene Islands | Reunion |
| 177 | Rome 1940 | -225 | -65 | 9 | International 1924 | Italy (Sardinia) | Rome 1940 |
| 178 | S-42 (Pulkovo 1942) | 28 | -121 | -77 | Krassovsky 1940 | Hungary | S-42 Pul'42- Hungary |
| 179 | S-42 (Pulkovo 1942) | 23 | -124 | -82 | Krassovsky 1940 | Poland | S-42 Pul'42- Poland |
| 180 | S-42 (Pulkovo 1942) | 26 | -121 | -78 | Krassovsky 1940 | Czechoslavakia | S-42 Pul'42- Czechoslavakia |
| 181 | S-42 (Pulkovo 1942) | 24 | -124 | -82 | Krassovsky 1940 | Latvia | S-42 Pul'42- Latvia |

| 182 | S-42 (Pulkovo 1942) | 15 | -130 | -84 | Krassovsky 1940 | Kazakhstan | S-42 Pul'42- Kazakhstan |
|---|---|---|---|---|---|---|---|
| 183 | S-42 (Pulkovo 1942) | 24 | -130 | -92 | Krassovsky 1940 | Albania | S-42 Pul'42- Albania |
| 184 | S-42 (Pulkovo 1942) | 28 | -121 | -77 | Krassovsky 1940 | Romania | S-42 Pul'42- Romania |
| 185 | S-JTSK | 589 | 76 | 480 | Bessel 1841 | Czechoslavakia (Prior 1 JAN 1993) | S-JTSK |
| 186 | Santo (DOS) 1965 | 170 | 42 | 84 | International 1924 | Espirito Santo Island | Santo DOS'65 |
| 187 | Sao Braz | -203 | 141 | 53 | International 1924 | Azores (Sao Miguel; Santa Maria Ids) | Sao Braz |
| 188 | Sapper Hill 1943 | -355 | 21 | 72 | International 1924 | East Falkland Island | Sapper Hill'43 |
| 189 | Schwarzeck | 616 | 97 | -251 | Bessel 1841 (Namibia) | Namibia | Schwarzeck |
| 190 | Selvagem Grande 1938 | -289 | -124 | 60 | International 1924 | Salvage Islands | Selvagem Grande'38 |
| 191 | Sierra Leone 1960 | -88 | 4 | 101 | Clarke 1880 | Sierra Leone | Sierra Leone'60 |
| 192 | South American 1969 | -62 | -1 | -37 | South American 1969 | Argentina | S-Amer'69- Argentina |
| 193 | South American 1969, | -61 | 2 | -48 | South American 1969 | Bolivia | S-Amer'69- Bolivia |
| 194 | South American 1969, | -60 | -2 | -41 | South American 1969 | Brazil | S-Amer'69- Brazil |
| 195 | South American 1969, | -75 | -1 | -44 | South American 1969 | Chile | S-Amer'69- Chile |
| 196 | South American 1969, | -44 | 6 | -36 | South American 1969 | Colombia | S-Amer'69- Colombia |
| 197 | South American 1969, | -48 | 3 | -44 | South American 1969 | Ecuador | S-Amer'69- Ecuador |
| 198 | South American 1969, | -47 | 26 | -42 | South American 1969 | Ecuador (Baltra; Galapagos) | S-Amer'69- Baltra, Galapagos |
| 199 | South American 1969, | -53 | 3 | -47 | South American 1969 | Guyana | S-Amer'69- Guyana |
| 200 | South American 1969, | -57 | 1 | -41 | South American 1969 | Mean for Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Guyana; Paraguay; Peru; Trinidad & Tobago; Venezuela | S-Amer'69-Regional Mean |
| 201 | South American 1969, | -61 | 2 | -33 | South American 1969 | Paraguay | S-Amer'69- Paraguay |
| 202 | South American 1969, | -58 | 0 | -44 | South American 1969 | Peru | S-Amer'69- Peru |
| 203 | South American 1969, | -45 | 12 | -33 | South American 1969 | Trinidad & Tobago | S-Amer'69- Trinidad,Tobago |
| 204 | South American 1969, | -45 | 8 | -33 | South American 1969 | Venezuela | S-Amer'69- Venezuela |
| 205 | South Asia | 7 | -10 | -26 | Modified Fischer 1960 | Singapore | South Asia |
| 206 | Tananarive Observatory 1925 | -189 | -242 | -91 | International 1924 | Madagascar | Tananarive Observ'25 |
| 207 | Timbalai 1948 | -679 | 669 | -48 | Everest (Sabah Sarawak) | Brunei; E. Malaysia (Sabah Sarawak) | Timbalai 1948 |
| 208 | Tokyo | -148 | 507 | 685 | Bessel 1841 | Japan | Tokyo- Japan |
| 209 | Tokyo | -148 | 507 | 685 | Bessel 1841 | Mean for Japan; South Korea; Okinawa | Tokyo-Regional Mean |
| 210 | Tokyo | -158 | 507 | 676 | Bessel 1841 | Okinawa | Tokyo- Okinawa |
| 211 | Tokyo | -147 | 506 | 687 | Bessel 1841 | South Korea | Tokyo- South Korea |
| 212 | Tristan Astro 1968 | -632 | 438 | -609 | International 1924 | Tristan da Cunha | Tristan Astro'68 |
| 213 | Viti Levu 1916 | 51 | 391 | -36 | Clarke 1880 | Fiji (Viti Levu Island) | Viti Levu 1916 |
| 214 | Voirol 1960 | -123 | -206 | 219 | Clarke 1880 | Algeria | Voirol 1960 |
| 215 | Wake Island Astro 1952 | 276 | -57 | 149 | International 1924 | Wake Atoll | Wake Island Astro'52 |
| 216 | Wake-Eniwetok 1960 | 102 | 52 | -38 | Hough 1960 | Marshall Islands | Wake-Eniwetok'60 |
| 217 | WGS 1972 | 0 | 0 | 0 | WGS 72 | Global Definition | WGS 1972 |
| 218 | Yacare | -155 | 171 | 37 | International 1924 | Uruguay | Yacare |
| 219 | Zanderij | -265 | 120 | -358 | International 1924 | Suriname | Zanderij |

## Appendix C    Ordering Information

# C.1 Product Options
## C.1.1 Standard Package

GPS-6021-X6: CF GPS with main unit, CD, Warranty card and quick reference.

# C.2 Optional Accessories
## C.2.1 Active Antenna
A-10302-MC    Active Antenna with 2 meter 180° MC Card connector
A-10305-MC    Active Antenna with 5 meter 180° MC Card connector

## C.2.2 PDA Holder

|    | Part No. | Description |
|----|----------|-------------|
| 1  | A-2001   | PDA Holder, Suction Cup, 150mm, Short Arm |
| 2  | A-2001-L | PDA Holder, Suction Cup, 150-320mm Adjustable |
| 3  | A-2002-B | PDA Holder, Suction Cup, 150mm, Short Arm, Magnetic Pad |
| 4  | A-2002-BL | PDA Holder, Suction Cup, 320mm, Long Arm, Magnetic Pad |
| 5  | A-2005   | PDA Holder, Suction Cup, 150mm, Short Arm, 4-Claw |
| 6  | A-2005-BL | PDA Holder, Suction Cup, 320mm Long Arm, 4-Claw |
| 7  | A-2006   | PDA Holder, Suction Cup, 150mm Short Arm, 3-Claw |
| 8  | A-2006-BL | PDA Holder, Suction Cup, 150mm Long Arm, 3-Claw |
| 9  | A-2007   | PDA Holder, Suction Cup, 150mm, Straight Short Arm, 4-Claw |
| 10 | A-2008   | PDA Holder, Suction Cup, 150mm, Straight Short Arm, 3-Claw |