

Highly accurate positioning

DGPS BEACON RECEIVER

Model GR-80

- Provides 5 m vessel positioning accuracy using the Standard Positioning Service of the worldwide GPS System
- DGPS performance is now available for DGPS-ready GPS navigators and plotters
- Hands-off operation with automatic selection of the best beacon station
- The GR-80 complies with all relevant IMO and IEC standards

The GPS (Global Positioning System) operated by the U.S. Government provides global coverage with an accuracy of 50 m 95% of the time. This service is available for 24 hours a day without any user fees. It offers a revolutionary means of accurately positioning vessels and for other related maritime activities. However, the range of accuracy actually achievable will not meet most mariners requirements in close-in coastal areas, harbors and harbor approaches. The

differential technique used provides a much more accurate navigation and positioning system, somewhere in the range of 5 m. DGPS service is becoming increasingly available on the U.S./Canadian coastlines, European waterways, Japan, etc.

The Furuno beacon receiver GR-80 is one of the best solutions for ships needing higher positioning accuracy than offered with the normal Standard Positioning Service (SPS). The accuracy of Furuno GPS receivers is generally



Differential operation of the GPS consists of several essential elements. In a word, a reference receiver is placed at a known point. It compares the known location with that predicted by the GPS reference receiver producing correction data. This data is broadcast in MSK modulated signals within the beacon band. The differential beacon receivers on ships receive and demodulate the signals, applying the correction data to the GPS receiver.

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50 m (95%) with Selective Availability, but the GR-80 can improve accuracy to a range of 5 m.

The GR-80's Automatic mode provides hands-off operation; the nearest beacon station is automatically selected by referencing GPS L/L data to the geographical database in the GR-80. Data flow between the GR-80 and the associated GPS navigator is automatic. There is no need to change the station

manually when the ship moves from one station's coverage to another station's coverage. The range of beacon stations is normally 200 km; however, the LF transmission is subject to sunspot activity, geographical features, time of day, season, etc. On occasion, the closest station may not always be a good station. In such a circumstance, the beacon receiver can be manually set by inputting the selected station's name and frequency. The LCD panel displays the names and frequencies of the selected stations, S/N ratio, field intensity and offset values as selected on menu.



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The future today with FURUNO's electronics technology. **FURUNO ELECTRIC CO., LTD.** 9-52 Ashihara-cho, Nishinomiya City, Japan Telephone: +81 (798) 65-2111 Catalogue No. N-830c

Comparison of positioning accuracy between GPS and DGPS (Actual data)

GPS receiver only



With GR-80 DGPS fixes -Tested simultaneously with use of 2 sets of the FURUNO GPS Plotter GP-3100 at fixed point.

Test data

Date: Location: Beacon station: Data update rate: Test time:

Jan 18, 1996 10:00 AM Yaizu, Shizuoka pref., Japan Daiozaki station, Mie pref., Japan 1 second 30 min

Note: All GPS receivers are subject to degradation of position and velocity accuracies under the U.S. Department of Defense. Position may be degraded up to 100 meters.

SPECIFICATIONS OF GR-80

Applicable to

Furuno GPS navigators GP-70 Mark-2, GP-80, GP-500 Mark-2 and GPS plotters

Beacon stations

Automatic selection of a nearest station Manual selection by station name or frequency

Coverage

200 km approx, from a beacon station

DGPS accuracy

5 m (95% of the time)

Sensitivity

6 dBµV (MSK 100 bps, 10-3 BER)

Antenna gain

6 dB (with 1.2 m whip)

Frequency range 283.5 - 325.0 kHz (All ITU regions), 0.5 kHz steps **Receiving system**

Single superheterodyne

IF: 455 kHz

Modulation and format

Minimum Shift Keying (MSK) in RTCM SC104 format Data speed: 25, 50, 100, 200 bps, auto or manual selection Acquisition time

5 s (8 dB S/N)





selectable	, , , , , , , , , , , , , , , , , , , ,	0 (110 2020/110 12
Data speed: 2400, 4800, 9600, 14400, 19200 bps		
		11100, 10200 500
FOWER SUFF	E1	
10.2 - 31.2 VDC, 5 W		
ENVIRONMENT (IEC 945 test methods)		
Temperature:	Receiver unit:	-15 to +55°C
	Antenna unit:	-25 to +70°C

Waterproofing: Receiver unit: IPX2 IPX6 Antenna unit:

EQUIPMENT LIST

Standard

- 1 Receiver unit GR-80
- Active antenna (Pre-amp) GR-8 with 15 m cable 2
- 3 Installation materials and spare parts
- Optional
- Antenna cable OP08-15-30 (30 m) 1
- Antenna cable OP08-15-60 (60 m) 2
- Rectifier PR-62 for 115/230 VAC 3

00025T Printed in Japan

- 1.2 m whip antenna FAW-1.2 4
- 2.6 m whip antenna 04S4176 5.
- Flush mount kit OP08-16 6.
- 7. Hose clamp OP08-18



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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