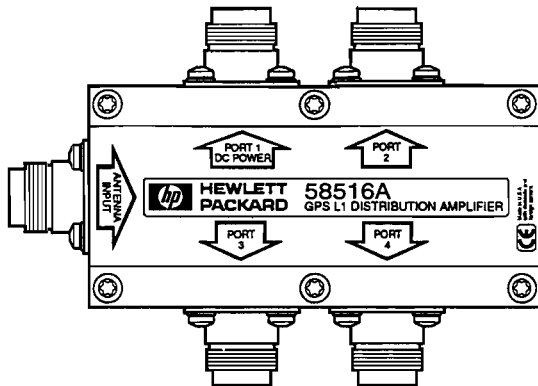


# HP 58516A

## GPS L1 DISTRIBUTION AMPLIFIER

### INFORMATION NOTE



**Figure 1. Hewlett-Packard 58516A Distribution Amplifier**

#### 1. INTRODUCTION

1.1. The HP 58516A GPS L1 Distribution Amplifier is one component of a complete line of GPS accessories for your GPS antenna system available from Hewlett-Packard. These accessories are designed to deliver precise GPS signals over a wide temperature range and in harsh environmental conditions.

1.2. The distribution amplifier is required if you wish to distribute the signal from a single antenna to as many as four GPS receivers.

#### 2. DESCRIPTION

2.1. The HP 58516A consists of a broadband, unity gain amplifier and a 1:4 signal splitter. Designed for use with GPS antennas, the unit features a high degree of isolation to eliminate feedback and interaction between any GPS systems connected to it.

2.2. Power to the standard unit is supplied by the GPS timing receiver connected to Port 1. An optional external dc power input (Option 05Q) is available, in which power is supplied instead through an SMC connector. This ex-

ternal power option allows the use of a power source separate from any of the connected GPS receivers. A unit with Option 05Q does not receive power through Port 1.

#### 3. USE WITH HP AND NON-HP SYSTEMS

3.1. Although designed for use with HP GPS frequency and time receivers, the HP 58516A can be used with other GPS receiver and antenna systems.

3.2. The HP 58516A operates over a voltage range of +4.5 Vdc to +30 Vdc. Voltage is supplied via the connecting cable (the center conductor is positive with respect to the shield) to Port 1 of a standard unit, or through an external dc power input on a unit with Option 05Q.

**Caution:** Power to the HP 58516A will be passed to the rest of the antenna system. For example, if a +30 Vdc supply is used to power the HP 58516A, the +30 Vdc will be passed through to the antenna. When using the HP 58516A with an HP 58504A GPS antenna, the maximum voltage should be no greater than +5.5 Vdc.

#### 4. INSIDE THIS INFORMATION NOTE

4.1. This note provides information on the following topics:

- Distribution amplifier description.
- Installation, including mounting distribution amplifiers.
- Recommended maintenance.
- Warranty.
- List of specifications.

## 5. CONSIDERATIONS FOR LONG CABLE RUNS

5.1. Due to process variations in the fabrication of the HP 58516A, the gain through the device can vary from +3 dB to -3 dB. Assume the worst case loss of the HP 58516A when determining if line amplifiers are necessary in your GPS antenna system.

5.2. The assumed worst case loss through the HP 58516A is equal to:

- 18 meters (60 ft) of cable length when using LMR 400 cable
- 8 meters (25 ft) of cable length when using RG-213 cable.

5.3. Use this procedure to determine if line amplifiers are required:

1. First, calculate the distance from the antenna to the most distant receiver.
2. Add the assumed worst case loss through the HP 58516A in terms of cable length.
3. Compare the result to the requirements for line amplifiers below. If line amplifiers are required, they should be added as close to the GPS antenna as possible (within 10 meters/33 feet).

## 6. REQUIREMENTS FOR LINE AMPLIFIERS

6.1. This section provides information that will help you determine if line amplifiers are required for your GPS antenna system installation.

**For LMR 400 cable:**

6.2. If the estimated cable length between the antenna and the most distant GPS receiver is (include the assumed worst case loss through the HP 58516A):

- Less than 115 meters (377 feet), no line amplifier is necessary.
- More than 115 meters (377 feet) and less than 240 meters (787 feet), you need 1 line amplifier.
- More than 240 meters (787 feet) and less than 360 meters (1181 feet), you need 2 line amplifiers.

- More than 360 meters (1181 feet), contact HP for assistance.

**For RG-213 cable:**

6.3. If the estimated cable length between the antenna and the most distant GPS receiver is (include the assumed worst case loss through the HP 58516A):

- Less than 53 meters (174 feet), no line amplifier is necessary.
- More than 53 meters (174 feet) and less than 105 meters (345 feet), you need 1 line amplifier.
- More than 105 meters (345 feet) and less than 158 meters (518 feet), you need 2 line amplifiers.
- More than 158 meters (518 feet), contact HP for assistance.

## 7. INSTALLATION

7.1. This section provides information on mounting the distribution amplifier.

### Parts Required

7.2. Having the items listed below on hand will help save time during installation.

- **Customer Supplied:**
  - If the distribution amplifier will be mounted to a surface, a mounting bracket is needed. Option AUB provides a mounting bracket and 4 screws. Otherwise, order (1) HP p/n 58516-00002 (mounting bracket) AND (4) p/n 0515-0372 (screws).
  - Use fasteners no larger than 6.35 mm (0.25 in) diameter with the mounting bracket.

### Tools Required

- TORX T-10 screwdriver for bracket screws.
- Drill and bits as required if you intend to mount the amplifier to a surface.

### Mounting Distribution Amplifier

7.3. The HP 58516A Distribution Amplifier can be mounted in any indoor location where it will not be exposed to excessive humidity or standing water. It should be placed between the GPS receivers and any installed line amplifiers, and/or lightning arresters.

7.4. Refer to Figure 2. A mounting bracket (1) is available for the HP 58516A distribution amplifier (2). Four screws (3) attach the bracket to the amplifier. For ordering information, see "Parts Required," above.

7.5. The bracket has four oval-shaped slots for mounting the amplifier to a surface. These slots are 6.35 mm (0.25 in) by 15.87 mm (0.625 in).

7.6. The HP 58516A Distribution Amplifier is intended for indoor use only. It can be mounted to any flat surface.

### Attaching the Bracket to the Amplifier

7.7. The distribution amplifier has four "blind" screw holes located on the back of the case (see Figure 2). Position the distribution amplifier so that the four blind holes in the amplifier case line up with the four mounting holes at the edges of the mounting bracket. Fasten the distribution amplifier to the bracket using the four screws.

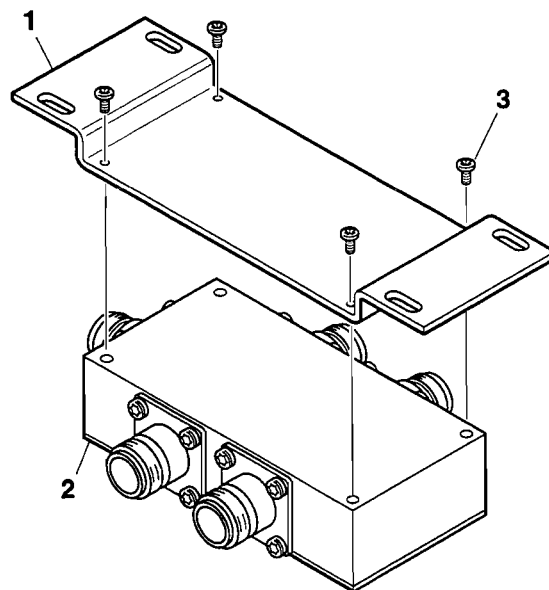


Figure 2. Distribution Amplifier and Mounting Bracket

## Mounting to a Surface

7.8. The amplifier assembly can be mounted to any flat surface. Refer to Figure 3.

7.9. For wood mounting, drill four holes using the bracket as a guide. Fasten the bracket/amplifier assembly (1 & 2) to the sur-

face using fasteners (3) no more than 6.35 mm (0.25 in) in diameter.

7.10. For masonry mounting, drill four holes using the bracket as a guide with a masonry drill. The diameter of the holes will depend on the diameter of the masonry anchors you use. Select anchors that accept fasteners no more than 6.35 (0.25 in) in diameter.

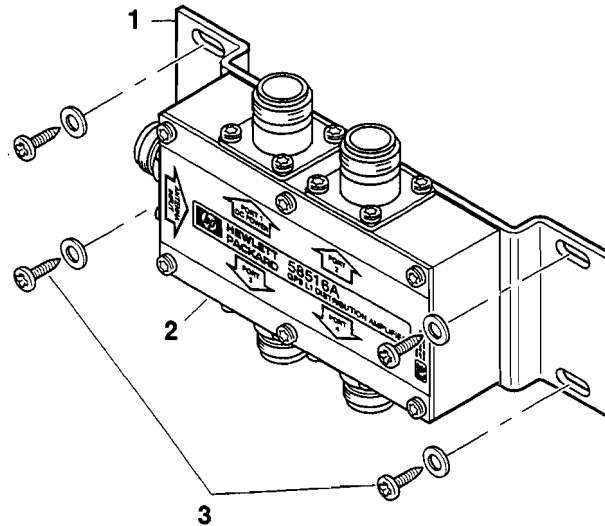


Figure 3. Surface Mounting the Distribution Amplifier

## Installation

7.11. Connect the cable from the GPS antenna to the antenna input connector.

7.12. Connect the initial GPS receiver to the "Port 1" connector. The receiver at this port provides dc power to the distribution amplifier and the GPS antenna. Additional receivers can be connected to any of the other port connectors.

**Note:** Option 05Q Only – An external dc supply must be connected to the SMC connector marked "EXT DC" or ANT PWR". The supply must be capable of providing +4.5 Vdc to +5.5 Vdc, at least 60 mA, less than 1% ripple.\* The positive voltage should be connected to the SMC center pin. All port connectors are de-blocked, and receivers can be attached to any port connector without priority.

\* See the Caution under the section entitled, "Use with HP and Non-HP Systems," when

using non-HP components or accessories in your system.

## 8. MAINTENANCE

8.1. There is no periodic maintenance required for the distribution amplifier. However, it is recommended that all components of the antenna system be checked periodically and replaced, if necessary, as specified in company procedures.

## 9. WARRANTY

9.1. This Hewlett-Packard product is warranted against defects in material and workmanship for a period of eighteen months from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

## NOTICE

Lightning strikes are a natural occurrence. Any antenna system is susceptible to damage from a direct lightning strike or the ra-

diated energy from a lightning strike in the near vicinity. DAMAGE OF THIS NATURE IS NOT COVERED BY HEWLETT-PACKARD'S WARRANTY.

## 10. SPECIFICATIONS/CHARACTERISTICS

10.1. The following table presents the specifications for the HP 58516A Distribution Amplifier.

**Table 1. HP 58516A Specifications/Characteristics**

Frequency Bandwidth (3 dB)	1575.42 MHz $\pm$ 20 MHz
Gain (antenna to output)	0 dB $\pm$ 3 dB @ 1575.42 MHz
Noise Figure	< 7.0 dB (5.0 dB typical) @ 1575.42 MHz
VSWR	< 2.5:1 (1.5:1 typical) @ 1575.42 MHz
Isolation	> 40 dB @ 1575.42 MHz (L1) > 40 dB @ $f \leq L1 - 40$ MHz > 40 dB @ $f \geq L1 + 40$ MHz
DC Power (Port 1 or optional external power connector) Operating voltage Damage level Operating current Maximum input current	+4.5 Vdc to +30 Vdc * > 30 Vdc, either polarity 10 mA 450 mA
<b>Note:</b> Ports 2 through 4 are terminated with a 200 $\Omega$ resistor to simulate the load of a GPS antenna.	
AC Input Level (antenna signal) Impedance Maximum operating Damage level	50 $\Omega$ , nominal -25 dBm +13 dBm
AC (output ports) Impedance	50 $\Omega$ , nominal
Operating Environment	0°C to +55°C
Operating Humidity	40% to 85% (non-condensing)
Dimensions (including connectors)	88.4 mm (3.5 in) W x 121 mm (4.76 in) L x 30.7 mm (1.2 in) H
Connectors	Female N-Type connectors
Weight	0.5 kg

\* When using the HP 58516A with an HP 58504A GPS antenna, the maximum voltage should be no greater than +5.5 Vdc.

## DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

**Manufacturer's Name:** Hewlett-Packard Company

**Manufacturer's Address:** Santa Clara Division  
5301 Stevens Creek Boulevard  
Santa Clara, California 95052-8059  
U. S. A.

declares, that the product

**System Name:** Accessories, GPS Time and Frequency Receiver

**Component** 58504A Antenna 58514A Bandpass Filter  
**Model Number and** 58505A/B Lightning Arrest. 58515A 1:2 DA/Splitter  
**Product Name:** 58509A/F Line Amplifier 58516A 1:4 DA/Splitter  
58512A 1:2 DA/Splitter 58517A 1:8 DA/Splitter  
58513A Antenna Assembly

**Product Options:** This declaration covers all options of the product.

conforms to the following Product Specifications:

**Safety:** IEC 1010-1: 1990 + A1 / EN 61010-1: 1993

**EMC:** CISPR 22: 1993 / EN 55022: 1994 Class B  
IEC 801-2: 1991 / EN 50082-1: 1992 4 kV CD, 8 kV AD  
IEC 801-3: 1984 / EN 50082-1: 1992 3 V/m, 1kHz 80% AM, 27-1000MHz  
IEC 801-4: 1988 / EN 50082-1: 1992 0.5 kV Signal Lines & DC Power Port  
IEC 1000-3-2: 1995 / EN61000-3-2:1995 Harmonics, Class A  
IEC 1000-3-3: 1994 / EN61000-3-3:1995 Flicker

**Supplementary Information:**

The product models listed above comply with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

Santa Clara, California, June 19, 1996

  
Bruce Euler, Quality Engineering Manager

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