

# 58517A

# GPS L1 Distribution

# Amplifier

## Information Note

This document describes the Symmetricom 58517A GPS L1 Distribution Amplifier.

This document applies to the Symmetricom 58517A GPS L1 Distribution Amplifier you have received unless update information is included with the equipment.

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## Warning Symbols That May Be Used In This Book



Instruction manual symbol; the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual.



Indicates hazardous voltages.



Indicates earth (ground) terminal.



or



Indicated terminal is connected to chassis when such connection is not apparent.



Indicates Alternating current.



Indicates Direct current.

# 58517A

## GPS L1 DISTRIBUTION AMPLIFIER

### INFORMATION NOTE

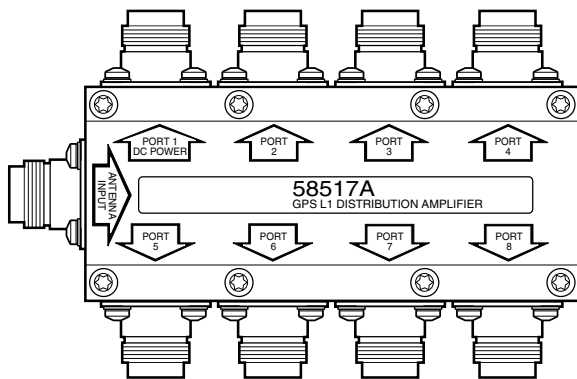


Figure 1. 58517A Distribution Amplifier

#### 1. INTRODUCTION

1.1. Illustrated above, the 58517A GPS L1 Distribution Amplifier is one component of a complete line of GPS accessories for your GPS antenna system available from Symmetricom. The 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 eight GPS receivers.

#### 2. DESCRIPTION

2.1. The 58517A consists of a broadband, unity gain amplifier and a 1:8 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 through an SMC connector. This external power option allows the use of a power source that is separate from any of the connected GPS receivers. A unit with Option 05Q does not receive power through Port 1.

#### 3. VOLTAGE RANGE

3.1. The 58517A operates over a voltage range of +4.5 Vdc to +30 Vdc. The voltage is supplied via the connecting cable (the center conductor is positive with respect to the shield) to Port 1.

**Caution:** Power to the 58517A will be passed to the rest of the antenna system. For example, if a +30 Vdc supply is used to power the 58517A, the +30 Vdc will be passed through to the antenna. If using the 58517A with a 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: this includes mounting the distribution amplifier.
- Recommended maintenance.
- List of specifications.

## 5. CONSIDERATIONS FOR LONG CABLE RUNS

**5.1.** Due to process variations in fabrication of the 58517A, the gain through the device can vary from +4 dB to -4 dB. Assume the worst case loss of the 58517A when determining whether line amplifiers are necessary in your GPS antenna system.

**5.2.** The assumed worst case loss through the 58517A is equal to:

- 25 meters (80 ft) of cable length if using LMR 400 cable
- 10 meters (33 ft) of cable length if using RG-213 cable.

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

1. Calculate the distance from the antenna to the most distant receiver.
2. Add the assumed worst case loss through the 58517A in terms of cable length.
3. Compare the result to the requirements for line amplifiers shown 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 will be a necessity 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 (include the assumed worst case loss through the 58517A) is as follows:

- 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 one line amplifier.

- More than 240 meters (787 feet) and less than 360 meters (1181 feet), you need two line amplifiers.
- If greater than 360 meters (1181 feet), contact Symmetricom for assistance.

**For RG-213 cable:**

**6.3.** If the estimated cable length between the antenna and the most distant GPS receiver (include the assumed worst case loss through the 58517A) is as follows:

- 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 one line amplifier.
- More than 105 meters (345 feet) and less than 158 meters (518 feet), you need two line amplifiers.
- If greater than 158 meters (518 feet), contact Symmetricom 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 will be needed. Option AUB provides a mounting bracket and four 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 58517A Distribution Amplifier can be mounted in any indoor location where it will not be exposed to excessive humidity or standing water. The 58517A should be placed between the GPS receivers and any installed line amplifiers, and/or lightning arresters.

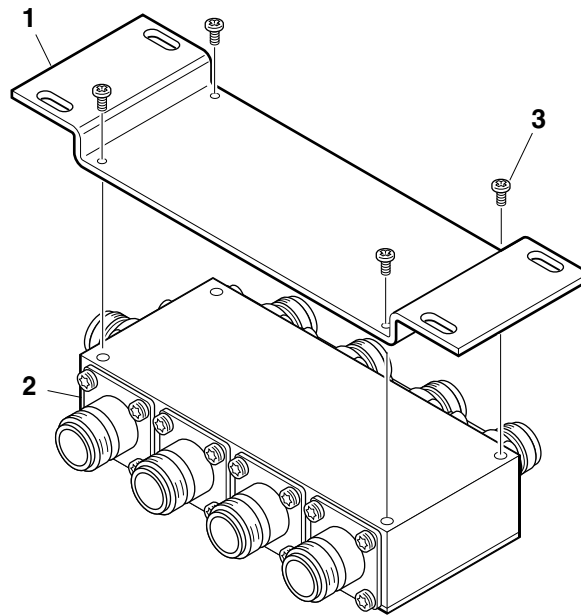
**7.4.** Refer to Figure 2. A mounting bracket (1) is available for the 58517A (2). Four screws (3) attach the bracket to the amplifier. See “Parts Required” above for ordering information.

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

**7.6.** The 58517A 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**

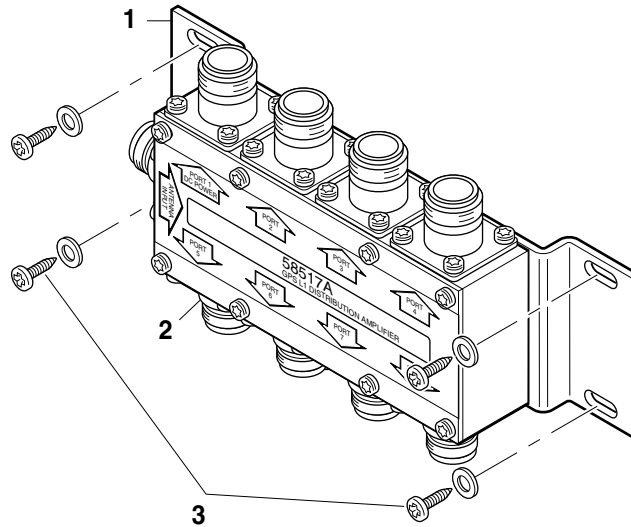
## Mounting to a Surface

**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 mounting bracket as a guide. Fasten the bracket/amplifier assembly (**1 & 2**) onto the

surface utilizing 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 mm (0.25 in) in diameter.



**Figure 3. Surface Mounting the Distribution Amplifier**

## Installation

**7.11.** First, connect the cable from the GPS antenna to the antenna input connector.

**7.12.** Connect initial GPS receiver to “Port 1” connector. 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 of the port connectors are dc-blocked, and receivers can be attached to any port connector without priority.

\* See the Caution under the section entitled, “Use with GPS Systems.”

## 8. MAINTENANCE

**8.1.** No periodic maintenance is required for the distribution amplifier. It is recommended however, that all components of the antenna system be checked periodically and replaced, if necessary, as specified in company procedures.

## 9. SPECIFICATIONS/CHARACTERISTICS

9.1. The following table presents the specifications for the 58517A Distribution Amplifier.

**Table 1. 58517A Specifications/Characteristics**

Frequency Bandwidth (3 dB)	1575.42 MHz $\pm$ 20 MHz
Gain (antenna to output)	0 dB $\pm$ 4 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	> 25 dB @ 1575.42 MHz (L1) > 40 dB @ $f \leq L1 - 40$ MHz > 40 dB @ $f \geq L1 + 40$ MHz
DC Power (either Port 1 or optional external power connector)	
Operating voltage	+ 4.5 Vdc to + 30 Vdc *
Damage level	> 30 Vdc, either polarity
Operating current	10 mA
Maximum input current	450 mA
<b>Note:</b> Ports 2 through 8 have been terminated with a 200 $\Omega$ resistor to simulate load of a GPS antenna.	
AC Input Level (antenna signal)	
Impedance	50 $\Omega$ , nominal
Maximum operating	- 25 dBm
Damage level	+ 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)	101.6 mm (4.0 in) W x 161 mm (6.34 in) L x 30.7 mm (1.2 in) H
Connectors	Female N-Type connectors
Weight	0.75 kg

\* When using the 58517A with a 58504A GPS antenna, the maximum voltage should be no greater than + 5.5 Vdc.