

# *SmoothTalker*®

## *Stealth Series Dual Band Booster Amplifiers*

### **BRB Stealth Z1 User Manual**



**BUILDINGS**



**COTTAGES**



Increases your Cellular and PCS Band Signals, expands your service coverage area, enhances voice call quality and significantly increases Data speeds.



**HOMES**

# Table of Contents

Kit Type Configurations.....	3
Optional parts.....	3
Antenna and Booster Installation.....	4
Installation Illustrations.....	5
Control panel .....	6
LED lights - Outside signal level/RX power.....	6
Frequently asked questions.....	7
Troubleshooting guide.....	7
Inside Antennas .....	8
Outside Antennas .....	8
Splitters/Power Dividers.....	8
Extention Cables .....	9
Specifications.....	11
Glossary of terms.....	12
FCC Information.....	12
Warranty.....	12

This is a CONSUMER device

BEFORE USE, you MUST REGISTER THIS DEVICE with your wireless provider and have your provider's consent. Most wireless providers consent to the use of signal boosters. Some providers may not consent to the use of this device on their network. If you are unsure, contact your provider.

You MUST operate this device with approved antennas and cables as specified by the manufacturer.

Antennas MUST be installed at least 20 cm (8 inches) from any person.

You MUST cease operating this device immediately if requested by the FCC or a licensed wireless service provider.

WARNING. E911 locator information may not be provided or may be inaccurate for calls served by using this device.

To comply with FCC rules the use of this device in any building is for personal use only.

# Package Contents

## BRBZ Series

(Individual Kit Configuration Parts Included Vary By Model)

### Typical Configuration

Outdoor Antenna



Indoor Antenna



Main Booster Unit



AC/DC Power Supply

NOTE : Your model may ship with different antennas.

### Optional Parts



Co-Ax Cables



RF Splitter/Power Divider



Co-Ax Adapters



Antenna Pole Mount Kit



2"



11"



14"



26"

Available Antennas

# Antenna and Booster Installation

## **Donor Antenna:** (outdoor signal antenna)

**a) Location:** There are three choices. fig. 2, 3, 4.

The choice of donor antenna location depends on the signal strength at the donor antenna location. Use your phone to determine if signal at your chosen location is adequate. Better signal level at the donor antenna location equals larger indoor coverage area.

**b) Directional Donor Antenna:** if using an optional directional donor antenna, point the antenna toward the desired tower. If the location of the desired tower is not known, initiate a phone call and use the signal indicator on your phone after the booster is operational, while turning the donor antenna, to determine optimum donor antenna direction for maximum signal strength.

**c) Omni-directional Donor Antenna:** if using an omni-directional donor antenna, it is recommended that it is placed as far as possible from the inside antenna, usually, 'outside pole mount' is recommended (Fig. 4). Use of omni-directional antennas will require more separation distance compared to directional antennas. Fig. 1

## **Distribution Antenna:** (indoor signal antenna)

**a) Location:** There are three choices. fig. 2, 3, 4.

The choice of donor antenna location depends on the area to be covered.

**b) Directional Distribution Antenna:** it is recommended that directional antennas are oriented in a fashion that is back to back of each other Fig. 1

**c) Omni-directional Distribution Antenna:** it is important that omni-directional antennas are separated as far apart as possible from each other. Use of omni-directional antennas will require more separation distance compared to directional antennas

**d) Splitting Indoor Signal:** it is possible to use more than one indoor antenna to cover areas that are separated by walls or floors by using antenna splitters or power dividers, however splitters have a level of signal loss (3dB) and the added cable run will also have signal loss, therefore the coverage area will be diminished. As a general rule, if outside signal is good, splitting signal to more than one distribution antenna results in reasonable coverage.

If outside signal is poor or marginal, splitting signal to more than one distribution antenna results in decreased coverage for both distribution antennas.

*Use only genuine SmoothTalker splitters. Contact your dealer or [www.smoothtalker.com](http://www.smoothtalker.com)*

## **Amplifier/Booster Location:**

Install the repeater in a location that has proper ventilation, away from excessive heat and moisture.

### **WARNING:**

Make sure all cables have a good connection and are connected to the corresponding antenna port on the Booster.

**DO NOT APPLY POWER** or turn on the power switch on the Amplifier/Booster before all cables and antennas are connected.

## **Connection and Start Procedure:**

Antenna connections must be snug and hand tight, '**Do Not Use Pliers or Wrench**'.

Connect the cable from outdoor antenna to RF port (antenna connector) labeled "Outdoor Antenna". Connect cable from indoor antenna to RF port labeled "Indoor Antenna".

Connect supplied AC/DC power supply to the amplifier and plug it into power source.

Turn on the power switch on the Amplifier/Booster.

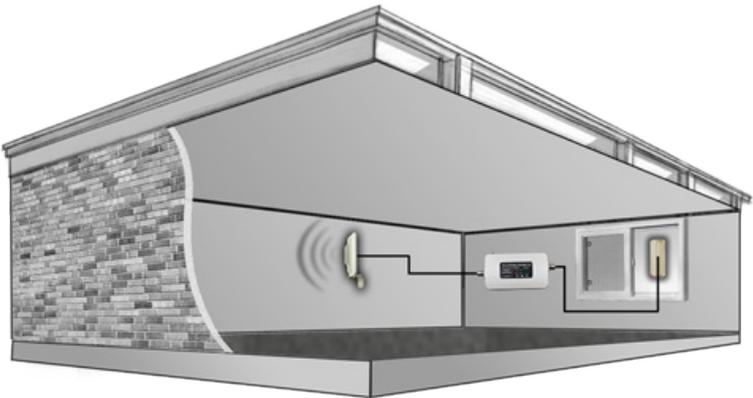
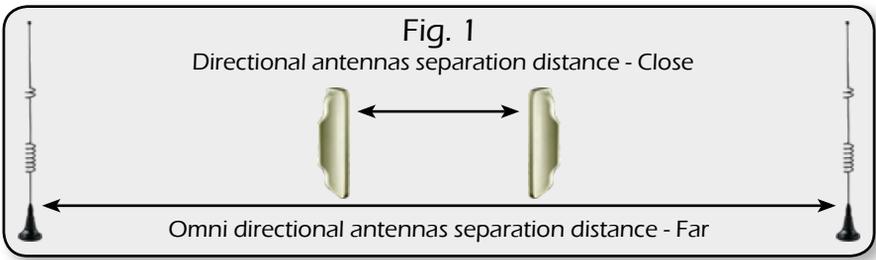


Fig. 2

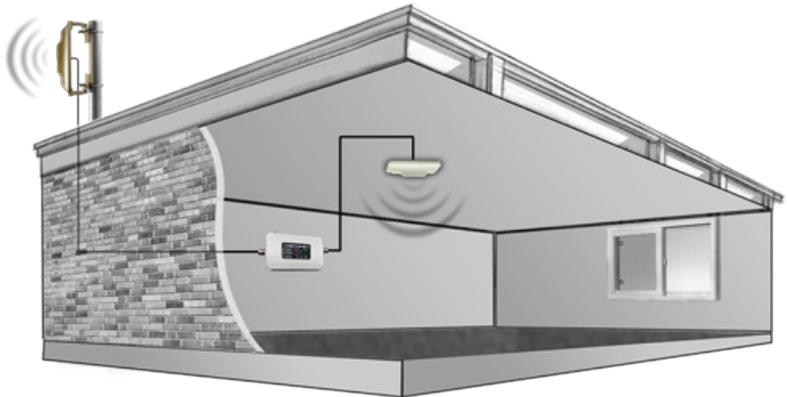


Fig. 3

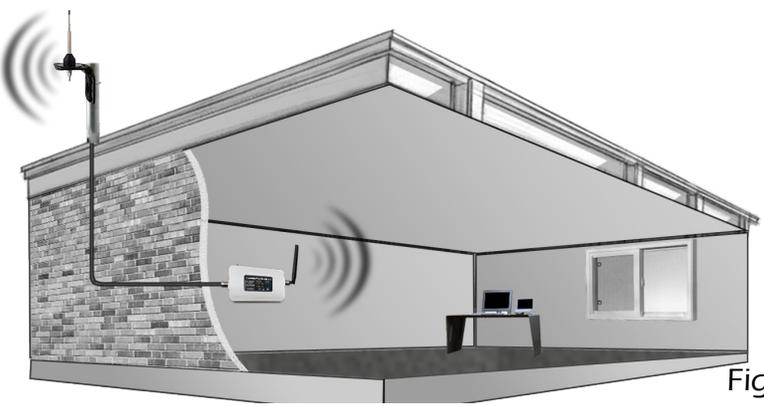


Fig. 4

# Control Panel: Understanding the Control Panel and LED lights

**General:** Mobile networks, phones and data devices operate in two frequency bands (800MHz & 1900MHz). The Stealth Booster will amplify signals in both bands if they are present. The band that the phone or cellular data device will transmit (TX) and receive (RX) on is determined by the cellular provider and cannot be chosen by the user. The booster LED lights will indicate outside signal level and booster gain.



## **Orange LED Lights (RX):**

There two orange LED lights, one for the 800MHz cellular band and one for the 1900MHz PCS band. LED ON state indicates that the RX (Receive Signal) function of the band is functioning normally.

LED Off state indicates that the band is shut down.

## **Green LED Lights (TX):**

There two Green LED lights, one for the 800MHz cellular band and one for the 1900MHz PCS band.

Solid ON state indicates that the TX (Transmit Signal) function of the indicated band is on and is at maximum gain.

Flashing Green LED in either 800MHz or 1900MHz indicates gain reduction in that band. Each flash equals 3db reduction in gain. One flash represents a 3dB reduction, two flashes represents a 6dB reduction etc. until the total gain of the booster has been suppressed.

## **Causes of Flashing Green LED Lights:**

1-If the outside antenna is located too close to the inside antenna or phone holder the booster will reduce gain in order to suppress any oscillation (feedback loop) and the Green LED will flash. To achieve higher gain or max gain further separation of the inside and outside antennas is required.

2-If the booster is close to a cellular tower (Strong cell tower signal ) it will automatically reduce its gain to protect the network. This condition will change as the booster approaches or leaves a cellular tower. This is normal and cannot be defeated or altered by the user.

## Frequently Asked Questions

**My booster is powered, running and the lights are on but my signal did not improve. Why?**

Check your antenna connections and make sure they are snug. Also make sure that the external and internal antennas are connected to corresponding antenna ports of the booster.

**Should the booster get hot?** Normal operation temperature for the booster is approximately 109° F, or 43° C. This will feel warm to the touch.

**Will the booster improve Voice and Data signals?** Yes.

**How large should my inside coverage area be?** Coverage area is dependent on two factors; the booster's gain and the signal level at the outside antenna. It is possible to cover a large area with a low gain booster if the outside signal is excellent, conversely, it is possible to have relatively small coverage area with a high gain booster if the signal outside is really poor.

**How do I increase my indoor coverage area?** If your inside coverage area is inadequate, try to move your external antenna to a location with better signal. If antenna location is optimized the coverage area is still too small, use a higher gain booster. If outside signal is really poor and the high gain booster does not increase the coverage area enough, use a line amplifier to increase gain and TX power (pg 5).

**Will the booster boost signals from service providers other than mine?** Yes. Smoothtalker Stealth series boosters are wideband RF amplifiers that will improve all Cellular and PCS signals in your area.

**Why does my friend's phone show better signal than mine?** Your friend's phone is probably using a different service provider that has a tower closer to your location than your service provider. For best indoor coverage, make sure that your outside antenna is pointing at your service provider's tower.

**Can I leave my booster on continuously?** Yes.

**Can I leave my booster on during a lightning storm?** To be 100% sure that lightning will not damage the booster, you must unplug it from the wall and disconnect the external antenna from the booster. If you must keep connected during lightning you can use a lightning arrester on the antenna and high quality surge protector on the power supply, however, Smoothtalker warranty does not cover lightning damage.

**I need more cable length. What do I use?** Only 50 Ohm co-ax cable should be used. Please contact SmoothTalker for cables and connectors.

## Troubleshooting Guide

Condition	LED indicators	Action
Automatic Shutdown.	Orange and green LED flash simultaneously every 2 secs in the freq. band that has been shutdown.	Separate antennas and/or re-orient directional antennas (back to back) and power OFF/ON the booster.
Oscillation (feedback) Suppression: Automatic cannot be manually overridden.	One or more green LED solid ON, one green LED flashing or OFF.	Gain has been reduced to suppress oscillation (feedback). Separate antennas and/or re-orient directional antennas (back to back) and power OFF/ON the booster.
High power control due to High RX signal (signal from tower): Automatic cannot be manually overridden.	One or more green LED solid ON, one green LED flashing or OFF.	Gain has been reduced to suppress high RX signal: a) Directional donor (outside) antenna: turn to point away from tower. b) Omni antenna: change to a location with lower signal.
High power control due to High TX signal (signal from phones): Automatic cannot be manually overridden.	One or more green LED solid ON, one green LED flashing or OFF.	Gain has been reduced to suppress high TX signal. Normally temporary but if phone or cellular device is constantly too close to inside antenna, move device away from internal antenna.

FCC Rules specify that all approved antennas, cables and accessories to be used with this booster are to be listed in this manual. The approved accessories are listed below.

### **Inside Antennas**

<b>Antenna</b>	<b>Description</b>	<b>Cable</b>	<b>Minimum Cable Loss (dB)</b>	<b>Maximum Antenna Gain (dBi)</b>	<b>Net Gain (dB)</b>
SEMD1XL, NL	Inside Antenna	18 ft. SEMRC205	-2.00	8.14	6.14
SEMOXL, NL	Inside Antenna	18 ft. SEMRC205	-2.00	0.00	-2.00
SEMOX, N	Inside Antenna	10 ft. SEMRC205	-2.00	0.00	-2.00
SEMD1GL	Inside Antenna	18 ft. RG6	-1.80	8.14	6.34
SEMOGL	Inside Antenna	18 ft. RG6	-1.80	0.00	-1.80
SEMOG	Inside Antenna	10 ft. RG6	-0.90	0.00	-0.90
SEMR1	Inside Antenna	Direct to Booster	0.00	0.00	0.00
SEMRBL1	Inside Antenna	Direct to Booster	0.00	0.00	0.00

### **Splitters/Power Dividers**

<b>Part #</b>	<b>Description</b>	<b>Insertion loss (dB)</b>	<b>Net gain (dB)</b>
ADCSPN2	“N” type 2-way splitter	-3.0	-3.00
ADCSPN3	“N” type 3-way splitter	-4.8	-4.80
ADCSPG2	RG6 type 2-way splitter	-4.0	-4.00
ADCSPG3	RG6 type 3-way splitter	-6.00	-6.00
ADCSPG4	RG6 type 4-way splitter	-7.50	-7.50

## **Extension Cables**

<b>Cable Part #</b>	<b>Description</b>	<b>Cable</b>	<b>Minimum Cable loss (dB)</b>
SEMRCBXmaXfe10	extension cable	10 ft. SEMRC205	-1.00
SEMRCBXmaXfe20	extension cable	20 ft. SEMRC205	-2.00
SEMRCBXmaXfe30	extension cable	30 ft. SEMRC205	-3.00
SEMRCBXmaXfe40	extension cable	40 ft. SEMRC205	-4.00
SEMRCBXmaXfe50	extension cable	50 ft. SEMRC205	-5.00
SEMRCBXmaXfe60	extension cable	60 ft. SEMRC205	-6.00
SEMRCBNmaNfe10	extension cable	10 ft. SEMRC205	-1.00
SEMRCBNmaNfe20	extension cable	20 ft. SEMRC205	-2.00
SEMRCBNmaNfe30	extension cable	30 ft. SEMRC205	-3.00
SEMRCBNmaNfe40	extension cable	40 ft. SEMRC205	-4.00
SEMRCBNmaNfe50	extension cable	50 ft. SEMRC205	-5.00
SEMRCBNmaNfe60	extension cable	60 ft. SEMRC205	-6.00
SEMRCBL4maL4fe10	extension cable	10 ft. LMR400	-0.60
SEMRCBL4maL4fe20	extension cable	20 ft. LMR400	-1.20
SEMRCBL4maL4fe30	extension cable	30 ft. LMR400	-1.80
SEMRCBL4maL4fe40	extension cable	40 ft. LMR400	-2.40
SEMRCBL4maL4fe50	extension cable	50 ft. LMR400	-3.00
SEMRCBL4maL4fe60	extension cable	60 ft. LMR400	-3.60
SEMRCBL4maL4fe70	extension cable	70 ft. LMR400	-4.20
SEMRCBL4maL4fe80	extension cable	80 ft. LMR400	-4.80
SEMRCBL4maL4fe90	extension cable	90 ft. LMR400	-5.40
SEMRCBL4maL4fe100	extension cable	100 ft. LMR400	-6.00
SEMRCBGmaGfe10	extension cable	10 ft. RG6	-0.90
SEMRCBGmaGfe20	extension cable	20 ft. RG6	-1.80
SEMRCBGmaGfe30	extension cable	30 ft. RG6	-2.70
SEMRCBGmaGfe40	extension cable	40 ft. RG6	-3.60
SEMRCBGmaGfe50	extension cable	50 ft. RG6	-4.50

## Extension Cables (continued)

Cable Part #	Description	Cable	Minimum Cable loss (dB)
SEMRCBGmaGfe60	extension cable	60 ft. RG6	-5.40
SEMRCBGmaGfe70	extension cable	70 ft. RG6	-6.30
SEMRCBGmaGfe80	extension cable	80 ft. RG6	-7.20
SEMRCBGmaGfe90	extension cable	90 ft. RG6	-8.10
SEMRCBGmaGfe100	extension cable	100 ft. RG6	-9.00

## Outside Antennas

Antenna	Description	Minimum Cable Length	Cable Loss (dB)		Maximum Antenna Gain (dBi)	Cable Loss (dB)	
			850 MHz	1900 MHz		850 Mhz	1900 Mhz
SEMD1XL, NL	Outside Antenna	48 ft SEM-RC205	-5.28	-10.56	8.14	2.86	-7.70
SEMDA2XL, NL	Outside Antenna	48 ft SEM-RC205	-5.28	-10.56	9.14	3.86	-6.70
SEMOXL, NL	Outside Antenna	48 ft SEM-RC205	-5.28	-10.56	0.00	-5.28	-15.84
SEM26THX, N	Outside Antenna	48 ft SEM-RC205	-5.28	-10.56	7.14	1.86	-8.70
SEM26THXL, NL	Outside Antenna	55 ft SEM-RC205	-6.05	-12.10	5.14	-0.91	-13.01
SEMD1GL	Outside Antenna	48 ft RG6	-2.9	-4.32	8.14	5.26	0.94
SEMDA2GL	Outside Antenna	48 ft RG6	-2.9	-4.32	9.14	6.26	1.94
SEMOGL	Outside Antenna	48 ft RG6	-2.9	-4.32	0.00	-2.88	-7.20
SEM26THG,	Outside Antenna	48 ft RG6	-2.9	-4.32	7.14	4.26	-0.06
SEM26THGL	Outside Antenna	55 ft RG6	-3.3	-4.95	5.14	1.84	-3.11

## Specifications

Operational Bands	800MHz Cellular and 1900MHz PCS
Impedance	50 Ohms
TX Output Power	29.9 dBm EIRP
RX Output Power	11.0 dBm EIRP
Oscillation Control (Automatic)	35 dB in 1db steps
Oscillation Control Timing	< 1 sec
RX High Power Control	Dynamic up and down < 50 milliseconds
TX High Power Control	Dynamic up and down < 50 milliseconds
Current Draw @ 12V	0.5 Amp - 0.8 Amp
Operating Voltage	6V
Noise Figure	< 5dB
Operating Temperature	-32F to +85F
Outside Antenna Connector	MCT Male
Inside Antenna Connector	MCT Male
Dimensions	6.25x3.5x1.125 inches
Weight	1.0 Lb
FCC ID	S4RBRB81975
<b>Model</b>	<b>Maximum Gain</b>
BRBUZ1-72	72dB
BRBUZ1-70	70dB
BRBUZ1-68	68dB
BRBUZ1-65	65dB
BRBUZ1-62	62dB
BRBUZ1-60	60dB
BRBUZ1-58	58dB
BRBUZ1-55	55dB

# Glossary of Terms

**Attenuation:** the reduction of the RF signal usually measured in dB. Attenuation is the opposite of Gain. Increasing attenuation has the same effect as turning down the volume control of a radio or stereo speaker.

**Booster:** also known as: RF amplifier, repeater or signal enhancer.

**dB:** short form for decibel. Unit of measure for RF signal gain or attenuation.

**Directional antenna:** an antenna designed to focus its energy mostly in one direction.

**Distribution antenna:** internal antenna used to distribute signal to the interior of a building or structure.

**Donor Antenna:** outside antenna used to provide signal from outside to inside.

**Frequency band:** the operational frequency range of the Smoothtalker booster and the cellular network frequencies that are amplified. These are commonly referred to as the 'Cellular Band' (824-894 Mhz) and the 'PCS Band' (1850-1990 Mhz).

**Gain:** the increase of the RF signal usually measured in dB. Gain is the opposite of Attenuation. Increasing gain has the same effect as turning up the volume control of a radio or stereo speaker.

**LED:** Light Emitting Diode.

**Omni-directional antenna:** an antenna designed to radiate its energy equally in all directions.

**Oscillation:** term to describe a feedback loop. This occurs when the signal from one antenna reaches the other antenna and the booster amplifies the signal creating a loop. This is the same effect as the squeal one hears when a speaker is brought close to a microphone.

**RF:** Radio Frequency.

**RX:** 'receive signal' originating at a base station or tower.

**Splitter/Power Divider:** a component with input and output connectors that will allow one originating signal to be split and distributed to two or more antennas.

**TX:** 'transmit signal' originating from a cellular phone or data device.

## **FCC Part: §15.21 Information to Users**

"The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form."

"This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation."

## **RF Exposure Warning**

**Please Note:** Antenna should be positioned at least 8" (20cm) from all person/persons as per requirements necessary to comply with the FCC MPE rules.

### **Notes:**

- 1-This booster is not user configurable. User changes are a violation under FCC rules and will void the user's authority to operate the equipment.
- 2-User changes changes or modifications will void warranty.

## **Warranty**

Smoothtalker boosters are warranted against manufacturing defects for a period of one year from the date of purchase.

The original bill of sale is required for any warranty claims.

For warranty claim contact original dealer or [smoothtalker.com](http://smoothtalker.com)