

# Cellular Signal Boosters



## Level 2 Training

Slides available at  
[www.wcipro.com/level2](http://www.wcipro.com/level2)

# Antennas

Wide Band Directional  
600mHz to 2600mHz



- +7dB Gain
- 45° Beam width
- Isolation, 18dB
- Includes mounting hardware
- Highly adjustable
- Easily tuned
- Two can be paired for better coverage

Panel Antenna  
600mHz to 2600mHz



- +5dB Gain
- 110° Beam width
- Isolation 8dB
- Includes mounting hardware
- Four mounting options

# Adding additional inside antennas

## Home Run:

**Splitters** –A splitter will have an even division of signal to each port. Wilson offers 2 and 3 way 75ohm splitters.

(859993)



-3dB/leg

(859994)



-4.8dB/leg

(859106)



-6dB/leg

## Daisy Chain / Trunk Line:

**Taps** – Are splitters that have an uneven division signal. There is a tap port (-10dB) and a pass thru port (-0.5dB).



(859907)

-10dB

-0.5dB

Pass through port

# Lightning and Weather



- Lightning surge protection
- Replaceable gas discharge element
- Protects downstream equipment
- 50 or 75 ohm models
- Low loss



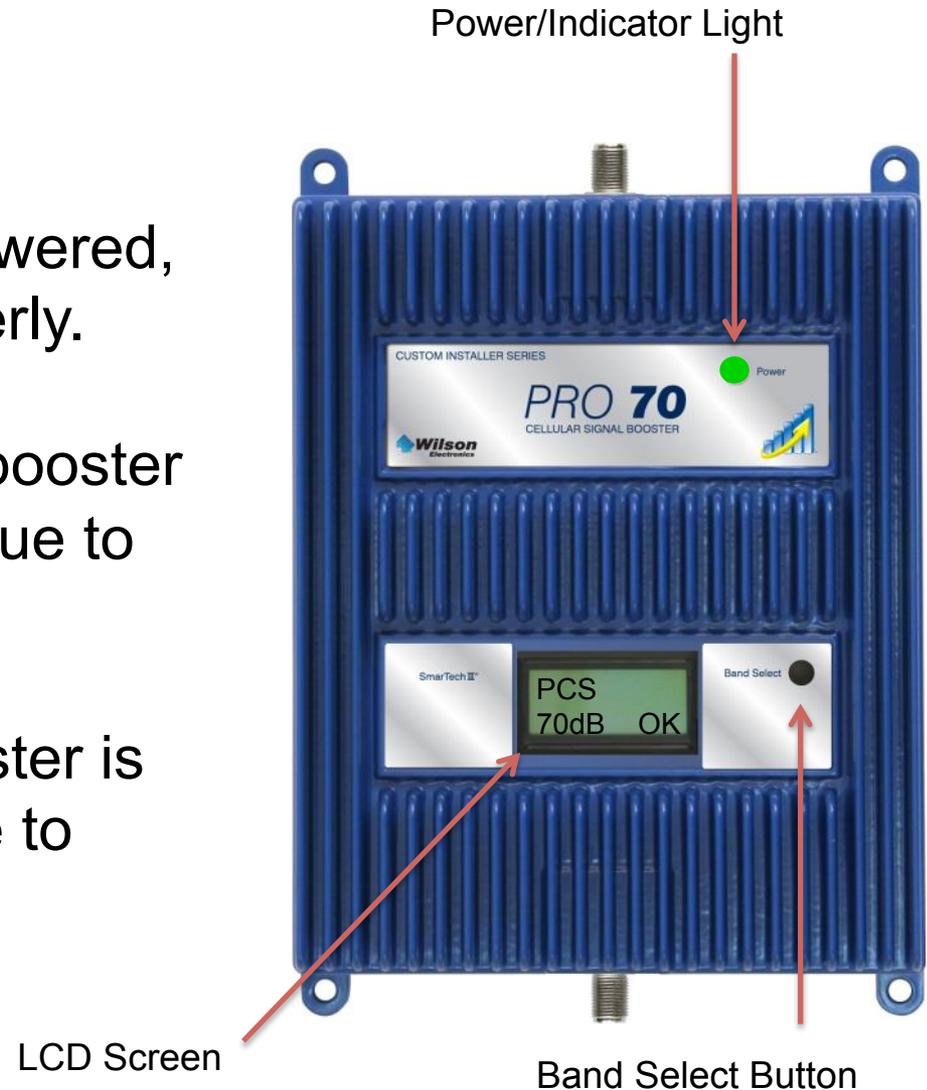
Improperly sealed outside connector

# Booster

**Green** indicates the unit is powered, at full gain, and working properly.

**Green Orange** indicates the booster is operating at reduced gain due to overload.

**Green Red** indicates the booster is operating at reduced gain due to oscillation (feedback).



# Booster

**Red** indicator light:

The booster has shut down due to extreme oscillation (feedback).



# Booster

**Orange** indicator light:

The booster has shut down due to extreme signal overload. (too close to a cell tower).



# Signal Meter

Zero Gain Antenna



- Essential site survey tool
- Detects signal from all carriers
- Optional Directional Antenna kit
- Easy to follow instructions
- Predictable results

## Optional Accessory Kit: (308410)

A. Wide-Band Panel Antenna 700-2700MHz (314411)

B. Pole Mount Assembly (901117)

C. 2' Extension Cable RG58, SMA Male to N-Male (955802)

A.



B.



C.



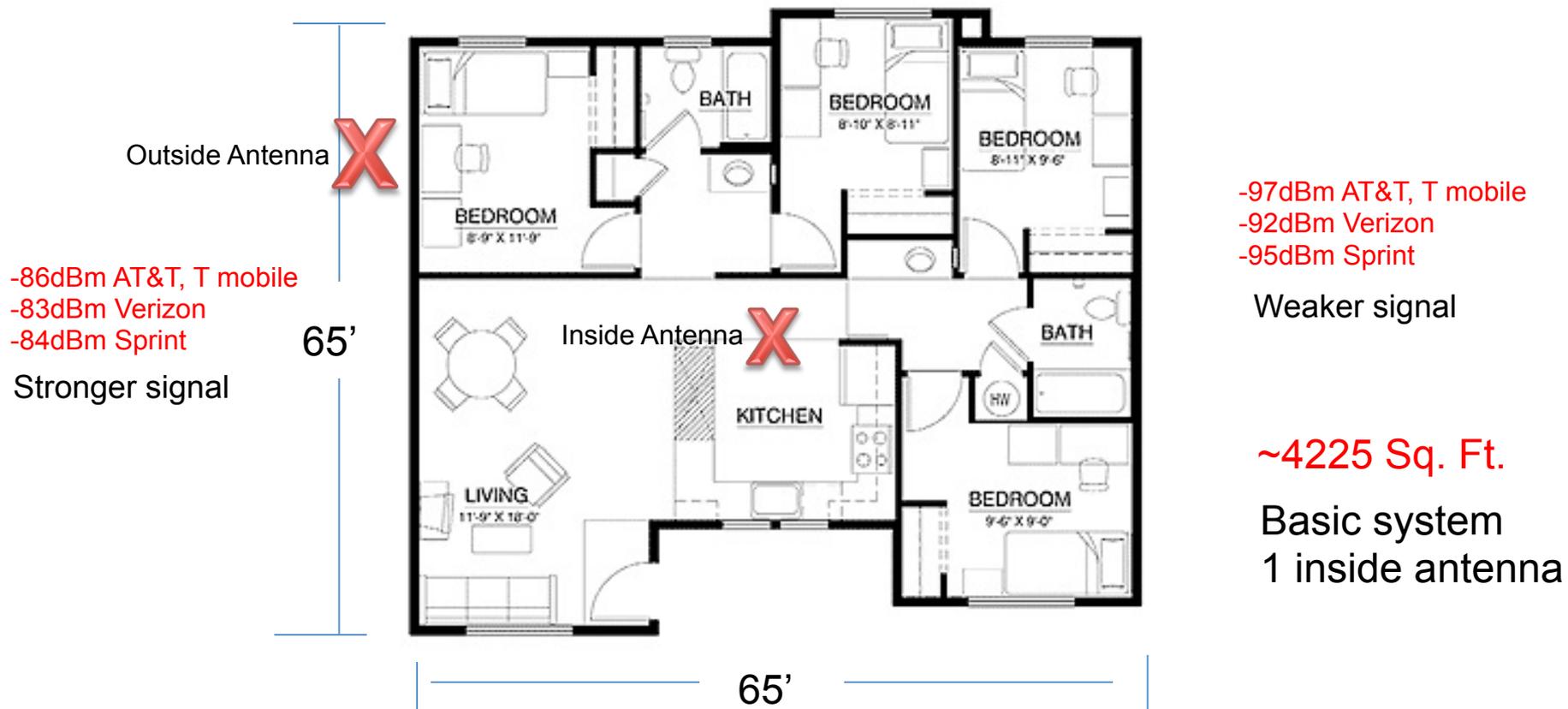
# Site Survey



1. Start with a floor plan, hand drawn is fine. Include approximate dimensions.
2. Record signal strength on floor plan, inside and outside on all sides of building.  
***Make sure to include all local carriers.***
3. Look out for signals stronger than  $-65dB$  which can cause overload and automatic gain reduction.

# Site Survey

Note the best locations for inside and outside antennas. As well as trouble spots to be aware of inside. Look for signal between -65dBm and -85dBm

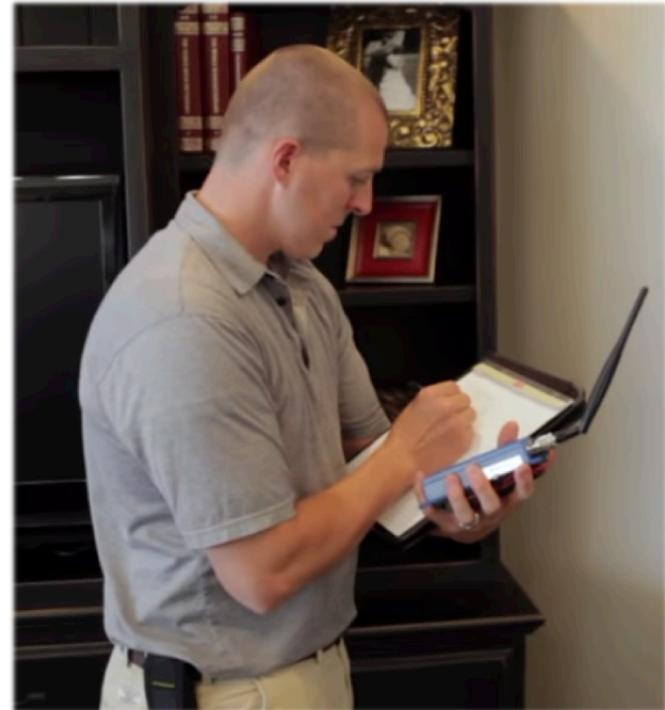


# Site Survey



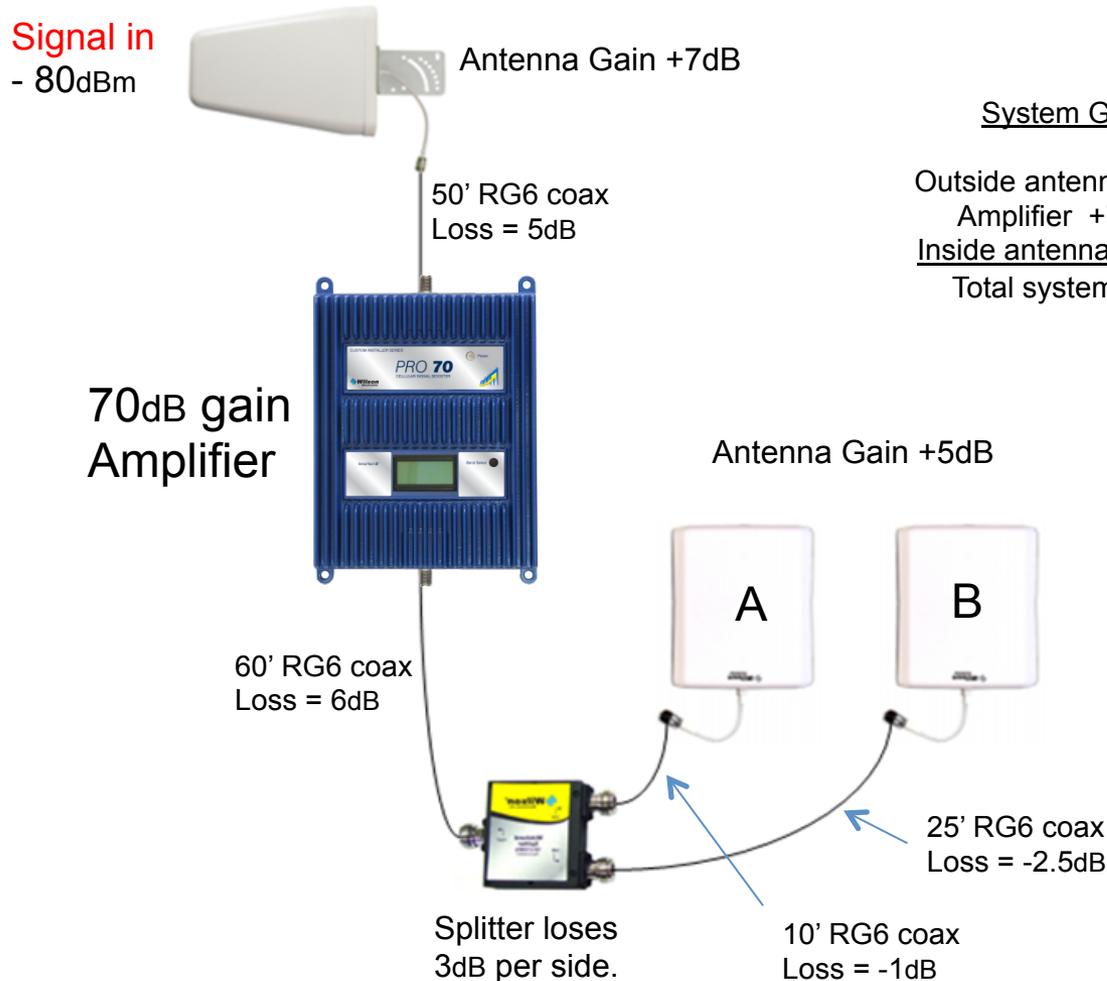
Directional Antenna Accessory Kit

## Interior Survey



# -20dBm Rule

Minimum **-20dBm** **calculated** signal for each inside antenna



### System Gain

Outside antenna +7dB  
 Amplifier +70dB  
 Inside antenna +5dB  
 Total system gain  
**+82dB**

### System Loss A

Co-ax cable -12.0dB  
 Splitter, per leg -3dB  
 Safety margin -6dB  
 Total system loss **-21.0dB**

### System Loss B

Co-ax cable -13.5dB  
 Splitter, per leg -3dB  
 Safety margin -6dB  
 Total system loss **-22.5dB**

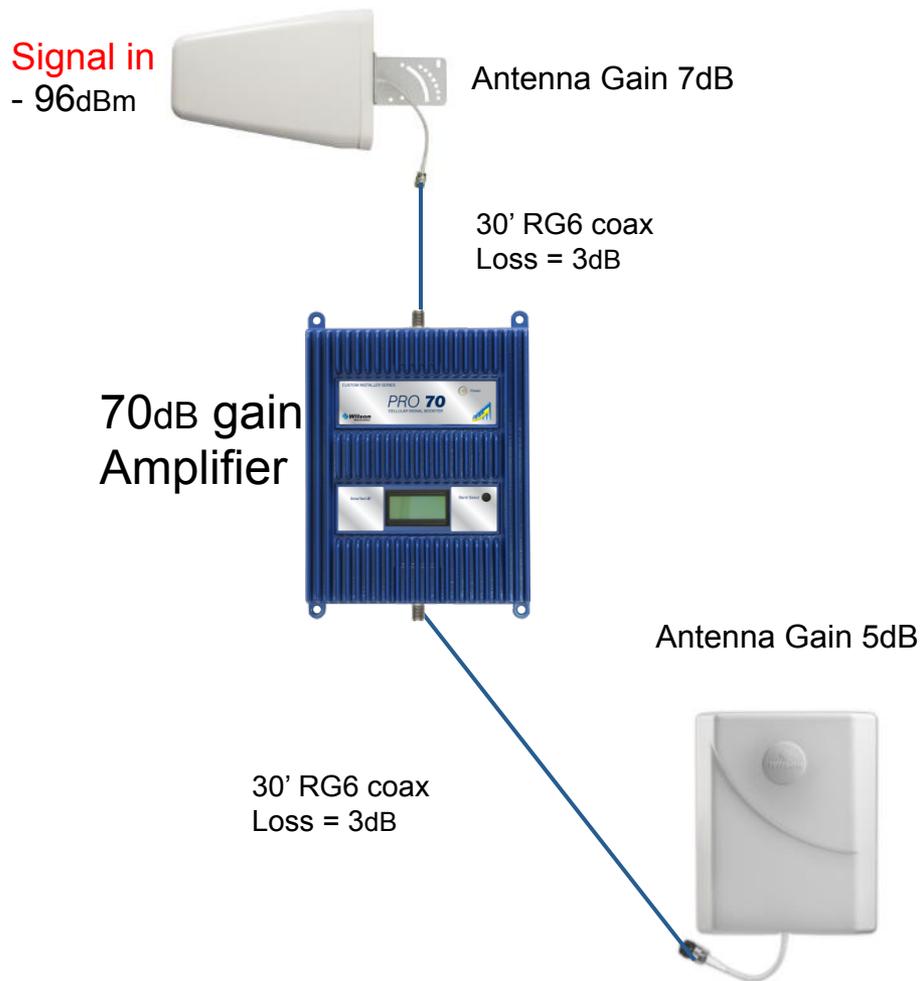
$$A = -80\text{dBm} + 82\text{dB} - 21.0\text{dB} = -19.0\text{dBm}$$

$$B = -80\text{dBm} + 82\text{dB} - 22.5\text{dB} = -20.5\text{dBm}$$

**Calculated Signal**  
**-19.0dBm A**  
**-20.5dBm B**  
 (2k to 4k coverage area)

# -20dBm Rule

## Weak Outside Signal



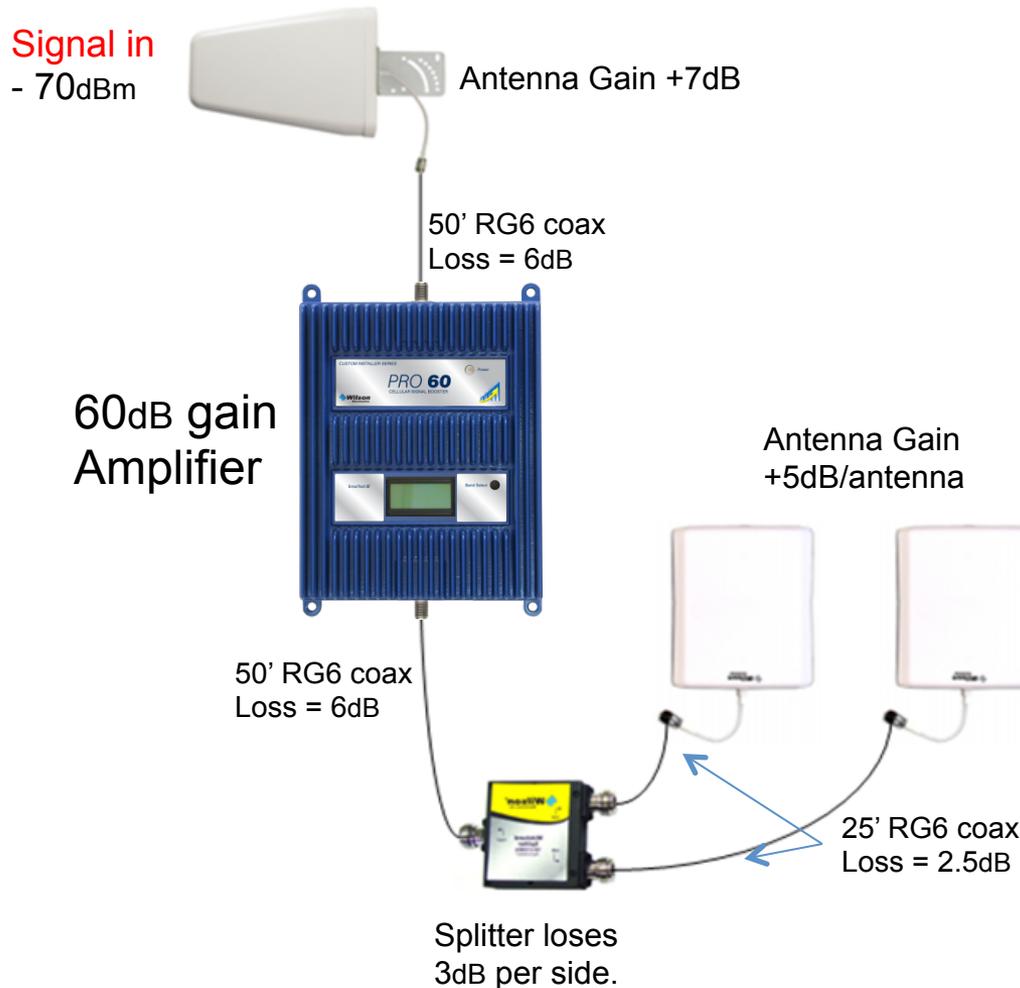
<u>System Gain</u>	<u>System Loss</u>
Outside antenna +7dB	Co-ax cable -6dB
Amplifier +70dB	Safety margin -6dB
Inside antenna +5dB	
Total system gain <b>+82dB</b>	Total system loss <b>-12dB</b>

$$-96\text{dBm} + 82\text{dB} - 12\text{dB} = -26\text{dBm}$$

**Calculated Signal**  
**-26 dBm**  
 (Poor results)

# -20dBm Rule

## Strong Outside Signal



### System Gain

Outside antenna +7dB  
 Amplifier +60dB  
 Inside antenna +5dB

Total system gain  
**+72dB**

### System Loss

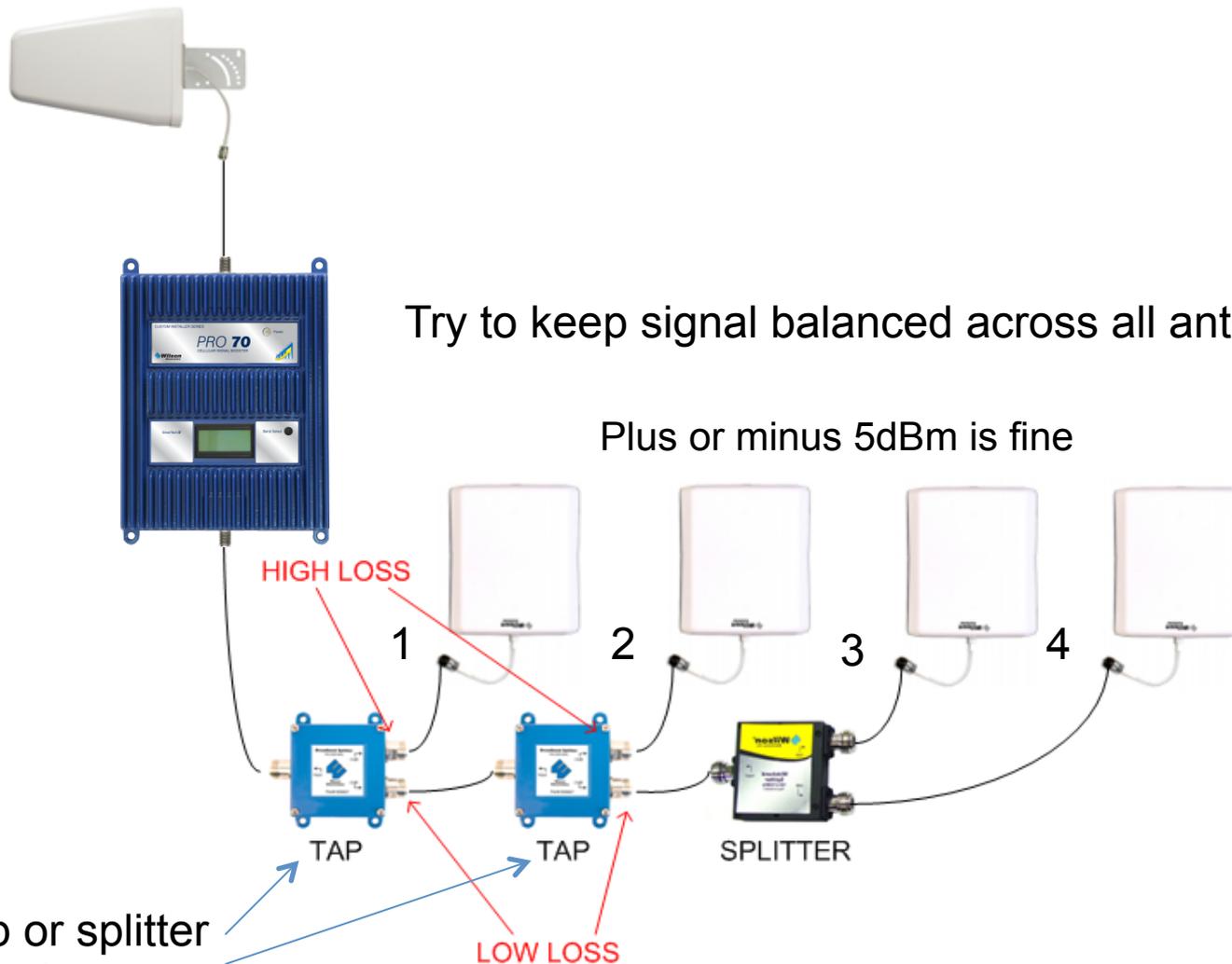
Co-ax cable -12.5dB  
 Splitter, per leg -3dB  
 Safety margin -6dB

Total system loss **-21.5dB**

$$-70\text{dBm} + 72\text{dB} - 21.5\text{dB} = -19.5\text{dBm}$$

**Calculated Signal**  
**-19.5dBm / antenna**  
 (good results)

# Adding additional inside antennas



Try to keep signal balanced across all antennas

Plus or minus 5dBm is fine

HIGH LOSS

1

2

3

4

TAP

TAP

SPLITTER

LOW LOSS

Could be tap or splitter depending on layout

# Building Recommendation Form

[http://www.wilsonelectronics.com/uploads/files/200\\_Building\\_Recommendation\\_Form\\_Rev\\_1.pdf](http://www.wilsonelectronics.com/uploads/files/200_Building_Recommendation_Form_Rev_1.pdf)

### Building Recommendation Request Form



The requested information below will allow us to offer you the best product and installation recommendation. Due to the high volume of requests, recommendations typically take 3 to 7 business days to complete; however, we always do our best to expedite the information to you sooner. If you have any questions, please call Tech Support at 866-294-1660.

---

#### Contact Information

First Name:  Last Name:

Business Name (if applicable):

Phone Number:  Email Address:

---

#### Project Information

Choose What Best Applies:

Project Name:

Address of Project:

Wilson Sales Representative (if applicable):

Disclaimer: Our building recommendations are designed by an expert team with years of experience, and typically work very well. However, remote recommendations of wireless systems are dependent on a number of variables which include complete and accurate information, in as much as the Wilson Electronics team designs systems in a robust manner as a good-faith effort, building recommendations are based solely upon the information provided. Therefore, no responsibility is assumed by Wilson Electronics, LLC, for any business or personal losses arising from the use of our designs. Thank you.

### Building Information

For putting your phone into Test Mode (to see the signal strength in decibels, rather than bars), please visit our most up-to-date list, located on the [Wilson Electronics website](#).

Cellular Service Provider: <input type="text"/>	Outside -dB Reading: <input type="text"/>
Cellular Service Provider: <input type="text"/>	Outside -dB Reading: <input type="text"/>
Cellular Service Provider: <input type="text"/>	Outside -dB Reading: <input type="text"/>
Cellular Service Provider: <input type="text"/>	Outside -dB Reading: <input type="text"/>

*Please provide a drawing for each floor that needs coverage.*

Square footage of each floor needing coverage:

Total square footage of the building: <input type="text"/>	Number of floors: <input type="text"/>
Square Footage of Floor #1: <input type="text"/>	Square Footage of Additional Floors (if applicable): <input type="text"/>
Ceiling height: <input type="text"/>	Is there concrete between floor levels? <input type="radio"/> Yes <input type="radio"/> No
Exterior building construction: <input type="text"/>	Interior wall construction: <input type="text"/>

Is the building pre-wired with cable? If yes, please note the type of cable:

Additional requirements (signal booster/antenna locations, cable preferences, etc):

**Wilson Tech Support (7am to 7pm MST)**  
**(866) 294-1660**

[tech@wilsonelectronics.com](mailto:tech@wilsonelectronics.com)

# Certification Test

Log into the Wilson Electronics web site at  
<http://www.wilsonelectronics.com/forms/WCI-Test>

Complete the WCI information form

Proceed to the test page and follow the instructions

Results will be returned via email along with priority  
tech support phone number and welcome packet  
within seven business days

